EXECUTIVE NOTE

THE STORAGE OF CARBON DIOXIDE (LICENSING ETC.) (SCOTLAND) REGULATIONS 2011

SSI 2011/24

The Storage of Carbon Dioxide (Licensing etc.) (Scotland) Regulations 2011 ("the Regulations") were made in exercise of the powers conferred by **sections 19, 21 and 104(2) of the Energy Act 2008** ("the 2008 Act") **and section 2(2) of the European Communities Act 1972** ("the 1972 Act")**.** The Regulations are subject to negative resolution procedure.

Policy Objectives

The purpose of the Regulations is to partly implement Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide ("the Directive"). The Directive establishes a legal framework for the environmentally safe geological storage of carbon dioxide to contribute to the fight against climate change. Geological storage means injection and storage of carbon storage in undersea geological formations. This will mean that carbon dioxide created by fossil fuel power stations or other industrial processes can be transported to and then injected into suitably safe storage sites. This meets EU, UK and Scottish requirements to reduce emissions of greenhouse gases and prevent dangerous climate change. The Scottish Government has a clear policy to decarbonise electricity generation by 2030 and carbon capture and storage is a key technology which will support this. The Regulations implement the requirements of the Directive relating to the licensing of carbon dioxide storage.

The Regulations:

- prevent the licensing of storage in the water column;
- set out the requirements for making an application for a licence and what provisions a licence must contain;
- set out the requirements for making an application for a permit to store carbon dioxide, the factors to be taken into account when considering the application and the provisions a permit must contain;
- set out the corrective measures to be taken in the event of a leakage or significant irregularity;
- provide for review, modification and revocation of storage permits and set out the consequences of revocation;
- detail the process for the preparation and approval of post closure plans; and
- impose obligations on the operator for the period between closure of a storage site and termination of a licence.

Most of the provisions in the Regulations are made under the powers in sections 19 and 21 of the 2008 Act. Section 19 gives the Scottish Ministers power to make provision about the circumstances in which they may grant licences and section 21 gives them power to make regulations about the terms and conditions of licences.

However, the provisions of the Directive are not restricted to requirements relating to the granting and content of licences. Where the 2008 Act does not give Scottish Ministers the power to make regulations to implement the Directive these are made under section 2(2) of the 1972 Act. They include regulation 3 (prohibition on storage of carbon dioxide in the water column and regulation 9 (power of the licensing authority to make directions regarding corrective measures to be taken).

For some other aspects of the Regulations, there might be a doubt about whether the powers in the 2008 Act are sufficient to fully implement the provisions of the Directive. Section 2(2) is therefore also cited to ensure that no difficulty arises in relation to the sufficiency of Ministers' powers under the 2008 Act.

Consultation

A consultation was carried out by the Department of Environment and Climate Change in June 2008. "Towards Carbon Capture and Storage" sought views on further steps that could be taken to prepare for and support the deployment of CCS technologies. The consultation was largely based on the anticipated proposals for the Directive. The Scottish Government supported this consultation across the UK on the basis that Scottish industrial stakeholders had expressed a preference for one single UK consultation. The Scottish Ministers were informed by the views expressed in the responses to the consultation when making these Regulations.

Financial effects and Business Regulatory Impact Assessment

Using current known proposals for Carbon Capture and Storage, the Department of Environment and Climate Change prepared an extensive Business Regulatory Impact Assessment. The costs outlined in that BRIA are likely to be applicable UK wide and it therefore forms the basis for the BRIA in Scotland. However, the BRIA refers only to DECC's role in the licensing scheme to be operated by the Secretary of State, and in so far as the BRIA is relevant to Scotland and the Scottish licensing regime, that role will be fulfilled by the Scottish Ministers.

Transposition of the Directive

The Regulations partially transpose the Directive by implementing those Articles which deal with the carbon storage licensing regime, as detailed in the accompanying Transposition Note (Annex B). The remaining Articles of the

Directive will be implemented by further legislative provision to be introduced in time for 25 June 2011, the date by which the Directive must be implemented.

Scottish Government, Energy Markets Division
January 2011

TRANSPOSITION NOTE

DIRECTIVE 2009/31/EC ON THE GEOLOGICAL STORAGE OF CARBON DIOXIDE ("the Directive")

The Energy Act 2008
The Storage of Carbon Dioxide (Licensing etc) (Scotland) Regulations 2011

Article	Aim	Transposition in Scotland[1]
1	**Subject matter and purpose**	
	The Directive establishes a legal framework for the environmentally safe geological storage of carbon dioxide to contribute to the fight against climate change	
2	**Scope and prohibition**	
2.1	The Directive applies to storage in the territory of the Member States, together with their exclusive economic zones and continental shelves	Section 17(1) prohibits the storage of carbon dioxide without a licence in the UK territorial sea and the Gas Importation and Storage Zone Section 18(2)(b) and (c) provides that the Scottish Ministers are the licensing authority for storage sites within the Scottish territorial sea and may be the licensing authority for sites which are only partly situated in that sea On 6 December 2010 sections 17 and 18 will be amended by the Energy Act 2008 (Storage of Carbon Dioxide) Regulations 2010 to extend to all parts of Scotland landward of its territorial sea
2.2	Exemption for certain R&D projects	Directive not implemented in Scotland. Section 17 of the Energy Act 2008 requires that all storage of carbon dioxide (with a view to its permanent disposal) has to be licensed, regardless of size.
2.3	A storage complex must not extend beyond area	Regulation 7(1)(b)

