Study in support of the mid-term evaluation of the functioning and the implementation of Council Directive 2009/119/EC on Oil Stocks

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"Mid-term evaluation of the functioning and implementation of Council Directive 2009/119/EC, of 14 September 2009, imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products"

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Disclaimer

The views expressed in this report are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission

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List of acronyms

IA	Impact assessment
bbl	Barrel (of oil)
cbm	Cubic meter
COE	Crude Oil Equivalent
CSA	Central Stockholding Agency (CSA and CSE are used interchangeably)
CSE	Central Stockholding Entity (CSA and CSE are used interchangeably)
CSO	Compulsory Stockholding Obligation
DORS	Downstream Oil Reporting System
DG ENER	European Commission, DG Energy
EC	European Commission
EOS	Emergency Oil Stocks
EU	European Union
IEA	International Energy Agency
IEP	International Energy Programme
JRC	Joint Research Centre (part of European Commission)
kbd	Thousand barrels per day
ktoe	Thousand tonnes of oil equivalent
Mbpd	Million barrels per day
MOR	Minimum Operating Requirements
MOS	Monthly oil and gas questionnaire
MS	Member State (of the European Union)
OCG	Oil Coordination Group (created by Article 17 of Directive 2009/119)
OPEC	Organisation of Petroleum Exporting Countries
SOE	State-Owned-Enterprise
SEQ	IEA Standing Group on Emergency Questions
ToR	Terms of Reference

Executive Summary

Trinomics (lead) and Technopolis supported DG Energy of the European Commission with the 'Mid-term evaluation of the functioning and implementation of Council Directive 2009/119/EC.[1] Directive 2009/119 repealed earlier legislation imposing an obligation on EU Member States to hold emergency oil stocks aiming to ensure the continuity of supply of petroleum products to consumers in case of possible disruptions. The general objective of this study is to provide the Commission with an independent evaluation of the functioning and implementation of Directive 2009/119. The main points to be evaluated were:

- Assess the impact of the Directive on the stockholding systems implemented across Europe (in particular if Member States moved to a new stockholding model) and the share of stocks held by different players (governments, CSEs, industry);
- Examine whether the differences between national stockholding systems have any negative consequences, e.g. on security of supply and on the internal market;
- Check whether the objectives of the Directive still correspond to the needs of the policy area (security of oil supply);
- Assess to what extent the main objectives of the Directive have been achieved:
    - to improve the availability of stocks;
    - to reach a better harmonisation with the IEA system;
    - to reduce Member States' administrative burden;
    - to improve the transparency of stocks.

In line with the EC Better Regulation Guidelines[2] we assessed Directive 2009/119 with regard to five evaluation criteria: effectiveness, efficiency, relevance, coherence and EU added value. Given the fact that this report is part of a mid-term evaluation of the functioning and implementation of Directive 2009/119, we have not analysed the pros and cons of the Directive vis-à-vis fundamentally different policy alternatives, but have, from a methodological perspective, concentrated on the comparison of Directive 2009/119 with the situation under the preceding Directive 2006/67.

Overall conclusion

Based on the findings presented in this report we evaluate the functioning and implementation of Directive 2009/119 positively. The rationale for EU legislation imposing an obligation on Member States to maintain minimum stocks of crude oil and petroleum products is confirmed and the Directive provides significant added value compared to relying on IEA methodology[3] only. The objectives of the Directive have largely been achieved: the availability and transparency of stocks have improved and there is a better harmonisation with the IEA system (which has been the partial cause of unintended negative side effects). However, the administrative burden has risen somewhat. All in all, the Directive contributes to strengthening the security of supply, to minimising negative impacts of a disruption on the EU economy and to ensuring an efficient response to supply difficulties (the overall objectives). This overall positive assessment is shared by the stakeholders consulted in the survey and the

1 Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products.
2 Better Regulation Guidelines SWD(2015) 111.
3 Agreement on International Energy Programme.

interviews: a large majority of the stakeholders consider that Directive 2009/119 enhanced the quality and credibility of the overall emergency oil stockholding system and that Directive 2009/119 is an improvement compared to the previous legislative acts that were repealed by the Directive.

Stockholding systems implemented across the EU

There continues to be a wide variety of stockholding systems for oil in the EU. As of today, 23 Member States have a Central Stockholding Entity (CSE), of which three are industry-led (AT, DK, FR) and two are managed solely by the Member State government (CZ, LV). Eleven CSEs, including one industry-led CSE, are the exclusive emergency stockholding entities in their respective countries (AT, BE, CZ, DE, EE, HR, HU, IE, LV, SI, SK) whereas in the other twelve Member States the obligation to hold emergency stocks is put on both the CSE and the oil industry (BG, CY, DK, FI, FR, IT, LT, LU, NL, PL, PT, ES). Five Member States do not have a CSE and place the entire obligation on the oil industry (EL, MT, RO, SE, UK).

The Directive contributed to the establishment of more CSE-based systems in the EU. Five Member States changed their stockholding system, four to a more CSE-based system (AT, BE, IT, LU) and one moved to an industry system (RO), although they are considering the establishment of a CSE in the future. Greece and Malta are also considering the establishment of a CSE. The UK were considering a privately-run CSE, but this approach was no longer possible following new guidance from Eurostat meaning this would be classified as a public entity. In line with the establishment of more CSE-based systems in the EU, the share of emergency stocks held by CSEs increased from 49% to 55% from January 2013 to December 2014.[4]

The remaining differences between national stockholding systems do not appear to have had any negative consequences on, for example, the security of supply or the internal market.

Effectiveness

The Directive is by and large effective: the specific objectives and planned outputs of the Directive have largely been achieved:

The effect of the Directive on the **availability of emergency stocks** is moderately positive. The actual level of emergency stocks has risen somewhat relative to the obligation since 2013, which in our view is related to the adoption of the 10% deduction rule (for more details see Chapter 5) and the fact that commercial stocks can no longer be counted to meet the stockholding obligation, which tends in times of crises to increase the actual amount of oil stocks available. The Directive also requires the full availability and accessibility of emergency stocks at all times and the feedback from stakeholders generally confirms that this is the case, albeit that around half of the Member States do not know whether minimum operating requirements (MORs) are included in the reporting of emergency stocks (which would cause doubt about the actual availability of all emergency stocks in case of a crisis). The fact that products held are a better reflection of consumption patterns than before has a positive effect on availability, whereas the revision of the emergency procedures in the Directive has had a positive effect on the harmonisation with the IEA and also contributes to ensuring an efficient response to supply difficulties.

[4] No data available before 2013.

We also observed that the level of commingled stocks (emergency stocks kept in the same storage facility as commercial stocks) went up somewhat and is expected to rise somewhat more in the coming years, but this development does not have an impact on availability. The inclusion of the notion of specific stocks in the Directive has not reached its goals and is therefore not effective (in terms of improving the availability of emergency stocks). As Member States have an alternative (holding one third of the stockholding obligation in the form of finished products reflecting consumption patterns), there is however no direct negative effect from including this notion in the Directive.

The feedback from stakeholders is in line with our conclusion that the Directive has a moderately positive effect on the availability of emergency stocks: 44% of the public authority respondents considered that the Directive improved the availability of emergency stocks, whereas 56% thought that availability has remained the same.

The effect of the Directive on the **transparency of stocks** is positive, in the sense that it improved the transparency of the composition of emergency stocks held in Member States. The distinction between emergency and commercial stocks has a positive effect on the transparency of stocks as well as the fact that non-transparent 'tickets of tickets' are no longer possible. The requirement to maintain a register of emergency stocks has also improved the quality of information about the location and quantity of Member State stocks held abroad. Furthermore, the improved comparability of the EU and IEA emergency oil stockholding figures has a positive effect on the transparency of emergency stocks and the reporting on individual product stocks held is more transparent than the former use of product categories.

Although emergency stocks and commercial stocks are defined in the Directive and the distinction between the two is clear, there remains uncertainty amongst stakeholders as to whether reported stocks by Member States are fully comparable. Issues also remain with auditing and control of stocks held abroad as well as discrepancies in cross-border stocks reporting.

The feedback from public stakeholders is in line with our conclusion that the Directive has had a positive effect on the transparency of emergency stocks: 82% of the public authority respondents to the survey considered that the Directive improved the transparency of emergency stocks, whereas 18% thought the transparency has remained the same.

The **harmonisation with the IEA system** regarding certain elements (reporting, calculation of the obligation, emergency response mechanisms) has improved, although the harmonisation efforts also created some efficiency problems that need to be addressed. The goal to **reduce the administrative burden** has however not been achieved. Both issues are further addressed under efficiency.

Efficiency

Efficiency relates to the extent to which the desired effects are achieved at reasonable cost. It is however very difficult, if not impossible, to put a (reasonable) value on the security of supply of oil and oil products. Rather, and in line with the Terms of Reference (ToR) for this study, we have looked at the effect on efficiency of the harmonisation with the IEA system and simplifying reporting, and assessed the effect of the Directive on storage costs (as compared to Directive 2006/67).

Total storage costs have gone down in absolute terms for most Member States in line with a lower stockholding obligation (linked to lower net imports/ inland consumption), but would have gone down more without the 10% deduction rule as without this rule less emergency stocks should be held. One-off costs of varying magnitude had to be met in order to change the type and/or volume of product stocks[5] for better reflecting consumption patterns. Also average per unit storage costs have gone up slightly because some Members States had to increase certain product stocks with relatively high per unit storage costs (such as jet fuel). These additional costs (relative to what would have applied under the previous Directive) have no impact on efficiency, given that there are benefits (better availability) in holding products that better reflect consumption patterns and additional stocks because of the 10% deduction rule.

The reporting requirements have increased. More reports have to be submitted to the Commission than before. Public authorities and, to a lesser extent, economic operators indicate that the administrative burden has risen. The impact on efficiency is less clear. Some reports are seen as useful, whereas the usefulness of some are questioned. Also, some of the reporting relates to energy statistics reporting required for other purposes.

The fact that Directive 2009/119 no longer requires Member States to conclude bilateral agreements for holding cross-border stocks had a limited positive effect on the use of cross-border stocks and has reduced ticket costs in these cases, with a subsequent positive effect on efficiency. This positive effect is diminished by the fact that many Member States still require bilateral agreements or Memoranda of Understanding.

There is now better harmonisation with the IEA system and a number of these harmonisation measures have a positive effect on efficiency. Firstly, rather than having to report separately, the adjusted monthly oil and gas questionnaire of Eurostat (MOS) combines the reporting processes of the EU and the IEA. Particularly for Member States that are also IEA members, this eased the reporting process and reduced administrative burden. Secondly, the EU method to calculate the obligation has been aligned with the IEA and the situation where Member States that were also members of the IEA faced two different obligations has ceased to exist. The methods to calculate the level of emergency stocks have also largely been aligned, with the exception of commercial stocks (which are part of the IEA calculation, but not part of the EU calculation). This has a positive effect on efficiency, as one calculation is now needed instead of two, and if Member States comply with the requirements of the Directive, they also automatically comply with the IEA requirements. Thirdly, as mentioned above, the revision of the emergency procedures has a positive effect on the harmonisation with the IEA, but the impact here is on effectiveness (it contributes to ensuring an efficient response to supply difficulties) rather than on efficiency.

The harmonisation with the IEA system has also resulted in a number of unintended side effects with a negative impact on efficiency. The underlying reason for these unintended side effects is that the annual changes in the obligation in the EU system generally lead to changes in emergency stockholdings, whereas the inclusion of commercial stocks in the IEA system acts as a cushion (i.e. additional buffer) and therefore the annual changes in the obligation often do not require actual adjustments in emergency stock levels.

[5] Stakeholders were reluctant to share precise details of these costs.

Firstly, the adoption of the naphtha rule (to account for stocks used for non-energy purposes) can result in large swings in the annual obligation of Member States to hold emergency stocks close to the 7% naphtha yield threshold.[6] Although this concerns a minority of Member States (six), it can give rise to such substantial transaction costs and inefficiencies (when its application leads to, potentially substantial, annual fluctuations in the required level of emergency stocks) that the overall negative effect on efficiency (costs go up without noticeable benefits) should not be neglected.

Secondly, as in the IEA system, to compensate for unavailable stocks only 90% of the total emergency stocks can be counted towards meeting the obligation. Whereas this deduction seems justified in the IEA system, this is much less so in the EU system: (1) the Directive stipulates that all emergency stocks should be available and physically accessible at all times, and (2) commercial stocks are not part of the emergency stocks and if sufficient commercial stocks are held on top of the emergency stocks it seems likely that the emergency stocks would in fact be available in case of an emergency (any unavailable stocks of economic operators would be part of their commercial stocks and not of their emergency stocks). The conclusion is that, although the obligation is formally the same, the actual availability of emergency stocks is higher in the EU system than in the IEA system. Hence, if the 10% deduction in the EU system is deemed not justified and was no longer applied, the storage costs would go down considerably, and would result in a contribution to the security of supply that is comparable to what is achieved under the IEA system.

Thirdly, Member States should comply no later than the 1st of April (was 31st of July until 2012) with the obligation for that particular year, whereas members of the IEA effectively have to comply on the 30th of April (was 31st of January until 2012). Given that the stockholding obligation is based on data for the year before and that the total stockholding obligation for a Member State needs to be subdivided over the CSE and economic operators, the time for making the necessary adjustments is very short. This may negatively affect the possibility of making the necessary adjustments to stock holdings in a cost-effective manner, particularly when the obligation goes up. This increases costs and because the benefits of meeting the obligation a few months earlier are relatively minor, this has a negative impact on efficiency.

Relevance and coherence

The problem analysis and needs assessment underlying the EU emergency stock policy remain valid. An update by the consultant of the IA analysis done in 2008, the stakeholder survey and the in-depth interviews confirm the relevance of holding emergency oil stocks. 90% of the survey respondents believe that the security of supply would be threatened if the EU and the IEA no longer required countries to hold emergency stocks. A large majority of the interviewees (from industry, government and CSEs) still feel that there is a need for emergency oil stocks to ensure security of supply. One of the underlying arguments is that demand-side measures to cope with supply disruptions are seen as being much less effective in comparison to holding emergency stocks. Also, although the oil market has become a somewhat more diverse international market, in which importers are able to switch to

[6] In the petrochemical industry, naphtha is a general term for the petroleum products that emerge first during the refining process of crude oil to create any other type of petroleum product (distillation). Since there are many types of crude oil and refining techniques, many different sorts of naphtha type products exist (in terms of chemical composition), but they are often classified as light (paraffinic) or heavy naphtha. Naphtha is most often used as input for creating other petroleum products (naphtha for petrochemical use) or – with some further refining – as a basis for gasoline fuels (based on Pandey, 2004).

alternative suppliers in case of supply disruptions, market reactions take time and supply disruptions may induce price spikes with a negative impact on the economy.

With regard to coherence, the objectives of Directive 2009/119 and the specific measures to achieve these objectives do not contradict the objectives and specific measures of other EU policy interventions. Although Directive 2009/119 is related to the broader field of energy security, emergency stockholding is rather distinct from other energy related policies. In Chapter 8 we have looked at the interlinkage of Directive 2009/119 with the overall EU energy policy framework, legislation relating to the security of gas supply, the inclusion of biofuels in the Renewable Energy Directive (2009/28), and the EU Refining Fitness Check[7]. The conclusion is that we see no problems with regard to the coherence of Directive 2009/119 with other EU policies.

EU added value

The Directive provides significant added value over the alternative of having no EU Directive. This conclusion is shared by virtually all consulted stakeholders in the survey and the interviews. The key reasons are:

- The EU is an integrated economy and an integrated and joint response is therefore more appropriate in order to minimise the impact of an oil supply disruption on the EU economy as a whole.
- Eight Member States are not members of the IEA. This could lead to differences in emergency oil stock systems and could complicate a joint response between IEA and non-IEA members.
- The IEA system is primarily designed to address large (global) supply disruptions, whereas Directive 2009/119 also includes the possibility of acting to address smaller, regional disruptions affecting one or more of the Member States.
- The EU (Court of Justice) has the power to impose fines or other sanctions on Member States who do not comply with the Directive, whereas the enforceability of the IEA obligation is low (i.e. the IEA cannot impose sanctions).
- Directive 2009/119 introduced the obligation of holding one third of the stockholding obligation in the form of finished products (or 30 days of inland consumption in the form of specific (product) stocks) reflecting consumption patterns. Compared to the IEA system, in which there is no requirement to hold finished products, this improves the availability of relevant oil products in case of a supply disruption.

Recommendations

Based on the analysis presented in this report, section 9.2 describes a number of recommendations to improve the functioning of Directive 2009/119. In short, these recommendations concern:[8]

- *The naphtha rule*. We recommend reviewing the naphtha rule, as relatively small changes in the naphtha yield (when this yield is close to 7%) could lead to large changes in the annual stockholding obligation and hence to substantial transaction costs;
- *The 1st of April compliance date*. We recommend that Member States should comply not later than the 1st of July, rather than the 1st of April with the obligation for that particular year, preferably in cooperation with the IEA. We also propose that the EU and the IEA should

7 Sectoral fitness check for the petroleum refining sector SWD(2015)284.
8 For further detail, see section 9.2.

harmonise whether compliance should be effective at the beginning of the month (as in the EU system) or at the end of the month (as in the IEA system);

- *The 10% deduction rule*. We recommend reviewing the 10% deduction rule. In chapter 9 we provide three options to adjust the 10% deduction rule (the 10% deduction rule would no longer apply a. to CSE-owned stocks; b. to all emergency stocks, including industry stocks and tickets (including amending Annex III to the Directive so that MORs cannot be counted as emergency stocks) c. to all emergency stocks under the condition that in addition to the emergency stocks, at least 10 days of commercial stocks (or 6.8 days for Member States with 61 days obligation) would be present in the country concerned at all reporting dates;
- The inclusion of *specific stocks* in the Directive has not had its desired effect. Many stakeholders consider it an anomaly that should not have become part of the Directive. We also see the drawbacks in the way in which specific stocks are currently included in the Directive. However, it can be argued that the concept has no negative impacts as Member States are not obliged to hold specific stocks. We therefore see no need for action in the short term and recommend reviewing specific stocks and any alternatives when a (more encompassing) revision of the Directive is considered in the future;
- *Harmonised conditions for cross-border stocks rather than bilateral agreements*. We recommend reviewing the option to describe the rights and obligations of the Member States with regard to cross-border stocks and tickets (mainly related to information provision and auditing of emergency stocks). This document could become an annex to the Directive and should have the aim of making the continued use of bilateral agreements superfluous;
- *Reporting requirements*. We recommend reviewing the need for the report required by Article 9(5) of Directive 2009/119 for Member States holding less than 30 days of specific stocks;
- *Methodology for calculating stock levels*. We recommend changing the wording in Annex III to accurately reflect that in the EU system 4% is not only deducted from crude oil, but also from NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons.
- In order to further improve the transparency of stocks we recommend:
    a. to consider how this transparency could be further improved in general, for example through making an explicit distinction between CSE-owned stocks, industry-owned stocks and tickets (bought by industry or CSEs and sold by industry or CSEs);
    b. considering the establishment of *a publicly available list linking all relevant components, feedstocks and oil products to the existing EU energy statistics Classification* to further improve the reporting of cross-border stocks and tickets and reduce the statistical discrepancies in the statistical reports.
- We recommend *clarifying the treatment of different types of naphtha* as an eligible emergency product in the Directive.

1 Introduction

1.1 Objectives of the study

Trinomics (lead) and Technopolis are supporting DG Energy of the European Commission with the 'Mid-term evaluation of the functioning and implementation of Council Directive 2009/119/EC.' Council Directive 2009/119/EC of 14 September 2009, imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products (Directive 2009/119)[9] repealed earlier legislation imposing an obligation on EU Member States to hold emergency oil stocks aiming to ensure the continuity of supply of petroleum products to consumers in case of possible disruptions, namely Directive 73/238, Directive 2006/67 and Decision 68/416. Article 22 of the Directive specifies that "by 31 December 2015, the Commission shall review the functioning and implementation of this Directive."

The general objective of this study is to provide the Commission with an independent evaluation of the functioning and implementation of Directive 2009/119. The main evaluation questions that should be addressed are:

- Assess the impact of the Directive on the stockholding systems implemented across Europe (in particular if Member States moved to a new stockholding model) and the share of stocks held by different players (governments, CSEs, industry);
- Examine whether the differences between national stockholding systems have any negative consequences, e.g. on security of supply and on the internal market;
- Check whether the objectives of the Directive still correspond to the needs of the policy area (security of oil supply);
- Assess to what extent the main objectives of the Directive have been achieved:
    - to improve the availability of stocks;
    - to reach a better harmonisation with the IEA system;
    - to reduce Member States' administrative burden;
    - to improve the transparency of stocks.

1.2 Activities undertaken and sources of information

The evaluation team have undertaken the following activities:

- *Desk research*. This includes an analysis of the transposition checks that were carried out on behalf of the Commission, the Directive itself, the impact assessment[10] that was prepared before developing the Directive and the consultation document[11] that was used to undertake the public consultation as part of the impact assessment, and other materials provided by the Commission (such as minutes of OCG meetings) or by other stakeholders (such as opinions on the Directive, specific notes on the impact of the naphtha rule and actual loss of oil or oil products when storage tanks needed to be emptied) and other materials and studies collected by the consultant).

[9] OJEU L 265, p.9.

10 : Impact assessment for the proposal for a Directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products. SEC(2008)2858.

[11] Consultation document on the revision of the emergency oil stocks regime in the EU "Towards a modern and effective system of oil stocks in Europe," 2008

- Two *online surveys*, a general survey and an administrative burden survey. 109 stakeholders filled in the general survey while 69 responses were collected for the administrative burden survey.[12]
- Between 50-60 in-depth *interviews* with 37 industry representatives, economic operators, OCG members and CSEs.
- Some of these interviews were conducted as part of six *case studies* (for Austria, Cyprus, the Netherlands, Romania, Spain and the UK). The case studies focused on four themes: (1) the availability of emergency stocks; (2) the justification for the 10% deduction; (3) cross-border stocks and cross-border tickets; and (4) emergency release mechanisms.
- *Stakeholder workshops*. A workshop was held in Rotterdam on 30 November 2015 with the representatives of CSEs from ten different Member States (three CSEs were unable to attend, but supported the main issues that were presented by the group) and a general stakeholder workshop was organised with administrative assistance from the Commission in Brussels on 12 January 2016 at which Trinomics presented the preliminary findings of the study. A final workshop with the OCG is scheduled for June 2016.
- A *data review* focusing on the collection and presentation of data and analyses related to the evaluation (sub)questions of the study. In this respect, Trinomics maintained regular contact (by telephone and by email) with both Eurostat and IEA to clarify data issues and the comparability between EU/Eurostat and IEA figures on emergency stocks.
- *Analysis and synthesis* through data triangulation of all collected facts, arguments and opinions as reflected in this report.

1.3 Structure of the report

This (draft) final report is structured as follows:

- An executive summary, including the key study findings, conclusions and recommendations;
- Chapter 1: an introduction summarising the objectives of the study, the policy context, sources of information and the structure of the report;
- Chapter 2: focuses on the main elements of our approach and methodology for the study. We present our evaluation framework and discuss the interlinkage between the evaluation questions included in the ToR for this study and the five evaluation criteria (effectiveness, efficiency, relevance, coherence and EU added value). We also discuss the main methods we have employed, including their strengths and weaknesses and give an overall assessment of the robustness of the results of the study;
- Chapter 3: provides background information and methodological context for the mid-term evaluation. We provide our interpretation of the intervention logic of the EU emergency oil stocks policy and briefly introduce the counterfactual, including a summary description of the main similarities and differences between the 2006 and 2009 Directives and the IEA system. Subsequently we discuss the transposition of Directive 2009/119 into national legislation and the extent to which non-complete transposition may have an impact on the functioning of the Directive. Chapter 3 ends with an overview of the stockholding systems across the EU;
- Chapters 4-8: are based on the information gathered via the various methods (desk research, surveys, interviews, case studies, workshops and data analysis), we present the study findings in an integrated way through linking the evidence obtained with the evaluation (sub)questions structured as per the five evaluation criteria. We present our findings related to effectiveness

[12] Out of the 109 respondents to the survey, nine hardly answered any of the questions.

(chapter 4), efficiency (chapter 5), relevance (chapter 6), coherence (chapter 7) and EU added value (chapter 8);

- Chapter 9: presents the overall conclusion and the final conclusion against each of the five evaluation criteria, based on the findings presented in the previous chapters. It also includes our recommendations;
- Annex A includes the six case study reports. Annex B presents the results of a data review focusing on the relevant evaluation (sub)questions of the study. The list of interviewed stakeholders is included in Annex C. Annex D and Annex E contain the results of the general survey and the administrative burden survey, respectively. Finally, Annex F provides a short history of the EU emergency oil stock policies starting with the first Directive on this issue in 1968. Also, the main similarities and differences between the 2006 and 2009 Directives and the IEA system are discussed at somewhat more length than in chapter 3.

2 Evaluation framework and approach

2.1 Introduction

This chapter presents the main elements of our approach for the study. In section 2.2 we present our evaluation framework and discuss the interlinkage between the evaluation questions included in the ToR for this study and the five evaluation criteria (effectiveness, efficiency, relevance, coherence and EU added value). This is followed by a discussion of the main methods we have used in this study in section 2.3. The concluding section 2.4 briefly summarises the strengths and weaknesses of our approach and the robustness of the results of this study.

2.2 Detailed evaluation questions

The Terms of Reference (ToR) for this evaluation contained a number of specific questions to be answered regarding the Directive. These questions were also summarised in the evaluation roadmap[13] that DG ENER produced. In our proposal to deliver this assignment we grouped these questions under the standard evaluation criteria, and described the methods we would use to answer each of the questions. The question grouping has evolved slightly as we have progressed with the work, mainly because of some (not unusual) overlap between the questions, and the need to decide where certain questions fit best in terms of ease of presentation and developing a coherent structure / storyline for this report.

The tables below present the standard evaluation criteria and show which question we have placed under each criteria. This illustrates the questions that we are answering in the body of this report (chapters 4 to 8).

Effectiveness

Effectiveness analysis considers how successful EU action has been in achieving or progressing towards its objectives. The question to be answered is: "*To what extent do the effects induced by an intervention correspond with its objectives as they are outlined in the intervention strategy?*" In order to address this question it is important to get a good understanding of the effects that have been induced by the Directive. The direct outputs need to be known as does what has resulted from these. It is also important to try and identify any unexpected impacts that have occurred.

Evaluation topics	Comments
1. Assess the impact of the Directive on the stockholding systems implemented across Europe (in particular if Member States moved to a new stockholding model) and the share of stocks held by different players (governments, CSEs, industry) 2. Examine whether the differences between national stockholding systems have any negative consequences, e.g. on security of supply and on the internal market	These topics are discussed in section 4.2.

[13] EVALUATION AND FITNESS CHECK (FC) ROADMAP - Mid-term evaluation of the functioning and implementation of Council Directive 2009/119/EC imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products. AP 2016/ENER/027 http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_ener_027_evaluation_art22_crude_oil_petroleum_en.pdf

4a) One of the main objectives of the 2009 Directive was to improve the availability of stocks, i.e. to ensure that in case of a disruption the stocks can be released quickly, efficiently and without undue obstacles. The evaluation should investigate whether and to what extent these measures contributed the improvement of the availability of stocks and security of supply. In particular, the evaluation should: 4a-1. assess the impact on the size and composition (crude oil, finished products, intermediate products, blending components) of stocks; 4a-2. examine the impact on costs to be borne by Member States and industry; 4a-3. assess the share of commingled stocks (emergency stocks held in the same tanks as commercial stocks) and whether this practice has an impact on availability; 4a-4. evaluate the availability of stocks in different stockholding regimes, e.g. by examining to what extent working stocks including minimum operating requirements (MOR) are reported as emergency stocks; 4a-5. assess whether specific stocks assure a better availability of stocks and why this system proved to be unattractive; 4a-6. consider whether the share of CSE stocks or specific stocks could be increased by additional incentives (e.g. exemption from the 10% deduction).	These topics are discussed in section 4.3, apart from question 4a-2 which is discussed in section 5.2. A related topic that we address is in section 4.3 is question 4b-5 on emergency response mechanisms and preparedness testing (related to 'can the stocks be released quickly, efficiently and without undue obstacles' mentioned in the availability of stocks).
4d) The Directive was meant to improve the transparency of stocks, in particular by distinguishing emergency stocks and commercial stocks. The questions were: 4d-1 assess whether the distinction between emergency stocks, commercial stocks and working stocks is clear and to what extent the figures reported by individual Member States are comparable; 4d-2 examine the differences between IEA and EU figures and the scope for reducing and/or better explaining the differences; 4d-3 check whether the categories of the previous directive and the category "any oil" are used by Member States and economic operators.	These topics are discussed in section 4.4.

Relevance

Relevance looks at the relationship between the needs and problems in society and the objectives of the intervention. The question to be answered is: *To what extent is an intervention relevant in respect to the needs, problems and issues identified in target groups*? Topics under this heading tend to focus on the problems and market failures that the policy is intended to address, and assess if these still exist and if the policy is capable of addressing them. In this evaluation the central issue is the impact on the Directive on security of oil supply.

Evaluation topics	Comments
3. Check whether the objectives of the Directive still correspond to the needs of the policy area (security of oil supply);	This topic is discussed in chapter 6.

Efficiency

Efficiency considers the relationship between the resources used by an intervention and the changes generated by the intervention. The question to be answered is: *How economically have the resources used been converted into effects?* The evaluation topics related to harmonisation with the IEA and administrative burden most of all relate to the efficiency of the Directive and are for this reason discussed under this evaluation criterion.

Evaluation topics	Comments
4b) Another important objective was to reach a better harmonisation with the IEA system. Directive 2009/119 approximates the calculation methodology to that of the IEA and, as a result, for most Member States the EU and IEA obligations are effectively the same. 4b-1. assess to what extent the methodology used for the calculation of the obligation and the level of stocks has been aligned with that of the IEA and what impact it had on the level and composition of stocks; 4b-2. check whether there is scope for further alignment (e.g. with respect to the date of switching to the new obligation) or need to deviate from the IEA regime (for example to avoid its disadvantages like the 7% naphtha rule which may lead to great fluctuations of the obligation, or the very wide range of products); 4b-3. look at the incremental costs of adjusting stock levels, particularly for the non-IEA countries, some of which had to increase stock levels considerably (some of these countries benefited from a 2-year transition period); 4b-4. examine the differences between Member States' methodologies, e.g. with regard to the eligibility of certain feedstocks/products, and the possible negative impacts of such differences; 4b-5. investigate whether the emergency procedures would allow a better coordination with the IEA in case of a disruption and a possible IEA collective action.	These topics are discussed in section 5.3, apart from issue 4b-5 which is discussed in section 4.3. The majority of these topics could also be classified as effectiveness given the importance of harmonisation as an objective of the Directive.
4c) The Commission endeavoured to reduce Member States' administrative burden by approximating the IEA methodology and by simplifying reporting: a single reporting tool (the MOS questionnaire) was developed which is used both by the IEA and the Commission. On the other hand, additional reporting obligations were introduced (commercial stocks, annual reports). Overall, there seem to be significant differences in the limits, conditions and authorisation procedures applied by Member States for cross-border stocks. 4c-1 assess how the changes in calculation methodology and reporting impacted the administrative burden of Member States, e.g. by checking the time needed to make the calculations and fulfilling the reports (monthly and annual);	These topics are discussed in section 5.4. These topics could also be classified under effectiveness given that one of the planned outputs was to reduce the administrative burden through simplifying reporting.

Evaluation topics	Comments
4c-2 consider whether there is scope for simplification with respect to the calculation of the obligation and the stock levels (e.g. relaxing the requirement to use the same method for a whole calendar year, foreseen in Annex III of the Directive); 4c-3 examine whether removing the requirement to conclude bilateral agreements had an impact on the use of cross-border stocks; 4c-5 survey the limits and conditions on the possibility of holding stocks abroad set by the different Member States (including the applicable authorization procedures and the possible requirement to have bilateral agreements) and assess to what extent the different restrictions impede cross-border stockholding and, possible, increase costs; 4c-6 assess to what extent economic operators can delegate their obligation to CSEs, both in their own country and abroad; if there are obstacles, how these could be addressed.	

Coherence

The evaluation of coherence involves looking at how well or not different actions work together. The questions to be answered are: '*To what extent are the elements of the intervention logic complementary, mutually supportive and non-contradictory? To what extent do the objectives and activities support or contradict those of other public interventions*?' The ToR does not include specific evaluation questions related to coherence. In Chapter 8 we analyse whether the objectives of Directive 2009/119 are fully in line with the objectives of other related legislation or policies at EU level and whether its specific measures do not contradict with specific measures in other EU regulations.

EU added value

EU-added value looks for changes whichcan reasonably be argued to be the result of EU intervention, rather than any other factors. The key issue to establish EU added value is to establish what the counterfactual would have been, and what the impacts and results of this counterfactual would have been. It is not possible to be certain on what would have happened without EU level action, but this question can be analysed based on the findings of the study and also raised with Member State level representatives and other relevant actors, as is done in Chapter 7.

2.3 Methods employed and their strengths and weaknesses

2.3.1 Literature review

A key literature source for this evaluation has been the Impact Assessment (IA) of the 2009 Directive, and the documents of the public consultation. In order to test the relevance of the Directive, we have used literature and interviews to update the key assumptions of the IA. This update was done by pulling out the key assumptions in the IA and searching for literature written since this date that considered these assumptions, with the intention being to check if they still (in the eys of the authors of the literature) remain true. We have also utilised some MS specific analysis, for example the UK's recent work on their analysis of the issues involved with creating a CSE, the detailed review of the system in the Netherlands and reports prepared by various Member States on the impact of the naphtha rule and the actual loss of stock when storage tanks needed to be emptied. The literature review has also included a review of the transposition analysis carried out by DG ENER, the minutes of the meetings of

the Oil Stocks Coordination Group (OCG) and literature provided by the IEA. The References at the end of the report contains a list of the literature we have reviewed in this study.

The wider literature focussed on this specific issue is relatively limited. Although there is extensive and detailed analysis of the oil price, and a reasonable amount of literature on risks to oil supply on a short time horizon, there is relatively little recent discussion of the role of strategic oil storage in security of supply. We have utilised the most relevant literature we have been able to identify, particularly in the relevance, coherence and EU added value chapters. Our method for identifying literature was to use the expertise within our team to suggest academics who are active in this area. This knowledge was used as a starting point for web based literature searches, for example the work of Paul Stevens from Chatham House provided a number of useful links and ideas to follow up.

2.3.2 *Data analysis*

The main complexity in analysing the data on the stock holdings in each Member State was the differences in what was (and is) reported under the pre and post 2013 arrangements and the IEA requirements. Although each set of data is internally consistent, in order to analyse the changes over time it has been necessary to combine the data sets. This has required a degree of extrapolation and infilling plus close cooperation with the holders of the data (DG ENER (for the pre 2009 data), Eurostat (for the post 2009 data and some pre 2009 data)) and the IEA.

2.3.3 *Surveys*

Our approach involved two detailed on-line surveys. There was a general survey and an administrative burden survey. Invitations to complete one or both surveys were sent out via e-mail to a list of stakeholders. The stakeholder list was collated by starting with the individuals on the OCG contact list that was provided by DG ENER and then asking each OCG contact (via e-mail) to provide contact details for their CSE (if they had one and if they were not already in the OCG), any relevant trade associations, other national or regional governmental stakeholders, and a sample of up to 10 oil companies who are obligated stock holders (if relevant). The list was also added to by our own contacts and research and by additional suggestions from DG ENER. This approach generated a substantial and diverse database with some 300 contacts. The Stakeholder types in the list can be broken down as follows:

Stakeholder type	Number
OCG contacts (strictly speaking the OCG has 28 members, one for each Member State, but most Member States are present at OCG meetings with more than one representative)	62
Other MS contacts (government, but not OCG contacts)	34
CSEs (excluding OCG contacts who could also be classified as CSE representatives)	29
Oil companies – obligated suppliers, some companies are active in multiple MSs so were included more than once, this was felt to be justified as the situation varies by MS, so the views of different individuals from the same company but in different MSs are valid	115
Other stakeholders (e.g. industry associations)	37
MS statistical offices (data providers)	23
Total	**300**

The general survey included a core set of questions for all respondents but included different sets of additional questions for different respondent types. The survey questions were grouped in the following four sections:

- Questions 1 to 4 were related to the identity of the respondents (name, country, type of organisation);
- Questions 5 to 31 were for Central Stockholding Entity (CSE), National governments (OCG member), Other national government, regional or local government and Other types of respondent;
- Questions 32 to 38 were for Oil companies;
- Questions 39 to 44 were for all respondents (impacts of the Directive and recommendations).

Table 2-1 General survey - number of respondents per type

		# of responses	As % of respondents within the group	As % of respondents
National administrations and CSEs	Central Stockholding Entities (CSEs)	20	41%	18%
	National government (OCG contact)	22	45%	20%
	Other national government, regional or local government	7	14%	6%
Oil industry and other	Oil industry	36	60%	33%
	Other	24	40%	22%
	Total	**109**	-	**100%**

Note that the individual percentages may not add up to 100% because of rounding errors.

The administrative burden survey was designed to collect data on the amount of staff time and any other costs associated with the data collection and reporting requirements of the Directive. As with the general survey, respondents were routed to specific questions depending upon what type of stakeholder they were. The invitation email made it clear that the administrative burden survey was only relevant to those parts of government and oil companies who gather and report data on oil stocks. The questions were grouped into four sections, as follows:

- Questions 1 to 4 were related to the identity of the respondents (name, country, type of organisation);
- Questions 5 to 12 were for Central Stockholding Entities (CSE), National governments (OCG contacts) and Other national government, regional or local government);
- Questions 13 to 19 were for Oil companies and Other types of respondent
- Questions 20 and 21 were for all respondents (recommendations).

Table 2-2 Administrative Burden Survey - Number of respondents per type

		# of responses	As % of respondents within the group	As % of respondents
National administrations	Central Stockholding Entities (CSE),	17	49%	25%
	National government (OCG contact)	12	34%	17%

	Other national government, regional or local government	6	17%	9%
Oil industry and other	Oil industry	26	76%	38%
	Other	8	24%	12%
	Total	**69**	**-**	**100%**

Note that the individual percentages may not add up to 100% because of rounding errors.

The surveys were drafted in close cooperation with DG ENER and were tested with OCG representatives from three Member States to check for clarity and usability. The invitations to complete the survey were sent out on in early November 2015 with two reminders sent out prior to the completion date in early December 2015. A small booster sample was run in March 2016 in an attempt to get additional responses from Member State Statistical offices to the administrative burden survey.

Calculating the response rate to the surveys is somewhat complex due to the fact that many respondents did not complete all the questions. The response rate is also complicated by the fact that there is overlap between the respondents to the two surveys, with some respondents answering both surveys, and by the fact that some of the invited stakeholders forwarded the invitation on to colleagues who were not on our original stakeholder list. In simple terms, the response rate for the general survey was 109 responses from 300 invitations, equivalent to 36%. For the administrative burden survey, if it assumed that other Member States contacts and other contacts (trade associations) were not relevant (as they should not have a reporting burden), then 69 responses were received from 229 invitations, equivalent to 30%.

It is important to point out that there was some (intentional) overlap between the individuals asked, for example with the OCG contacts, many Member States have more than one OCG contact name included in our stakeholder list, but we would not expect more than one OCG response per Member State.

The strengths of the survey are:

- A relatively good response rate, given the unsolicited nature of the majority of the invitations;
- The respondents were very well informed, so the answers are based on a good working knowledge of the Directive in action;
- The questions were virtually all derived from the ToR and the Fitness Check roadmap, so they directly correspond to the evaluation questions that we need to answer;
- Trialling the survey with OCG members helped us to streamline the questions and clarify the terminology;
- There is a combination of closed and open questions, with open questions offering respondents the ability to add their own text. Respondents provided substantial and valuable additional information including examples and recommendations.

The weaknesses of the survey are:

- The sample was largely selected via the contacts of the OCG contacts, with some additions from our own and DG ENER's contacts. This approach was hard to avoid due to the technical, and relatively obscure, nature of the subject matter. It would have been very difficult for anyone not involved in the oil stocks process to answer the vast majority of the questions that we wished to pose. The stakeholder list that we constructed was representative by Member

State and stakeholder type, and we are confident that we got input (via the survey and/or interviews / workshops) from all relevant stakeholders;

- Many respondents missed some of the questions. The decision was taken to allow questions to be missed because it was thought better to allow respondents to answer the questions that they could, rather than only accepting fully completed surveys – as many respondents would only be able to complete some of the questions;
- Some respondents from the same country provided different answers. This was not an issue for questions related to an opinion or a judgement because it is perfectly plausible that different people from the same institution can have different opinions or judgements. However, this occurrence was more complicated for descriptive / factual questions and implied a long and thorough analysis of each response to check for consistency and to eliminate contradictory /unreliable responses (when possible);
- The data on costs that we collected via the administrative burden survey, was not as comprehensive or detailed as we would have liked. From the text responses in the surveys and the interviews it is apparent that many respondents found it impossible to isolate the work associated with the Directive's requirements from other routine activities.

Annexes D and E provide a detailed analysis of the survey questions and responses, with the answers broken down by respondent type where relevant.

2.3.4 Workshops

Our approach has involved the following two workshops:

- A stakeholder workshop with ten CSEs (organised on 30 November 2015);
- A general stakeholder workshop on 12 January 2016 in Brussels where Trinomics presented the preliminary findings. This workshop was held on the morning of an OCG meeting, to enable easy attendance from OCG members (as key stakeholders). All of the industry associations and oil companies in the stakeholder list (see survey) were also invited. Attendance from industry and trade associations was somewhat lower than ideal (11 of the 57 attendees were from companies or trade associations), but those who did attend made a useful contribution.

Both of these workshops provided extremely useful input to our work. The general stakeholder workshop provoked a number of written position papers from key stakeholders and also helped us to refine the issues which would most benefit from additional analysis, via data collection, interviews and country profiles.

2.3.5 Interviews

In order to add depth to the interviews and probe more deeply on specific issues, we have carried out a number of interviews. The table below shows the number by type. Note that we had two or more interviews with several stakeholders.

The range of stakeholders was in line with our targets and we feel it gives us a good sample of Member State types (in terms of oil stock holding arrangements) and sizes. It should also be remembered that almost all Member States were represented at the stakeholder workshop that was organised in January 2016. The industry associations consulted also represent the views of numerous companies.

Table 2-3 Number of in-depth interviews per stakeholder type

Stakeholder type	Number interviewed
European Commission	2
MS Contacts (including OCG members)	12
CSEs	9
Oil companies	10
Other stakeholders	4
Total	**37**

Ideally we would have liked more opinions from non-oil industry stakeholders, such as consumer groups and/or NGOs. However, the detailed and technical nature of the evaluation questions makes it very hard for non-specialists to offer an opinion. The Commission will hold a public consultation as part of this evaluation. This should offer the opportunity for less technical opinions to be collected and added.

2.3.6 Case studies

Our original approach to selecting and populating the case studies was adjusted in line with our (and DG ENER's) suggestions at the interim report stage. The agreed approach was to prepare six country case studies focussing on a number of specific topics in each country, to enable a structured comparison of approaches and issues. The specific topics are:

- A comparison of the actual availability of emergency stocks when the obligation is fully imposed on industry as compared to the availability when the obligation is (also) met by a CSE;
- The pros and cons of cross-border stocks and cross-border tickets;
- The justification of the 10% deduction rule in the EU system;
- The mechanism in place to release stocks in case of a disruption.

With an analysis of the following two issues on a 'horizontal' basis (i.e. not covered for all 6 countries - because the issues are common for all):

- The impact of the naphtha rule on the volatility of the annual obligation;
- The date by which countries should comply with the new stockholding obligation for the year (based on the previous year's oil use statistics).

The countries we selected, with the agreement of DG ENER, for the case studies are shown in the table below. The table also illustrates the factors that were taken into account in selecting the countries in order to get a representative sample.

Table 2-4 Countries selected for the country case studies

Country	Stockholding system	In-country storage facilities	IEA member	Island	Cross-border tickets allowed
Austria	CSE, industry led	Yes	Yes	No	No
Cyprus	Mixed	No (limited)	No	Yes	Yes
Netherlands	Mixed	Yes	Yes	No	Yes
Romania	Industry	Yes (producer)	No	No	Yes
Spain	Mixed	Yes	Yes	No	Yes
UK	Industry	Yes (producer)	Yes	Yes	Yes

As expected, some of the issues investigated in the case studies produced a uniform response, but this should not necessarily be viewed as a failing because it confirms that the variations in type of country do not necessarily affect views / experience in these issues.

The case studies are presented in annex A.

2.4 Strengths and weaknesses and robustness of the results

2.4.1 Strengths and weaknesses in the methodology

The sections above discuss the strengths and weaknesses of each of the methods employed. In summary these are:

Strengths:

- Good variety of MS involvement – with a good geographical spread and with a good mix of oil stock systems.
- Input from all stakeholder groups who are able to offer a well-informed opinion on the (relatively obscure) subject of oil stocks.
- A variety of methods – literature review, data analysis, survey and interviews – to enable cross checking of conclusions.

Weaknesses:

- Lack of input from wider stakeholder groups – e.g. consumer groups – although they would have struggled to answer the vast majority of the detailed and technical questions we were seeking to answer.
- A relatively small sample in the survey and interviews – though they are a good selection of the relevant and informed stakeholders.
- A low response rate on the administrative burden from national statistics offices. We made several attempts to boost this response but these were not very successful.

2.4.2 Confidence in our results

The discussion of methods in the preceding sections highlights the key strengths and weaknesses with each of the aspects. Given the detailed and specific nature of the questions posed in the ToR and in the Fitness Check roadmap, a relatively small number of individuals across Europe have the practical and policy knowledge to answer these questions, we are confident that our approach is as comprehensive and in depth as is possible given the budget and time constraints of this work.

Our approach has been to correlate the findings from the literature, including the Impact Assessment of the Directive, with the results of the survey and the opinions gathered from the interviews and workshops and with our analysis of the data on stockholding and stockholding types. We are confident that this approach has made maximum use of the available sources of information and has produced robust results. The public consultation that DG ENER will carry out will add an important group of opinions from stakeholders who are potentially impacted by the Directive but are not able to comment on its detailed arrangments, for example consumer groups who may have an opinion on the impact of the Directive on retail oil prices.

3 Intervention logic and background information

3.1 Introduction

This chapter provides background information and methodological context for the mid-term evaluation. In section 3.2 we present our interpretation of the intervention logic of the EU emergency oil stocks policy based on an analysis of official EC documents. This is followed by a short discussion of the counterfactual in section 3.3. In this section we also summarise the main similarities and differences between Directive 2009/119 and its predecessor, Directive 2006/67, and compare Directive 2009/119 with the IEA system. Section 3.4 discusses the transposition of Directive 2009/119 into national legislation and the extent to which non-complete transposition may have an impact on the functioning of the Directive. The chapter ends with an overview of the current stockholding systems in section 3.5.

3.2 Our interpretation of the intervention logic

The main elements of the intervention logic underlying Directive 2009/119 are best described in the recently published 'Evaluation and fitness check roadmap' (or roadmap for short).[14] The intervention logic described in this section is largely based on this roadmap, supplemented with information on the problem analysis from the impact assessment[15] (prepared before developing the Directive) and the consultation document[16] (that was used to undertake the public consultation as part of the impact assessment). We also checked the consistency of these documents with the Directive itself[17] and the Terms of Reference for this mid-term evaluation.[18] The text below discusses the problems that the policy was designed to address. This is followed by a review of the specific objectives of the Directive, the planned outputs and the actions taken.

What is the problem? (What are the needs?)

Notwithstanding efforts to improve energy efficiency and increase the share of renewables in energy consumption, the European Union depends heavily on a continuous, reliable and affordable supply of oil, particularly the transport sector and chemical industry. Indigenous oil production within the EU is low (compared to imports) and decreasing, global demand is increasing and the supply of oil is more and more concentrated in a handful of countries, many of which are exposed to high geopolitical risks. The risk of supply disruptions is therefore increasing. Market and administrative reactions to such a supply disruption (switch to other suppliers, fuel switching, increase of indigenous production, demand restraint measures) take time and will only be a partially effective response.

[14] European Commission (2015cb). See http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_ener_027_evaluation_art22_crude_oil_petroleum_en.pdf (version on the website of February 2016).
[15] European Commission (2008a)
[16] Consultation document on the revision of the emergency oil stocks regime in the EU "Towards a modern and effective system of oil stocks in Europe," 2008. See http://europa.eu/rapid/press-release_IP-08-623_en.htm
[17] Council Directive 2009/119/EC of 14 September 2009 "imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products."
[18] Terms of Reference for the mid-term evaluation of "the functioning and implementation of Council Directive 2009/119/EC, of 14 September 2009, imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products," 2015.

Rationale and overall objectives

Given the problems described above , the accepted solution is that emergency stockholdings of oil and the ability to draw down such stocks are the easiest and fastest way of making large volumes of additional oil and/or oil products available to the market, thereby alleviating market shortage during supply disruptions. This is particularly valid in the short term, until markets adapt to the new circumstances and potential administrative measures have a material impact on market conditions. Also, since oil markets are global, any disruptions to oil supply – whether they occur in one or more Member State or outside the EU – will have repercussions on all Member States. Furthermore, in integrated economies such as the EU internal market, the level of emergency preparedness of any single Member State will influence the level of preparedness of the Union as a whole. If minimum requirements are imposed throughout the EU, it may be easier to avoid the emergence of a problem or to cope with a disruption. Finally, given the system provided by the IEA to maintain minimum stocks, an independent EU system is deemed necessary because not all Member States are member of the IEA and it is not likely that they all will join the IEA in the foreseeable future.[19] In addition, the IEA system does not have the ability to impose sanctions on members that do not fulfil their obligations and there may be smaller, regional disruptions which affect one or more Member State but do not trigger the IEA mechanism which is focused on disruptions with a global impact.

The discussion above results in the following three overall objectives, which are included as expected results/impacts in the roadmap that has been prepared for this evaluation:[20]

- to strengthen security of supply of oil products;
- to minimise negative impacts of a disruption on the EU economy (high resilience to oil supply disruption);
- to ensure an efficient response to supply difficulties, in coordination with the IEA.

Specific objectives, actions and planned outputs

According to the roadmap, Directive 2009/119/EC aims to achieve the following two specific objectives:

- to guarantee the availability of emergency stocks to be used in case of supply disruptions;
- to ensure convergence between EU and IEA stockholding requirements.

The actions that Member States have to take in support of these objectives include that they should:

- maintain emergency stocks of crude oil and/or petroleum products equal to at least 90 days of net imports or 61 days of consumption, whichever is higher;
- send the EC a statistical summary of their stocks at the end of each month and an annual report;
- have emergency procedures in place in order to release quickly their emergency stocks.

In addition, the roadmap refers to the objectives of the revision of the previous rules in Directive 2009/119 that were mainly contained in Directive 2006/67. In the intervention logic (see also Figure 2-1) we have treated these objectives as planned outputs of the Directive:

1. ***Improved availability of stocks***. Compared to the requirements under Directive 2006/67/EC, the requirements related to availability have been clarified (e.g. excluding stocks held by

[19] The above justification for an independent EU system should however not lead to a competition between the two systems. Instead, they should function in a complementary way, reinforcing each other in case of a disruption.
[20] European Commission (2015b). See http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_ener_027_evaluation_art22_crude_oil_petroleum_en.pdf (version on the website of February 2016).

bankrupt companies) and a definition of physical accessibility has been introduced. The Directive also contains rules on setting up Central Stockholding Entities (CSEs), requires that at least one third of the obligation to hold emergency stocks is held in the form of finished products (which should reflect consumption patterns), and introduces the so-called specific stocks (stocks that meet stricter requirements related to their composition and availability). Finally, the Directive prohibits the sub-delegation of the obligation, thereby avoiding potentially non-transparent and unreliable tickets.

2. ***Better harmonisation with the IEA system***. The Directive approximates the calculation methodology to that of the IEA. For net importers, the obligation became 90 days of average net imports and, like in the IEA system, a 10% deduction was introduced, meaning that de facto 100 days need to be held. In the Directive, also net exporters have a stockholding obligation equal to 61 days of inland consumption (de facto 67.8 days given the 10% deduction), whereas in the IEA system net exporters do not have a stockholding obligation. Also the way emergency stocks are calculated was harmonised with the IEA, including how naphtha yield should be accounted for.[21] Furthermore, the Directive revised the emergency procedures, distinguishing disruptions triggering an IEA collective action and those which do not. Differences that remain include the imposition of stricter requirements on the availability and composition of stocks: in particular the Directive requires that one third of total stocks should be held in the form of finished products reflecting consumption patterns and commercial stocks (stocks not held for the specific purposes of the Directive) may not be counted in the EU system but can be counted in the IEA system.
3. ***Reduced administrative burden***, by approximating the IEA methodology and by simplifying reporting. A single reporting tool (the MOS questionnaire) was developed which is used by both the IEA and the Commission, while at the same time additional reporting obligations were introduced (commercial stocks, annual reports).[22] The requirement under the previous legislation allowing cross-border stockholding only if there was a bilateral agreement between the Member States concerned was abolished and replaced by lighter (authorisation) requirements.
4. ***Improved transparency of stocks***, in particular by distinguishing emergency stocks and commercial stocks.

Graphical representation of the intervention logic, including actions and results

A simplified intervention logic, based on Tool #42 of the EC *Better Regulation Guidelines*, is presented in Figure 3-1 below. Figure 3-1 also incorporates the five evaluation criteria effectiveness, efficiency, relevance, coherence and EU added value.[23]

[21] In the petrochemical industry, naphtha is a general term for the petroleum products that emerge first during the refining process of crude oil to create any other type of petroleum product (distillation). Since there are many types of crude oil and refining techniques, many different types of naphtha type products exist (in terms of chemical composition), but they are often classified as light (paraffinic) or heavy naphtha. Naphtha is most often used as input for creating other petroleum products (naphtha for petrochemical use) or – with some further refining – as a basis for gasoline fuels (based on Pandey, 2004). Naphtha yield is a ratio that represents the volume of naphtha that is produced from a unit of refinery input (crude oil). More specifically, it is calculated by dividing the output of naphtha by the refinery inputs (crude oil or others).

[22] The main difference between the EU and IEA methodology is in commercial stocks. Basically, the IEA counts public (i.e. CSE/government held) stocks plus all commercial stocks declared by the countries, minus a fixed 10% for unavailable stocks. Under the Directive, Member States have to differentiate between public stocks, stocks held by economic operators for emergency purposes and "regular" commercial stocks. Only the first two are counted into the Member States' coverage of their obligation and the Directive also applies the 10% deduction.

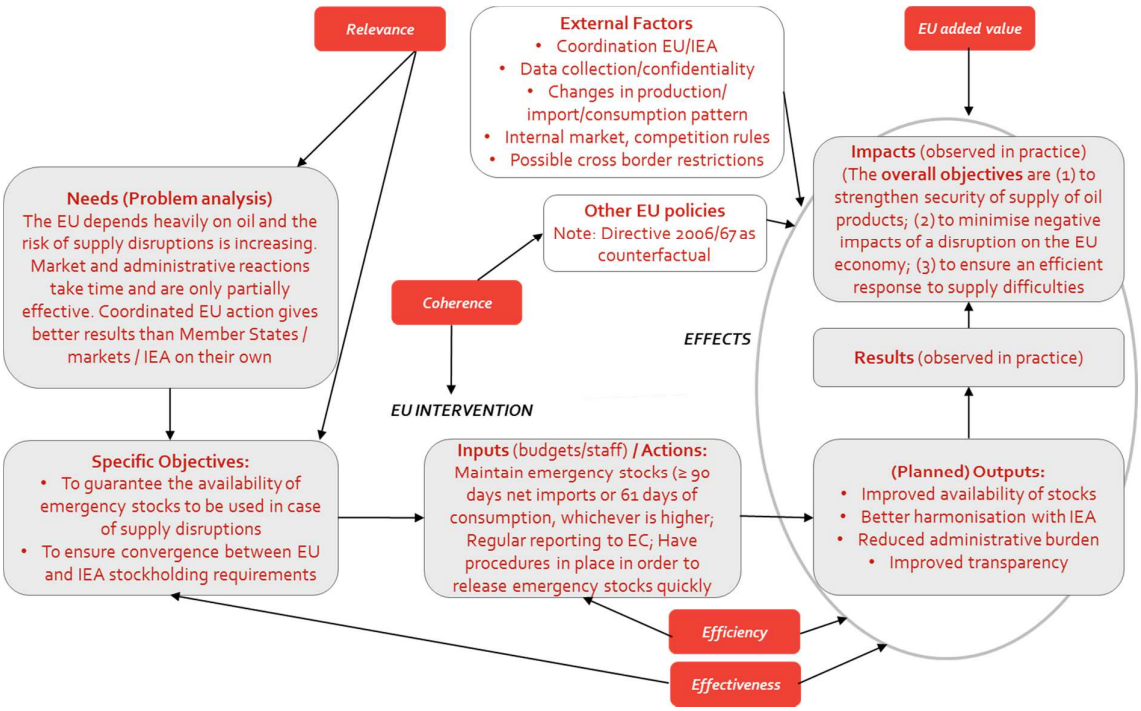
[23] Note that for lack of space in Figure 3-1, the inputs and actions have been included in one box rather than in two separate boxes. Answering evaluation questions 1, 2 and 4 essentially deals with collecting evidence on the causal chain following from the main actions that are prescribed in the Directive via the outputs and effects the Directive aims to produce to the results and impacts observed in practice, while answering evaluation question 3 essentially deals with establishing the contribution the Directive has on the strengthening of security of supply in the EU and the problem analysis underlying the needs assessment of the EU policies regarding minimum stocks.

3.3 Choice of counterfactual

In the mid-term evaluation, it is important to explore not just whether or not the effects have been realised, but also what role the Directive has played in delivering these effects. Methodologically, the observed effects (the factual) have to be compared with the anticipated effects under an alternative policy scenario (the counterfactual), while having controlled for the impact of external factors/ other EU policies in both scenarios, to establish EU added value. Hence, the agreement of the counterfactual is also key to the intervention logic. Given the focus of this mid-term evaluation on the functioning and the implementation of Directive 2009/119, the counterfactual we have chosen is the legislative framework prior to the 2009 revision. In chapter 3, section 3.4, we discuss the main differences between Directive 2009/119 and Directive 2006/67.

While answering evaluation question 3 from the ToR ("Check whether the objectives of the Directive still correspond to the needs of the policy area"), we have also considered the counterfactual scenario of the EU not having its own policy and being entirely reliant on the IEA system to maintain stocks (the "no Directive, just the IEA system" counterfactual). Table 3-1 summarises the key difference and similarities between the 2006 Directive, the 2009 Directive and in the IEA system.

Figure 3-1 Simplified intervention logic



Source: Trinomics based on the methodology described in Tool#42 in the EC Better Regulation Guidelines.

Note: the EU intervention is described by the objectives, inputs, actions and (planned) outputs of Directive 2009/119/EC.

Table 3-1 Emergency stockholding rules under the 2006 and 2009 Directives and the IEA

	2006 Directive	2009 Directive	IEA
Stockholding obligation	90 days of average inland consumption, for each of three categories. Up to 25% deduction corresponding to indigenous production.	90 days of average net imports or 61 days of average inland consumption, whichever is higher. Introduction of 10% deduction, so de facto 100 days or 67.8 days.	90 days of average net imports. No obligation for countries that are net exporters. 10% deduction is applied, so de facto 100 days.
Composition of stocks	Compliance for each category individually. Intermediate products and crude oil could be used to comply with the obligation per category.	Compliance at aggregated level. As part of the CSO, Member States must hold 30 days "specific stocks" or 1/3 of total stocks in finished products.	No specific rule regarding composition of stocks: stocks for compliance are transformed into crude oil equivalent and compared to the obligation.
Obligation calculation	Obligation calculated for each category individually, in product equivalent. The obligation based on data for year *t-1* must be adhered to by the 31st of July in year *t*.	General obligation calculated with products and crude oil, in crude oil equivalent. A naphtha yield of 4% (or the actual naphtha yield, if it is higher than 7%) is deducted from primary products. The obligation based on data for year *t-1* must be adhered to by the 1st of April in year *t*.	Equal to the 2009 Directive. Compliance with the calculation according to year *t-1* must happen by the end of April.
Calculation of emergency stocks	No differentiation between commercial and emergency stocks. Stocks calculated in tonnes of product equivalent for each category. Crude oil tonnes transformed to product tonnes according to actual transformation ratios of crude oil to finished products.	Commercial stocks are not included in the calculation. Stocks calculated in tonnes of crude oil equivalent. Member States choose between two different fixed rules to transform primary products and finished products into crude oil equivalent. A naphtha yield of 4% is subtracted from crude oil, NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons.	The rules for transformation of primary products and finished products into crude oil equivalent are the same as in the 2009 Directive. A naphtha yield of 4% is subtracted from crude oil, NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons.
Cross-border tickets and delegation	Obligation to sign bilateral agreements. No explicit regulation on delegation possibilities, sub-delegation possible in practice.	No obligation to sign bilateral agreements. Explicit right to delegate stockholding obligations for economic operators. Sub-delegation explicitly forbidden.	The IEA requires bilateral agreements for countries to hold stocks abroad. This agreement must ensure that the stock held abroad can be accessed in case of an emergency without obstacles.

	2006 Directive	2009 Directive	IEA
Reporting obligations	Monthly report on the level of emergency stocks for each category. Separate reporting to the EU and the IEA.	Monthly statistical summaries on (1) the level and composition of emergency stocks, (2) commercial stocks, and (3) specific stocks; Annual reports (1) with summary of register of non-specific stocks, and (2) for countries which did not choose to hold 30 days of specific stocks. Harmonized reporting rules with IEA. For CSEs, on an ongoing basis full information on stock volumes available for tickets to economic operators.	Integrated reporting for the EU and the IEA through the MOS questionnaire (monthly statistical summaries).

3.4 Transposition of Directive 2009/119 into national legislation

All Member States had to transpose Directive 2009/119 into their national legislation by 31 December 2012. Those Member States that were not members of the IEA and fully meet their inland consumption of petroleum products by imports had two more years to ensure full compliance with the Directive, and had to keep 81 days of net imports as emergency stocks in the interim period. By the end of 2012, out of the twenty Member States that should have completed transposition, only nine had done so. The majority of Member States declared complete transposition during 2013, with a few of them following suit in 2014 and the last one in the beginning of 2015.

An assessment of the conformity of the national legislation with the Directive in the summer of 2015 indicated that there were problems with transposition for all Member States, except Cyprus. Most of these problems referred to legislative omissions with regards to what could be considered as relatively minor points of the Directive. For example, 14 out of the 28 Member States did not transpose all the concepts listed in Article 2. The Article which was most incorrectly or insufficiently transposed was Article 9, which deals with specific stocks. However, it is noteworthy that only three Member States originally chose to have specific stocks, which means that an incorrect or insufficient transposition appears not to have had a noticeable effect on the functioning of the European stockholding system.

There are some cases of insufficient or incorrect transposition that may have effects on the efficacy and efficiency of the emergency stockholding system, namely problems in transposing articles related to the obligation itself (Articles 3 and 4, which were not perfectly transposed in 12 cases), availability and physical accessibility (Article 5, relevant to 14 Member States) and to the emergency procedures and contingency plans (Article 20, 20 Member States).

Other common cases of disconformity found in the compliance checks were related to the calculation methodologies (incorrect/insufficient transposition of Annexes, observed with regards to 11 Member States) and rules concerning delegation rights (Article 8, 14 Member States).

