

Title: Compulsory Stocking Obligations on Refiners and Non-Refiners in the UK	Impact Assessment (IA)
IA No: DECC0176	Date: 27/10/2015
Lead department or agency: DECC	Stage: Consultation
Other departments or agencies: -	Source of intervention: EU
	Type of measure: Other
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Summary: Intervention and Options	RPC: GREEN
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Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB in 2014 prices)	In scope of One-In, Two-Out?	Measure qualifies as
-£10.11m	-£10.11m	£1.11m	No	N/A

#### What is the problem under consideration? Why is government intervention necessary?

##### Compliance with the EU Oil Stocking Obligation

The UK is obligated to hold emergency stocks of oil – by both the EU and the International Energy Agency (IEA) – primarily to release in a co-ordinated fashion with other members to the international market in the event of a major supply disruption. To meet our obligations, DECC directs oil companies (refiners and non-refiners) who supply significant amounts of oil products in the UK to hold emergency stocks. Company obligations currently differ between refiners and non-refiners. Refiners are obligated at 67.5 days of their supply while non-refiners are obligated at 58 days of their supply. As a result of changes to refiner/non-refiner UK market share and an updated EU Oil Stocking Directive, introduced in 2013 we need to update our obligations on UK companies. In addition, the total obligation on the UK is expected to increase from 2021 because the calculation for the UK obligation will change from 67.8 days of inland consumption to 100 days of net imports, which will exacerbate the shortfall without policy change.

Changes to the UK's CSO policy are therefore necessary in order to enable the UK to stay compliant with its international obligations.

#### What are the policy objectives and the intended effects?

The policy objectives are two-fold. Firstly, to ensure that the UK achieves compliance with the EU Directive in the near-term, following the revisions, maintaining the credibility of oil stocking as an essential energy security measure. Secondly, to ensure compliance is guaranteed in the future. This takes into consideration the likely change of the level of UK obligation in 2021 to 100 days of net imports, and the need to be resilient to changes in the relative market share of refiners and non-refiners in the UK.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

All options considered (including the baseline) reflect the fact that the policy would only come in to force from July 2016.

**The baseline:** The base case assumes that there is no change to the level of obligation until 2021 (year 6), resulting in UK non-compliance with the EU's oil stocking obligation. From 2021 it assumes the level of the obligation increases in line with projections of the UK obligation so that the UK is compliant in every year. Furthermore the base case assumes no change in the 9.5 day difference between the rate that refiners and non-refiners are obligated (no change to 'differential').

**Option One:** Increase the level of obligation on refiners and non-refiners in year 1 (Second half of 2016) to ensure compliance. Further increases to the level of obligation for both refiners and non-refiners from year 6, in line with the base case. Retain the 9.5 day differential.

**Option Two:** No increase in the level of obligation on companies until year 6, in line with base case, resulting in non-compliance before then. Maintain the 9.5 day differential until year 6, at which point the differential is eliminated. Both refiners and non-refiners' obligations would then increase in year 6 in line with increases in total obligation.

**Option Three:** No increase in the level of obligation on refiners until year 7, but reduce the differential to 5 days in year 1, meaning an increase in the obligation on non-refiners in year 1. In year 6, reduce the differential to 0. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards. This is the preferred option as it is the lowest cost option to achieving both policy objectives.

**Option Four:** Eliminate the differential entirely in year 1, with non-refiners obligations increasing to the current level on refiners. This ensures compliance from year 1. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards.

	Ensures compliance in the near-term	Compliance guaranteed in future (from 2021)*	Net Present Value (£m)
Option 1	Green	Red	-10.61
Option 2	Red	Green	0
Option 3	Green	Green	-10.11
Option 4	Green	Green	-21.35

\*Option 1 does not guarantee compliance in the future because the differential remains – a change in market share between refiners and non-refiners could leave the UK non-compliant.

**Will the policy be reviewed?**

We will keep the policy under review as required in line with Government's approach to meeting EU and other international obligations.

Does implementation go beyond minimum EU requirements?	No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	Micro No	< 20 No	Small No      Medium No      Large Yes
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)	Traded: N/A		Non-traded: N/A

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister: Andrea Leadsom Date: 27/10/2015

# Summary: Analysis & Evidence

# Policy Option 1

**Description:** Increase the level of obligation on refiners and non-refiners in year 1 to ensure compliance. Further increase the level of obligation for both refiners and non-refiners from year 6, in line with the base case. Retain the 9.5 day differential.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2015	PV Base Year 2015	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -17.70	High: -3.52	Best Estimate: -10.61

COSTS (£m)	Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	-	Years	0.8
High	-		2.0
Best Estimate	0		1.2

### Description and scale of key monetised costs by 'main affected groups'

Additional obligation costs:

The increase in costs is the cost of holding additional oil relative to the base case. Relative to the base case, the obligation on refiners and non-refiners is increased from year 1 to 5 to result in overall compliance. The present value of this cost is £10.6 million.

High and low estimates reflect higher/lower ticket prices relative to the base case.

### Other key non-monetised costs by 'main affected groups'

n/a

BENEFITS (£m)	Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	-	Years	0
High	-		0.5
Best Estimate	0		0

### Description and scale of key monetised benefits by 'main affected groups'

Benefits (high case only) reflect a lower ticket price relative to the base case.

### Other key non-monetised benefits by 'main affected groups'

The obligation is intended to ensure the UK has access to the agreed level of stocks to mitigate substantial global supply disruptions. This option ensures compliance from year 1 avoiding possible risks and costs associated with being non-compliant, but is not resilient to market changes (both pre and post 2021). Any further decline in refiners' market share could result in non-compliance without further changes to the level of obligation.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
A key assumption is that additional obligation changes are met through the purchase of tickets (options to buy stock held by third parties) rather than physical stocks. This assumption was tested extensively with industry and is intuitive given that storage in the UK is limited and expensive to build new and as such is cheaper to utilise tickets. The current low margin environment for the UK downstream sector also reduces incentives to build additional storage.		
The baseline assumes obligations on refiners and non-refiners are increased from 2021 to ensure the UK is compliant after 2020 when the obligation is projected to rise. The high and low ranges have assumed a +/- 1% difference in the ticket price. This is illustrative and captures some of the uncertainty.		

## BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:	In scope of OIOO?	Measure qualifies as
Costs: 1.2      Benefits: 0      Net: -1.2	No	N/A

# Summary: Analysis & Evidence

# Policy Option 2

**Description:** No increase in the level of obligation on companies until year 6, in line with base case, resulting in non-compliance before then. Maintain the 9.5 day differential until year 6, at which point the differential is eliminated. Both refiners and non-refiners' obligations would then increase in year 6 in line with increases in total obligation.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2015	PV Base Year 2015	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -6.99	High: 6.99	Best Estimate: 0

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	-	Years	1.3	9.7
High	-		2.1	16.1
Best Estimate	0		1.5	11.2

### Description and scale of key monetised costs by 'main affected groups'

Additional obligation costs:

The increase in costs is the cost of holding additional oil relative to the base case. Relative to the base case, the obligation on non-refiners is increased from 2021 (from 62 days to 67.5 days in 2021). The present value of this cost (to 2035) is £11.2 million.

High and low estimates reflect higher/lower ticket prices relative to the base case.

