

<b>Title:</b> Future Management of the Compulsory Stockholding Obligation in the UK  IA No: DECC0117  <b>Lead department or agency:</b> Department of Energy and Climate Change	<b>Impact Assessment (IA)</b>		
	<b>Date:</b> 07/12/2012		
	<b>Stage:</b> Consultation		
	<b>Source of intervention:</b> Domestic		
	<b>Type of measure:</b> Secondary legislation		
<b>Contact for enquiries:</b> Hannah Wadcock / Apurva Shah / Sara Davies			

<b>Summary: Intervention and Options</b>	<b>RPC:</b> RPC Opinion Status
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**Cost of Preferred (or more likely) Option**

Total Net Present Value	Business Present Value	Net	Net cost to business per year (EANCB in 2009 prices)	In scope of One-In, One-Out?	Measure qualifies as
£24.5m	£24.5m		£-1.18m	Yes	OUT

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

The UK is required by the EU and the IEA to hold emergency stocks of oil products to release to market in the event of global short-term oil supply disruptions, known as the compulsory stocking obligation (CSO). The amount of stocks the UK is required to hold is forecast to rise in the future as UK Continental Shelf production declines. To satisfy these obligations, currently Government issues individual directions to business. There are concerns the present system creates underinvestment in adequate storage, and may harm the ability of the UK to meet the CSO in the long-run, posing a long-run risk to resilience.

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

The policy objective is to ensure that the CSO continues to be met as the overall obligation increases in the future; so that the UK both holds and can deploy sufficient emergency stocks to mitigate the detrimental impacts on the UK, EU and IEA members of any global oil supply disruption. This supports Government's objectives to improve energy resilience.

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

*Option 1: "do nothing".* The UK's CSO continues to be met through issuing individual directions on obligated companies.

*Option 2: Government Strategic Reserve.* Companies remain obligated to meet the current CSO but Government manages the total increase in the overall stocking obligation by purchasing physical stocks and tickets to meet the obligation.

*Option 3: Private Stockholding Agency.* Government facilitates the setting up of a private agency which obligated companies will use to manage the increase in obligation, by purchasing stocks and tickets. The agency would be a 'not for profit' body funded by contractual fees in proportion to stock volumes delegated. This option has no cost to the exchequer.

*Option 4: Government top slice option.* This is a middle ground between Government Strategic reserve and a private stockholding agency, where Government owns stocks through the agency.

Option 3 is the preferred option as it presents welfare benefits without a cost to the exchequer. We believe a private stockholding agency will increase investment certainty and better manage the aggregate obligation by exploiting economies of scale and scope. We will seek to update our assessment in light of any consultation responses received.

<b>Will the policy be reviewed?</b> It will be reviewed <b>If applicable, set review date: April 2015</b>					
Does implementation go beyond minimum EU requirements?				N/A	
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	<b>Micro No</b>	<b>&lt; 20 No</b>	<b>Small No</b>	<b>Medium Yes</b>	<b>Large Yes</b>
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)			<b>Traded:</b> n/a	<b>Non-traded:</b> 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: \_\_\_\_\_ Date: \_\_\_\_\_

# Summary: Analysis & Evidence

# Policy Option 2

Description: Government Strategic Reserve

## FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2012	Time Period Years 30	Net Benefit (Present Value (PV)) (£m)	
				Best Estimate: £36.1m

COSTS (£m)	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Cost
Best Estimate	£1m		£1m			£19.4m

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

As under option 3, the main costs of option 2 are the initial start-up costs of setting up the agency, valued at £1m PV, and the ongoing operating costs of the agency, valued at £18.4m PV. Ongoing running costs are staffing costs and associated overheads.

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

While costs are likely to be as under option 3, a public agency may incur higher costs than a private agency.

BENEFITS (£m)	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Benefit
Best Estimate	n/a		£4.1m			£55.5m

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

Under option 2, there is a reduction in the costs of managing the CSO as the "contingency buffer" and therefore storage costs decrease, valued at £15.9m PV. This arises from the aggregate obligation being potentially lower than the sum of the stock, over and above the CSO, held by individual companies. In addition, an agency may be able to make use of a lower cost of capital, with an associated saving in investment costs of £1.2m. Thirdly, storing oil has an associated opportunity cost and by storing less this is reduced, with a value of £26.8m. Finally under this option Government purchases oil from industry and ownership of the asset changes hands. The opportunity cost faced by Government of storing oil is lower than that of industry and hence there is an additional future benefit stream valued at £11.5m in PV (this is the only monetised benefit that differs between options and relates to the entire CSO).

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

A Government Reserve may be able to reduce the risk of non-compliance and so increase resilience when faced with global supply disruptions as Government has direct control over the supply of some stock.

### Key assumptions/sensitivities/risks

Discount rate (%) 3.5

A key assumption in the analysis is the future split between physical stocks and the ticket market, given the inherent uncertainties. Sensitivity analysis of changing the ratio of tickets to physical product held each year by 10% yields a change in NPV of +£9.5m Refer to paragraph 63 for a full list of sensitivities tested.

## BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: £0.9	Benefits: £2.7	Net: £1.74	Yes	OUT

# Summary: Analysis & Evidence

# Policy Option 3

Description: Private Stockholding Agency

## FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2012	Time Period Years 30	Net Benefit (Present Value (PV)) (£m)				
			Low: Optional	High: Optional	Best Estimate: £24.5m		
<b>COSTS (£m)</b>		<b>Total</b> (Constant Price)	<b>Transition</b> Years	<b>Average</b> (excl. Transition)	<b>Annual</b> (Constant Price)	<b>Total</b> (Present Value)	<b>Cost</b>
<b>Best Estimate</b>		£1m		£1m		<b>£19.4m</b>	
<b>Description and scale of key monetised costs by 'main affected groups'</b>							
The main costs of option 3 are the initial start-up costs of setting up the agency, valued at £1m PV, and the ongoing operating costs of the agency, valued at £18.4m PV. Ongoing running costs are staffing costs and associated overheads.							
<b>Other key non-monetised costs by 'main affected groups'</b>							
n/a							
<b>BENEFITS (£m)</b>		<b>Total</b> (Constant Price)	<b>Transition</b> Years	<b>Average</b> (excl. Transition)	<b>Annual</b> (Constant Price)	<b>Total</b> (Present Value)	<b>Benefit</b>
<b>Best Estimate</b>		n/a		£3.2m		<b>£43.9m</b>	
<b>Description and scale of key monetised benefits by 'main affected groups'</b>							
Under option 3, there is a reduction in the costs of managing the CSO as the "contingency buffer" decreases, valued at £15.9m PV. This arises from the aggregate obligation being potentially lower than the sum of the stock, over and above the CSO, held by individual companies. In addition, an agency may be able to make use of a lower cost of capital, with an associated saving in investment costs of £1.2m. Thirdly, storing oil has an associated opportunity cost and by storing less this is reduced, with a value of £26.8m.							
<b>Other key non-monetised benefits by 'main affected groups'</b>							
An agency may be able to reduce the risk of non-compliance and so increase resilience when faced with global supply disruptions. In addition, this option would offer increased resilience in the event of a closure of a refinery as the agency manages the obligation centrally and would adjust the fee to compensate rather than companies being forced to accommodate the change in their obligation themselves.							
<b>Key assumptions/sensitivities/risks</b>						<b>Discount rate (%)</b>	3.5
A key assumption in the analysis is the future split between physical stocks and the ticket market, given the inherent uncertainties. Sensitivity analysis of changing the ratio of tickets to physical product held each year by 10% yields a change in NPV of +/-£9.5m Refer to paragraph 63 for a full list of sensitivities tested. There is a risk an agency would not have an incentive to minimise costs as these are recovered through a levy on industry. However this risk will be mitigated through the governance structure of the agency.							