3.5 Overview of stockholding systems in the EU

In order to comply with the stockholding requirements of the Directive, Member States are free to choose different models and put the obligation on different parties. Although the systems that can be observed in the EU all vary to some extent, we have classified them under three stockholding models, ranging from most to least centralised. The most centralised systems are those in which one organisation (referred to as Central Stockholding Entity (CSE) and usually established by the State),[24] is the sole organisation responsible for holding emergency stocks. The most decentralised model is a model in which the entire stockholding obligation is put on the economic operators in the oil industry (and consequently no CSE exists), while the intermediate model is one in which the stockholding obligation is divided between industry and the CSE. Note however, that the CSE can also be an industry-led organisation, with varying influence of the government on its operations.[25]

[24] Note that also the government itself could hold emergency stocks. Currently, however, in all countries where there used to be government stocks, a CSE has been established as a legal entity with the purpose to hold emergency stocks for the purpose of meeting the requirements of Directive 2009/119.
[25] Note however, that in national accounts Eurostat treat the stocks held by all types of CSE as a public asset (as the stocks are regarded as a public good), so apart from the influence that the government has on operations of the CSE, the extent to which a CSE can be fully 'private' is open to debate.

As of today, there are 23 CSEs in the European Union, of which four are industry-led. The four industry-led CSEs are ELG (in Austria), FDO (Denmark), SAGESS (France) and CORES (Spain). Out of the 23 CSEs, 11 are the exclusive stockholding entities in their respective countries, whereas the remaining 12 hold stocks alongside the industry. Five Member States currently have no CSE, placing the entire obligation on the industry: Greece, Malta, Romania, Sweden and the UK. Italy (in 2014) and Luxembourg (in 2015) recently changed their system from a purely industry-based stockholding model into a mixed one.

The table below provides summary information about the stockholding systems in the 28 EU Member States. It also shows which Member States are members of the IEA, the shares of the stockholding obligation held by different players and presents information about the storage capacity and refining capacity per Member State. The information in this table is further analysed or referred to in Chapter 4 and to a lesser extent in Chapters 5-8.

Table 3-2. Summary of stockholding systems in Europe

Member State	Membership IEA	Stockholding model	CSE name	Legal form	Obligation (days)	December 2014					Total EOS (kt)	EOS/Total stocks	Storage capacity (kt)	Refining capacity (kt / 90days)
						Stocks/ obligation	% CSE or government	% economic operators	% products	% held abroad				
Austria	Yes	CSE	ELG	Industry-led	90	110%	98%	2%	51%	14%	3,056	90%	*5,663*	*2,618*
Belgium	Yes	CSE	APETRA	SOE	90	120%	100%	0%	44%	63%	4,338	64%	*10,297*	*9,528*
Bulgaria	No	Mixed	State Reserve and War-Time Stocks Ag.	Agency	90	79%	25%	75%	78%	16%	728	58%		***2,161***
Croatia	No	CSE	HANDA	Agency	90	103%	100%	0%	40%	28%	677	57%		
Cyprus	No	Mixed	COSMOS	SOE	90	91%	66%	34%	100%	40%	499	95%		
Czech R.	Yes	CSE	SSHR	SOE	90	110%	100%	0%	100%	3%	2,011	68%	*3,604*	*2,431*
Denmark	Yes	Mixed	FDO	Industry-led	61	121%	63%	37%	79%	4%	1,431	45%	*8,683*	*2,087*
Estonia	Yes	CSE	Eesti Vedelkütusevaru Agentuur	SOE	61	120%	100%	0%	100%	62%	220	63%	*2,746*	
Finland	Yes	Mixed	NESA	Agency	90	207%	72%	28%	78%	2%	3,816	77%	*8,581*	*3,254*
France	Yes	Mixed	SAGESS/CPSSP	Industry-led	90	108%	71%	29%	65%	2%	19,202	85%	***36,800***	***16,882***
Germany	Yes	CSE	EBV	Agency	90	113%	100%	0%	37%	2%	24,514	72%	*56,548*	***25,299***
Greece	Yes	Industry	-	-	90	118%	0%	100%	66%	0%	3,515	93%	*8,152*	***6,115***
Hungary	Yes	CSE	HUSA	Agency	90	134%	100%	0%	59%	0%	1,209	63%	*1,659*	*2,337*
Ireland	Yes	Mixed	NORA	Agency	90	109%	93%	7%	96%	38%	1,684	86%	*1,037*	*921*
Italy	Yes	Mixed	OCSIT/Acquirente Unico	SOE	90	101%	1%	99%	56%	22%	12,743	74%	*22,310*	***24,360***
Latvia	No	CSE	Ministry of Economics	Agency	90	106%	100%	0%	100%	27%	339	83%		***0***
Lithuania	No	Mixed	Agency	SOE	90	113%	41%	59%	64%	0%	458	57%		***2,333***
Luxembourg	Yes	Mixed System (as of 2015)	Ag. nationale de stockage de produits pétroliers	Agency	90	94%	0%	100%	58%	90%	696	92%	*168*	*0*
Malta	No	Industry	-	-	90	97%	0%	100%	100%	93%	194	58%		***0***
Netherlands	Yes	Mixed	COVA	Agency	90	128%	36%	64%	37%	28%	5,946	72%	*25,743*	*15,647*
Poland	Yes	Mixed	Material Reserves Agency	Agency	90	117%	22%	78%	37%	0%	6,303	78%	*11,250*	*7,143*
Portugal	Yes	Mixed	URP/ENMC	Agency	90	104%	38%	62%	61%	7%	2,483	80%	*5,663*	*4,052*
Romania	No	Industry	-	-	61	102%	0%	100%	46%	0%	1,279	69%		***5,249***
Slovakia	Yes	CSE	EOSA	Agency	90	108%	100%	0%	35%	0%	711	59%	*1,201*	*1,559*
Slovenia	No	CSE	Sl. Agency for Commodity Reserves	Agency	90	110%	100%	0%	100%	30%	598	89%		***0***
Spain	Yes	Mixed	CORES	Industry-led	90	120%	47%	53%	57%	1%	14,731	95%	*26,486*	***18,986***
Sweden	Yes	Industry	-	-	90	106%	0%	100%	77%	14%	2,830	64%	*13,097*	***5,353***
UK	Yes	Industry	-	-	61	98%	0%	100%	54%	37%	11,739	83%	*11,323*	***16,792***
EU-28	-				-	116%	54%	46%	55%	13%	127,950	77%	***261,011***	***175,106***

Sources: Eurostat, IEA and Member States. For Czech Republic, Latvia and Estonia, Eurostat does not report stocks held abroad on behalf of CSEs, but according to Member States only the CSE's hold EOS. Italy had no CSE stocks according to Eurostat in Dec/2014, but Italian authorities gave information showing that there was a small amount of EOS in the CSE. Finally, Maltese stocks held abroad appear in Eurostat as being on behalf of CSE/government, but Malta has a pure-industry system. Based on all these informations from the MS, this table was updated.

Sources for refining and storage capacity: Black: 2012 or more recent data from country reports in IEA website www.iea.org/netimports ; Blue: 2014 data of Statistical Review of the World; Red: 2010 data European Commission (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010SC1398&from=EN); Green: Data directly obtained from the Member State

Abbreviations: CSE - Central Stockholding Entity, EOS - Emergency Oil Stocks, SOE - State-owned enterprise

4 Effectiveness

4.1 Introduction

In evaluations of EU regulatory interventions, effectiveness is evaluated by answering the question: *"to what extent do the effects induced by an intervention correspond with its objectives as they are outlined in the intervention strategy?"*[26] Or, in other words, to what extent have the objectives been achieved and the planned results been produced and has this contributed to achieving the overall objectives (strengthening the security of supply of oil, minimising the negative impacts of a disruption of supply on the EU economy and ensuring an efficient response to supply difficulties) of Directive 2009/119?

In this chapter we analyse the findings related to the evaluation questions that are most linked to the effectiveness criterion (cf. Chapter 2). We also discuss the impact of the Directive on stockholding systems implemented across the EU, the share of stocks held by different players and whether the differences between the stockholding systems have any negative consequences (section 4.2), on the availability of stocks (section 4.3) and on the transparency of stocks (section 4.4). In section 4.5 we present our preliminary conclusions. Our final conclusions with regard to effectiveness also incorporate the findings presented in Chapters 5-8 and are presented in Chapter 9.

4.2 Impact of the Directive on stockholding systems

4.2.1 Impact on stockholding systems and share of stocks held by different players

Directive 2009/119 continues to give Member States considerable freedom with respect to their stockholding system. The type of stockholding system chosen in a Member State can however influence the way in which the CSO is fulfilled. For example, with respect to decisions on how and where emergency stocks are held, industry or governments tend to have different preferences. It is therefore important to understand whether the Directive caused a change in the type of stockholding systems in the EU.

Table 4-1 elaborates on the information presented in section 3.5 and indicates whether Member States changed their system just before or after the transposition deadline for the 2009 Directive. Even though a system with fully government-owned stocks is possible (a government-system), this option is not presented in the table because it is technically not present in the EU. There are a few countries with a fully government-led CSE that is integrated in the operations of the Ministry in that country (such as Latvia and the Czech Republic). These could be considered as government-based stockholding systems, but since they are officially administered as CSEs, we have classified them as such.

In the case of a mixed system, the obligation is shared between a CSE and industry. In the table this is indicated by a green checked box in the "mixed" system column. In the same row, the "X" indicates whether the CSE that is active in the mixed system is a government-led or an industry-led organisation.[27] Both CSE-types are non-market bodies as their prime function is to serve a public goal (energy secturity), but their governance structure differs. A CSE that is industry-led typically has a

[26] European Commission (2004)
[27] See section 3.6 for a short note on the extent to which a CSE can be seen as a truly private organisation.

majority of board or management members that are direct representatitives from industry. A government-led CSE is typically managed by (independent) recruited staff by the government.

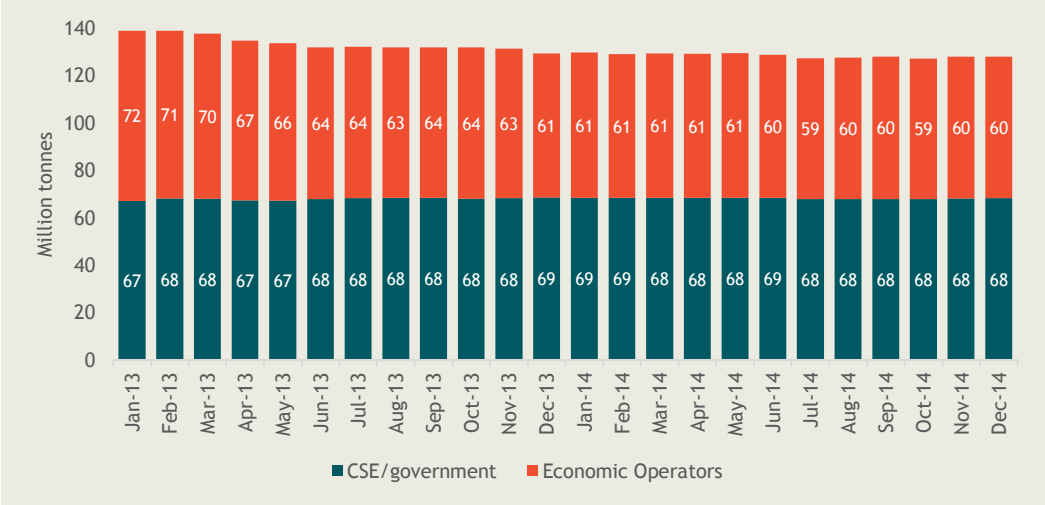
Table 4-1 Change in stockholding systems

Country	Current system				System before the Directive	Remarks
	Industry	Mixed	Government-led CSE*	Industry-led CSE*	(until '09)	
Austria					Mixed	The CSE existed, but became the main player in 2012
Belgium					Mixed	
Bulgaria			X			
Croatia						
Cyprus			X			
Czech Republic						Fully government-owned CSE
Denmark				X		
Estonia						
Finland			X			
France				X		
Germany						
Greece						
Hungary						
Ireland						
Italy			X		Industry	A SOE runs the CSE (established in 2014)
Latvia					CSE	Latvia changed the legal status of its CSE in 2012. The CSE is fully government-led (part of Ministry)
Lithuania			X			
Luxembourg			X		Industry	Created a CSE in 2015, but it has not yet become active
Malta						Has an industry system, including large share of stocks owned by SOEs
Netherlands			X			
Poland			X			
Portugal			X			
Romania					Mixed	
Slovakia					CSE	Slovakia changed the legal status of its CSE from government-led to an agency in 2013
Slovenia						
Spain			X			Spain's CSE is controlled both by industry and the government - though government has veto power.
Sweden						
UK						

Source: Combined and verified information from the general survey, interviews, analysis of Eurostat data and national legal documents.
*Note: * the "X" indicates whether the CSE that is active in the mixed system is a government-led or an industry-led organisation.*

As shown in Table 4-1 five Member States changed their stockholding system during the process of transposing Directive 2009/119 into national legislation (disregarding Latvia and Slovakia who changed the legal status of their CSE). Currently, 11 of 28 (**39%**) Member States fulfil their stockholding obligation fully through a CSE, 12 out of 28 (**43%**) do so with a mixed system and the remaining five (18%) through a fully industry-based system. The countries that changed their systems, except for Romania, moved to a more CSE-based system, either by moving from an industry-based system to a mixed system (Italy & Luxembourg) or from a mixed system to a CSE-only system (Belgium and Austria). Romania, together with Greece and Malta, is currently also considering establishing a CSE in the near future.

Figure 4-1 Composition of total emergency stocks in the EU-28, 2013-2014



Source: Eurostat, Trinomics calculations.

The increasing share of CSEs in the EU has an impact on the overall share of emergency stocks held by economic operators and governments/CSEs. Figure 4-1 depicts the evolution of the total share of emergency stocks held by government/CSEs and obligated industry players from January 2013 to December 2014. Unfortunately, there is no data available for the years before 2013. In the period shown in the figure, the share of emergency stocks held by government or industry-led CSEs increased from 49% to 55%. More detailed data for the shares of emergency stocks held by the different players across all EU-28 Member States is presented in Annex B. As there are no strictly government-held emergency stocks in the EU, we can conclude that since the adoption of the Directive, the share of emergency stocks held by CSEs has increased in line with the increase in the number of stockholding systems in the EU that actively use a CSE to meet their stockholding obligation.

Impact of the Directive on the observed changes in stockholding systems

This section considers the question, to what extent Directive 2009/119 caused the observed change in stockholding systems in the EU. The results of the general survey show that from the countries that have changed or are considering changing their system, the majority of respondents (75%) state that the Directive had some influence on their decision to change the system towards a more CSE-based system. The interviews revealed that the impact of the Directive on Member States' consideration of change was mainly of a strategic political nature. This is because the Directive is felt to implicitly promote the use of CSEs, but it does not include direct incentives for setting them up. In most cases, country-specific factors were more important drivers for changing the stockholding system. The main

advantage of establishing a CSE was reported as being to create a more level playing field in the oil market as smaller traders (without their own storage or logistics facilities) would now be able to delegate their obligation to the CSE. Some governments also considered that it is difficult and costly to monitor industry compliance with the obligation and they also wished to improve transparency, which they felt a larger share of centrally-controlled stocks helped achieve.

On the other hand, there is some evidence that the Directive implicitly discourages the set-up of private sector-run CSEs because of an alleged inconsistency between the Eurostat Guidance Note on the Sector Classification of CSEs in national accounts[28] and the Directive. To illustrate this point, the UK organised a public consultation on the future management of the UK stockholding system, including the possibility of creating an industry-led CSE to better manage the UK's CSO between 2013 and 2014[29]. Based on widespread support for the establishment of a mandatory-membership industry-led CSE, a process to investigate the way towards such a CSE was initiated. However, the process revealed difficulties with setting up an industry-led CSE that is in line with the definitions of the EU Directive and the classification of CSEs in national accounts according to the Eurostat Guidance Note. One of the options presented in the Guidance Note (establishing a private company owned by private operators), would, according to UKPIA[30], not be possible in combination with the goals of the Directive as the foreseen *compulsory* industry membership would classify the body as a non-market body, thus not a fully private company. That option seemed therefore conceptually not possible. The other option, establishing an association with the economic operators as members, would see the primary function of the CSE as being to manage the CSO (according to Article 7.2 of the Directive). This structure would classify the association as "*an agent of the government and it should be classified within the general government sector*".[31] According to UKPIA, this would not match the ambition of the UK's intentions to establish a privately-run CSE. On this basis, UKPIA[32] pointed out that the Eurostat Guidance Note and the definitions of the Directive do not allow for the establishment of a fully-privately run CSE that is not classified in national accounts as falling under the government sector. As the Directive aims to support the establishment of CSEs, this definition of CSEs in the Guidance Note could be viewed as a barrier to the Directive's ambition to support the establishment of CSEs.

To conclude, the Directive has had some impact on the landscape of stockholding systems in the EU because five Member States have recently changed their system mostly in favour of a more CSE-based system and another three Member States are actively considering this. Having said this, the Directive was arguably not the most important reason for these changes. Therefore, we conclude that the Directive had a small positive impact on the creation of additional CSEs and the share of CSE-held stocks in the EU.

4.2.2 *Impact of the difference in stockholding systems on the functioning of the Directive*

We did not find evidence of potentially significant negative impacts on achieving the overall objectives (ensuring security of supply, minimising the impact of a supply disruption on the EU economy and ensuring an efficient response to supply difficulties) arising from the differences in stockholding systems. Since the emergency coordination is initiated at EU level and delegated to national governments, the response can be centrally coordinated amongst governments. The stakeholders

[28] Eurostat (2014a)Available at: http://ec.europa.eu/eurostat/documents/1015035/2041357/Guidance-Note-Classification-of-CSEs.pdf/b6b6af21-b200-4529-ba22-7db3246b40d4
[29] https://www.gov.uk/government/consultations/future-management-of-the-compulsory-stocking-obligation-in-the-uk
[30] In an interview with Sanja Spasojevic in January 2016
[31] Eurostat (2014a)
[32] In an interview with Sanja Spasojevic in January 2016

consulted for the study confirmed that the procedures at EU and national level are sufficiently well coordinated and the crisis coordination among EU Member States sufficiently well enforced by the EU institutions to overcome differences between stockholding systems. Moreover, many economic operators already operate cross border in the EU and dialogue between the CSEs exist which would facilitate coordination in times of emergency.

Beyond the level of coordination, different requirements related to availability for cross-border stocks and tickets applied by different stockholding actors across the EU inhibit a fully functional EU Internal Market for emergency oil stocks. Some Member States (more details in Section 5.4.2) apply restrictions with respect to availability in their tenders for emergency stock storage contracts in order to ensure the speedy availability of cross-border stocks to their national markets. For example, government-controlled systems are particularly likely to include such **sailing clauses** in their calls for tender on emergency storage facilities, which stipulate, for example, that emergency stocks cannot be located further away than 3-days of transport time from the home market (3-day sailing clause). This limits the eligibility of certain contractors depending on the distance between the issuing country and the storage location of the potential contractor. The interviews with public authorities gave the impression that obligated economic operators in industry-led systems might place less emphasis on the speed of release of their stocks held cross-border for emergency purposes domestically. Larger oil corporations could namely optimise the distribution of the emergency stocks centrally at EU-level. This would however not jeopardize security of supply at EU level as the stocks held abroad are still physically made available for emergency purposes in the EU as a whole.

4.3 Impact of the Directive on the availability of emergency stocks

The Directive aims to improve the availability of stocks and to guarantee the availability of emergency stocks to be used in the event of supply disruptions. The Directive also aims to contribute to achieving the overall objective of strengthening the security of supply of oil products. In this section we review the following elements that may have an impact on the availability of stocks:

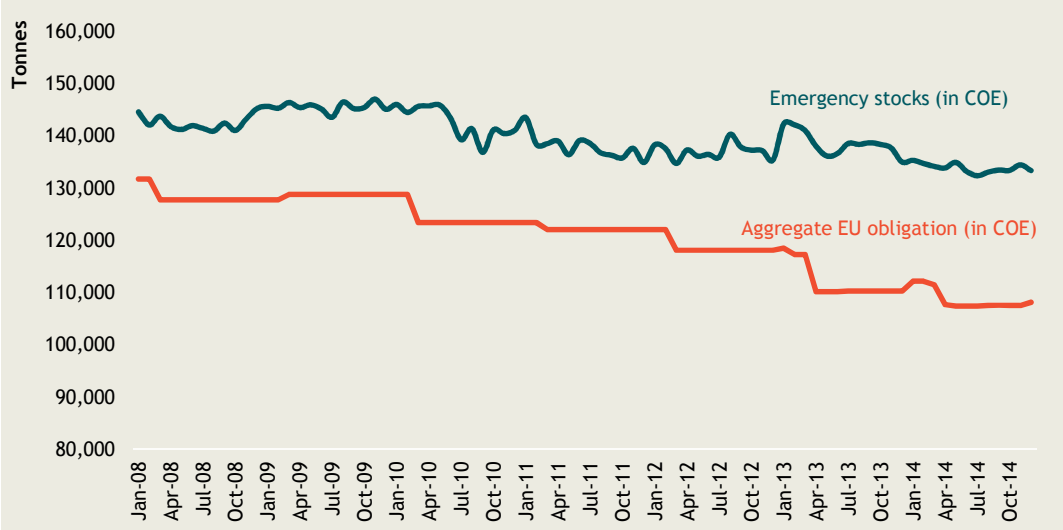
- **4.3.1** Impact on the size and composition of stocks;
- **4.3.2** Impact on commingled stocks and their impact on availability;
- **4.3.3** The availability of stocks in different stockholding regimes;
- **4.3.4** Specific stocks and their impact on availability;
- **4.3.5** The effectiveness of incentives to increase the share of CSE-held stocks or specific stocks;
- **4.3.6** Impact of the Directive on the emergency response mechanism.

4.3.1 Impact on the size and composition of stocks

In order to assess the impact of the Directive on the level of emergency stocks in the EU, Figure 4-2 depicts the evolution of emergency stocks in the EU as compared to the evolution of the aggregate EU obligation. Note that the data series for 2008-2012 (before the Directive) and 2013-2014 (after the Directive) depicted in Figure 4-2 were adjusted for the level of commercial stocks to make them comparable (see note to the figure). The aggregate EU obligation declined between January 2008 and October 2014 largely because of a slow decrease in the consumption of oil. As a result, the volume of total emergency stocks in the EU has also declined, but not by as much. The gap between the minimum required volume of emergency stocks (the obligation) and the actual available stocks increased at the beginning of 2013, when most Member States fully transposed the new Directive. The adoption of the 10% deduction to account for unavailable stocks in Directive 2009/119 in combination with the

exclusion of commercial stocks is believed to have led to a *de facto* increase in the level of emergency stocks. During interviews public authorities and CSEs also mentioned that Directive 2009/119 led to a relative increase in the volume of emergency stocks physically held in the EU with respect to the level of the obligation. We conclude that it is likely that the Directive had a **slightly positive impact on the level of emergency stocks held.**

Figure 4-2 Aggregate EU emergency stocks levels versus obligation, 2008-2014



Source: DG ENER (2008-2012), Eurostat (2013 onwards)
Note: Both series are presented in Crude Oil Equivalents (COEs) and some adjustments were made to make the data series for 2008-2012 and 2013-2014 comparable. As emergency stocks before Jan-2013 included commercial stocks, a correction has been made to exclude commercial stocks in the calculation both before and after Jan-2013. However, for Greece, Italy, Ireland and Portugal both data series (before and after 2013) include commercial stocks as the share of commercial stocks before Jan-13 could not be identified. The 'aggregate EU obligation' was calculated on the basis of three main oil products before Jan-13 and on the basis of crude-oil-equivalents after Jan-13 (assuming full transposition of the 2009 Directive). The obligation before Jan-2013 in crude-oil-equivalents is calculated by multiplying the obligation in tonnes by 1.2. The data series exclude Croatia.

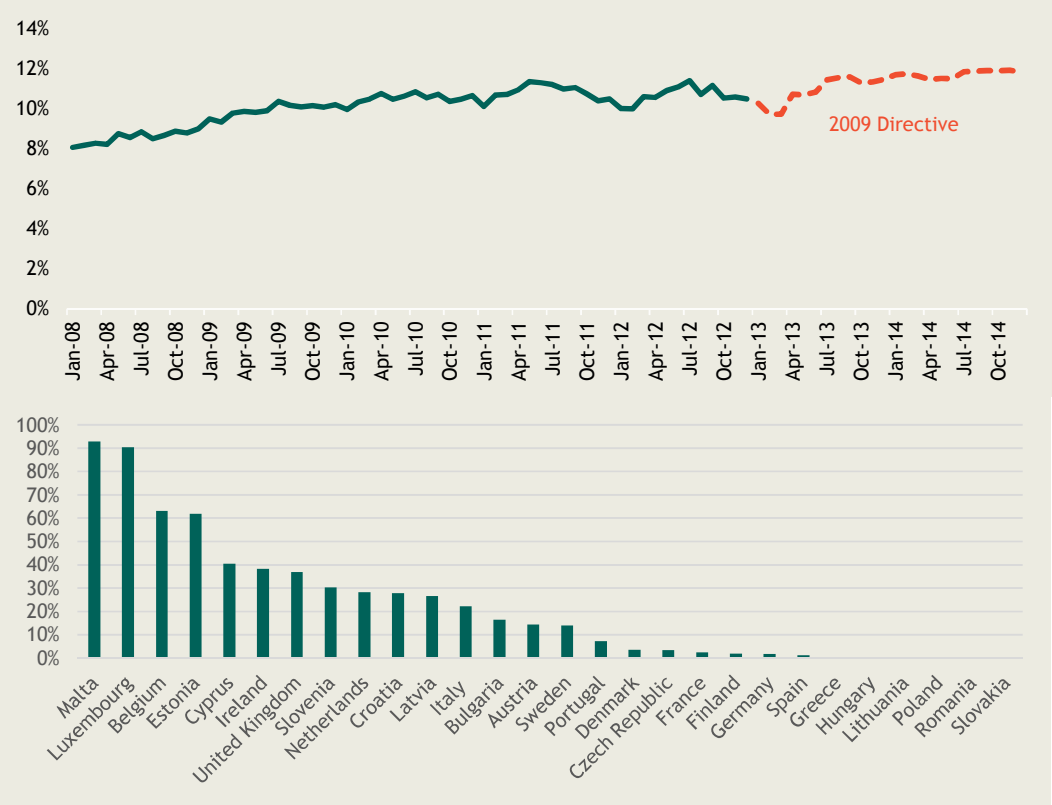
Impact of the Directive on the share of stocks held abroad

Directive 2006/67 included a requirement for a bilateral agreement between Member States in order to hold stocks cross-border or buy tickets in another country. Directive 2009/119 does not include that requirement anymore. As a result, it is currently theoretically easier to have emergency stocks abroad as there is no need to have a bilateral agreement and thus we could have expected an increase in cross-border stockholdings since the transposition of the Directive.

Figure 4-3 shows, however, that the total share of stocks held abroad has been growing, but not at a much faster rate than before the Directive came into force. There is significant variation between Member States in terms of the share of emergency stocks held abroad. Typically, small countries such as Malta and Luxembourg do not have large amounts of domestic storage capacity and need to resort to storage capacity in neighbouring countries. Other countries specifically prohibit holding stocks cross-border in order to guarantee the availability of emergency stocks for their country. Section 5.4.2 elaborates on the conditions imposed on cross-border stockholdings.

Therefore the removal of the requirement to have a bilateral agreement does not appear to have led to an increase in the share of cross-border stocks or tickets. As it turns out, many countries still require some form of bilateral agreement even after the transposition of the new Directive (84% of respondents to the survey mentioned that their country requires some sort of agreement for cross-border stocks).

Figure 4-3 Share of stocks held abroad (%)



Source: Eurostat and DG ENER

Note: The data represent a (weighted) average of stocks held abroad for all EU Member States. The country specific figures refer to December 2014

The main reason for this given in the interviews was that the removal of the requirement for a bilateral agreement actually increased the uncertainty with respect to the conditions under which stocks can be held abroad. In the absence of a bilateral agreement, the Directive directly provides the reference regulation, but the Directive does not stipulate precise conditions on information sharing, auditing of oil stocks or any other type of conditions under which stocks can be held cross border. In order to ensure full transparency about the quality and availability of stocks held abroad, the desire has emerged for an institutionalised exchange of information on the location, volume and quality of stocks held abroad. In order to arrange this, many countries kept the requirement for some sort of agreement in order to increase transparency.

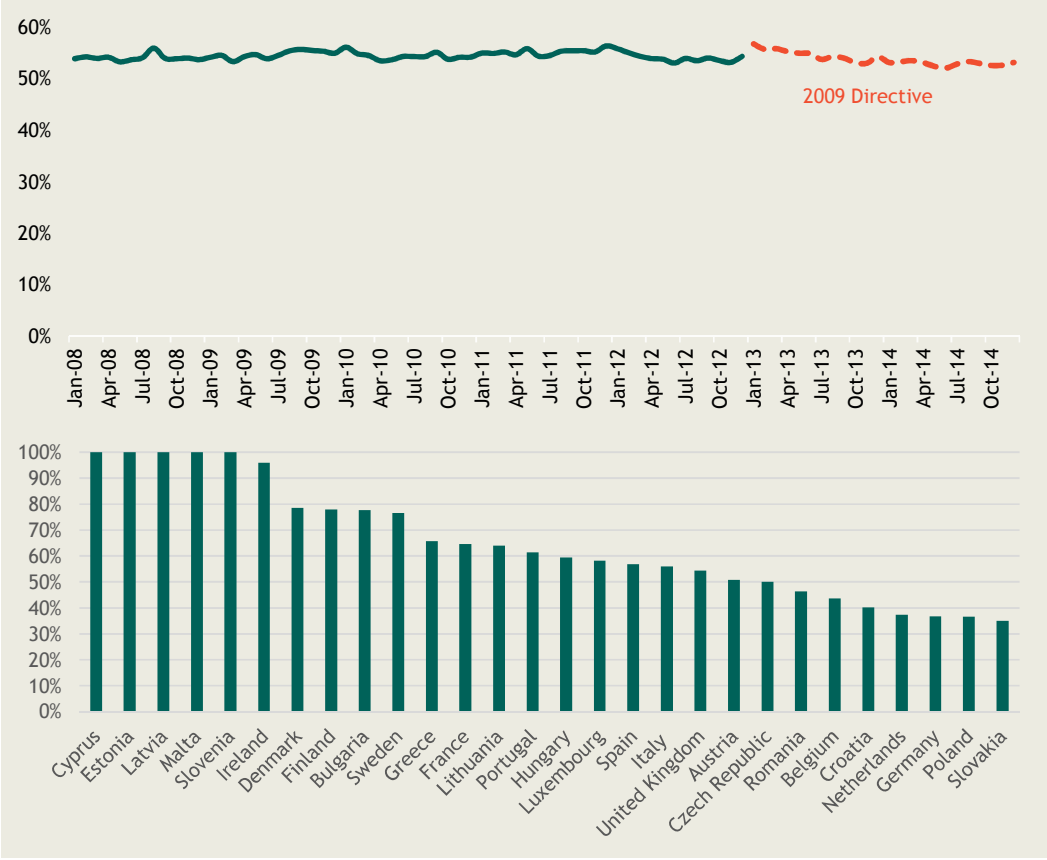
There is however some anecdotal evidence that removing the requirement for a bilateral agreement from the Directive has facilitated holding stocks cross-border. For example, Cyprus increased the number of countries with which it holds tickets from one to four, allowing the CSE to benefit from a larger supply of oil storage possibilities, in turn enabling the CSE to optimise their emergency stockholdings from a cost- and availability perspective.

Section 4.4.2 discusses cross-border stockholding in more detail. In general though, the removal of the requirement for a bilateral agreement did not increase the ease of the process of dealing with cross-border stocks and tickets. The data also shows that the Directive did not have a significant impact on the development of the share of cross-border stocks.

Impact of the Directive on the composition of emergency stocks

As regards the composition of stocks, the Directive changed the type of petroleum products that could and should be stored as emergency stocks: it discarded the three main oil product categories (that were used in the previous Directive) and introduced a minimum share of stocks to be held as finished products. Member States can either choose to hold 1/3 of the overall obligation in a number of 'standard' oil products that represent jointly at least 75% of aggregate energy demand in the country or, alternatively, Member States can hold 'specific stocks' (of finished products) equal to at least 30 days of inland consumption. Under the 2006 Directive, stocks were to be kept in the three main oil product categories, but it was also possible to meet the obligation through storing intermediate products and/or crude oil only. Figure 4-4 presents the development of the share of total emergency stocks held as products from 2008 to 2014 for the EU.

Figure 4-4 Share of stocks held as products (%)



Source: Eurostat and DG ENER

Note: the country specific figures refer to December 2014

As the figure shows, the share of stocks held as products has remained stable before and after 31 December 2012 (transposition deadline for the new Directive) at a level of around 54%. Interviews confirmed that the Directive did not have a material impact on the total share of product stocks in total emergency stocks. However, Table 4-2 illustrates that several Member States changed the composition of their emergency stockholding after the transposition of Directive 2009/119 and as a result a larger number of Member States store a larger variety of petroleum products.[33] As the Table shows, the majority of Member States did not change their decision to either store, or not store, a certain product.

Table 4-2 Number of EU Member States storing particular petroleum products before and after the transposition of the 2009 Directive

# of EU Member States for which the following product	Was stocked, but is no longer stocked (2)	Was not stocked but is now stocked (3)	No change (4)	Currently stocked (5)	Currently not stocked (6)	Information n/a (7)
Gas/diesel oil	0	0	28	26	0	2
Motor gasoline	0	0	28	25	1	2
Kerosene type jet fuel	1	1	26	24	2	2
Crude Oil	0	1	27	23	3	2
Fuel oil	7	0	21	19	7	2
Refinery feedstocks	0	3	25	11	14	3
Aviation gasoline	1	1	26	11	13	4
Other kerosene	0	1	27	11	14	3
Additives / oxygenates	0	2	26	9	17	2
Gasoline type jet fuel	0	1	27	9	15	4
LPG	0	3	25	8	16	4
Other product	0	1	27	5	19	4
Naphtha	1	1	26	3	21	4
Petroleum coke	1	2	25	3	21	4
Natural gas liquids	0	1	27	2	22	4
Other hydro-carbons	0	1	27	2	22	4
Ethane	0	1	27	2	22	4

Source: Trinomics General Survey results

Note: The table shows the number of Member States that store the petroleum product type listed in the first column. Column 2 shows the number of Member States that stored a certain product before the transposition of the 2009 Directive but do not store this product anymore after the transposition. Column 3 shows the number of Member States that store a certain product after the transposition but did not do so before the transposition. Column (4) shows the number of Member States that did not change their decision with regard to storing or not storing that particular product. Columns (5) and (6) show the number of Member States that currently store (5) or do not store (6) a certain product. Column (7) shows the number of Member States for which no information on the storing of a certain product was available in the survey results.

In most cases only one, two or three Member States started storing some products that they did not store before (column 3). As explained in more detail in the survey report (Annex D), when countries had to adjust their product stocks because of the Directive, most only had to change one or two product stocks. The most significant change was the removal of 'fuel oil' (one of the 'main' oil products in the previous Directive) from the emergency stocks in seven Member States (see column 2). The table also shows that 'gasoline' and 'gas and diesel oil' continue to be stored by most Member States and that the Directive did not trigger any changes in the storing of these key energy products. After the transposition of the Directive 2009/119, 'gas and diesel oil', 'motor gasoline', 'kerosene type jet fuel'

[33] Comparing columns (3) and (2) shows that more Member States decided to store petroleum products that they did not store before, rather than the other way around (deciding not to store products that they stored before).

and 'crude oil' are the petroleum products that are stored by most Member States (at least 23 Member States store these products – see column 4).

The observed changes reflect the increased freedom that the Directive provides in terms of a longer list of eligible products. In addition, Member States are required to hold 1/3 of their total obligation in products that jointly constitute at least 75% of their aggregate domestic energy demand, which contributes to an improved overall availability of emergency stocks as the existing emergency stocks more accurately reflect the needs of the economy in times of crisis compared to the previous situation. Even though this change is positive, the scale of the change is not significant, as most Member States did not change their approach with respect to storing (or not storing) a particular product.

We conclude that the observed changes in product stocks demonstrate a positive effect on the availability of emergency stocks because of the improved match between emergency product stocks and the products required during a crisis. However, the impact of the Directive on the overall level of product stocks held is small. Taken together, the **impact of the Directive on the composition of emergency stocks could be viewed as small, but moderately positive**.

4.3.2 Impact of the Directive on commingled stocks and subsequent impact on availability

The Directive allows obligated parties to store stocks for emergency purposes in the same tanks as stocks held for commercial purposes (commingled stocks). There is little data about the extent to which obligated parties in Member States use commingled stocks to fulfil their obligation. The general survey included a question on the expected share of commingled stocks, but the responses for individual Member States often differed too significantly in order to be able to draw solid conclusions. The results of the general survey however do indicate that the share of commingled stocks appears to have remained stable in most Member States since the implementation of the Directive as the majority of the respondents (69%) indicated this (see Figure 4-5). However, a large share of the respondents also believe that the share of commingled stocks has either increased significantly (8%) or somewhat (11%) in the past three years. A minority of survey respondents thought that the share of commingled stocks slightly decreased (3%). Therefore, it is most likely that the share of commingled stocks has remained stable or increased since the implementation of the Directive. Most respondents think that this share will remain approximately the same in the future (54%) or will increase further (26%) as presented in Figure 4-6. Only 11% of respondents think that the share of commingled stocks might decline in the future. Hence, despite the absence of precise data on the share of commingled stocks, the expectation is that the share of commingled stocks has slightly increased and will continue to slightly increase into the future.

The interview results suggest that at least part of the increase in the use of commingled stocks is because of the 2009 Directive. Because of the changes in the type of products that need to be stored (at least 1/3 of the overall obligation in products that comprise 75% of aggregate energy demand), various Member States have made adaptations with regard to the types of oil products that they hold as emergency stocks, as explained in the previous section. Certain product stocks (particularly jet fuel) need to be regularly refreshed in order to maintain the quality of the product stock. By holding a right (option) on a fixed share of the product stock in a (continuously refreshed) commercial tank, holding commingled stocks can be a cost-effective solution. In fact, there have been Member States that increased the share of commingled stocks somewhat to effectively deal with the revised product stock obligations.

Figure 4-5 Did the share of commingled stocks change after transposition to the Directive?

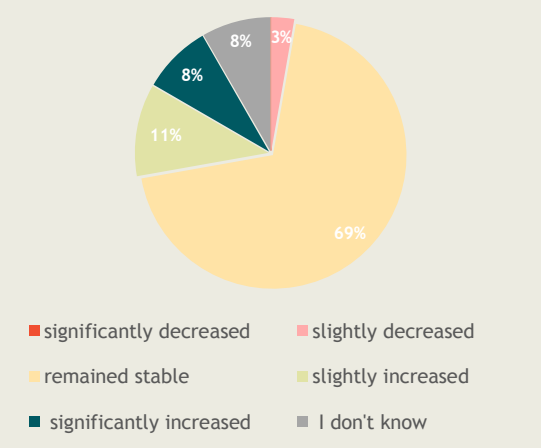
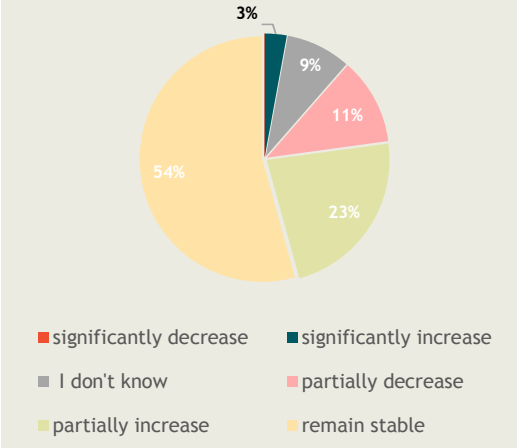


Figure 4-6 How will the share of commingled stocks change in the future?



Source: Trinomics general survey

Holding commingled stocks is not believed to negatively impact the availability of emergency stocks. The survey results show that 83% of respondents believe that commingled stocks do not hamper the availability of stocks in the event of a supply disruption (see Annex D, Figure D-2). Indeed, on the contrary, results from interviews with economic operators and public authorities indicate that commingled stocks might even offer an advantage in terms of availability as commercial storage tanks are automatically connected to the commercial infrastructure, which can ensure a quick release of the stocks in case of emergency. In addition, the quality of the emergency stock is considered to be good as there is automatic refreshing of the stocks. A potential uncertainty relating to the availability of commingled stocks is that the share of emergency stocks when held in commercial tanks at a refinery site may constitute part of the Minimum Operating Requirements (MOR) of the refinery (see sub-section 4.3.3. for more detailed discussion and definition of MOR). However, since stocks typically held in commingled tanks are largely finished products and the MOR often consists of crude or intermediate products, this scenario is considered unlikely.

As a result, the evidence suggests that the share of commingled stocks is likely to have remained the same or may have slightly increased. Commingled stocks are not found to have a negative impact on availability. As they can typically be made quickly available and are automatically refreshed there are some advantages of holding commingled stocks. Therefore, **the impact of the Directive on the share of commingled stocks is considered small but positive**.

4.3.3 Availability of stocks in different stockholding regimes

The Directive allows obligated parties to hold emergency stocks in a variety of facilities, on national territory or abroad and in full ownership or as ticket. The Directive also allows stocks present in commercial industry systems to be eligible for emergency stocks. Emergency stocks need to be earmarked as such, though, and be fully available for meeting the requirements of the Directive. Such 'commercial stocks' are therefore defined in the Directive as "*those stocks held by economic operators which are not a requirement under this Directive*". Annex III of the Directive specifies which type of stocks are allowed to be reported as emergency stocks for the purpose of the EU obligation (and which ones are not). For example, eligible emergency stocks may include quantities held in dedicated facilities such as dedicated storage tanks or salt caverns but also in industry facilities such as refinery

tanks, as working stocks and in storage tank bottoms. With respect to ownership, the Directive accepts stocks owned directly by CSEs for emergency purposes as well as stocks that can be bought from an industry operator at any given point in time but are not owned yet (using a ticket). Even though these different options are all allowed according to the Directive, this section discusses whether there is a difference with respect to the availability of these different types of stocks and whether, as a result of this, the overall availability of emergency stocks differs for industry-led stockholding systems and government-led/CSE-based systems.

Emergency stocks held in dedicated storage facilities solely for the purpose of meeting the EU emergency stockholding are believed to be the most certain in terms of their availability in times of emergency (i.e. they are believed to be fully available) as the full contents of the tank are owned for emergency purposes and can be made fully available in times of emergency. Government owned or (government-controlled) CSE owned stocks held in dedicated storage are believed to be fully available for release as they are held solely for the purpose of the Directive in addition to stocks already held by economic operators.[34]

However, when emergency stocks are held in commercial facilities, they are held as a share of a larger volume of industry stocks available in the facility. We call these stocks held by economic operators 'industry stocks' in order to avoid confusion with 'commercial stocks'. The latter is namely defined in the Directive as those stocks with economic operators that are not emergency stocks. Industry stocks may be eligible as emergency stocks for example when these stocks are held in refinery tanks, bulk terminals, are held as working stocks or in storage tank bottoms (as defined in Annex III of the Directive). Figure 4-7 illustrates what industry stocks typically consist of (illustrated for a refiner):

Figure 4-7 Industry stocks

- *Minimum Operating Requirements (MOR)* – Refer to the absolute minimum level of oil and oil products needed for the uninterrupted daily operation of the oil industry (though not defined in the Directive). Covers the technically minimum level of crude and intermediate products that need to be present in the refinery installation pipes and tanks in order to be able to continue processing operations.
- *Working stocks* – are also not specifically defined by the Directive, but can be counted towards eligible emergency stocks (see also Section 4.4.1). Generally understood to consist of crude oil, intermediate products and finished products that are held to optimise the production and distribution process of the economic operator. For a refiner, the share of working stocks is much higher than for a trader for example, as optimisation of refinery processes require more and different type of stocks than the optimisation of trading operations. Among refineries, levels of working stocks also differ as complex refineries can use up to 150 different products as feedstocks, whereas other refineries can only use one product

[34] This argument was made in EU (2008) and confirmed by most stakeholders during the study.

as feedstock. Working stocks might also include certain products further downstream allowing them to meet specific customer needs through optimal mixing.

- *Operational stocks* – Depending on the market conditions (contango/backwardation), oil industry operators may strategically hold additional stocks that can be sold at a later point in time for a profit (arbitrage).
- *Trading stocks* – consisting of those oil stocks that are purely present in a country for trading (export and import) purposes, i.e. without commercial function for the country.

In theory, all industry stocks could be eligible for emergency stocks as long as they meet the definition of availability and physical accessibility as defined in the Directive (Articles 2 & 5). Since MOR stocks cannot be made available for emergency purposes to the wider economy as they are not physically accessible ('stuck' at the refinery), these stocks technically do not meet the definition of availability and should not be part of reported EU emergency stocks. However, neither *working stocks* (included as eligible emergency stocks in the Directive) or *MORs* are defined or explicitly mentioned in the Directive[35]. As Figure 4-7 illustrated, working stocks can be seen as stocks on top of MORs, but the Directive provides no exact definitions for both and therefore MORs could also be interpreted by refiners as part of the working stocks for their operations. There is therefore a risk in the current arrangement of the stockholding system that in countries where the obligation is (partially) delegated to industry, the emergency stocks they hold actually include (part of) their MOR. Therefore in the absence of any specific national regulations in this field, there is a risk that part of the emergency stocks are not fully available in Member States where emergency stocks are held with economic operators that have MORs.

The Directive stipulates that in line with the IEA system all eligible emergency stocks need to be reduced by 10% (the '10% deduction') to account for the existence of unavailable stocks in the system (more details on the justification and rationale for the 10% deduction is provided in the chapter on efficiency). Despite this deduction, the actual availability of emergency stocks in different stockholding systems is determined by:

1) the extent to which working stocks are used as emergency stocks; and
2) the extent to which MORs are part of working stocks and therefore included in the reporting of emergency stocks across the different stockholding systems in the EU.

1. Working stocks as part of emergency stocks

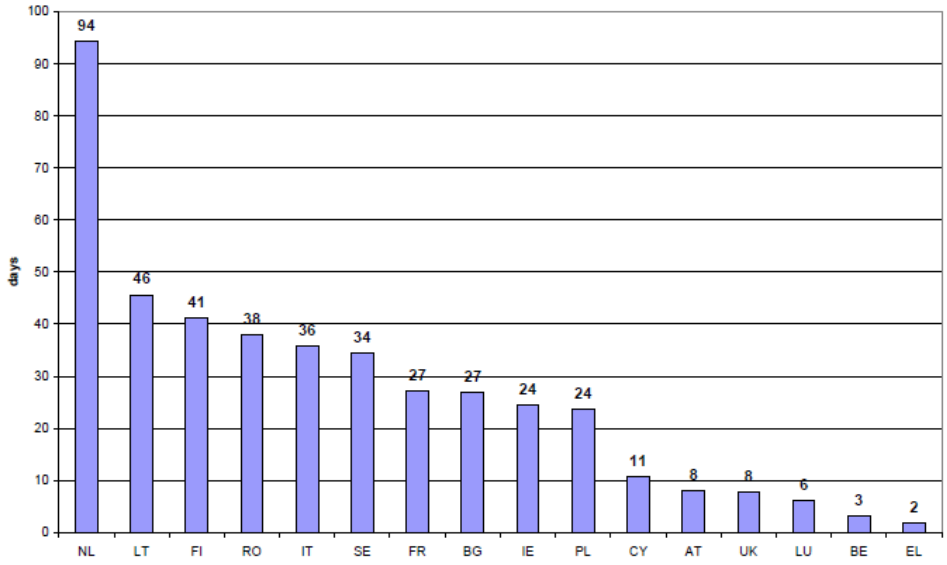
Even though the Directive allows working stocks to be included in emergency stocks, there is no definition of working stocks. As such, there is no consistent data on the precise share of working stocks across countries, but some interviewees mentioned that the share of working stocks in eligible emergency stocks could have been as high as 50% in the early 1970s in Member States with multiple refineries. This share has declined over time as the result of cost-reducing measures and the continuous improvement in the efficiency of the production processes of the oil industry (e.g. through Just-In-Time inventory management[36]).

[35] The discussion on the clarity of the concepts of working stocks, emergency stocks and commercial stocks is also continued in more detail in section 4.4.1.
[36] Just-In-Time inventory management is a procurement management principle which departs from the ideal to have as little volumes of inputs (raw materials, intermediate products, or other) to the production process physically available on the production site, so that the production facility does not need to invest in large storage facilities (and therefore reduce costs). The production process is optimised by timing the delivery of input materials 'just-in-time' for the start of the production.

2. Are MOR included in the emergency stocks?

Results from a survey undertaken for the EC Impact Assessment for the Directive show that the share of MORs ranged from 2 days to 94 days of inland consumption across different Member States in which at least a part of the emergency stocks are held by industry (see Figure 4-8).

Figure 4-8 MORs in days of inland consumption



Source: European Commission, 2008, Impact assessment for the proposal for a Directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products, p.37.

As mentioned above, MORs are higher in countries with refining capacity and also increase with the complexity of refineries. The MORs in for example the Netherlands (with a large petrochemical cluster in Rotterdam) are therefore higher than in Cyprus or Luxembourg which do not have refineries. Since the survey underlying this data gathering exercise did not provide a precise definition of MORs, it is likely that Member States interpreted the MORs differently. Moreover, the data were gathered before the introduction of the new Directive. More recent data on the share of MORs in total emergency stocks after the transposition to Directive 2009/119 is not available.[37]

Table 4-3 Member State approach to reporting of MOR in their stockholding systems

Survey respondents from public authorities from Member States that:		
Guarantee the MORs are not included in reporting of Emergency Stocks	*Cannot guarantee that MORs are not included in reporting of Emergency Stocks*	*Do not know whether MORs are included in reporting of Emergency Stocks*
Respondents from: Austria, Belgium, Czech Republic, Germany, Italy, Netherlands, Poland, Slovakia, Slovenia, Sweden, United Kingdom	Respondents from: Croatia, Cyprus	Respondents from: Bulgaria, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Portugal, Romania, Spain

Source: Trinomics General Survey results

Note: no information is available for Greece and Malta

[37] The latest IEA survey on the size of MORs also dates from 2003.

On top of the uncertainty surrounding the specific size of MORs, the results of the survey conducted among public authorities (Ministries & CSEs) show that a large share of respondents from Member States either do not know how MORs are dealt with (respondents from 13 Member States) or cannot confirm that they are not part of their reported emergency stocks (respondents from two Member States, see Table 4-3). Respondents from eleven Member States mentioned that they were sure that MORs are not included in the reporting of emergency stocks in their country, for example by clarifying the issue of MOR in national legislation. Those respondents that could not guarantee or did not know whether MORs are part of emergency stocks, mentioned that the Directive does not provide a definition of MOR and therefore these results also potentially suffer from a difference in interpretation across Member States. To further illustrate how working stocks and MOR are dealt with in national legislation, Box 4-1 illustrates the approach in three Member States.

Box 4-1 Availability of emergency stocks in some of the case study countries

The Netherlands is one of the countries that can guarantee that MOR are not included in reported emergency stocks. In the process of the transposition of the 2009 Directive, the Netherlands defined the eligibility of emergency stocks in their national legislation by taking over the definitions in Annex III of the Directive, but also adding a few clarifications to the existing definitions used in Annex III. An in-depth review of the legislation dealing with the emergency oil stocks in the Netherlands (*Wet Voorraadvorming Aardolieproducten, 2012)*[38] shows that on top of the stocks that should be excluded according to Annex III of the Directive, the Dutch legislation also specifically excludes "*stocks held in pipelines and processing installations in refineries.*" These can be considered to cover a large part of potentially unavailable stocks at refinery sites. Since the Netherlands has seven refinery sites with a significant amount of crude refining capacity, it was important for the Dutch government to provide clarity.

In **Cyprus** (one of the two Member States that cannot guarantee that MORs are not included in the reporting of emergency stocks) the obligation is put on both a publicly-controlled CSE and industry. According to the CSE, there is no guarantee that MORs are not included in the Cypriot emergency stocks. The domestic legislation does not detail MOR specifically and literally transposes the permitted and excluded categories of stocks as defined in Annex III of the Directive. However, as Cyprus does not have a refinery, the level of MOR in the country is not likely to be high. In addition, a relatively large share of the obligation (some 25%) is met using tickets and their ticketing contracts are defined based on volumes of oil Free On Board and therefore should reflect a 100% availability of these stocks.

Romania (one of the 13 Member States that indicated not knowing whether MORs are included or not in the reporting of emergency stocks) has a fully industry-led system. The Romanian authorities believe that this brings the advantage of holding emergency stocks close to the market and with players that are best placed to deal with the storing of oil products. Romania is aware that the real availability of emergency stocks in an industry system might be somewhat lower due to the presence of unavailable stocks. Since Romania also has refining capacity (six refineries) there might be a relatively large share of MOR in the reported emergency stocks. Authorities however implicitly mention that the MOR in their country are not higher than 10% of emergency stocks by arguing that the 10% deduction currently applied to eligible emergency stocks could be reduced as the share of unavailable stocks is believed to be lower in reality. Romanian domestic legislation implementing the Directive has literally taken over Annex III of the Directive (with the exception of a minor point on specific stocks) and therefore does not provide additional clarification as regards the potential inclusion of MORs in the Romanian stockholding system (Law 360 of 18-12 2013)[39].

[38] Available at: http://wetten.overheid.nl/BWBR0032775/2014-01-25
[39] Published in Official Gazette no. 818, available at: http://romaniascout.ro/wp-content/uploads/2013/12/Lege-360-din-18.12.2013-Monitorul-nr.-818-din-21.12.2013.pdf

Even though the size of the MORs in countries is not known, both survey and interview results show that there is a significant likelihood that MORs are still included in the reporting of emergency stocks, or at least that there is no certainty that they are not. Therefore, all Member States might technically be compliant with the Directive, but actually have different levels of truly available emergency stocks. This concern holds specifically for Member States with mixed or industry-led systems that cannot guarantee that MORs are not included in the reporting.

Some additional uncertainty in relation to the real availability of emergency stocks is introduced by the possibility of storing stocks in facilities abroad (cross-border stocks) or acquiring the option to buy stocks owned by a foreign operator (cross-border tickets). Without going into detail into the transparency issues related to cross-border stocks (which is reviewed in Section 4.4.2), the availability of cross-border stocks is generally perceived to be less certain than domestically held stocks due to the additional coordination involved and the reduced ability to control the availability of stocks. In the case of cross-border tickets, similar concerns about the possible inclusion of MORs in working stocks abroad apply. In terms of availability, the following ranking by type of emergency stocks therefore emerges (ranked from high to low certainty of full availability):

1. emergency stocks owned by government or CSE and stored in dedicated domestic storage;
2. emergency stocks owned by government or CSE and stored in dedicated foreign storage;
3. emergency stocks based on domestic tickets bought by/from CSEs;
4. emergency stocks held by industry and domestic tickets bought from other industry players;
5. emergency stocks based on foreign tickets bought by/from CSEs;
6. emergency stocks based on foreign tickets bought by/from industry players.

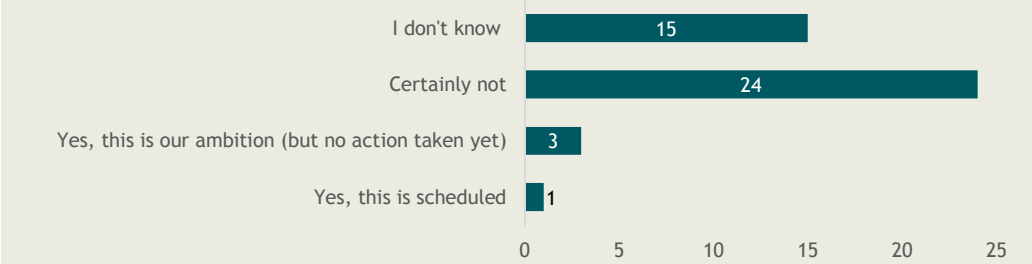
Conclusion

In short, Directive 2009/119 seems not to have taken away the uncertainty surrounding the real availability of emergency stocks when they are held by industry due to the presence of MORs with oil industry players. The size of MORs varies significantly across Member States largely dependent upon their refining capacities and the complexity of installations. Since Directive 2009/119 allows emergency stocks to be held by industry and allows *working stocks* and *stocks in tank bottoms* there is a risk that in Member States with high MORs and a high share of stocks held with industry a part of these emergency stocks are covered by MOR as industry players could perceive these as working stocks. Since the Directive does not specifically define MORs or working stocks, some Member States assured the availability of emergency stocks by ensuring in domestic legislation that MORs should not be part of emergency stocks. According to our survey results, though, only 11 out of 28 Member States could guarantee that MORs are not part of emergency stocks. The Directive does account for the fact that some technically unavailable stocks might be part of stockholding systems by taking the IEA 10% deduction that needs to be applied to total eligible emergency stocks. It is however not clear whether the 10% deduction covers the share of unavailable stocks across all Member States. In order to increase the level of confidence that all emergency stocks are available during an emergency across all stockholding systems, an updated review of MORs in EU Member States (or potentially wider if done together with the IEA) could be undertaken in order to understand the precise share of MORs in the reported emergency stocks under the definitions in the new Directive. Alternatively, the type of eligible emergency stocks in Annex III of the Directive could be revised by more specifically excluding technically unavailable stocks (such as in tank bottoms, in refinery pipelines etc.) and clarifying the definition of working stocks (see also section 4.4.1).

4.3.4 *Specific stocks and their impact on availability*

One of the new elements in Directive 2009/119 as compared to Directive 2006/67 is the concept of 'specific stocks'. Specific stocks are meant to further enhance the security of supply in the EU by making finished oil products that are in high demand in the Member States (more easily) available in times of emergency. Member States have the option of holding specific stocks equal to minimum 30 days of inland consumption as an alternative to holding 1/3rd of the CSO in finished products that jointly constitute 75% of aggregate energy demand in the country. Article 9 of the Directive stipulates a number of requirements for specific stocks, relating to ownership (they must be owned by government or CSEs), type of products (only selected finished products) and availability (the stocks must be held for the full length of the notified period of at least one year).

Figure 4-9 If the rules stay the same, will your country's stocks include specific stocks in the future?



Source: Trinomics survey.

Note: This question was asked to respondents of Member States that do not hold specific stocks (25 Member States).

Following the transposition of the Directive, only three Member States decided to hold specific stocks (France, Denmark and Lithuania). The large majority of Member States do not see a benefit of holding them and a majority of the respondents to the survey also indicated that their countries will 'certainly not' hold them in the future if the rules remain unchanged (see Figure 4-9). In both the survey and the interviews, respondents mentioned that the Directive does not include a direct incentive to hold specific stocks and that they do not present an additional advantage in terms of security of supply. A specific stock was described as simply a 'label' that is applied to a product stock that should be held anyway, as 1/3rd of the national obligation should be held in the form of finished products. Therefore, the products that would be held as a specific stock or as part of the 1/3rd obligation would technically be exactly the same product. Because of the reduced flexibility (of having to fix the composition and level of stocks for a full year and the government/CSE ownership) most respondents to the survey and interviews could not see clear reasons for holding specific stocks.

Some stakeholders also referred to the unclear language and somewhat more complicated calculation method for specific stocks in Annex III of the Directive. Specific stocks should be held that are equivalent to at least 30 days of *inland consumption* whereas the CSO for most Member States is calculated on the basis of *net imports*. Additionally, Annex III of the Directive mentions that "*no 10% reduction is to be applied when calculating the level of specific stocks […] with a view to verifying compliance with the minimum levels laid down by Article 9*". A few interviewees mentioned that this presents a potential slight cost advantage as the level of product stocks to be held for the Directive would be the difference between 30 days of inland consumption and 33.3 days of net imports (1/3 of 90 days+10%). Even though the 10% deduction is applied in both cases to the overall obligation (leading to effectively 100 days of emergency stocks held in the case of an obligation of 90 days of net imports),

the share of minimum required product stocks could be lower when holding specific stocks. As product stocks are generally somewhat more expensive to store (see section 5.1), this could lead to a small cost advantage. However, none of the survey respondents or interviewees mentioned that this actually presented a cost advantage for them. The majority of interviewees had also not observed this potential slight calculation advantage and mentioned that the uncertainty with respect to the overall calculation of the obligation with specific stocks also acted as a deterrent from holding them.

One of the three countries that hold specific stocks is currently in the process of reviewing its decision (France).[40] France decided to hold specific stocks because at the time of the transposition of the new Directive the authorities interpreted the report required by Article 9.5 of the Directive[41] as potentially difficult and expensive to produce in light of the challenges in the oil sector at that time (strikes). However, after the EC clarified the contents of the required report specified in Article 9.5 and France understood that the requirements for the report were less complex and expensive than anticipated, they abstained from communicating the most recent list of specific stocks in January 2016, effectively deciding not to hold them any longer. France does not see the advantage of specific stocks as they are simply a 'label' placed on a physically identical product. The potential calculation advantage did not play a role in the decision for France to hold specific stocks as the volume of finished products (eligible for specific stocks) held in France before the transposition was significantly higher than the required 30 days.

Denmark strongly supports a CSE-based stockholding system and attached much value to the availability of petroleum products in the country. As the costs of holding specific stocks in Denmark were low (the finished products were already there in the required volumes), Denmark aimed to support the role of the CSE by holding specific stocks. Denmark regards the reporting requirements relating to specific stocks to be lower than if 1/3rd of the CSO would be held in the form of finished products as the type of information that needs to be supplied is easy to obtain.

Lithuania also decided to hold specific stocks since January 2013, but did not indicate seeing a significant advantage to holding them. The publicly-controlled CSE already owned a significant amount of petroleum products and could therefore reduce the financial burden on the industry in a cost-effective manner by transferring the product-specific obligation of the Directive to the CSE. In terms of reporting and storage costs, Lithuania notes that there is no significant difference between holding specific stocks or 1/3rd of the obligation in finished products.

The above discussion shows that holding specific stocks as part of the overall emergency stocks is not a common choice. We conclude that specific stocks **do not improve the availability of stocks**. Since the underlying physical product will be the same when marked a specific stock or not, there is no difference in terms of availability. Additional clarity in the Directive as to how the volume of eligible emergency stocks are precisely calculated with or without specific stocks and what the precise reporting requirements are should help to make the decision to hold specific stocks more transparent. In those instances where holding specific stocks might indeed lower total costs of stockholding, this might increase the share of specific stocks in countries with an active CSE in the future. In all other instances, it is expected that without a change in the regulations, most Member States will continue to

[40] The information below is based on direct communication with stakeholders in France, Denmark and Lithuania.
[41] Annual report analysing the measures taken by national authorities to ensure and verify the availability and physical accessibility of emergency stocks as referred to in Article 5

decide not to hold specific stocks due to the fact that they present no advantage over the alternative to hold product stocks.

4.3.5 The impact of additional incentives on the share of CSE-held stocks or specific stocks

The Directive mentions that the existence of CSEs brings the goals of the availability of oil stocks and the safeguarding of energy supply closer (recital (8) of the Directive). As discussed in Section 4.2, the share of stocks held by CSEs in the EU has been increasing since the transposition, but there are still a number of countries with a fully industry-based system and/or countries with a significant share of the obligation put on industry. When discussing potential incentives to increase the share of CSE-held stocks in the EU, a large majority of the (particularly CSE) stakeholders interviewed referred to a waiver of the 10% deduction on CSE-owned stocks that is currently applied to the total of emergency stocks. The waiver of the 10% deduction for CSE-owned stocks was also part of a recent communication from a group of Member States to the EC outlining some specific propositions to improve the functioning of the Directive.[42]

Many CSE representatives argue[43] that a waiver of the 10% deduction for CSE-held stocks should be considered as they argue that none of the stocks owned by CSEs would be unavailable. Even though the Directive does not provide a justification for the inclusion of the 10% deduction, we understand it is a result of the harmonisation with the IEA system, which applies the deduction to account for potentially unavailable stocks (such as tank bottoms)[44]. They argue that if the CSE owns stocks in dedicated tanks, a very large share of the stored emergency stock can be immediately released if necessary. There might be losses relating to product stocks due to natural degradation and evaporation, but these are not estimated to be very high (i.e. <1%)[45] and additional stocks would also be stored in order to make sure that the required amount is available. Section 5.3.5 presents the rationale for including the 10% deduction in more detail and explains that on the basis of the discussions held at IEA SEQ meetings, the 10% deduction is politically viewed as covering unavailable stocks in the broadest manner as possible. From this point of view, the argument that CSE-stocks do not contain technically unavailable stocks does not hold any longer and then the waiver of the 10% deduction for CSE-stocks could be viewed as a political choice to stimulate a higher share of CSE-stocks.