### Other key non-monetised costs by 'main affected groups'

This option would not ensure compliance until 2021, exposing the UK to risks and costs associated with non-compliance.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	-	Years	1.2	9.1
High	-		2.1	16.7
Best Estimate	0		1.5	11.2

### Description and scale of key monetised benefits by 'main affected groups'

The saving is generated from a reduction in the obligation per year relative to the base case. Benefits accrue to refiners and offset the cost on non-refiners. Relative to the base case, the obligation on refiners is reduced from 2021 (from 71.5 days to 67.5 days in 2021). The present value of this benefit (to 2026) is £11.2 million which is the same as options 3 and 4.

High and low estimates reflect lower/higher ticket prices relative to the base case.

### Other key non-monetised benefits by 'main affected groups'

From 2021 the removal of the differential should make the system substantially more resilient because changes in market share between refiners and non-refiners would not reduce total stock holdings, and therefore would not affect UK compliance. The absence of a differential should increase the predictability and transparency of future obligations.

Key assumptions/sensitivities/risks	Discount rate (%)
A key assumption is that additional obligation changes are met through the purchase of tickets rather than physical stocks. This assumption was tested extensively with industry and is intuitive given that storage in the UK is limited and expensive to build new and as such is cheaper to utilise tickets.	3.5
The baseline assumes obligations on refiners and non-refiners are increased from 2021 to ensure the UK is compliant after 2020 when the obligation is projected to rise. The high and low ranges have assumed a +/- 1% difference in the ticket price. This is illustrative and captures some of the uncertainty.	

## BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m: Costs: 1.5	In scope of OIOO? No	Measure qualifies as N/A
Benefits: 1.5		

# Summary: Analysis & Evidence

# Policy Option 3

**Description:** No increase in the level of obligation on refiners until year 7, but reduce the differential to 5 days in year 1, meaning an increase in the obligation on non-refiners in year 1. In year 6, reduce the differential to 0. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards. This is the preferred option as it is the lowest cost option to achieving both policy objectives.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2015	PV Base Year 2015	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)					
			Low: -17.20	High: -3.03	Best Estimate: -10.11			
COSTS (£m)		Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)				
Low	-	-	2.2	18.4				
High	-		3.2	26.3				
Best Estimate	0		2.6	21.3				
<b>Description and scale of key monetised costs by 'main affected groups'</b>								
Additional obligation costs: The increase in costs is the cost of holding additional oil relative to the base case. Relative to the base case, the obligation on non-refiners is increased from 58 days to 62.5 days between year 1 and 2020 and further from 2021 (from 62.0 days to 67.5 days in 2021). High and low estimates reflect higher/lower ticket prices relative to the base case.								
<b>Other key non-monetised costs by 'main affected groups'</b>								
n/a								
BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)				
Low	-	-	1.2	9.1				
High	-		2.0	15.4				
Best Estimate	0		1.5	11.2				
<b>Description and scale of key monetised benefits by 'main affected groups'</b>								
Benefits accrue to refiners from 2021 relative to the base case. This is because the obligation on refiners is reduced from 71.5 days to 67.5 days in 2021. The benefits/savings from Option 3 are the same as for Option 2 and 4. High and low estimates reflect higher/lower ticket prices relative to the base case.								
<b>Other key non-monetised benefits by 'main affected groups'</b>								
The obligation is intended to ensure the UK has access to the agreed level of stocks to mitigate substantial global supply disruptions. This option ensures compliance from year 1, thereby avoiding potential risks and costs associated with being non-compliant, and is more resilient than the current system and Option 1 to market changes pre-2021 (although could be vulnerable to a significant market exit). From 2021 the removal of the differential should make the system substantially more resilient because changes in market share between refiners and non-refiners would not reduce total stock holdings, and therefore would not affect UK compliance. The absence of a differential should increase the predictability and transparency of future obligations. High and low estimates reflect lower/higher ticket prices relative to the base case.								
<b>Key assumptions/sensitivities/risks</b>				<b>Discount rate (%)</b>	3.5			
A key assumption is that additional obligation changes are met through the purchase of tickets rather than physical stocks. This assumption was tested extensively with industry and is intuitive given that storage in the UK is limited and expensive to build new and as such is cheaper to utilise tickets.								
The baseline assumes obligations on refiners and non-refiners are increased from 2021 to ensure the UK is compliant after 2020 when the obligation is projected to rise. The high and low ranges have assumed a +/- 1% difference in the ticket price. This is illustrative and captures some of the uncertainty.								

## BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: 2.6	Benefits: 1.5	Net: -1.1	No	N/A

# Summary: Analysis & Evidence

# Policy Option 4

**Description:** Eliminate the differential entirely in year 1, with non-refiners obligations increasing to the current level on refiners. This ensures compliance from year 1. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2015	PV Base Year 2015	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -27.14	High: -11.63	Best Estimate: -21.35

COSTS (£m)	Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Years			
Low	-	3.5	29.5
High	-	4.5	37.7
Best Estimate	0	3.9	32.6

### Description and scale of key monetised costs by 'main affected groups'

Incremental obligation costs:

The increase in costs is the cost of holding additional oil relative to the base case. Relative to the base case, the obligation on non-refiners is increased from 58 days to 67.5 days in year 1 2016 and increased further after 2021). The present value of this cost (to 2035) is £32.6 million.

High and low estimates reflect higher/lower ticket prices relative to the base case.

### Other key non-monetised costs by 'main affected groups'

n/a

BENEFITS (£m)	Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Years			
Low	-	1.2	9.1
High	-	2.0	15.4
Best Estimate	0	1.5	11.2

### Description and scale of key monetised benefits by 'main affected groups'

The saving is generated from a reduction in the obligation per year relative to the base case. Benefits accrue to refiners and offset the cost on non-refiners. Relative to the base case, the obligation on refiners is reduced from 2021 (from 71.5 days to 67.5 days in 2021). The benefits/savings from Option 4 are the same as for Option 2 and 3.

High and low estimates reflect lower/higher ticket prices relative to the base case.

### Other key non-monetised benefits by 'main affected groups'

The obligation is intended to ensure the UK has access to the agreed level of stocks to mitigate substantial global supply disruptions. This option ensures compliance from year 1, thereby avoiding potential risks and costs associated with being non-compliant. The removal of the differential should make the system substantially more resilient because changes in market share between refiners and non-refiners would not reduce total stock holdings, and therefore would not affect UK compliance. The absence of a differential should increase the predictability and transparency of future obligations.

Key assumptions/sensitivities/risks	Discount rate (%)
A key assumption is that incremental obligation changes are met through the purchase of tickets rather than physical stocks. This assumption was tested extensively with industry and is intuitive given that storage in the UK is limited whilst elsewhere in Europe purpose built storage exists and as such is cheaper to utilise.	3.5

The baseline assumes obligations on refiners and non-refiners are increased from 2021 to ensure the UK is compliant after 2020 when the obligation is projected to rise. The high and low ranges have assumed a +/- 1% difference in the ticket price. This is illustrative and captures some of the uncertainty.