## BUSINESS ASSESSMENT (Option 3)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
<b>Costs: £0.9</b>	<b>Benefits: £2.1</b>	<b>Net: £1.18</b>	Yes	OUT

# Summary: Analysis & Evidence

# Policy Option 4

Description: Government Top Slice

## FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2012	Time Period Years 30	Net Benefit (Present Value (PV)) (£m)		
					<b>Best Estimate: 28.4m</b>

<b>COSTS (£m)</b>	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Cost
<b>Best Estimate</b>	£1m		£1m		<b>£19.4m</b>	

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

The main costs of option 3 are the initial start-up costs of setting up the agency, valued at £1m PV, and the ongoing operating costs of the agency, valued at £18.4m PV. Ongoing running costs are staffing costs and associated overheads.

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

n/a

<b>BENEFITS (£m)</b>	Total (Constant Price)	Transition Years	Average (excl. Transition)	Annual (Constant Price)	Total (Present Value)	Benefit
<b>Best Estimate</b>	n/a		£3.5m		<b>£47.8m</b>	

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

Under option 3, there is a reduction in the costs of managing the CSO as the "contingency buffer" decreases, valued at £15.9m PV. This arises from the aggregate obligation being potentially lower than the sum of the stock, over and above the CSO, held by individual companies. In addition, an agency may be able to make use of a lower cost of capital, with an associated saving in investment costs of £1.2m. Thirdly, storing oil has an associated opportunity cost and by storing less this is reduced, with a value of £26.8m. Under this option Government purchases oil from industry and ownership of the asset changes hands. The opportunity cost faced by Government of storing oil is lower than that of industry and hence there is an additional future benefit stream valued at £3.8m in PV (this is the only monetised benefit that differs between options and relates to the entire CSO).

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

An agency may be able to reduce the risk of non-compliance and so increase resilience when faced with global supply disruptions. In addition, this option would offer increased resilience in the event of a closure of a refinery as the agency manages the obligation centrally and would adjust the fee to compensate rather than companies being forced to accommodate the change in their obligation themselves. Moreover government ownership of stock might further reduce non-compliance risk

### Key assumptions/sensitivities/risks

Discount rate (%) 3.5

A key assumption in the analysis is the future split between physical stocks and the ticket market, given the inherent uncertainties. Sensitivity analysis of changing the ratio of tickets to physical product held each year by 10% yields a change in NPV of +/-£9.5m. Refer to paragraph 63 for a full list of sensitivities tested. There is a risk an agency would not have an incentive to minimise costs as these are recovered through a levy on industry. However this risk will be mitigated through the governance structure of the agency.

## BUSINESS ASSESSMENT (Option 4)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
<b>Costs: £0.9</b>	<b>Benefits: £2.3</b>	<b>Net: £1.37</b>	Yes	OUT

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## Evidence Base

1. This impact assessment analyses the costs and benefits of potential policies for future management of the UK's compulsory stocking obligation (CSO) for oil stocks.

### Background

#### CSO obligation

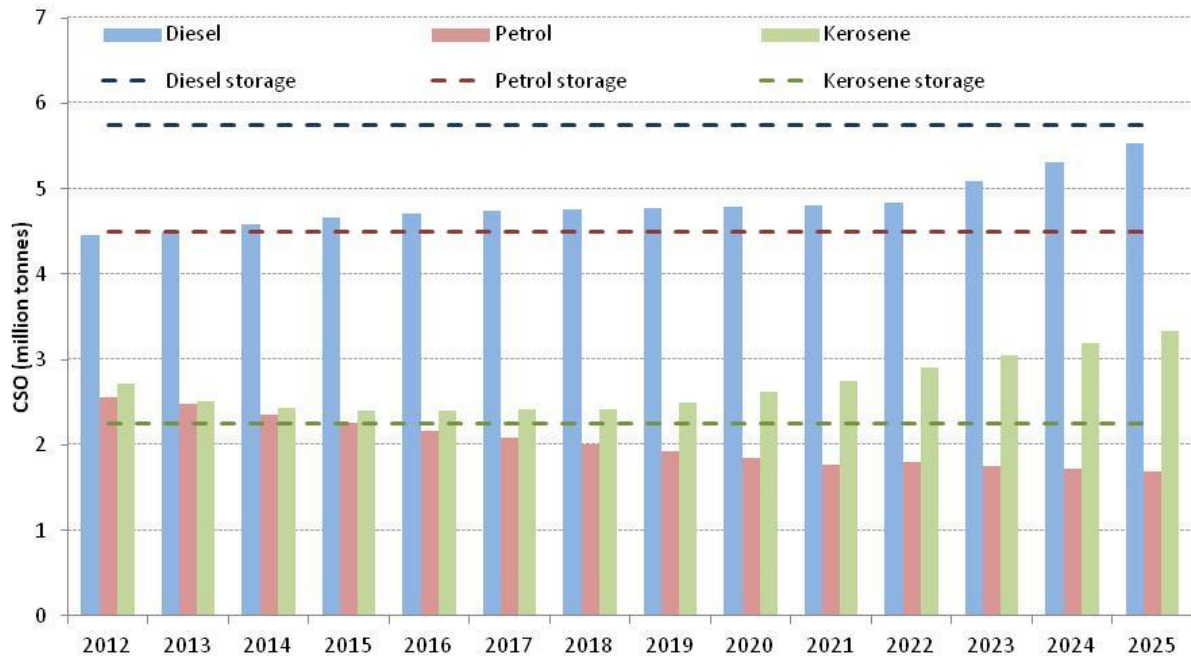
2. The UK is required to hold emergency stocks of crude oil and petroleum products to release to the international market in the event of global short-term oil supply disruptions. These stocks can be released to bridge a gap in supply. This is to comply with international requirements set by the EU and the International Energy Agency (same stocks used to meet both obligations). The EU currently require the UK to hold 67.5 days of annual daily inland consumption. The IEA requirements are based on net imports and currently are a smaller volume given the UK's indigenous production.
3. The UK is required to meet these obligations to mitigate detrimental impacts on the UK, EU and international partners in the event of a supply disruption. If sufficient stocks are not in place, the energy resilience of the UK and other member states may be threatened. Potential impacts include oil prices rising significantly, and a lack of product available to market. The UK is also required to provide monthly updates to the Commission on the levels of stocks held and would be at risk of infraction should stockholdings fall below required levels.
4. The UK's CSO is projected to increase in the future as UKCS production declines and the IEA requirement becomes binding. In addition, as obligated companies must be compliant at all times (i.e. not just for month end reporting), they tend to hold a "contingency buffer" of stocks above what is strictly needed. This potentially puts UK companies at a competitive disadvantage, as they have to employ greater working capital and face higher sunk costs relative to companies in other EU member states which have an (established) agency, and face a fixed annual cost.
5. Currently, the UK manages its obligation through placing obligations on individual companies, using powers in the Energy Act 1976 to issue directions setting out individual stocking obligations. These are calculated on a quarterly basis and sent out to the 24 companies subject to the obligation (those who supply above 50,000 tonnes of petroleum products), based on their market share. The market share is calculated retrospectively from data for four quarters, using data for imports plus production (refiners only) minus exports. Companies then provide monthly returns for their stock-holding, which are compared to their calculated obligations to ensure these requirements are being met.
6. Companies largely meet their obligations through stocks held in the UK. Their obligations can also be met through contractual arrangements with other companies based outside the UK, 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. We currently estimate that approximately 25% of the total obligation is met through contractual agreements with companies in other EU Member States. The remaining 75% is made up through physical stocks held in the UK at refineries / in storage sites by companies directly obligated or other UK companies.
7. All bilateral agreements assure unconditional access to the stocks in an emergency and if the IEA requests a stock release as a result of an international crisis then 'ticket' stocks are released at the request of the ticket holder.
8. From January 2013 under the UK Oil Stocking Order 2012 companies will be required to meet one third of the obligation in petrol, gas/diesel oil, and aviation fuel. The remaining two thirds of the obligation can be held in crude oil or any product.