Alternatively, the CSE has a contract with a storage company that stores the CSE-owned stocks, in which case the entire amount of their stock can be released in an emergency as the contract with the storage company specifies the precise (and full) amount of stock that should be made available. In a similar way, in case CSE holds contracts with industry to buy stocks in an emergency (tikcets) , the CSE will have the option to buy a precise and certain amount of stock, which would also legally guarantee the release of that precise volume. Potentially unavailable stocks or tank bottoms that might be part of the facility with which the CSE has the ticket or the storage contract would in this case be the responsibility of the industry. The industry might deal with these technical difficulties by incorporating them in the price of the ticket (or in the price of the storage if the CSE owns the stocks itself).

Therefore, in whichever way the CSE meets its obligation, their emergency stocks held can be made fully available in times of emergency and based on their contracts can be demonstrated as containing

[42] *Letter to European Commission pursuant to review of Council Directive 2009/119/EC of 14-09-2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products review*, 19-02-2016.
[43] In bilateral interviews and during a workshop with EU CSEs held in Rotterdam on 30-11-2015
[44] International Energy Agency (2016). See https://www.iea.org/netimports/explanations/methodology/
[45] More details in Box 5-2

no unavailable stocks. However, if CSEs store emergency stocks with industry or hold tickets with industry the situation is – from a national security of supply perspective - effectively not different from an industry-based system that needs to guarantee the full availability of emergency stocks (excluding an unavailable fraction). Indeed, from this perspective, some stakeholders outlined that the 10% deduction might even be considered redundant in the entire Directive as Article 5.1 stipulates that Member States shall "*at all times […] ensure that emergency stocks and specific stocks are available and physically accessible for the purposes of this Directive*". If this were strictly the case, even emergency stocks held by industry players could be eligible for the 10% deduction waiver. But as the previous section outlined, due to remaining uncertainties with the definitions of MORs and working stocks and their potential inclusion in reported emergency stocks, the uncertainty with respect to availability remains.

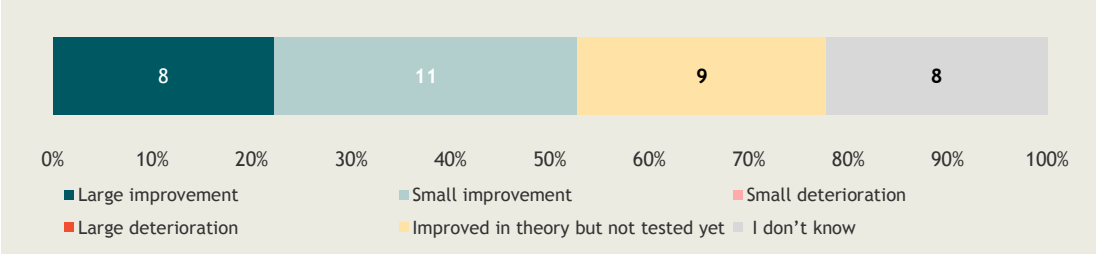
Therefore, in the Directive's current form, an effective and fair incentive to increasing the share of CSE-held stocks would be a **waiver of the 10% deduction on stocks owned and physically stored in dedicated tanks by CSEs. T**he IEA should be fully involved in this process, as a potential adjustment of the rules in the EU should (preferably) be aligned with the IEA rules. However, the extent to which industry-based systems will switch to more CSE-held stocks as a result of such a potential waiver depends, inter alia, on the net outcome of the cost savings achieved by the 10% deduction, the costs of acquisition of emergency stocks by the CSE and the costs of acquiring dedicated storage facilities.

4.3.6 Impact of the Directive on emergency response mechanisms

This section is intended to answer the question as to whether the Directive has affected the emergency procedures to allow a better coordination with the IEA in the event of an oil supply disruption and a possible IEA collective action. We have answered this question via a combination of interviews, survey questions and the analysis of the stock release mechanism in a selection of Member States.

The general survey contained a specific question on the extent to which the 2009 Directive allows for improved coordination with the IEA in case of disruption. The figure below indicates a positive response to this question from 19 respondents of the 28 that expressed an opinion. The other nine felt that coordination has only improved in theory. None of the respondents indicate a deterioration. Respondents mentioned that the coordination with the IEA for events that have not led to an International Collective Action has improved and that there has been a useful and positive exchange of best practices at the level of Emergency Response Reviews.

Figure 4-10 Effect of the new Directive on the coordination with the IEA in case of disruption



Source: Trinomics General Survey

The survey also contained a question on whether the Directive has (or will) lead to an improvement in the availability of emergency stocks in the respondent's country in the event of a crisis. The response to

this question was slightly less positive in that only 19 of 46 respondents to the question answered that yes (4 to a large extent and 15 to a small extent, with these respondents all coming from IEA member countries), 24 responded that the Directive had not improved the availability. Those who answered no may not be saying that the Directive has made the availability worse, but could well be saying that it has simply not affected availability. This interpretation is backed up by the fact that 34 from 40 respondents felt that the Directive has enhanced the credibility and quality of the whole system. A point that was raised during the interviews, which is of relevance here, is that a number of stakeholders felt that security of supply and adequacy of response has increased as it was previously possible to cover product obligations (based on consumption) with stocks of crude oil.

Country profiles / studies on availability

The procedures adopted by the Member States for releasing stocks appear to be consistent with each other. All Member States would wait for the IEA Governing Board to declare a crisis and contact them, for the non IEA members this contact would come via the European Commission. Each country would be requested to release the same percentage of their stocks (strictly speaking the same number of days of consumption). The Member State government would then instruct their CSE and /or industry to release stocks. From the case studies it is clear that the way in which Member States release their stocks in the event of an IEA request to do so is strongly influenced by the nature of their stockholding system. For those Member States with a system based solely on industry holding stock (e.g. the UK and Romania) the Member State government can simply reduce the stock holding obligation on each obligated company, which is intended to provide an incentive to release stocks into the commercial market. For Member States with CSEs, if (as is most common, e.g. NL, Spain, Cyprus) some of the stocks are held by industry (either via CSE tickets, or as part of the national obligation) the National Government (via the CSE) can either take up the option of the ticket or reduce the industry obligation and make stocks instantly available to the market in the same way as those Member States with an industry only system. Those Member States with CSEs which hold their own stocks also have the option of releasing these stocks. This stock release is a slower process than the release of industry held stocks because the oil typically has to be released to the market (i.e. sold) via a tendering process. This mix of stockholding types builds a form of sequential release into the transnational (i.e. EU wide) stocks that is recognised and seen as beneficial. It does not appear that the 2009 Directive has had any significant impact on the mix of stockholding types so this benefit remains.

From the case studies and interviews an interesting point is that there is no intention to profit from selling the emergency stocks, which reaffirms their purpose as being to keep the market supply going and not to protect / manipulate prices. However, those CSEs which release their own stocks via tender would sell to the highest bidder. There also appears to be some variation with regard to the view of the purpose of the stocks, the general IEA view is that the purpose of releasing stocks is considered to be to make product available for the international market in general, responding to major crises rather than local supply disruptions. Hence the precise location of stocks is not critical. Others, especially those more remote from oil market hubs, appear more inclined to think of their own supply / market first. With regard to the total availability of stocks, in theory both the emergency and commercial stocks would be available in the event of a crisis (as implied by the IEA calculation method), but in most countries the national governments only have legal powers over the emergency stocks and it is difficult to know if all the commercial stocks would actually be available in the event of a crisis.

IEA exercises are conducted to test the overall effectiveness of the IEA system. The exercises are conducted every two years covering communications and data reporting and management and decision making (typically a 2 day exercise with many participants) as well as more focused tests to look at specific issues (typically 1 day tests with sector specialists). These exercises have sometimes considered scenarios of more regional (as opposed to global) supply crises which would only affect a part of Europe. Romania has recently taken part in an IEA exercise (along with other Member States, including all non IEA Member States via the Commission) to simulate stock release in the event of a supply disruption, even though they are not an IEA member. They did this to test their response and show their willingness to participate under the solidarity concept provided by the Directive.

Box 4-2 Examples of Member State stock release

There have been two relatively recent events in which the emergency response mechanism was tested and actual emergency stocks were released to the market for all IEA Members[46]: Libya Collective Action (2011) & Katrina Collective Action (2005). For ***the Netherlands*** in case of the Libya action, the Ministry and COVA (the Dutch CSE) successfully tested a variety of responses in order to check the availability and speed of release. The NL response time (i.e. the time taken to release stocks) for this incident was 3-6 weeks. COVA released emergency stocks to the market by

1) Selling crude oil owned by COVA for which COVA had expiring contracts with storage companies;
2) calling a number of options for crude oil tickets and bringing them on the market through tendering;
3) the sale of a ticket of diesel.

The availability of ***UK*** stocks were tested during Hurricane Katrina (which reduced refinery supplies in the US). When a release was ordered, most of the northern European response was via stocks held in the ARA (Amsterdam, Rotterdam, Antwerp) hub location, with UK refineries in effect back filling via increased exports to cover some of the drop in ARA volumes. Freight prices increased significantly and shipping availability became more critical but the system worked to provide more supply into world markets.

Conclusion on Emergency Response

It is generally accepted that the 2009 Directive has resulted in a system that is more closely aligned with the IEA, and that this improvement in alignment has helped clarify the approach to responding to an incident. It also appears that the alignment has not negatively influenced the ability of Member States to respond to more localised incidents that would only affect parts of Europe, with the IEA actually leading exercises to simulate responses to relatively localised interruptions.

4.4 Impact of the Directive on the transparency of emergency stocks

Another important intended impact of the 2009 Directive was to improve the transparency of emergency stocks. In this section, four particular topics in relation to transparency are discussed:

4.4.1. Distinction between emergency stocks, commercial stocks and working stocks;
4.4.2. Transparency related to cross-border stocks and cross-border tickets;
4.4.3. Differences between IEA and EU figures;
4.4.4. Use of previous categories of oil products and the category of 'any oil'.

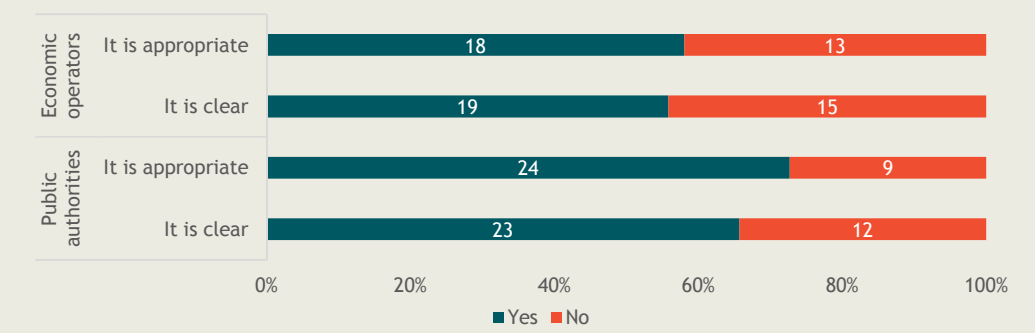
[46] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32005H0885

4.4.1 Distinction between emergency stocks, commercial stocks and working stocks

Directive 2009/119 aimed to improve the transparency and availability of stocks by (inter-alia) distinguishing emergency stocks and commercial stocks. Indeed, the Directive defines 'emergency stocks' as those oil stocks that each Member State is required to maintain pursuant to Article 3 of the Directive and 'commercial stocks' as those stocks that are held by economic operators and are not a requirement under this Directive.[47] Therefore, stocks that are held by economic operators for commercial purposes on top of their obligation are not counted towards meeting the stockholding obligation. According to the interviews, this distinction between what constitutes emergency stocks and what constitutes commercial stocks from the perspective of the Directive is regarded as clear since the definitions for these concepts are mutually exclusive and collectively exhaustive. Since this separation is understood and is clear for the involved stakeholders, this distinction is believed to be appropriate for reaching the overall goals of the Directive.

However, according to the survey respondents and interviewees uncertainty remains with respect to the precise definition of stocks that qualify as 'emergency stocks'. As presented in Annex III, the Directive allows stocks present in commercial systems ('working stocks') as stocks that could qualify as emergency stocks for the Directive. Notably, stocks held by economic operators as *working stocks* would without obligation on them be classified as 'commercial stocks'. However working stocks could also be used by economic operators with a delegated obligation as emergency stocks. In addition – as discussed in section 4.3.3 – we cannot be sure that MORs are excluded from the reporting of emergency stocks in all Member States. The survey results showed that public authorities cannot always guarantee that MORs are excluded based on their national legislation, even if the Directive has been fully transposed. The Directive namely does not provide a specific definition for *working stocks* or *MORs* and therefore most interviewed stakeholders feel that - despite the clear definitions of emergency stocks and commercial stocks – there remains ambiguity with respect to the comparability of the reported emergency stocks across Member States.

Figure 4-11 Do you think the distinction between emergency stocks, commercial stocks and working stocks is clear and appropriate?



Source: Trinomics General survey

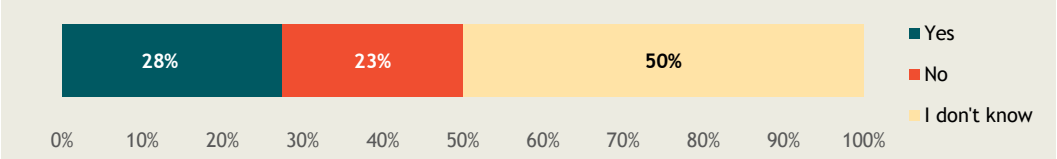
Taken together, Figure 4-11 shows that a small majority of public authority and economic operator survey respondents regard the distinction of these three concepts as clear. Generally slightly more public authority representatives regard these concepts as clear compared with oil companies. This is likely to be due to the fact that oil companies deal more directly with the classification of their working stocks as commercial stocks or emergency stocks. Also, only a slight majority of oil companies

[47] See Article 2 of Directive 2009/119/EC.

(58%) think that the distinction between these concepts is appropriate for meeting the objectives of the Directive. In additional interviews, oil-company stakeholders indicated that any stocks held for the Directive need to be made available for emergency purposes in line with the requirements of the Directive. As a result, all emergency stocks (whether stored in industry systems or dedicated government facilities) meet the same requirements in terms of release. It is therefore not needed ('apporpriate' in the survey) to having to understand the difference between the different types of emergency stocks. Slightly more public authority respondents (72%) think it is appropriate to distinguish between working, commercial and emergency stocks. Interviews with them indicate concerns that in the absence of clear definitions for working stocks, this concept is interpreted differently across Member States and could include MORs in one country and not in others (as discussed in section 4.3.3).

As a result, despite the clear separation of commercial stocks and emergency stocks from the perspective of the Directive, only 28% of all survey respondents think that the figures reported on commercial and emergency stocks are comparable between Member States (see Figure 4-12). The remainder either does not know (50%) or does not think that the figures are comparable (23%). Stakeholders remain uncertain with respect to the definition of working stocks across Member States and particularly whether these include MORs or not. Since working stocks are eligible emergency stocks, some uncertainty remains with respect to the comparability of the level of emergency stocks held across the EU.

Figure 4-12 Do you think the figures on emergency, commercial and working stocks reported by Member States are comparable?



Source: Trinomics General Survey (n=40)

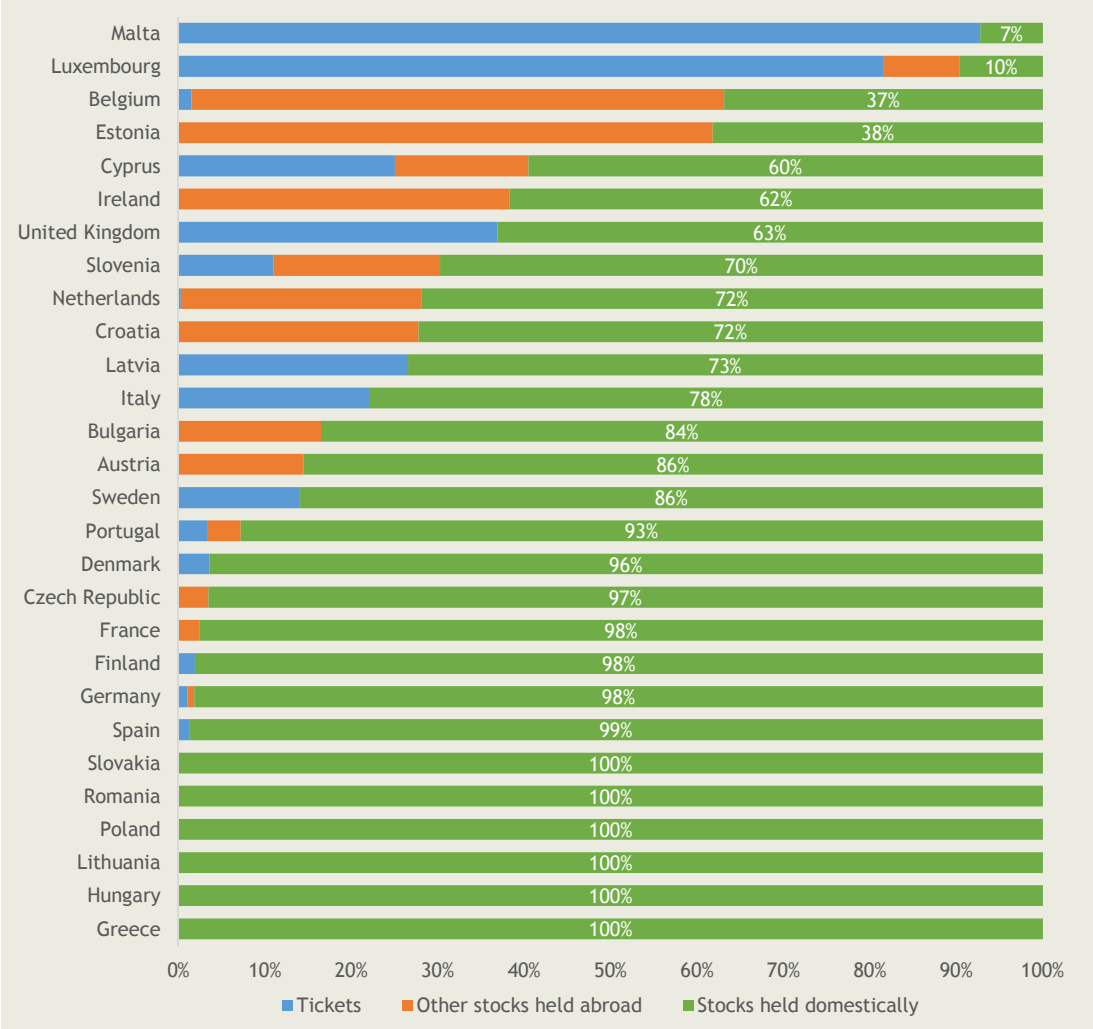
4.4.2 *Transparency related to cross-border stocks and cross-border tickets*

Many Member States either hold emergency stocks in other countries or have tickets with foreign economic operators or foreign CSEs. The EU average of stocks and tickets held abroad is 13% of the total emergency stocks in 2014 (see Figure 4-13). Figure 4-13 illustrates that the share of stocks held abroad varies considerably in the EU, ranging from 93% of the emergency stocks in Malta to 0% in six Member States (EL, HU, LT, PL, RO and SK). Storing stocks or holding the right to buy stocks in other EU Member States presents certain advantages from the perspective of the Internal Market. The overall cost of stockholding can be reduced if use is made of excess storage capacity abroad instead of building additional storage facilities and if excess stocks abroad can be used to fulfil the national CSO.

However, various public stakeholders expressed concerns with respect to the transparency of cross-border stocks and cross-border tickets in the EU in relation to three areas:

1) Reduced ability to monitor the volume and quality of stocks;
2) Potential for double-counting and discrepancies in reporting;
3) The absence of a regulatory framework to govern cross-border stocks in the EU.

Figure 4-13 Member States share of cross-border tickets in overall emergency stocks (Dec 2014)



Source: Eurostat

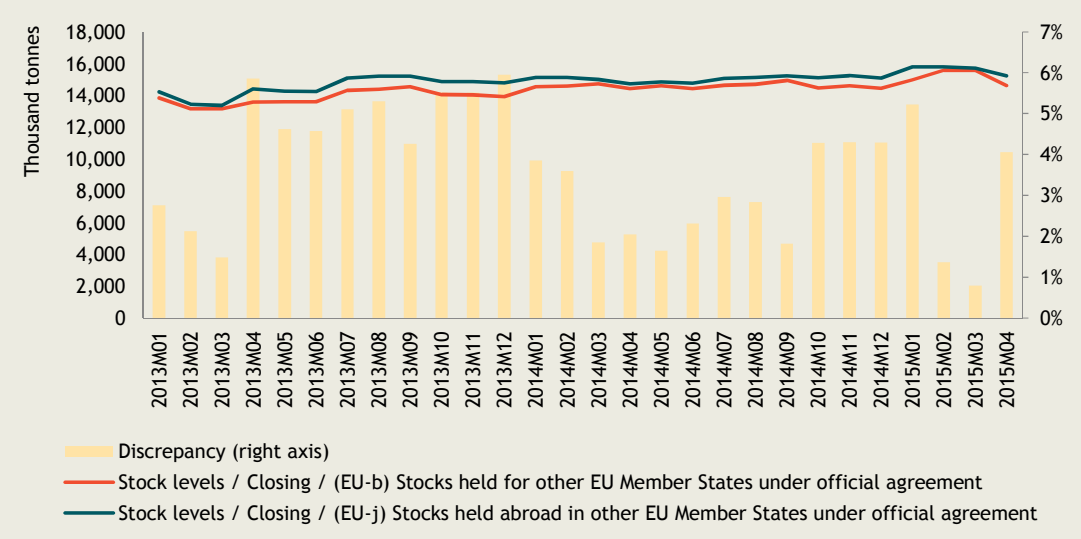
Note: the EU average of cross-border tickets and other stocks held abroad is 13% (cf. also Figure 4-3)

With respect to the first area of concern, stocks or tickets held abroad are physically more difficult to monitor for the owner in another country. The owner has to rely on the audits and checks that are performed by the host country and trust the information supplied about the volume and quality of stocks. In the case of cross-border tickets, the buyer typically does not specify such auditing requirements and often relies on the information supplied by the provider of the ticket (who might be monitored by its public authorities). In general, this leads to less control and information about the volume and quality of stocks. However, many countries require approval of bilateral emergency stockholdings or the trading in tickets by both Member States' national governments in addition to the agreement between the obligated party and the foreign stockholder or ticket seller. Despite the fact that the Directive does not require a bilateral agreement anymore (though prior authorisation is still required), the approval of cross-border transactions between national governments is in most countries still facilitated by some type of bilateral agreement (see section 5.4.2), typically stipulating agreed emergency procedures, arrangements with respect to audits and/or information exchange procedures. Therefore, even though the Directive does not stipulate the need for a bilateral agreement, the

concerns about the reduced ability to monitor and control the volume and quality of stocks abroad are typically still addressed by most Member States in some type of bilateral agreement. The additional precision in the required detailed register of emergency stocks introduced in the Directive also add to the transparency of the type and volume of stocks held abroad.

Secondly, emergency stocks held cross-border sometimes suffer from discrepancies in reporting about their precise volume or the type of product stored. In principle, stocks held in another Member State are included in the reporting of emergency stocks by the Member State that owns the stocks and subtracted from the reporting of available stocks in the hosting Member State. Therefore in the aggregate the total volume of stocks held cross-border and stocks held for other countries should be equal. The EC Impact Assessment for this Directive indicated evidence that Member States account for emergency stocks differently and/or count stocks held for domestic and foreign emergency purposes twice[48]. The potential size of these discrepancies between bilateral stockholdings was estimated to be approximately 10-20% of total emergency stocks in 2004 based on IEA figures. Directive 2009/119 aimed to increase transparency, but the most recent data from Eurostat indicate that discrepancies in reporting of cross-border stocks remain. Figure 4-14 indicates that some 1%-6% of total stocks held cross-border are still double counted, although this suggests a significant reduction from the situation prior to the Directive. The IEA also mentioned that discrepancies in cross-border stock reporting are still discovered in emergency response reviews. Even though this is a reduction compared to the 2004 data, interview results suggest that discrepancies in reporting might not have been reduced and that there can be large differences in the way countries classify a ticket, even though the underlying product is the same. This could lead to misunderstandings and uncertainty at the level of national governments and the EU as to which stocks are precisely available when formulating potential actions to specific situations.

Figure 4-14 Stock levels reported as held abroad and domestically held for other countries, EU-28



Source: Eurostat

Thirdly, the scope for discrepancies in cross-border stock reporting has not been reduced since the introduction of the Directive as the need for a bilateral agreement was removed. Some stakeholders

[48] European Commission (2008c).

mentioned that in the absence of the need for a bilateral agreement, the Directive should ideally provide a governing framework detailing the conditions under which cross-border stocks or tickets can be held or traded and stipulate conditions as to how they should be monitored and administered. Because this framework is not provided in the Directive, the argument is made that many countries still require bilateral agreements for cross-border stocks and cross-border tickets.[49]

In order to ensure the transparency and availability of cross-border stocks in the presence of these challenges, Member States have developed different policies for dealing with cross-border stocks and cross-border tickets. Box 4-3 illustrates the policy in three Member States.

Box 4-3 Examples of Member States' attitudes towards cross-border stocks and cross-border tickets

The Netherlands does not restrict foreign parties from buying tickets in the Netherlands and in principle also does not restrict the storing of stocks or buying of tickets abroad for Dutch obligated parties. However, the Dutch government has to approve all cross-border emergency stocks trading activity and only allows stocks to be held in countries with which the Netherlands holds a bilateral agreement (currently 11 Member States, mostly neighbouring countries). The trading in cross-border tickets in the Netherlands is strictly monitored and governed by an electronic platform through which each ticket deal must be registered. This allows the Dutch government to monitor the trade in tickets and it forces economic operators to specify the conditions and details of the tickets in certain pre-defined categories, which reduces the scope for misunderstandings between ticket traders. As Dutch companies and the Dutch CSE can only buy tickets in countries with which the Netherlands holds bilateral agreements, there is an overarching framework between the two governments that defines what information is exchanged and clarifies the definitions used for trades.

In **Austria,** economic operators are not permitted to hold cross-border stocks or cross-border tickets. As Austria only has one pipeline for crude oil imports (the TAL/AWP pipeline) and is a landlocked country, the government prefers to hold all emergency stocks within Austria or within this pipeline system (e.g. at the depot in Trieste, Italy, which is connected to the pipeline). This preference reflects concerns over the potentially lower availability of cross-border stocks to Austria– the only way to transport oil products from abroad is by rail, car or river barge, which could take a long time and is therefore not ideal from a (domestic) security of supply perspective.

Cyprus is a country that quite strongly depends on cross-border tickets because of its relatively small size and the absence of a significant national storage infrastructure. However, from a security of supply perspective, holding cross-border tickets is not ideal for a country that is located in the Mediterranean sea rather distant from other EU Member States. As a result, Cyprus is planning the construction of a new domestic storage terminal. Currently, COSMOS (the Cypriot CSE) still holds tickets for 195,000 tonnes of stocks (2016 data), which are mostly with CSEs in Belgium, the Netherlands, Italy, the UK, Malta and Finland. The auditing of the quality and volume of the stocks underlying the tickets is difficult as the physical location of the stocks is not in the country and is therefore more costly. Therefore, COSMOS has to rely on the systems in place in the other countries. By ticketing with CSEs rather than economic operators, it was felt that there is more certainty that the stocks are actually available.

In conclusion, transparency issues remain inherent to cross-border stocks and cross-border tickets due to the reduced ability of the owners to control and check the stocks in other countries. Despite the fact

[49] Because the aim is to safeguard the availability of foreign stocks, bilateral agreements are usually required by national authorities for national operators (incl. the CSE) to have cross-border stocks/ tickets, but not if foreign parties want to buy stocks or tickets in their home country.

that the Directive removed the requirement for a bilateral agreement between countries, it reduced the severity of the cross-border transparency issues that exist for longer. By integrating reporting with the IEA, statistical discrepancies in bilateral stockholdings have been reduced. Additionally, the detailed registry of emergency stocks that was introduced in Article 6 requires Member States to keep record on the precise location and volume of their emergency stocks at all times. However, the majority of Member States continue to require some form of bilateral agreement in order to facilitate the monitoring and approval of cross-border emergency stock transactions. As a result, the contractual availability of stocks held cross-border and the related emergency response mechanisms seem to be appropriately arranged at Member State level. There should therefore be no significant concerns with respect to availability of cross-border stocks and tickets at Member State level.

However, since the Directive does not define conditions for bilateral cross-border emergency transactions and discrepancies in cross-border stockholding reporting remain, the governance of cross-border stocks at EU level could be improved. In order to increase the information about stocks held cross-border and reduce reporting discrepancies, clearer guidelines on the way in which cross-border stocks should be administered and/or basic requirements for monitoring and compliance checks could be considered in the Directive.

4.4.3 Differences between IEA and EU stockholding figures

The Directive aimed to harmonise the IEA and EU stockholding systems. As a result, a large part of the IEA stockholding calculation was adopted in the Directive, so that EU Member States and IEA members practically experience one and the same obligation. Many stakeholders confirmed that the alignment from this perspective was successful (see also Chapter 5). However, there are still some fundamental differences between the IEA and the EU stockholding systems in terms of which stocks are eligible as emergency stocks and, to a lesser extent, how the obligation is calculated.

Table 4-4 compares the stockholding obligation and the calculation of emergency stocks between the EU and IEA system. The calculation of the stockholding obligation mainly differs due to the distinction that the EU makes between countries that are net importers or net exporters of oil products. The IEA does not impose an obligation on net exporters, whereas in the EU system these countries have an obligation based on their inland consumption. With respect to the calculation of the eligible emergency stocks and the adjustments applied, the largest difference between both systems is that the IEA counts all stocks in a country, including all stocks held by industry for commercial trading and operational purposes, whereas the EU only counts stocks (from a list of eligible stock types) specifically earmarked as emergency stocks.

Table 4-4 Comparison of EU and IEA stockholding and emergency stocks calculations

	EU stockholding calculation	IEA stockholding calculation
Obligation	**The greater of:** **1.** [Net imports of primary products + Net imports of all refined oil products (excl. naphtha and international marine bunkers) - converted to COE by a factor of 1.065] **2.** [Observed inland deliveries of motor & aviation gasoline, gasoline-type and kerosene-type jet fuel,	Net imports of **primary products +** Net imports of all **refined oil products** (excl. naphtha and international marine bunkers) - converted to COE with a factor of 1.065

	EU stockholding calculation	IEA stockholding calculation
	other kerosene, gas/diesel oil and fuel oil - converted to COE by a factor of 1.2]	
Adjustments	Naphtha yield of 4% is deducted from the net imports of primary products. For countries with a naphtha yield >7%, actual naphtha yield factors or volumes should be used.	Naphtha yield of 4% is deducted from the net imports of primary products. For countries with a naphtha yield >7%, actual naphtha yield factors or volumes should be used.
Eligible stocks	Oil stocks made available and physically accessible for the Directive from the list of eligible quantities defined in Annex III of the Directive [= Total oil stocks (incl. crude oil, NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons / Commercial stocks to be excluded / Including several oil products]	**Total oil stocks in a country** (crude oil, NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons, including stocks of additives, such as biofuels; net any bilateral stockholdings [including oil products, though not required])
Adjustments	- Naphtha yield of 4% is deducted from stocks of primary products - Refined oil product stocks counted as COE emergency reserves by counting either **1.** [Product stocks (Annex C Regulation 1099/2008) x 1.065] or **2.** [Stocks of main products – motor & aviation gasoline, gasoline-type and kerosene-type jet fuel, other kerosene, gas/diesel oil and fuel oil – x 1.2] - 10% deduction for unavailable stocks	- Naphtha yield of 4% is deducted from stocks of primary products - Refined oil product stocks counted as COE of emergency reserves by counting either **1.** [All existing products stocks x 1.065] or **2.** [Stocks of three main product groups – gasolines, middle distillates and heavy fuel oil – x 1.2] - 10% deduction for unavailable stocks

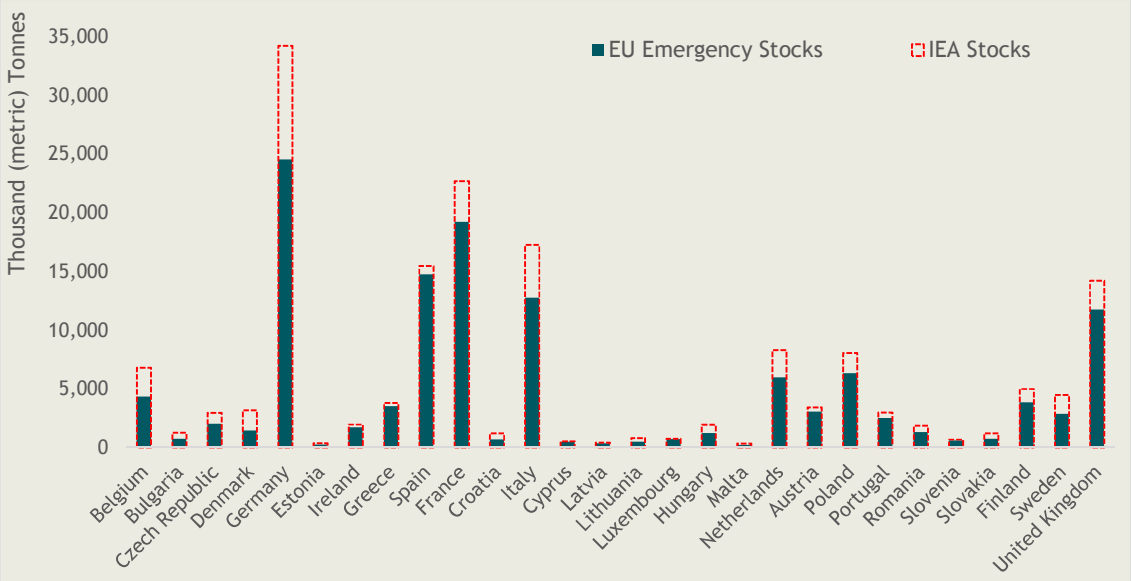
Therefore, the obligation is often practically identical (for net importers), but the level of eligible emergency stocks that can be counted towards the obligation is typically higher for the IEA system than for the Directive. Figure 4-15 illustrates the resulting differences in the calculated obligations for the EU and IEA system and the eligible volumes of emergency stocks under both systems for December 2014. It clearly shows that depending on the characteristics of the oil industry in a country, the differences sketched in Table 4-4 could give rise to different volumes of eligible emergency stocks. For example, due to the transit function of its harbours, there is a large volume of additional commercial stocks present in the Netherlands destined for trading (=commercial stocks not counted towards the EU obligation, but included for the IEA definition). Other EU countries with a lot of refining facilities, such as Germany and France, also have a large share of commercial stocks additionally available.

4.4.4 Use of previous categories of oil products and use of category "any oil"

It is important that all Member States use the same categories of oil products in their reporting of emergency stocks, especially when accounting for and dealing with cross-border stocks and cross-border tickets. It emerged from the interviews that most stakeholders think that the same categories of oil products are used throughout the Member States as they are clearly described and stipulated in the Directive and in the reporting templates. However, there was more uncertainty about the categories of oil products used on (cross-border) tickets. As described in Section 4.3.2, the absence of a clear EU regulatory framework for cross-border stocks and cross-border tickets might give rise to discrepancies in reporting on which type of oil products are stored and/or held as tickets, in particular if the products concern complex (components of) finished products. Still, most Member States believed that the categories of oil products from the previous Directive were not used anymore, but many voiced their

concerns that they noticed thatcertain economic operators trade tickets with the category 'any oil', which does not reveal any information as to which type of oil product is in fact stored. They preferred that the Directive prohibits the use of the note "any oil" on tickets.

Figure 4-15 EU emergency stocks and IEA obligation, as at December 2014



Source: Eurostat
Note: EU eligible Emergency Oil Stocks = Stock levels / Closing / (EU-l) from the MOS; IEA = Stock levels / Closing / (l) Total stocks (a-b-c+j+k) from the MOS

4.5 Summary of findings on effectiveness

This chapter discussed the evaluation questions that are mostly related to assessing the effectiveness of the Directive. In particular, these questions concerned:

1. The impact of the Directive on stockholding systems implemented across the EU (incl. the share of stocks held by different players and whether the differences between the stockholding systems have any negative consequences);
2. The impact on the availability of stocks; and
3. The impact on the transparency of stocks.

The Directive has had a small effect on the stockholding landscape in the EU: five out of the 28 Member States recently changed their stockholding system, mostly towards a more CSE-based system (a development implicitly favoured by the Directive), despite the fact that the Directive does not include direct incentives for the establishment of CSEs. In line with this development, between January 2013 and December 2014 the share of emergency stocks held by CSEs or governments increased from 49% to 55%. The differences in stockholding systems in the EU do not have a significant impact on the functioning of the Internal Market or on the functioning of the Directive. Two areas that require attention in order to further strengthen the functioning of the Internal Market for emergency oil stocks are the auditing and control of cross-border stocks across Member States and improving the monitoring and administration – and therefore the transparency - of cross-border tickets.

With respect to the Directive's aim to improve the availability of emergency stocks, six specific topics were addressed (as summarised in Table 4-5). After the transposition of the Directive, the level of emergency stocks increased slightly, most likely as a result of the introduction of the 10% deduction rule in combination with the fact that commercial stocks can no longer be counted. Since the introduction of the Directive, the share of CSE-held stocks has increased and four Member States set up a CSE (see Table 4-1), partly as a result of the Directive (Austria, Belgium, Italy and Luxembourg). As the availability of CSE-owned stocks is perceived to be slightly better, this is assessed as a positive development. The composition of stocks also changed slightly and, although the share of finished products in the emergency stocks remained fairly stable, it is now a better reflection of the demand for finished products, because it requires that the finished products held jointly constitute more than 75% of national aggregate demand. As a result of the changed product obligation, Member States currently store slightly more stocks in commingled storage, which has the advantage that these stocks are automatically connected to the commercial infrastructure (and hence can be made quickly available in case of an emergency) and that these stocks are refreshed on a continuous basis. However, when emergency stocks in commingled tanks actually constitute the MORs of industry operators, their availability is somewhat more uncertain. Given the fact that working stocks, stocks in tank bottoms and other potential MOR for the oil industry may be included in the calculation of emergency stocks, the actual availability of emergency stocks can differ across stockholding systems dependent upon on the share of stocks held by economic operators and the refining capacity in the Member State in question. It is uncertain whether the 10% deduction in the calculation of eligible emergency stocks is an accurate reflection of the potentially unavailable emergency stocks held by industry, but this percentage certainly appears to be far too high for stocks owned by CSEs or governments. Therefore, many CSEs and public authorities argued that a waiver of the 10% deduction for CSE-held stocks should apply. This waiver could also act as an effective incentive to increase the share of CSE-held stocks, including specific stocks. The introduction of specific stocks does in our view not have a significant effect on the availability of stocks. Taken as a whole, the Directive has had a moderately positive impact on the availability of emergency stocks in the EU.

Table 4-5 Impact of the Directive on the availability and transparency of emergency stocks

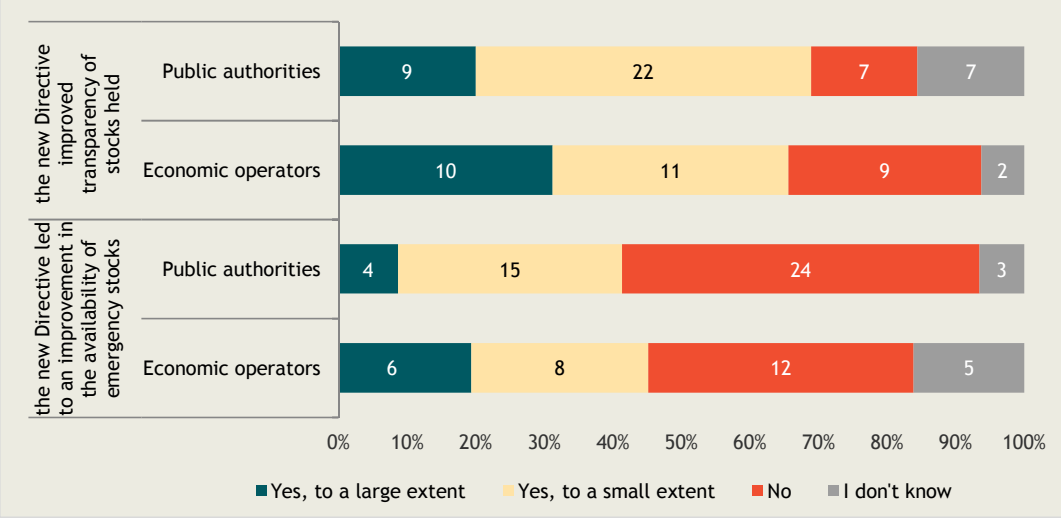
	Availability	Impact of Directive
1	Level and composition of stocks	Positive
2	Commingled stocks	Neutral
3	Stockholding systems	Positive
4	Specific stocks	None
5	Potential effect of incentives for CSE-held or specific stocks	N.A.
6	Emergency Response Mechanisms	Positive
	Transparency	**Impact of Directive**
1	Distinction between emergency, commercial and working stocks	Neutral
2	Transparency of cross-border stocks and cross-border tickets	Positive
3	Differences between IEA and EU stockholding figures	Positive
4	Use of former oil product categories or the 'any oil' category	Positive

The Directive has somewhat improved the transparency of emergency stocks (see Table 4-5), although transparency issues remain. By aligning its calculation methodology with the IEA but maintaining some key differences (in particular with respect to the inclusion of commercial stocks), the Directive introduced a clear difference with respect to what constitutes emergency stocks for the EU Directive

and what are commercial stocks (all other stocks). However, as the Directive does not provide clear definitions for stocks that are typically used for commercial purposes but can also be eligible as emergency stocks (notably *working stocks*) and potentially including MOR, uncertainty surrounding the comparability of Member States' reported figures remains. Transparency issues also remain in the area of cross-border stocks and tickets because discrepancies in cross-border stocks reporting remain and the ability for stock owners to control and audit the quality of stocks abroad is limited. However, the Directive increased the availability of information about the location and volume of stocks through the need to set up a register of emergency stocks. Also, as a result of a close approximation of the EU and IEA stockholding figures, statistical discrepancies were reduced. The former oil product categories also seem not to be used in cross-border trades anymore and only one Member State is reported to use the non-transparent 'any oil' comment on cross-border tickets.

The overall impact of the Directive on availability and transparency of emergency stocks is therefore assessed as slightly positive on the aggregate compared with the previous Directive. Respondents to the survey generally corroborate this conclusion. As shown in Figure 4-16, the majority of economic operators and public authorities that responded to this question answered that the new Directive improved the transparency of stocks to a large or slight extent. With respect to availability, a small majority of respondents thought that the Directive has not improved the availability of emergency stocks, while a large minority considers that there is a positive effect. Based on the individual interviews and close examination of the impact of the Directive on availability as discussed above it remains safe to conclude that the Directive most likely had a slightly positive impact on the availability of emergency stocks in the EU (as summarised in Table 4-5).

Figure 4-16 Overall opinion on the impact of the Directive on availability and transparency of emergency stocks



Source: Trinomics general survey

Note: Respondents included economic operators and public authorities and replied to the questions: Do you agree with these statements? Compared to the previous Directive, the new Directive improved the transparency of stocks held/led to an improvement in the availability of emergency stocks

5 Efficiency of the Directive

5.1 Introduction

Efficiency in the context of an EU intervention relates to answering the question "*were the costs involved justified, given the changes/effects which have been achieved?*"[50]. In other words, the evaluation of efficiency reviews the costs that need (and needed) to be incurred to comply with the requirements of the Directive and compares them with the effects and outputs that these requirements create towards meeting the overall objectives. As presented in chapter 2, the 'effects' of the Directive should relate to the achievement of the overall objectives of ensuring security of oil supply and minimising the impact of a supply disruption on the EU economy. The 'outputs' were defined as the four specific objectives that were formulated in the revision of the current objective. Therefore this section compares the effects and outputs achieved by the Directive – many of which are described in the previous chapter - with the costs borne by Member States for achieving these. Two of the planned outputs relate to improving the efficiency of the Directive and are therefore explicitly reviewed in this chapter, as captured by the following questions:

- To what extent did the Directive improve efficiency through **better harmonisation with the IEA system?**
- To what extent did the Directive improve efficiency by **simplifying reporting**?

The first step in our analysis is to review the type of costs incurred for complying with the Directive and the development of these costs. The chapter is structured against the following evaluation questions:

1. What has been the development in the different type of costs borne for meeting the requirements of the Directive and do they compare with the induced effects? [**Section 5.2**]
2. To what extent did the Directive improve efficiency through better harmonisation with the IEA system? [**Section 5.3**]
3. To what extent did the Directive improve efficiency by simplifying reporting? [**Section 5.4**]

The detailed sub-evaluation questions that are discussed within each of the three main evaluation questions are presented in Chapter 2.

5.2 Costs for meeting the requirements of the Directive

It is important to understand all of the costs related to compliance with the Directive. The most important stakeholders in Directive compliance (and therefore the stakeholders which incur costs) are the relevant services of the European Commission (EC), national government administrations, CSEs (for those Member States where this is applicable) and oil companies fulfilling (a share of) the CSO. The costs related to the Directive can be grouped into five broad categories:

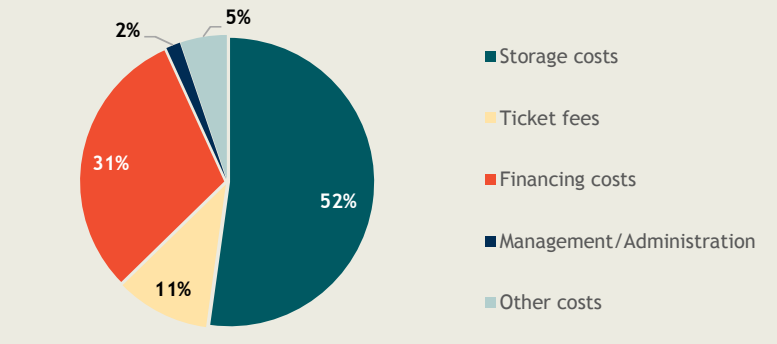
1. Financial costs.
2. Storage costs.
3. Costs for management of stocks.
    a. Inspection and analysis.
    b. Refreshment of products.
    c. Reporting and general management.

[50] European Commission (2013), p. 10.

4. Ticket costs.
5. Costs related to policy implementation and monitoring (EC, national government).

It is important to note that the scale of these costs vary. A 2008 review of costs[51] related to storing emergency stocks for governments and publicly-controlled CSEs, found that storage costs were the largest cost incurred (see Figure 5-1). Total costs of storage also vary depending on the type of facility used for storing the emergency stocks. As shown in Table 5-1, the most expensive storage type is dedicated (stand-alone) tanks (€37-46 per cubic meter per year). Emergency stocks held in commingled storage cost somewhat less (€31-40/cbm/year) as operational costs for the facility can be shared with industry. The cheapest options are stocks held in salt or rock caverns. However, as explained in the previous chapter, there can be a trade-off between costs of storage and how quickly stocks can be brought on the market as the stocks in caverns typically take longer to release than stocks held in facilities already connected to commercial infrastructure. Costs relating to financing, for example for the acquisition of stocks or construction of storage facilities, are also responsible for a large (31%) share of total costs. The relative share of these costs differs between stockholding systems as management & administration as well as financing costs are different for an industry-based than for a CSE-based stockholding system. However, stakeholder interviews for this evaluation found that the relative shares are not likely to differ to a large extent. The evaluation should therefore take into account that requirements leading to changes in storage would have a larger impact on total costs than for example efficiency improvements in reporting.

Figure 5-1 Shares of costs for government/agency stocks



Source: European Commission (EC), 2008, Impact assessment for the proposal for a Directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products, p.47

Table 5-1 Costs of storing emergency stocks across facilities

Type of facility	€ per cbm/year
Stand-alone facility	37-46
Add-on facility	31-40
Salt cavern	22-25
Rock cavern	25-31

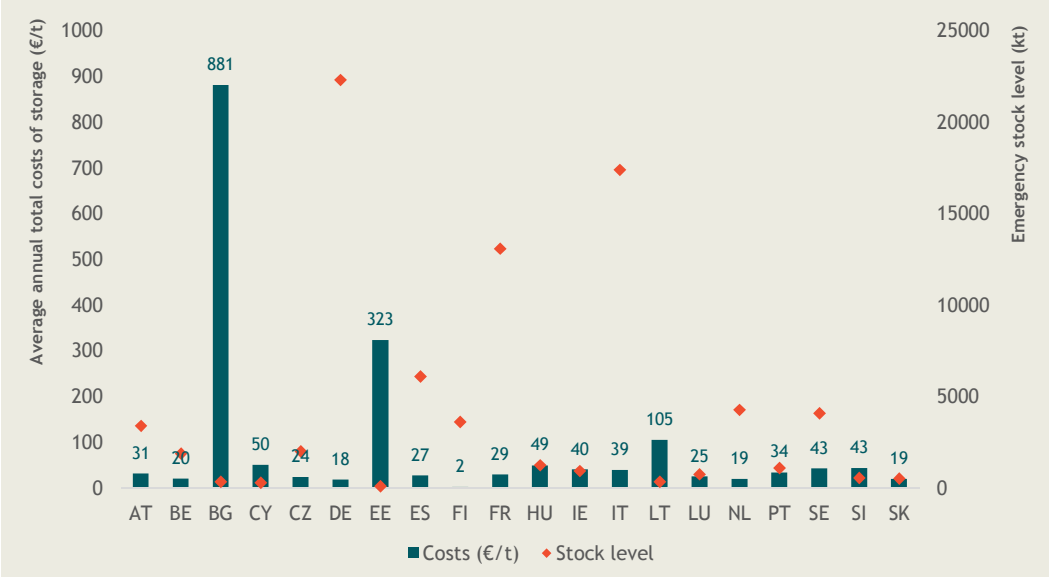
Source: Elliott, J., 2012, Overview of IEA Oil Emergency Response Policies and Procedures. 3rd Energy Community Workshop on Emergency Oil Stocks 25-26 April 2012, p. 21

[51] European Commission (2008), p.47

5.2.1 Development in storage costs borne by Member States

Since the type of facilities used for storing stocks differ across Member States, the average costs incurred for the storage of emergency stocks also differ. The consultation performed in 2007 in support of the impact assessment for the Directive found evidence for significant cost differences between Member States (see Figure 5-2).[52] The most significant outliers in terms of costs (Bulgaria, Estonia and Lithuania) should be interpreted with care as these were Member States that had recently joined the EU and they were still building up their stock levels in line with their transition periods. The other Member States that reported cost data reported storage costs in the range of €2-50 per tonne per year. The average cost of storage (weighted by the absolute volume of emergency stocks held) across the EU based on these data amounted to **€31.3 per tonne** (excluding BG, EE, LT the weighted average was **€27.3 per tonne**). This average of storage costs lies within the range [€22-46/cbm/year] provided by the IEA (see Table 5-1).

Figure 5-2 Development in costs of storing emergency stocks in Member States (2007)

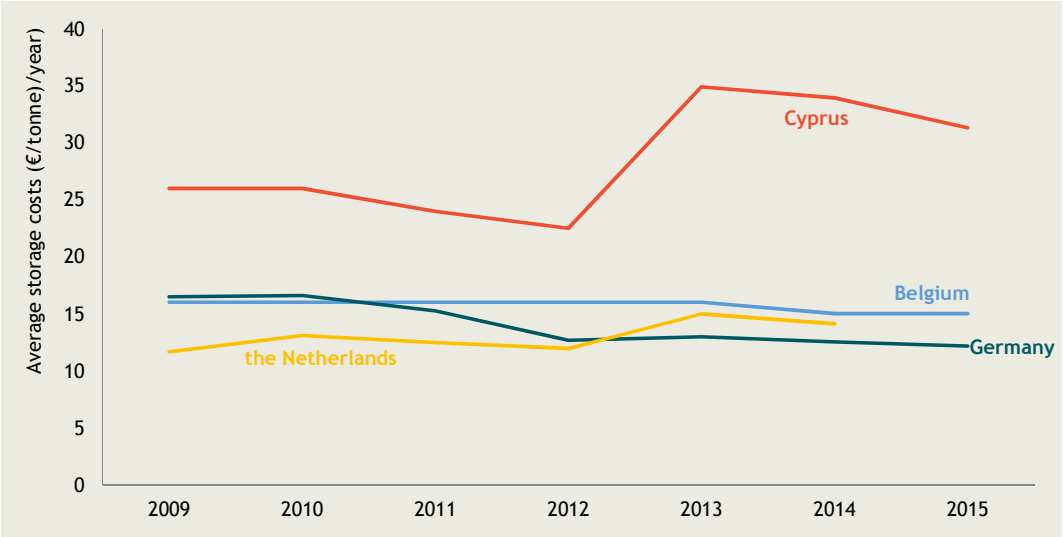


Source: European Commission (EC), 2008, Impact assessment for the proposal for a Directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products, pp. 43

Since the storage costs estimates presented in Figure 5-2 were obtained in 2007, well before the adoption and *a fortiori* the transposition of the new Directive, it is important to assess whether there have been significant changes in the development of storage costs since then. Economic operators and relevant public authority representatives were asked to provide data on their average costs of storage since 2009 in the survey for this study. Figure 5-3 presents the results from the analysis of the answers. Unfortunately only a small number of Member States provided information on the development of their storage costs. In combination with results from the interviews, we conclude that most Member States have not experienced major changes in the average costs of storing since 2009, but for some Member States the Directive did cause some small increases in the costs of storage.

[52] European Commission (2008), p.43

Figure 5-3 Development in costs of storing emergency stocks in Member States



Source: Trinomics General Survey

Note: Only representatives from four MS completed the question on costs of storing in the survey.

Figure 5-3 does however illustrate a sharp increase in storage costs for Cyprus, which due to the timing (towards 2013) could be interpreted as linked to the Directive, but was actually caused by the fact that a large share of emergency stocks in Cyprus were held via tickets (in 2012 only in Greece). Between 2012 and 2013, the ticket price in Greece increased twenty-fold from ~€0.12 per m^3 in 2012 to ~€2.75 per m^3 in 2013 due to a temporary scarcity of heavy fuel and additional demand from other countries for tickets. As a result of the Directive's relaxed requirements on bilateral agreements, Cyprus could increase its ticket holdings with additional countries after 2013 and ease the pressure on their ticket prices. Germany's average costs slightly declined in 2012, which was caused by a slight overall increase in the stockholding obligation. The most important reason for the decrease in average costs of storing was however the increased obligation for Germany[53], which increased the total level of emergency stocks and – as a result of some economies of scale in storage – reduced the average per unit cost of storing.

The development in storage costs for the Netherlands has been rather stable from 2009 to 2014, except for a slight increase in storage costs from 2012 to 2013. As a result of the oil product obligation in the Directive, the Netherlands had to start storing jet fuel, some additional motor gasoline and diesel, which had to be acquired and some additional storage to be arranged. This led to some additional (one-off) storage costs as a result of the Directive, which increased the average per unit costs of storage for the Netherlands as an increasing share of oil products (particularly jet fuel) increase the total average per unit cost of storage. The storage costs reported in the survey are approximately in line with the storage costs (though structurally somewhat lower) reported in the EC consultation in these countries (Figure 5-2).

Based on the data reported by the Member States in the survey, and from additional stakeholder interviews, we conclude that the additional product obligation introduced in the Directive slightly increased the average *per unit* storage costs for some Member States that had to adjust their oil

[53] As a result of an increased naphtha yield above 7% as well as the conversion to COEs.

product compositions. The *total* costs for complying with the requirements of the Directive however have structurally increased somewhat due to an increased volume of emergency stocks that needed to be held[54] as a result of the changes in the methodology introduced in the Directive (notably due to the introduction of the 10% deduction, as discussed in Section 4.3.1). A part of these costs were incremental one-off costs for transition to the regime of Directive 2009/119 (see below).

5.2.2 *Incremental costs of adjusting stock levels*

Despite the intermediate conclusion that the Directive did not significantly impact the unit storage costs for most countries, the additional requirements introduced in the Directive have generally led to some one-off incremental costs. The scale of these costs depended on:

1) how the overall level of the CSO and eligible emergency stocks structurally changed for the Member State as a result of the transition to the new Directive;
2) the type of products that had to be stored due to the new obligation to store a minimum of 1/3rd of the CSO in products (jointly representing at least 75% of aggregate demand) or 30 days as specific stocks; and
3) whether the Member State was a net-exporter or net-importer of oil before and after the transition to the new Directive.

With regards to the first point, Chapter 4 discussed how the new Directive introduced a number of additional requirements that led to a structural increase of about 5% of the level of Member States' obligations and eligible emergency stocks (at the overall EU level). The inclusion of the 10% deduction for unavailable stocks could have led to a *de facto* 10% increase in costs as the Directive required this as additional amount of stocks to be held. However, not all Member States experienced this as additional costs as such because most of them already stored more stocks before the transition to the new Directive and therefore did not have to acquire the additional 10% of stocks. Also, on average the obligation went down in line with the decreasing net imports and inland consumption. Secondly, the introduction of the naphtha[55] trigger in the calculation methodology has led to potential volatility in the annual stockholding obligation for some Member States, which could affect the total costs of storage. As both the 10% deduction and the naphtha trigger were included in the obligation as a result of the desire to improve harmonisation with the IEA, both issues are discussed in more detail in Section 5-3. The *one-off incremental* impact of both issues during the transition to the new Directive are believed to be marginal as only in exceptional cases did countries have to increase their emergency stocks due to the 10% deduction rule or a change in the obligation from the naphtha trigger.

As regards to the second point, the incremental costs of the transition to the new Directive were believed to be more substantial as many countries needed to change the type and/or volume of product stocks as a result of the new Directive. As product storage facilities are on average 25% more expensive than crude oil facilities,[56] the acquisition and initial storage construction costs did constitute a significant cost item for some countries depending on the type of product and its volume that needed to be stored. Stakeholders were reluctant to share the precise details of these costs.

[54] As compared to the counterfactual (that Directive 2006/67 would still be in force).
[55] In the petrochemical industry, naphtha is a general term for the petroleum products that emerge first during the refining process of crude oil to create any other type of petroleum products (distillation). Since there are many types of crude oil and refining techniques, many different types of naphtha type products exist (in terms of chemical composition), but they are often classified as light (paraffinic) or heavy naphtha. Naphtha is most often used as input for creating other petroleum products (naphtha for petrochemical use) or – with some further refining – as a basis for gasoline fuels.
[56] Stelter, J., & Nishida, Y. (2013)

Lastly, EU Member States with a low volume of net imports (e.g. Estonia, UK) or net-exporters (e.g. Denmark) at the time of the transition to the Directive were faced with the removal of the 25% deduction from the overall stockholding obligation that the previous Directive provided. However, these countries now typically fall under the 61-day inland consumption requirement in the new Directive, which has resulted in practically unchanged overall obligations. For example, Denmark only had to increase its CSO by 0.3 days as a result of the new Directive in 2013. This switch has therefore not caused a major impact on incremental one-off costs.

5.3 Impact of harmonisation with the IEA system

One of the objectives for the revision of the Directive was to align the EU stockholding system more closely with the IEA stockholding system. Most importantly, the alignment of calculation methodologies for the obligations and eligible stockholdings and the alignment of emergency response mechanisms were improved. The latter was discussed in Chapter 4. The impact of the alignment of the methodologies on efficiency is discussed in this section. The section also discusses elements that could further be aligned with the IEA or topics on which the EU system might need to deviate more.

5.3.1 Alignment of methodologies and the impact on the level and composition of stocks

The alignment of the methodology can have an impact on efficiency in case it affects the level or type of emergency stocks held by Member States, which in turn affect the total costs of storage. The costs incurred can then be compared with the benefits to understand the overall efficiency. The Directive revised both the methodology for the calculation of the obligation and the calculation of eligible emergency stocks.

Methodology for calculating the stockholding obligation [Annex I]

With respect to the calculation of the overall stockholding obligation, the methodology in the Directive is now largely identical to the IEA methodology as presented in Table 4-4 in the previous chapter. With respect to the previous version, the Directive's calculations changed in three dimensions:

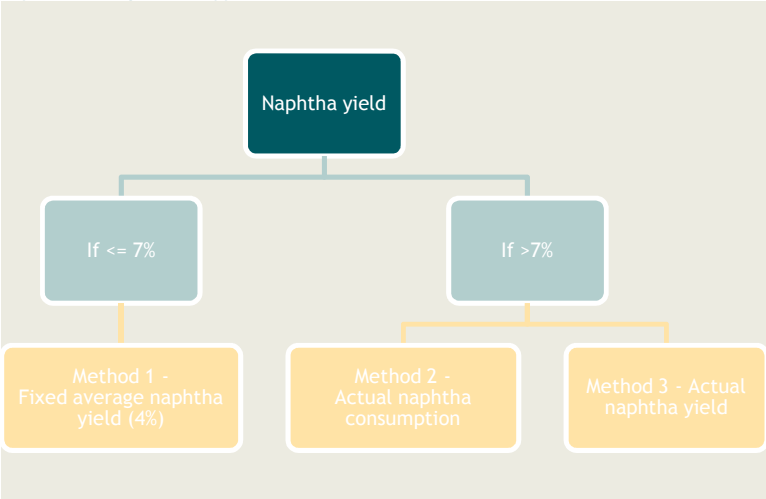
a. Change of the calculation base **from inland consumption to net imports** for those Member States for which the 90 day-equivalent of net imports is greater than the 61 day-equivalent of inland consumption (for the others the calculation remained on the basis of inland consumption but was updated to better align with the IEA methodology);
b. Change in the unit of measurement from volumes (tonnes) to **crude-oil equivalents (COE)**;
c. Introduction of a correction of the obligation based on the **naphtha yield** of a country.

As explained in the previous Chapter (Section 4.2), the changes from inland consumption to net imports (point (a) above) and to COEs (point b) have not resulted in major changes for Member States' overall stockholding obligation. As a result, these changes have not led to significant additional costs for meeting the requirements of the Directive. However, various CSE representatives[57] feel that the inclusion of a naphtha yield[58] discount factor and a trigger level have reduced the efficiency of the Directive due to the potential for large 'artificial' swings in the annual obligation of Member States. The adverse impact of the naphtha trigger was also included in a notice to the EC from nine OCG members detailing six propositions for adjustments to Directive 2009/119 ("notice from OCG members" from now on).

[57] Representatives from CSEs of Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovak Republic, Estonia, Austria and Germany during a workshop in Rotterdam on 30-11-2015.
[58] For a non-technical description of naphtha and naphtha yield, see section 3.4

Annex I of the Directive defines the COE of imports of petroleum products as the combination of the net imports of primary oil products (such as crude) and other oil products. In order to account for stocks used for non-energy purposes (such as naphtha for petrochemical use), primary oil products are reduced by 4%, representing the average naphtha yield in the EU, *or* "if the average naphtha yield within the national territory is greater than 7%" the net actual consumption of naphtha should be deducted or the actual average naphtha yield. These three possible methods for calculating the overall stockholding obligation are schematically shown in Figure 5-4.