## BUSINESS ASSESSMENT (Option 4)

Direct impact on business (Equivalent Annual) £m:		In scope of OIOO?	Measure qualifies as
Costs: 3.8	Benefits: 1.5	Net: -2.3	No N/A

# Evidence Base

## Executive Summary

1. Emergency oil stocks are a critical tool to defend against the harmful impacts of major disruptions to global oil supply. The UK is obligated to hold emergency stocks of oil – by both the EU and the International Energy Agency (IEA) – primarily to release in a co-ordinated fashion with other members to the international market in the event of a major supply disruption. Each EU Member State must hold stocks totalling the higher volume of 67.8 days of total inland consumption or 100 days of net imports. For the UK, our obligation is currently based on 67.8 days of inland consumption, but will eventually switch to the 100 day net import level as UK crude oil production declines. Based on independent (IPA) and internal DECC analysis, we assess this switch to happen in 2021 and from this time the total obligation will grow in terms of volume.
2. To meet our obligation, DECC directs oil companies (refiners and non-refiners) who supply significant amounts of oil products in the UK to hold stocks that could be released in an emergency. Company obligations currently differ between refiners and non-refiners. Refiners are obligated at 67.5 days of supply while non-refiners are obligated at 58 days of supply.
3. At the time that the policy to set company obligations at these levels was implemented, the levels enabled the UK to be compliant with its total obligation. This is no longer the case. As of January 2013, the UK no longer obligates enough to meet its total obligation. Prior to 2013 the gap between total company obligations and the total UK obligation had been covered, in part, by commercial stocks (stocks held by companies over and above their obligation) and offshore stocks (constantly replenished stocks related to North Sea production). Since the new EU Oil Stocking Directive came into force at the end of 2012, commercial stocks no longer count toward the obligation. This has affected the UK's compliance with its EU obligation. Another key factor is the substantial changes to the UK midstream oil market in recent years.
4. There is a risk of being fined by the EU Commission or facing other reputational consequences if EU Member States does not comply with their international obligations. Non-compliance by individual members also risks undermining the stocking system as others may be encouraged to 'free ride'.
5. The gap between company and the total UK obligation is likely to grow in the medium to long term as a result of: (i) a decline in refinery market share (because refiners are obligated at a higher level than non-refiners); (ii) the growth of the import market (obligated at lower level); and (iii) and, the switch of the UK obligation to a requirement to hold 100 days of average net daily imports rather than 67.8 days of average daily inland consumption.
6. A Government review of the UK's CSO policy is necessary in order to enable the UK to ensure compliance with its international obligations. This is important to maintain the credibility of oil stocking as an essential energy security measure.
7. The policy objectives set out in this Impact Assessment (IA) are subsequently two-fold:
  - I. To ensure that the UK achieves compliance with the EU Directive in the near-term, following the revisions, maintaining the credibility of oil stocking as an essential energy security measure.
  - II. To ensure that the UK compliance policy is such that compliance is guaranteed in the future. This takes into consideration the likely change of the level of UK obligation in 2021 to 100 days of net imports, and the need to be resilient to changes in the relative market share of refiners and non-refiners in the UK.
8. In choosing policy options we have considered the above objectives regarding compliance. In addition we have reflected on whether Minimum Operating Requirements, on which the differential is currently based, have changed substantially, and whether other factors, in particular the substantial changes to market share of non-refiners and refiners in recent years and the expected increase in size of the total obligation, are more relevant going forward.
9. We – and independent consultants (see para 23) – have discussed with industry whether MOR is likely to have changed, but the indications are that it has remained relatively stable. The analysis also concluded that changes in market share and the increasing size of the total obligation had a substantially greater impact on compliance with the obligation.

10. Therefore we have chosen options that test various ways to meet our compliance objectives, and with either a 9.5 day differential or moving to no differential at all (i.e. obligations on companies reflect entirely relative supply to market).
11. The policy options chosen for changing the level of obligations on UK companies are compared against a base case. The base case assumes that there is no change to the level of obligation until 2021 (meaning UK non-compliance until then). The base case assumes increased levels of obligation from 2021 in line with the overall anticipated in UK obligation. The base case assumes no change in the 9.5 day difference between the rate that refiners and non-refiners are obligated.
- **Option One:** Increase the level of obligation on refiners and non-refiners in year 1 to ensure compliance. Further increase the level of obligation for both refiners and non-refiners from year 6, in line with the base case. Retain the 9.5 day differential.
    - *Net present value of -£10.61m. This option meets objective 1 by ensuring compliance in year 1, but only to the extent there is no further decline in refiners' market share. This option does not meet the second objective of being resilient and responsive to future changes to the market. To remain compliant our policy would need revisiting on a regular basis, post 2021, resulting in administrative costs to DECC. As such this is not the preferred option.*
  - **Option Two:** No increase in the level of obligation on companies until year 6, in line with base case, resulting in non-compliance before then. Maintain the 9.5 day differential until year 6, at which point the differential is eliminated. Both refiners and non-refiners' obligations would then increase in year 6 in line with increases in total obligation.
    - *Net Present Value of £0. This option does not meet objective 1 by ensuring compliance with the EU directive in the near term. As such this is not the preferred option. Under this option the UK would be non-compliant with our EU obligations until year 6. UK non-compliance risks undermining the credibility of oil stocking as an essential energy security measure. This option does meet the objective of being resilient to market changes in the CSO post-2021.*
  - **Option Three:** No increase in the level of obligation on refiners until year 7. Reduce the differential to 5 days in year 1, meaning an increase in the obligation on non-refiners in year 1. In year 6, reduce the differential to 0. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards. This is the preferred option as it is the lowest cost option to achieving both policy objectives.
    - *Net Present Value of -£10.11m. This option meets objective 1 by ensuring that the UK is compliant with the EU Directive in year 1. It also meets the second objective of being resilient to market structure changes in the long run. Having a phased transition spreads the cost to business. This is the preferred option as it is the option that meets both objectives satisfactorily whilst minimising the cost to business.*
  - **Option Four:** Eliminate the differential entirely in year 1, with non-refiners obligations increasing to the current level on refiners. This ensures compliance from year 1. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards.
    - *Net Present Value of -£21.35m. This option meets objective 1 by ensuring that the UK is compliant with stocking regulations. It also meets the second objective of being resilient to changes in market structure in the long run. However, this is not the preferred option as it does not minimise cost to business and as such has the largest negative NPV of all options.*

**Summary table:**

Option	Differential	Compliant?	NPV
1	Remains at 9.5 days	Yes, but would need adjusting every year.	£-10.61m
2	Remains at 9.5 days until year 5. No differential from year 6 onwards.	Non-compliance until year 6.	£0m
3	Reduce differential to 5 days in year 1. No differential from year 6 onwards.	Yes	£-10.11m
4	No differential from year 1.	Yes	£-21.35m

Our preferred approach is option 3, which meets both of our objectives at the minimum cost to business.

## **Background**

12. The UK is required under EU Directive 2009/119/EC (the Directive) to hold oil stocks at the larger of 100 days of average net daily imports or 67.8 days of average daily UK inland consumption to mitigate the damaging effects of potential supply disruptions<sup>1</sup>. For the UK, as an oil producing country, 67.8 days of net daily inland consumption is currently the larger, equating to around 12 million tonnes crude oil equivalent of oil stocks that must be held. As UK crude oil production declines, the overall obligation will increase, and will eventually be based on 100 days of average net daily imports. Our estimate of when this switch will happen is 2021, and from this time the total obligation will grow in terms of volume. As a member of the IEA the UK also commits to maintain emergency oil stocks equivalent to at least 90 days of net oil imports. The IEA and EU obligations can be met with the same stockholdings and due to different reporting requirements the UK currently exceeds its IEA obligation.
13. The UK has always met these international obligations by directing individual companies who supply substantial quantities – more than 50,000 metric tonnes within a year – of refined product into the UK to hold stocks that can be used in an emergency. The DECC Secretary of State is able to direct companies to hold stocks using powers under the Energy Act 1976 (“the 1976 Act”) and the Oil Stocking Order 2012 (“the Order”). Under current policy and legislation, around 20 companies are obligated, primarily refiners and non-refiners.
14. Companies meet their individual obligations, directed by DECC, in either their own facilities in any EU Member State, or by arranging for another company to hold stocks on their behalf (this is done through contracts known as ‘tickets’). Tickets require approvals from the UK and (if the ticket is for stocks held outside of the UK) the other EU Member State government. In the UK, it is left to the market to decide how and where best to hold these emergency stocks. DECC continues to review this distribution and method of stockholding but at present there is a good geographical spread along the extent of the supply chain.
15. Details of individual obligations are sent to companies on a quarterly basis, and calculated based on companies’ market share. This is done by reference to companies’ supplies to market over a 12 month period, beginning 18 months before the obligated quarter and ending six months prior to the obligated quarter. Refiners and non-refiners are obligated at different levels, currently at 67.5 days of supplies for refiners and 58 days for non-refiners; the 9.5 day difference has been coined the ‘differential’.