**Problem under consideration**

- 9. The UK is one of few remaining countries to delegate stock obligations to individual market suppliers rather than a central body. Market participants are obliged to store reserved stocks and take on the sunk cost and ongoing obligation as part of day-to-day business. To individual business, the perception is that this cost is non-transparent and difficult to assess as it gets blurred with the day-to-day costs of managing stock for business needs. For potential market entrants this acts as an additional uncertainty.
- 10. Most other European Member States manage the obligation through a central body, including France, Ireland and Spain. Industry have informally indicated to DECC that they prefer this approach because the costs are more transparent, e.g. the agencies publish their accounts on an ongoing basis, and more consistent, usually constituting a fixed fee. This enables the industry to plan for these costs on a longer term basis rather than managing the cost month by month, and also enables industry to better explain the cost pass through to their customers.
- 11. There are concerns that the system for managing the CSO in the UK creates investment uncertainty, leading to underinvestment in adequate storage, and so may harm the ability of the UK to meet the obligation in the medium to long-term. This carries the potential risk of infraction against the UK with associated significant costs, and also undermines the UK's preparedness to manage the impacts of a global short-term supply disruption.
- 12. The issue can be summarised by the following three headings:

**Obligation is increasing, and with it the costs of compliance**

- 13. As our domestic production of crude oil declines, the net imports obligation set by the IEA will override the EU's requirement. Internal DECC forecasts suggest that the IEA's obligation based on overall net imports will set in from 2022 and so therefore will result in an increase in the obligations levied on individual companies. A preliminary breakdown by products shows that the net imports obligation may set in earlier for individual products, particularly kerosene which is the most limited stock in terms of UK production relative to consumption.
- 14. The chart below illustrates the DECC forecast obligation by product type alongside the current estimated storage by product in the UK.



- 15. DECC analysis suggests that the increase in CSO could lead to an additional cost of £3.1billion by 2042 (£1.4billion in PV terms).
- 16. The uncertainty over the increases in the obligation, and the associated costs of this have raised questions from industry over the effectiveness of the current policy approach. In particular, they are concerned that the current framework may not incentivise the necessary investment in storage capacity.

**Storage is reaching capacity, particularly for middle distillates**

17. Current data suggests total UK storage is between 12-13 MTe for the main petroleum products consumed in the UK (petrol, diesel/gas oil and kerosene). DECC forecasts suggest that additional storage needed for these products could be in the region of 1million tonnes by 2025.
18. New storage build for individual companies is expensive and inherently risky. An agency would have better access to finance and on more favourable terms than smaller individual companies and could fund this through loans from member companies.
19. The nature of the cost of CSO (non-transparent and largely woven into every day operating costs) has given companies little incentive to invest in larger long-term storage assets in response to the approaching increase in the obligation. Given the uncertainties of the UK downstream oil market, most companies are unprepared to allocate large amounts of liquid capital for investment in long-term CSO storage facilities when higher returns are available elsewhere. This could lead to market exit by some market players and an increase in CSO cost per firm which further compounds the risk of non compliance in the future.
20. Industry claim that lack of investment in new storage facilities is primarily due to their *substantial* cost. Given their need being predominantly linked to a growing CSO obligation, there is very little or no commercial added-value in building these facilities for individual companies, particularly when the liquid capital necessary for these investments can be allocated elsewhere with higher returns. In other words, the industry currently lacks incentive to build additional long-term storage as CSO costs are only expected to increase whilst commercial value will remain flat or depreciate.

**Ticket market volatile and increasingly tight given EU lack of storage capacity / middle distillate production.**

21. If no storage is built (in the medium term) the industry will, by default, be increasingly reliant on the ticket market for all categories of fuel. The availability of storage sites is more critical when considering this by product type, as storage facilities cannot be substituted between products. Under DECC central forecasts the UK obligation currently breaches our estimated storage capacity for jet fuel and is forecast to run out of diesel storage by 2025.
22. The UK is well placed for storing light distillate and heavy distillates but middle distillate<sup>1</sup> storage is in short supply, reflecting that UK refineries were originally designed and configured to primarily refine petrol, and so storage facilities were built to match this production mix. UK demand, in common with many other European countries, is increasing for diesel and aviation fuel whereas our refineries are geared to produce gasoline and fuel oil (originally for electricity generation). The UK will continue to require storage facilities for gasoline and fuel oil before they are exported. In addition, as more diesel and aviation fuel is imported in the future these products will also require separate storage (and an increasing amount over time).
23. This structural imbalance of middle distillate products is also seen at a European level, and North West Europe generally is reliant on non-EU imports to meet demand for diesel and kerosene. Over the longer term, therefore, there is an EU-wide forecasted increase in reliance on the ticket market under the “do nothing” option. The likelihood is that the supply of tickets will reduce as Europe as a whole increases its deficit of middle distillate products. This tightening of the ticket market will lead to an increase in cost on the industry and associated risk of non-compliance, potentially reducing the UK’s ability to mitigate the effects of a short-term supply disruption.
24. In particular, it is likely that tickets for jet fuel will be priced at a premium. The EU as a whole is a net importer of this product, and the UK is the third largest global consumer (with the highest demand in the EU). This is likely to be exacerbated by the transposition of the EU Oil Stocking Directive through the Oil Stocking Order 2012. This Directive identifies particular products for the UK to store (based on consumption), and so will increase demand for stocks of these finished products. Jet fuel has not previously been separately obligated which has further contributed to uncertainty over the cost of these tickets. Given our domestic demand for this product the UK has a high level of risk associated with exposure to the ticket market for jet fuel.
25. Ticket trading occurs over-the-counter through brokers and directly through industry parties. Price reporting is complicated by the availability of contracts of different lengths. Price transparency is relatively poor in the market and we do not have a comprehensive dataset on ticket prices.