Figure 5-4 Naphtha trigger



Source: Adapted from Annex I of Directive 2009/119

The size of the annual overall obligation therefore depends on the size of the average naphtha yield in the country. The inclusion of the naphtha trigger at 7% is intended to ensure the availability of emergency stocks for energy use in countries with high naphtha yields. If a country operates at a level close to the naphtha trigger, small changes in the naphtha yield (e.g. from 6.9% to 7.1%) can lead to a very different level of the total obligation and in turn necessary changes in the level of emergency stocks. Based on the MOS data available in Eurostat (since 2013), Figure 5-5 shows the evolution of the naphtha yield for the EU Member States for the 2013-2015 reporting periods and highlights the trigger value of 7%. As shown, nine Member States have a naphtha yield close to 0% as they have no refineries/petrochemical plants and another ten Member States have consistently low (well below 7%) naphtha yields. Another three Member States show consistently high naphtha yields (well above 7%). Therefore, for 22 out of 28 Member States the inclusion of the naphtha trigger has not caused, and is not likely to cause, changes in the calculation methodology in the future. However, for six Member States (highlighted in Figure 5-6), their naphtha yield has been close to the 7% trigger in the reported years and for some has been both above and below the 7% during this time. The impact on the overall stockholding obligation of these 'jumps' below and above the trigger could only be calculated for Hungary and Slovakia as the MOS data in Eurostat only includes all information needed for the calculations for 2013 and 2014 (at the time of writing). Box 5-1 explains the impact of the naphtha trigger for these countries.

Box 5-1 Impact of naphtha trigger illustrated for Slovakia and Hungary

Figure 5-7 illustrates the possible impact of the trigger by comparing the change in the overall stockholding obligation for Hungary and Slovakia based on the three calculation methods. The obligation for Hungary in 2014 was 895,000 metric tons on the basis of method 2 (based on naphtha yield of 7.9% in 2013). Due to the reduction in the naphtha yield in 2015 to 6.9%, Hungary had to switch to Method 1 and deduct the average naphtha yield, resulting in a new obligation of 1,156 thousand metric tons in 2015. This represents an increase of **29%.** Due to the increased net imports in the country, the overall obligation would have increased regardless of the naphtha yield. However, if Hungary's naphtha yield had been 7% and Method 2 of the calculation would continue to apply, the stockholding obligation for Hungary would have been 1,010 thousand metric tons, an increase of 'only' **13%.** The difference between the two calculation methods is 146,000 metric tons of storage, the equivalent of approximately **€4.6 million** (using the EU average storage price of €31.3 per metric ton).

In the case of Slovakia, which moved from a 7.2% naphtha yield in 2013 and a 6.9% naphtha yield in 2014, the total stockholding obligation from 2014 to 2015 was also affected by the change in calculation methods. Using method 3 (due to the 7.2% yield in 2013), the 2014 obligation amounted to 622 thousand metric tons. Due to the new calculated yield just below the 7%, method 1 of the calculation had to be used for the 2015 obligation, resulting in new stockholding levels of 662 thousand metric tons, an increase of **6%**. Had Slovakia remained with method 2 (which would have been the case had its yield dropped to 7% only), the 2015 stockholding volume would have been 637 thousand metric tons, an increase of **0.4%**. The difference between the two scenarios is 25,000 metric tons (or **€782,500**).

Representatives from ministries and particularly CSEs stressed the impact of the trigger on their operations. For example for Belgium the 2016 obligation might increase by 30% as a result of a lower naphtha yield. The naphtha trigger can therefore induce sudden significant changes to the overall stockholding levels, with potentially significant consequences for the obligated parties. This can be particularly costly when the obligation significantly increases, as new stocks need to be acquired and stored, whereas these new stocks might become redundant the next year when the naphtha yield might change to just the other side of the trigger and the obligation changes again. In that case, the acquired stocks would need to be sold again.

The rationale for including the trigger, other than to harmonise with the IEA and to account for petrochemical naphtha, was not clear to the stakeholders. The benefit for ensuring the availability of emergency stocks for energy purposes seems to not be strongly affected if the trigger was removed. Since the aim is to correct the eligible emergency stock levels for stocks that are held for non-energy purposes, it is most straightforward to deduct the actual level of naphtha yield, rather than the average naphtha yield in the case the actual naphtha yield falls below a certain level. Various CSEs have therefore proposed lowering the naphtha trigger to 4% and OCG representatives from nine Member States have drawn attention to this issue in a letter to the EC for proposed amendments to the Directive. Since most stakeholders agree that a potential adjustment of the trigger should ideally be done together with the IEA in order to maintain alignment, the impact of the proposed lowering of the trigger is discussed in section 5.3.2.

Figure 5-5 Naphtha yield for 2013-2015 reporting periods (reflecting 2011, 2012, 2013 and 2014 energy data)

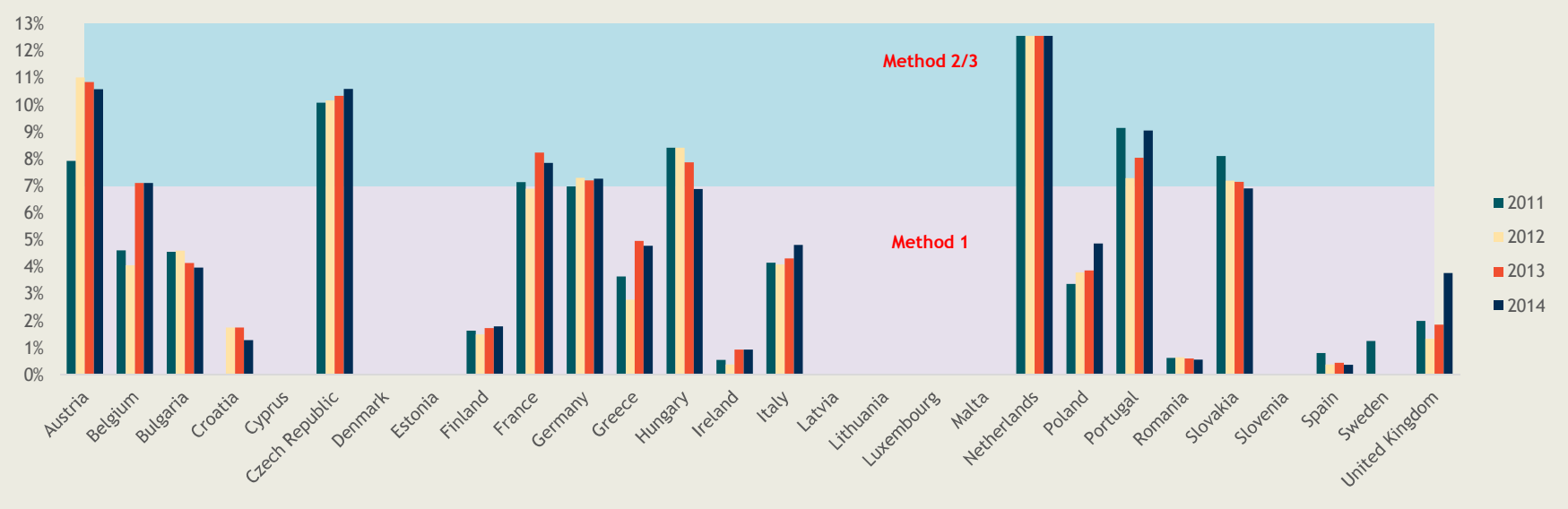


Figure 5-6 Naphtha yield for countries close to the trigger

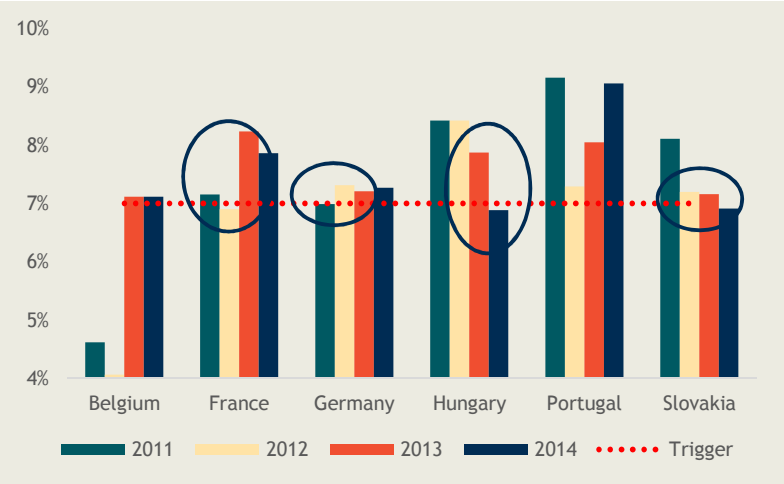
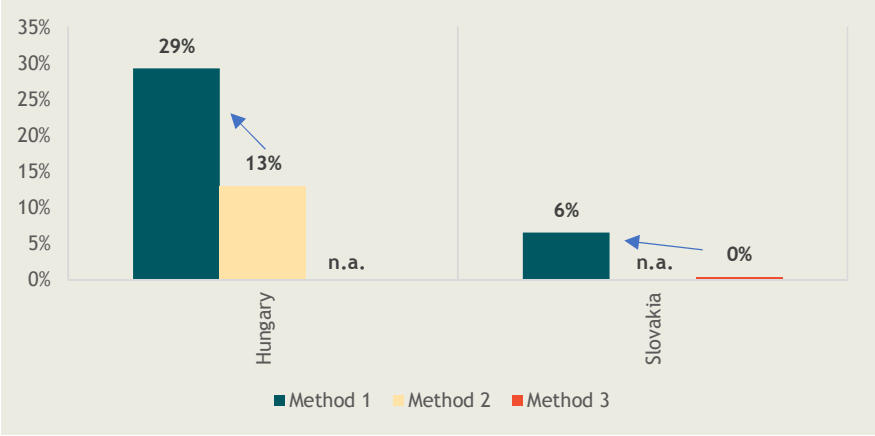


Figure 5-7 Impact changing calculation methodologies, % change in in the CSO from 2014 to 2015 for the three possible Annex I calculation methods



Source: Eurostat, Trinomics calculations

Methodology for the calculation of eligible emergency stocks [Annex III]

The method of calculating the level of eligible emergency stocks for meeting the calculated obligation (as detailed in Annex III of the Directive) was revised for different purposes:

a) harmonise with the products allowed in the IEA system [away from the three main product categories allowed in the previous Directive];
b) Introduce COE calculations for oil products;
c) Account for the possibility to hold 'specific stocks';
d) Align (non)eligibility of stocks in certain type of facilities or locations; and,
e) Introduce a 10% deduction to account for potentially technically unavailable stocks.

Section 4.3.1 already presented the impact of the revision of the EU system to include a minimum share of required product stocks (a). The harmonisation of the methodology to calculate the volume and type of eligible emergency stocks led to the adoption of two possible methods for Member States to count their eligible volumes of emergency stocks (Method A and B in Annex III of the Directive). Even though it is beyond the scope of this evaluation to discuss the rationale and efficiency of both methods, we understood that on the aggregate the introduction of the two different methods did not lead to significant changes in the efficiency of the Directive. However, in the case of Cyprus, the introduction of the two different methods in combination with a revision of the calculation of the stockholding obligation (in Annex I) did lead to a *de facto* lowered availability of emergency stocks compared to the previous Directive as illustrated in Box 5-2.

Box 5-2 The storing of petroleum coke in Cyprus[59]

Cyprus is one of the few countries in the EU that consumes and imports a relatively large volume of petcoke, used as source of fuel for the Cypriot cement industry. It therefore seems important to be able to meet this demand also in an oil supply emergency situation. In the previous Directive, imports of the three main oil product categories were counted, which did not include petcoke. At the same time, eligible oil stocks could include intermediate and final products (including petcoke). In the new 2009 Directive, the calculation of the stockholding obligation (Annex I) *does* include the imports of petcoke (123,885 MT for consumption in Cyprus in 2015). In 2016, the volume of daily net imports according to Annex I amounted to 6.52 toe. Using **Method A** of Annex III, the volume of eligible emergency stocks to be held is 6.52*(90/0.9/1.065) = **612,207MT**. Using **Method B** of Annex III, the volume of eligible emergency stocks amounts to 6.52*(90/0.9/1.2) = **543,333 MT**. The difference between both methods is **~69,000 MT**, which correspondeds to approximately **€414,000** per year using ticket prices for Cyprus in March 2016 (€0.5/MT/month). Even though Method A allows including the storage of petcoke as part of eligible emergency stocks, Cyprus chooses Method B as it results in a lower total obligation (cheaper for the entire oil industry). However, in Method B Petcoke cannot be counted as emergency stock. Therefore, even though Cyrpus is fully compliant using Method B, the difference between both calculation methods and the accounting of imports of Petcoke in Annex I leads to a *de facto* lowered availability of appropriate emergency stocks to meet the demand for oil products in Cyprus.

The inclusion of specific stocks was also discussed from an efficiency perspective in Section 4.3.4. We found that from changes (b), (d) and (e), the introduction of the 10% deduction has the most significant impact on the calculation of eligible emergency stocks (based on the outcomes of all interviews and the survey results).

[59] All data and figures obtained from Mr. Tsioutis (KODAP) in bilateral email exchanges

From an efficiency perspective, it is therefore important to weigh its benefits against the increased costs. The inclusion of the 10% deduction is a result of the desire to improve harmonisation with the IEA system. The IEA system counts all available stocks in a country as eligible emergency stocks as they consider that all stocks in a country would potentially be available during an emergency (including commercial stocks held for trading purposes), except for technically unavailable stocks for which a 10% deduction is applied. Article 1.2 and 1.3 of the Annex of the International Energy Program (IEP) of the IEA justifies the 10% deduction as being applied to account for those stocks which are "*technically determined as being absolutely unavailable in even the most severe emergency*"[60]. The 10% in the IEA system was estimated by a large review amongst their members (that was last updated in 2003).

The calculation of the EU obligation also includes a 10% deduction. However, unlike the IEA system, the EU does not count the stocks that are not specifically held as emergency stocks (commercial stocks) and requires that emergency stocks need to be fully available and physically accessible at all times. Therefore, the requirement to have emergency stocks that should be fully available at all times and the inclusion of the 10% can be perceived somewhat as a 'double punishment', effectively increasing the volume of emergency stocks to be held. OCG representatives from nine Member States ("notice from OCG members") and a representative number of CSEs[61] have therefore also questioned the inclusion of the 10% from the perspective of efficiency of the Directive and regarded a review of the level of 10% necessary. Box 5-3 provides more details surrounding the size of the deduction.

Box 5-3 Justification of the level of the 10% deduction

The inclusion of tank bottoms, pipeline tankage and working stocks in the EU calculation (Annex III) may justify the inclusion of at least some deduction as stocks may be included in the calculation that are in fact unavailable (i.e. tank bottoms). The IEP did not define the 10% level as a fixed number, but mentioned that the SEQ "*shall examine the concept and report on criteria for the measurement of absolutely unavailable stocks.*" (Article 1.2). Italy used this opportunity in 1999 to discuss the size of the deduction for unavailable stocks and presented evidence that the volume of oil in tanks that could be considered inaccessible bottoms was between 2.5% and 4% depending on tank size. Italy also presented evidence that it is *technically* possible to recover up to 99% of products stored. In order to justify this evidence, a working group was established to answer the following questions:[62]

1. If the 10% deduction should be applied strictly to technically unavailable stocks or to unavailable stocks from a broader operational perspective (reflecting MOR)?
2. If the 10% reflected MOR, whether a reduction to 5% would be justified?
3. Whether the 5% should apply only to Italy or to all IEA Member States?
4. Whether government and agency stocks should receive special treatment?

The working group concluded that tank bottoms may account for less than 5%, but that overall MOR account for far more than 10%. The majority of members therefore favoured maintaining the 10% deduction from a political perspective in order to prevent eroding the IEA's stockholding base. Therefore, the other questions were not considered and as a result the EU and IEA methodologies include a 10% deduction.[63]

[60] International Energy Agency (2014), pp. 34.
[61] Representatives from CSEs of Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovak Republic, Estonia, Austria and Germany during a workshop in Rotterdam on 30-11-2015.
[62] Bamberger, C. (2003), pp. 181
[63] Bamberger (2003)

However, since the EU stockholding system does not consider all commercial stocks and provides stricter rules for the availability of 'commercial' emergency stocks, CSE stakeholders from ten Member States[64] and nine additional Member States[65] mentioned that the 10% deduction could be reduced in the calculation, or be waived entirely for CSE-held stocks. In this light, EOSA (Slovakian CSE) monitored the volume of unavailable stocks during the refreshing of product stocks (once in five years)[66] and found that for CSE-owned product stocks (diesel and gasoline) the average percentage of losses was 0.5% of total bookkeeping volume due to 'natural diminution' (e.g. evaporation). Evidence from Slovakia therefore also points to the actual figure for technically unavailable stocks being lower than 5%. Based on this evidence, any waiver or lowering of the deduction could therefore be discussed together with question 1 above, as discussed in 2000 in the SEQ.

Irrespective of the exact proportion of technically unavailable emergency stocks in case of a crisis, from a macro perspective the application of the 10% deduction rule effectively means that the requirements of the EU system are more strict than those of the IEA system. This results in higher availability of emergency stocks in the EU system as compared to the IEA system, but also in higher costs. If this is a deliberate political choice, no changes are necessary. However, if the harmonisation with the IEA was meant to include harmonising the emergency stock levels effectively available under both systems, the 10% deduction rule should in our view be reviewed. The removal of the 10% deduction rule would de jure lead to a deviation from the IEA system, although de facto a full alignment could be achieved. An alternative option to consider in this respect is that the 10% deduction rule would no longer apply under the condition that in addition to the emergency stocks, at least 10 days of commercial stocks (or 6.8 days for Member States with 61 days obligation) would be present in the country concerned at all reporting dates. Taking this route would effectively fully align the EU requirements with the IEA requirements (in terms of the number of days that effectively need to be held). A potential drawback of this option would be that certain Member States would not be able to guarantee that 10 days of commercial stocks would be present at all times, without putting such an obligation on the industry (or on the CSE), which would effectively nullify the impact of the abolition of the 10% deduction rule. On the other hand, for Member States with commercial stock levels that are consistently (well) above the 10 (or 6.8) days there would be a material difference if this route would be taken. An alternative (sub)option would be to require that in the EU as a whole on average at least ten days[67] of commercial stocks would be present at all times.

Next to the 10% deduction, some stakeholders mentioned two additional points that require clarification in the Directive, but as they do not trigger unwanted results do not have a significant impact on efficiency:

- **The treatment of naphtha as product stock**
  A few interviewees mentioned that the Directive is slightly unclear as regards the treatment of naphtha as a product stock. This issue was also mentioned by FuelsEurope in their reaction to the planned review of the Directive.[68] According to Annex I of the Directive, naphtha is excluded from the calculation of the stockholding obligation. As a result, Annex III of the Directive also seems to exclude *"stocks of naphtha"*. The IEA methodology for emergency

[64] Representatives from CSEs of Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovak Republic, Estonia, Austria and Germany during a workshop in Rotterdam on 30-11-2015
[65] In their notice to the EC containing propositions for the review of the Directive ("Notice from OCG Members")
[66] Information shared bilaterally with Trinomics study team during CSE workshop in Rotterdam on 30-11-2015. Source information available upon request.
[67] Or slightly less, to account for the fact that some Member States have an obligation to hold 61 days.
[68] Fuels Europe (2015)

stock calculations explicitly includes "*stocks of naphtha for gasoline production*" in the accompanying explanation. According to FuelsEurope and some interviewees, the EU calculation should also allow naphtha for gasoline purposes and are unclear whether the Directive allows it. In fact, however, the Directive *does allow* stocks of naphtha destined for gasoline production (through isomerisation) as eligible emergency stocks. According to the definition of motor gasoline in Annex B of Regulation EC 1099/2008, blending components such as naphtha isomerates are also classified as motor gasoline. Therefore the Directive allows storing naphtha for gasoline production both through Method A and Method B in Annex III to the Directive, but excludes naphtha for petrochemical use from the list of eligible stocks, similar to what the IEA does. However, as this was not entirely clear to all stakeholders, the Directive might be clarified by including the definitions of motor gasoline and the allowed list of products as stipulated in Method A of Annex III to the Directive.

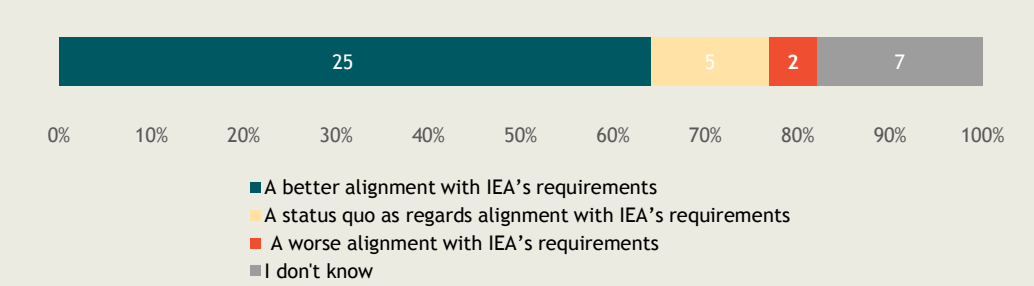
- **Reduction of average naphtha yield from primary oil products**
  Both the IEA and the EU system exclude naphtha for petrochemical use from eligible emergency stocks and from the calculation of the obligation (see Table 4-4). In order to account for petrochemical naphtha as product stock, the IEA methodology[69] defines that a 4% deduction (corresponding to the average naphtha yield) should be deducted from primary oil products, constituting "*crude oil, NGLs, refinery feedstocks, additive/oxygenates (including biofuels) and other hydrocarbons*". Annex III to the Directive also aims to deduct 4% as average naphtha yield from these stocks, but only mentions that "*Crude oil stocks are reduced by 4% [….]*", which is theoretically not the same. Despite the slight discrepancy in wording between the Directive and the IEA methodology, the detailed calculations in the MOS show that both for the IEA and the EU the primary products [crude oil, NGLs, refinery feedstocks, additive/oxygenates (including biofuels) and other hydrocarbons] are used for the deduction of the 4% naphtha yield. Therefore, since effectively the same calculation is applied in the EU and IEA system, the wording in Annex III to the Directive could be clarified to avoid any misinterpretations.

Overall impact of the harmonisation of calculation methods with the IEA

The calculation methods have significantly changed as a result of the harmonisation with the IEA system. The inclusion of the naphtha trigger and the 10% deduction were found to (potentially) be most significant in terms of increasing the total costs related to meeting the stockholding obligation. Stakeholders recognised the significantly improved situation of now having to deal with effectively one obligation for both the IEA and the EU instead of two as was previously the case. The survey results indicate that most government and CSE representatives (64%) considered the adjustments in the calculations to have led to a better alignment with the IEA requirements, or at least not a worsening (13%). Only 5% answered that in their view the alignment with the IEA has worsened, while the remaining 18% responded that they did not know (see Figure 5-8). The most frequently cited benefits were in terms of reduced efforts for reporting and administration of the obligation (as discussed in more detail in Section 5-4).

[69] International Energy Agency: (2016) https://www.iea.org/netimports/explanations/methodology/

Figure 5-8 Has the Directive led to a better alignment with IEA's requirements?



Source: Trinomics General Survey

The judgement on the overall impact of efficiency (comparing the costs and benefits of the alignment with the IEA) should however also take into account the additional costs resulting from the naphtha trigger and the 10% deduction. The rationale for including a naphtha trigger level rather than deducting the actual naphtha yield percentage is not straightforward from the perspective of security of supply and availability of emergency stocks. Without a trigger level at 7%, or a lowered trigger level to 4%, the availability of emergency stocks would namely still be corrected for petrochemical naphtha stocks according to the most recent yield figures. At the same time, the costs related to having the trigger level could be substantial for individual Member States and therefore its inclusion is questionable from an efficiency point of view. The inclusion of the 10% deduction de facto increases the obligation and hence (*ceteris paribus*) the availability of emergency stocks. In this sense, there is no impact on efficiency as the benefits rise in line with the costs needed to hold these extra stocks. The question is however what the justification is of the 10% deduction in the EU system, in particular whether this is needed to guarantee the actual availability of 90 days of emergency stocks. To answer this question, amongst others more detailed insights are required on the precise definition of MOR and recent MOR levels in the Member States (see paragraph on "10% deduction" in section 5.3.2. below).

5.3.2 Scope for further alignment or need to deviate with the IEA system

Even though the Directive improved harmonisation with the IEA system in terms of aligning its reporting, calculation methodologies and emergency response mechanisms, some fundamental differences between the systems remain. There are areas in which the Directive is justifiably different from the IEA methodology, but there are also areas which would benefit from further alignment between the systems. Based on the survey results, twenty CSE or government representatives (**63%**) believed that – in general - there was scope for further alignment, whereas the remaining twelve (**37%**) believed there is a need to further deviate. From the additional interviews, it appears that the answer to this question depended on which element of the Directive is being discussed. Based on the differences described in the previous section and the previous chapter on effectiveness, we conclude that there are three areas requiring attention:

1) Potential simplification of the naphtha rule;
2) Compliance dates;
3) 10% deduction.

We feel it is not entirely appropriate to consider them as areas with a need for further alignment or a need to deviate, because all three areas were aligned with the IEA as a result of the Directive. Because it is more difficult to meet the EU obligation than the IEA obligation (the commercial stocks that cannot be counted in the EU system function effectively as a cushion in the IEA system) the impact of for

example the naphtha rule and the compliance date are, if at all, much less felt in the IEA system than in the EU system. From the EU Member States perspective there are good arguments to change the current requirements (which would imply a deviation from the IEA system), but ideally the changes would be coordinated with the IEA and jointly implemented (as ideally, there should be alignment in these areas).

Potential simplification of the naphtha rule

The introduction of the naphtha trigger may cause significant 'jumps' in the stockholding obligation for those MSs with an average naphtha yield close to 7%. In order to increase the efficiency of the Directive, a group of CSE stakeholders[70] proposed removing the trigger from the calculation and basing the calculation of the CSO on the *lowest result* from two calculations:

1) Obligation = net imports * (1-actual % of naphtha yield) - but if actual naphtha yield is <4%, deduct the average naphtha yield of 4%.
2) Obligation = net imports – actual naphtha consumption.

In this way, the calculation of the obligation becomes less volatile as the actual naphtha yield is used more often. Security of supply is still respected for this alternative as total emergency stocks are still corrected for stocks destined for petrochemical naphtha use.

In order to independently judge whether the proposal from CSEs improves the efficiency of the Directive, we calculated the impact on the annual obligations of this proposal using the data reported for the 24 months in 2014 and 2015 from all EU-28 MS. The obligations of the Member States were calculated based on the lowest number from the two alternatives above. Figure 5-9 presents the results.

The yellow bar presents the percentage change in the total stockholding obligation from 2014 to 2015 under the current calculation of the stockholding obligation. The blue bar presents the change in the stockholding obligation if the 2014 and 2015 obligations had been calculated on the basis of the above proposal. The dots represent the difference between the two calculations in percentage points. The figure illustrates that the change in the calculation has a positive impact for four Member States as their stockholding obligation changes less drastically. For one Member State (Poland) the change in the calculation would actually be worse from an efficiency perspective as their calculation increases a little bit more from the change in the calculation method, although the difference between both methods is only 0.3%. The impact of the calculation method on the volatility of all stockholding obligations combined is also positive as the average change of the stockholding obligation from 2014 to 2015 under the current calculation is **2.9%** and under the proposed revised calculation slightly lower at **2.2%.** This suggests that the alternative method improves the efficiency of the Directive, by reducing the total costs of stockholding (through reducing the volatility in stockholding obligations) without compromising security of supply as the calculation of the CSO still deducts the actual naphtha yield and therefore corrects for stocks that are not available for emergency energy purposes. We therefore consider the above-mentioned proposal a valid proposal that would improve the efficiency of the Directive. The proposed simplification of the naphtha trigger would have to be considered together with the IEA, though, in order not to create differences between the calculation methods in both systems.

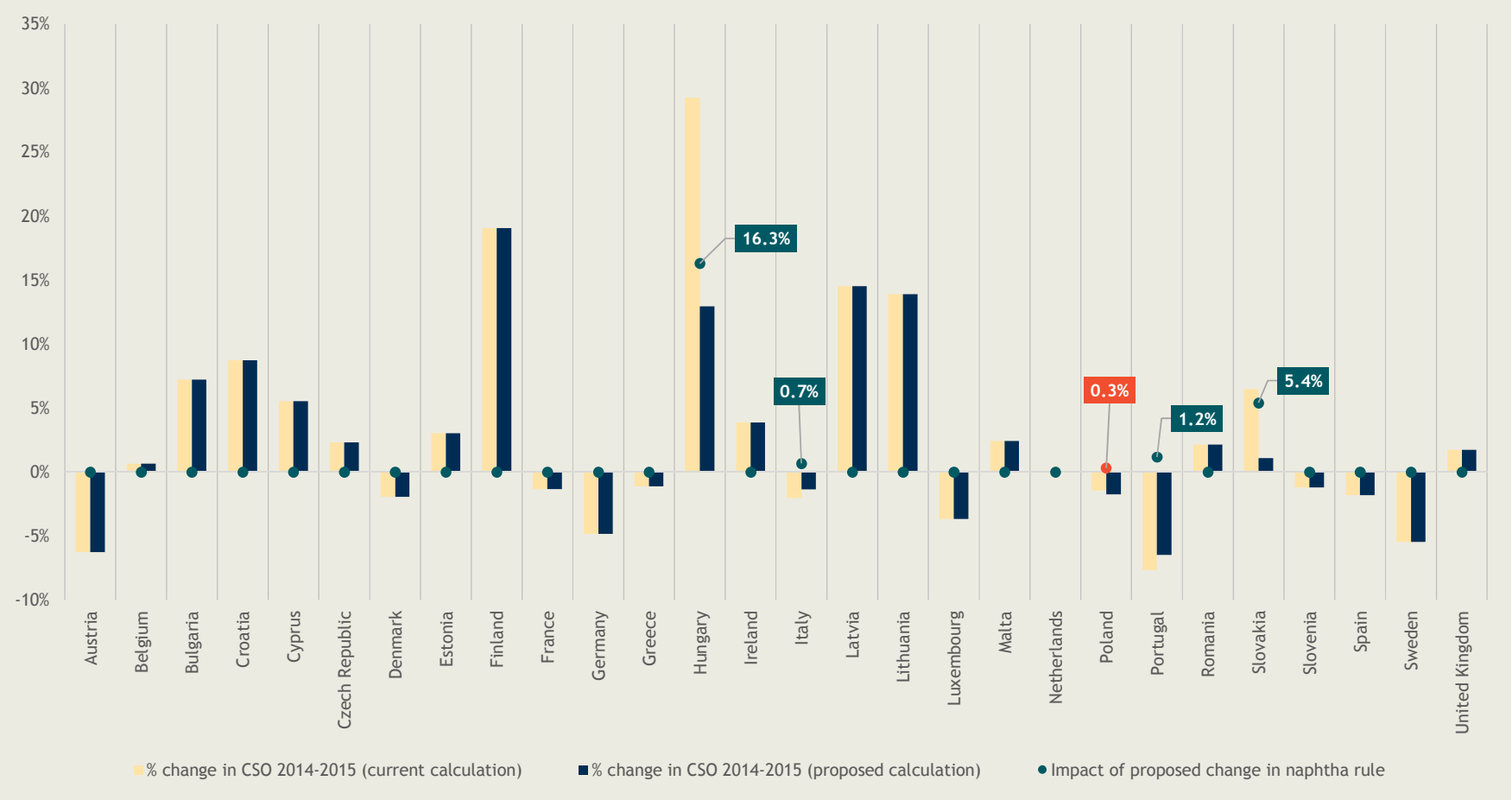
[70] Representatives from CSEs of Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovak Republic, Estonia, Austria and Germany

1st of April compliance date

A second topic that according to many stakeholders need attention is the annual date by when emergency stocks need to be physically in place. The annual stockholding obligation in the EU system is calculated on the basis of the previous year's MOSs. The Directive defines a deadline of 55 days for delivery of the MOS. Therefore, the deadline for the December MOS is (approximately) the 25th of February. Therefore, in the months of January, February and March, the energy statistics from two years ago may be used to calculate the stockholding obligation (see Article 3.3 of the Directive). The IEP of the IEA defines that the calculation of net oil imports for determining the level of obligation should be based on the average daily level of the previous calendar year (Chapter 1, Article 2.1). Initially, this meant that emergency stock levels needed to be in place on the basis of end-December stock levels, practically implying a compliance date of 1 January. However in 2011, this was revised by the SEQ such that the rollover to a new base year for daily net-imports follows a similar process as in the EU system and compliance for the months of January, February and March is assessed on the basis of the data from two calendar years ago.

Therefore, the first moment in the calendar year the stockholding obligation changes is April, which also implies that at this time the physically available emergency stocks need to reflect the new stockholding obligation. However, the EU Directive has stricter requirements regarding availability than the IEA since Article 5.1 of the Directive states that: *"At all times, Member States shall ensure that emergency stocks and specific stocks are available and physically accessible for the purposes of this Directive."* In addition, Article 3.3 describes "*the daily averages […] shall be determined as regards the period from 1 January to 31 March of each calendar year, on the basis of the quantities imposed or consumed during the last year but one before the calendar year in question*". Therefore, obligated parties in the EU translate these requirements into an obligation to physically hold the required amount of emergency stocks directly from 1 April of each year. For the IEA, compliance with the new annual obligation is assessed on the basis of end-April stock levels.

Figure 5-9 Impact of removal of naphtha trigger



Source: Eurostat, Trinomics calculations

During our consultations many EU stakeholders, including CSE representatives[71] and a group of national representatives in the OCG[72] have suggested that the compliance date is too soon in the year to be able to make necessary stock adjustments in a cost-efficient manner. Since all previous year's MOS questionnaires are sent at the latest by the 25th of February to Eurostat, this implies that the precise stockholding obligation is only known at that time. As the stockholding obligation subsequently has to be divided over the obligated organisations and this needs to be communicated to them (at least in industry-based and mixed systems), which could take at least an additional week. This effectively leaves four or five weeks for CSEs and other obligated parties to react and acquire or dispose of stocks if necessary.

The process of a public entity acquiring new stocks can be time consuming, for example it often involves a tendering process, which requires budget approval, exploring and informing the market, writing tender specifications, allowing potential contractors to respond to the tender specifications, awarding the contract and arranging the logistics and the physical transfer of the products. Sometimes, there is also time needed for contractors that lost the tendering procedure to launch a complaint. Ideally, agencies enter into long term contracts when acquiring new stocks as that makes the total costs lower, but that also requires more care during the contracting process. In total, such processes can take at least 6-8 weeks.

In total, these processes take more time than is available between the 25th of February and the 1st of April, which could result in temporary non-compliance. Alternatively, Member States need to comply via short term market actions (through buying tickets for example), which are typically more expensive than longer term solutions, which increases the total costs of stockholding. On the other hand, the approximate size of the stockholding obligation should be known by Member States based on the 11 out of 12 MOS returns that were already submitted and the changes implied by the final MOS submission are usually not large. For some countries close to the 7% trigger the precise data from the previous year might be needed to know the exact obligation and as a result these Member States have to wait until all data is compiled by their national statistical offices.

Directive 2006/67 allowed Member States to calculate their stockholding obligation by 31st March at the latest and to ensure that the necessary changes were reflected in actual stockholding volumes by 31st July that same year (Article 4.2 of Directive 2006/67/EC). Trinomics regards this change in the Directive a **reduction in efficiency** compared to the previous Directive. Therefore, Trinomics supports the view expressed by a fairly large group of stakeholders to (more or less) return to the previous arrangements by extending the rollover date by three months, such that the new stockholding obligation is effective from 1st July onwards. This would give more time to negotiate the most cost-efficient options for the new stockholding obligation. The potential disadvantage is that energy data from two calendar years ago continues to be used for three more months. As ideally changing the compliance date would not lead to a deviation with the IEA system, the potential revision of the compliance date has to be reviewed in close collaboration with the IEA.

[71] Representatives from CSEs of Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovak Republic, Estonia, Austria and Germany during a workshop in Rotterdam on 30-11-2015.
[72] Member States Belgium, Estonia, France, Germany, Ireland, Italy, the Netherlands, Sweden and the UK in a letter to the EC detailing propositions for the improvement of the Directive.

10% deduction

The impact of the 10% deduction on efficiency has been discussed in Section 5.3.1. As discussed, in line with the case brought by Italy in 1999, we believe that the justification of the 10% deduction largely depends on whether it is perceived to cover only *technically* unavailable stocks or more broadly to cover any type of unavailable stocks (as clarified during the case of Italy in the SEQ). The Directive does not provide a clear view on the justification of the 10% rule and therefore it is hard to judge the rationale for including it. In case the 10% deduction covers more broadly unavailable stocks, a review of the precise height of MORs across Member States in current emergency stocks reporting would provide a valuable insight into the justification of including the 10% deduction also in the EU system. If a waiver or lowering of the 10% deduction for all EU emergency stocks is considered because of the strict availability requirements as compared with the IEA system, we believe there would be a **need to deviate** from the IEA in order to realise the changes. However, if, for example, an IEA-wide review of unavailable stocks justified a lowering of the 10% deduction by both the EU and the IEA (but we were informed that a recent IEA review confirmed the 10%), this would keep the EU and IEA system aligned and the efficiency of the Directive could be increased without jeopardising the security of supply of emergency stocks.

5.4 Impact of simplification of reporting and other requirements

In line with the recent Better Regulation guidelines,[73] reducing administrative burden through simplification of reporting is an important overall EU policy objective. In addition, this section discusses the impact of the Directive on reducing administrative burden also by reviewing the elimination of the need for a bilateral agreement to hold stocks abroad and/or existing requirements on bilateral stockholdings.

5.4.1 Impact on administrative burden from reporting obligations

The 2009 Directive changed reporting obligations for stakeholders quite significantly by aligning reporting with the IEA but also changing the nature of the reporting obligations as compared to the previous Directive. Directive 2006/67 included the following reporting obligations:

- Article 4.1 – A monthly statistical summary of stocks existing at the end of each month;
- Article 4.2 – An annual report calculating the new obligation to be submitted by 31 March;
- Article 7.1 – Monthly reports on stocks maintained for the benefit of another Member State and stocks held in other Member States for the country's own benefit.

Before the 2009 Directive, reporting on the EU obligation was infrequent and provided only partially relevant information (on the basis of a separate reporting template) to the IEA.[74] Additional information for IEA members were also sent via the MOS questionnaire to the EC and to the IEA, but the timing of the submission of the MOS was different for the EU and the IEA (the IEA required the MOS to be submitted within 2 months, the EU after 3 months). Some additional oil stocks information was provided via the Joint Oil Data Initiative (JODI) to additional international organisations.[75] The next sections discuss how the administrative burden from the 2009 Directive changed because of new reporting obligations and the integration of the EU reporting obligations with those of the IEA.

[73] European Commission (2015a)
[74] European Commission (2008c)
[75] European Commission (2008c)

Additional reporting obligations

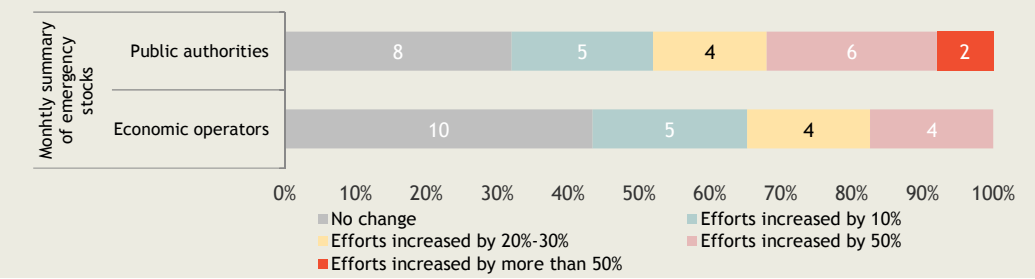
In order to improve the transparency and information about EU emergency stocks, the 2009 Directive updated the reporting requirements from the previous Directive and added an obligation to provide information on specific stocks (if Member States hold these) as well as on commercial stocks in the country. In total, the Directive places the following reporting obligations on Member States:

- **Article 6** – Keep a continually updated and detailed register of all emergency stocks (excluding specific stocks), indicating where and how much emergency stocks are stored for the obligation. The summary copy of the register should be submitted annually and the register has to be submitted to the EC upon request within 15 days;
- **Article 7.4** - [For CSEs] Publish (i) on an ongoing basis full information, broken down by product category, on the stock volumes that it can undertake to maintain for economic operators, or, where appropriate, interested CSEs; and (ii) at least 7 months in advance the conditions subject to which it is willing to provide services related to maintaining the stocks for economic operators;
- **Article 9.5** – [If less than 30 days specific stocks are held] Annual report on the measures taken by authorities to ensure and verify the availability and physical accessibility of emergency stocks;
- **Article 12 -** Monthly statistical summaries of emergency stocks through the MOS;
- **Article 13 -** [If specific stocks are held] Monthly statistical summaries for specific stocks;
- **Article 14** – Monthly summary of commercial stocks held within national territory through the MOS.

As a result, the number of reporting requirements has increased compared to the previous Directive. Building a registry of emergency stocks, the report on specific stocks and the monthly summary of commercial stocks are all additional to the 2006 Directive. Administrative burden from the Directive is therefore expected to have increased from these additional requirements. The in-depth interviews confirm that most public stakeholders regard that the reporting efforts have increased.

Figure 5-10 suggests that according to most of the obligated public authorities and economic operators in the EU the reporting efforts related to submitting the monthly report on emergency stocks have increased. Particularly public authority stakeholders cite an increase in efforts (**68%**), mostly in the range of 10% to even 50% (15 out of 25 respondents, 60%). Economic operators generally reported less increase in efforts, though the majority cited an increase.

Figure 5-10 Change in administrative burden related to reporting monthly statistical summaries

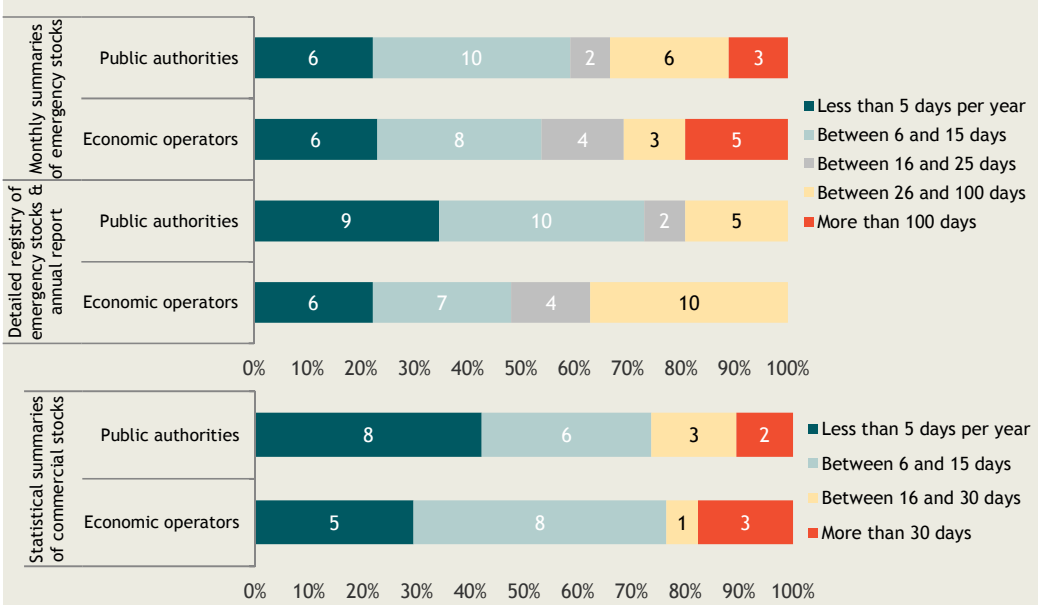


Source: Trinomics Administrative Burden Survey

Since the other reporting requirements did not exist in the previous Directive, the change in efforts related to those reporting requirements can be compared with a change from zero efforts before. The

administrative burden survey therefore collected information on the efforts generally required to comply with the new reporting requirements. Figure 5-11 summarises the results.

Figure 5-11 Change in administrative burden related to reporting requirements in Directive 2009/119



Source: Trinomics Administrative Burden Survey

The findings show that 59% (for the monthly summaries), 73% (annual report and detailed registry) and 72% (monthly report of commercial stocks) of public authority respondents estimate that reporting related to these requirements requires between 0 and 15 days per year. Of the three reporting requirements, the monthly summaries of emergency stocks are regarded as most time consuming for public administrations (including CSEs). Economic operators reported all three reporting requirements as being more labour intensive than the public authorities. For example, 48% of companies estimate that reporting the data for the monthly summaries takes more than 15 days a year. They estimate that the reporting takes them between 16 and 100 days per year. The findings suggest that economic operators generally take more time to complete the detailed registry of emergency stocks than the public authorities do for the same task. A little less than half (48%) of companies estimate that this task takes less than 15 days a year, compared to 72% of public authorities. In contrast, reporting monthly summaries of commercial stocks is regarded as being a less time consuming task by economic operators than by public authorities, with 76% of companies estimating that it takes less than 15 days per year.

According to the countries that hold specific stocks (France, Denmark and Lithuania), the reporting requirement related to Article 9.4 of the Directive does not constitute a significant reporting burden as the report can be standardized and resubmitted with adjusted figures (if needed) every year (e.g. in Denmark a short 1-page letter is written once a year). In relation to specific stocks, the obligation to submit an annual report (if less than 30 days of specific stocks are held) "*analysing the measures taken by national authorities to ensure and verify the availability and physical accessibility of its emergency stocks as referred to in Article 5 and […] arrangements made to allow the Member State to control the use of these stocks in case of oil supply disruptions*" (Article 9.5) was the reason why France decided to hold specific stocks in the first place as it regarded the burden to draw up this reported as potentially high. However, after the contents of the report were clarified bilaterally to them by Commission staff,

they decided to withdraw holding specific stocks (as from 1st of January, 2016) and submit the report instead. Several interviewees and nine Member States ("notice from OCG-members")[76] questioned the usefulness of the Article 9.5 report and propose to remove this requirement from the Directive. We already concluded from the analysis of specific stocks that there is no significant benefit of holding specific stocks from the perspective of security of supply as the volume and type of products held under the alternative (1/3rd of the obligation in finished products) are typically identical. Therefore, we also argue that it is unnecessary to request additional evidence by means of the report required under Article 9.5 that emergency stocks are physically accessible for emergency purposes in relation to not holding specific stocks. The report would have more value if it is required from *all* Member States (not just those that hold less than 30 days of specific stocks) and therefore it could also be considered to link this reporting requirement to Article 5, instead of Article 9.

Integrated calculation and reporting with the IEA

The 2009 Directive integrated all EU reporting obligations into the MOS questionnaire and streamlined the questionnaire so that it met the needs of both the IEA and the EU. A number of definitions and concepts in the MOS were clarified and adjusted. The MOS was also adjusted to include the following worksheets which are only for EU Member States:

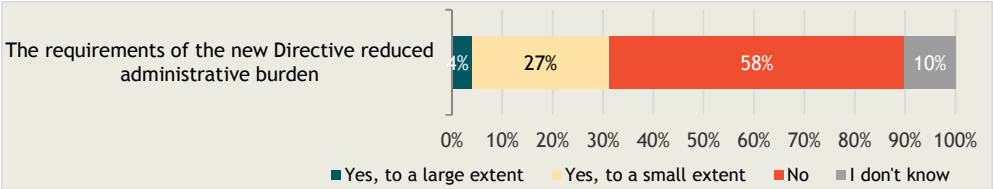
- Table 5b "EU-Emergency Stocks";
- Table 5c "EU-Commercial Stocks";
- Table 8c "Stocks held abroad, of which pursuant to government / CSE delegation;
- Days Equivalent Calculation sheet – automating the calculation of the EU obligation.

The adjusted MOS combined three reporting processes before the revision of the Directive (the IEA, the EC Directive and the Eurostat oil statistics) into one. According to interviewees combining the reporting requirements eased the reporting process and reduced administrative burden, especially for countries that are both IEA members and EU Member States. Instead of having to submit three different reports to three institutions, countries are now only required to submit two reports to three institutions (the MOS to the EU and the IEA and the JODI to other international institutions). Most public respondents (CSEs & Ministries) to the survey regard the integration of the IEA and EU reporting processes an improvement (**64%** of respondents believed it achieved greater alignment with the IEA, see Figure 5-8). The integration also created some minor efficiency gains, but since the MOS questionnaire was expanded with extra data requirements for EU Member States the overall change has not led to a major reduction in effort.

This efficiency gain cannot, however, compensate the additional administrative burden as a result of the increased number of reports that have to be submitted to the Commission (as described in the previous paragraph). Therefore, overall, our conclusion is that the administrative burden related to reporting has increased. This conclusion is backed up by the fact that most respondents to the survey (**58%** of all economic operators and public authorities) do not believe that the Directive led to a reduced administrative burden (see Figure 5-12).

Figure 5-12 Impact of the Directive on reducing administrative burden

[76] Member States Belgium, Estonia, France, Germany, Ireland, Italy, the Netherlands, Sweden and the UK in a letter to the EC detailing propositions for the improvement of the Directive.



Source: Trinomics general survey

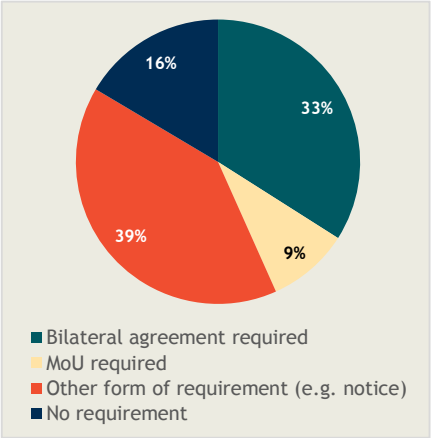
5.4.2 Limits and conditions for holding stocks abroad

The Directive aimed to reduce administrative burden by removing the requirement for a bilateral agreement between countries wishing to hold cross-border emergency stocks. The previous Directive included a provision that stipulated the need for such a bilateral agreement and also required the submission of the agreement to the EC (Article 7 of Directive 2006/67/EC). Directive 2009/119 removed the need for a bilateral agreement. However, according to information from the stakeholder interviews, many Member States now place different conditions and requirements for holding cross-border stocks. The results from the online survey (Figure 5-13) show that only 16% of respondents reported that their respective governments did not require any type of agreement anymore, while the majority (**84%**) reported that some sort of agreement is still required, with differing level of stringency. Most countries allow foreign parties to purchase tickets from their domestic economic operators or their CSE without a bilateral agreement, but a large number of countries put restrictions on cross-border stocks or cross-border tickets for their obligated parties (see Section 4.4.2). As a result, some countries are perceived as more open than others.

Interviews with a range of public authority representatives and the survey results found that the requirements stipulated in bilateral agreements differ from country to country but typically relate to the type and frequency of audits conducted on cross-border stocks and tickets, how information is shared on the volume and quality of stocks and how governance is arranged between Member States in the event of an emergency. As regards the information requirements, the following information is typically required by most Member States for cross-border stockholdings:

- name, address, telephone, fax, e-mail and contact person of the store-holder, economic operator and/or CSE performing the stockholding;
- Stocks types and quantities held;
- Location of the storing facility;
- Period of stockholding;
- Written consent of the respective Member State or its CSE, in the territory in which the stocks are to be held.

Figure 5-13 Requirements for holding stocks abroad



Source: Trinomics General Survev

Other conditions that countries have imposed on cross-border stockholdings include a different treatment of applicable VAT rates for foreign stockholdings, which restricts cross-border transactions and the inclusion of sailing clauses in procurement processes, which places eligibility criteria on

potential stockholders based on their geographical location. With respect to the treatment of VAT, problems arise for publicly-controlled CSEs which cannot charge VAT on the stockholding fee they charge to oil companies as the obligation is viewed as a public service. However, when CSEs hold cross-border stocks they *often* have to pay VAT for the foreign stockholding, without being able to reclaim it from the cross-border stockholder. This creates a financing problem for the publicly controlled CSE. In addition, some countries restrict the access to tenders to exclude storage companies located more than 3-days transport time away (3-day-sailing range). Strictly speaking, this condition is contrary to EU procurement rules, but it is deemed necessary in order to guarantee security of supply related to foreign stockholdings. According to FuelsEurope,[77] some Member States also impose extensive conditions or restrictions on the quantity, location, ownership status and specification of stocks held abroad. Economic operators in some Member States were restricted in their freedom to delegate their obligation to foreign CSEs. Many countries limit cross-border stockholdings to 30% of the total stockholding, but the limits in some Member States can reach 100% for delegation to foreign economic operators.

There is evidence that for countries that have removed the need for a bilateral agreement and other requirements, the process of buying and selling tickets has become much easier. For example, Cyprus has benefited from the fact that it became easier to buy tickets in other countries (note that the continued need for a bilateral agreement most often applies to the domestic economic operators/CSE willing to hold stocks abroad, and not to foreign economic operators/CSE wanting to buy tickets or purchase stocks in the home country). As a result, the number of countries Cyprus holds tickets with increased from one (Greece) to four (Greece, the Netherlands, Spain and the UK). The change resulted in reduced administrative burden, and arguably an increase in security of supply, because of an increased diversity of ticket providers. The ability to choose from a wider range of ticket providers also gave Cyprus the ability to 'shop around' and (most probably) reduce the oil stock holding costs per unit.

Overall, we conclude that limits and conditions on cross-border stocks and tickets are still common in the EU emergency stockholding system. A large number of Member States still require some type of bilateral agreement, despite the removal of the need for a bilateral agreement. The stringency and types of limits and conditions vary widely between countries, ranging from no limits to an entire prohibition of holding cross-border stocks and tickets.

5.4.3 Additional scope for simplification of reporting

Despite the observed increase in administrative burden related to reporting requirements from the Directive, stakeholders did not provide suggestions for simplification of reporting and/or the calculation of the obligation other than those suggestions already presented in this chapter. A suggestion that was made by more than one stakeholder[78] to further improve transparency of cross-border emergency stocks, relates to classifying 'relevant components' of certain eligible oil products in EU-wide standard statistical categories. Many of these relevant components are often very specific and company-unique products that could be interpreted to belong in different categories of the Combined Nomenclature (CN) classification. When an obligated party in one Member State buys tickets on such products in another Member State, both have to classify the stockholding in their reporting but due to the very specific nature of the product they might do so in different categories. Some stakeholders reported that this is a common problem and might cause discrepancies in the statistical reports on bilateral

[77] Fuels Europe (2015)
[78] Including Fuels Europe (2015)

stockholdings. We therefore recommend to create common definitions of the most relevant and common (specific) components and products for emergency stocks and provide a central guidance correspondence list to the products in the EU Energy Statistics classifications, so that all Member States can use this commonly accepted classification in their reporting of cross-border stocks.

5.5 Summary of findings on efficiency

This chapter on efficiency assessed the trade-off between the costs incurred and the benefits obtained by the different requirements of the Directive. The results and effects obtained by Directive 2009/119 vis-à-vis its predecessor were discussed in the previous chapter (effectiveness). This chapter focused on understanding the costs incurred on the basis of the following questions:

1. What has been the development in the different type of costs borne for meeting the requirements of the Directive?
2. To what extent did the Directive improve efficiency through harmonisation with the IEA?
3. To what extent did the Directive improve efficiency by simplifying reporting?

The evidence on the development of costs since the implementation of the Directive is scarce as only four countries completed the information on storage costs in the survey. The results from these four Member States and additional anecdotal evidence from the interviews suggest that *per unit* costs of storage have not changed significantly, but that some incremental one-off costs for adjustments to comply with to the Directive were incurred by some Member States. Since the new Directive requires products stocks to be held that jointly constitute at least 75% of aggregate demand, some Member States had to acquire some products that they did not store before and some of these products have relatively high per unit storage costs, leading to an overall slight increase of average per unit storage costs. Also the inclusion of the 10% deduction effectively increased the volume of stocks and led to a corresponding increase in costs.

Secondly, stakeholders recognised the significantly improved situation of now having to deal with effectively one obligation for both the IEA and the EU instead of two as was previously the case. The alignment of the calculation methodologies was accompanied by an integrated calculation tool (the adjusted MOS), which facilitated reporting and complied with the reporting obligations for the IEA and the EU simultaneously. Indeed, more than 60% of the survey respondents mentioned that the Directive led to a better alignment with IEA requirements. This positive effect on administrative burden and efficiency however cannot compensate for the increased administrative burden resulting from the increased overall reporting requirements.

As the EU preserves the difference with the IEA on the distinction between commercial stocks and (fully available) emergency stocks, the harmonisation also created two areas with reduced efficiency. First, the calculation of the stockholding obligation now includes the naphtha trigger, which on the basis of data from 2011-2014, has the potential to create artificially high swings in the stockholding obligation for six Member States. For these Member States, the trigger could cause swings in the annual obligation from 6%-29% and have a substantial effect on costs, without obvious benefits. Anyhow, the naphtha yield is deducted in order to account for stocks that are not destined for energy purposes (such as naphtha for petrochemical use) and therefore the deduction of the actual annual average naphtha yield should suffice to ensure the availability of emergency stock. Therefore, the inclusion of the naphtha

trigger has a negative impact on efficiency for those Member States close to the naphtha yield trigger level.

Table 5-2 Impact of the Directive on efficiency compared to its predecessor

	Development of costs	Impact of Directive
1	Development of total storage costs	None
2	Incremental costs of adjusting stock levels	None One off costs were made of varying magnitude, but holding products that better reflect consumption patterns also has benefits
	Harmonisation with the IEA	**Impact of Directive**
1	Alignment of calculation of stockholding obligation and of eligible emergency stocks	Positive
2	Integrated reporting with the IEA	Positive
3	Naphtha rule	Negative
4	1st of April compliance date	Negative
	Simplification of reporting	**Impact of Directive**
1	Impact of changes in reporting obligations	Negative
2	Impact of removing the need for a bilateral agreement and possible remaining limits and conditions on cross-border stocks	Slightly positive

Secondly, the fact that Member States should comply not later than on the 1st of April (was 31st of July) with the obligation for that particular year may well increase the total costs for compliance with the Directive. Since national statistical offices often have the MOS data for the full previous year ready only by the end of February, there is too little time left until April 1st to arrange cost-efficient solutions for a potentially altered stockholding obligation. The impact on efficiency from moving the date of compliance forward is therefore assessed as negative.

The inclusion of the 10% deduction for unavailable stocks was questioned by the majority of interviewees and survey respondents due to the requirement in the Directive that EU emergency stocks should be fully available. CSE representatives[79] and nine Member States ("notice from OCG members")[80] argued that its inclusion leads to a *de facto* increase of the level of stocks and argued that its size to be revised from the perspective of efficiency on the basis of evidence of technically unavailable stocks in the system. This study did not gather enough evidence to propose another appropriate level and also recognizes that its original justification in the IEA was a political decision to view the deduction covering unavailable stocks more broadly (in which case it is important to get an understanding of the volume of Minimum Operating Requirements). Since the justification for including the 10% deduction is not clearly provided in the Directive, we also cannot strongly judge the rationale for including the 10%. Chapter 4 already presented that it is uncertain what the share of MORs in EU working stocks is and therefore the impact of the inclusion of the 10% deduction is uncertain.

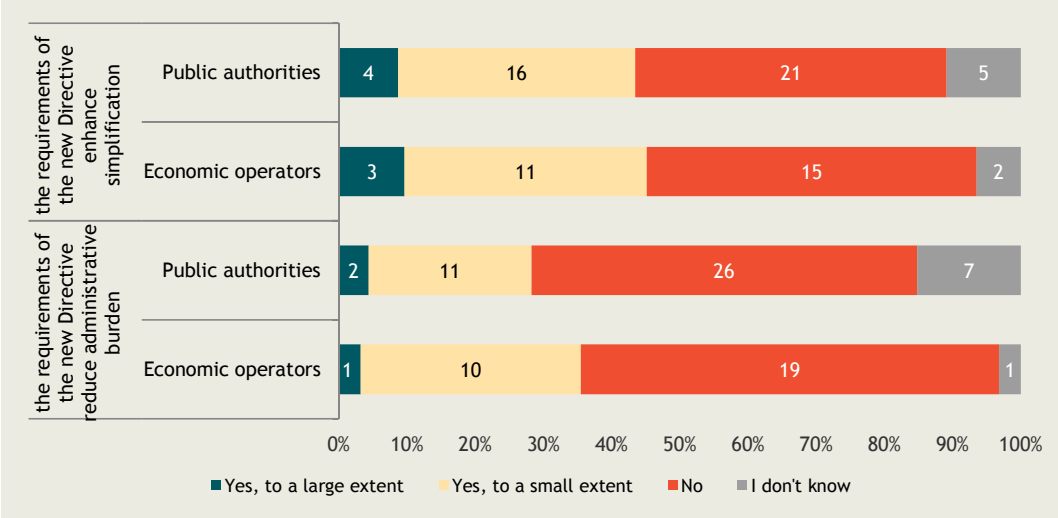
[79] CSEs from Ireland, Netherlands, Belgium, Spain, Czech Republic, Denmark, Slovakia, Estonia, Austria and Germany.
[80] Member States Belgium, Estonia, France, Germany, Ireland, Italy, the Netherlands, Sweden and the UK in a letter to the EC detailing propositions for the improvement of the Directive.

Lastly, the new Directive introduced a number of additional reporting obligations. On the one hand, this has increased transparency about the availability and quality of emergency stocks in the EU. On the other hand, the additional reporting requirements are believed to have increased administrative burden for obligated stakeholders. Depending on the stockholding system, a Member State should submit 4-5 reports compared to 3 before. For the reports with similar content, the level of detail required increased and therefore most stakeholders (68% of public authorities and 57% of economic operators) believe that the level of effort for existing reports generally increased. The new reporting requirements were critically assessed for their relevance compared with their costs. For example, the report required by Article 9.5 (explaining availability of emergency stocks in the absence of specific stocks) does not seem to add significant value in light of the other requirements of the Directive covering this issue.

The removal of the need for a bilateral agreement for cross-border stockholdings and tickets was meant to ease cross-border transactions. However, a majority of Member States (84% of survey respondents) continue to require some sort of bilateral agreement and include several requirements for cross-border stockholdings. This generally concerns obligated parties wishing to hold stocks or tickets abroad, but not foreign parties that want to buy tickets from domestic economic operators and their CSEs. The Directive therefore only had a limited positive effect on the use of cross-border stocks. In the case of Cyprus, the removal of the need for a bilateral requirement has led to a diversification of countries where tickets are held and to lower ticket costs.

Overall, the Directive enhanced simplification compared to the previous Directive according to a slight minority of economic operators and public stakeholders (approximately 48% of respondents from both groups), largely due to the harmonisation with the IEA. However, the additional reporting requirements and two areas of increased inefficiencies for some Member States (naphtha trigger and date of compliance) made most respondents question the impact of the Directive on administrative burden. The majority of stakeholders (67% of public authorities and 63% of economic operators) responded that the new Directive did indeed not reduce administrative burden.

Figure 5-14 Overall assessment of the effect of Directive 2009/119 as compared to Directive 2006/67



Source: Trinomics General Survey

Note: Survey questions: 1. Did the requirements in the new Directive enhance simplification? 2. Did the requirements in the new Directive reduce administrative burden?

6 Relevance

6.1 Introduction

In any evaluation of an EU intervention, it is important to reflect on the need to have a regulatory intervention in general and on the need to have this at EU level (instead of simply at Member State level). The economic, social and/or political climate may change over time, which could make a previous intervention redundant (or less relevant). Therefore, the evaluation criterion "Relevance" looks at the extent to which an intervention remains relevant with respect to the needs, problems and issues identified in the target groups. In the context of this Directive, is it still relevant to have an EU legal instrument given the evolving circumstances in the global energy market and in the changing geopolitical environment? More concretely, is there still a need to stipulate minimum requirements for emergency oil stocks to ensure the security of oil supply and to minimise the impacts of a disruption in supply?