## **Differential between refiners and non-refiners**

16. The current 9.5 day differential in obligation between refiners and non-refiners is currently based on the “Minimum Operating Requirement” (MOR) of different types of operator. The MOR is an indication of the level of stocks different types of operators (refiners and non-refiners) generally have in their facilities to remain operational. In 2006 it was concluded that the MOR for refiners was 9.5 days higher than non-refiners, hence the 9.5 day differential. In considering our review of the levels of obligation, we – and independent consultants (see para 23) – have discussed with industry whether MOR is likely to have changed, but the indications are that it has remained relatively stable. However, we have also explored whether other factors are more relevant in setting the obligation, in particular market share and the increasing size of the total obligation.

## **Current obligations and compliance**

17. The current 9.5 day differential was re-set following an independent review by Energy Market Consultants (UK) Ltd in 2006.
18. With the obligations on refiners at 67.5 days and non-refiners at 58 days, the UK does not obligate enough to meet its total obligation. Prior to the implementation of the Directive at the end of 2012 this shortfall in meeting our obligation was covered, in part, by offshore stocks (constantly replenished stocks related to North Sea production) and commercial stocks (stocks held by companies over and

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<sup>1</sup> Under the EU Directive, the obligations are actually set at the higher of 90 days of average net daily imports, or 61 days of average daily consumption. However, the Directive sets out that 10% of stocks are deemed inaccessible in ‘tank bottoms’ and therefore the obligations set out in this paper incorporate this.

above their obligation).<sup>2</sup> Since the introduction of the Directive, commercial stocks no longer count toward the obligation as they are not considered to be obligated stocks (companies are not directed to hold them).

19. Non-compliance is likely to become a bigger issue in the medium to long term resulting from market changes including refinery closures (i.e. those companies obligated at the higher level), the growth of the import market (obligated at lower level), and, in particular, when the UK switches to the 100 days of average net daily imports model from the current 67.8 days of average daily inland consumption.
20. The Government's policy to have a differential, with refiners obligated at a higher level, exacerbates our compliance issues under such market changes. For example, in the last five years the market share of non-refiners has more than doubled, which has driven a greater level of non-compliance.

### **Problem under consideration**

21. The change in the Directive meaning commercial stocks can no longer be counted, and changes in the market share of refiners and non-refiners over time, have meant that UK company obligations are not high enough to ensure compliance with the EU obligation, and this will continue without change to the current approach. Also the total amount of stocks the UK is required to hold is projected to rise as the UK Continental Shelf production declines, meaning the UK obligation will switch to 100 days of net imports. This raises further concern about the UK's ability to meet its obligation in the future.
22. In summary, the current level of obligations therefore need to be reviewed because:
  - A) Non-compliance with the EU's obligation risks damaging the credibility of oil stocking as an essential energy security measure.
  - B) The level of the UK's compliance deficit is likely to grow in the future resulting from market changes including refinery closures (i.e. those companies obligated at the higher level), the growth of the import market (obligated at lower level), and, in particular, when the UK switches to being obligated at 100 days of net imports.

### **Policy objective**

23. The policy objectives are two-fold:
  - 1) To ensure that the UK achieves compliance with the EU Directive in the near-term, following the revisions, maintaining the credibility of oil stocking as an essential energy security measure.
  - 2) To ensure that the UK compliance policy is such that compliance is guaranteed in the future. This takes into consideration the likely change of the level of UK obligation in 2021 to 100 days of net imports, and the need to be resilient to changes in the relative market share of refiners and non-refiners in the UK.

### **Description of options considered (including do nothing):**

24. In choosing policy options we have considered the above objectives regarding compliance. In addition we have reflected on whether Minimum Operating Requirements, on which the differential is currently based, have changed substantially, and whether other factors, in particular the substantial changes to market share of non-refiners and refiners in recent years and the expected increase in size of the total obligation, are more relevant going forward. Independent analysis commissioned by DECC on the factors affecting compliance going forward indicated that MOR had stayed relatively stable, but changes in market share and the total obligation had a substantially greater impact. We have chosen options that test various ways to meet our compliance objective; including with either a 9.5 day differential today or no differential at all (i.e. obligations are the same for all operators, therefore relative share of stocks reflects relative supply to market). Note that testing different variations of the differential that lie within the spectrum of the options have not been presented as

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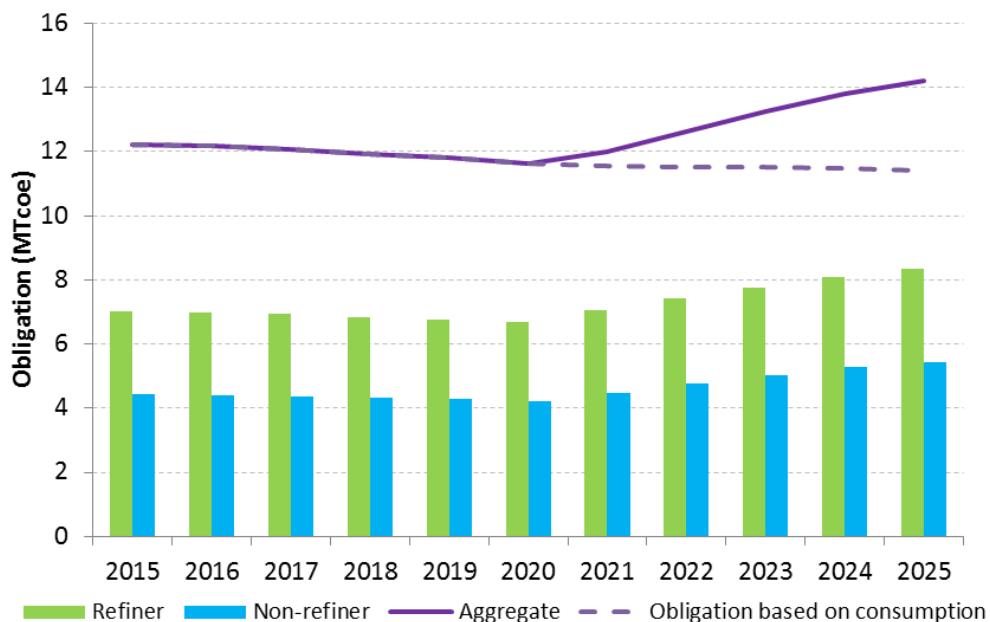
<sup>2</sup> The level at which companies are now obligated also factored in the ability to count 'offshore' stocks (offshore stocks are considered to be working stocks, not commercial stocks, and comprise produced crude in storage tanks attached to certain producing fields) held by companies toward the obligation, as these stocks are counted towards the overall UK stockholdings. It was understood when the levels were last reviewed that offshore stocks may not always be able to meet the shortfall and that the overall level of obligation on companies may need to be increased to account for this.

they will simply lie in between those presented either in terms of compliance/non-compliance or total cost.