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<sup>1</sup> Middle distillates - a general classification of refined petroleum products that includes distillate fuel oil (including diesel oil) and kerosene. Sourced from [http://www.eia.gov/pub/oil\\_gas/petroleum/data\\_publications/weekly\\_petroleum\\_status\\_report/current/pdf/glossary.pdf](http://www.eia.gov/pub/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/current/pdf/glossary.pdf)



26. Rapid ticket cost movements are likely to further erode thin margins and risk increasing company non-compliance or (at the more extreme end and in combination with other burdens), market exit. Under the current framework, should companies leave the UK market the policy approach is for remaining obligated companies to meet any national obligation arising from unplanned market exits. Should companies leave the UK market under the “do nothing” approach this could therefore exacerbate the situation for other companies (adding unexpected additional costs) and possibly prompt legal challenge against DECC.
27. In short, increasing reliance on the ticket market is a risk of “do nothing”. Given the uncertainty and likely tightening and volatility of the market there are likely to be resilience benefits from facilitating less exposure to the ticket market.

### **Rationale for Intervention**

28. Government already intervenes in the market by imposing a compulsory oil stocking obligation on the grounds of security of supply and resilience. The rationale for altering the current mechanism of intervention is a combination of the following factors:
29. Low returns: There appears to be a lack of willingness to invest in new storage as the return on doing so would likely be low given that it would primarily be used as storage for the mandatory obligation. Moreover with higher returns available elsewhere on the capital required for investment there is little incentive to invest large amounts of liquid capital purely in physical storage and a strong incentive to cover incremental obligations with tickets. The volatility of the ticket market and uncertainty over future prices mean that companies cannot be confident that storage will be more cost effective than tickets.
30. High risk: Compounding low returns is the relatively high risk attached to investment in storage in the UK. The low margin nature of the industry and associated risk of market exit creates additional uncertainty over the future making long-term investments inherently more risky.
31. Myopia and moral hazard: In the short run companies have an incentive to cover incremental obligations through tickets (bilateral or otherwise). It is this greater exposure to the ticket market in the longer term that increases the risk of future non-compliance and so acts as a moral hazard (where industry do not necessarily have incentives to act in the best interest of UK PLC in the long run).
32. Co-ordination failure: the present system for managing the obligation creates a co-ordination problem for companies to jointly invest in storage. This is exacerbated by an expectation from industry that an agency may or indeed will be set up in the longer term on the basis of the approach taken by other European countries. Combined with the above drawbacks to investment this has led to apparent inertia in industry to act in the absence of a “level playing field” where each individual company believes the onus is on another. And as storage reaches capacity in the UK this poses a long run issue for government.
33. Given the forecast increase in obligation (paragraphs 14 and 15) intervention could help coordinate the necessary investment and realise gains from economies of scale. Greater investment certainty will help deliver continued UK compliance and provide greater cost transparency in line with international best practise.

### **Policy Objective**

34. The policy objective is to ensure that the CSO continues to be met in the future in the UK, as the overall obligation increases in response to declining UKCS production; so that the UK both holds and can deploy sufficient emergency stocks to mitigate the detrimental impacts on the UK, EU and IEA members of any global oil supply disruption. This supports Government’s objectives to improve energy resilience.

### **Description of Options**

35. We consider the following options in the “cost-benefit analysis” section below:
36. *Option 1: “do nothing”*. The CSO continues to be satisfied by individual directions on obligated companies.
37. *Option 2: Government Strategic Reserve*. Companies remain obligated to meet the current CSO but Government creates a public agency to manage the increase in the overall stocking obligation by purchasing physical stocks and tickets to meet the obligation. The set-up costs and ongoing costs of

the agency would be funded through a levy payable by each oil company and consumer of oil products (those obligated under the Directive).

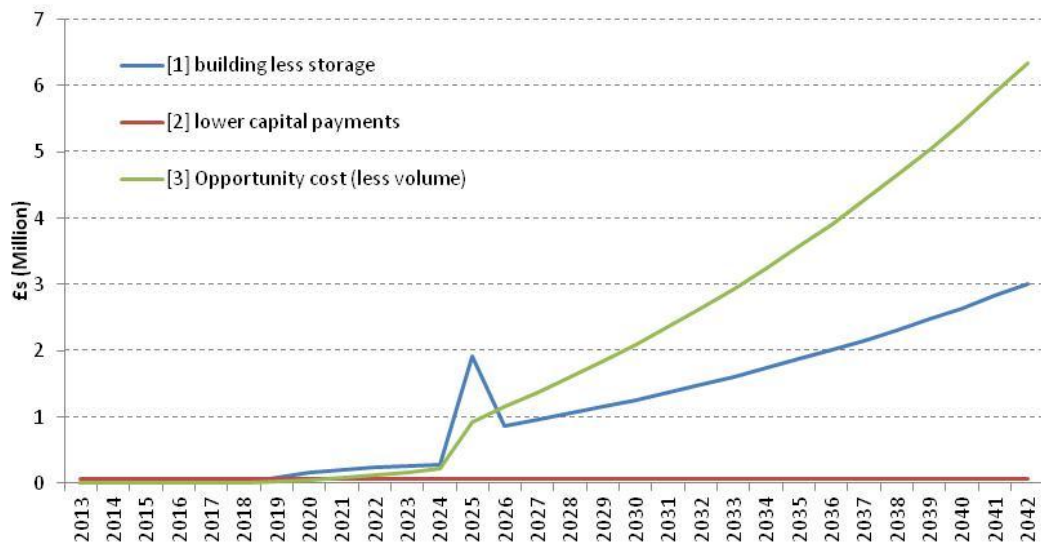
38. *Option 3: Private Stockholding Agency.* Companies remain obligated to meet the current CSO but a private stockholding agency would be set up to manage the incremental CSO, with a view to managing the full obligation in the longer term. The agency would manage the increase in CSO by purchasing stocks and tickets to meet the obligation. The initial start up costs and ongoing agency costs would be funded by a levy on obligated companies, though the agency would be strictly not for profit to comply with EU guidance.
39. *Option 4: Government top slice option.* This option is a variation of the private stockholding agency where Government would own a fixed percentage of the stock through the agency, modelled as one third.