6.2 Literature review findings on relevance

A logical point to start in an evaluation of the relevance of the Directive is what was said on this issue in the Impact Assessment (IA), and the supporting analysis, prior to its 2009 adoption. It is clear that the main reason for revising Directive 2006/67 was not because of any change to the underlying need for it. The introduction to the Impact Assessment states "the importance of the subject was confirmed in the conclusions of the 8-9 March European Council which called for "improving oil data transparency and reviewing EU oil supply infrastructures and oil stock mechanisms, complementary to the IEA crisis mechanism, especially with respect to availability in the event of a crisis".

It is also clear from the IA that the consultations on the proposed revisions also revealed no concerns over the fundamental need for the Directive: "Most stakeholders supported the objectives of the revision spelled out in the consultation document. In particular, efforts to decrease administrative burden, to establish coherent emergency procedures complementary to the IEA and to strengthen compliance by reinforced verification and control received general support."

Despite the apparent confidence in the relevance of security of oil supply and the ability of oil reserves to help address this, the IA discussed a number of factors that justified this. These discussions can be grouped under the following points:

1. Oil is important to the economy of Europe;
2. Europe is, and will continue to be, dependent on imports of oil;
3. Much of the oil in the world is extracted from countries which are at risk from geopolitical tensions;
4. Oil supply constraints (and price spikes) have a negative impact on the economy;
5. Strategic oil reserves have the ability to reduce the impact of supply constraints and price spikes.

The remainder of this section presents the views from the Impact Assessment and then updates them based on recent statistics and opinions from the literature.

Oil is important to the economy of Europe

The IA discussed the reliance of the EU on oil, with the key point being that it accounted for approximately 37% of the total energy mix. The IA concluded that oil supply disruptions represent an important threat to the EU economy. It also concluded that the risk of disruptions had grown for a number of reasons in recent years, the main reasons being the strong global demand growth, the concentration of supply and the diminishing spare capacity (of oil production).

Statistics on the amount of oil consumed in the EU-28, and its share of the total gross inland energy consumption[81], indicate that in 2008 the EU-28 consumed 653,911.5 ktoe, which was 35.5% of the total energy consumption of the EU-28. By 2014 total energy consumption had decreased by 12.7% (mainly due to a combination of improved energy efficiency, growth in the use of renewable energy sources and industrial restructuring), and the use of oil had decreased by 15.5%, but still accounted for 34.4% of the total.

The IA recognised the fact that oil had been largely phased out from European electricity production and its role is decreasing in heating. However, the IA pointed out that oil still dominates transport, where it has limited viable alternatives, and without a technological breakthrough (e.g. low cost, high capacity batteries to enable electric cars), oil may continue to have a dominant role in this sector in the next decades. The IA also pointed out that oil is difficult to replace as a feedstock for the chemical industry. Recent statistics indicate that transport is the sector where reductions in energy use have been least impressive with final energy consumption in transport in the EU 28[82] reducing by 8.26 % between 2008 and 2014. The share of renewable energy in the fuel consumption of transport[83] has increased from 3.6% in 2008, to 5.9% in 2014, although it is important to bear in mind that this is virtually all in the form of plant derived biofuels which are added to conventional gasoline or diesel.

The BP prediction of EU-28 energy use in 2035[84], is of a 5% reduction in primary energy consumption, with a continuation of the change between sources, with growth in renewables (including biofuels) (+126%), natural gas (+20%), and hydro (+5%) but continuing reduction in demand for coal (-53%), oil (-20%), and nuclear (-29%). Despite this shift, oil is expected to remain the dominant fuel with a share of primary energy of 30% by 2035, followed by natural gas (27%), and then renewables (including biofuels), which overtake coal in 2023 and reach a share of 19%.

Europe is, and will continue to be, dependent on imports of oil

The IA discussed the high dependence of the EU on oil imports. In 2006, nearly 85% of the oil used in the EU was imported from third countries. The IA stated that the most important sources of import were OPEC countries (37% of extra-EU imports), Russia (33%) and Norway (15%). With decreasing indigenous production, the EU's dependence was expected to reach 93% by 2030.

[81] Eurostat data. Available at: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdcc320&plugin=1
[82] Eurostat data. Simplified energy balances - annual data [nrg_100a]. Last update: 17-02-2016
[83] Eurostat data. Available at:
http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdcc340&plugin=1Code: tsdcc340,
[84] BP (2016). Observation: the BP statistics are well respected and were available with a greater breakdown and with a longer future projection than the IEA statistics.

Total EU oil production stood at 2.4 million barrels per day (mbpd) in 2006, down from a peak of 3.7 mbpd in 1999. The IA quoted the IEA World Energy Outlook from 2007, with its reference scenario that predicted world oil consumption in 2030 would be 37% higher than it was in 2006.

Since 2008, total world oil production (according to the BP statistical review of world energy[85]) has increased by 7%, from 82,847 kbd (thousand barrels a day) to 88,672 kbd in 2014. Oil production in the EU has continued to decrease over the last eight years, with a 37% reduction between 2008 and 2014. This reduction is important to security of supply in the EU because it increases reliance on imported sources of oil. This trend is expected to continue into the future when EU produced oil will represent an even smaller share of the global total, at a time when global oil production is expected to continue to increase (a 16% increase predicted between 2014 and 2035).

The EU's share of total world consumption has decreased from 17.1% in 2008 to 14.1% in 2014. This reduction in share is a result of reducing demand in the EU, combined with growing demand elsewhere in the world (particularly in China and India). This reduction in share is important because it implies that Europe will become less significant of a market and will be in greater competition with other (larger) markets when looking to purchase oil.

Much of the oil in the world is extracted from countries which are at risk from geopolitical tensions

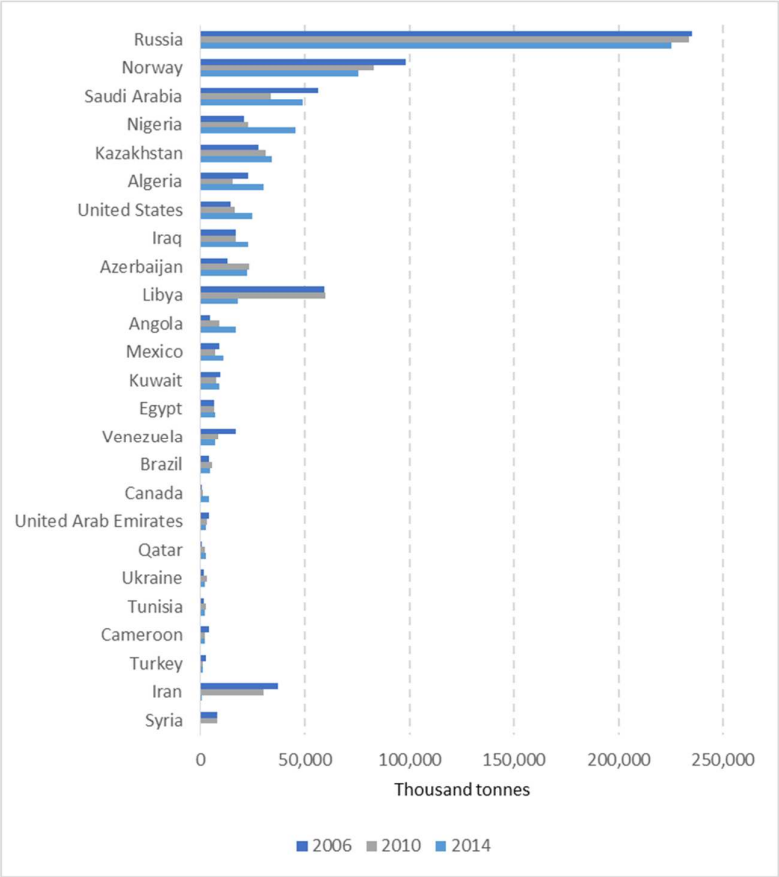
The IA discussed the sources of oil imports into Europe. It highlighted the fact that oil production was expected to become more concentrated in a small number of countries, many of which are exposed to high geopolitical risks, with a growing share of global production (and of EU oil imports) coming from the Middle East. This raises concern about the risk of major oil supply disruptions because of the instability in many countries of the region and past experience of disruptions from some countries in the last few decades (from the 17 serious oil supply disruptions involving a loss of at least 0.5 Mbpd crude oil, listed by the IEA World Energy Outlook 2005, 12 were related to events in the Middle East)."

The IA stated that supply from some producing countries can be threatened by wars, internal conflicts, export or import embargos and terrorism. In addition, oil movements from these countries often involve transport along long and vulnerable maritime and pipeline routes, susceptible to wars and other conflicts, terrorism, piracy and accidents. These risks are exacerbated by the resurgence of "resource nationalism" in several producing countries, raising the risk that these countries could use their market dominance to influence prices and/or "select" recipients of their supplies.

The figure below presents a review of the sources of oil imports into Europe over the last eight years

[85] BP (2016). See: http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/oil-review-by-energy-type/oil-production.html

Figure 6-1 Origin of petroleum product imports into Europe



Source: Trinomics, based on Eurostat data[86]

The figure illustrates a number of the supply risks discussed in the IA and elsewhere. For example the 2014 data shows a major drop in supply from Libya (internal conflict) and cessation of supply from Syria (internal conflict) and Iran (sanctions), all of which are examples of tension in major oil producing countries. On the positive side, supply has somewhat diversified with a growth in imports from Nigeria, Kazakhstan, Algeria, the United States and Azerbaijan. Russia remains the dominant source, with a virtually unchanged share of the total of 25.6% in 2010 and 25.7% in 2014. Norway remains the second largest source, although imports from Norway have reduced in line with their falling production. Total imports reduced by 3.5% between 2010 and 2014.

The IA pointed out (para 2, page 10) "*that a disruption can occur not only in producing countries or intercontinental transport routes but also within Europe. Many of the inland refineries, supplied by pipeline, have no or limited possibility to switch to another supply route if the pipeline is blocked for whatever (political, technical, etc.) reason. In January 2007, the Druzhba pipeline carrying oil from Russia to Europe was halted due to a conflict between Russia and Belarus, cutting oil supplies to many refineries in the EU.*" Given that oil continues to be sourced from (largely) the same countries now as it was at the time of the IA these risks to supply infrastructure remain relevant.

[86] Eurostat data: available at http://ec.europa.eu/eurostat/en/web/products-datasets/-/NRG_123A accessed on 18/3/2016.

The IA also pointed out the risks associated with national oil delivery routes and infrastructure *"Refineries, inland waterways and ports receiving oil tankers may also be vulnerable to accidents, terrorist attacks or strikes. In March 2007, an 18-day strike at France's Fos-Lavera oil hub threatened to shut down a number of refineries in France, Germany and Switzerland and cause a regional fuel shortage. Storage facilities might be also exposed to the above risks but their large number and geographical spread makes them less vulnerable than e.g. refineries or pipelines."* These risks also remain in place.

A 2012 paper[87] written by Paul Stevens of Chatham House considers the impact of political instability in oil exporting countries and the potential impact on oil prices. The paper was written at a time when oil prices were peaking, but the paper suggested that the market was oversupplied, partly because of higher prices reducing demand. The paper discusses a number of political factors that influence oil prices, and vice-versa, i.e. the impact of low oil prices on the politics of the oil producing countries. There were clear signals of reduced demand from Europe, which should have the effect of reducing oil prices, but there were also concerns related to the tension between Israel and Iran (partly fuelled by Israeli mistrust of the Iran nuclear programme) that could lead to interruptions in supply (which would tend to push prices up). The paper also discusses the pressure on certain Middle Eastern countries to increase oil prices in order to generate / protect oil export incomes in order to support their regimes and contain any public disquiet. The paper postulated that very low oil prices (and therefore low import revenue) could cause these countries problems. A potential scenario which could arise was: a price war (between oil exporters fighting to retain market share), forcing prices even lower, followed by a period of internal repression in some oil exporting countries as revenues fail to buy compliance among populations, and internal unrest among producers, which could lead to supply disruption followed by prices bouncing back.

The paper described the oil price dilemma for most OPEC members. These countries need higher oil prices to support them, but these higher prices will cause demand to fall and other supplies, including unconventional resources (e.g. US shale oil, oil sands, Russian arctic fields), to increase (because higher prices make it viable to extract less profitable reserves). This will force prices lower. On the other hand, low oil prices also have some benefits for the large oil producers in OPEC (particularly Saudi Arabia). A low oil price has the effect of making the production of non-conventional oil less (or even non) profitable. It also reduces the likelihood of investment in bringing more (particularly) non-conventional production on line. Low oil prices also help to protect the future demand of oil, because it delays 'demand destruction' – i.e. oil users permanently switching away from oil to other sources. Lower oil prices are also popular with importing countries, as they help to boost their economy (by reducing import costs and taking less of each consumer's budget). The extent to which OPEC states can last out periods of lower oil prices depends on their past ability to have built up reserves of funds. Some OPEC states (e.g .Saudi Arabia) have much larger reserves than others.

A more recent comment by the same author[88], suggests that the OPEC producers (mainly Saudi Arabia) decision to not cut production in 2014 (which would be the typical reaction to relatively weak global demand and low oil prices), is largely driven by a desire to put pressure on the shale oil producers of the US, which Saudi believes will be forced into a less (or non) profitable position by the low oil prices. The comment suggests that "many (rightly) saw this decision as a significant landmark in global oil

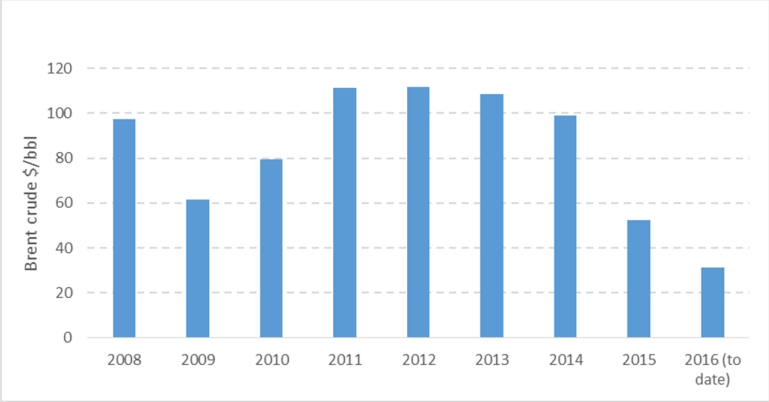
[87] Stevens, P. and M. Hulbert (2012).
[88] Stevens, P. (2014).

markets. In effect, OPEC had ceded any semblance of control over the market and prices, instead launching the oil price onto a sea governed by market forces". The paper is sceptical if oil demand (and hence price) will eventually recover in the way that OPEC appear to be expecting. The scepticism is based on a belief that the relatively low demand is not just driven by global recession (in which case it would recover), but is also the result of historically high oil prices and the end of fuel price subsidies in economies (e.g. India and China) that have been responsible for growth. The latter two of these reasons will induce switching away from oil, and this reduction in demand is permanent. Another concern that the comment raises is that the cost of existing shale oil production may be overestimated by many, especially if the oil income only needs to cover the operating / break even costs. The costs of future shale oil development may also reduce because the recent boom in shale operations has grossly inflated project costs. A very recent review of oil price trends in the Harvard Business Review[89] appears to confirm that shale oil production has not been as strongly impacted by the low oil price as was expected and that the prospects for a growth in such non-conventional supplies from other countries (e.g. China and Argentina) remains high and this increase is likely to keep oil prices relatively low as the ability of OPEC countries to control prices via production cuts diminishes. The article also discusses the fact that the currently low oil price is in fact relatively close to the historic norm and predicts medium to long term prices in line with the IEA predictions, at around $50 per barrel.

Oil supply constraints (and price spikes) have a negative impact on the economy

Since the IA (in 2008) oil prices first rose, but then fell. The oil price is of great significance to security of supply because it has a major impact on the profitability of oil production and the likelihood of investment in identifying and developing oil reserves into future sources. This is particularly important for those sources which have higher cost of production, because if the cost of production is higher than the price which the oil can be sold for the source will not be viable.

Figure 6-2 Brent Crude oil prices



Source: BP, US Energy Information Administration[90]

Medium to long term predictions of oil price are an important factor in any consideration of future oil security. The central scenario of the 2015 IEA World Energy Outlook[91], predicts that "the oil market rebalances at $80/bbl in 2020, with further increases in price thereafter. Demand picks up to 2020, adding an average of 900 kb/d per year, but the subsequent rise to 103.5 mb/d in 2040 is moderated by higher prices, efforts to phase out subsidies (provided that momentum behind reform is maintained,

[89] Hartmann and Sam (2016).
[90] EIA data. Available at: http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rbrte&f=m
[91] International Energy Agency (2015).

even as oil prices pick up), efficiency policies and switching to alternative fuels. Collectively, the United States, EU and Japan see their oil demand drop by around 10 mb/d by 2040."

The IEA's Low Oil Price Scenario predicts that oil prices will remain "close to $50/bbl until the end of this decade, before rising gradually back to $85/bbl in 2040. Higher demand, led by the transport sector, pushing oil use up to 107 mb/d in 2040. The Middle East's share in the oil market ends up higher than at any time in the last forty years. OPEC oil export revenue falls by a quarter relative to central scenario, despite the higher output. The economic benefits are counterbalanced by increasing reliance on the Middle East for imported crude oil and the risk of a sharp rebound in price if investment dries up. The outlook for biofuels is hit by cheaper conventional transport fuels, as is the uptake of vehicles powered by electricity and natural gas and the incentive to invest in more efficient technologies."

A 2014 paper [92] provides a review of the impact of oil prices on the economy and the role of strategic stocks, albeit from a mainly US perspective.[93] The paper confirms that spikes in oil prices do have a negative impact on economic growth. This paper also reviews the current state of oil-supply security noting that previous episodes of supply instability appear to have become chronic conditions. While new unconventional oil production technologies have revitalised North American oil production, there are significant barriers to a world-wide uptake of these technologies. Strategic petroleum stocks could provide additional protection to the world economy during an oil supply disruption if they are used promptly and in sufficient volume to prevent large oil-price spikes. Despite the large volume of world-wide emergency reserves, their effectiveness in protecting world economies is not assured. Strategic oil stocks have not been used in sufficient quantity or soon enough to avoid the economic downturns that followed past oil supply outages. In addition, the growth of U.S. oil production has reduced the ability of the U.S. Strategic Petroleum Reserve to protect the economy following a future oil supply disruption. The paper concludes that

> "Oil supply appears to have become slightly less able to (quickly) respond to increases in demand. Apart from stock draws or increased Saudi production, oil producers are unable to respond to higher oil prices by increasing production to any significant degree. Oil companies can only respond to higher or lower oil prices by increasing or decreasing planned investments in new production capacity. Consequently, the short-term elasticity of oil supply with respect to price is quite small. If high income growth increases the world-wide demand for oil faster than the world-wide growth of supply, oil producers cannot quickly respond to the consequent increases in oil prices as their maximum production generally depends on investments made years earlier."

Strategic oil reserves have the ability to reduce the impact of supply constraints and price spikes

The IA states the stocks are intended to be released when supply is agreed to be constrained in order to remove this constraint and prevent prices spiralling upwards as demand is unable to reduce quickly or deeply enough (i.e. demand is insufficiently elastic) in order to reflect the reduced supply. There are some papers which question the fundamental design of the strategic stocks system. A paper from 2011[94] includes the following summary of problems with the policies on strategic oil supplies (the EU Directive, the IEA system and the US' oil reserve):

[92] Difiglio (2014)
[93] Note that this paper uses the term strategic oil stocks rather than emergency oil stocks.
[94] Luciani and François-Loïc (2011)

- "The rules for the activation of strategic stocks are nebulous – the main objective is expected to be compensation for physical shortfalls of supply, but price movements anticipate any such shortfall and crises manifest themselves as price rather than quantity shocks. Undoubtedly, prices are far more volatile than the quantities supplied. At the same time, price shocks may also be independent of actual/expected changes in the quantities supplied;
- Strategic stocks necessarily have a limited duration; experience has consistently shown that the availability of unused capacity in major producing countries is much more important and effective in compensating for physical supply shortfalls;
- The accumulation of strategic stocks should not be viewed in isolation from commercial stocks and possible demand-management policies in case of supply emergencies;
- The desirable size of strategic stocks is difficult, if not impossible, to determine. The effect of accumulating stocks on markets and prices is not clear and could result in increased volatility, rather than the opposite."

The paper makes two suggestions as to how these problems could be addressed.

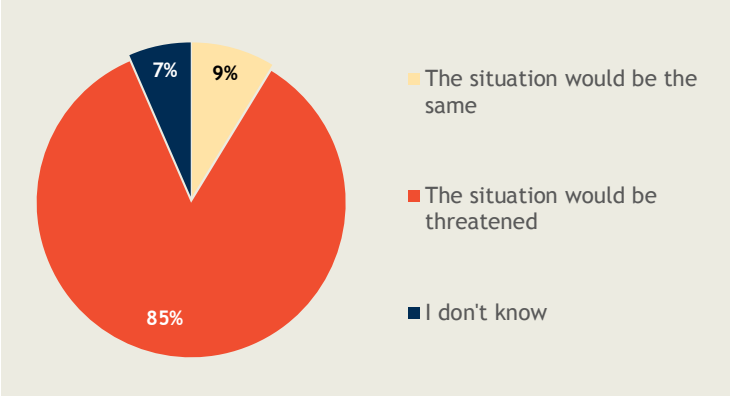
- Playing down the distinction between strategic and commercial stocks, and adopting policies to encourage accumulating and holding stocks on the part of all operators; and
- Facilitating cooperation between major oil importers and exporters with a view to encouraging and consolidating the existence of a sufficient cushion of unused capacity to compensate for supply shortfalls.

The first of these points is generally in line with our suggestion to consider the way in which commercial stocks are treated in emergency stocks, i.e. to better align this with the IEA procedure (cf. our recommendation related to the 10% deduction in Chapter 9). The second point is interesting but is somewhat beyond the scope of this report, and is also an issue that the EC could arguably do little to influence given the lack of any major (on a global scale) oil producers in the EU.

6.3 Survey and interview findings on relevance

The interviews we conducted discussed the need for having an EU-regulation by discussing the situation without a Directive. From the results, it became clear that a large majority of stakeholders (from industry, government and CSEs) still feel that there is a need for emergency oil stocks to ensure security of supply. This opinion was also supported by the survey with 85% of the respondents considering that the security of oil supply would be threatened if the EU and the IEA no longer required countries to hold emergency stocks (see Figure 6-3). Of course, the relevance of having an EU Directive should be assessed against the counterfactual of having no EU Directive, but still having an IEA system. The survey response could be taken as a fair representation of the need for having a Directive, because as is also argued in the next section (EU Added Value), the situation with only an IEA system would be significantly worse for the EU as not all EU Member States are IEA members and the EU IEA members mention that enforceability of the (already weaker) IEA obligation is low.

Figure 6-3 the security of oil supply without an EU Directive and the IEA system



Question: According to you, what would be the effect on security of oil supply, if the EU and the IEA no longer required countries to hold emergency stocks?

Source: Trinomics survey

The in-depth interviews with the three groups of stakeholders (government, CSEs and industry**) found that there is still a real need for having an EU Directive**, because:

1. Although total oil supply has increased in recent years (e.g. because of shale oil from North America), so has global demand (with Europe's share of this decreasing), market volatility and risks (e.g. due to geopolitics). This implies that the risks to Europe of a supply interruption have not reduced so there remains a strategic need to retain emergency oil stocks.
2. Some regard the IEA stockholding requirements as being more difficult to enforce than the EU Directive, for example because of the inability of the IEA to levy fines for non-compliance in the way that the EU (the Court of Justice of the EU) could do with the Oil Stocks Directive (under the specific procedure of Article 260(2) TFEU). It is also still the case that some Member States are not IEA members, and therefore they would have no obligation to hold emergency stocks without the Directive. Both of these points imply that an EU Directive strengthens the response of the EU as a whole in the situation with a Directive compared to the situation without Directive.
3. Other responses that could help Member States in the event of an oil supply interruption, such as interventions on the oil demand-side, like restricting traffic, are seen as being much less effective in comparison to holding emergency stocks, as these stocks should enable the oil based economy to continue through times of crisis.

6.4 Conclusion

From the literature review, survey and interviews it is apparent that the main reasons for having a system of emergency oil stocks remain in place, and show no signs of decreasing in the future. These reasons are: 1. Oil is important to the economy of Europe; 2. Europe is, and will continue to be, dependant on imports of oil; 3. Much of the oil in the world is extracted from countries which are at risk from geopolitical tensions; 4. Oil supply constraints (and price spikes) have a negative impact on the economy; 5. Strategic oil reserves have the ability to reduce the impact of supply constraints and price spikes.

This leads to the conclusion that the relevance of the Directive remains high.

7 EU Added Value

7.1 Introduction

EU Added Value is defined as a measure of the value resulting from EU intervention that is additional to the value that would have resulted from intervention initiated at the regional or national level. In the context of this evaluation, the question is whether having an EU Directive on emergency oil stocks adds more value than a situation without EU intervention: a combination of those Member States with IEA obligations and non IEA Member States not having any international commitments to holding oil stocks.

7.2 Update of the Impact Assessment analysis on EU Added Value

The Impact assessment (IA) began with a problem analysis which reviewed the history of Oil Supply Security in EU Member States back to its origins in the early 20th century, the 1970s oil shocks and subsequent formation of the IEA in 1974. The IEA and EU systems were recognised as having very similar, but not identical, objectives. The IEA system was characterised as follows: "After the oil price shock of 1973 seriously damaged the world economy and created a period of high inflation and stagnation, the International Energy Agency (IEA) was created in 1974 with a mission to protect oil consuming countries. The IEA took over the 90-day stockholding obligation from the European Communities but introduced different rules to make allowance for the oil production of some of its member countries, particularly the United States. The IEA emergency system is basically geared to addressing large global disruptions."

The existence of a separate EU system was justified on the following basis: "An independent EU system is deemed necessary because it is not likely that all EU Member States will join the IEA in the foreseeable future. In addition, there may be smaller, regional disruptions which affect one or more Member States but do not trigger the IEA mechanism which is focused on disruptions with a global impact. For example, the disruption of supplies through an oil pipeline would potentially cause serious problems to the country(ies) concerned. If such a disruption has no significant effect on the global market, it is unlikely to trigger an IEA action but an EU action might still be required to mitigate the negative regional impacts. The above justification for an independent EU system should not lead to a competition between the two systems. Instead, they should function in a complementary way, reinforcing each other in case of a disruption."

There appears to be no evidence of any change from the points raised in the IA.

7.3 Interview and survey conclusions on EU Added Value

In line with the conclusions from the interviews and surveys on the Relevance of the Directive, all stakeholders consulted felt that the Directive provided significant **EU Value Added** over the alternative of a system without an EU Directive. The key reasons are:

- The EU is an integrated economy and in times of crisis an integrated and joint response is therefore appropriate and required in order to minimise the impact of an oil supply disruption on the EU economy as a whole;

- Those Member States which are not IEA members could develop an emergency oil stock system which was significantly different to the emergency systems that IEA members are obliged to develop. This (potentially large) difference could well complicate a joint response as non-IEA members might stock much differently in terms of products and volumes. Moreover, by providing an EU integrated system, it is also easier for third party countries (non-EU) to align their energy policies with the EU system (such as Energy Community members, etc.);
- The Directive is generally viewed as imposing an equal / fair obligation on all Member States that gives each Member State the ability to respond both domestically and collectively. This is seen as a strength of the Directive and a demonstration of its EU value added as the system ensures a level playing field based on solidarity;
- Many stakeholders felt that even for those Member States that are also IEA members, a system without the EU Directive (only based on the IEA obligation) would have some important drawbacks in comparison to the current IEA and EU approach. The drawbacks of the IEA obligation include no product requirement (which could lead to the most in demand products not being available quickly enough) and the fact that commercial stocks are included in the emergency stock (thereby reducing the extra buffer that they provide under the EU system. It was also pointed out that the IEA does not have the power to impose fines (or other sanctions) on countries which do not comply with its standards, whereas the EU (Court of Justice) does have this power over Member States who do not comply with its Directives.

As the response clearly shows the vast majority feel that the situation would be worse without the Directive.

7.4 Conclusion

The conclusion on EU added value is that the Directive continues to offer a better solution than a response from each Member State. The main reasons are the ability to engage non IEA members in the system, the ability to independently respond to EU / regional EU incidents independently of the IEA, the fact that the Directive gives a collective response to a (potential) collective problem and does so in a way which reduces the risk of free riders and with a response that imposes equal burdens and benefits.

8 Coherence

8.1 Introduction

Coherence is defined as the extent to which the objectives and activities of the intervention support or contradict those of other public interventions. In other words, when analysing coherence of a Directive, the analysis studies whether its objectives are fully in line with the objectives of other related legislation or policies at EU level and whether its specific measures do not contradict with specific EU measures in other regulations.

At first glance, the EU's Emergency Oil Stocks Directive does not seem to have many other directly related EU policies or regulations within the broader field of energy security (apart from the IEA policies at international level, not strictly part of the evaluation of coherence).

8.2 Literature review conclusions on Coherence

A key aspect of coherence for this evaluation is the way in which security of supply sits within energy policy as a whole. Energy security remains at the core of European Commission energy policy. The EU's 2030 Energy Framework[95] continues with the three pillar approach of the 2020 energy framework. The three pillars are that the energy system should be competitive, secure and sustainable. The 2050 greenhouse gas reduction target is the other overarching objective. The 2030 Energy Framework reaffirms the need to consider security of supply and also the need to provide Member States with some flexibility in how they achieve this and the need for the solutions to be affordable.

On energy security the communication mentions the IEA projection that the EU reliance on imported oil will slightly increase from around 90% in 2014 to more than 90% by 2035. The communication also highlights the increasing cost of energy imports with rising demand for energy at global scale and insufficient competition in EU energy markets being blamed for sustained high commodity prices. The communication says that "in 2012, Europe's oil and gas import bill amounted to more than €400 billion representing some 3.1 % of EU GDP compared to around €180 billion on average in the period 1990-2011. This increases the EU's vulnerability to supply and energy price shocks." The communication states energy security should be addressed via three routes; further exploitation of sustainable indigenous energy sources (fossil, renewable and nuclear), diversification of the countries and routes for the supply of imported fossil fuels and reduction of energy demand. As part of the 2030 Framework, the Commission also proposed a governance scheme based on national plans for competitive, secure and sustainable energy which aims to increase and enhance regional coordination and coherence between EU and national energy policies. It also proposed three energy security indicators: diversification of energy imports and the share of indigenous energy sources used in energy consumption; deployment of smart grids and interconnections between Member States; and technological innovation.

In 2014 the European Commission launched a revised energy security strategy. This was supported by a staff working document[96]. The staff working document highlights the continuing dependency of the EU

[95] European Commission (2014b)
[96] European Commission (2014a)

on imported oil (almost 90% in 2012), which is predicted to increase as domestic oil production continues to fall. The variation between Member States is also highlighted, with import dependency higher for some Member States than others, though virtually all are heavily import dependent. With regard to oil the paper summarises the position as (paragraph 3, page 6) "risks of supply disruption mitigated by liquid global oil markets and regulated stocks, but a tight supply/demand balance, the concentration of suppliers and high import dependency can lead to price shocks with significant economic consequences in case of supply disruption events".

At face value it appears interesting to briefly compare the policy and legislation relating to the security of gas supply in the EU-28 to that of oil security. There appear to be major similarities between oil and gas with the EU heavily dependent on imports of gas, with Russia and Norway the two largest sources, followed by Algeria. There are European regulations on the security of gas supplies[97]. These regulations define situations that constitute a serious threat to gas security in a Member State and inter-alia define a supply standard of 30 days of supply to private households and vulnerable consumers (e.g. hospitals) in the event of such a situation. These regulations are currently under review, largely as a result of EU-wide stress tests in 2014, which indicated that national policies do not sufficiently take into account the security of supply situation in their neighbouring countries and the existence of serious shortcomings in taking into account external risks which includes the lack of access to information on commercial gas supply contracts. There are however a number of important differences between oil and gas supply and storage, that are summarised in the executive summary of a report[98] for the European Commission on "The role of gas storage in (the) internal market and in ensuring security of supply":

- While downstream gas transport is almost entirely performed by fixed infrastructure (i.e. pipelines), tanker trucks can be used to distribute oil. This makes the gas distribution system less resilient, in the sense that where oil tanker trucks are used the loss of one of them will not have large consequences on oil distribution, but if any part of a gas pipeline is damaged, supply downstream is heavily affected;
- Available spare capacity, either physically or contractually, is sometimes limited in existing gas pipelines, whereas more oil trucks can deliver more oil to petrol stations via the road system in case of extreme oil demand;
- Holding oil resources is much cheaper, due to the physical nature of the commodity, which is liquid at common temperature and pressure levels. Holding an equivalent amount of natural gas is far more costly.

These differences limit the comparability and transferability of experience between oil and gas.

There have been some concerns raised about the inclusion of biofuels within the Oil Stocks Directive, the logic being that Member States should be obliged to hold stocks of blended biofuels in the same way as they are required to hold stocks of other oil products. This holding requirement could reflect the percentage of biofuels required by the Renewable Energy (RE) Directive (2009/28/EC), i.e. by 2020, the EU aims to have 10% of the transport fuel of every EU country come from renewable sources such as biofuels[99]. Fuel suppliers are also required to reduce the greenhouse gas intensity of the EU fuel mix by

[97] https://ec.europa.eu/energy/en/topics/imports-and-secure-supplies/secure-gas-supplies. 2010 regulations (Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC), with proposals launched in 2016 to update these regulation.
[98] European Commission (2015c).
[99] The 10% target can also be reached by using electrically powered vehicles (with a share of the electricity assumed to come from renewable sources) not just liquid fuels.

6% by 2020 in comparison to 2010. The criteria for acceptable biofuels under the RE Directive was revised in 2015 in order to address concerns over indirect land use changes (i.e. land in protected areas being diverted in their type of food production in favour of indirectly producing biofuel).

It has been reported in the interviews that it is difficult to store finished products blended with bio-components for a long time without costly replacement (refreshment). The complexity of storing bio-components and the diverse range of additives involved suggest that there would be little strategic value in requiring the storage of biofuels. The Directive already states (Article 16) that biofuels and additives shall be included in stocks when they have been blended with petroleum products and they are stored within the Member States in a blended state for use in transport.

The Joint Research Centre (JRC) has recently completed a report[100] entitled EU Petroleum Refining Fitness Check: Impact of EU Legislation on Sectoral Economic Performance. The report looks at the impact of EU legislation on the cost basis (and hence international competitiveness) of oil refineries in the EU. The Emergency Oil Stocks Directive was one of ten Directives considered in this exercise. The key conclusions related to the Directive were:

- Based on the existing evaluations and evidence, the overall benefits of emergency stockholding are generally seen as high given its importance for the EU and national energy security policies.
- Analysing the MS-specific arrangements, we conclude that the obligation is generally financed in a competitiveness-neutral way; where the obligation is imposed on the industry, strong indications exist that the costs of stockholding can be (fully) passed on to end consumers. Competition on a 'level playing field' is, however, a necessary condition for the full pass through to occur.
- Under certain national arrangements, the oil refining industry can benefit from stockholding obligations by renting out its spare storage capacity and/or by selling 'tickets'.
- Since the 2009 Directive allowed for a transposition period until the end of 2012, with additional exceptions for certain MS until the end of 2014, it appears premature to precisely assess its impacts at the moment.

The Oil stocks Directive obliges Member States to complete the MOS. This is an administrative burden, but it is important to realise that oil is not the only energy source for which Member States are obliged to submit statistics to the European Commission. Regulation 1099/2008[101] contains a detailed list of the annual, monthly and short term monthly data submissions that are required from all Member States (and associated countries). The Annexes list the data requirements for solid fuels and manufactured gases, natural gas, electricity and heat, oil and petroleum products, renewable energy and energy from waste. For each energy type the Annexes (56 pages) of the Regulation list the specific energy products involved, the supply and transformation, energy sector use, use in other sectors, imports and exports, production and stocks (where applicable) plus definitions. The approach required to collate these statistics, used, inter-alia, to create energy balances for each Member State, is also described in the Regulation. It is beyond our scope to compare the reporting efforts required for each energy type (although the energy reporting burden is currently being considered as part of the REFIT Energy

[100] Joint Research Centre (2015).
[101] REGULATION (EC) No 1099/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2008 on energy statistics

reporting / governance evaluation[102]) but it is apparent that the reporting on oil is of a comparable scale to that required for other energy types.

There are two areas which could be considered issues of internal coherence for the Directive. Both of these are discussed in more depth in the effectiveness section of this report, because they relate to the achievement of key objectives of the Directive. However, it is relevant to summarise them here. The first point relates to an apparent contradiction between the requirement of the Directive that all stocks should be available and physically accessible versus the statement in Annex III to the Directive that *working stocks* (which potentially include MORs) and *stocks in tank bottoms* can be included in the emergency stocks, although they have restricted accessibility (and thus a reduced availability according to the definition of the Directive). The other point relates to coherence with the IEA, and the continuing difference between the Directive and the IEA requirements regarding the inclusion of commercial stocks. Despite the desire to align with the IEA, the decision was taken to preserve the difference with the IEA with respect to the treatment of commercial stocks. The EC continues to exclude industry stocks not marked as emergency stocks ('commercial stocks' – all stocks held by economic operators not held for the requirements of the Directive), whereas the IEA considers all stocks in the country (including all commercial stocks) as eligible emergency reserves. The main reason for this decision appears to have been for the additional 'buffer' that the commercial stocks provide.

8.3 Conclusion

The Oil stocks Directive still appears to be a good match with the overarching energy policy of the European Union, given the long term commitment to continue to support energy security (along with energy affordability and sustainability). There do not appear to be any conflicts with other areas of energy security, although the situation with regard to security of gas supply is somewhat difficult to compare. A recent study by the JRC also indicates that the Directive is not in conflict with EU policy regarding oil refineries. The level of reporting effort required by the Oil stocks Directive appears to be in line with the reporting requirements for other energy types.

[102] See the evaluation roadmap at http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_ener_024_cwp_refit_reporting_planning_obligations_en.pdf

9 Conclusions and recommendations

9.1 Overall conclusion

Based on the findings presented in this report we evaluate the functioning and implementation of Directive 2009/119 positively. The rationale for EU legislation imposing an obligation on Member States to maintain minimum stocks of crude oil and petroleum products is confirmed and the Directive provides significant added value compared to relying on IEA methodology only. Also, the objectives of the Directive have been largely achieved. The availability of emergency stocks has improved somewhat, there is better harmonisation with the IEA system, and the transparency of stocks has improved. The administrative burden has however not decreased, as was intended. The information collected as part of this mid-term evaluation points at a moderate rise of the administrative burden. This overall positive assessment is shared by the consulted stakeholders in the survey and the interviews: a large majority of the stakeholders consider that Directive 2009/119 enhanced the quality and credibility of the overall emergency oil stockholding system and that Directive 2009/119 is an improvement compared to the previous legislative acts that were repealed by the Directive.

The analysis shows that a 'perfect' emergency stockholding policy does not exist, but rather that there are various trade-offs, such as between effectiveness and efficiency and harmonisation with the IEA and the ability to set policy priorities independently from the IEA. This is also reflected in the views of the many stakeholders that we consulted as part of the stakeholder surveys, in-depth interviews and in relation to the six country case studies. Although most of the respondents are generally positive about the current EU stockholding system and come up with recommendations to improve the current system and not to change it, some are in favour of more far reaching alternatives. These alternatives range from allowing all stocks to be counted to meet the stockholding obligation (as in the IEA system) at one end of the spectrum, to establishing an EU wide CSE to hold dedicated emergency stocks on behalf of the EU Member States at the other end of the spectrum. Given the fact that this report is part of a mid-term evaluation of the functioning and implementation of Directive 2009/119, we have not analysed the pros and cons of the Directive vis-à-vis fundamentally different policy alternatives, but have, from a methodological perspective, concentrated on the comparison of Directive 2009/119 with the situation under the preceding Directive 2006/67.

With regards to the harmonisation of the EU system with the IEA system, which is one of the objectives of Directive 2009/119, it is important to observe that one of the most fundamental differences between the two systems continues to exist. In the IEA system *all stocks* can be counted to meet the stockholding obligation, but in the EU system a clear distinction is made between *emergency stocks* and *other (commercial) stocks*, stocks that are held for operational or commercial purposes and not for the purpose of the Directive. In other words, all stocks in the EU system that are not labelled as emergency stocks cannot be counted to meet the stockholding obligation. Although this may not be obvious at first sight, this distinction between the EU and the IEA system has important consequences for the impact of certain other harmonisation measures, such as the 10% deduction rule, the 1st of April compliance date and the naphtha rule. We discuss these issues under efficiency below; the point we want to make here is that, without harmonisation of this fundamental aspect of the respective stockholding systems (all stocks vs stocks designated as emergency stocks), the harmonisation of certain other elements is not straightforward and potentially not desirable.

9.1.1 Relevance and coherence

The analysis in this report shows that the problem analysis and needs assessment underlying the EU emergency stock policy, as discussed in the intervention logic in Chapter 3, remain valid. In the IA, the justification for an EU intervention was given through providing evidence on the following statements:

- Oil is important to the economy of Europe.
- Europe is, and will continue to be, dependant on imports of oil.
- Much of the oil in the world is extracted from countries which are at risk from geopolitical tensions.
- Oil supply constraints (and price spikes) have a negative impact on the economy.
- Strategic oil reserves have the ability to reduce the impact of supply constraints and price spikes.

An update of the IA analysis with regards to these five statements (presented in Chapter 6) reaffirms the validity of the rationale underlying Directive 2009/119. Although the oil market has become a somewhat more diverse international market, in which importers are able to switch to alternative suppliers in case of supply disruptions, market reactions take time and supply disruptions may induce price spikes with a negative impact on the economy.

The stakeholder survey and the in-depth interviews confirm the relevance of holding emergency oil stocks. 90% of the survey respondents believe that the security of supply would be threatened if the EU and the IEA no longer required countries to hold emergency stocks. A large majority of the interviewees (from industry, government and CSEs) still feel that there is a need for emergency oil stocks to ensure security of supply. One of the underlying arguments is that demand-side measures to cope with supply disruptions are seen as being much less effective in comparison to holding emergency stocks.

With regards to coherence, the objectives of Directive 2009/119 and the specific measures to achieve these objectives do not contradict with the objectives and specific measures of other EU policy interventions. Although Directive 2009/119 is related to the broader field of energy security, emergency stockholding is rather distinct from other energy related policies. In Chapter 8 we have looked at the interlinkage of Directive 2009/119 with the overall EU energy policy framework, legislation relating to the security of gas supply, the inclusion of biofuels in the Renewable Energy Directive (2009/28), and the EU Refining Fitness Check. The conclusion is that we see no problems with regard to the coherence of Directive 2009/119 with other EU policies.

9.1.2 Effectiveness

The Directive is by and large effective: the specific objectives and planned outputs of the Directive have largely been achieved. The effect of the Directive on the availability of emergency stocks and the transparency of stocks is moderately positive and positive, respectively. The harmonisation with the IEA system regarding certain elements (reporting, calculation of the obligation, emergency response mechanisms) has improved, although the harmonisation efforts also created some problems that need to be addressed. The goal to reduce the administrative burden has however not been achieved. All in all, we conclude that the Directive contributes to strengthening the security of supply, to minimising negative impacts of a disruption on the EU economy and to ensuring an efficient response to supply difficulties (the overall objectives).

The main findings regarding availability and transparency are summarised in Table 9-1 and Table 9-2. A summary of the main findings regarding harmonisation and administrative burden is given under efficiency (Section 7.1.3).

Table 9-1 Summary of the main findings regarding the availability of emergency stocks

Availability of stocks	Observed development	Impact of the Directive
Level of stocks	At EU level, the level of emergency stocks exceeds the aggregate EU obligation in the period analysed (2008-2014). After correction of differences in definitions between the time series, this difference has grown since Jan. 2013.	The adoption of the 10% deduction rule and the fact that commercial stocks can no longer be counted to meet the stockholding obligation are believed to have led to this relative increase of the emergency stocks.
Composition of stocks	The share of stocks held as products remained fairly stable at around 54% from 2008-2014. Certain MSs changed the type of products held to bring them more in line with consumption patterns.	The fact that products held better reflect consumption patterns than before has a positive effect on availability.
Commingled stocks	The level of commingled stocks went up somewhat and is expected to rise somewhat more in the coming years, mainly because of the requirement to hold finished products linked to domestic consumption.	Commingled stocks do not have an impact on availability.
Stockholding systems	Five MSs changed their stockholding system, mostly to a more CSE based system. Three MSs are considering establishing a CSE. The UK wanted to establish a (privately-run) CSE, but refrained from doing so because public debt would go up.	Although other reasons were more important, the Directive contributed to the establishment of more CSE-based systems in the EU.
Share of stocks held by different players	The share of emergency stocks held by governments/ CSEs increased from 49% to 55% from Jan. 2013 to Dec. 2014. [No data available before 2013]	The increasing share held by governments/ CSEs is correlated with the establishment of more CSE-based systems in the EU, to which the Directive contributed.
Impact of MORs and working stocks	MORs and working stocks are eligible as emergency stocks, but 11 MS guarantee that MORs are not included in the reported emergency stocks. MORs/ working stocks are considerably higher for refineries than for traders; CSE owned stocks do not include MORs or working stocks.	MORs are not available for selling on the market, whereas the full availability of working stocks is questionable. In theory MORs/ working stocks could be part of emergency stocks or commercial stocks, dependent on the difference between total and emergency stocks per obligated operator and on who owns the stocks.
Specific stocks	Three Member States (DK, FR, LT) decided to hold specific stocks, although since Jan. 2016 FR no longer holds specific stocks. Only a few MS consider holding them, a large majority do not see the benefits and many regard the concept an anomaly in the EU system.	The inclusion of the notion of specific stocks in the Directive has not reached its goals and is therefore not effective. As MSs have an alternative (product stocks), there is also no direct negative effect from including this notion in the Directive.
Emergency response mechanisms	Emergency procedures exist and country examples show that this can be done quickly, efficiently and without undue obstacles. There is improved coordination with the IEA according	The revision of the emergency procedures in the Directive has a positive effect on the harmonisation with the IEA and contributes to ensuring an efficient response to supply difficulties.

Availability of stocks	Observed development	Impact of the Directive
	to most of the survey respondents (none think it got worse).	
Overall opinion of stakeholders	44% of the public authority respondents considered that the Directive improved the availability of emergency stocks, whereas 56% thought the availability has remained the same.	The feedback from stakeholders is in line with our conclusion that the Directive has a moderately positive effect on the availability of emergency stocks.

Table 9-2 Summary of the main findings regarding the transparency of emergency stocks

Transparency of stocks	Observed development	Comment / conclusion
Distinction between emergency & commercial stocks	Both types of stocks are defined in the Directive and the distinction is clear. There is uncertainty as to whether reported stocks are fully comparable.	The distinction between emergency and commercial stocks has a positive effect on the transparency of stocks. Issues remain with regard to comparability of reporting.
Working stocks & emergency / commercial stocks	2/3rd of the survey respondents consider the distinction clear and appropriate. The main issue is that the concept of working stock is interpreted differently across MSs. Working stocks are higher for refiners than for traders and zero for CSE-owned stocks.	Emergency stocks may include working stocks (and MORs). This may be in contradiction with the requirement that emergency stocks should be available (for selling on the market) and physically accessible at all times, but only if insufficient commercial stocks are held on top of the emergency stocks.
Transparency of cross-border stocks and cross-border tickets	There is a requirement to maintain a register of emergency stocks. Sub-delegation is explicitly forbidden. Issues remain with auditing and control of stocks held abroad as well as discrepancies in cross-border stocks reporting.	The effect on transparency is positive: the information about the location and quantity of stocks held abroad has improved and non-transparent 'tickets of tickets' are no longer possible.
Differences between IEA and EU stockholding figures	The harmonisation in reporting decreased the differences between the IEA and EU stockholding figures.	The improved comparability of the EU and IEA figures has a positive effect on the transparency of emergency stocks.
Use of former oil product categories or the 'any oil' category	Former oil product categories are not used in cross-border trades and only one MS apparently uses the non-transparent 'any oil' category on cross-border tickets.	The reference in the Directive to specific products is more transparent than the use of product categories. It is also positive that the 'any oil' category is hardly used anymore on cross-border tickets.
Overall opinion of stakeholders	82% of the public authority respondents to the survey considered that the Directive improved the transparency of emergency stocks, whereas 18% thought the transparency has remained the same.	The feedback from public stakeholders is in line with our conclusion that the Directive has a positive effect on the transparency of emergency stocks.

9.1.3 *Efficiency*

As discussed in chapter 2, efficiency relates to the extent to which the desired effects are achieved at reasonable cost, whereas the effects relate to the achievement of the (overall) objectives and the planned outputs of the Directive. It is however very difficult, if not impossible, to put a (reasonable) price on the security of supply of oil and oil products. Rather, and in line with the ToR for this study, we have looked at the effect on efficiency of the harmonisation with the IEA system and simplifying reporting and assessed the effect of the Directive on storage costs (as compared to Directive 2006/67).

Our conclusion is that, while overall we do not see any serious issues with regards to efficiency, there are a number of issues that have a negative effect on efficiency that would benefit from attention. These issues are mainly unintended side effects of the harmonisation with the IEA system (naphtha rule, compliance date, 10% deduction rule) or relate to the increased administrative burden through additional reporting requirements. The underlying reason for these unintended side effects is that changes in the obligation in the EU system generally lead to changes in emergency stockholdings, whereas in the IEA system the inclusion of commercial stocks acts as a cushion (i.e. additional buffer) and therefore changes in the obligation often do not require actual adjustments in emergency stock levels. These issues are further discussed in section 9.2 where we present our recommendations. The main study findings on which this conclusion is based are summarised in table 9.3 and 9.4 below.

Table 9-3 Effect on efficiency of storage costs and simplifying reporting

Storage costs and simplifying reporting	Observed development	Comment / conclusion
Average per unit storage costs	These costs seem to have gone up slightly because some MSs had to increase certain product stocks with relatively high per unit storage costs.	This has no impact on efficiency, given that there are benefits in holding products that better reflect consumption patterns
Total storage costs	Costs have gone down (in line with a lower obligation linked to lower net imports/ consumption), but would have gone down more without the 10% deduction.	No impact on efficiency as such: the 10% deduction increases emergency stock levels and hence availability. [The justification of the 10% deduction is a separate issue.]
Incremental costs of adjusting stock levels	One-off costs of varying magnitude had to be met in order to change the type and/or volume of product stocks. [Stakeholders were reluctant to share precise details of these costs.]	This has no impact on efficiency, given that there are benefits in holding products that better reflect consumption patterns.
Administrative burden from overall reporting obligations	The reporting requirements have increased, more reports have to be submitted to the Commission. Public authorities and, to a lesser extent, economic operators indicate that the administrative burden has risen.	Although the administrative burden has risen, the impact on efficiency is less clear. Some reports are seen as useful, whereas the usefulness of some are questioned. Some of the reporting relates to energy statistics reporting required for other purposes – see coherence.
Bilateral agreements and cross-border stocks.	The majority of MSs still require some sort of agreement, in particular for obligated parties wishing to hold stocks or tickets abroad (but not for foreign parties that want to buy tickets from domestic economic operators/ their CSE).	Removing the requirement to conclude bilateral agreements had a limited positive effect on the use of cross-border stocks and has reduced ticket costs in these cases. This effect is hampered by the fact that many MSs still require bilateral agreements or MoU.

Table 9-4 Effect on efficiency of harmonisation with the IEA

Harmonisation with the IEA	Observed development	Comment / conclusion
Integrated reporting with the IEA	Rather than having to report separately, the adjusted MOS combines the reporting processes of the EU and the IEA. Particularly for MSs that are also IEA members, this eased the reporting process and reduced administrative burden.	The joint MOS has a positive effect on administrative burden and efficiency, but cannot compensate for the increased administrative burden resulting from the increased overall reporting requirements.
Calculation of the obligation	The method to calculate the obligation has been aligned with the IEA and the situation where MSs that were also member of the IEA faced two obligations has ceased to exist.	This has a positive effect on efficiency, as one calculation is needed instead of two and if Member States comply with the requirements of the Directive, they automatically also comply with the IEA requirements.
Calculation of emergency stocks	The methods to calculate the level of emergency stocks have largely been aligned, with the exception of commercial stocks (which are part of the IEA calculation, but not part of EU calculation)	
Naphtha rule	The naphtha rule (to account for stocks used for non-energy purposes) can create large swings in the annual obligation of MSs close to the 7% naphtha yield threshold. This may affect six MSs.	The naphtha rule can give rise to substantial transaction costs and inefficiencies, when its application leads to (potentially substantial) annual fluctuations in the required level of emergency stocks.
10% deduction	As in the IEA system, to compensate for unavailable stocks, only 90% of the total emergency stocks can be counted for meeting the obligation. Whereas this deduction seems justified in the IEA system, this is much less so in the EU system.	With all other things equal the 10% deduction, in effect, increases the obligation and hence the availability of emergency stocks, and has no impact on efficiency. However, if the 10% deduction is deemed not justified and was no longer applied, the storage costs would go down considerably while the contribution to the security of supply would still be at least as much as under the IEA system.
1st of April compliance date	MSs should comply not later than the 1st of April (was 31st of July) with the obligation for that particular year, whereas members of the IEA effectively have to comply on the 30th of April (was 31st of January). Given that the stockholding obligation is based on data for the year before and that the total stockholding obligation for a Member State needs to be subdivided over the CSE/government and economic operators, the time for making the necessary adjustments is very short.	The period available for making the necessary adjustments in emergency stock levels may well be too short to make the necessary adjustments in a cost-effective manner, particularly when the obligation goes up. This increases costs and because the benefits of meeting the obligation a few months earlier are relatively minor, this has a negative impact on efficiency.

9.1.4 EU added value

The Directive provides significant added value over the alternative system of no EU Directive. This conclusion is shared by virtually all consulted stakeholders in the survey and the interviews. The key reasons are:

- The EU is an integrated economy and an integrated and joint response is therefore more appropriate in order to minimise the impact of an oil supply disruption on the EU economy as a whole.
- Eight Member States are not members of the IEA. This could lead to differences in emergency oil stock systems and could complicate a joint response between IEA and non-IEA members.
- The IEA system is primarily designed to address large (global) supply disruption, whereas Directive 2009/119 also includes the possibility of acting to address smaller, regional disruptions affecting one or more of the Member States.
- The EU (Court of Justice) has the power to impose fines or other sanctions on Member States who do not comply with the Directive, whereas the enforceability of the IEA obligation is low (i.e. the IEA cannot impose sanctions).
- Directive 2009/119 introduced the obligation of holding one third of the stockholding obligation in the form of finished products (or 30 days of inland consumption in the form of specific (product) stocks) reflecting consumption patterns. Compared to the IEA system, in which there is no requirement to hold finished products, this improves the availability of relevant oil products in case of a supply disruption.

9.2 Recommendations

Based on the analysis presented in this report, we have a number of recommendations to improve the functioning of Directive 2009/119:

- *The naphtha rule*. We recommend reviewing the naphtha rule, as relatively small changes in the naphtha yield (when this yield is close to 7%) could lead to large changes in the annual stockholding obligation and hence to substantial transaction costs, i.e. inefficiencies. In section 5.3 we have analysed a concrete alternative to the current naphtha rule. This alternative effectively removes the volatility of the annual obligation caused by the current naphtha rule and has a relatively minor impact on the emergency stock levels in the Member States. It would be preferable if the change in the naphtha rule was coordinated with the IEA and jointly implemented by the EU and the IEA;
- *The 1st of April compliance date*. We recommend that Member States should comply not later than the 1st of July, rather than the 1st of April with the obligation for that particular year. Given the fact that the stockholding obligation is based on data for the year before and that the total stockholding obligation for a Member State needs to be subdivided over the CSE/government and/or economic operators, there should be enough time to make the necessary adjustments. This will also increase efficiency, because if CSEs and obligated economic operators had more time to make the necessary adjustments, they could pay more attention to the cost-effectiveness of these adjustments. We also propose the EU and the IEA harmonise whether compliance should be effective at the beginning of the month (as in the EU system) or at the end of the month (as in the IEA system). This appears to be a relatively minor point that could be harmonised without any detrimental consequences.

- *The 10% deduction rule*. The application of the 10% deduction rule effectively means that the requirements of the EU system are more strict than the IEA system. This results in higher availability of emergency stocks in the EU system as compared to the IEA system, but also in higher costs. If this is a deliberate political choice, no changes are necessary. However, if the harmonisation with the IEA was meant to include harmonising the emergency stock levels effectively available under both systems, we recommend reviewing the 10% deduction rule. Acknowledging the fundamental difference between the IEA system (in which all stocks can be counted to meet the obligation) and the EU system (which makes a distinction between emergency and commercial stocks and requires the full availability and accessibility of emergency stocks at all times) the removal of the 10% deduction rule would de jure lead to a deviation from the IEA system, although de facto a full alignment can be achieved (in option c., but not in options a. and b. below). The following three options could be considered:
    a. The 10% deduction rule would no longer apply for CSE-owned stocks. These stocks do not contain MORs or working stocks and are fully available. This option would stimulate Member States to hold CSE-owned stocks, potentially also in the form of specific stocks;
    b. The 10% deduction rule would no longer apply to all emergency stocks, including industry stocks and tickets. The argument for this option is that the Directive requires the full availability and accessibility of all emergency stocks and that making a distinction between CSE-owned stocks and industry stocks is not justified and unfair to Member States who place a large part of the obligation on industry. If this route is taken, we recommend to amend Annex III to the Directive so that MORs cannot be counted as emergency stocks;
    c. The 10% deduction rule would no longer apply under the condition that in addition to the emergency stocks, at least 10 days of commercial stocks (or 6.8 days for Member States with 61 days obligation) would be present in the country concerned at all reporting dates. Taking this route would effectively fully align the EU requirements with the IEA requirements (in terms of the number of days that effectively need to be held). A potential drawback of this option would be that certain Member States would not be able to guarantee that 10 days of commercial stocks would be present at all times, without putting such an obligation on the industry (or on the CSE), which would effectively nullify the impact of the abolition of the 10% deduction rule. On the other hand, for Member States with commercial stock levels that are consistently (well) above the 10 (or 6.8) days there would be a material difference if this route would be taken.

  and further elaboration is needed before a decision on changing the 10% deduction rule could be made. For example, an alternative suboption to option c. would be to require that in the EU as a whole on average at least ten days[103] of commercial stocks would be present at all times instead of imposing this restriction on each of the Member States separately;
- The inclusion of *specific stocks* in the Directive has not had its desired effect. Many stakeholders consider it an anomaly that should not have become part of the Directive. We also see the drawbacks of the way in which specific stocks are currently included in the Directive. However, it can be argued that the concept has no negative impacts as Member States are not obliged to hold specific stocks. We therefore see no need for action in the short

[103] Or slightly less, to account for the fact that some Member States have an obligation to hold 61 days.

term and recommend reviewing specific stocks and any alternatives when a (more encompassing) revision of the Directive is considered in the future;

- *Harmonised conditions for cross-border stocks rather than bilateral agreements*. The Directive no longer includes the requirement that cross-border stocks and cross-border tickets can only be held if there is a bilateral agreement between the two Member States concerned. In practice, however, we found that many Member States still require some sort of bilateral agreement, in order to ensure the availability of these stocks, in particular how their quality and availability can be audited and can be assured in the case of an emergency. Moreover, a bilateral agreement could include provisions on the way in which both Member States systematically share information on the availability and quality of these cross-border stocks and tickets. We recommend that the EC provides guidance on the conditions and characteristics under which Member States can hold stocks and tickets abroad, for example by considering one of two options:
    a. Develop an EU-wide model agreement, containing a compulsory standard lay-out and common definitions for oil products and minimum requirements for third-party audits and information sharing for the Member States to refer to or use when developing their own bilateral agreements. This would increase coherence across Member States in the bilateral agreements they use and increase the transparency of the cross-border stocks and tickets held by Member States at EU-level;
    b. Develop binding conditions for holding stocks cross-border in the EU, describing the rights and obligations of the Member States with regard to cross-border stocks and tickets (mainly related to information provision and auditing of emergency stocks). The content of this document would have to be developed in close cooperation and agreed with all Member States (e.g. in the OCG) and could become an Annex to the Directive with the aim to make the continued use of bilateral agreements superfluous.
- *Reporting requirements*. The administrative burden has increased because, in comparison to Directive 2006/67, the number of reports that Member States have to submit to the European Commission has increased. Based on the evidence gathered, we conclude that the additional reporting requirements do not significantly jeopardise the efficiency of the Directive as the increased transparency brought by some of the additional reporting requirements should be viewed as a benefit that justifies the input. Still we recommend the EC, in line with the ongoing Fitness Check on the reporting obligations in the EU energy *acquis*[104], should critically review the value added of each individual reporting obligation. Specifically, we regard the report required by Article 9.5 (obliging Member States holding less than 30 days of specific stocks to draw up an annual report on measures to ensure and verify the availability and physical accessibility of its emergency stocks) as redundant in light of the availability requirements stipulated in Article 5 of the Directive. Alternatively, in line with our conclusion on specific stocks that these stocks do not present a significant advantage over holding product stocks in terms of availability and security of supply, the report could also be linked to Article 5 of the Directive and apply to all Member States.
- *Methodology for calculating stock levels*. In the calculation tool in the MOS, the average naphtha yield of 4% is deducted from crude oil, NGL, refinery feedstocks, additives/oxygenates

[104] Trinomics and Technopolis Group currently perform an independent preparatory study in support of the Fitness Check Roadmap for the energy acquis adopted by the EC (available at: http://ec.europa.eu/smart-regulation/roadmaps/docs/2016_ener_024_cwp_refit_reporting_planning_obligations_en.pdf)

and other hydrocarbons. This calculation applies to both the EU and the IEA system. Annex III to the Directive however suggests that in the EU system the 4% is only deducted from "*crude oil stocks*". We recommend changing the wording in Annex III to precisely reflect that in the EU system, such that 4% is deducted from crude oil, NGL, refinery feedstocks, additives/oxygenates and other hydrocarbons.

- In order to further improve the transparency of stocks in general, we recommend to consider how this transparency could be further improved, for example through making an explicit distinction between CSE-owned stocks, industry-owned stocks and tickets (bought by industry or CSEs and sold by industry or CSEs).
- We recommend considering the establishment of *a publicly available list linking all relevant components, feedstocks and oil products to the existing EU energy statistics classification*. From the evidence gathered, we conclude that statistical discrepancies between the reports of Member States on cross-border stocks and tickets remain. A standard and agreed (statistical) definition of all relevant components and oil products that could be referred to in bilateral agreements (or in the harmonised conditions we proposed to develop above) so that both Member States would use the same (statistical) definition to refer to the same product held cross border. The difficulty lies in the fact that many of these relevant components are often very specific and company-unique products that do not have a defined Combined Nomenclature (CN) code or energy statistics code. We recommend that Member States and oil companies should link the most important components and oil products used for cross-border stockholdings in a publicly available list of products, including their definition and accompanying energy statistics code. This will further improve the transparency of cross-border stocks and tickets and reduce the statistical discrepancies in the statistical reports.
- We recommend *clarifying the treatment of different types of naphtha* as an eligible emergency product in the Directive. In line with the IEA, naphtha is excluded from the calculation of the stockholding obligation (Annex I). Annex III to the Directive also excludes "*stocks of naphtha*" for the calculation of eligible emergency stocks. This wording is however not precise enough since 'stocks of naphtha destined for gasoline production' *are allowed* by the Directive as eligible emergency stocks (in line with the IEA), because it is defined as a component of motor gasoline in Annex B to Regulation EC 1099/2008. Therefore, the interpretation of the Directive might be improved by changing the formulation of "stocks of naphtha" to "*stocks of naphtha (excluding stocks of naphtha for gasoline production*)".

References

Bamberger, C. (2003). *The History of the IEA: The First 20 Years - Volume IV*. Paris: IEA-OECD.