25. The policy options chosen for changing the level of obligations on UK companies are compared against a base case. Impacts in year 1 are lower than subsequent years to reflect the policy change coming into effect half way through the calendar year.
26. **Base case:** assumes that there is no change to the level of obligation until 2021 (year 6), resulting in UK non-compliance with the EU's oil stocking obligation. From 2021 it assumes the level of the obligation increases in line with projections of the UK obligation so that the UK is compliant in every year. Furthermore the base case assumes no change in the 9.5 day difference between the rate that refiners and non-refiners are obligated (no change to 'differential')..

Appraisal year year	Historic 2H 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2025
<u>Obligation (days consumption)</u>											
Refiner	67.5	67.5	67.5	67.5	67.5	67.5	71.5	75.5	79.5	83.0	86.0
Importer	58.0	58.0	58.0	58.0	58.0	62.0	66.0	70.0	73.5	76.5	
Differential	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

**Chart:** Shows the projection of the overall obligation and the implied levels of non-refiner and refiner obligations under the base case.



- **Option One:** Increase the level of obligation on refiners and non-refiners in year 1 to ensure compliance. Further increases to the level of obligation for both refiners and non-refiners from year 6, in line with the base case. Retain the 9.5 day differential.

Appraisal year year	Historic 2H 2016	1 2017	2 2018	3 2019	4 2020	5 2021	6 2022	7 2023	8 2024	9 2025	10 2025
<u>Obligation (days consumption)</u>											
Refiner	67.5	69.5	69.5	69.5	69.5	69.5	71.5	75.5	79.5	83.0	86.0
Importer	58.0	60.0	60.0	60.0	60.0	60.0	62.0	66.0	70.0	73.5	76.5
Differential	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

- **Option Two:** No increase in the level of obligation on companies until year 6, in line with base case, resulting in non-compliance before then. Maintain the 9.5 day differential until year 6, at which point the differential is eliminated. Both refiners and non-refiners' obligations would then increase in year 6 in line with increases in total obligation.

<b>Appraisal year</b>	<b>Historic</b>	<b>1 2H 2016</b>	<b>2 2017</b>	<b>3 2018</b>	<b>4 2019</b>	<b>5 2020</b>	<b>6 2021</b>	<b>7 2022</b>	<b>8 2023</b>	<b>9 2024</b>	<b>10 2025</b>
<b>Obligation (days consumption)</b>											
Refiner	67.5	69.5	69.5	69.5	69.5	69.5	71.5	75.5	79.5	83.0	86.0
Importer	58.0	60.0	60.0	60.0	60.0	60.0	62.0	66.0	70.0	73.5	76.5
Differential	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

- **Option Three:** No increase in the level of obligation on refiners until year 7, but reduce the differential to 5 days in year 1, meaning an increase in the obligation on non-refiners in year 1. In year 6, reduce the differential to 0. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards. This is the preferred option as it is the lowest cost option to achieving both policy objectives.

<b>Appraisal year</b>	<b>Historic</b>	<b>1 2H 2016</b>	<b>2 2017</b>	<b>3 2018</b>	<b>4 2019</b>	<b>5 2020</b>	<b>6 2021</b>	<b>7 2022</b>	<b>8 2023</b>	<b>9 2024</b>	<b>10 2025</b>
<b>Obligation (days consumption)</b>											
Refiner	67.5	67.5	67.5	67.5	67.5	67.5	67.5	71.5	75.5	79.0	81.5
Importer	58.0	62.5	62.5	62.5	62.5	62.5	67.5	71.5	75.5	79.0	81.5
Differential	9.5	5.0	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0

- **Option Four:** Eliminate the differential entirely in year 1, with non-refiners obligations increasing to the current level on refiners. This ensures compliance from year 1. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards.

<b>Appraisal year</b>	<b>Historic</b>	<b>1 2H 2016</b>	<b>2 2017</b>	<b>3 2018</b>	<b>4 2019</b>	<b>5 2020</b>	<b>6 2021</b>	<b>7 2022</b>	<b>8 2023</b>	<b>9 2024</b>	<b>10 2025</b>
<b>Obligation (days consumption)</b>											
Refiner	67.5	67.5	67.5	67.5	67.5	67.5	67.5	71.5	75.5	79.0	81.5
Importer	58.0	67.5	67.5	67.5	67.5	67.5	67.5	71.5	75.5	79.0	81.5
Differential	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Modelling and Analysis

27. The following section sets out the method and modelling framework we have used to monetise the costs and benefits.

### Data and Assumptions

28. We have drawn heavily on the IPA&MUSE study commissioned in 2014 by DECC<sup>3</sup>. Assumptions were discussed with industry and a draft version of the model was sense checked with industry. Note that whilst we use the IPA&MUSE study as a foundation we adjust their market share assumptions in our baseline. We assume market shares of refiners and non-refiners remain constant over the appraisal horizon and changes to this have been tested as a sensitivity. This provides greater clarity over the impact of changes to market shares. The table below shows the data sources and key assumptions in this impact assessment.

<sup>3</sup> The Model was commissioned to test sensitivities such as market share of suppliers and size of the differential on the ability of the UK to meet its overall obligation.

Assumption	Source	Description
Total oil consumption	DECC statistics	Projected oil products consumption adjusted to exclude bunker fuel and converted into MT
Total oil production	DECC statistics	Projected crude oil production including NGLs
Market share	DECC statistics	Estimated non refiner/refiner market share of supply to market of obligated products
Proportion of obligated product consumption of total consumption	DECC statistics	Calculated using DUKES table 3.13
Overall obligation	-	DECC modelling using inputs above

29. The analysis from IPA and our own analysis indicated that of the sensitivities tested, market share and oil production had a significantly greater impact on stock levels held towards the obligation and costs than the size of the differential between different operators. In testing different sizes of differential it was also identified that the impact of this was relatively small. Therefore in setting out policy options in this impact assessment we have considered options that, in broad terms, either have a differential at the level it is at today or have no differential at all.

#### *Granularity of obligations*

30. We have assumed that obligation levels will be set in 0.5 day increments.

#### *Monetised Costs*

31. Cost of holding oil: The cost of holding oil can be considered to be the physical cost of storing the oil (e.g. tank fees and maintenance) plus the opportunity cost of alternative returns that could have been earned by using the capital for something else. The costs of holding additional stock for any one firm will ultimately depend on how they chose to meet the obligation - whether through holding physical stocks or by purchasing tickets<sup>4</sup>. However, the ticket cost must implicitly reflect the cost of holding oil. We have assumed that all incremental obligations above the current level are met through tickets. Therefore the costs of any additional obligation is considered to be the total amount of additional oil multiplied by the cost of tickets needed to cover that additional quantity. Note that admin costs have not been included as the additional admin cost of maintaining the incremental obligation is negligible. This is because obligated companies already devote resource to managing their obligation and this change does not pose a substantive additional burden as it simply involves increases/decreases to ticket purchases. Note that in high / low estimates the difference between the central estimate in monetised costs reflects the difference in ticket prices paid by both refiners and non-refiners.

<sup>4</sup> Companies largely meet their obligations through stocks held in the UK. Their obligations can also be met through contractual arrangements with other companies either within the UK or based elsewhere in the EU, determining that they will hold relevant products for a specified period of time, and make these available to purchase at market price should they be required ("bilateral tickets"). These "tickets" are rights to withdraw oil stocks held under the CSO Reservation Agreement.