**Summary and preferred option**

40. Option 3 is the preferred option. This is the preferred option as it presents welfare benefits without a cost to the exchequer. We believe a private stockholding agency will increase investment certainty and better manage the aggregate obligation by exploiting economies of scale and scope. We propose that the UK introduces secondary legislation under the European Communities Act to enable a private stockholding agency to be set up with compulsory membership and delegation of the incremental increase in obligation of individual companies.
41. The main monetised benefits of option 3 are the agency being able to hold less contingency buffer in aggregate than each obligated company, and the associated reduction in cost of storage and tickets, valued at £15.9m PV. There is also an associated benefit from the opportunity cost of holding less product (£26.8m). In addition, an agency may be able to make use of a lower cost of capital for borrowing, with a reduction in costs valued at £1.2m PV. This may aid in incentivising investment in new storage. Option 3 also minimises the impact on government balance sheet, whereas Option 2 has a large and negative impact on the exchequer. The main cost of Option 3 is the initial set-up of the agency and continuing running costs at a value of £19.4m in PV terms.
42. Option 4 is not preferred. While this option would allow a stricter control over release of a proportion of the stocks, it also represents a cost to the exchequer for the purchase of stocks in addition to the costs detailed above, valued at £91.8m PV. Option 2 is also not preferred. While the other costs and benefits are likely to be similar to those under option 3, costs in the public sector are likely to be higher. And crucially this option also carries an upfront cost to the exchequer of purchasing stock, with an estimated value of £32.7m.
43. In our consultation, we will be seeking views on the impacts of the possible policy options. We will examine the responses received, and update our assessment of the costs and benefits, in light of any new evidence received during the consultation process.
44. Monetised costs and benefits of the preferred option are set out below:

<b>Benefits (£m PV):</b>	
Difference due to holding less 'contingency buffer' (and thus building less storage)	<b>15.9</b>
Difference due to lower cost of capital for building storage so lower annual payments on loans	<b>1.2</b>
Opportunity cost of holding less product	<b>26.8</b>
<b>Costs (£m PV):</b>	
One-off cost of setting up agency	<b>1.0</b>
Ongoing agency costs - staffing, overhead etc.	<b>18.4</b>
<b>NPV</b>	<b>£24.5m</b>

45. The profiles of undiscounted benefits for the preferred option are set out below. (Equivalent detail for option 2 and 4 is set out in the annex)



46. The profiles illustrate that in 2025 benefits from the policy option become significant as the forecast obligation (for diesel in particular) rises above current levels of storage capacity.

### Cost benefit analysis

#### Establishing a base case: “do nothing”

47. An appraisal period of 30years has been used to best represent the time horizon of impacts of the policy and capture the long term issue of the problem under consideration. Given the nature of the investment decisions and physical building of storage a shorter appraisal window would be misrepresentative and not capture longer term potential impacts. As is illustrated by the profiles of benefits above (and in the annex) an appraisal period of 20years or 40years would not materially change the conclusions of the impact assessment as impacts are significant after 10 years.

48. As is consistent with the approach set out in the Green Book, this impact assessment assesses costs and benefits that signify a change in total welfare. Therefore wealth transfers are not captured under costs or benefits but the implications are discussed under the wider impacts section. For consistency transfers have not been included in the Business Assessments.

49. At present, individual companies tend to operate an additional buffer stock over and above the obligation to mitigate against their individual risk of non-compliance and short-term variability in demand and supply. In establishing a base case, we have therefore assumed individual companies maintain a contingency buffer of 5%<sup>2</sup>. Using DECC forecasts of future CSO levels, with a 5% uplift for assumed ‘contingency buffer’, and taking into consideration current surplus stocks that could be used to meet future increases in the obligation, we have projected a rise in the CSO to 24.1 million tonnes by 2042.

50. At present up to 29% of the UK’s total obligation is met through tickets held with other companies in the UK (“domestic tickets”), and 25% of the total obligation is met through tickets held with companies in other EU Member States (“bilateral tickets”). The remaining 46% is made up through physical stocks held in the UK at refineries/in storage sites by companies directly obligated. In the analysis we use the physical/ticket average ratio over the last 5 years and keep this constant going forwards. Furthermore, we assume all new physical stock is met through the building of new storage, with an associated building cost of £242/tonne and operating costs of £31/tonne/year<sup>3</sup>.

51. To fund investment, we have modelled companies borrowing funds at an assumed cost of capital of 8.5% (real) and 100% debt financing.

#### Option 3: Private Stockholding Agency [preferred option]

##### Benefits

52. An agency is likely to maintain a lower ‘contingency buffer’ than under the “do nothing” scenario. The agency would deal with the obligation on an aggregate basis and so changes in obligations between companies would be netted off at this aggregate level. Thus the ‘contingency buffer’ that the agency

<sup>2</sup> In “Assessing the current system for meeting the UK’s stocking obligations” (2010), Deloitte use an average contingency buffer of 5%, based on evidence from companies that suggested a range of 4-7%.

<sup>3</sup> Deloitte (2010) “Assessing the current system for meeting the UK’s stocking obligations,” based on a tank size of 30,000m<sup>3</sup>.

would need to maintain on a day to day basis is likely to be smaller than the sum of individual company 'contingency buffers' as demand is more stable on a national scale hence the CSO is likely to be more predictable. We assume this reduces the buffer margin to 4%. Using the assumptions outlined in "Key Assumptions" section below, this results in a saving of £15.9m PV relative to the base case.

53. Under this option agency costs would be charged through a levy placed on the companies using the agency, likely through an average cost payable by each company. As this levy is likely to be a more secure future cash flow, this implies a lower level of risk for lending to an agency, reducing the cost of capital. Deloitte<sup>4</sup> estimate more secure cash flows as a result of a levy on costs could lead to a reduction in the cost of capital of 0.5ppts, compared to that of a private sector company. Using this assumption in our modelling results in savings of £1.2m in PV terms.
54. In addition, under option 3 there is a benefit from the opportunity cost of storing the oil under the base case. In general the opportunity cost of storing product is the foregone interest on the value of the product plus the costs of storing it. At an aggregate level a lower 'contingency buffer' is equivalent to storing less product and thus there is a benefit equal to the lower opportunity cost of storing less. This has been assessed to be the foregone interest and is valued at £26.8m in PV terms.

### Costs

55. Under option 3, there is an initial cost of setting up the agency, valued at £1m. There are also on-going costs of the agency, including staffing costs and associated overheads. Deloitte<sup>5</sup> estimated these at £1m per year resulting in £18.4m in PV terms.