British Petroleum. (2016). *BP Energy Outlook*. Retrieved from http://www.bp.com/content/dam/bp/pdf/energy-economics/energy-outlook-2016/bp-energy-outlook-2016-regional-insights-european-union.pdf

Difiglio, C. (2014). Oil, economic growth and strategic petroleum stocks. *Energy Strategy Reviews*(5), 48 - 58.

Elliott, J. (2012). Overview of IEA Oil Emergency Response Policies and Procedures. *3rd Energy Community Workshop on Emergency Oil Stocks 25-26 April 2012* (p. 21). Zagreb: IEA.

European Commission (EC). (2004). *Evaluating EU Activities - A Practical Guide for the Commission Services.* Luxembourg: European Communities.

European Commission (EC). (2008) *Consultation document on the revision of the emergency oil stocks regime in the EU "Towards a modern and effective system of oil stocks in Europe* http://europa.eu/rapid/press-release_IP-08-623_en.htm

European Commission (EC). (2008). *Commission staff working document - Accompanying document to the proposal for a directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products - Impact assessment {COM(2008) 775} {SEC(200.* Brussels, Belgium: European Commission.

European Commission (EC). (2008). *Impact assessment for the proposal for a Directive of the Council imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products.* EC. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008SC2858&from=EN

European Commission (EC). (2015). *Roadmap: Mid-term evaluation of the functioning and implementation of Council Directive 2009/119/EC imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products. AP 2016/ENER/027.* Brussels, Belgium: European Commission.

European Commission. (2004). *Evaluating EU Activities - A Practical Guide for the Commission Services.* Luxembourg: European Commission.

European Commission. (2008). *Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics.* Brussels, Belgium: European Commission.

European Commission. (2014). *COMMISSION STAFF WORKING DOCUMENT In-depth study of European Energy Strategy Accompanying the document Communication from the Commission to the Council and the European Parliament European energy security strategy {SWD/2014/0330 final/3}.* Brussels, Belgium: European Commission.

European Commission. (2014). *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A policy framework for climate and energy in the period from 2020 to 2030 {COM/2014/015 final}.* Brussels, Belgium: European Commission.

European Commission. (2015). *Commission Staff Working Document - Better Regulation Guidelines {COM(2015) 215 final}* . Brussels, Belgium: European Commission. http://ec.europa.eu/smart-regulation/guidelines/docs/swd_br_guidelines_en.pdf

European Commission. (2015). *The role of gas storage in internal market and in ensuring security of supply.* Brussels, Belgium: European Commission.

European Commission. (2015) *Sectoral fitness check for the petroleum refining sector:*

https://ec.europa.eu/energy/sites/ener/files/documents/SWD_2015_284_F2_STAFF_WORKING_PAPER_EN_V4_P1_835479.pdf

European Commission. (2016). *Secure gas supplies*. Retrieved from DG Energy: https://ec.europa.eu/energy/en/topics/imports-and-secure-supplies/secure-gas-supplies

European Council. (1968). *Council Directive 68/414/EEC of 20 December 1968 imposing an obligation on Member States of the EEC to maintain minimum stocks of crude oil and/or petroleum products*. Brussels, Belgium: European Council.

European Council. (1998). *Council Directive 98/93/EC of 14 December 1998 amending Directive 68/414/EEC imposing an obligation on Member States of the EEC to maintain minimum stocks of crude oil and/or petroleum products*. Brussels, Belgium: European Council.

European Council. (2006). *Council Directive 2006/67/EC of 24 July 2006 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products (Codified version) (Text with EEA relevance)*. Brussels, Belgium: European Council.

European Council. (2009). *Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products*. Brussels, Belgium: European Council. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:265:0009:0023:EN:PDF

Eurostat. (2014). *Eurostat Guidance Note on Sector Classification of Central Stockholding Entities in National Accounts in ESA 2010*. Luxembourg: Eurostat. Retrieved from http://ec.europa.eu/eurostat/documents/1015035/2041357/Guidance-Note-Classification-of-CSEs.pdf/b6b6af21-b200-4529-ba22-7db3246b40d4

Eurostat. (2014). *Sector Classification of Central Stockholding Entities in National Accounts in ESA 2010*. Brussels, Belgium: Eurostat. Retrieved from http://ec.europa.eu/eurostat/documents/1015035/2041357/Guidance-Note-Classification-of-CSEs.pdf/b6b6af21-b200-4529-ba22-7db3246b40d4

Eurostat. (2015). *Energy statistics - supply, transformation and consumption (nrg_10)*. Brussels, Belgium: Eurostat. Retrieved from http://ec.europa.eu/eurostat/en/web/products-datasets/-/NRG_100A

Eurostat. (2015). *Gross inland energy consumption by fuel type*. Brussels, Belgium: Eurostat. Retrieved from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdcc320&plugin=1

Eurostat. (2015). *Imports Oil - Annual Data*. Brussels, Belgium: Eurostat. Retrieved from http://appsso.eurostat.ec.europa.eu/nui/show.do

Eurostat. (2015). *Share of Renewable Energy in fuel consumption of transport*. Brussels, Belgium: Eurostat. Retrieved from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdcc340&plugin=1

FuelsEurope. (2015). *Fuels Europe's recommendations on the review of the Compulsory Stocks Obligation Directive*. Brussels, Belgium: FuelsEurope. Retrieved from https://www.fuelseurope.eu/uploads/Modules/Resources/fuelseurope-position-paper-on-compulsory-stocks-obligation-directive.pdf

Hartmann, B., & Sam, S. (2016). *What Low Oil Prices Really Mean*. Boston, USA: Harvard Business Review. Retrieved from https://hbr.org/2016/03/what-low-oil-prices-really-mean?cm_sp=Article-_-Links-_-Comment

International Energy Agency. (2014). *Agreement on an International Energy Program*. Paris, France: IEA. Retrieved from http://www.iea.org/media/aboutus/iep.pdf

International Energy Agency. (2015). *World Energy Outlook 2015*. Paris, France : IEA. doi: 978-92-64-24365-1

http://www.worldenergyoutlook.org/weo2015/

International Energy Agency. (2016). *IEA Methodology for Calculating Minimum Stockholding Obligation and Compliance*. Paris, France : IEA. Retrieved from https://www.iea.org/netimports/explanations/

Joint Research Centre. (2015). *EU Petroleum Refining Fitness Check: Impact of EU Legislation on Sectoral Economic Performance*. Brussels, Belgium: European Commission.

Luciani, G. H. (2011). *Strategic Oil Stocks and Security of Supply*. Brussels, Belgium: Centre for European Policy Studies.

Stelter, J., & Nishida, Y. (2013). *Focus on Energy Security - Costs, Benefits and Financing of Holding Emergency Oil Stocks*. Paris: IEA.

Stevens, P., & Hulbert, M. (2012). *Oil Prices: Energy Investment, Political Stability in the Exporting Countries and OPEC's dilemma*. London, UK: Chatman House. Retrieved from https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/1012pp_opec.pdf

US Energy Information Administration. (2016). *Petroleum and Other Liquids*. Washington DC, USA: EIA. Retrieved from http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rbrte&f=m

Annex A – Case Studies

Case Study – Austria

Interviewees Mr. Martin Prieler (ELG), Ms. Siebenhandl (Federal Ministry of Science, Research and Economy), Mr. Swoboda (OMV)

Current system

Austria currently has an emergency stock holding model that is largely CSE based. Erdöl-Lagergesellschaft m.b.H. (ELG) was originally established in 1976 when Austria entered the IEA and served as the stock holder for the 5 main marketers at that time in Austria. ELG built its first terminal at Lannach near Graz in south-eastern Austria to store crude oil. The location was connected to TAL/AWP pipeline which passes the site *en route* from Trieste on the Italian Mediterranean coast to the Schwechat refinery near Vienna.

After the 2009 Directive on Emergency Stocks, ELG was set up as a CSE as a private entity but under state control. The shareholders are now OMV (55.6%), BP (23.1%), Shell (16.7%) and Eni (4.6%). ELG is a non-profit organisation; it cannot pay dividends but can invest in infrastructure and product and pay off loans. The most important stakeholder is the Republic of Austria; the Ministry of Economics holds a seat on the supervisory board and has a veto right on all CSO topics.

In Austria, each marketer submits data on imports and exports to the Ministry of Economics which in turn calculates what share of the overall obligation each company has, based on the previous year's net imports. It is up to each marketer to decide how they meet that obligation; ELG must offer to provide storage for any obligated party that requests it. Each marketer choosing to use ELG's services pays a volume related fee.

Currently around 97-98% of the national obligation is held by ELG with the balance held either directly by obligated parties or by other registered stock holding companies under the act. ELG owns approximately 75% directly itself with the remaining 25% being owned by other Austrian companies under private contract (not tickets).

Companies that provide storage or hold stock under contract for ELG are typically OMV, BP, Shell and RAG (an upstream producer). For those who hold stock under a private contract there is a predetermined pricing formula agreed upfront if stocks are required to be released. There are also stocks held under contracts which are ELG's while the tanks are rented from the oil companies. Contracts are long term (up to 15 years) or evergreen, with annual confirmation on volume. The notice period on the contracts is minimum of 6 months so that ELG can usually manage stock holdings without an interruption to the level of cover. Market prices ultimately include paid fees so that stockholding costs can be recovered. Typically the contracts have break points that allow for some renegotiation of terms e.g. in a market where demand is falling, quantities to be held would decline as the national obligation declines.

Availability of emergency stocks

Austria is a land locked country so has particular logistical challenges. There is a crude pipeline from Trieste in Italy (TAL and AWP) and a product pipeline (PLW) from Vienna to Linz. ELG operates three depots in Vienna/Lobau and others near Linz, which are connected to the PLW pipeline and the Schwechat refinery. Approximately 90% of the population can be very readily supplied from these

depots. There are approximately 40 additional sites where smaller volumes are held under contracts. OMV, as a TAL shareholder, has direct access to the depot in Trieste, Italy, where ELG is entitled to rent some capacity and holds stock there. There is a treaty between Italy and Austria granting Austria special rights for using infrastructure in the port of Trieste and so stocks held there count towards the emergency stock holding of Austria. Hence Austria holds 100% of its emergency stocks in Austria and at the pipeline connected depot at Trieste.

If there needed to be a stock release, ELG has the same supply infrastructure as the oil companies in Austria. Some regions in Austria e.g. in the west, are remote from the main depots and the refinery and are normally supplied from neighbouring countries (Germany and Italy) by rail. It is likely that this arrangement would continue in a crisis.

The advantages and disadvantages of cross-border stocks and tickets

Domestic ticketing known in Austria as 'sub-delegation' is possible. ELG holds stocks at depots owned by economic operators under commercial contracts. It is not permitted for economic operators to hold cross-border stocks or tickets.

As Austria only has one pipeline for crude oil imports (the TAL/AWP pipeline) the Government has long preferred to hold all emergency stocks within Austria or within this pipeline system (e.g. at the depot in Lannach or Trieste). This preference reflects concerns over the potentially lower availability of cross-border stocks and the absence of international product pipelines; the only way of importing products is by rail car, tank trucks or river barges.

Austria might consider ticketing between CSEs but not between economic operators. Austrian legislation does not allow any cross-border tickets under commercial contracts with the exceptions of contracts between CSEs. The Ministry does not currently seem likely to change its approach to meeting the emergency stock holding obligation.

The justification of the 10% deduction rule in the EU system

ELG does not currently support having a different percentage deduction rule in implementing the Directive compared to the IEA system; this could make implementation more difficult. It would, though, make sense to exclude specific stocks from the 10% deduction. OMV considers that the 10% deduction rule does not reflect the technical standard of stock recovery. In an emergency, essentially almost everything in tanks could be recovered. If a change in the 10% deduction rule was to be suggested as a result of the propositions put forward by some MSs (as detailed in the joint paper to the Commission regarding the evaluation of the Directive put forward by nine MSs), Austria is unlikely to oppose this.

Emergency Release Mechanisms

Once a release is requested by IEA and communicated by the European Commission, coordination of the response would be by the Ministry of Economics. The Ministry would confirm to ELG what release is required and ELG would plan and manage the release. Stocks would be released from ELG depots and/or those held in-country under contracts. Stocks are offered to the market rather than there being an absolute requirement to sell these stocks. Most infrastructure is close to Austria's core market so supply should be quick. Some stocks being held already have a price formula agreed in the event of a release.

Depending on the nature of any crisis, OMV may be able to run more crude through the Schwechat refinery. However the refinery typically runs at high levels of utilisation so the capability to increase throughput may be limited. Alternatively ELG could release some of its in-country crude oil stocks to the refinery, allowing the release of crude oil supply supposed to be delivered to Trieste back into the Mediterranean market.

Case Study – Cyprus

Interviewees Mr. Nicolas Tsioutis (KODAP)

Current system

Cyprus has a mixed system to comply with the Emergency Oil Stocks Directive, consisting of a part of the obligation put on industry and a part on the CSE. The CSE, called the Cyprus Organisation for Storage and Management of Oil Stocks or COSMOS (KODAP in Greek), was founded in 2003 to comply with the Directive. COSMOS is a non-profit semi-governmental organisation operating under the supervision of the Minister of Commerce, Industry and Tourism of Cyprus. COSMOS has a nine person board of directors; an independent chairman (Government appointed), four from various government ministries, one from the Electricity Authority of Cyprus and the remaining three from COSMOS or COSMOS members (i.e. from industry). The presence of industry representatives on the board means that industry has a significant role in the CSE.

The Ministry of Commerce, Industry and Tourism of Cyprus has yet to issue official regulations to obligate the companies. However oil companies operating in Cyprus are currently holding around 60 kt in emergency stocks which is more than 12 days of net imports, on a voluntary agreement basis. The Electricity Authority also holds stocks of around 130,000-150,000 tonnes of products (around 30,000-50,000 tonnes as gasoil and 100,000 tonnes as fuel oil). COSMOS holds 202,000 tonnes of refined white product, with the balance as tickets (165,000 tonnes in 2015, and 195,000 tonnes for 2016). These quantities sum to the equivalent to around 90 days of net imports.

Since 2015 COSMOS stocks have been held in 175,000 m^3 of rented capacity at the VTTI terminal at Vassiliko (VTTV). Prior to this, COSMOS held over 100,000 tonnes of stocks at the old refinery site (that had been converted into a terminal) near Larnaca. However, this was non-compliant with the Seveso Directive, specifically with LPG being stored too close to residential areas. COSMOS is now designing its own facilities which are due for commissioning around 2019/20 (180,000 m^3). The new facility will be close to VTTV and connected by pipeline to use VTTV jetty and road loading. Until the new facilities are commissioned, COSMOS will continue to rent capacity at VTTV. COSMOS also has other facilities including 40,000 m^3 for diesel at a power station site near Limassol. A local oil company, Petolina, has its own facilities in Cyprus. Exxonmobil and Hellenic Petroleum have their own facilities in Larnaca but these are relatively old so may need to be replaced or renovated in the foreseeable future. Only Vassiliko and Larnaca are supplied by sea. All inland and other deliveries are by road but distances across the island to retail sites and other customers are not great.

Availability of emergency stocks

Most stocks are held within Cyprus and mostly in terminals and depots on the South coast, close to the major demand centres. All deliveries are ultimately made by road truck (no product pipelines or rail deliveries). With relatively short distances for final delivery, it is possible to make stocks rapidly available within Cyprus if a release is required. However, some stock is held under cross-border tickets in more distant parts of Europe (e.g. UK, Finland). These stocks could not be rapidly supplied to Cyprus but could be released into local oil markets. COSMOS did experience an extended delay (approximately 2 months) when trying to move stocks back from Greece to Cyprus in 2015 for the commencement of the contract with VTTI; the fire in May 2015 at Hellenic Petroleum's Aspropyrgos refinery caused a pipeline to be damaged, preventing delivery to COSMOS's vessel.

Cyprus uses the second calculation method described in Annex III to the Directive (Method B, based on four products only rather than the extended list of products). Method B can result in a lower calculated required stock level to meet the total obligation compared to Method A of approximately 60,000-70,000 tonnes.

Petroleum coke continues to be an issue in the context of emergency stocks; it is included in the import calculation (which is significant in Cyprus), increasing the stockholding obligation. However, as Method B is used to calculate stocks, emergency stocks are not held as petroleum coke, rather as heavy fuel oil instead. If petroleum coke was to be held as an emergency stock, it would not be counted under Method B. Petroleum coke can only be counted as stock held using Method A but using Method A would penalise all companies in Cyprus as they would have to pay a share of the cost of holding the higher levels of stock. Further, if petroleum coke was not available, it would be substituted by coal which is not held as an emergency stock. Overall, this presents a dilemma for Cyprus.

The advantages and disadvantages of cross-border stocks and tickets

COSMOS holds tickets for 195,000 tonnes of stocks (at 2016), mostly now with CSEs in Belgium, Netherlands, Italy, UK, Malta and Finland. COSMOS has in the past also ticketed with Vitol in Cyprus (in 2015) but this year's tickets are all abroad as they are cheaper. COSMOS cannot hold stocks for economic operators. The Government has to approve tickets held abroad. Auditing is difficult to do and so COSMOS has to rely on systems in place in the other countries. COSMOS is a member of ACOMES (international conference of CSEs) and through its technical committees they are aware that actual availability in the month can be lower than at month end when levels are reported. By ticketing with CSEs rather than economic operators, it was felt that there is more certainty that stocks are actually available.

Disadvantages of cross-border stocks and tickets:

- Auditing
- Month ends higher than mid months
- Distance by sea can be significant
- Potential non availability due to technical issues e.g. as happened in Greece
- Price volatility – on exercising ticket, need to pay current price for product release. Can be hedged but management does not tend to approve this.

Advantages of cross-border stocks and tickets:

- Avoids having to build additional capacity
- Can take advantage of cheap tickets at certain times
- Reduces working capital.

The justification of the 10% deduction rule in the EU system

Cyprus is not an IEA member. 10% deduction is an EU obligation and it is understood this was in part to align the Directive with the IEA requirements. The level of 10% for the deduction seems very high if it is to represent stocks that may not be readily released and 5% is thought would be more reasonable. Experience in moving stocks suggests that tank bottoms and pipeline volumes can be pumped out. As an example, when emptying 130,000 m^3 of tankage, only 400 m^3 of off-spec product was slopped out of (~0.3%) with even less (<50 m^3)as sludges which went to the cement industry. It was felt that the 10%

deduction should be on the product sellers, not on the CSE. Tickets purchased by the CSE are for precise quantities which are to be fully delivered so why should a 10% deduction apply to tickets?

Emergency Release Mechanisms

In a crisis, Cyprus based stocks would be released first. These stocks would be sold to local oil marketers. Next, more remote stocks held under tickets would be released and vessels chartered if it was necessary to bring stocks to Cyprus. Swap deals with companies that work across Europe could be undertaken for more remote stocks as some operators will hold stocks at VTTV as well as in, say, Netherlands or other parts of North-West Europe. In crisis, the Minister would issue a notice to release stocks and possibly also issue controls on consumption.

For the Hurricane Katrina release, COSMOS was not in full operation so did not contribute to the release. For the Libyan uprising, the IEA coordinated a release of stocks from its members in June 2011 and requested release of 2 days' of stocks from certain non-IEA countries such as Cyprus. However, Cyprus did not participate in the release as there was, in July 2011, a major explosion on a naval base that destroyed Cyprus's largest power station and resulted in severe power outages.

Case Study – the Netherlands

Interviewees: Frans Wieleman, Bob Ent (Ministry of Economic Affairs, 11th of February 2016) & Bart van Holk (COVA, 1st of March 2016)

Availability of emergency stocks

- The Netherlands has a mixed system where approximately 80% of the central stockholding obligation (CSO) is met by a CSE (COVA) and the remaining 20% by industry. Next to emergency stocks earmarked to meet the CSO, the Netherlands has additional oil stocks used solely for commercial purposes. Commercial stocks consists of a number of different types of stocks (reflecting the different reasons for which stocks are held):
    1) **Minimum Operating Requirements -** Stocks held at refineries to meet the minimum requirement amount to keep the refinery running from a technical perspective (e.g. oil kept in processing pipes at the refinery site). There has once been a review of the IEA among member countries to estimate the share of MOR in commercial stocks. It was stated that the share of MOR in a country's total commercial (and/or emergency stock system) differs strongly depending on the presence of refineries and the type of refineries. Only countries with refineries can theoretically have MOR in their emergency stocks and the share of MOR increases with the complexity of the refinery (the more intermediate type products, the more pipelines on site etc.).
    2) **Working stocks -** on top of the MOR, Dutch refiners hold an additional amount of oil stocks as feedstock to the refinery in order to be able to continuously operate the refinery and to optimise the productivity of the refinery through optimal mixing of feedstocks. Dutch refiners are sometimes able to use as much as 150 different types of crude as feedstock. However, in other countries this may be a much lower amount due to the fact that only a limited number of feedstock types might be used in the refineries (e.g. refiners in Austria can only accept one type of feedstock). In addition to the feedstocks (upstream), refineries keep product stocks (downstream) allowing them, also through mixing these product stocks in order to get the right product specifications, to supply their customers in an uninterrupted manner. The level of working stocks in a country in general therefore strongly depends on the presence of a refinery. In the past (1970s), the combination of 1)+2) amounted to approximately 50% of all emergency stocks held in the Netherlands by economic operators. [when the IEP was agreed upon in the early 1970s, the general idea was that out of the 90 days emergency stocks, 45 days would be working stocks] Over time, this share has declined due to technological progress as well as improved management procedures such as Just-In-Time inventory management. Nowadays, this share is more likely to be around 33% [30 days out of the 90 days].
    3) **Operational stocks -** Depending on the type of market situation (contango/backwardation) at a given point in time, the volume of commercial stocks held by industry fluctuates to benefit from arbitrage opportunities in the market.
    4) **Trading stocks -** consisting of those oil stocks that are purely present in a country for trading (export and import) purposes, i.e. without commercial function for the country. In the Netherlands, the share of trading stocks is large since the Rotterdam harbour is a large transit hub for oil trade in the world. In most countries (especially

landlocked countries), this share is small. Due to the hub function that Rotterdam plays, there will always be more than 90 days of oil stocks in the Netherlands.

- In a supply crisis situation, the level of necessary working stocks (2) is likely to decrease. The available type of feedstocks will decline and as a result the output of the refinery will decline as well.
- Commingled stocks add to the complexity of understanding the share of emergency stocks really available in times of a crisis as these are emergency stocks literally mixed with commercial stocks held by industry. Strictly speaking, emergency stocks held for industry or CSE/government in commingled tanks are part of the working stock tanks for industry and could therefore pose a problem from the perspective of full availability of the emergency stocks. There are however (strong) advantages of holding a share of stocks in commingled tanks (automatic refreshing). Therefore COVA uses contracts that ensure emergency stocks in commingled tanks are strictly 'on-top-of' the working stocks of industry and need to be made available for 100% in case of emergency. This is assured by carefully written articles in the contracts with industry. In the Dutch reporting of emergency stocks, the stocks held by COVA in commingled tanks are therefore also not reported as 'working stocks'. An extreme example in the Netherlands is the storing of jet-fuel that has become obligatory since the transposition of the new Directive. The quality of jet fuel is very important for flight safety and therefore needs to be refreshed every three months. Holding the emergency stocks of jet-fuel in commingled tanks is therefore a good solution. COVA made strict contracts with a large buyer of jet fuel (that maintains their own storage tanks), which – as part of the agreement – presents detailed monthly reports to COVA about how much stock the tank contains and is held for emergency purposes.
- In all Member States – regardless of the share of MOR, working or operational stocks – there is uncertainty as to how large these shares are and to what extent industry declares their MOR stocks as eligible emergency stocks (which could be legitimate by declaring them as working stocks). For example, for countries that are close to the 90 days of available emergency stocks in their country, it is likely that in reality less than 90 days is available due to the presence of working stocks in the system. The uncertainty and share of working stocks increases with the share of industry-held stocks in a country. Countries with 100% government owned stocks or without refineries should not have this uncertainty/problem. But even in a system with 100% of stocks held by agencies there is a danger that eligible oil stocks might be covered by MORs and working stocks that would not be available in times of crisis as agencies also contract industry to hold emergency stocks for them. In case industry covers this contract with a share of MOR and/or working stocks, availability would still be threatened in a crisis situation.
    - To address this situation, in the Netherlands industry is obliged to keep emergency stocks on top of MOR through excluding 'stocks held in pipelines and processing installations in refineries' as eligible emergency stocks in the Dutch regulation. COVA adopts this working definition of emergency stocks in their contracts in order to make sure that their stocks are held on top of MOR. In this way the availability is higher than for example in the UK system where the obligation is also imposed on smaller retailers that do not have working stocks.
- As a result, an alternative scenario of obliging Member States to hold 60 days of *agency* emergency oil stocks (stocks that are owned by the agency and are in addition to stocks held by economic operators) might represent a more safe and reliable alternative to the current situation.

- In the Netherlands, the total obligation imposed on industry has been declining because the release to the domestic market by industry players has been decreasing (this is related to the specific way how in the Netherlands the obligations of economic operators are calculated). In general, many players on the retail market are moving upstream in the supply chain, which results in a more fragmented downstream market with an increasing share of smaller players that release <100,000 t/year on the domestic market (which makes them exempt from the CSO).
- The availability of emergency stocks with COVA is good as traditionally COVA has been able to even sell tickets on their stocks of emergency oil.
- The CSO for the Netherlands has been volatile in the recent past due to the emergency of the shale gas boom. The refining industry in Rotterdam, which is well connected to the supply of shale gas from the US, has been using shale gas as feedstock whenever prices were low, but that impacted the naphtha yield significantly, resulting in a changing obligation from year to year.
- Caverns are by far the cheapest way to store oil stocks, but the security of supply depends on their connectivity with commercial infrastructure.

Justification of the 10% deduction

- The 10% deduction was a political decision by the IEA, acknowledging that all stocks can be counted in the IEA system, including MOR, working stocks and (other) commercial stocks.
- The 10% deduction on unavailable stocks in the EU is *de facto* an increase in the emergency stock holding obligation. This 10% deduction is not fully justified in the EU system, as MOR should not be part of EU emergency stocks (but is this always the case?) and if stocks are owned by the government or the CSE this deduction is not justified at all. The only problem if the 10% deduction would no longer be required, is that the IEA and EU mechanism to count emergency stocks would differ on this point.
- In principle, unavailable tank bottoms can affect both industry and agency stocks, depending on the state of the facilities where the stocks are stored, but this should be not more than 1-1.5% of the stocks. The 10% is seen as a an effective incentive to increase agency stocks (when removing the deduction would be applied to agency stocks only).

Cross-border stocks and cross-border tickets

- In the Netherlands, there is a need for governmental consent between two countries when a company or agency wants to store stocks it owns itself abroad or when it wants to buy a ticket from an economic operator abroad. Therefore the government in country A knows about the location, volume and type of products stored in country B and the government in country B knows the similar information.
- In the case of the Netherlands, these inter-governmental agreements and information exchanges are governed by bilateral agreements. The Dutch government holds 11 bilateral agreements with countries in the EU.
- COVA holds a selected share of its emergency stocks abroad (for example in salt caverns in Germany). However, COVA can only hold emergency stocks in countries with which the Netherlands has a bilateral agreement that stipulates the conditions under which emergency stocks are held in both countries. For both cross-border tickets and cross-border stocks it holds that COVA needs approval from both the Netherlands and the partner country governments when it wants to store oil or buy tickets abroad. Through the bilateral agreement, COVA has the certainty/comfort that

there is a decent legal framework in place that makes sure that the emergency stocks can be made available if needed and that the necessary information flows about the management of the emergency stocks abroad are in place.

- For the compliance and quality checks of the stocks stored abroad, both company A and country A rely on the checks by country B (if the stocks are held in country B) – the government of country B can check whether there would be double selling of stocks. In the Netherlands, the Customs Services (*Dienst Douane*) checks emergency stock holdings (using bookkeeping information, they do not check the actual presence of the stocks) for other countries (with whom the Netherlands holds bilateral agreements). It seems however that foreign companies or foreign governments hardly ever asked for the monitoring results or for a specific check on the actual presence of stocks.
- The checking and monitoring systems (currently arranged bilaterally between countries) does not function adequately (this also depends on the unknown quality of the national registers) and the Directive provides insufficient guidance on improving this situation. The quality of the registers of oil stocks held at national level may generally not be sufficient to check the actual availability. The way in which countries check the availability of emergency stocks will also differ based on the different cultures in countries (e.g. there might be more physical checks in Eastern European countries as compared to Western European countries where the system relies more on accounting checks).
- An option would be to ask the EC to check stocks owned/held cross-border, but a bigger problem (than monitoring) is the quality of the stocks that underpin issued tickets. In countries where the CSO is put on industry and which just about complies to the CSO, these stocks are bound to include working stocks and maybe even MOR (in particular if total stocks are not much more than emergency stocks in that country).
- A radical change in the European stockholding system would be the establishment of one large pan-European Central Stockholding Agency that manages and holds emergency stocks for all EU Member States and distributes the physical presence of stocks most optimally. The CSE would hold one large registry of which stocks are held where and by whom, which would overcome information asymmetries and double-counting. A new obligation of 60 days of fully CSE-owned stocks could be established, which circumvents the use and counting of commercial and working stocks. Despite the lower CSO (from 90 to 60 days), the security of supply could even increase due to the optimisation of the system at EU level.

Emergency Release Mechanisms

- The response to an emergency situation will differ from situation to situation as the supply shock could be very targeted on specific products or countries. Therefore, the Ministry of Economic Affairs will always assess on a case-by-case basis what the best response would be (in consultation with COVA).
- According to the national regulation, the Minister of Economic Affairs has the official authority to place an obligation on COVA and the industry to release emergency stocks.
- The official procedure in case of an IEA emergency for the Netherlands is:
    - There will first be a Governing Board decision by the IEA in Paris, stipulating what type of crisis it is and determining the shares of emergency stocks that member countries have to release (always the same percentage per country);
    - Followed by a notice of activation (detailing the action that members have to take) This will arrive to the Ministry, which will, after internal consideration, send a signal to COVA for release of stocks. Simultaneously, there will be a discussion with the

industry to check whether they experience problems of any kind and what could be done to alleviate them;

- COVA then follows to check the type of contracts that they have and which stocks they hold where. Depending on the speed of release that is needed, COVA will consider which stocks to release first:
  - **Release of stocks held by industry** to the market (fully integrated in the infrastructure already). Equally quick is the release of **COVA-stocks held as tickets** with industry players. COVA can 'waive' the ticketing agreement that COVA holds with an industry player, such that the share of stocks held by the industry player for COVA are immediately in the possession of the market.
  - **Selling COVA stocks on bilateral basis** - can be released on a bilateral basis with the economic operator where the stocks are held, but it can also be released to the market through a tender. call the option of the ticket or to make dedicated agency stocks available for a bilateral agreement with two or three potential buyers by asking for the price they are willing to pay and then selling it without tendering procedures. The rule-of-thumb for the pricing of the stocks is PLATTS + a mark-up (e.g. PLATTS + $1). The price-setting is always based on market prices as emergency stocks are primarily used to make sure that the real availability of oil is assured (not to manipulate market prices).
  - **Dedicated COVA-stocks** – The official (third fastest) way is to release CSE-owned stocks through official public tendering, which is the common way of bringing emergency stocks in the market. The entire tendering process approximately takes 6 weeks as the quality and quantity of the stored oil needs to be verified by an independent third party and the storage company needs to agree on the terms of release of the stocks (including the logistics), on the basis of which the tender specifications need to be written and market players need time to respond to the tender.
- Through the use of tendering mechanisms, economic principles ensure that the emergency oil stocks are directed towards the parties that most need it (=willing to pay the highest price).
- There have been two recent events in which the emergency response mechanism was tested and actual emergency stocks were released to the market: Libya Collective Action (2011) & Katrina Collective Action (2005). For the Libya action, the Ministry and COVA successfully tested a variety of responses in order to check the availability and speed of release. The response time was 3-6 weeks for that case. COVA released actual emergency stocks to the market by (i) the sale of expiring contracts of crude oil, (ii) calling a number of options for crude oil tickets and bringing them on the market through tendering and (iii) the sale of a ticket of diesel.

Miscellaneous

- Specific stocks should equal 30 days of inland consumption of a particular product. These 30 days can be significantly lower than 33.3 days of net imports (one third of the CSO should be held as products). Cf. Annex III of the Directive where it is stipulated how the level of specific stocks should be calculated. This difference between 30 days of inland consumption and 33.3 days of net imports will vary from country to country and from year to year. Cost considerations are/could/should therefore be an important factor to go for specific stocks or not.

- Countries should allow that part of their stocks could be stored in a foreign country, e.g. Austria requires that all stocks are held nationally.
- Regarding the calculation of the eligible volume of stocks held, there is a slight difference between the EU Directive and the IEA in the formulation of the stocks over which the average naphtha yield is deducted. In Annex III of the Directive, 4% is deducted from 'crude oil stocks', whereas in the IEA methodology 4% is deducted from 'crude oil, NGL, refinery feedstocks and other hydrocarbons'.
- The transposition of the 2009 Directive did lead to significant one-off costs in order to be compliant for the Netherlands mostly triggered by the obligation to hold 1/3 of the obligation in product stocks (in line with 75% of aggregate energy demand). As a result, the Netherlands had to store jet fuel (costly), and additional motor gasoline and diesel.

Case Study - Romania

Interviewees: Mr Cornel Zeveleanu. Ministry of Energy. Thursday 25th of February 2016 and OMV Petrom

Availability of emergency stocks

The current system is based on the stocks being held by economic operators only (like the UK). The Ministry of Energy is the competent authority for the purposes of the Directive. This was as defined in the Romanian law (Law 360 of 2013) which transposed the Directive. OMV Petrom is obligated to store 40% of the Romanian requirement. This obligation comes from the Ministry of Energy. The obligation is assigned on a yearly basis, with the amount allocated according to market share, via letters to each obligated party. The industry sees this as a Government Decision for the country. Obligation is on a crude equivalent basis with 30% in specific stocks. 1/3rd of total can be as products, 2/3rd as crude. An important reason for the current approach (and for the proposed approach) where economic operators retain responsibility for stocks, is that the economic operators in question are best placed to deal with the demands and stocks in the products they specialise in.

At the present time the Romanian government is considering changing their system to one which includes (takes into consideration) the role of CSE. The options for this are under analysis and at the moment it appears that this will be the way forward. It is recognised that the current law does not fully transpose the Directive, so the law is being revised to address this. This revision is likely to be used to bring a CSE based approach in. The current timetable for revision is that the law will be modified in the first half of this year, and will come into force starting with the next exercise (i.e. the next annual cycle of reporting). The model foreseen is not entirely defined yet, but the approach is likely to include the government / CSE holding specific stocks, with the government retaining control of the CSE. The CSE may look to construct its own storage facilities but this implies costs, so the financing options for this are currently being investigated.

Comingling is allowed, with commercial and emergency stocks in the same tankage but separately measured. MORs provided, the authorities are permitted to verify these but it is not clear how frequently this happens. They only report the emergency stocks (in line with the data template). They do not report to the IEA as they are not a member. The commercial stocks are all stocks held above the emergency level, so they do exist. They agree that some recognition of the strategic value of these commercial stocks (on top of the emergency stocks) would be an improvement to the Directive. This would be a useful thing to consider in future revisions of the Directive. The future law / regulation change will alter the reporting requirements, commercial stock data will also be collected.

Justification of the 10% deduction

They understand the rationale (pipelines, tank bottoms etc.) and they apply the deduction, but they feel that the number is larger than it realistically needs to be.

Cross-border stocks and cross-border tickets

During the last year, the Competent Authority have allowed economic operators to delegate up to 13% of their obligations, including delegating their holding to overseas companies. The current process to revise the law envisages setting up clearer and more flexible delegation rules, including the potential use of ticketing. There is currently some delegation of stock holding. At least two of the economic

operators do it. Virtually all of the delegated stocks are held in neighbouring countries but one economic operator holds stock in Germany. Operators have to get consent from the Competent Authority to use delegation. They also have to get consent from the MS Competent Authority where the stocks are being held.

Emergency Release Mechanisms

Romania has recently taken part in an IEA exercise to simulate stock release in the event of a supply disruption, even though they are not an IEA member. They did this to test their response and show their willingness to participate under the solidarity concept provided by the Directive.

Stock release should be simple. The government would instruct economic operators to release stocks onto the market. If the crisis went beyond 61 days, there would need to be a review of the approach. The precise route of communication on requesting a stock release is not clear to Romania. It is not clear if the route would be IEA to EC to Romania, or if the IEA would go straight to Romania. Clarification on this has been sought from the Commission (via the OCG) – no response has been received from them yet. IEA assume that the communication route would be via the EC.

Romania also have questions (highlighted by taking part in the IEA exercise) on what price level the stocks should be released to the market at, because it is highly likely that the price would be on an upward trend if supply was being constrained. They are aware of the risks of price speculation in releasing stocks to a supply constrained market. They would also like some clarification on this issue. IEA confirmed that they would not set a price at which the oil should be released. The stock release process is intended to help prevent price speculation.

Miscellaneous

One issue which does arise is the difficulty for economic operators (and MS governments) to prove that the oil sold is equal to the gross inland consumption. The economic operators have no control on the location of the final use of the products they sell. This could be an issue for all Member States – as oil purchased in one country could be destined for use in another.

Compliance date of April 1st *i*s a problem, but not a large one, for Romania. They agree that a later date would be better.

Case Study - Spain

Interviewees: Mr. Diego Vazquez

Availability of emergency stocks

The Spanish Ministry of Industry, Energy and Tourism regulates the stockholding system in Spain, which imposes obligations on economic operators and on the stockholding agency CORES. Reporting and evaluation of private operators stocks is done by the CSE under the oversight of the Ministry. Approximately 50% of emergency stocks are held by CORES and the other half is held by economic operators. The obligation is as follows: CORES holds 42 days for each operator and the industry holds 50 days itself. However, operators can ask CORES to hold up to 100% of their obligation (but this amount can never be lower than 42 days).

The rules for delegation were recently made more flexible in Spain, allowing for industry operators to hold their stocks at the CSE or other operators beyond the minimum amount that CORES has to maintain (42 days). As a result, any operator can ask CORES to maintain up to 100% of their obligation. This new rule was important especially for small operators, which found it more difficult to comply with the obligation (because of the costs of putting in place their own storage capacity).

The Spanish system is a balance between CSE-owned stocks and privately owned stocks. The market operators pay a fee to the CSE, which is their source of revenue.

The CSE carries out regular inspections on the stocks held by the industry in order to check that the stocks are available and physically accessible. The procedures for inspection have recently been tightened - the first report will be ready next year.

Justification of the 10% deduction

All operators are obliged to have stocks physically available and accessible to the market so MORs are excluded as are 'non-available' stocks e.g. in fuel stations. Perception is that there is a variation between MSs in what is treated as commercial stocks (and excluded). The 10% deduction would be less of an issue if commercial stocks were included.

Cross-border stocks and cross-border tickets

Cross-border ticketing is strictly regulated, but is allowed, in Spain as long as there is a bilateral agreement in place (even though this is not required by the Directive). The Spanish legislation limits tickets to 40% of an economic operators obligation (and 40% of the national total), but the actual figure is a lot lower than that. Recently, new legislation was passed to repeal the requirement on the bilateral agreement for foreign EU operators holding their stocks in Spain.

There are rules for the purchase or sale of tickets. Tickets can be bought or sold for gasoline, middle distillates (kerosene and diesel) and fuel oil. The "any oil" category is not allowed. Spanish companies may only sell tickets for "coke" and Spanish companies may only purchase tickets abroad for a few products, such as "gasoline".

The CSE is responsible for the oversight of tickets sold by Spanish operators.

Until very recently, a bilateral agreement was needed for foreign operators to stockpile (tickets included) in Spain. So far, Spain has concluded arrangements with Portugal, France, Italy, Ireland, Malta and New Zealand. Very recently, Spain modified this rule so that EU operators are allowed to have their stocks without a bilateral agreement as long as the requirements of a specific Ministerial Order are fulfilled. No such Order has been issued so far, in the meanwhile, bilateral agreements are required. Assume that COVA does not have any tickets in Spain.

Emergency Release Mechanisms

The recent Exercise in Capitals, organised by the IEA, provides a good illustration of the process of releasing stocks. The procedures are those reflected in the ICRP so there shouldn't be big changes in the procedures across MSs although the bodies involved would change. In this case, the relevant government department (the hydrocarbons unit) acts as a link with the Secretariat of the IEA. The hydrocarbons unit are representatives in the Standing group for Emergency Questions. The Director General of the hydrocarbons unit is a member of the Governing Board and is kept informed of the activities of the standing group at all times. Any decision to release stocks or to implement demand restraint measures should be adopted by the Council of Ministers. Provided an emergency situation is declared, the emergency stocks shall be released either by CORES (through a tender to all the operators), or directly by the operators following the instructions of the authorities.

Once a decision has been taken to release stocks, CORES and the government unit would monitor the market via permanent contact with the key stakeholders in the market and also by means of emergency questionnaires from which they would get information on the Spanish oil market with a short delay (shorter than usual).

Case Study – UK

Interviewees Mr. Gould (Petroineos), Mr. Umbreit & Mr. Newman (BP), Mr. Rolfe & Mr. Mullins (DECC) and Ms. Spasojevic & Mr. Hunt (UKPIA)

Current system

The UK meets its emergency stockholding obligations through a 100% industry based model, with no CSE. Legally-binding directions are issued by the UK Department of Energy and Climate Change (DECC) to substantial suppliers of oil in the UK (obligated companies) to hold certain levels of stocks. Information on supply and stocking is currently collected by DECC using either:

- The Downstream Oil Reporting System (DORS), used by all companies with an oil stocking obligation
- The Oil Stocking System (OSS) used to collect information on stocks held by non-obligated companies.

The UK's requirement is to hold 61 days of inland consumption as it is currently a large producer of oil within the EU. This is increased to 67.8 days due to the Directive's 10% deduction of stocks rule. DECC currently requires refiners to hold 67.5 days of supply, whilst non-refiners currently have a 58 days' obligation. The current differential in stock holding requirements between refiners and non-refiners was established in 2006 in part to reflect minimum operating requirements for refiners over importers (prior to 2006 the differential was greater, but was reduced following a consultation by DECC); DECC is currently considering whether this differential in obligations remains appropriate to ensure compliance now and in future and a consultation process with industry is currently in progress.

When economic operators report stock holdings, they are not required to distinguish between minimum operating requirements, working stocks and commercial stocks. If the total stocks reported, with due allowance for the netting process and tickets bought or sold, is above the calculated obligation, then the difference is in effect stock considered to be held for commercial reasons. Any such stocks would need to be replaced after an emergency stock release to bring an economic operator back to a stock level that meets its obligation within an agreed transition period.

For the UK, certain working stocks are included in the reporting and calculation of what is available as emergency stocks in line with what the Directive permits. DECC excludes certain stocks (some of which are working stocks such as pipeline contents), again in line with the Directive.

DECC's main focus (under this Directive) is between 'obligated' and 'commercial' stocks. So long as 'working' stocks are held in a fashion permitted under the Directive (and are accessible/available at all times) then they could count as 'obligated.'

DECC has forecast ("Future management of the compulsory stocking obligation in the UK", 4 April 2013) that the obligation basis will change to 90 days of net imports by 2018-2026 as oil production levels fall, which will in effect be 100 days of stock due to the 10% deduction rule. The recent consultation on the levels of obligation on companies modelled 2021 as the year in which the switch to 90 days would take place.

Once obligations have been calculated and agreed with obligated parties, DECC issues an oil stocking direction that specifies the overall obligation and specific finished product stock requirements for gasoline, gas/diesel oil (distillate fuel oil), and jet fuel. The UK uses the first calculation option from Annex III of the Directive which allows obligated companies to include a wide range of stocks and convert those into the required crude oil equivalences by multiplying them by 1.065.

In the UK there is a "netting" process to reflect how companies trade with each other within the UK. This is an industry-led system which allows companies to change their reported levels of supply (on the relevant electronic DECC forms) by transferring product between themselves before the direction is calculated.

Some or all of a company's obligated stocks can be held by another company in the UK under the "United Kingdom ticket arrangement". Ticket arrangements are subject of prior authorisation by DECC. International ticketing is also permitted; these tickets need to be authorised in advance by DECC and DECC needs to be assured that ticketed stocks are both accessible and available at all times. To ensure this happens, the UK has arrangements in place with each relevant Government for the authorisation of tickets, and for the reporting of stocks to the UK, other Member State and the EU Commission.

Availability of emergency stocks

Under the new Directive, now that commercial stocks aren't counted, everything counted as emergency stocks *must* be available. It was noted that meeting the obligations is legally-binding on companies and that means companies will strive to fully meet their obligations otherwise the potential consequences are severe.

Co-mingling of stocks is not considered to affect the availability of stocks. No UK stocks are held segregated and in remote locations. Reporting is only done at the end of the month but it is a legally binding requirement to have stocks available every day of the year. DECC conducts annual audits which can be at any point in a month. Ad-hoc audits are also possible.

Emergency stocks are essentially all in the regular distribution system but some parts of the system are effectively "one way" so reverse flows could not easily be made. However, the purpose of releasing stocks is considered to be to make product available for the market in general, responding to major crises rather than local supply disruptions. Hence the precise location of stocks is not critical.

Many UK refineries and import locations are connected to inland distribution depots via pipelines. Some depot locations are served only by road or rail connections. Some refineries also make coastal deliveries.

Ultimately the UK Government has considerable power to direct obligated parties under the 1976 Energy Act if necessary.

The availability of UK stocks were tested during Hurricane Katrina (which reduced refinery supplies in the US) when as release was ordered; most of the northern European response was via stocks held in the ARA (Amsterdam, Rotterdam, Antwerp) hub location, with UK refineries in effect back filling via increased exports to cover some of the drop in ARA volumes. Freight prices increased significantly and

shipping availability became more critical but the system worked to provide more supply into world markets.

The advantages and disadvantages of cross-border stocks and tickets

UK legislation allows for both domestic and cross-border ticketing to meet stock holding obligations. This is in line with the current Directive.

The main perceived advantages of cross-border stock and tickets include:

- Allowing obligated parties to reduce the cost of meeting obligations through matching those with surplus stocks with those with insufficient stocks
- From an industry perspective, avoiding building unnecessary additional storage facilities and obligated parties having to buy additional stocks
- Providing a mechanism by which the UK can contribute to the aim of providing additional supplies into the market regardless of where those stocks are held, helping addressing a global or pan-regional crisis

The main perceived disadvantages of cross-border stocks and tickets include:

- Inability for UK to directly audit cross-border stocks
- Risk that cross-border stocks are not immediately and fully available for release
- Risk of double-counting of stocks as being available for meeting both countries' obligations
- Any oil tickets could be held in the form of products that are not fully aligned with market demand or readily useable for use in certain markets e.g. petroleum coke

The UK has developed a number of procedures in order to mitigate most of these risk areas. The UK has arrangements in place with many EU Member States, though the approach varies from MS to MS. DECC has developed an agreed format which is now in use to cover ticketing between the UK and 18 MSs. Some MSs, such as Sweden, have said that they do not require a MoU but other conditions have been mutually agreed. DECC also offers pilot schemes for ticketing to see if it works for both parties.

Before cross-border ticketing is approved, DECC has to gain approval from the competent authority of the relevant Government, and vice versa. DECC has to satisfy itself that there are suitable standards, procedures and methodologies in place covering auditing, availability and release of ticketed stocks. There is also an onus on the UK obligated parties to ensure that any ticketing agreements they enter into are appropriate as it is a legal requirement that their obligation can be met each and every day of the month.

Double counting has not been a problem but two countries reporting the same stocks in different ways has happened e.g. different product types. UK has worked with other MSs to try to improve the consistency of reporting and this has improved over the last year or so.

DECC's view is that any incident triggering a release of stocks would be global so stocks simply need to be released into the market, and the market will start to return to normal.

The justification of the 10% deduction rule in the EU system

In the UK, it was considered that the 10% deduction rule is probably inappropriate and tends to increase actual stock holdings above what would otherwise be necessary. The rule is intended to try to take

account of potential unavailability of the last 10% of stocks and is the same level of deduction as is made under the IEA stock holding calculation. However, the stocks that are included in the IEA calculation include some stocks that are excluded from the EC Directive calculation e.g. commercial stocks, stocks in pipelines and in retail stores/service stations.

It has been suggested by some industry respondents that this requirement is outdated and a deduction of around 4-5% or lower would be more reasonable. Nine member states have submitted a joint paper to the Commission regarding the evaluation of the Directive; one point on this paper argues that the 10% deduction rule should not apply to obligated stock and that this deduction could be removed or at least reduced.

It was felt that the 10% deduction is an arbitrary level of deduction and that there is a discrepancy between the IEA and EU calculation methodology. Hence the 10% deduction rule is not fully justified in the EU system.

DECC's view is that everything should be counted in the calculation as contributing to the level of stocks held including commercial stocks. However if this is not to be the case, DECC suggests there should not be a rule that says there is 10% deduction when everything in the calculation has, by definition, to actually be available. It was suggested though that any change to the Directive calculation should be discussed with the IEA.

Several respondents reported that the actual level of stock that is not accessible is far less than 10% in the UK refining and distribution system. This is evidenced by the level of stock recovery that is ultimately possible when tanks are emptied for maintenance.

Emergency Release Mechanisms

The release of emergency stocks is most likely to occur as a result of a request from the IEA. The operation to release stocks is coordinated by the IEA and EC. There is a 6 stage process as follows:

1. **Incidence.** The IEA monitors market conditions and if it identifies a significant incident likely to prompt an oil supply crisis, communicates its preliminary assessment to Member States. In the UK, DECC would communicate with other Member States and, if required, set up an Emergency Response Team (ERT) to evaluate the situation and advise senior officials and UK government ministers.
2. **Potential IEA Collective Action.** If there was consensus, a plan of collective action would be agreed. In the UK the ERT would seek the Government's formal agreement to the Initial Response Plan, calculate the UK expected contribution to the collective action and communicate to industry. The contribution would be in the form of a reduction in compulsory stockholding obligation.
3. **Activation.** Subject to agreement across member countries, the IEA would issue a Notice of Activation, with an initial action for 30 days. In the UK the ERT would communicate to the industry as a whole but also with separate discussions with individual obligated companies.
4. **Implementation.** The ERT inform CSO holders of revised obligation levels and agree a timeframe for stock drawdown (usually one month). This would be monitored weekly to ensure effectiveness and modified if necessary.

5. **Termination of the Collective Action.** If the IEA agrees that the collective action is to be terminated, this is communicated by Press Release and the ERT communicates with CSO holders to agree a plan for rebuilding stocks.
6. **Review of the Collective Action.** DECC reviews action taken by the UK to identify issues or potential improvements. IEA similarly reviews the collective action across it member countries.

It should be noted that the release of stock in the UK is achieved through DECC reducing the obligations on economic operators. Companies can choose what stocks to release. Stocks have to be made *available* to the market but companies are not *forced* to sell them.

A request for a stock release doesn't have to be from the IEA but it is likely that is would be. Stocks could be released for local crises – in that case the UK would ask the EC for a temporary reduction to its EU obligation.

There may be reasons why the response times could differ from country to country. Ministerial sign off for a release of stocks may vary from country to country. In some countries physical release might involve auctioning CSE stocks. Some countries *must* sell stock when a release is ordered unlike the UK where stocks need to be *made available* for sale in the market.

For UK refiners, stocks are already being turned over quite quickly. However there may be limited scope to change refinery operations to enhance supply - crude oil purchases are often made around 2 months in advance so feedstock cannot be changed rapidly. Refineries are often operating at up to 90-95% of their capacity so they have very limited ability to run more crude oil.

Exercises are conducted to test the overall effectiveness of the IEA system. The IEA conducts exercises approximately every two years covering communications and data reporting and management and decision making (typically a 2 day exercise with many participants) as well as more focused tests to look at specific issues (typically 1 day tests with sector specialists). These exercises have sometimes considered scenarios of more regional (as opposed to global) supply crises such as a closure of the Druzhba crude oil pipeline from Russia which would only affect central and Eastern Europe.

Annex B - Data review - emergency oil stocks in the EU

This section provides a summary of our review of the data on oil stocks provided by DG ENER and extracted from the Eurostat Website. The Annex at the end of this review contains a number of charts and graphs which help to illustrate our analysis.

Introduction

The 2009 Directive changed and consolidated rules on emergency oil stockholdings for the Member States of the European Union. In order to comply with the obligations imposed by the 2009 Directive and its predecessors, Member States put in place different national systems that may differ in a variety of details. The oil stockholding systems in the EU can generally be placed in one of three groups: purely industry-led systems, centralised systems and mixed systems.

The systems can be assessed based on the degree to which they ensure effective compliance with the rules of the Directive, that is, the extent to which the minimum emergency stockholding obligations are met and whether these stocks are available and accessible. Availability and accessibility of stocks are not clear-cut concepts. However, objective approximations can be made based on the extent to which stocks are held in the form of products and whether stocks are held in other countries of the European Union, as allowed by the Directive. This information can be obtained through analysis of publicly available data, and is discussed below. The objective of this chapter is to provide an overview of the level and composition of emergency stocks in the European Union, its recent evolution and the differences between Member States and the three main systems.

Stockholding systems in the EU

Each Member State has some freedom to determine, through the design and enactment of national legislation, the rules according to which emergency oil stocks will be held for compliance with the European Directive. However, as already stated, the different systems can be grouped into three categories: industry-based system (decentralised), CSE-based systems (centralised) and mixed systems.

In a completely decentralised system, such as the UK, all the obligation to hold stocks is placed upon the industry operators. The individual obligation must be set so as to guarantee that the stock levels and their characteristics meet the legal requirements, but there is no centralised organisation, that is set up with the purpose of storing emergency stocks.

In most Member States there is a stockholding organisation with the purpose of storing emergency oil stocks. These Central Stockholding Entities (CSEs) assume different forms, such as private, industry-led organisations (as in France), state-owned companies (as in Germany) or government entities (as in the Czech Republic). Some Member States (e.g. France) place obligations on industry, but also have Central Stockholding Entities, thus creating a “mixed” system. In 2015, 9 of the 28 Member States (32%) met all their stockholding obligations via Central Stockholding Entities, 5 Member States (18%) only had industry

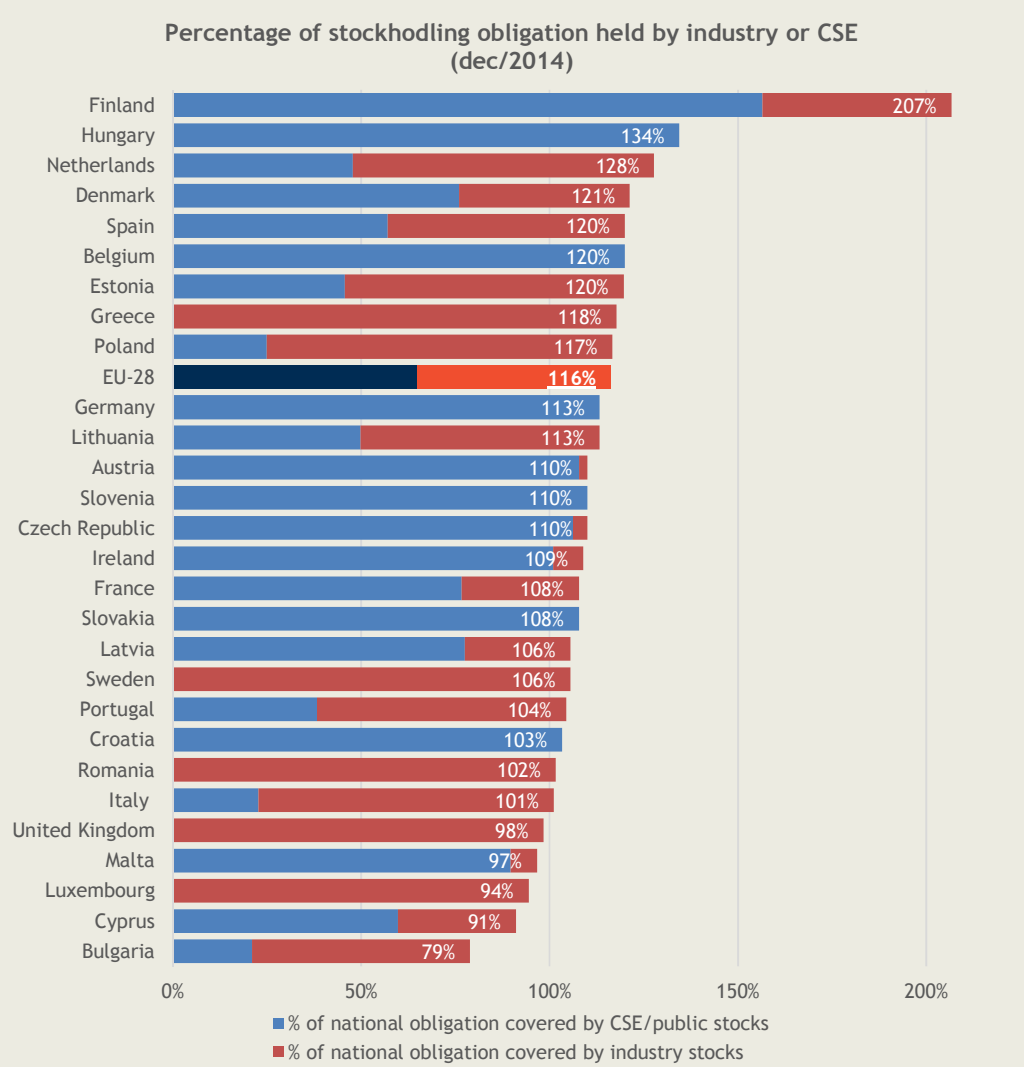
operators holding stocks and the remaining 14 (50%) opted for mixed systems in which both a Central Stockholding Entity and the industry have stockholding obligations.

The following table shows the different models chosen by each country. The last column shows the extent to which the Central Stockholding Entities, where they exist, are used in order to meet the minimum stockholding requirements as stipulated by the Directive. The figure below and the table shows this same number, adding the percentage of the stockholding obligation that is met by industry operator stocks.

Table B-0-1 Typology of stakeholder systems in EU Member States

Member State	Model	Name of CSE	Legal nature	Date of creation of CSE	CSE stocks /national obligation (12/14)
Austria	CSE	ELG	Industry-led	*2012*	*108%*
Belgium	CSE	APETRA	SOE	*2006*	*120%*
Bulgaria	Mixed	State Reserve and War-Time Stocks Agency	Agency	*1950*	*21%*
Croatia	CSE	HANDA	Agency	*2006*	*103%*
Cyprus	Mixed	COSMOS	SOE	*2003*	*60%*
Czech Republic	CSE	SSHR	SOE	*1969*	*109%*
Denmark	Mixed	FDO	Industry-led	*1964*	*76%*
Estonia	CSE	Eesti Vedelkütusevaru Agentuur	SOE	*2005*	*120%*
Finland	Mixed	NESA	Agency	*1928/1993*	*156%*
France	Mixed	SAGESS/CPSSP	Industry-led	*1988*	*77%*
Germany	CSE	EBV	Agency	*1978*	*113%*
Greece	Industry	-	-	-	*0%*
Hungary	CSE	HUSA	Agency	*1993/2006*	*134%*
Ireland	CSE	NORA	Agency	*1995*	*101%*
Italy	Mixed	OCSIT/Acquirente Unico	SOE	*2014*	*1%*
Latvia	CSE	Ministry of Economics	Agency	*2012*	*106%*
Lithuania	Mixed	Petroleum Products Agency	Agency	*2002*	*50%*
Luxembourg	Mixed	Ag. nationale de stockage de produits pétroliers	Agency	*2015*	*0%*
Malta	Industry	-	-	-	*0%*
Netherlands	Mixed	COVA	Agency	*1980/1987*	*48%*
Poland	Mixed	Material Reserves Agency	Agency	*2010*	*25%*
Portugal	Mixed	URP/ENMC	Agency	*2001*	*38%*
Romania	Industry	-	-	-	*0%*
Slovakia	CSE	EOSA	Agency	*2013*	*108%*
Slovenia	CSE	Slovenian Agency for Commodity Reserves	Agency	*1995*	*110%*
Spain	Mixed	CORES	Industry-led	*1995*	*57%*
Sweden	Industry	-	-	-	*0%*
UK	Industry	-	-	-	*0%*

Figure B-1. Distribution of obligation between CSE/public entities and industry operators



Source: Eurostat (nrg_141m, nrg_142m and nrg_143m).
Note: The % of national obligation covered was calculated according to Annex III of the 2009 Directive, based on gross values of products and crude oil stocks according to ownership, as reported in Eurostat. It includes stocks held abroad.

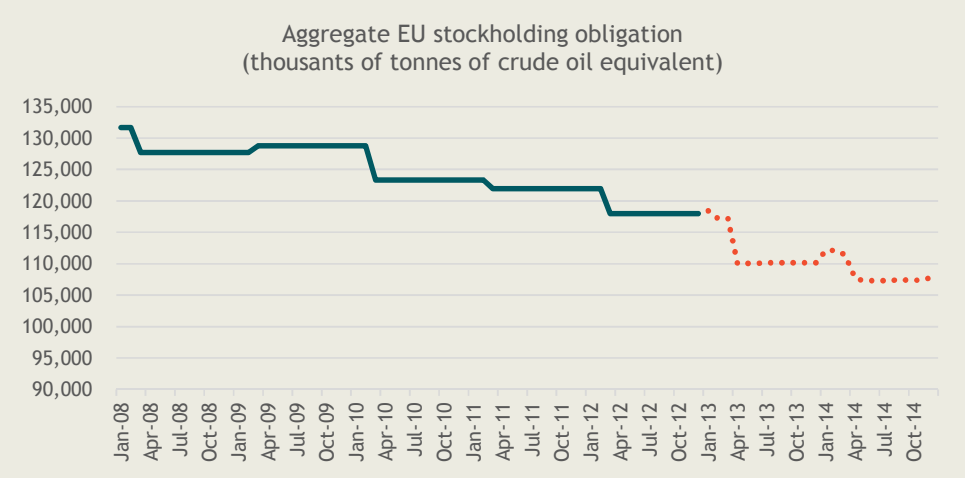
Level, composition and location of stocks in the EU as a whole

The aggregate level of oil stocks in the EU has consistently been above the aggregate obligations of the Member States over the period for which public data is available, (from January 2008 to now). The gross tonnage of emergency stocks in the European Union in December 2014 was approximately 128 million tonnes, of which 55% was held in the form of finished products, giving a total EU stock level of approximately 126 million tonnes in crude oil equivalent available stocks[105]. In the same month the sum of national stockholding obligations for the 28 Member States was approximately 108 million tonnes (in crude oil equivalent tonnes). Overall, the European Union had 16% more emergency stocks than the minimum required. Figure B-1 illustrates that virtually all Member States comply with the rules. In December 2014, only four of them had emergency stocks levels below the minimum required. The one most distant from the target, Bulgaria, held 79% of its obligated level.

[105] This was obtained by performing the calculation explained in Annex III of the 2009 Directive. It consists of subtracting 4% of stocks of crude oil and feedstocks, adding 20% to stocks of finished products. Furthermore, a 10% of overall stocks are deducted.

Since 2008, the minimum level of stocks has continuously fallen in the European Union, reflecting reduced overall demand for oil products. It is difficult, however, to directly compare the minimum stockholding obligations of the EU countries before the current Directive and after it. Under the previous Directive, Member States had to simultaneously comply with stock levels in three different categories of products, and an aggregated measure of the obligation may overlook differences in energy content. From 2013 onwards, the date from which the new Directive started to apply in all countries[106], there is only one aggregated obligation, calculated in terms of crude oil equivalent. Figure 2 presents an attempt to compare the aggregated obligation. The figures were obtained by multiplying the aggregated obligation pre-2013 by 1.2 in order to obtain approximated crude oil equivalent measures.