## *Non-Monetised Costs*

32. There is a risk of being fined by the EU Commission or facing other reputational consequences if the UK does not comply with its international obligations. Given the uncertainty and the circumstance specific nature of the costs these have not been monetised, however, as the Commission would have to follow a lengthy process if it did decide to challenge the UK's compliance with the obligation, DECC would have time to respond to any such proceedings.
33. Non-compliance by individual members risks undermining the stocking system as others may be encouraged to 'free ride'. Potential costs of non-compliance spreading leading to an unravelling of the system could be significant in the event of a global supply disruption. However this level of unravelling considering the scale of non-compliance at the moment is extremely unlikely. A supply disruption that needed stock releases greater than volumes of oil currently stocked even by non-compliant countries would need to be enormous and historically unprecedented.

## *Monetised Benefits*

34. The saving generated from any reduction in obligation year on year relative to the base case has been monetised by modelling the reduction in spending on tickets. In all options considered where the differential is removed these accrue to refiners, as their obligations are lower than compared with the base-case. Note that in high / low estimates the difference between the central estimate in monetised benefits reflects the difference in ticket prices paid by both refiners and non-refiners.

## *Non-Monetised Benefits*

35. Greater clarity on the future of obligation levels and the size of any differential should make it easier for companies to plan more effectively. Changes that ensure the system allows for compliance now and in the future regardless of changes to the UK downstream oil market should also help ensure a clearer system for operators and government. Meeting the obligation also ensures the UK has access to the agreed level of stocks to be able to mitigate substantial global supply disruptions.
36. The CSO obligations fall on business and costs (benefits) have been treated as costs (benefits) to business. Given the low margin environment with which the sector operates in it is likely that in practice costs will be passed through to consumers. The implications of this are discussed under the wider impacts section.

## **Cost Benefit Analysis**

Establishing a base case:

37. As per Green Book guidance, an appraisal period of 10 years (beginning in 2016) has been used to best represent the time horizon of impacts of the policy and capture the medium term issue of the problem under consideration. Given there are significant uncertainties surrounding the sector over the long term a longer appraisal horizon does not seem appropriate. As the policy under consideration is the level at which refiners and non-refiners are obligated and the 'differential' between them the baseline with which to assess options has been modelled as continuation of the status quo. The 9.5 day differential in obligation is maintained over the appraisal horizon.
38. The base case assumes the current non-compliance with the Directive remains until 2021, as the level at which companies are obligated remains as it is now. The base case then assumes that in 2021 the UK would switch from an obligation of 67.8 days of daily inland consumption to 100 days of daily imports, at which point new obligation levels would have to be set. It is assumed that at that point the new levels would be set so that the UK was compliant. From 2021 it is assumed that obligations would be adjusted each year (if necessary) in increments of 0.5 days to ensure the UK in aggregate was just compliant. Para 25 sets out the assumed level of obligation (in days) on refiners and non-refiners in each year for the base case and the other options.
39. The overall level of the obligation is determined by the projected levels of UK oil production and UK consumption respectively (see data and assumptions). In addition the current market share of refiners and non-refiners remains unchanged over the appraisal horizon however this has been tested as a sensitivity. The proportion of consumption accounted for by obligated products also remains constant. This has not been tested in isolation as a sensitivity but has the same impact as a change to the obligation through alternative consumption and/or production profiles. The ticket price remains the same in real terms and has been tested as a sensitivity.

40. The same level of 'offshore' stocks counted toward the obligation as today remains constant in the base-case, and across all options. This is the lowest recent level of offshore stocks recorded, which was 0.45m tonnes.

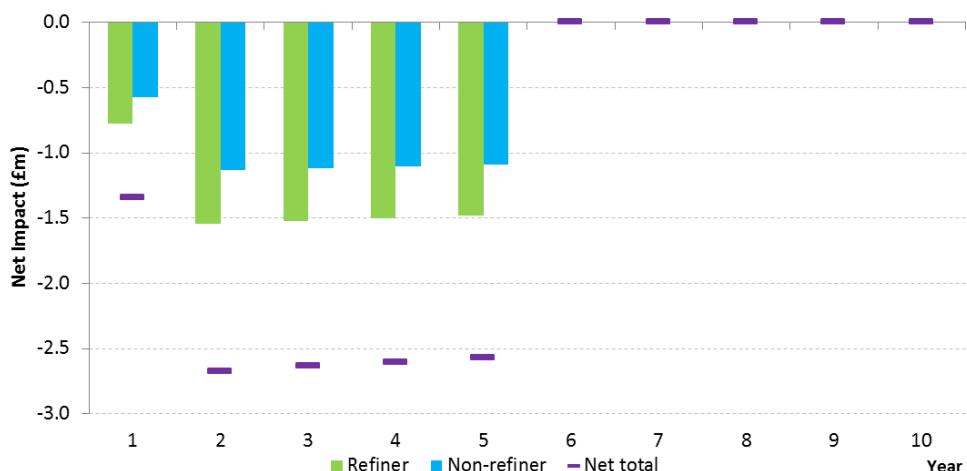
41. The impact of changes to some of these status quo assumptions are tested in the sensitivities section.

**Option 1: Increase the level of obligation on refiners and non-refiners in year 1 to ensure compliance. Further increases to the level of obligation for both refiners and non-refiners from year 6, in line with the base case. Retain the 9.5 day differential.**

42. The current 9.5 day difference between refiners and non-refiners is retained but obligations are increased to ensure compliance rather than delaying until 2021 as in the base case. (This is equivalent to increasing the total obligation to 69 days of consumption). The level of days obligation on market players is broken down in para 25.

43. The NPV of this policy is -£10.61m. This is driven by the increase in costs each year of a higher obligation until year 6 where the obligation was projected to increase in the base case anyway. The chart below illustrates the net impact per year between refiner and non-refiner.

**Chart 1: Option 1 costs vs base case**



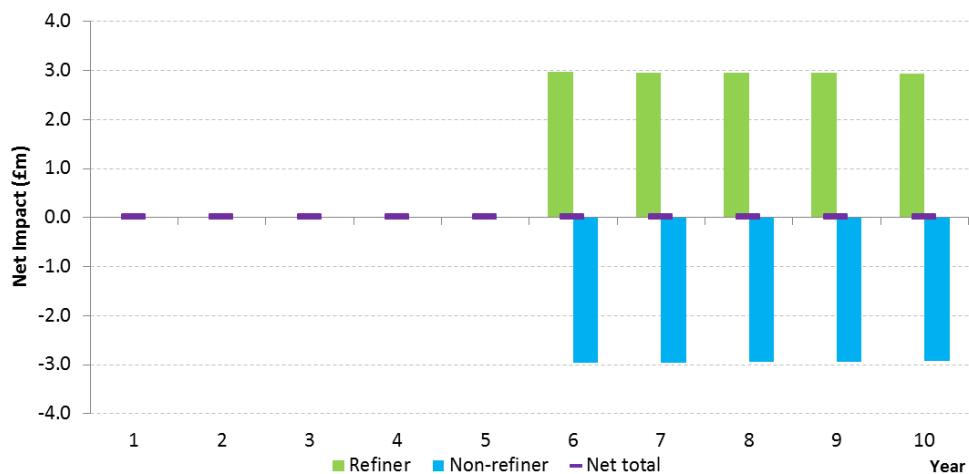
44. This option meets objective one by ensuring that the UK is compliant with the EU obligation before 2021, but only to the extent there is no further decline in refiners' market share. However, this option does not meet the second objective of being resilient to future market changes. To remain compliant our policy would need revisiting on a regular basis, post 2021, resulting in administrative costs to DECC and greater uncertainty for industry. As such this is not the preferred option.