### Non monetised costs and benefits

#### Costs

56. Monitoring and compliance costs are likely to be marginally higher under this option, to include monitoring the agency as well as the individual companies. Monitoring and compliance costs are those that arise from having to monitor compliance by the agency in addition to the companies that are under obligation. The marginal cost to government of doing this, given current costs of monitoring companies are incurred, is likely to be minimal and so have not been quantified.

#### Benefits

57. Resilience: this option may offer increased resilience by decreasing the risk of non-compliance, as in the case of a global supply disruption, an agency could meet a shortfall from one company with additional stocks from another company it deals with.
58. In addition, this option would offer increased resilience in the event of a closure of a refinery. Under the current framework, should companies leave the UK market the current approach is for remaining obligated companies to meet any national obligation arising from unplanned market exits. Individual companies would do this by changing the amount of working capital stock in use. An agency could better plan for a market exit and re-distribute increased obligations across companies simply by adjusting the levy paid by obligated companies.
59. Even playing field: obligated companies that have access to bond markets have different credit ratings and so pay different prices to borrow money at present. Under an agency the differing cost of borrowing money between companies will not be relevant in the context of the CSO and therefore those with high borrowing costs stand to gain. Note that the aggregate reduction in borrowing cost has been monetised though the benefit of the cost of managing the CSO being even between companies has not been monetised.
60. Use of salt caverns: evidence from industry suggests that use of salt caverns as storage are significantly lower than building new storage. A recent (2011) company report received by UKPIA estimates salt cavern refurbishment costs, for an 800 000m<sup>3</sup> area, at about £2.5m, contrasting with costs of £25m to build a new 80,000m<sup>3</sup> steel tank. In practical terms the scale and location of salt cavern storage makes it difficult for individual companies to use commercially, although it could be viable for part of an agency's asset storage mix and thus may provide significant cost savings. This has not been monetised due to uncertainty over viability of use, though if they were able to be used this would increase the estimated benefits.

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<sup>4</sup> Deloitte (2010) "Assessing the current system for meeting the UK's stocking obligations."

<sup>5</sup> Deloitte (2010) "Assessing the current system for meeting the UK's stocking obligations."

61. Industry are extremely supportive of this option and have invested in consultancy reports and resource to take this concept forward, which demonstrates the benefits they perceive that would result from this approach. Although not monetised this is a signal that there are clear benefits of such a scheme to industry.

### **Option 2: Government Strategic Reserve**

62. While the set-up and ongoing operating costs of the agency under option 2 are likely to be the same as those under option 3, costs in the public sector may be higher. This option also carries an upfront cost to the exchequer, valued at £91.8m PV, and may present issues for government balance sheet.

63. The benefits of option 2 are likely to be the similar to those under option 2. In addition, under this option, as ownership of the asset changes between private companies and government, there is an additional benefit stream resulting from the lower opportunity cost government faces of storing oil, valued at £11.5m in PV.

64. There is also a potential increase in resilience to cope with short-term supply disruption as Government has direct control over supply of some stock. The benefits of increased resilience have not been quantified, but are an important rationale for intervention.

### **Option 4: Government top slice**

65. Under option 4, the start-up and ongoing agency costs are likely to be the same as under option 3. However, under option 4 there is also a cost to the exchequer for the purchase of stocks, valued at £32.7m.

66. The benefits under option 4 are likely to be similar to those as under option 3. In addition, under this option Government purchases oil from industry and, as ownership of the asset changes, there is an additional benefit stream resulting from the lower opportunity cost government faces of storing oil, valued at £3.8m PV. Option 4 would also allow stricter control over release of a proportion of the stock as Government has direct control over supply of some stock. The benefits of increased resilience have not been quantified, but are an important rationale for intervention.

## **Modelling and Analysis**

67. The following describes the method and modelling framework we have used to conduct the monetisation of costs and benefits.

### Costs

68. Set up costs: these have been sourced from a Deloitte report<sup>6</sup> that assumed that one-off costs to reflect the transition to an agency would be £1m. This does not include the cost of legislation, only direct set up costs of the agency such as hiring staff, determining office location and procedures to create it as a legal entity.

69. Recurring costs: these have been assumed to be £1m each year and cover recurring staffing costs and associated overheads.

### Benefits

70. Less “contingency buffer”: at present individual companies operate an additional buffer stock over and above the obligation to mitigate against risk of non-compliance and short-term variability in demand and supply. We estimate that companies retain 5% of product over and above their individual obligation.<sup>7</sup> On a national scale demand is more stable than individual company product sales and the CSO is therefore likely to be more predictable. The agency would therefore have scope to reduce this contingency buffer over and above the obligation; we have assumed a reduction to 4%, which reduces the cost. The monetisation of this represents the difference in storage costs between the base case and the respective option. This is calculated by multiplying the product volume of the lower “contingency buffer” by the per tonne storage cost and added to the upfront building cost. We assume that all the incremental CSO that is held as physical product above the ‘contingency buffer’ is stored in newly built storage. This is comprised of the upfront cost of building with the operating cost of the facility.

71. Lower costs of capital: This captures the notion that an agency would have better access to financing options than individual companies as it can gain from risk pooling and therefore gain access to

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<sup>6</sup> Deloitte (2010) “Assessing the current system for meeting the UK’s stocking obligations.”

<sup>7</sup> In “Assessing the current system for meeting the UK’s stocking obligations” (2010), Deloitte use an average contingency buffer of 5%, based on evidence from companies that suggested a range of 4-7%.

cheaper credit. This is calculated by taking away the difference in interest payments between base and option that would be accrued for building the required storage. We have assumed that new building of storage is financed through debt and that the agency would benefit from a 0.5ppt cheaper credit. The respective costs of debt we have used are 8.5% for individual companies and 8% for the agency.

72. Lower opportunity cost (of holding less product): storage of product presents an opportunity cost in the form of foregone interest (compounded) plus the physical cost of storage. The benefit of storing less product in aggregate is measured as the interest on the difference in value between levels of product being stored. To assess this we have assumed that changes in the crude price as set out in DECC oil fossil fuel price projections<sup>8</sup> are passed through into product price changes. The calculation is the difference between the foregone interest accrued between the option and the base. We have assumed a 6.5% real rate of return. Note that we have not assessed the opportunity cost on the cost of storage as this is being funded by debt under all our scenarios.
73. Lower opportunity cost (of change in asset ownership): This refers to the opportunity cost of storing product in the future and a benefit stream results from Government ownership of stock as the difference between the foregone interest under Government ownership and foregone interest under industry ownership. Government rate of return is 3.5% whilst industry assumed return is 6.5%. Note that this is the only monetised benefit that differs between options and the opportunity cost applies to the total CSO, not just the 'contingency buffer'.