Figure B-2. Stockholding obligation

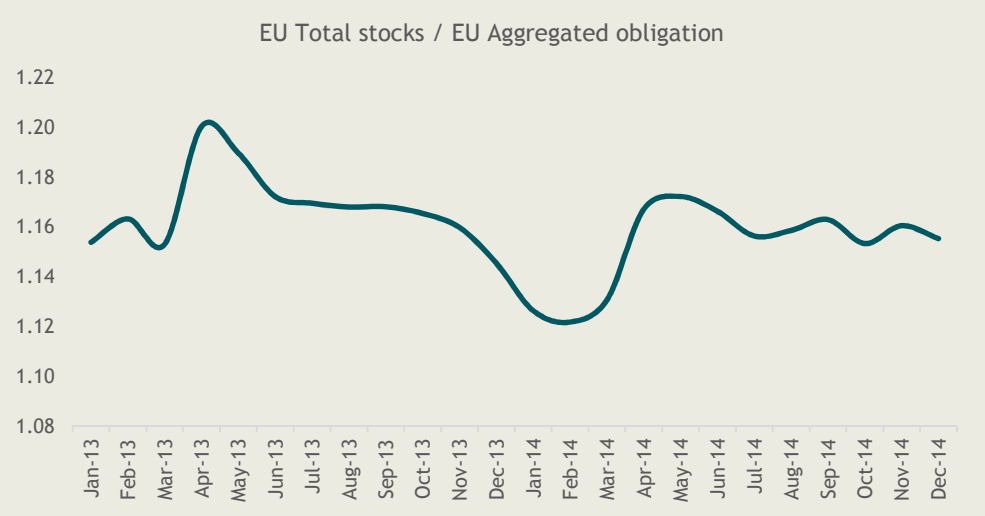


Source: DG ENER (2008-2012) and Eurostat (2013 onwards)
Note: the aggregated value for the obligation pre 2013 in crude oil equivalent was estimated by multiplying the aggregated obligation of 90 days for each country (deducting 25% for UK and DK) by 1.2.

From January 2013 to December 2014, the aggregate EU obligation fell from 118 million tonnes to 108 million tonnes, a 9% drop. However, the total gross level of stocks (without the calculations for technical equivalence), was reduced by approximately the same amount, falling 8% from 139 million tonnes to 128 million tonnes. The approximately identical percentage reduction implies that compliance with the system was not affected. Looking at aggregate figures does not enable an easy analysis of compliance in Europe as a whole. Nevertheless, it is possible to estimate the aggregate level of oil stocks as calculated for compliance by applying the calculations of Annex III of the 2009 Directive to the overall oil stocks, and comparing it with the obligation. This adjustment illustrates that the compliance rate with the Directive remained stable between January 2013 and December 2014. Regarding compliance, an important difference is that the 2009 Directive explicitly excludes commercial stocks from emergency stocks, which was not the case with the previous Directive. As shown in Figure 1, the European Union had approximately 16% more stocks than the minimum required in December 2014.

[106] Note that for Member States that are not member of the IEA, the stockholding obligation was of 81 days of net imports until 31 December 2014.

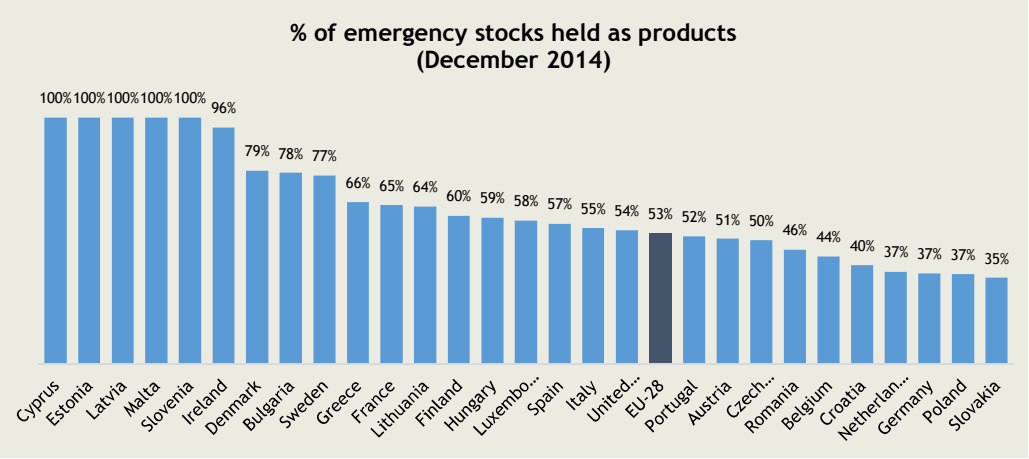
Figure B-3. Overall EU compliance rates after 2013



Source: Eurostat (own calculations and estimations, nrg_141m and nrg_143m)
Note: the value of the total stocks was calculated by applying the rules of Annex III of the 2009 Directive, based on the proportion of products in overall stocks reported in Eurostat.

With regard to the composition of stocks, the data show that most stocks are kept in the form of products. Overall, 53% of the gross European Union stocks tonnage in December 20142014 consisted of finished products. As shown in figure 4, six countries – Cyprus, Estonia, Latvia, Malta, Slovenia and Ireland – kept all their stocks (or almost all in the case of Ireland) in the form of finished products. In contrast to this, the Slovak Republic, Poland, Germany, the Netherlands and Croatia kept little more than 1/3 of their stocks as finished products.

Figure B-4. Products



Source: Eurostat

As can be seen from the figure, all countries follow the Directive's rule that at least 1/3 of emergency stocks must be kept in the form of products. A reason why some Member States may choose to minimise the share of finished products they hold is cost, because it is relatively more complex and costly to store finished products than crude oil. A factor which might encourage some Member States to hold an increased share of finished products is security of supply: in case of a supply disruption, finished products can be directly discharged into the market, whereas crude oil must first be refined. Member States with no, or very little refining capacity are also more inclined to hold a high percentage of finished products; The five countries with all their stocks in the form of finished products – Cyprus, Estonia, Latvia, Malta and Slovenia, have no refining capacity and Ireland, with only one refinery also has a high percentage of stocks held as finished products. In contract, the countries that hold relatively little products as a percentage of their total stocks, typically have high refining capacity. The following table summarises the refinery capacity in Europe, according to various sources.

Table B-0-2 Refining capacity

	refining capacity			storage capacity		
Most recent data	kt/90days	kb/90days	kb/d	kt	kb	kcm
Austria	2618	19188	213	5663	41510	4950
Belgium	9528	69840	776	10297	75478	9000
Bulgaria	2161	15840	176			
Croatia						
Cyprus						
Czech Republic	2,431	17,820	198	3,604	26,417	3,150
Denmark	2,087	15,300	170	8,683	63,644	7,589
Estonia				2,746	20,127	2,400
Finland	3,254	23,850	265	8,581	62,898	7,500
France	16882	123743	1375	36800	0	0
Germany	25299	185439	2060	56548	414499	49425
Greece	6115	44820	498	8152	59753	7125
Hungary	2337	17127	190	1659	12160	1450
Ireland	921	6750	75	1037	7600	906
Italy	24360	178560	1984	22310	163535	19500
Latvia	0	0	0			
Lithuania	2333	17100	190			
Luxembourg	0	0	0	168	1230	147
Malta	0	0	0			
Netherlands	15647	114690	1274	25743	188694	22500
Poland	7121	52200	580	11250	82463	9833
Portugal	4052	29700	330	5663	41510	4950
Romania	5249	38477	428			
Slovakia	1559	11430	127	1201	8806	1050
Slovenia	0	0	0			
Spain	18986	139170	1546	26486	194140	23149
Sweden	5353	39240	436	13097	96000	11447
United Kingdom	16792	123084	1368	11323	83000	9897

Sources for refining and storage capacity: Black: 2012 or more recent data from country reports in IEA website www.iea.org/netimports ; Blue: 2014 data of Statistical Review of the World; Red: 2010 data European Commission (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010SC1398&from=EN); Green: Data directly obtained from the Member State

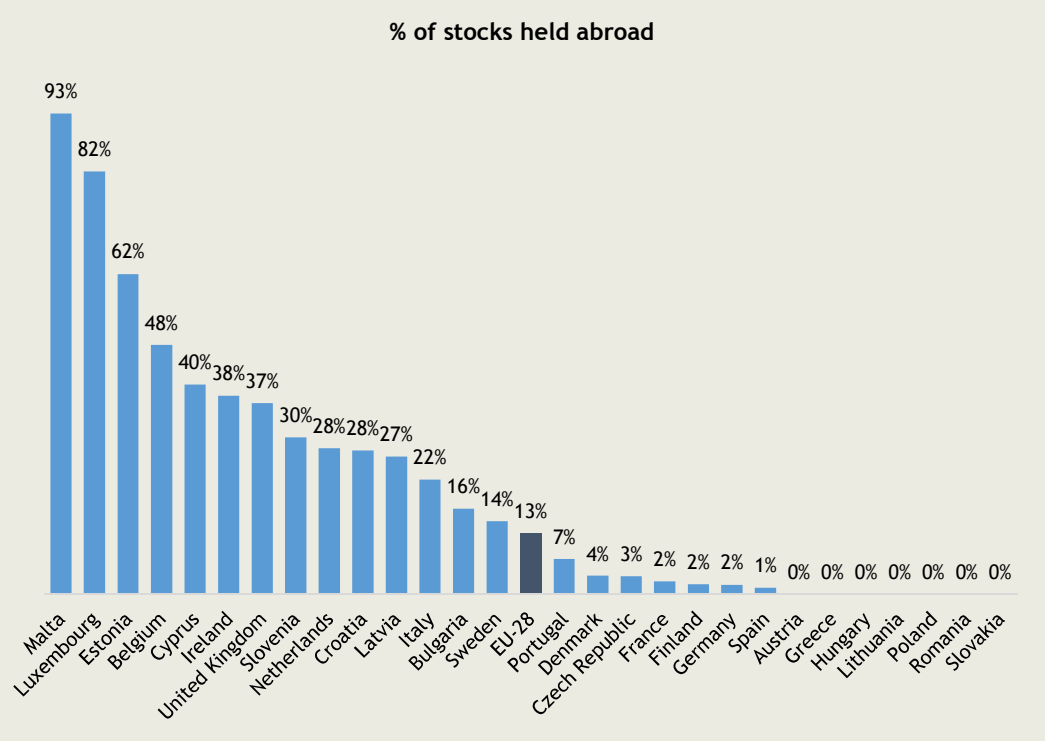
The following equivalent measures were used.

Table B-0-3. Equivalent measures

Equivalent measures	
1	*barrel petroleum*
0.119	*cubic meter*
158.987	*Liter petroleum*
136.426	*Kg Petroleum*
0.136	*Tonne petroleum*
7.330	*barrels/tonne petroleum*

With regard to the physical location of the stocks, most Member States hold their stocks within their borders. On average 13% of the EU stocks were held by one Member State on behalf of another one. However, this varies a lot from country to country, as depicted in Figure 5. Small countries such as Luxembourg and Malta have almost all of their stocks held abroad, but several countries hold virtually all of their stocks internally.

Figure B-5. Stocks held abroad



Source: Eurostat

How do the different systems differ in level, composition and location of stocks?

This evaluation of the 2009 Directive seeks to analyse (inter-alia) how the different stockholding systems in the EU compare in terms of compliance with the stockholding obligations and whether or not there are significant differences in important aspects such as stock levels, compliance, composition and location.

The level of stocks in the European Union constantly change from one month to the other, due to oil prices, costs and ultimately changes in the obligation levels based on consumption of net imports Therefore, it is not easy to assess whether the different systems influence the stock levels in the EU. However, it is useful to observe the correlations between the different models (represented by binary dummy variables), and the stock levels if we control statistically for the size of the obligation. By running a simple statistical regression with monthly observations from 2008 to 2014, we see no systematic difference between the stocks levels of Member States with centralised systems (mixed systems or pure-CSE systems) and those without centralised systems, controlling for the stockholding obligation (see Column III of Table B-4). Those Member States that had pure-CSE systems over this period actually presented *lower* stock levels on average (Column I of Table B-4) than purely industry-based systems, whereas those with mixed systems presented higher stocks on average. However, when looking exclusively at the period after the 2009 Directive entered into force (from 2013 onwards), those MS with CSEs present a clear higher average stocks level (Column VI of Table B-4), and those with a mixed system present an even higher average (Column IV of Table B2).

A similar pattern appears when using the same analysis technique to examine compliance using an indicator consisting of the ratio of the emergency oil stocks and the obligation. In this case, the pure-CSE system is negatively correlated with the compliance indicator and is statistically significant, suggesting that purely decentralized systems had, on average, higher compliance rates over the period (Column I of Table B3). However, those countries with a mixed system show a superior performance of, on average, 10 percentage points relative to the purely-decentralised systems (idem). For this set of regressions, the results also change when looking only at the period after 2013. In this case, pure-CSE systems and mixed systems both had higher average compliance rates than pure industry systems, and the MS with mixed systems were the ones that, on average, had the highest compliance rates. On average, the difference between the compliance rates of MS with mixed systems and MS with purely industry-based systems was of 21 percentage points in the years 2013 and 2014.

These results cannot be directly interpreted as a causation, that is, it is not *because* countries chose a mixed system that they fared better in complying with the Directive. These estimates are correlations, and they are coherent in showing that, on average purely decentralised systems and centralised systems performed equally well in terms of complying with the minimum stock levels obligation and keeping a certain stock level. Mixed systems, on the other hand, performed better for both indicators.

The results are summarised in the following table. The regressions were estimated with pooled-ordinary least squares. Since there is a difference in methodology between the values of emergency oil stocks before and after 2013 due to the inclusion of commercial stocks in the previous series, data prior to 2013 was only used if commercial stocks could be eliminated. This was checked by consultation with some Member States (Germany, UK, Cyprus, France and Denmark), and for some Member States it is clear that the pre 2013 data already did not include commercial stocks.

Table B-0-4 Regressions with stock levels

Dependent variable: Stock levels	Emergency Stocks (I)	Emergency Stocks (II)	Emergency Stocks (III)	Emergency Stocks (IV)	Emergency Stocks (V)	Emergency Stocks (VI)
Obligation	1.40***	1.40***	1.40***	1.14***	1.14***	1.14***
	(.01)	(.01)	(.00)	(.01)	(.01)	(.01)
Pure CSE	-188.64**	-	-	279.35***	-	-
	(79.79)			(88.42)		
Mixed	99.98	-	-	557.17***	-	-
	(78.49)			(87.66)		
CSE	-	-	3.76			152.55**
			(67.92)			(76.31)
Model	-	-103.01***	-	-	101.91**	-
		(39.86)			(44.89)	
2009 Directive	-1264.15***	-1267.17***	-1268.43***	-	-	-
	(77.32)	(77.45)	(77.56)			
Intercept	193.21***	270.65***	153.10**	-147.99**	42.86	49.84
	(65.77)	(60.59)	(64.40)	(73.50)	(67.95)	(70.92)
Number of observations	2292	2292	2292	672	672	672
Years	2008-2014	2008-2014	2008-2014	2013-2014	2013-2014	2013-2014
R2	.9603	.9601	.9600	.9812	.9802	.9801

*Note: ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level. Monthly data from DG ENER (2008-2012) and Eurostat (2013-2014).*

Table B-0-5 Regressions with compliance rates

Dependent variable: Compliance rates	Compliance (I)	Compliance (II)	Compliance (III)	Compliance (IV)	Compliance (V)	Compliance (VI)
Pure CSE	-.19***	-	-	.07**	-	-
	(.02)			(.03)		
Mixed	.10***	-	-	.21***	-	-
	(.02)			(.03)		
CSE	-	-	-.04**			1.14***
			(.03)			(.02)
Model	-	-.11***	-	-	.02	-
		(.01)			(.01)	
2009 Directive	.02	.01	.02	-	-	-
	(.02)	(.02)	(.02)			
Intercept	1.25***	1.33***	1.24***	1.06***	1.15***	1.07***
	(.01)	(.01)	(.01	(.02)	(.02)	(.02)
Number of observations	2292	2292	2292	672	672	672
Years	2008-2014	2008-2014	2008-2014	2013-2014	2013-2014	2013-2014
R2	.1157	.0492	.0025	.0821	.0020	.0466

*Note: ***Significant at 1% level. **Significant at 5% level. *Significant at 10% level. Monthly data from DG ENER (2008-2012) and Eurostat (2013-2014).*

It is difficult to determine whether the stock ownership model (owned by industry operators or a central stockholding entity) is systematically correlated with specific characteristics of the stock, such as its contents (finished products or crude oil) or location (abroad or home). A description of the situation in December 2014 illustrates how small these differences are in practice. Of all stocks owned by governments or CSEs in the European Union in December 2014, 55% were held as products. By contrast the figure for stocks owned by the industry was 54%, almost exactly the same. A slightly greater contrast is observed in the comparison between the share of stocks held abroad for the two kinds of ownership. Among stocks owned by government or CSEs, 11% were held in another country, whereas 15% of industry stocks were held abroad. The following two tables summarise the composition and location of these two kinds of stocks in the European Union in December 2014.

Table B-0-6 Stocks owned by governments or CSEs in December 2014

Member State	Level of government/CSE-owned Stocks (kt)	% held abroad	% held as products
Austria	2995	15%	51%
Belgium	4338	63%	44%
Bulgaria	185	0%	100%
Croatia	677	28%	40%
Cyprus	327	62%	100%
Czech Republic	1942	0%	100%
Denmark	898	0%	78%
Estonia	84	0%	100%
Finland	2762	3%	100%
France	13653	0%	65%
Germany	24514	2%	37%
Greece	0	0%	0%
Hungary	1209	0%	59%
Ireland	1562	41%	96%
Italy	2823	100%	63%
Latvia	249	0%	100%
Lithuania	187	0%	100%
Luxembourg	0	0%	0%
Malta	180	100%	100%
Netherlands	2123	0%	58%
Poland	1388	0%	24%
Portugal	950	0%	42%
Romania	0	0%	0%
Slovakia	711	0%	35%
Slovenia	598	30%	100%
Spain	6884	0%	65%
Sweden	0	0%	0%
United Kingdom	0	0%	0%
EU-28	*71239*	*11%*	*55%*

Table B-0-7 Stocks owned by industry in December 2014

Member State	Level of Industry-owned Stocks (kt)	% held abroad	% held as products
Austria	61	0%	43%
Belgium	0	0%	0%
Bulgaria	543	22%	70%
Croatia	0	0%	0%
Cyprus	172	0%	100%
Czech Republic	69	100%	100%
Denmark	533	10%	80%
Estonia	136	100%	100%
Finland	1054	0%	20%
France	5549	8%	64%
Germany	0	0%	0%
Greece	3515	0%	66%
Hungary	0	0%	0%
Ireland	122	0%	100%
Italy	9920	0%	53%
Latvia	90	100%	100%
Lithuania	271	0%	39%
Luxembourg	696	90%	58%
Malta	14	0%	100%
Netherlands	3823	44%	26%
Poland	4915	0%	40%
Portugal	1533	12%	73%
Romania	1279	0%	46%
Slovakia	0	0%	0%
Slovenia	0	0%	0%
Spain	7847	2%	50%
Sweden	2830	14%	77%
United Kingdom	11739	37%	54%
EU-28	*56711*	*15%*	*54%*

Note: For reasons unknown to Trinomics, the stocks held abroad of the Czech Republic are recorded in Eurostat as industry stocks, although to our knowledge the Czech Republic has a purely government/CSE system.

Conclusion

The data analysis we have completed does not conclusively demonstrate whether the stock ownership model has a significant quantitative impact on the stock levels, location or composition. However, on average, countries with mixed systems had higher levels of stocks and compliance rates than countries with purely centralised or decentralised models. The reasons for this could be related to other institutional features that are not analysed in our work.

A more qualitative assessment of the functioning of the system is provided in the body of the report, where we obtained direct information through surveys and interviews about institutional details and procedures regarding the operation of the emergency stockholding system in Europe.

Member State characteristics appear to play a role in defining how and where stocks will be held. Countries that have very large shares of their stocks held abroad tend to be smaller countries, for example Malta has 94% of its emergency stocks held abroad, and Luxembourg has 82%. This could be linked to a lack of storage capacity. Some Member States, especially in Eastern Europe, Hungary, Lithuania, Poland, Romania and Slovakia, have chosen to hold all their stocks within their borders. This may be due to political or institutional reasons.

Domestic reasons may also be behind the choices of Member State regarding the share of products that are held as emergency stocks. All Member States appear to comply with the Directive by holding 1/3 of emergency stocks as products (with Slovakia holding 35% by December 2014), some of them, namely Cyprus, Estonia, Latvia, Malta and Slovenia, only held products and no crude oil. This is clearly a choice of the Member States. This is likely to reflect the refinery capacity of the country, with less (or no) refineries implying a larger share of products in their stocks. In December 2014, the average in Europe was for 53% of the stocks to be held in the form of products, and the remaining 47% in the form of crude oil.

Annex C – List of interviews

	Name	MS	MS Govt.	CSE	Company	Other	Comment
1	Mr. Olivier Triquet	France	x				
2	Mr. Jan Bartos					x	IEA
3	Mr. George Lanners	Luxembourg	x				
4	Ms. Stinne-Maria Thomassen	Denmark	x				
5	Mr. Zsolt Tasnadi					x	EC
6	Ms. Lina Svegzdaite	Lithuania	x				
7	Mr. Diego Vazquez	Spain	x				
8	Mr. Peter Dam-Hendriksen	Denmark		x			
9	Mr. Frans Wieleman	Netherlands	x				
10	Mr. Ralph Klesel	Germany		x			
11	Ms. Antigone Gikas					x	Eurostat
12	Mr. Christian Kroeppl					x	Eurostat
13	Mr. Risto Leukkunen	Finland		x			
14	Mr. Nicolas Tsioutis	Cyprus		x			KODAP, numerous calls on the Cyprus case study
15	Mr. Bonocori / Mr. Martin	France		x			
16	Ms. Meuleman / Mr. De Mot	Belgium		x			
17	Ms. Jana Vanova	Czech Republic		x			
18	Ms. Dixon / Mr. Confrey	Ireland	x				
19	Mr. Bart van Holk	Netherlands		x			
20	Mr. Cornel Zeveleanu	Romania	x				Ministry of Energy
21	Mr. Iuliu Bogdan Mihalcea	Romania			x		OMV Petrom
22	Ms. Alexandra Caraciobanu	Romania			x		MOL Romania Petroleum Products
23	Mr. Jose M Gordo	Spain			x		DISA, joint call with UPEI
24	Mr. De Meulder	Spain				x	UPEI, joint call with DISA
25	Mr. Chris Gould	UK			x		Petroineos.
26	Mr. Kenneth Rygaard	Denmark			x		Statoil
27	Mr. Francesco Dolci	NL/UK			x		OTX - oil tickets exchange platform
28	Mr. Gabriel Desentis	NL			x		Solid Bridge, Advisor and broker for Strategic Stocks
29	Mr. Bjoern Umbreit	UK			x		BP UK
30	Mr. Jason Newman	UK			x		BP UK
31	Mr. Michael Swoboda	Austria			x		OMV, call on the Austrian case study
32	Mr. David Rolfe	UK	x				DECC, calls on the UK case study
33	Mr. William Mullins	UK	x				DECC, calls on the UK case study

	Name	MS	MS Govt.	CSE	Company	Other	Comment
354	Ms. Angela Siebenhandl	Austria	x				Federal Ministry of Science, Research and Economy
35	Ms. Sanja Spasojevic	UK				x	UKPIA, meeting and calls on the UK case study
36	Mr. Chris Hunt	UK				x	UKPIA, emails on the UK case study
37	Dipl.-Ing. Martin Prieler	Austria		x			ELG, calls on the Austrian case study

Annex D - General survey report

Table D-1 shows the number of respondents per type of organisation that at least partially answered the survey questions.

Table D-1 General survey - number of respondents per type of organisation

		# of responses	As % of respondents within the group	As % of respondents
National administrations and other	Central Stockholding Entities (CSEs),	20	27%	18%
	National government (OCG member)	22	20%	20%
	Other national government, regional or local government	7	10%	6%
	Other	24	33%	22%
Oil industry	Oil industry	36	100%	33%
	Total	**109**	-	**100%**

General note: for some countries, several surveys were collected. Responses were sometimes consolidated at Member State level (one response per Member State). The rule is simple: for answers reflecting beliefs or feelings, responses are presented at respondent level; for descriptions of a situation, responses are presented at Member State level.

Change in the stockholding system

Most Member States do have a CSE in place (Q5). Out of these, four MS indicate setting-up such a system after the adoption of the 2009 Directive: Austria, Croatia, Italy and Slovakia.

Table D-2 Feedback from survey respondents about the stockholding system in their country

Member States	System before the Directive	System After the Directive	No change
Austria	Not a CSE	CSE	
Belgium			CSE
Bulgaria			Mixed system
Croatia	Mixed	CSE	
Cyprus			CSE
Czech Republic			CSE
Denmark			Mixed system
Estonia			CSE
Finland			Mixed system
France			Mixed system
Germany			CSE
Greece			Industry

Member States	System before the Directive	System After the Directive	No change
Hungary			CSE
Ireland			CSE
Italy	Industry	CSE	
Latvia			Government
Lithuania			Mixed system
Luxembourg	Industry	Mixed	
Malta			Industry
Netherlands			Mixed system
Poland			Mixed system
Portugal			CSE
Romania			Not a CSE
Slovakia		CSE	
Slovenia			CSE
Spain			CSE
Sweden			Industry
UK			Industry

Question 5 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Can you indicate the nature of the emergency oil stockholding system in your country before and after the transposition of the new Directive).
Note: Responses are consolidated at Member State level.

Greece, Malta and Romania are envisaging setting-up a CSE, while Finland, Latvia and the UK do not plan to change their stockholding system.

For the Member States having a CSE, 16 have a public company and 4 have a private company (Q6).

Table D-3 Legal form of the CSE

	CSE is a private, industry-led organisation/agency	CSE is a public company
Member States	Austria, Denmark, France, Spain	Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Germany, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovenia

Question 6 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): If your country has a Central stockholding entity (CSE), what is the legal form of this CSE?
Note: Responses are consolidated at Member State level.

The legal form of the CSE has changed in the last 4 years for 3 Member States (Q7).

Table D-4 Change of the legal form of the CSE

	Change	No change
Member States	Latvia, Luxembourg, Portugal	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania,, Netherlands, Poland, Portugal, Slovakian, Slovenia, Spain

Question 7 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other):: If your country has a Central stockholding entity (CSE), has the legal form changed in the last 4 years?
Note: Responses are consolidated at Member State level.

The majority of Member States (8) without a CSE do not plan to change their system. In contrast, two Member States plan to set-up a CSE-based system while three plan to set-up a mixed system (industry and CSE-based (Q8).

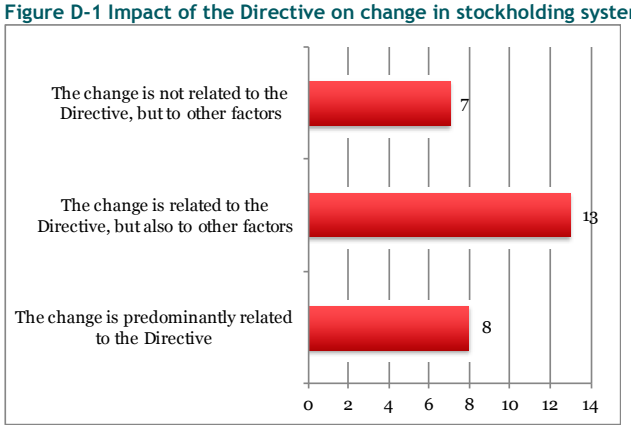
Table D-5 Change to a new system

	Change from an industry system towards a CSE-based system	Change from an industry system towards a mixed system (industry and CSE-based)	No change
Member States	Luxembourg, Poland	Greece, Malta, Romania	Czech Republic, Finland, Hungary, Latvia, Netherlands, Slovakia, Sweden, United Kingdom

Question 8 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): If your country does not have a Central stockholding entity (CSE), is it considering moving to a new system in the coming years?
Note: Responses are consolidated at Member State level.

According to three quarters of respondents (21 out of 28), the past or future changes in the stockholding system are partially or predominantly due to the Directive (Q9).For the remaining respondents, these changes are due to other events.

Figure D-1 Impact of the Directive on change in stockholding system



Question 9 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): If the stockholding system has changed or will change, is this related to the Directive or to other factors? Note: 28 responses collected.

Overview of observed changes in the stocked specific oil products

The composition of stocks has not dramatically changed since the adoption of the new Directive, but some changes do seem to have taken place / occurred for several products (Q10 and Q11). As pointed out by the following tables:

- Most often, the products that were stocked before the 2009 Directive continue to be so; while those that were not stocked before the 2009 Directive are still not stocked;
- There is noticeable change for fuel oil since seven Member States that had such stocks prior to the 2009 Directive do not have any since the implementation of the 2009 Directive. Instead, some Member States have increased their stocks of crude oil;
- Three products, namely refinery feedstocks, additives / oxygenates and LPG are now stocked by three additional Member States (alongside the majority of Member States which stock these products already).

In general Member States continue to stock products they stocked before the 2009 Directive. However, a few of them have started to stock additional products. In particular, some Member States explain that these changes are due to the new Directive.

Table D-6 Observed changes in the stocked specific oil products

# of EU Member States for which …	the product was stocked but is no longer stocked	the product was stocked and is still stocked	the product was not stocked and is now stocked	the product was not stocked and is still not stocked	information is not available	Comments
Crude Oil	0	22	1	3	2	In most of EU Member States, crude oil is still stocked. This is in line with the idea of the Directive to maintain minimum stocks of crude oil.
Natural gas liquids	0	1	1	22	4	Natural gas liquids are still not stocked in most of EU Member States.
Refinery feedstocks	0	8	3	14	3	Only three EU Members States which did not stock refinery feedstocks before the Directive are doing it now, while 14 do not.
Additives / oxygenates	0	7	2	17	2	More than the half of EU Members States still do not stock additives/oxygenates even after the implementation of the Directive.
Other hydro-carbons	0	1	1	22	4	Other hydro-carbons are still not stocked in most of EU Member States.
Ethane	0	1	1	22	4	Ethane is still not stocked in most of EU Member States.
LPG	0	5	3	16	4	Above 16 of the EU Members States are continuing to not stock LPG.
Naphtha	1	2	1	20	4	Naphtha is still not stocked in most of EU Member States.
Motor gasoline	0	25	0	1	2	For most of EU Member States, motor gasoline is still stocked.
Aviation gasoline	1	10	1	12	4	Only one country has moved to stock aviation gasoline while it is still not stocked in at least 12 EU Member States.
Gasoline type jet fuel	0	8	1	15	4	Only one country has moved to stock gasoline type jet fuel while it is still not stocked in at least 15 EU Member States.
Kerosene type jet fuel	1	23	1	1	2	In most of EU Member States, Kerosene type jet fuel is still stocked. This is due to the fact that jet fuel of kerosene type was a product of the Category 2 as defined in the Directive 68/414. Even though the 2009

# of EU Member States for which …	the product was stocked but is no longer stocked	the product was stocked and is still stocked	the product was not stocked and is now stocked	the product was not stocked and is still not stocked	information is not available	Comments
						Directive abolished the previous categories (1, 2 and 3), jet fuel of kerosene type is still considered as a "specific stock" so most countries continue to stock it.
Other kerosene	0	10	1	14	3	Only one country has moved to stock other kerosene while it is still not stocked in the half of EU Member States.
Gas/diesel oil	0	26	0	0	2	In most of EU Member States, gas/diesel oils are still stocked. Like kerosene type jet fuel, gas/diesel oils were products of the Category 2. Therefore, they were stocked and are still stocked in countries as "specific stocks".
Fuel oil	7	19	0	0	2	For 19 of EU Member States, fuel oil is still stocked. Fuel oil belonged to the Category 3 according to the Directive 68/414. Since it is considered as a "specific stock" in the 2009 Directive, 2/3 of the Member States continue to stock it. However, the fact that 7 countries no longer stock fuel oil since the implementation of the 2009 Directive is due to the Directive itself: it allows to fulfil fuel oil obligation by crude oil.
Petroleum coke	1	1	2	20	4	Petroleum coke is still not stocked in most of EU Member States.
Other product	0	4	1	19	4	Other products are still not stocked in most of EU Member States.

Question 10 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Following the transposition of the Directive in your country, has there been an evolution of the authorised stock composition? Have new categories been added? Have previous categories been withdrawn? (We are interested in what is actually stocked and reported, rather than what is allowed to count toward the stock but in practice is not reported as emergency stock).
Question 11 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Could you please describe the key differences in the composition of stocks now compared to the situation prior to the new Directive? Note: Responses are consolidated at Member State level.

Table D-7 Impact of the Directive on improvement of availability of stock

Member State	No change	Minor change	Major change	Comments - key differences in the composition of stocks now compared to the situation prior to the new Directive
Austria	×			No key differences
Belgium	×			No key differences
Bulgaria		×		There is no change excluding the aviation gasoline which was stocked but is no longer stocked.
Croatia		×		Level of stocks of crude oil has increased.
Cyprus	×			Cyprus preserves stocks for the four main categories (Gasolines, Diesel/Gasoil, Jet-A1 and Fuel Oils) to fulfil the consumption of Petcoke, LPG, Asphalt and Lubs.
Czech Republic	×			No key differences
Denmark	×			The key composition of emergency stocks on categories has not changed, but provisions have been introduced ensuring that fuel oil stocks - which are abundant - cannot count as emergency stocks for other categories and that obligations for kerosene type jet fuel cannot be fulfilled entirely by other stocks.
Estonia	×			No key differences
Finland	×			No key differences
France	×			No key differences
Germany		×		- Fuel oil obligation was replaced by crude oil - Prior to the new Directive Germany stocked products of the Category 3, namely heavy fuel oil, which was ceased. The overall ratio crude oil / products has not changed.
Greece	Na	Na	Na	
Hungary	×			No key differences
Ireland		×		- There is no key difference in the type of oil stocks held before and after the introduction of the new Directive - Oil has been eliminated from electricity generation in Ireland whereas previously it was needed. Jet fuel is now being stocked
Italy			×	Italy moves from the former three categories to the full list of products allowed by the EU Directive

Member State	No change	Minor change	Major change	Comments - key differences in the composition of stocks now compared to the situation prior to the new Directive
Latvia	×			- More volumes due to counting of a wider types of oil products - Latvia stocks only diesel oil and motor gasoline
Lithuania	×			No key differences
Luxembourg		×		New stocks on crude oil
Malta	Na	Na	Na	
Netherlands		×		No key differences
Poland	×			No key differences
Portugal		×		Stocks of biofuels and additives to incorporate (additives/oxygenates)
Romania	×			No key differences
Slovakia		×		- Current level of emergency stocks held by EOSA (Emergency Oil Stock Agency) is 97,45 days of daily net imports. About 62 % of the emergency stocks is kept in the form of crude oil (512 thousand tonnes) and 38 % in the form of oil products (motor gasoline, diesel and kerosene jet fuel – 254 thousand tonnes) Fuel oil was stocked but is no longer stocked.
Slovenia	×			No key differences
Spain	×			No key differences. Spanish Legislation impose an obligation to maintain 20 days of security stocks in natural gas and LPG
Sweden		×		Kerosene type jet fuel is now included in the emergency stocks
United Kingdom		×		Longer list of products can now be counted under EU Directive 2009/119/EC (option A), which is extended to obligated companies to give them flexibility.

Question 10 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Following the transposition of the Directive in your country, has there been an evolution of the authorised stock composition? Have new categories been added? Have previous categories been withdrawn? (We are interested in what is actually stocked and reported, rather than what is allowed to count toward the stock but in practice is not reported as emergency stock).

Question 11 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Could you please describe the key differences in the composition of stocks now compared to the situation prior to the new Directive?

Note: Responses are consolidated at Member State level.

The low number of figures received on average yearly cost of stocking of oil (emergency stocks) show that the cost is very stable from 2009 to 2015, but that there was a peak in 2013 for three countries : Cyprus, Germany and the Netherlands (Q12). Coincidently, these three countries have started to stock crude oil or fuel oil or have increased their stocks of these products.

Table D-8 Average yearly cost of stocking of oil (emergency stocks) from 2009 to 2015

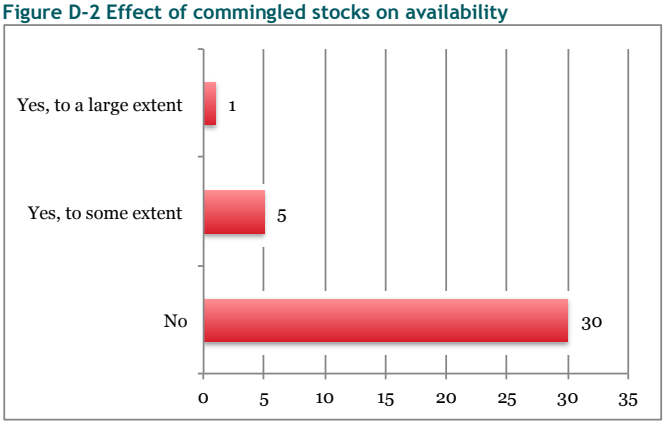
	2009	2010	2011	2012	2013	2014	2015
Belgium[107]	100	100	100	100	100	94	100
Cyprus[108]	n.a.	100	92	94	155	97	92
Germany[109]	99	100	92	83	102	97	97
the Netherlands[110]	89	100	95	96	125	94	n.a.

Question 12 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): If the information exists and you are willing to share it, what has been the average yearly cost (€ per tonne) of stocking of oil from 2009 to 2015 (emergency stocks)?
Note: some respondents gave amount per tonne while other gave amount per m3. All figures were put into index on a 2010 base (2010 is the first year for which value is available for each country).
Note: 4 responses collected.

Commingled stocks

Data is not exploitable on the % of emergency stocks that commingled with commercial stocks (Q13). Whatever the level of commingled stocks, a very large majority of respondents consider that the fact that emergency stocks are commingled with commercial stocks does not hamper the availability of stocks in the event of a supply disruption (Q14).

Figure D-2 Effect of commingled stocks on availability

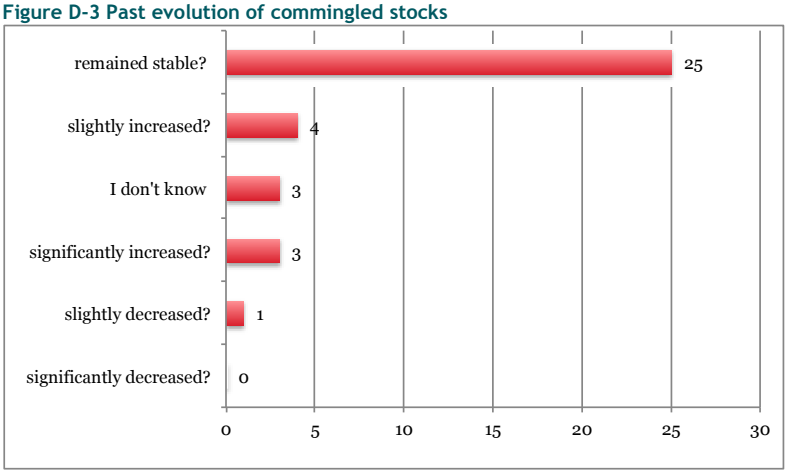


Question 14 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Do you think that the fact that emergency stocks are commingled with commercial stocks might hamper the availability of stocks in the event of a supply disruption?
Note: 36 responses collected.

Since the implementation of the Directive, according to respondents, the share of commingled stocks has not changed in most cases (Q15).

[107] 2009 to 2016: 16, 16, 16, 16, 16, 15, 15
[108] 2010 to 2016: 25.98, 23.98, 22.49, 34.91, 33.92, 31.30
[109] 2009 to 2016: 16.50, 16.60, 15.26, 12.66, 12.97, 12.54, 12.15
[110] 2009 to 2016: 11.67, 13.08, 12.49, 11.94, 14.98, 14.11

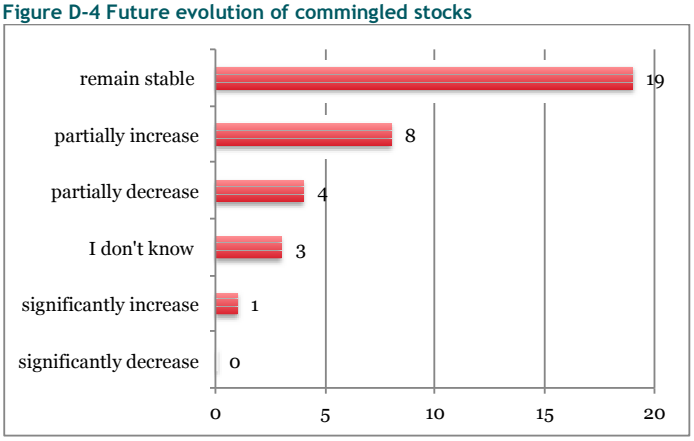
Figure D-3 Past evolution of commingled stocks



Question 15 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Since the implementation of the Directive, has the share of commingled stocks significantly decreased/slightly decreased/remained stable/slightly increased/significantly increased?
Note: 36 responses collected.

Half of the respondents consider that the level of commingled stocks will remain stable in the future (Q16).

Figure D-4 Future evolution of commingled stocks



Question 16 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): In the coming years, do you think that the share of commingled stocks will significantly decrease/significantly increase/partially decrease/partially increase/remain stable/I don't know?
Note: 35 responses collected.

Specific stocks

Only three Member States hold specific stocks (Q17).

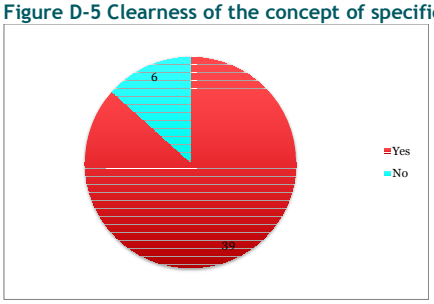
Table D-9 Existence of specific stocks

	Specific stocks are not held	Specific stocks are held
Member States	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom	Denmark, France, Lithuania,

Question 17 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Does your country hold specific stocks as identified by the Article 9 of the Directive?
Note: Responses are consolidated at Member State level.

The concept of specific stocks is clear for the large majority of respondents even if six out of 45 respondents say it is not (Q18).

Figure D-5 Clearness of the concept of specific stocks



Question 18 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Is the concept of specific stocks clear for you?
Note: 45 responses collected.

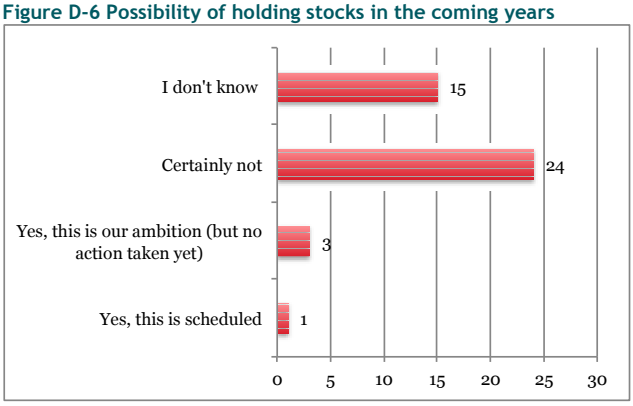
According to respondents, the main reason to hold specific stocks is to ensure quicker availability in case of emergency and not to reduce cost of stocking (Q19). In these three countries, the level of specific stocks will remain stable in the future (Q20).

Respondents in Member States where there are no specific stocks were requested to explain the reasons why their country's stocks do not include specific stocks (Q22). 7 respondents provided comments, which are as follows :

- We do not find any benefit to include specific stocks;
- There are no benefits for including specific stocks for our country. As a non-profit organisation our main concern is to minimise our costs and since we do not own 100% of our emergency stocks we cannot benefit from the specific stocks reporting (10% reduction). On the contrary we will be penalised;
- No advantage for this declaration only more obligation and constraints;
- The cost-benefit equation has not been in favour of specific stocks;
- Lack of incentives to hold specific stocks;
- We do not see any benefit of that;
- We see little or no advantage in separately categorising some of our stocks as specific stocks. There are aspects of the conditions relating to specific stocks which remove flexibility in stock management.

In Member States where no specific stocks are held, in most cases, according to respondents, the situation will remain the same, i.e. the countries will not hold specific stocks in the future if the rules remain the same (Q22).

Figure D-6 Possibility of holding stocks in the coming years



Question 22 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): In the coming years, if the rules remain the same, will the stocks of your country include specific stocks?
Note: 43 responses collected.

Only respondents for Romania and Slovenia claim their country will hold specific stocks in the coming years. None of the respondents specify the reasons why (Q23).

Minimum Operating Requirements

Only 11 Member States can guarantee that Minimum Operating Requirements (MOR) are not included in their reporting of Emergency Stocks. Two Members cannot guarantee this, and 13 do not know whether Minimum Operating Requirements are not included in their reporting of Emergency Stocks (Q24).

Table D-10 Guarantee that Minimum Operating Requirements (MOR) are not included their reporting of Emergency Stocks

	Member States that can guarantee that Minimum Operating Requirements are not included in their reporting of Emergency Stocks	Member States that cannot guarantee that Minimum Operating Requirements are not included in their reporting of Emergency Stocks	Member States that do not know whether Minimum Operating Requirements are not included in their reporting of Emergency Stocks
Member States	Austria, Belgium, Czech Republic, Germany, Italy, Netherlands, Poland, Slovakia, Slovenia, Sweden, United Kingdom	Croatia, Cyprus	Bulgaria, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Portugal, Romania, Spain

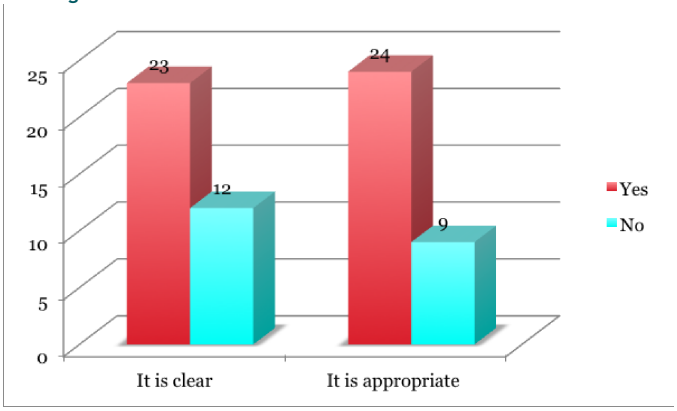
Question 24 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Can you guarantee that Minimum Operating Requirements are not included in your reporting of Emergency Stocks?
Note: Responses are consolidated at Member State level. Information is not available for Greece and Malta.

Several respondents emphasise the fact that the Directive does not provide a definition of MORs (Q25). In some countries, MORs are counted within emergency stocks, while in others they are not.

Clearness and appropriateness of definitions

Two thirds of respondents consider that the distinction between emergency stocks, commercial stocks and working stocks is clear and is appropriate (Q26).

Figure D-7 Clearness and appropriateness of the distinction between emergency stocks, commercial stocks and working stocks



Question 26 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Do you think the distinction between emergency stocks, commercial stocks and working stocks is clear and appropriate?
Note: 35 responses collected.

According to respondents, issues are related to the fact that a clear definition of "working stocks" is missing or because the definition of the "commercial stocks" is not sufficiently explained.

While 11 respondents indicate thinking the figures on emergency stocks, working stocks and commercial stocks reported by individual Member States are comparable, 9 think they are not (Q27).
According to eight of them, this is due to the following reasons:

- In systems where the obligation to have emergency stocks lays upon the operators, a considerable part of the "emergency stocks" will be working/commercial stocks held by refiners/oil companies or stocks held by traders for speculation reasons. Stocks owned by Member States/their agencies are stocks on top of the normally available stocks;
- Each country has its own characteristics mainly due to logistics optimisation and oil infrastructures;
- Industry stocks and CSE owned stocks are of different quality with regard to emergency preparedness (e.g. products like "petrol coke" or "any oil" are probably less useful than the main products);
- Different systems (agencies versus industry) means different products and differences in handling MORs;
- Member States have different requirements regarding the products that fulfil the stockholding obligation. Therefore, a comparison of emergency stocks is difficult;
- Comparison of the reported volumes of MOR with the reported volumes in the countries (including the bilateral held stocks) will reveal that many countries do not have 90 days of free accessible/available stocks at their disposition;
- Since there is not a definition of what commercial stocks are, MS interpret it in several ways;

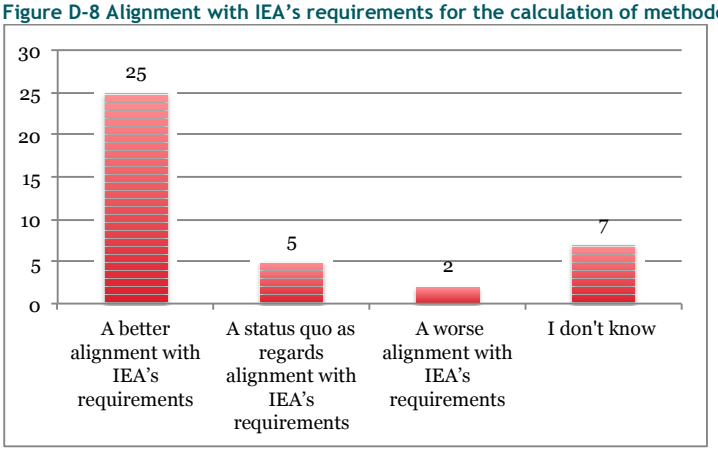
- Given the uncertainties around definitions it might be possible that the data is not comparable.

This point is remarkable: it seems the Member States consider that they fulfil their obligations as regards the Directive but do not trust that other Member States do so.

Alignment with IEA's requirements

Almost two thirds of the respondents indicate that regarding the calculation methodology (of the obligation and the calculation) and reporting, overall, the Directive has led to a better alignment with IEA's requirements (Q29).

Figure D-8 Alignment with IEA's requirements for the calculation of methodology and reporting



Question 29 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): Regarding the calculation methodology (of the obligation and the calculation) and reporting, overall, has the Directive led to a better alignment with IEA's requirements/a status quo as regards alignment with IEA's requirements/a worse alignment with IEA's requirements/I don't know?
Note: 37 responses collected.

The verbatim comments shown below illustrate the positive effects according to seven respondents:

- The new Directive has led to a better alignment by taking over the method of calculating the yearly obligation and the basis of the calculation method of the actual coverage. A MS, thus, has one obligation compared to two in the past. But is this a good thing? The old Directive focused on the main oil products consumed by the end consumers in the MS. The tax payable in order to finance the system was levied on the same products and volumes. The IEA calculation method is based on net imports of all oil products and starts with the determination of the naphtha yield of a MS. If this naphtha yield (the intake of the refineries of the MS in relation to the naphtha production of the MS) is below or above 7%, different methods to take into account the naphtha issue apply which may cause drastic changes in stockholding obligation from year to year. In our case, these variations go from 25 to 38% in the past few years. All this without any changes in the oil consumption of the country, which is the basis for the system's funding. This same phenomenon also occurs, of course, at the IEA level, but in order to comply with the IEA stockholding obligation a MS can count the commercial stocks of its oil industry toward its obligation. This is not the case for the obligation toward the European Directive;
- Synergy-effects in terms of reporting;
- There are positive effects in the form of synergies as the same questionnaires and methodologies are used;

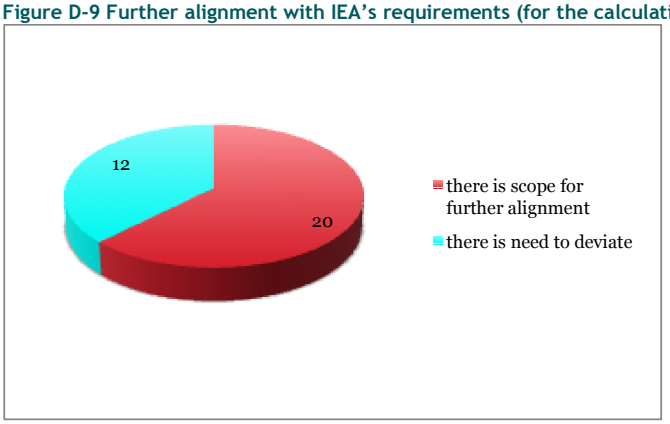
- One report going to both but there are still differences e.g. commercial stocks count towards IEA's 90 days but not EU 90 days etc. Not 100% aligned but closer;
- The total obligation is now the same
- For the total level of obligations there is a better alignment with IEA's requirements. However, the essential difference is that countries outside the EU may use commercial stocks as coverage, whereas EU-countries must have obligated stocks (free accessible/available) as coverage. Also the extra product conditions are an essential difference for the EU countries compared with the non-EU-countries. The EU-system is therefor much more expensive (unlevel playing field) compared to the other IEA countries;
- The directive has improved the availability of emergency stocks (physical and legal) and the ability to create new category of stocks (specific stocks).

Four respondents are more balanced in their judgements:

- Positive effect is better alignment with IEA's requirements. Negative effect is that some of the IEA rules are not reasonable under some circumstances, e.g. deduction of naphtha yield from the crude oil imports or the 10% reduction from the total stocks
- I do not know. The fact that the Spanish model continues to be based on internal consumption and just includes converting criteria as regards EU new obligation based on net imports, means that there is no full guarantee
- It is better in some ways and worse in others. In theory the net imports calculation moving closer to the IEA calculation is an improvement, but in practice the UK has an obligation based on consumption (which the IEA does not have). Using the longer list of products is also better alignment with the IEA. However, stopping counting commercial stocks worsens alignment;
- Although a number of calculation methods have been aligned with the IEA regulation (e.g. calculation of the obligation) other concepts have been introduced by the EU directive which are different again from the IEA methodology (e.g. Specific stocks). Specifically, the EU Directive excludes all naphtha stocks indifferent of its use, in contradiction to the IEA which excludes only petrochemical naphtha.

While 20 respondents consider there is scope for further alignment, 12 indicate that there is need to deviate (Q30).

Figure D-9 Further alignment with IEA's requirements (for the calculation methodology and reporting



Question 30 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): As regards the alignment with the IEA, do you consider that there is scope for further alignment/there is need to deviate? Note: 32 responses collected.

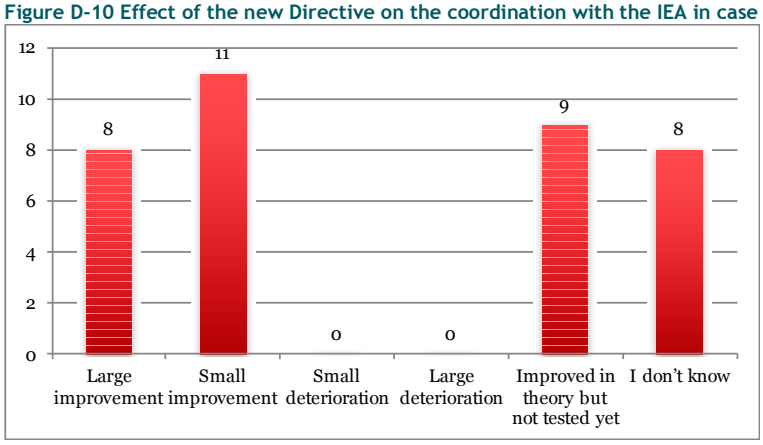
21 respondents provided detailed justification of their answers. According to them, reasons to justify a further alignment are as follows:

- The Directive has improved alignment with IEA's requirements, that typically deal with global or extended crisis situations that –fortunately- seldom happen. We are concerned that while Europe pays to hold a substantial volume of CSO there doesn't seem to be a way in which these volumes can also be used to support or prevent local, smaller crisis. The Directive should elaborate the possibilities and procedures to allow for emergency stocks of one Member State to be used to support or prevent a local/regional or intra EU emergency situation;
- Lesser differences between systems mean lesser efforts and costs for national/governmental Administrations especially in times of budget cuts leading to staff savings in many countries;
- We feel that the obligation calculation method should be uniform for all countries, independent of the naphtha output of their refineries as this naphtha has nothing to do with the oil consumption in the country for energy purposes (the naphtha is a feedstock to the petrochemical industry). In order to promote stocks owned by MS/agencies (which seems to be a clear wish of the Commission and will greatly improve the credibility of the EU stockholding system), the 'improved' Directive could abolish the 10% reduction for unavailable tank bottoms for stocks managed by MS/agencies;
- It seems like an unnecessary administrative burden that data sets like Monthly Oil Statistics must be uploaded to EU via Eurostat and to the IEA via Energy Data Management Centre;
- Different accounting of the commercial stocks leads to major differences in reports;
- To cease 10% deduction as far as agency stocks are concerned. To stick to the preference for a certain amount of product stocks (IEA also allows 100% crude oil). To change the calculation method of the naphtha deduction;
- At IEA level also commercial stocks are counted towards the stockholding obligation and there is no regulation of the composition of stocks (relation crude oil vs. products). We have a strong preference for the EU system with 90 days of "real" emergency stocks and requirements to hold a certain part of the overall stocks in the form of products. Besides we think that it is useful to store main products as products with marginal relevance for the consumption can be produced from crude oil stocks which many MS have. Furthermore, we think that would be useful to deviate with regard to the 10% deduction. Emergency stocks which are fully available (and are not MOR) like our CSE stocks should benefit from a lower deduction
- The 10% reduction clause should not be applied to stocks of CSEs
- Yes, but it could be that the IEA needs to adjust also, not just the EU
- We need complete and full alignments
- MOR currently provided appears excessive both in case of normal activities and in case of crisis;
- Two different levels are not communicative [in the sense that one combined system to comply with would be better];
- Reporting methods could possibly be further aligned
- The IEA and the EU should make efforts to align their systems more in the directions of the current EU Directive with respect to availability, accessibility and products obligations. Given the emergency procedures and stock draw as first kind of measure it would make sense that all countries would get a minimum obligations related to the Base Period Final Consumption instead of net imports. That would eliminate free riders in the system. The 10% deduction in the EU Directive for MOR/unavailable is a contradiction/inconsistent with the conditions in the Directive on the availability and accessibility;
- A better approach regarding the calculation methodologies of the obligations stocks;

- Some of the IEA rules need to change;
- I think that commercial stocks should be counted towards national obligations as in the IEA methodology;
- Yes, by basing the national model on net imports
- IEA have still a lot of advantage when it comes to exercises, plan for crises management and supervisions
- Calculation methodology in the Directive could still be better aligned with the IEA. Similarly regarding commercial stocks
- We believe that obligated parties should be allowed to use naphtha stocks for compulsory coverage when used for gasoline production. At the same time, we believe that the European Commission must work with the IEA towards further evolution of IEA rules. For example, an updated technical study on the fixed 10% provision for unavailable stocks be launched, based on both current practices and recent techniques available.

Clearly, respondents considered that the new Directive allows for improved coordination with the IEA in case of disruption (Q31). 19 respondents consider there is an improvement (large or small), while 9 indicate the coordination is improved only in theory. None of the respondents indicate a deterioration.

Figure D-10 Effect of the new Directive on the coordination with the IEA in case of disruption

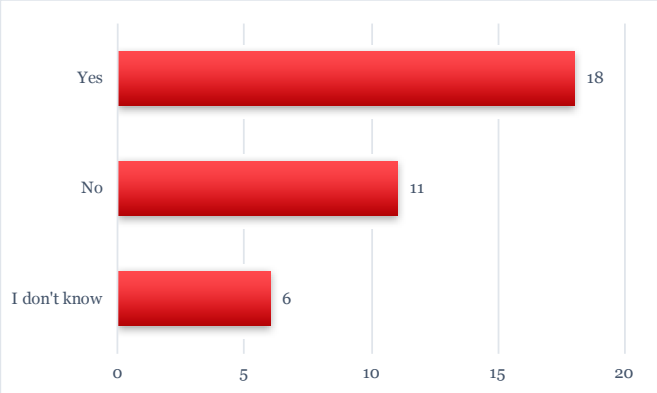


Question 31 (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other): To what extent does the 2009 Directive allow for improved coordination with the IEA in case of disruption?
Note: 36 responses collected.

Questions to oil companies: Minimum Operating Requirements and clearness and appropriateness of definitions

One half of oil companies that responded to the survey is able to guarantee that Minimum Operating Requirements (MOR) are not included in their reporting of Emergency Stocks (Q32). Another half either cannot or does not know.

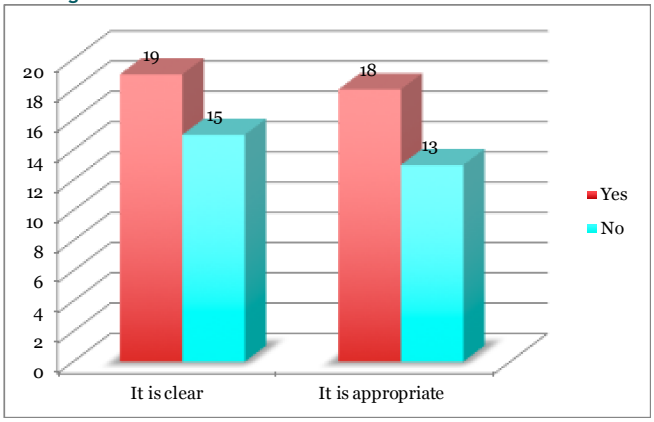
Figure D-11 Inclusion of Minimum Operating Requirements in the reporting of Emergency Stocks



Question 32 (for Oil companies): Can you guarantee that Minimum Operating Requirements are not included in your reporting of Emergency Stocks?
Note: 35 responses collected.

More than half of the respondents think the distinction between emergency stocks, commercial stocks and working stocks is clear and appropriate, while less than one half thinks it is not (Q33).

Figure D-12 Clearness and appropriateness of the distinction between emergency stocks, commercial stocks and working stocks



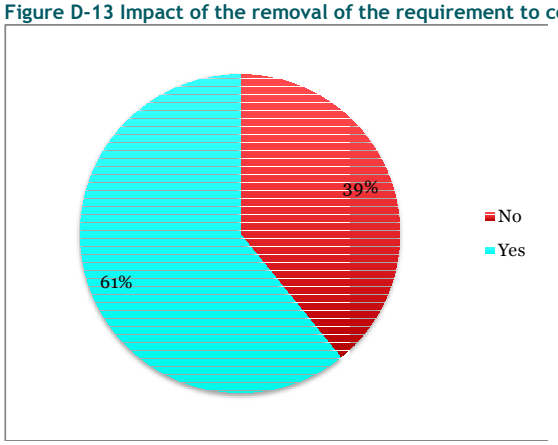
Question 33 (for Oil companies): Do you think the distinction between emergency stocks, commercial stocks and working stocks is clear and appropriate?
Note: 34 and 31 responses collected.

However, according to several companies, it is very time consuming to do the split into these three kinds of stocks. Ten respondents for whom the distinction between the different stocks is not clear or not appropriate put forward the following arguments (Q34):

- The concepts of "Minimum Operating Requirement" or "working stocks" are not defined, nor in the Directive nor in the IEA Treaty;
- It is not clear or easy to enforce the distinction between commercial and operating stocks;
- Definition of these stocks is not uniformly interpreted.

For 61% of respondents, the removal of the requirement to conclude bilateral agreements had an impact on the use of cross-border stocks (Q35).

Figure D-13 Impact of the removal of the requirement to conclude bilateral agreements



Question 35 (for Oil companies): Do you consider that removing the requirement to conclude bilateral agreements has had an impact on the use of cross-border stocks?
Note: 34 responses collected.