**Option 2: No increase in the level of obligation on companies until year 6, in line with base case, resulting in non-compliance before then. Maintain the 9.5 day differential until year 6, at which point the differential is eliminated. Both refiners and non-refiners' obligations would then increase in year 6 in line with increases in total obligation.**

45. This option is also assessed against the base case and entails a policy change to remove the differential in obligation that becomes effective in 2021 (year 6), the same year as the overall obligation is projected to rise in the base case and changes in obligations will be required anyway.

46. The NPV of this policy is £0m. Over the horizon the annual cost to non-refiners of a higher obligation relative to the base case is offset by the benefit to refiners of a lower obligation. The chart below illustrates the net impact per year between refiner and non-refiner.

**Chart 2: Option 2 costs vs base case**

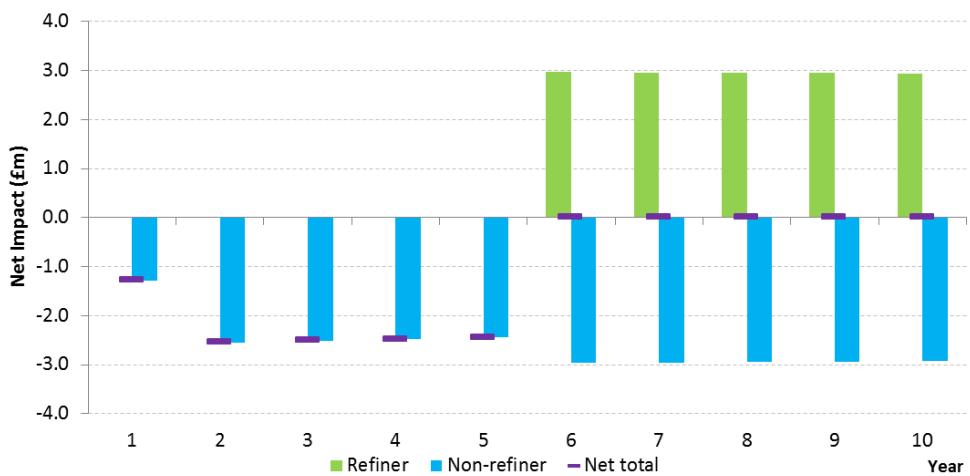


47. Whilst non-compliant until year 6, this option risks damaging the UK's credibility in negotiating with the EU on other matters, and the credibility of oil stocking as an essential energy security measure.
48. While this option meets objective two of being resilient to market changes in market share over the long run it does not meet objective one in that the UK remains under compliant until year 6. As such this is not the preferred option.

**Option 3: No increase in the level of obligation on refiners until year 7, but reduce the differential to 5 days in year 1, meaning an increase in the obligation on non-refiners in year 1. In year 6, reduce the differential to 0. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards. This is the preferred option as it is the lowest cost option to achieving both policy objectives.**

49. This option is assessed against the do nothing baseline and entails a policy change to remove the differential in two phases, first reducing it to 5 days in year 1 and to 0 days in 2021 (year 6). This would be done by increasing the obligation on non-refiners in time to a level which is the same as refiners.
50. The NPV of this policy is -£10.11m. This is driven primarily by the increase in obligation for non-refiners relative to the base case as the differential is reduced in year 1. From year 6 onwards the annual cost to non-refiners of a higher obligation relative to the base case is offset by the benefit to refiners of a lower obligation relative to the base case.
51. The decision to phase in higher obligations over a number of years reflects feedback from industry (captured in the IPA / Muse report) that companies have long term contracts in place in order to meet company obligations and that the market would need time to react to the increased obligations, which will be met by increased demand for tickets.

**Chart 3: Option 3 costs vs base case**



52. There is a non-monetised benefit with this option that it ensures that the UK can maintain compliance immediately with a degree of confidence. As with Option 2, setting the difference at 0 days from 2021 ensures the UK's stockholding regime is robust to a change in refiner's market share from that point forward.

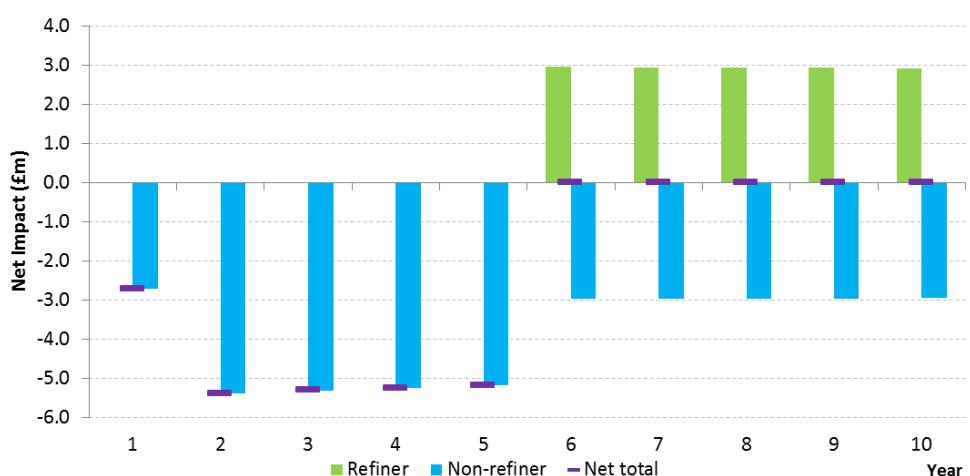
53. This option meets objective one by ensuring that the UK is compliant with stocking obligation in the near term. It also meets the second objective of being resilient to market structure changes in the long run. Having a phased transition also reduces costs to business. This is the preferred option as it is the option that meets both objectives satisfactorily whilst minimising the cost to business.

**Option 4: Eliminate the differential entirely in year 1, with non-refiners obligations increasing then to ensure compliance from year 1. Both refiners and non-refiners' obligations would then increase in line with increases in total obligation from year 6 onwards.**

54. This option is assessed against the base case and entails a policy change to remove the difference in obligation to 0 days in year 1.

55. The NPV of option is -£21.35m. This is driven by the increase in obligation for non-refiners relative to the base case as the differential is reduced in year 1 to 0 days.

**Chart 4: Option 4 costs vs base case**



56. There is a non-monetised benefit with this option that ensures that the UK can maintain compliance immediately. In addition setting the difference at 0 days allows enough headroom to absorb uncertainty in the level of the obligation through changes to consumption and production so that the

UK is less likely to be non-compliant, as with option 3. The UK refining sector, as well as in the EU more broadly, faces a very challenging future and further market changes are likely.

57. This option meets objective one by ensuring that the UK is compliant with stocking regulation. It also meets the second objective of being resilient to changes in market structure in the long run. However, this is not the preferred option as it does not minimise cost to business and as such has the lowest NPV of all options.

#### *Justification for the level of analysis*

58. The level and rigour of analysis in this impact assessment is justified as we have considered the main costs and benefits of the policy option involved. In addition whilst there is uncertainty over the underlying obligation levels driven by projected consumption and production levels the relative ranking of options is fixed (as illustrated by the sensitivity analysis) and as such the uncertainty does not influence the order of preferred options.