Key Sensitivities tested

- Forecast ticket price (by product)
- 'Contingency buffer'
- Changes to product forecasts
- Changes to ticket/physical split
- Differences in assumed financing costs
- Costs of storage

74. The table below illustrates the impact of the sensitivities of option 3 tested relative to the base case. In each instance the sensitivity has been tested in isolation with other variables set to base case. The sensitivity analysis undertaken illustrates that results are robust to varying assumptions though specific advice on assumptions will be sought in consultation.

Sensitivity	Change to NPV (£m)	
	Low	High
Ticket price +200%/+500% each year	+0.4	+1.5
Difference in assumed contingency buffer +/-0.5ppt	-22	+22
CSO forecasts +10%/- 10%	-5.2	+5.7
Proportion of tickets held +/- 10%	-9.5	+9.5
Difference in cost of capital +0.5%/- 0.25%	-0.6	+1.2
Costs of storage small tank/medium tank	+98.5	+344.8

<sup>8</sup> [http://www.decc.gov.uk/en/content/cms/about/ec\\_social\\_res/analytic\\_projs/ff\\_prices/ff\\_prices.aspx](http://www.decc.gov.uk/en/content/cms/about/ec_social_res/analytic_projs/ff_prices/ff_prices.aspx)

75. Clearly the reduction in product stored between the two scenarios drives the benefit of the 'contingency buffer' and this is a sensitivity that we will seek advice on in consultation. Most sensitivities result in a reasonable range.
76. However, assuming different storage costs between the base case and the option assessed presents sensitivities of a high order of magnitude. Given the sensitivity of this assumption we have assumed that under the base case and the option large tank storage is invested in. This is consistent with the view reached in Deloitte's analysis. We will seek further advice on this issue in consultation.

### **Wider impacts**

77. Devolution - 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.
78. Threat of exit: the threat of market exit has been raised as a disadvantage of the current system, given a lack of transparency in the costs incurred in meeting the CSO. Option 3 would increase transparency and therefore reduce the threat of market exit. However, the cost of meeting the CSO is small in comparison to other factors which companies would consider when considering market exit, and thus we believe this impact would be small.
79. Funding constraints: both option 2 and option 4 transfer assets from industry to government, with an associated cost to Government of £91.8m PV under option 2 and £32.7m PV under option 4. This presents affordability issues as it will impact on government balance sheet. As this impact assessment only considers changes to total welfare this transfer of asset from industry to government has not been captured in the business assessment.

### **Direct costs to business**

80. The section above ("Cost-benefit analysis") discusses cost and benefits to society at large, including business. For the purposes of one-in, one-out (OIOO), we believe the direct costs on business of option 3 are the initial costs of setting up the agency and ongoing operating costs, with a total value of £19.4m PV, which are funded by industry via a levy from the agency. The direct benefits to business are the reduction in storage costs as a result of reduced contingency buffers, reduction in costs as a result of a lower cost of capital, and the associated reduced opportunity cost, with a total value of £43.9m PV. This gives a positive NPV of £24.5m for business, so we believe the policy to be a net OUT.

## **Risks and assumptions**

### **Key assumptions**

#### **Level of CSO**

81. CSO requirements in the future, split by product, use DECC forecasts to 2025 and thereafter increase at the average rate for each product.
82. Stock obligations are split by product; diesel, petrol and kerosene.
83. At present individual companies operate an additional buffer stock over and above the obligation to mitigate against risk of non-compliance and short-term variability in demand and supply. In establishing a base case, we have estimated individual companies maintain a contingency buffer of 5%, using Deloitte estimates<sup>9</sup>. Under option 3 this margin is assumed to decline to 4% because on a national scale demand is more stable than individual company product sales, the CSO is likely to be more predictable and the agency would therefore have scope to reduce this contingency buffer over and above the obligation.
84. All surplus physical product (not tickets) above current storage is assumed to be stored in newly built storage. Incremental tickets are therefore assumed to be held bilaterally.
85. To assess the opportunity cost we have assumed a 6.5% real rate of return. Based on a sample of large oil companies the average cost of equity sourced from Bloomberg was 10.7% (real) which we have adjusted down to allow for large company sample bias.

### **Storage**

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<sup>9</sup> In "Assessing the current system for meeting the UK's stocking obligations" (2010), Deloitte use an average contingency buffer of 5%, based on evidence from companies that suggested a range of 4-7%.

86. There are potential economies of scale of storage of building larger storage tanks compared to smaller tanks. In the base case, the incremental increase in stocking obligation is estimated at 12.4 million tonnes by 2042, or around 0.5 million tonnes per obligated company. We have assumed companies will construct the larger tanks, with a size of 30000m<sup>3</sup>, to maximise the potential economies of scale. Note that under all options the modelling has assumed that industry build storage and therefore costs of financing between options do not change.
87. Costs of storage are comprised of upfront building costs of £242/tonne, and on-going operating costs of £31/tonne/year, based on Deloitte estimates.<sup>10</sup>
88. We have assumed that building storage is 100% debt financed.

#### ***Ticket/Physical product split***

89. The ratio of CSO being met by tickets and that being met by physical stock is based on average data for 2007-2012. We have assumed the ratio is constant under all options. However it is possible that the future market may develop differently. For instance, under option 3 the agency may be more likely to meet future obligation increases using physical stock given the uncertainty and likely tightening of the ticket market. This also has resilience benefit arguments.

#### ***Ticket prices***

90. The price and availability of tickets in the future cannot be easily estimated. We have applied scenario analysis on ticket prices assuming three scenarios, shown below. The current price case is based on Q4 2011 companies and brokers information provided confidentially to DECC.

#### ***Product prices***

91. Product prices are estimated using DECC oil price projections to 2030, and then flat-lined thereafter.

#### ***Costs***

92. We have assumed the costs of meeting the existing obligation are the same in all models, with the main differences in costs between policy options driven by the costs associated with meeting future incremental CSO requirements.
93. Levy is charged to companies by the agency to cover the costs and set up of the agency.
94. Investment costs are 0.5% less for agency than individual company.

#### ***Incremental tickets***

95. All incremental tickets are assumed to be bilateral tickets. i.e. the stock is not held in the UK.

#### ***Risks***

96. There is a risk an agency would not have an incentive to minimise costs as these are recovered through a levy on industry. However this risk could be mitigated through a governance structure that aligns industry's and agency's incentives.
97. There is a risk that the agency cannot exploit economies of scope and reduce the 'contingency buffer' significantly. This is something that we intend to seek views on in consultation. Moreover although this impacts the potential monetised benefits the non monetised benefits from central coordination of the obligation remain, mitigating the severity of this risk.
98. There is also a potential risk that the agency could simply retain the obligation in tickets and mitigate the said benefits from lower exposure to the ticket market. In implementation this is something that government would look to address through governance of the agency. In addition this is in part mitigated by the price signal that a tightening ticket market would display as it would present a more costly option than storing in physical product.