23 respondents provided justifications of their reply, as follows:

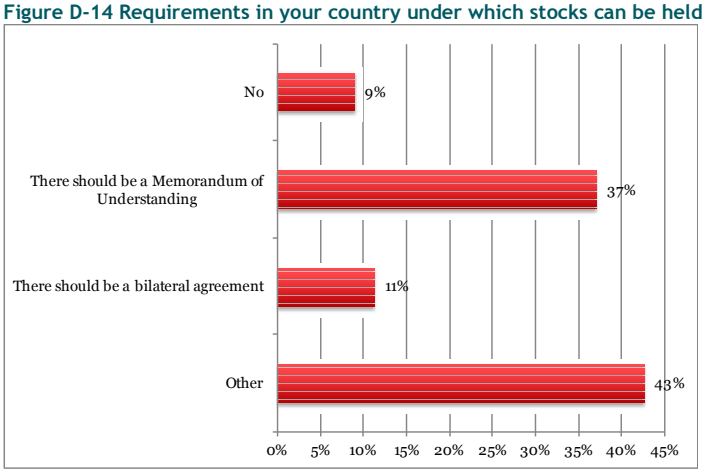
- It is easier to conclude bilateral agreements between EU countries;
- Cross-border trade of tickets has certainly become more liquid. When we, as an agency, have a surplus of stocks, we sell tickets on those surplus stocks. Due to the removal of the need to have bilateral agreements we have sold tickets to MS such as Portugal, Sweden, Cyprus, countries with whom we do not have a bilateral agreement or MoU;
- This type of system is more simplified and flexible;
- The removal of the requirement had a positive effect on our ticketing agreements as now we have a lot more options rather than when we had bilateral agreements;
- New scheme is more simple and preparations take less time;
- We trade CSO tickets in a broader geography than before
- The agreement of the administration is required to use the faculty of cross-border stocks;
- Growth of cross-border stocks and tickets
- Removal has increased the number and quantity of International ticket contracts. Available storage capacities in domestic storage facilities are utilised better. Relationship with relevant companies and authorities has improved
- However, it is not absolutely clear from the wording of the Directive that Bilateral Agreements are no longer needed and this should be clarified by the EU Commission. Some countries still insist on having bilateral agreements, and some are happy to have MOU's;
- Stockholding agreements between countries are still required despite the Directive. However it is not a barrier to holding stocks in another country as the necessary guarantees need to be in place to the satisfaction of both parties;
- It increased the number of countries where it is possible to hold stocks;
- It has expanded the number of countries where possible holding stocks;
- Now there are much more Countries where you we transfer CSO;
- There was a favourable impact as this facilitated cross-border stocks and decreased restrictions due to the removal of compulsory bilateral agreements. As a result the delegation and/or storage options for each Member State have increased;

- Formally no requirements exist, though the national administration will need to be satisfied that stocks held in another Member State will remain physically accessible and available to the companies, and that the relevant Government has given authorisation for holding those stocks;
- Bilateral Agreements were/are a type of barrier to trade within the Union and have seen an important increase on trades of International Stocks from countries where it was not possible in the previous Directive;
- Less bureaucracy and enhanced market mechanisms lead to increased use of cross-border stocks;
- Countries believe that stocks should be stored primarily in their own territories, if there are possible capacities. It is considered as strategic assets and the bilateral relations between countries can change/worsen over the time. It can be also problematic to explain to public that such strategic assets are stored abroad;
- Removing the requirement for bilateral agreements is only part of the process. Procedures, VAT, percentage restrictions still a problem;
- Improved flexibility in the total system. Still a bit slow development of making it work 100%;
- It creates clear efficiency across Europe and reflects modern storage and refining structure. That said going forward it will be important to understand these market dynamics. Adding countries to a system that share no natural geographical trade flow will impact this concept (i.e. Australia / New Zealand);
- Though the requirement has been abandoned, some national administrations are still working via the existing bilateral agreements. This reduces the coverage flexibility between the EU countries.

It is important to emphasise that many respondents indicate that their countries have kept the obligation to have bilateral agreement.

One third of respondents (37%) claim there should be a MoU and one out of ten (11%) a bilateral agreement (Q36). For another one out of ten (9%) there is no requirement.

Figure D-14 Requirements in your country under which stocks can be held abroad



Question 36 (for Oil companies): What are the requirements in your country under which stocks can be held abroad? Note: 34 responses collected.

Respondents were requested to mention the limits and conditions on the possibility of holding stocks abroad (Q37). We collected three responses, as follows:

- Different country interpretations of cross-border stockholding requirements are distorting the market for International tickets. In addition, different VAT treatment of stock holding fees across

countries restrict transactions. The problem mainly arises where a CSE is established by the Government and where CSE is legally interpreted as a public obligation and therefore the CSE cannot charge VAT on top of the oil stockpiling fee to be paid by the oil companies. Furthermore, when such stocks are held overseas, the agency is required to pay VAT on top of the storage costs without being able to reclaim the VAT. Given that oil stocks are managed on behalf of the end consumer or oil companies, CSO should be treated as a service (i.e. oil supply in case of oil disruption) Stock holding fees should therefore be treated as a service for VAT purposes;

- As the Directive says that agencies should preferably store in their own country, we restrict our calls for tenders (we buy products and services with respect of the public procurement rules) within a 3-day sailing range. It would, indeed, be somehow difficult to explain to the Belgian end consumer , if we were to store in e.g. Malta because the offer from a Maltese company was the best, that he has to wait in a crisis until we have finally repatriated these stocks;
- That entitlement shall apply to up to 30 percent of the prescribed individual levels of stocks of the respective crude oil and petroleum products categories. The obligated person: shall submit a written request to the agency not later than 20 calendar days before the start of the period, for which approval is sought, which must include: 1. name, address by corporate seat, as well as correspondence address, telephone, fax, e-mail address and contact person of the store-holder, economic operator and/or central stockholding entity of another European Union Member State, which will perform the stockholding; 2. stocks types and quantities; 3. location of the storing facility, where stocks would be held; 4. the period of stockholding; 5. written consent of the respective Member State or its central stockholding entity, in the territory of which the respective stocks are to be held; the expression of consent shall include data on the types and quantities of stocks and the period of stockholding, as well as a commitment to submit monthly information of the stocks of the obligated person held in its territory for the period of stockholding.

To finish with this item, if applicable, respondents were invited to provide information on the extent to which economic operators can delegate their obligations (via "tickets") to the CSE (or to other companies) in their own country or abroad (Q38).

31 companies provided detailed information.

- The ‘individual stockholding obligation’ of Belgian oil companies is zero since 1/4/2012. If they were to have a small stockholding obligation, these stocks would need to be held in products and in Belgium. A company could, in that case, always transfer its obligation toward APETRA. There is no limit for Belgian companies to holding stocks for companies/agencies from other MS;
- Abroad - not more than 30%; on the territory of the country - 100% to other economic operators;
- On the territory of other countries - EU members; can be stored up to 30 per cent of the stocks individually determined;
- 30% abroad; no restriction for the local keeping;
- Economic operators (storage companies) do not delegate obligations further;
- Economic operators are required to delegate 70 % of their compulsory stockholding obligation to the Danish CSE. In addition, economic operators can delegate additional parts of their compulsory stockholding obligation to the Danish CSE or to other economic operators provided the parties agree to such delegation and provided that such delegation complies with the Danish regulations.
- Economic operators may buy tickets abroad max 30%;
- Any economic operator must opt to delegate either 56% or 90% of its obligation and cover their non-delegated part of the obligation by their own stocks or purchased tickets;

- Declaration to the Energy Ministry;
- Holding stocks abroad is practically impossible due to the necessary requirements;
- Although permitted by Legislation, it is practically undoable to hold stocks abroad due to the very strict restrictions for the approval of depot facilities. For tickets held in Greece, bilateral agreements cannot have duration less than a year
- An economic operator can delegate all his obligations to the CSE of his own country and up to 70% to the CSE abroad;
- Starting from 1st of April 2016 Italian CSE will have 6 days of stocks and no more limit for other delegations;
- Communications inside our country. Authorisation when abroad;
- In own country - up to 100%, abroad - up to 30%;
- An operator can always delegate to the agency, but the agency has the right to refuse certain delegations;
- A legal draft for the creation of a CSE (ANSPP) exists, but has not entered into force yet;
- Only for 48 days out of 93 days total storage requirement;
- Not allowed in Luxembourg;
- Approval by the local CSE;
- 100 per cent delegation is possible;
- This is possible if there is approval form both Governments;
- We do not have any limitation on that
- The Dutch CSE (COVA) holds all the Dutch compulsory stock for the part which is not delegated to market operators. Market operators hold 12% of the Dutch obligation;
- To CSE: In the level that gives possibility for the CSE in a calendar year; To other companies - access depends on market; Abroad - see answer 31;
- They are obliged to delegate their obligation to CSE in their own country. It is mandatory and no other delegation poss;
- In our country all oil companies delegate their duties (to create and maintain stocks) to special Agency, the Agency (for providing this service) charges the companies with defined fee;
- Yes, economic operators can delegate 100% of their industry obligation (50 days of 92 days total obligation) to Spanish CSE or other companies. CSE maintains a compulsory 42 days of 92.;
- No CSE in Sweden. No limits except the 30%. Delegation shall not be sub-delegated;
- There are no limits on quantity of tickets economic operators can use to cover their obligations, either from CSEs or other economic operators;
- The United Kingdom Government has decided not to establish a public CSE and a private CSE is prohibited by anomalous guidance issued by Eurostat. Therefore all of the CSO obligation remains unevenly distributed between refiners (67.5 days) and importers (58 days).

Impacts of the new *Directive*

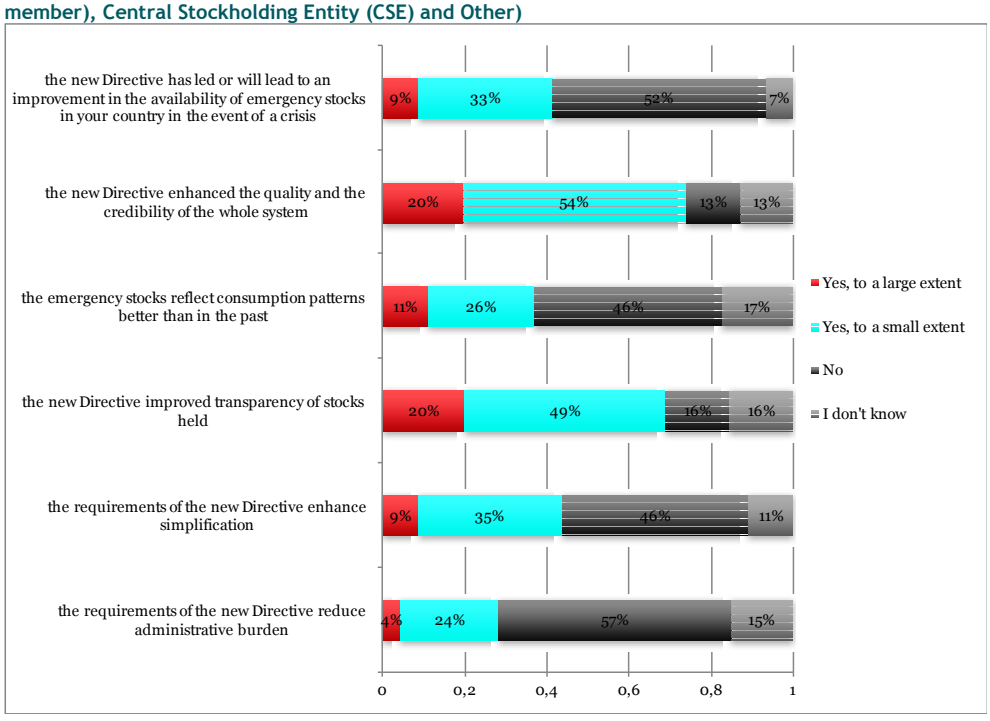
According to the respondents, the two main results are that the new Directive enhanced the quality and the credibility of the whole system (for 75% of the respondents) and have improved transparency of stocks held (for 67% of the respondents) (Q39).

Figure D-15 Effect of the new Directive (all respondents)

Question 39: To what extent does the 2009 Directive allow for improved coordination with the IEA in case of disruption? Note: 77 responses collected.

Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other do not significantly reply differently that all respondents.

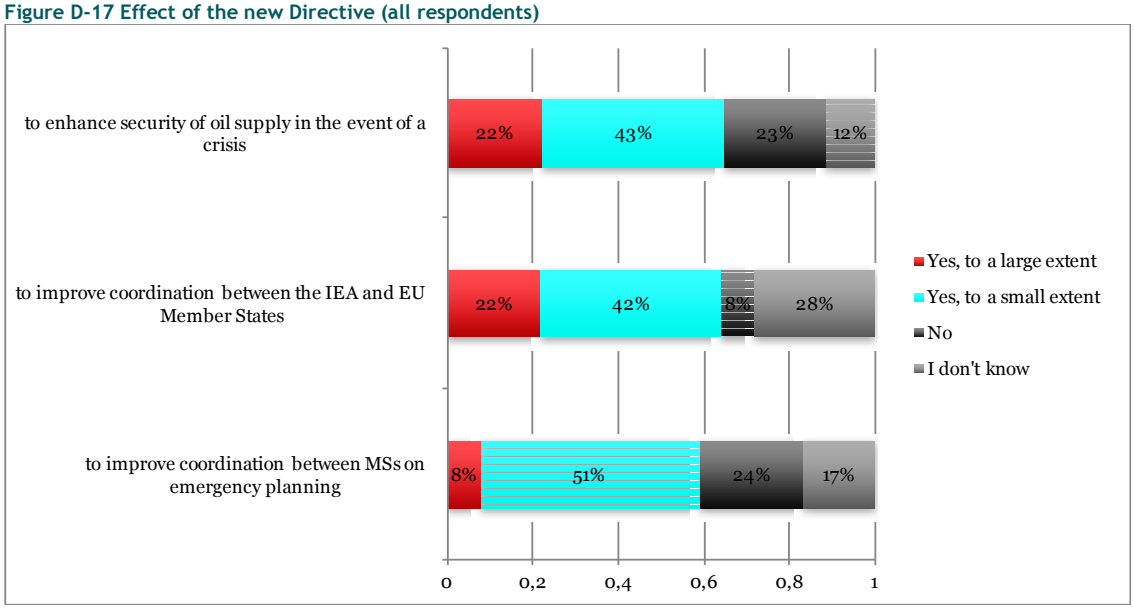
Figure D-16 Effect of the new Directive (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other)



Question 39: To what extent does the 2009 Directive allow for improved coordination with the IEA in case of disruption?
Note: 46 responses collected.

Overall, between 60% and 70% of respondents consider that the Directive promotes actions which help 1) to improve coordination between MSs on emergency planning, 2) to improve coordination between the IEA and EU Member States and 3) to enhance security of oil supply in the event of a crisis (Q40).

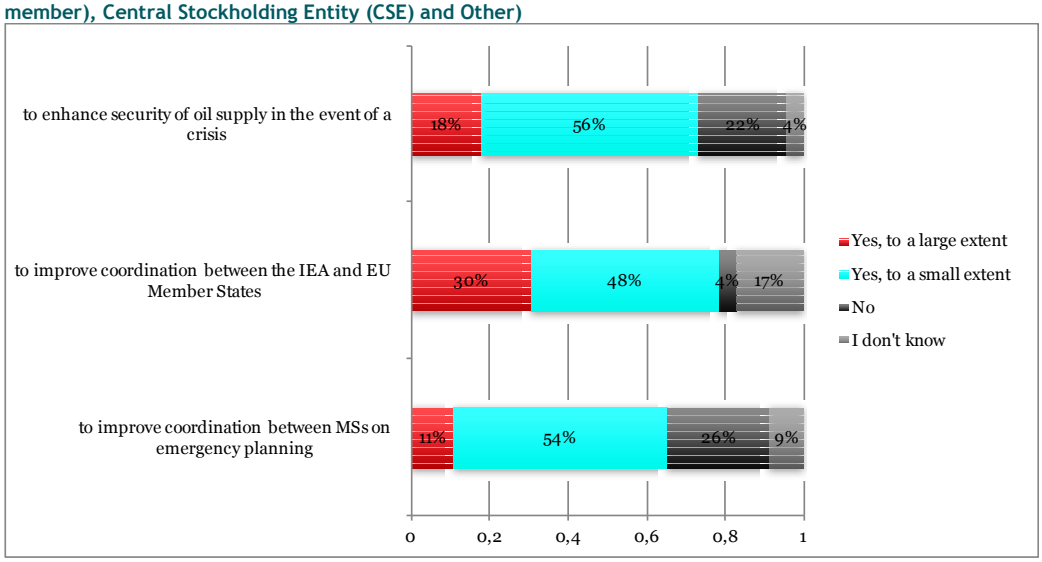
Figure D-17 Effect of the new Directive (all respondents)



Question 40: Do you agree with these statements? Overall, the Directive promotes actions which help,…?
Note: 78 responses collected.

Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Others are more inclined to see positive effects of the Directive, since for the same questions, between 65% and 78% of them consider that the Directive promotes actions which help 1) to improve coordination between MSs on emergency planning, 2) to improve coordination between the IEA and EU Member States and 3) to enhance security of oil supply in the event of a crisis (Q40).

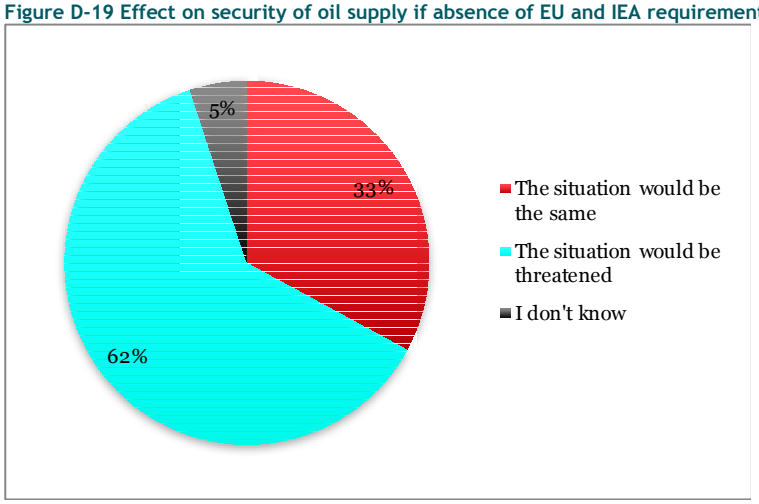
Figure D-18 Effect of the new Directive (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other)



Question 40: Do you agree with these statements? Overall, the Directive promotes actions which help?
Note: 46 responses collected.

62% of respondents consider that if the EU and the IEA no longer required countries to hold emergency stocks, the situation would be threatened (Q41). One third believes the situation would be the same.

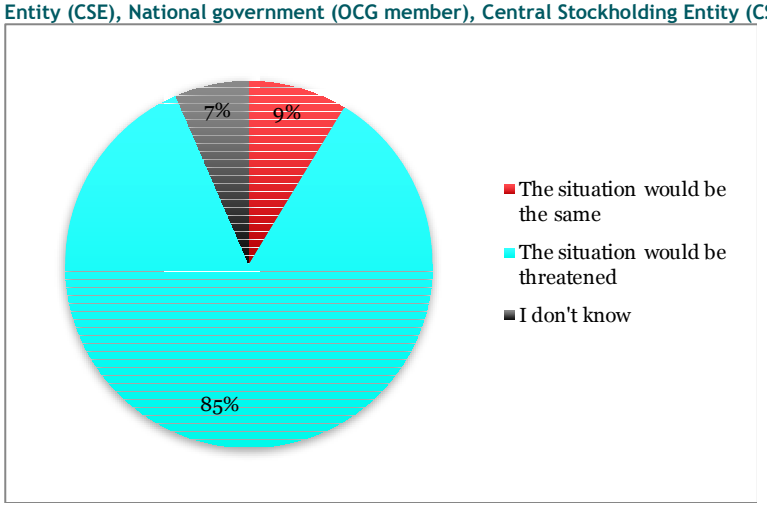
Figure D-19 Effect on security of oil supply if absence of EU and IEA requirements (for all respondents)



Question 41: According to you, what would be the effect on security of oil supply, if the EU and the IEA no longer required countries to hold emergency stocks?
Note: 72 responses collected.

Clearly, there is almost a consensus among Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other to consider that if the EU and the IEA no longer required countries to hold emergency stocks, the situation would be threatened (Q41).

Figure D-20 Effect on security of oil supply if absence of EU and IEA requirements (for Central Stockholding Entity (CSE), National government (OCG member), Central Stockholding Entity (CSE) and Other)



Question 41: According to you, what would be the effect on security of oil supply, if the EU and the IEA no longer required countries to hold emergency stocks?
Note: 46 responses collected.

Recommendations to improve the achievement of the objectives of the new Directive

Respondents were requested to make proposals (Q42) in order to:

- Increase availability of emergency stocks;
- Increase the size of specific stocks;
- Increase the size of the CSE stocks;
- Decrease the cost of monitoring;
- Decrease the cost for reporting on stocks;
- Decrease the cost of stocking.

A general comment is to be made on the proposals made by respondents. Again, it seems that the respondents do not trust the MSs with respect to their requirements as regards emergency stocks. Several respondents insist on the need to check the actual stock of emergency stocks and it can be assumed that this statement can be made for the other MSs (as if the respondents consider that their own country respect the rules but the other MS do not).

The recommendations presented below are structured in two or three columns. The first column includes the proposals that we consider most detailed and best argued.[111] The second column contains proposals that are mutually contradictory. For example, some respondents plead for a simplification of the rules for the "tickets" while other consider that "tickets" should no longer be allowed. Finally, the third column includes proposals that we regard rather generic or less realistic.

Regarding the proposals to increase the size of specific stocks, there is one that was mentioned several times: respondents plead for removing the 10% reduction. Several respondents also highlight that at the time being there are no real incentives.

[111] Note that this distinction is made by the ones that prepared the survey report and not necessarily reflects the opinion of the Trinomics project team.

Table D-11 Proposals made by respondents to increase availability of stocks

Detailed and argued proposals	Contradictory proposals	Generic or less realistic proposals
• Really suppress the use of the "any oil" category • Limit the scope of products/ increase storage of main products • Impose to hold stocks of petroleum products • Check regularly and randomly the stocks in the MSs • Oblige all countries to have an agency that has to hold a certain minimum level of emergency stocks with explicit emergency qualities	• Remove the barriers that hamper "tickets" vs. limit the "tickets"/Limit cross-border stocks/ Impose a threshold of stocks in products that must be held in each country. • Forbid to use MOR/working stocks as emergency stocks vs. Promote Commingled stocks for Emergency Stocks + Commercial and Working stocks	• Implement a single European register of the economic operators that can provide stocks or capacities for storage • Increase technical and safety standards of storage facilities • Change the obligation of emergency planning and coordination between the MSs in case of crisis. • Put the focus on capability to release stocks instead of volumes.

Question 41: According to you, what changes to the Directive (or its implementation) do you think would improve the achievement of each of the following objective: increase availability of stocks?
Note: 45 responses collected. Also note that "any oil" cannot be reported in the MOS and is hardly used anymore in ticket contracts.

We collected 33 proposals to increase the size of the CSE stocks. Nine respondents say that is not needed and that the EC should not try to do that. A respondent suggests allowing CSE to join forces. He/she says that through economies of scales, European CSEs would issue joint tenders for oil purchases-that will increase their buying power and can bargain good oil prices.

Table D-12 Proposals made by respondents to increase the size of specific stocks

Detailed and argued proposals	Generic or less realistic proposals
• Get rid of all the rules on beforehand publication in the European Gazette, same number of days for each product, include owned stocks of crude oil and foresee a reward: the non-deduction of 10% for unavailable tank bottoms. Furthermore: expand the article 10.3. on the 'unconditional immunity' of specific stocks to crude oil and all stocks owned by a MS/agency, whether or not they bare the label 'specific'. • Set incentives, e.g. to cease 10% deduction	• Specific stocks to be commingled with oil stocks and accounted as emergency stocks. • Oblige MSs to hold specific stocks • Simplify the conditions on specific stocks in the Directive - very administratively burdensome

Question 41: According to you, what changes to the Directive (or its implementation) do you think would improve the achievement of each of the following objective: increase the size of specific stocks?
Note: 34 responses collected.

Proposals for reducing the cost of monitoring and proposals for reducing the cost of reporting are similar to each other. Some are even made twice. Several respondents highlight that the cost of monitoring and of reporting is not a major issue. Some proposals made to decrease the cost of monitoring and of reporting seem easy to implement (implementing an electronic monitoring), some less (setting up a stock platform at a EU level).

Table D-13 Proposals made by respondents to decrease the cost of monitoring and of reporting

Detailed and argued proposals	Generic or less realistic proposals
• Accept electronic monitoring and implementation of it • Simplify the rules so there are fewer ways of fulfilling the CSO • Set-up a stock platform on a EU level useable by both MS administrations as well as operators (CSE, industry). It would integrate both control and administration. • Reinforce alignment of National, EU and IEA methods	• Centralise Storage at the EU level • Simplify the rules so there are fewer ways of fulfilling the CSO

Question 41: According to you, what changes to the Directive (or its implementation) do you think would improve the achievement of each of the following objective: decrease the cost of monitoring and of reporting?
Note: 33 responses collected.

In order to decrease the cost of stocking, respondents are numerous to emphasise that the 10% deduction of stocks is very costly and to plead for its removal. Other proposals are made to increase the cross-border mobility and the possibility to have stocks held abroad (which is not forbidden but considered as complex by some respondents).

Table D-14 Proposals made by respondents to decrease the cost of stocking

Detailed and argued proposals	Generic or less realistic proposals
• Get rid of the 10% deduction of the levels because these 10% are real stocks that cannot be count, but they are financed in the moment of purchase and they are held as the other 90%. • Redefine operability issues in case of replacing one oil product category by another or in case of relocating the storage location. Currently this results in double amount of reserves retained for a period of 7 - 10 days • Simplify access to international storage and ticketing • Allow the inclusion of commercial stocks as per the IEA (so long as there are some legal controls over these, e.g. emergency powers)	• Avoid storage in small and remote bulk plants. Reduce number of storage sites, concentrate CSO in large platforms dated with solid and tested loading capabilities • Ensure a security stock supply really shaped on the real geopolitical risks • Decrease the number of oil products which we need to be included into the calculation • Decrease the level of global obligation • Oblige CSEs to hold total CSO

Question 41: According to you, what changes to the Directive (or its implementation) do you think would improve the achievement of each of the following objective: decrease the cost of stocking?
Note: 41 responses collected.

Recommendations to *simplify the system without jeopardising the main objectives of the Directive*

Respondents were requested to identify changes in the rules that would simplify the system without jeopardising the main objectives of the Directive (Q43). Most of the comments are related to the naphtha and the 10% deduction.

38 comments were made, as follows:

- Naphtha should be excluded from the Oil Stocks Directive: In an emergency situation there is an urgent need for finished products to be used, allowing crude oil as an emergency feedstock to be

processed in the meantime. Naphtha is a feedstock that needs to be processed to become a gasoline blending component. There is no need for such additional feedstocks for gasoline. The required amount of gasoline stocks should be kept as a finished product and partly in the yield of crude oil. Naphtha for other purposes should be part of different stocks or agreements in those Member States concerned. Products kept as emergency stocks should be harmonised across EU by name, type, norm or linked with CN custom codes to represent the same recognisable product;

- Regulate naphtha deduction properly, eliminate UTB regulation of 10% for CSE [Trinomics interprets this as 'eliminate the 10% deduction for CSE'], make ticketing more reliable (register);
- 1) Starting date: The new directive fixes a start of a new stockholding year with the obligation calculated on the oil statistics of the previous calendar year on 1st April of a year. Under the previous directive the stockholding obligation was calculated by the member states themselves based in inland consumption. And, very important, it foresaw an adjustment period to the new obligation of 3 months. The IEA Obligation starts on 1st July of a year. The exact stockholding obligation cannot be notified by a member state to its stockholders until often the beginning of March of a year. Especially in case of a rise of the obligation it is impossible in the remainder of time to still take measures in order to comply with this obligation. An 'improved' directive would therefore re-instate the 3-months adjustment period or have the stockholding year start on 1st July. 2) The new directive is sometimes very cryptically written. Article 7, 3 deals with the delegation of 'tasks'. It is unclear what is comprised by "delegating tasks": Storage? Tickets? Accounting? Reporting? A clarification would be very welcome
- The type of the stocks is to be clearly defined, thus the calculation of the levels will take an equal basis. The types of the oil products is better to be determined as motor gasoline, kerosene-type jet fuel, gas/diesel oil, fuel oil, LPG as it was in the old Directive. It seems that only few MS have stocks of other products, but if there is a crisis the main products that are going to be released are the above listed. Depending on the specifics of consumption in the MS the other products can be held as specific stocks or in addition to the main. To calculate the levels on the basis of the consumption are used precisely defined oil product but on the basis of net import the scale of the oil products is wider including Ethane, White spirit and SBP, Bitumen, Paraffin waxes, Petroleum coke. That is why it is better the products to be precisely defined. Ethane, White spirit and SBP, Bitumen, Paraffin waxes, Petroleum coke are not the most appropriate products;
- The 10% deduction of the levels is a real burden because these 10% are real stocks that cannot be count, but they are financed in the moment of purchase and they are held as the other 90%;
- In Annex 3 of the Directive, in our opinion, there is a collision, as follows: "The calculation may include quantities held: …. in pipeline tankage, … .The calculation may never include: ….quantities held: in pipelines;4. In order to be realized strict control and to be decreased the cost of the monitoring it would be better to be reduced the places of stockholding, such as bulk terminals, pipeline tankage, in barges, in intercoastal tankers, in oil tankers in port, in inland ship bunkers.5. Art. 8 (4) specifies time limits as 200 days, 170 days – they are too long and impracticable;
- Agreement between the countries to removed. To be agreement between operators only under supervision of the respective Ministry;
- LPG, Petcoke, Lubs and Asphalt in a crisis or oil disruption situation will not be used- so these products should not be accounted for emergency stocks. On the other hand, LNG or Natural Gas should be accounted and alternative fuels should be preserved (Gasoil) when used in Power Generation. Thus depending on the use in each Member state, each country should be allowed to disclose or add oil products that will be accounted for emergency stocks

- In emergency stocks should be held just crude oil and the "main products", like gasoline, road diesel, jet fuel, heavy fuel oil;
- Eliminate specific stocks;
- 10% reduction in calculation of the stock volumes is not justified. Removal of that restriction would simplify the system a lot;
- Article 3 p. 3 - the requirement to recalculate and possibly re-establish the obligated stocks by the beginning of Q2 is too ambitious and should be prolonged;
- Reporting burden from oil company perspective is not too high;
- Limit / shorten the list of acceptable oil products;
- An EU electronic platform as mentioned in previous question would not only simplify workings and enhance communication between MS / CSE's / industry, but also allow the EU to react more swiftly in case of emergency;
- Reduce or eliminate the possibility of substituting the obligation on refined products by the gross proceeds;
- Change the rules for the naphtha deduction, i. e. abolish the spike from 7% to 4%
- It would be desirable to change the rule for the deduction of the naphtha yield. Currently, the stockholding obligation might change quite significantly up or down due to the threshold values which exposes MS to sharp increases or decreases in obligation. However, we do not favour the option of deducting the overall naphtha consumption;
- Avoid step between 4% and 7% naphtha yield (Annex I);
- Keep stocks in as much generic specification as possible;
- No need for specific stocks and related reporting, calculation rules would need some change according to naphtha production change;
- Sole methodologies should be applied;
- Stop applying 10% tank bottom in calculation, simplify naphtha provisions; start reference year obligation in July; set requirement for at least one third of stocks to be held as finished products (rather than crude); stocks should be held in line with national consumption patterns (broadly); reduce reporting burden;
- To delete fuel oil from the list of the "preferred products", as these products do not significantly help to mitigate a crisis. Reduce the period of at least seven months in advance when offering "services" (e. g. Stock-Tickets) to Third Parties;
- Rules with regard to the quality of emergency stocks (e.g. the composition of stocks) should be put in place. Member States should be required to hold stocks that broadly relate to consumption trends e.g. large amounts of petroleum coke stocks in Member States with very little consumption of petroleum coke make no sense and do not enhance the EU's energy security;
- It would be appropriate to consider the drafting of a reference MoU. MOR should be lower than current;
- Removal of sub delegation limit. Include the product inside the pipelines to cover obligation;
- Simplify the draft for MoU and Bilateral agreements;
- It would be very helpful the drafting of a reference MoU. A reduction of MOR is necessary (10% deduction made by I.E.A. for unavailable stocks is too high);
- Currently, the stockholding obligation of some Member States might change quite significantly up or down due to the naphtha calculation method and threshold values which exposes Member States to sharp increases or decreases in obligation which are hard to manage. This should be adapted;
- Move the implementation date for the yearly obligation from 1st April to 1st June, allowing 3 months to build or decrease stocks;

- Get rid of the specific stocks. Get rid of the registers reports. All essential information is in the MOS;
- Go back to the CAT 1 + CAT 2 + CAT 3 system. It will certainly be more expensive than the current 2009 Directive but much more robust;
- The need for implementing a more accurate methodology regarding the way to determine the "observed gross inland deliveries";
- All MSs should allow delegation of stocks to another MSs without requiring bilateral agreement and without limiting the delegation threshold. Ticketing should also be allowed in all MSs. Due to logistics reasons, sometimes it is easier to supply certain regions from a neighbouring country than from another region of the same MS (e.g. it is easier to supply Transylvania region of Romania from Hungary than from South-Eastern Romania due to distance and infrastructure reasons). The monthly data supplied by MSs should also be harmonised. The list of eligible products to meet the compulsory stock obligations should also be reduced by eliminating products such as Petcoke, Sulfur, Paraffin and waxes;
- Change the naphtha deduction calculation, remove 10 % reduction (tank bottom), shift the starting date of new obligation from April 1-st to July 1-st;
- There is a discrepancy across Europe with regards to the eligibility of certain feedstocks/products to cover the various CSO categories: Some feedstocks/products are eligible for CSO coverage in one country but not in another. This is in contradiction with the objective of the Directive, which is to create a transparent market leading to a more level playing field across Europe for CSO costs.
- Allow CSEs to be established without having to be counted as a public body (as required by Eurostat).

Finally, respondents were free to make any other comments on the Directive (Q44). 21 free comments were made, as follows:

- (1) Cooperation among Member States still bounded by requirements around the presence of bilateral agreements/ MoUs imposed at the national level; (2) Limitations around the amount of emergency stocks that can be held abroad frequently result in higher prices for domestic CSO tickets; (3) Lack of uniform rules on procedures to approve cross-border CSO tickets often perceived by market participants as problematic; (4) Heterogeneous restrictions around accepted products and different product definitions across the EU contribute to prevent the creation of a level playing field; (5) Difficulties in reconciling products defined in Regulation (EC) 1099/2008 with those in the EU Combined Nomenclature, and in classifying refinery feedstock/ blending components;
- There is no legal definition of “working stocks” but the notion is used in Annex 3 of the Directive; The chapter heading of Article 4 needs to be clarified in order to be clear that the subject is how to calculate the stocks held;
- 1. Limiting the list of petroleum products that can serve as Emergency stocks – to only such products which are vital for the normal functioning of the economy:- Raw materials – crude, fuel oil and vacuum gas oil;- Fuels – LPG, motor gasoline A 95 H, Fuel for diesel engines, jet fuel, gas oil and fuel oil. We believe that other petroleum products listed in the Directive have no practical value for overcoming the problems in crisis situations. 2. The very maintaining emergency stocks of crude oil is far from meaning that in a crisis the fuel consumption will be seamless provided for. For a manufacturer, another situation is possible - which will not allow fixed date supply of the fuel consumption/consumers, and this is the case of repairing individual key plants / part of or even the whole refinery/. With this in mind, we consider it appropriate to maintain a portion of

Emergency stocks in finished petroleum products instead of crude oil, and in such a case the method for determining stocks by domestic consumption should apply, i.e. the amount of "replaced" petroleum products can be calculated for a 60-day period, and not for a 90 day period / as in Emergency stocks of crude oil /. G PP =G crude x (60/90) or approximately G PP = 0,7 x G crude Moreover, from 100 t of crude after processing not more than 80-85 % fuels are obtained. 3. The deadlines for establishing and maintaining emergency stocks shall be aligned for all countries - members of the European Union, which will optimize the storage of stocks by the system of "stock-ticket". The discrepancy between that deadline in the Directive (01.04) - Art. 3, para. 3 and the deadline in the Act of our country (30.04.) does not allow synchronization and eventually leads to excess funds in storage that affect consumers. 4. In the Insurance the European practice is to avoid clauses (i.e. Insurance for nuclear risks required under our law for stocks), which actually makes insurance policies only more expensive, the Directive shall require the stocks to be insured under the general procedure for insurance of crude oil and petroleum products;

- The EU directive must be pragmatic and follow the oil consumption path in each member state irrelevantly of any IEA directions. The 10% reduction is unfair to be charged on the buyer of tickets and not to be forced to be kept by the seller, and 'naphtha yield point' must be reviewed (In Cyprus we do not import naphtha however is unfair for other CSE);
- We find the 10% reduction for tank heels wrong, since we on a operational basis regularly empties our tanks 100%. Therefor it is wrong not to be able to count the last 10% into the fulfilment of the obligation;
- Article 7 p.4 (b) - 7 months deadline does not comply with a real life;
- Delegating obligation abroad should be limited to enhance national supply security;
- Data reporting must be kept as clear as possible;
- 1. Remove Fuel Oil from the list of preferred products; 2. Interdict the use of "any oil"; 3. Effective control of cross-border-tickets; 4. Clarification of Art. 7,3 ("delegation of tasks"); 5. Simplify Art. 7,4 (reduce 7-month-period significantly); 6. limit exemptions for the rotation of specific stocks;
- For emergency stocks and Central Stockholding Entity (CSE) stocks which are fully available and accessible at all times (as required under article 5 of the Directive), the 10% reduction which is imposed in annex III: methods for calculating the level of stocks held should not be applied. Member States are seeking a revision of the calculation methodology to get rid of this 10% tank bottom deduction. It is assumed that the IEA methodology could also eventually be aligned with this position in due course;
- Compared to the previous Directive requirement to hold 90 days of average daily inland consumption, requirement of this Directive to keep 90 days of average daily net imports or 61 days of average daily inland consumption is more complicated. Method for calculating the levels of stocks (Annex III) should be detailed, and all procedures should be detailed as well;
- Still too many options for MS to apply restrictive territorial criteria. Still not enough "single market" in it;
- Harmonize as much as possible in collaboration with the IEA. Changing the methodology on the naphtha yield would make sense. Complete in the new Directive the control system for bilateral stock holding so we really get rid of the bilateral agreements and MoU's and realise an Internal market;
- Art.7 (4b) of the Directive: 7 months in advance announcement-the minimum-period should be reduced (maybe 6 weeks before the start of a new quarter);

- The Directive should cover the broader scope on measures to be taken in the event of crisis. Therefore it actually should be the directive on oil stocks and emergency planning. The oil stocks should be considered as a part of the measures to be taken in the oil supply crisis;
- As regards question 32, if the EU and IEA no longer required countries to hold emergency stocks, such stocks would be required by MS but in a smaller amount. Current level obligation is no longer justified;
- The Directive still did not address the distortion of assigning same total obligation to all agents (instead of same additional obligation);
- The new European obligation for MS of 90 days of net imports of crude oil and oil products is being achieved in Spain with an obligation for companies of 92 days of internal consumption of the 3 traditional categories of products (gasolines, gasoil and kerosene, heavy fuels). The consequence is a serious distortion of competition that affects independent companies and in the end, diversification and security of supply. Why? Because that part of the obligation that is generated by products which are not commercialized by non-refiners as asphalt, lubs, coke, etc. is being supported by all companies, so the independent companies are supporting part of the obligation generated by refiners;
- All stocks including tank bottoms to be calculated as these volumes are available on demand. Base the obligation on sold volumes instead of as now on import and exports;
- Allow CSEs to be established without having to be counted as a public body (as required by Eurostat);
- In certain Member States the CSO Legislation requires refiners to hold a higher obligation than importers, thus providing a competitive advantage for importers. Member States should therefore ensure a more level-playing field, including justification and transparency of any exemptions or partial exemptions granted to some market participants.

Annex E - Administrative burden survey

Table E-1 shows the number of respondents per type of organisation that at least partially answered the survey questions.

Table E-1 Administrative Burden Survey - Number of respondents per type

		# of responses	As % of respondents within the group	As % of respondents
National administrations	Central Stockholding Entities (CSE),	17	49%	25%
	National government (OCG member)	12	34%	17%
	Other national government, regional or local government	6	17%	9%
Oil industry and other	Oil industry	26	76%	38%
	Other	8	24%	12%
	Total	**69**	-	**100%**

Efforts per year to fulfil the obligations of the Directive for the national administrations

Efforts per year vary across respondents for fulfilling their obligations in relation to Article 6 of the Directive (Q6). However, for seven out of ten, there are less than 15 days per year.

Table E-2 Efforts per year to keep a detailed register of emergency stocks and to submit an annual report to the EC

	# of responses	As % of respondents
Less than 5 days per year	9	36%
Between 6 and 15 days	9	36%
Between 16 and 25 days	2	8%
More than 25 days	5	20%
Total	25	100%

Question 6: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

Overall, activities required by Articles 12 and 13 are more time consuming (Q7).There are six respondents out of ten that indicate that these activities require less than 15 days, three respondents indicate that they need more than 100 days.

Table E-3 Efforts per year to draw up monthly statistical summaries of emergency stocks

	# of responses	As % of respondents
Less than 5 days per year	6	22%
Between 6 and 15 days	10	37%
Between 16 and 25 days	2	7%
Between 26 and 100 days	5	19%
More than 100 days	3	11%
Total	**27**	**100%**

Question 7: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

For one third of respondents, the efforts have not increased or decreased in comparison to the situation prior to 2013 Directive (Q8). For another third, efforts have increased between 10 to 30%. For one quarter of respondents, efforts have increased by 50%.

Table E-4 Evolution of efforts per year to draw up monthly statistical summaries of emergency stocks

	# of responses	As % of respondents
No change	8	33%
Efforts increased by 10%	5	21%
Efforts increased by 20%-30%	3	13%
Efforts increased by 40%	1	4%
Efforts increased by 50%	5	21%
Efforts increased by more than 50%	2	8%
Total	**24**	**100%**

Question 8: What is your estimate of the increase or decrease in these efforts in comparison to the situation prior to 2013 (ideally as a % of the previous efforts)?

In order to draw up statistical summaries of commercial stocks held within their national territory (Article 14 of the Directive), efforts seem not to be that important for the national administrations (Q10 and Q12). For one half of respondents (8 out of 18), these activities require less than 5 days per year. For one third (13 out of 18), they are less than 15 days.

Table E-5 Efforts per year to draw up statistical summaries of commercial stocks held within their national territory

	# of responses
Less than 5 days per year	8
Between 6 and 15 days	5
Between 16 and 30 days	3
More than 30 days	2
Total	**18**

Questions 10 and 12: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

For those who reported commercial stocks to the IEA or EC before the entry into force of the new Directive (Q9), efforts have either not changed/slightly increased or increased by 50% according to respondents (Q11).

Table E-6 Evolution of efforts per year to draw up statistical summaries of commercial stocks held within their national territory

	# of responses
No change	2
Efforts increased by 5%	2
Efforts increased by 50%	2
Total	**6**

Question 11: What is your estimate of the increase or decrease in these efforts in comparison to the situation prior to 2013 (ideally as a % of the previous efforts)?

Efforts per year to fulfil the obligations of the Directive for the companies

For one half of the companies that responded, efforts per year to collect information for the detailed register of emergency stocks are less than 15 days (Q13). However, for more than one third of respondents, these efforts require more than 25 days.

Table E-7 Efforts per year to collect information for the detailed register of emergency stocks

	# of responses	As % of respondents
Less than 5 days per year	6	22%
Between 6 and 15 days	7	26%
Between 16 and 25 days	4	15%
More than 25 days	10	37%
Total	**27**	**100%**

Question 13: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

As for the national administrations, overall, activities required by Articles 12 and 13 are more time consuming (Q14).One half of respondents indicate they need less than 15 days for these activities, but five respondents report more than 100 days.

Table E-8 Efforts per year to collect information for the monthly statistical summaries of emergency stocks

	# of responses	As % of respondents
Less than 5 days per year	6	23%
Between 6 and 15 days	8	31%
Between 16 and 25 days	4	15%
Between 26 and 100 days	3	12%
More than 100 days	5	19%
Total	**27**	**100%**

Question 14: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

For four respondents out of five, the efforts have not increased not decreased in comparison to the situation prior to 2013 (Q15). For another four respondents out of five, efforts have increased between 5 to 30%.

Table E-9 Evolution of efforts per year to collect information for the monthly statistical summaries of emergency stocks

	# of responses	As % of respondents
No change	10	43%
Efforts increased by 5%-10%	5	22%
Efforts increased by 20%-30%	4	17%
Efforts increased by 50%	4	17%
Total	**23**	**100%**

Question 15: What is your estimate of the increase or decrease in these efforts in comparison to the situation prior to 2013 (ideally as a % of the previous efforts)?

Companies do not appear to spend large amounts of time to collect information to draw up statistical summaries of commercial stocks held within their national territory (Article 14 of the Directive): for 13 respondents out of 17, less than 15 days are needed (Q17 and Q19).

Table E-10 Efforts per year to collect information to draw up statistical summaries of commercial stocks

	# of responses
Less than 5 days per year	5
Between 6 and 15 days	8
Between 16 and 30 days	1
More than 30 days	3
Total	17

Questions 17 and 19: What is your estimate of the efforts in your organisation needed for these activities in man days per year?

For those who reported these commercial stocks before the entry into force of the new Directive (Q16), efforts have not changed or slightly increased for the large majority of respondents (Q18).

Table E-11 Evolution of efforts per year to draw up statistical summaries of commercial stocks held within their national territory

	# of responses
No change	8
Efforts increased by 10%	1
Efforts increased by 50%	3
Total	12

Question 18: What is your estimate of the increase or decrease in these efforts in comparison to the situation prior to 2013 (ideally as a % of the previous efforts)?

Respondents were asked to suggest any ways in which the reporting on emergency and commercial stocks could be simplified (Q20). The majority of respondents underlined that the current situation does not raise specific problems and that they are satisfied with it. A comment that was made several times is a request for an online reporting system, but this depends on the national processes.

Other suggestions that were made include:

- Align with the IEA by removing the distinction between the two;
- Annual report (Directive Article 6) should be standardised and identical for all Members States;
- Base the reporting on sales volumes instead of import and exports;
- Introduce database for European ticket arrangements;
- The Directive should include an EU-wide unified table, linking customs codes (CN codes) of the various feedstocks / products, while remaining consistent with reporting requirements of Eurostat. A stock platform on an EU level useable by both MS administrations as well as operators (CSE, industry) could integrate both control and administration;
- We find it very resource demanding to complete the reporting under the current set of rules. We find it unnecessarily detailed. Given the reason for reporting (e.g. in case of an emergency or supply crisis) we find no reason to be so detailed. It seems like statistic reporting and not emergency reporting.

Finally, respondents were invited to make any other comments on the Directive (Q21). Comments were as follows:

- There is hardly any added value for the separate EU Table compared to the IEA Table on emergency stocks. So skip the separate EU Table;
- Include all stocks even tank bottoms as these volumes are available on request;

- It is better the type of the stocks to be clearly defined, thus the calculation of the levels will take an equal basis;
- Specific stocks are another administrative burden. We suggest to skip this part of directive;
- The reporting cost is insignificant for us as it is minimum. The significant costs are the Financing of the owned stocks, the rentals of storage and the tickets that we have;
- There is a discrepancy across Europe with regards to the eligibility of certain feedstocks/products to cover the various CSO categories: Some feedstocks/products are eligible for CSO coverage in one country but not in another. This is in contradiction with the objective of the Directive, which is to create a transparent market leading to a more level playing field across Europe for CSO costs. To avoid inconsistency, we believe that the directive ought to: - Ensure a level playing field by harmonising among Member States; - Comprise an EU-wide unified table, linking custom codes (CN codes) of the various feedstocks/products with their eligibility for CSO coverage (several categories could be possible for one product), Ideally, an EU electronic platform as mentioned in question 20 would not only simplify workings and enhance communication between MS / CSE's / industry, but also allow the EU to react more swiftly in case of an emergency that required stock release;
- We suggest to review the need of the yearly article 9.5. report.

Annex F – Background to the Directive

Introduction

In this annex we briefly present the history of EU emergency stock policies from the first Directive in 1968 until Directive 2006/67, followed by a description of the main similarities and differences between Directive 2009/119 and its predecessor, Directive 2006/67. In this section we also compare Directive 2009/119 with the IEA system, given the efforts that were undertaken to harmonise the EU system and the IEA system.

From Directive 68/414 to Directive 2006/67

The 1968 Directive

In 1968, the European Economic Community issued its first Directive on emergency oil stocks. Council Directive 68/414/EEC obliged the Community's Member States (six at the time[112]) to hold a minimum amount of stocks, calculated on the basis of the country's internal consumption and production. Directive 68/414 was modified in 1972[113] and 1998[114] by further Directives, and these three Directives were consolidated in 2006.[115]

Directive 68/414 required Member States to maintain stocks corresponding to 65 days of average domestic consumption of each of the following three product categories:[116]

1. Motor spirit and aviation fuel.
2. Gas oil, diesel oil, kerosene and jet-fuel of the kerosene-type.
3. Fuel oils.

The obligation was calculated as an aggregation of the final tonnage of consumption of these product categories in the preceding year. Stocks could be composed of final products as well as intermediate products or crude oil. However, only final products could be accounted for in the actual tonnage, whereas for quantities of intermediate products and crude oil a technical deduction was required to make them equivalent to the products of each category.[117] Consequently, any of the three categories could include stocks of crude oil, but these stocks would be calculated differently according to the category it was being stocked for. Countries' calculations were not uniform across the Community, and were based on technical measures, such as the quantity of crude oil needed for the production of the products in the respective categories.

In order to comply with the Directive, the stocks needed to meet certain general requirements. The Directive listed the stocks that could be counted (in terms of where they were kept) and those that could not be counted for meeting the obligation.[118] For example, stocks in gas stations, in pipelines or those held for military purposes did not qualify. However, there were no restrictions on private

[112] Belgium, France, Germany, Italy, Luxemburg and the Netherlands.
[113] Council Directive 72/425/EEC.
[114] Council Directive 98/93/EC.
[115] Council Directive 2006/67/EC.
[116] Article 3 of Council Directive 68/414/EEC.
[117] Article 5 of Council Directive 68/414/EEC.
[118] Article 6 (3) of Council Directive 68/414/EEC.

ownership of emergency stocks, and all stocks held by companies could be counted towards meeting the obligation if these stocks met the requirements of the Directive.

Another important provision of Directive 68/414 referred to oil-producing countries. These countries could deduct a maximum of 15%[119] from their stockholding obligation, depending on the production of products made from indigenous oil production.

Subsequent changes in the Directives of 1972, 1998 and 2006

The requirement that Member States had to keep oil stocks according to the three product categories, and that their obligations could be reduced depending on the level of indigenous production were preserved in the Directives of 1972, 1998 and 2006. However, some of the specific rules related to these main elements of Directive 68/414 changed in the Directives that followed.

The first change occurred with Directive 72/425, which increased the oil stockholding obligation of each Member State from 65 days to 90 days of average inland consumption in the previous year for each of the three product categories. Subsequently, Directive 98/93 increased the maximum deduction of the stockholding obligation of countries with indigenous production from 15% to 25%. This change reduced the emergency stocks obligation for the UK and Denmark at the time, the latter being the only net exporter of oil in EU-15. Finally, Directive 2006/67 consolidated the rules set out in the three previous Directives. It included a more detailed reporting obligation for the Member States, but did not change the stockholding obligations: Member States still had to hold 90 days of average inland consumption in three different product categories, with the possibility of deducting 25% from the stockholding obligation for countries with indigenous oil production.

The Directives allowed Member States to delegate their stockholding obligations to third parties, including having their stocks held in another Member State. The practice of delegating obligations is known as “ticketing.” The 1968 and 2006 Directives established some limitations to a Member State purchasing tickets abroad and cross-border stockholding required bilateral agreements between governments.[120]

Table 0-1Stockholding obligation introduced and changed from 1968 to 2006

	1968 Directive	1972 Directive	1998 Directive	2006 Directive
Stockholding obligation	65 days inland consumption for categories 1, 2 and 3	90 days inland consumption for categories 1, 2 and 3	No change	*The 2006 consolidated the rules introduced by the 1968 Directive and modified in 1972 and 1998*
Deduction for indigenous production	Up to 15% deduction (9.75 days)	No change	Up to 25% deduction (22.5 days)	

[119] Article 1 of Council Directive 68/414/EEC.
[120] Article 6 (2) of Council Directive 68/414/EEC

The IEA

In parallel to the stockholding system set up in the EU, an agreement was signed among various countries: the International Energy Agency was created in 1974. Signatories of this original agreement had the obligation to hold 60 days of oil stocks based on net imports. Net exporters were, therefore, exempt from any stockholding obligation. This obligation differed from that of the EU in that it made no reference to specific categories of oil products. The IEA obligation was increased to 70 days in 1976 and to 90 days in 1980. Countries which are members of both the IEA and the European Union have to comply with the two systems and provide the corresponding reports. Currently, of the 28 Member States of the EU, only 8 are not IEA members[121].

The 2009 Directive on Emergency Oil Stocks made the IEA and EU systems closer by harmonising calculation rules and eliminating the previous three product categories. The IEA requires net importers to hold 90 days of net imports as emergency stocks, whereas net exporters have no stockholding obligation. The EU Directive requires Member States to hold 90 days of net imports or 61 days of consumption, whichever is higher. The main harmonisations in calculation were that the EU adopted the IEA calculation rules for net imports (e.g. deducting the naphtha yield from primary products), the calculation rules for actual stocks (e.g. deducting 10% from total stocks) and the definitions of which storage facilities could and could not hold emergency stocks. However, some important differences between the systems remain, such as the treatment of commercial stocks.

Main differences between the 2006 and 2009 Directives

The 2009 Directive reformed the stockholding system in Europe in several fundamental ways. The six main differences between Directive 2009/119 and Directive 2006/67 relate to:

- stockholding obligation;
- composition of stocks;
- obligation calculation;
- stocks calculation;
- cross-border tickets;
- reporting obligations.

These differences are discussed in turn below and summarised in Table 3-2, which also highlights the commonalities and differences with the IEA requirements.

Stockholding obligation

The 2006 Directive obliged Member States to hold stocks equivalent to 90 days of internal consumption. Since most European countries have little or no indigenous oil production, this rule was close to the 90 days net imports required by the IEA, which in effect is 100 days as the IEA applies a 10% deduction on all stocks. The 2009 Directive replicated IEA's 10% deduction for calculating oil stocks[122]. According to the new rule, Member States are obliged to hold 90 days of *net imports* (like the IEA) or 61 days of internal consumption, whichever is higher.[123] With the 10% deduction, this means that countries have to hold 100 days of net imports or 67.8 days of average daily internal consumption. Only four Member

[121] The eight MS that are not members of the IEA are: Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta, Romania and Slovenia.
[122] Annex III of Council Directive 2009/119/EC.
[123] Article 3 of the Council Directive 2009/119/EC.

States (Denmark, Estonia, Romania and the United Kingdom) fall under the 61-day rule, so for the other 24 Member States the EU obligation is exactly the same as the IEA requirement.

The 61-day rule reflects the benefit granted by Directive 2006/67 to countries with indigenous production: the UK and Denmark were allowed to deduct 25% of their obligation to maintain 90 days of average internal consumption, meaning that they had to hold 67.5 days. Under the 2009 Directive, these countries have to hold 67.8 days of average internal consumption (61 days plus 10% deduction), which means that the obligation remained practically the same for them.

Composition

In Directive 2006/67 the stockholding obligation was calculated for three different categories of finalised products. Though intermediate products and crude oil stocks could be used to comply with these obligations, Member States needed to comply with each of the three categories individually. The 2009 Directive abolished these categories, imposing one single aggregated obligation and simplifying the calculations for compliance checks. This is in line with the IEA requirements.

The Directive differs from the IEA in establishing rules on the composition of the stocks. Every Member State has to choose between two alternatives:[124] either it holds at least 1/3 of its stockholding obligation in finished products or it opts to hold at least 30 days of so called "specific stocks." Specific stocks are required to be owned by the Member State or the CSE set up by it, and they need to be stored within the geographical boundaries of the European Union.

The choice for holding specific stocks implies further obligations. Each Member State holding at least 30 days of specific stocks has to keep a detailed register; stricter rules apply when storing specific stocks commingled with other stocks; and an "unconditional immunity from enforcement action" applies to specific stocks. The "unconditional immunity" means that specific stocks cannot be given as collateral for loans, for example, which increases the cost of holding these stocks.

Obligation calculation

The level of minimum stocks that each Member State must hold is either 90 days (100 days with the 10% deduction) of *net imports* or 61 days (67.8 days) of *inland consumption*. The calculation of both average daily net imports and average daily inland consumption is made in tonnes of crude oil equivalent, and calculated according to rules laid out in the Directive. In Directive 2006/67 the calculation was made based on tonnes of products of each of the three categories.

For the calculation of net imports, the Directive requires the consideration of all crude oil, natural gas liquids (NGL), refinery feedstocks, other hydrocarbons and finalised products excluding naphtha.[125] The quantities of crude oil, NGL, refinery feedstocks and "other hydrocarbons" (as defined in the Regulation) are adjusted by deducting 4% for naphtha yield (to account for the use of these materials for non-energy purposes, i.e. in the chemical industry). However, if the actual naphtha yield in the Member State is calculated to be above 7%, the full naphtha yield or the net naphtha consumption may be deducted from the obligation. After the naphtha yield deduction, the net imports of all products (except naphtha) are summed up. The total amount is then multiplied by 1.065, as an approximate

[124] Article 9 (5) of Council Directive 2009/119/EC.
[125] Annex I of Council Directive 2009/119/EC.

measure to calculate the crude oil equivalent. The methodology to calculate net imports is identical to that of the IEA.

For the calculation of inland consumption[126] (which in recent years applied to Denmark, Estonia, Romania and the UK), only the following products are taken into account: motor gasoline, aviation gasoline, gasoline-type jet fuel, kerosene-type jet fuel, other kerosene, gas/diesel oil and fuel oil. The crude oil equivalent is calculated by multiplying the sum of these products by 1.2.

One major difference in comparison to the previous Directive is the explicit inclusion of biofuels in the calculation, though they only count for calculating the obligation when they have been blended with the products listed in the Regulation.[127]

The obligation for one given year is calculated as the average daily net imports or average inland consumption over the whole preceding year beginning on 1 January and finishing on 31 December. The obligation starts to be binding on 1 April.[128] This means that, up to 31 March in a given year, a Member State's obligation is calculated according to the net imports (or inland consumption) of two years earlier, but as from 1 April it is based on the figures for the previous year. Under the IEA rules, countries have until 30 April to calculate and adapt the newly calculated obligation (reflecting the fact that the IEA requires that the changed obligation needs to be met at the end of the month and not at the beginning of the month). In this respect, the 2006 Directive was much more flexible, in that it required Member States to recalculate their obligations by 31 March but gave them up until 31 July to comply with the newly established obligation.[129]

Stocks calculation

The calculation of the level of the emergency stocks is the same for the 90-days and 61-days countries. It is also harmonised with the IEA, except for one important difference: the 2009 Directive makes a distinction between "commercial stocks" and "emergency stocks." According to the Directive, "commercial stocks" are stocks held by economic operators above the levels required by national legislation for compliance with the Directive.[130] Under previous Directives (and still under the IEA rules), this distinction was not made for compliance purposes, and all stocks were counted, as long as they fitted the general requirements of location and composition.

Several Member States impose stockholding obligations upon economic operators, so that a certain amount of stocks must be accessible and available for emergency situations. Stocks held in addition to the stockholding obligation by an economic operator are considered as "commercial stocks" and are excluded from the calculation of the (total) emergency stocks. In addition, stocks held by CSEs or governments are counted as emergency stocks if they are held for this purpose.

The Directive also changed and standardised the calculation procedures for emergency stocks, replicating the IEA methodology. Under the 2006 Directives, stocks were calculated separately for each of the three product categories, and the calculation unit was "tonnes of product" of the category. Any

[126] Annex II of Council Directive 2009/119/EC.
[127] Article 16 of Council Directive 2009/119/EC.
[128] Article 3 (3) of Council Directive 2009/119/EC.
[129] Article 4 (2) of Council Directive 2006/67/EC.
[130] Article 2(k) of Council Directive 2009/119/EC.

crude oil held under that category had to be transformed in equivalent tonnes of product, using actual values of input-output ratios.[131]

The methodology in the 2009 Directive is more straightforward.[132] Instead of calculating the levels in terms of tonnes of product equivalent, stocks are calculated in crude oil equivalent. Crude oil stocks are themselves deducted by 4%, corresponding to an assumed naphtha[133] yield[134]. Stocks of products are multiplied by 1.065 or, if only a limited range of products are considered, by 1.2.
As mentioned above, after calculating the oil equivalent of each stock and summing them, under the 2009 Directive a deduction of 10% applies, as in the IEA methodology.

Overall the type of stocks that can be counted towards the obligation did not substantially change from the 2006 to the 2009 Directive, although the kinds of storage facilities that are allowed are not described in exactly the same words.

Cross-border tickets and delegation

Since the 1968 Directive Member States have been allowed to hold stocks abroad,[135] but bilateral agreements were required (also in the 2006 Directive) between the two countries concerned.[136] The 2009 Directive lifted the need for countries to sign bilateral agreements in order to hold stocks abroad. However, Member States are still allowed to limit the extent to which obligated parties may keep stocks abroad.[137]

The delegation of stockholding obligations (tickets) was not explicitly regulated by the previous Directives, which merely acknowledged the possibility of holding stocks abroad and set conditions for this to happen. The 2009 Directive, however, explicitly guarantees that obligated parties, particularly economic operators, have the right to delegate at least part of their obligation to a third party.[138] In particular, economic operators with a stockholding obligation shall always have the right to delegate at least 10% of their obligation, and by 31 December 2017 this amount will increase to 30%.[139] The sub-delegation (tickets of tickets) of the obligation is however explicitly forbidden in the 2009 Directive.

Reporting obligations

The 2006 Directive required Member States to report to the Commission on the size of emergency oil stocks (for each of the product categories) on a monthly basis. The requirement for monthly reporting was continued in the 2009 Directive, although the content of this report changed substantially because of the newly formulated stockholding obligations. The monthly report also includes the levels of commercial stocks.[140] In addition to the monthly report, each Member State has to submit an annual report to the Commission on the quantities and location of the emergency stocks that are not classified

[131] Article 5 (2b) of Council Directive 2006/67/EC.
[132] Annex III of Council Directive 2009/119/EC.
[133] In the petrochemical industry, naphtha is a general term for the petroleum products that emerge first during the refining process of crude oil to create any other type of petroleum product (distillation). Since there are many types of crude oil and refining techniques, many different types of naphtha type products exist (in terms of chemical composition), but they are often classified as light (paraffinic) or heavy naphtha. Naphtha is most often used as input for creating other petroleum products (naphtha for petrochemical use) or – with some further refining – as a basis for gasoline fuels (based on Pandey, 2004).
[134] Naphtha yield resembles a ratio that represents the volume of naphtha that is produced from a unit of refinery input (crude oil). More specifically, it is calculated by dividing the output of naphtha by the refinery inputs (crude oil or others).
[135] Article 6(2) of Council Directive 68/414/EEC.
[136] Article 7 of Council Directive 2006/67/EC.
[137] Article 5(1, second paragraph) of Council Directive 2009/119/EC.
[138] Article 8(1) of Council Directive 2009/119/EC.
[139] Article 8(2) of Council Directive 2009/119/EC.
[140] Article 13 of the Council Directive 200909/119/EC on specific stocks and Article 14 on commercial stocks.

by the Member State as specific stocks.[141] Countries which do not hold 30 days of specific stocks must also submit an annual report explaining measures taken to ensure the availability and accessibility of these stocks.[142]

While there used to be separate reporting flows to the EU and the IEA, these reporting flows were harmonised in the 2009 Directive with the introduction of the monthly oil stock questionnaire (MOS) that is used for reporting to both the EU and the IEA. Nevertheless, there are still differences, the main one being the fact that commercial stocks cannot count towards the obligation in the EU system.

[141] Article 6 of the Council Directive 200909/119/EC.
[142] Article 9 (5) of the Council Directive 2009/119/EC.

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