#### *Risks and assumptions*

59. A key assumption is that incremental obligation changes are met through the purchase of tickets rather than physical stocks. This assumption was tested extensively with industry and is intuitive given that storage in the UK is limited and as such is cheaper to utilise tickets.
60. Whilst ticket prices remain uncertain and will be driven by supply and demand for storage in the region, it is intuitive to assume that companies will continue to opt for tickets as a way to fulfil their marginal obligation until it becomes viable to invest in storage in the long-run. Impacts of changes to ticket prices have been assessed in the sensitivities section and implicitly cover a sensitivity to the increased cost of holding oil regardless of the mechanism by which stocks are obligated.
61. This IA assumes that the UK will continue to count ‘offshore’ stocks towards its international obligation. This is consistent with current UK reporting of these stocks, however, the days of obligation referred to in para 25 beyond 2021 rely on these stocks’ inclusion. If these stocks were no longer able to be counted towards the UK overall obligation then industry obligations would need to be increased to cover this shortfall. However, this would likely be an impact on the total level of obligation on companies, rather than on the differential itself.
62. To formulate the base case we have assumed that the UK is compliant after year 6 when the obligation is projected to rise. This implies that Government would take the view that continually and increasingly being non-compliant would be an unacceptable risk to take given the worsening shortfall.

#### *Direct costs and benefits to business (including One-in, Two-out)*

63. The measure is out-of-scope of OITO. The measure is amending an existing policy to meet an EU obligation which does not involve gold-plating, early implementation or failure to derogate.
64. All costs and benefits to business of the measure as outlined above are direct. Equivalent annual net cost to business (EANCB) of each policy option considered has been calculated as per the guidance set out in the Better Regulation Framework Manual. All figures are presented in the summary template and are summarised in the table below.

	Option 1	Option 2	Option 3	Option 4
PV net impact to business per year (price base 2014; PV base 2015)	-1.2	0	-1.1	-2.4
EANCB per year (2014 prices)	-1.2	0	-1.1	-2.3

#### *Wider Impacts*

65. Small and micro business assessment – refiners and non-refiners that will be impacted by this measure are all large organisations as the obligation only applies to those companies that supply over 50,000tonnes/year. Small and micro businesses will not be impacted by the measure.
66. Devolution – there are no devolution issues as emergency oil stocks are a reserved matter and the oil stocking obligation will continue to cover the UK. Energy generally is devolved in Northern Ireland but oil stocking is not.
67. Price increases – increased costs of obligations are likely to be passed onto consumers However, on a pence per litre basis the impact on price is likely to be lower than 1p/litre.
68. Competition assessment – The proposed option has positive competition impacts as it provides a long term level playing field for all market participants such that the regulatory burden is equal between types of supplier. This is beneficial as competition can help create incentives for firms to be more efficient and to invest.

#### *Sensitivities*

69. The illustrative sensitivities below illustrate how the impacts of potential changes in key external drivers of the cost of the oil stocking obligation are much greater than the variation in cost between the policy options that have been considered. Furthermore the ranking of the policy options considered above is not sensitive to these external drivers.
70. The table below reports the net impacts of the cost of the oil stocking obligation from changes in key external drivers assessed against all options.

Sensitivity	NPV delta (nearest £5m) relative to...				
	Base case	Option 1	Option 2	Option 3	Option 4
<b>Market share</b> – refiner market share is modelled to reduce by 10% in year 1 (equivalent to approx. 1 refinery closure)	+5	+5	+5	+5	+0
<b>Consumption</b> – modelled as 5% higher per year	-45	-45	-45	-45	-45
<b>Production</b> – modelled as 10% higher per year	+15	+15	+10	+15	+15
<b>Ticket price</b> – modelled as 5% higher per year	-35	-35	-35	-35	-35

Sensitivity	Impact on compliance in year 1 relative to...				
	Base case	Option 1	Option 2	Option 3	Option 4
<b>Market share</b> – refiner market share is modelled to reduce by 10% in year 1 (equivalent to approx. 1 refinery closure)	Worsens	Become non-compliant (1.1%)	Worsens	Become non-compliant (0.6%)	None
<b>Consumption</b> – modelled as 5% higher per year	Minimal	Minimal	Minimal	Minimal	Minimal
<b>Production</b> – modelled as 10% higher per year	None	None	None	None	None
<b>Ticket price</b> – modelled as 5% higher per year	None	None	None	None	None

Sensitivity	Change to obligation cross-over year relative to...				
	Base case	Option 1	Option 2	Option 3	Option 4
<b>Market share</b> – refiner market share is modelled to reduce by 10% in year 1 (equivalent to approx. 1 refinery closure)	None	None	None	None	None
<b>Consumption</b> – modelled as 5% higher per year	-1 (year 5)	-1 (year 5)	-1 (year 5)	-1 (year 5)	-1 (year 5)
<b>Production</b> – modelled as 10% higher per year	+1 (year 7)	+1 (year 7)	+1 (year 7)	+1 (year 7)	+1 (year 7)
<b>Ticket price</b> – modelled as 5% higher per year	None	None	None	None	None

71. Reducing refiner market share in year one (and increasing non-refiner market share by the same amount) results in a calculated NPV of +£0-£5m depending on the option. All else equal, a reduction in refiner market share results in a benefit to the (remaining) refining sector as their overall obligation in volume terms is lower because they have a lower market share<sup>5</sup>.
72. However, there is a substantial increased cost to the non-refining sector as their market share has increased by an amount equal to the initial decline in refiner share. Despite this, it is not a one-to-one offset as the cost that the non-refining sector faces is less than the benefit from the refining sector as a whole having a lower absolute obligation (there is effectively one less refiner), due to the fact that the 9.5 day differential is still in place. As such the result is that UK non-compliance increases. In this context the positive NPV of this sensitivity is misleading as it is simply capturing the benefit of less compliance.
73. Higher consumption by 5% every year (all else equal) increases the UK's obligation and so increases the cost, resulting in an NPV of between -£45m and -£50m (it's assumed that the obligations on industry are increased to ensure the same level of compliance). This scenario also causes the cross-over year between obligation based on days consumption and net imports to move one year forward (2020). Whilst this is an extreme sensitivity of compounded higher than expected

<sup>5</sup> This is partly offset as the refining sector's absolute obligation then increases marginally from 2021 onwards in order for the UK to maintain compliancy. However, the additional cost is negligible, at around £0.5m across the period for all options.

consumption growth, it is helpful to illustrate the order of magnitude that such sensitivities and uncertainties imply. This sensitivity is symmetric and lower consumption by 5% every year results in +£45m-£50m NPV depending on the option.

74. Higher domestic production by 10% every year (all else equal) decreases the obligation and decreases the cost, resulting in an NPV of +£15m-£20m depending on the option. This scenario also causes the cross-over year between obligation based on days consumption and net imports to move one year back (2022). This sensitivity is symmetric and lower production by 10% every year results in an NPV between -£15m and -£20m. These two factors (changes to consumption and production) would affect the total obligation but should have no material impact on the ranking of policy options which meet both objectives (options 3 and 4).
75. A higher ticket price corresponding to a higher cost of holding oil of 5% higher per year results in an NPV of £-40m across all options. This is intuitive given that a higher cost of holding oil results in a higher obligation cost (for a given level). This sensitivity is independent of the options considered and so would not impact on the NPV ranking of options.
76. We have intentionally chosen extreme sensitivities to illustrate an implied order of magnitude of the cost of the oil stocking obligation options under significant changes to the underlying assumptions. The exercise shows that ranking of the policy options that meet both policy objectives (options 3 and 4) is not sensitive to these external drivers. To capture some of the uncertainty around the central NPV estimates we have chosen an illustrative scenario of 1% higher/lower ticket prices per year.