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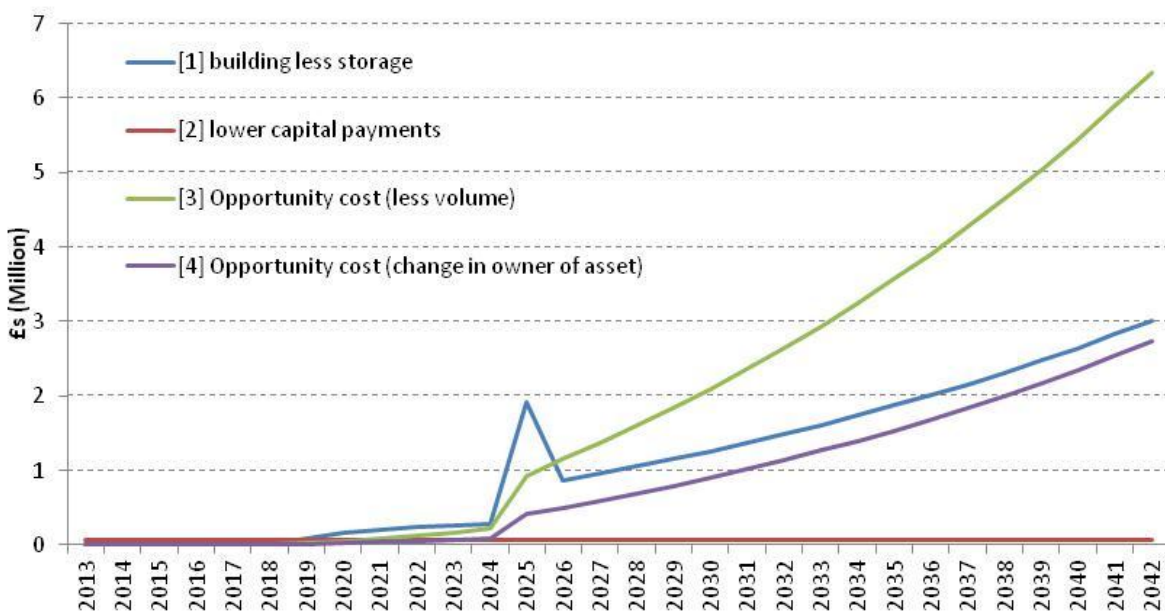
<sup>10</sup> Deloitte (2010) "Assessing the current system for meeting the UK's stocking obligations."



## Annex

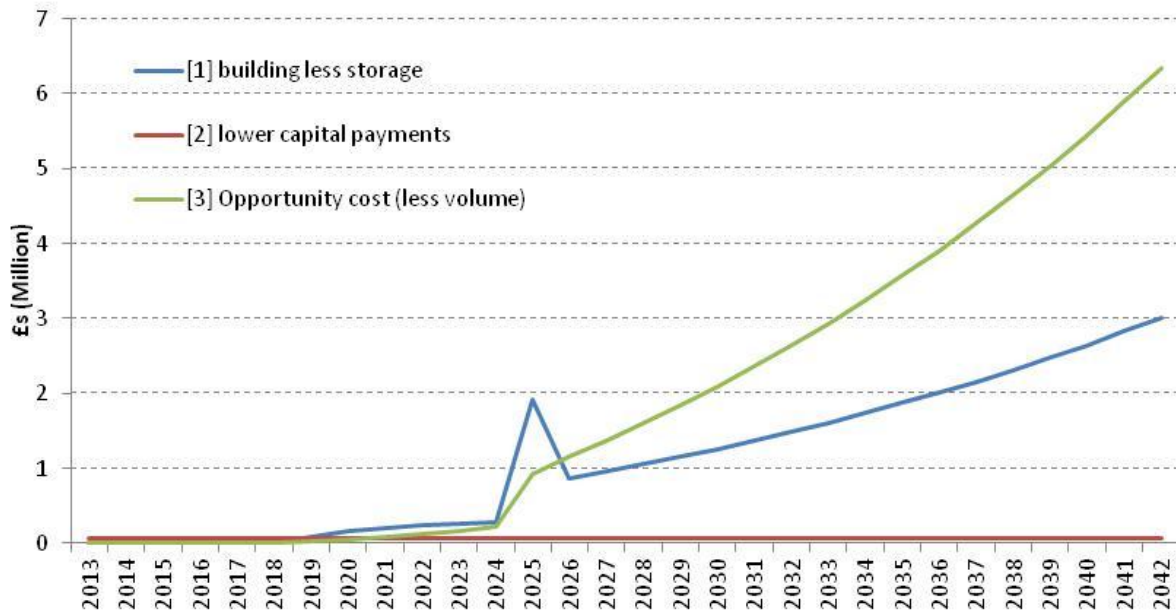
NPV table and profile of benefits (undiscounted) for each option:

<b>Option: Govt Strategic Reserve (2)</b>		
<b>Benefits:</b>	PV	Average (cons p)
Difference due to holding less 'contingency buffer' (and thus building less storage)	<b>15.9</b>	1.13
Difference due to lower cost of capital so lower annual payments on loans	<b>1.2</b>	0.07
Opportunity cost of holding less product (from contingency buffer)	<b>26.8</b>	2.00
Lower opportunity cost of storage (owner of asset)	<b>11.5</b>	0.86
sum:	55.5	4.1
<b>Costs:</b>		
One-off cost of setting up agency	<b>1.0</b>	
Ongoing agency costs - staffing, overhead etc.	<b>18.4</b>	1.00
sum:	19.4	1.0
<b>NPV</b>		
	<b>36.1</b>	



### Option: Private Agency (3)

Benefits:	PV	Average (cons p)
Difference due to holding less 'contingency buffer' (and thus building less storage)	<b>15.9</b>	1.13
Difference due to lower cost of capital so lower annual payments on loans	<b>1.2</b>	0.07
Opportunity cost of holding less product (from contingency buffer)	<b>26.8</b>	2.00
Lower opportunity cost of storage (owner of asset)	<b>0.0</b>	0.00
sum:	43.9	3.2
<b>Costs:</b>		
One-off cost of setting up agency	<b>1.0</b>	
Ongoing agency costs - staffing, overhead etc.	<b>18.4</b>	1.00
sum:	19.4	1.0
<b>NPV</b>	<b>24.5</b>	



## Option: Top Slice (4)

Benefits:	PV	Average (cons p)
Difference due to holding less 'contingency buffer' (and thus building less storage)	<b>15.9</b>	1.13
Difference due to lower cost of capital so lower annual payments on loans	<b>1.2</b>	0.07
Opportunity cost of holding less product (from contingency buffer)	<b>26.8</b>	2.00
Lower opportunity cost of storage (owner of asset)	<b>3.8</b>	0.29
sum:	47.8	3.5
<b>Costs:</b>		
One-off cost of setting up agency	<b>1.0</b>	
Ongoing agency costs - staffing, overhead etc.	<b>18.4</b>	1.00
sum:	19.4	1.0
<b>NPV</b>	<b>28.4</b>	