[1] References to sections are to sections in the Energy Act 2008 (c 32) and references to regulations are references to regulations in the Storage of Carbon Dioxide (Licensing etc) (Scotland) Regulations 2011

	defined in Article 21	
2.4	Storage in the water column shall not be permitted	Regulation 2
3	**Definitions**	Regulation 1
4	**Selection of storage sites**	
4.1	Member States retain the right to determine the areas from which storage sites may be selected	To be implemented administratively. These administrative processes will be developed as the CCS demonstration projects progress (namely Longannet which is currently the only remaining entrant).
4.2	They must undertake an assessment of storage capacity The Commission may organise an exchange of information	To be Implemented administratively
4.3	Assessment of storage site must be done pursuant to the criteria in Annex I	Regulation 7(1)(a)
4.4	A formation may only be selected as a storage site if there is no significant risk of leakage and no significant environment or health risks	Regulation 7(1)(c)
5	**Exploration permits**	
5.1	Where intrusive exploration is determined to be necessary, it must not take place without a permit	Section 17(2)(c) and reg 3(2) The “appraisal term” of a licence corresponds to the “exploration permit” referred to in the Directive
5.2	Application procedures to be open to all on the basis of objective, published and non-discriminatory criteria	Regulation 3, and to be implemented administratively More detailed criteria will be contained in guidelines published on the Scottish Government and Crown Estate websites
5.3	Duration of exploration permit to be limited, but under certain conditions may be extended Permits shall be granted in respect of a limited volume area	Regulation 4(1) and (2) To be implemented administratively. Coordinates will be specified in the licence

5.4	The licence holder shall have the sole right to explore No conflicting uses of storage complex to be permitted	To be implemented administratively To be implemented administratively It will be a licence condition to hold a Crown Estate lease
6	**Storage permits**	
	No storage site to be operated without a permit; There is to be only one operator per site; No conflicting uses of site to be permitted	Section 17(2)(a) and Schedule 2, paragraph 5 Regulation 8(1)(a) To be implemented administratively. These administrative processes will be developed as the CCS demonstration projects progress (namely Longannet which is currently the only remaining entrant).
6.2	Application procedures to be open to all on the basis of objective, published and transparent criteria	Regulations 3 and 6
6.3	Priority for the granting of a storage permit is to be given to the holder of an exploration permit, subject to certain conditions No conflicting uses of complex to be permitted during permit application procedure	Regulation 6(1) and (2) To be implemented administratively Conflicting licences or consents will not be granted
7	**Applications for storage permits**	
	Applications must contain:	
7.1	name and address of potential operator;	Regulation 6(3)(a)
7.2	proof of technical competence of potential operator;	Regulation 6(3)(b)
7.3	characterisation of site and complex and assessment of security of storage;	Regulation 6(3)(b)
7.4	total quantity of CO_2 to be injected and stored, prospective sources and transport methods, composition of streams, injection rates and	Regulation 6(3)(c)(i) and (iii) to (vi) Proposed date of commencement of injection also included (regulation 6(3)(c)(ii)) Gold Plating - simply to provide more

	pressures, location of injection facilities;	information about the project to the authority.
7.5	measures to prevent significant irregularities	Regulation 6(3)(d)
7.6	proposed monitoring plan;	Regulation 6(3)(e)
7.7	proposed corrective measures plan;	Regulation 6(3)(f)
7.8	proposed provisional post-closure plan;	Regulation 6(3)(g)
7.9	information required by Directive 85/337/EEC	Regulation 6(3)(h)
7.10	Proof of financial security	Regulation 6(3)(i)
8	**Conditions for storage permits**	
8.1	Storage permit may only be issued if the authority is satisfied that:	
(a)	all relevant requirements of Directive and other relevant Community legislation are met	No further provision required
(b)	operator is financially sound, technically competent and reliable, and development and training is provided	Regulation 7(1)(d) and (3)
(c)	interactions within same hydraulic unit are taken into account	Regulation 7(4)
8.2	Permit may only be issued if the authority has considered any Commission opinion on the draft permit	Regulation 7(7)(b)
9	**Contents of storage permits**	
	Permit must contain at least:	
9.1	name and address of the operator	Regulation 8(1)(a)
9.2	precise location and delimitation of the storage site and storage complex, and information on the hydraulic unit	Regulation 8(1)(b)
9.3	operational requirements, quantity of CO_2 authorised to be stored, reservoir pressure limits, maximum injection rates and pressures	Regulation 8(1)(c)
9.4	composition of CO_2 stream and acceptance procedure; further injection and storage	Regulation 8(1)(d) and (e), and Schedule 2, paragraph 1

	requirements if necessary	
9.5	approved monitoring plan; obligation to implement and update it; reporting requirements	Regulations 7(5) and 8(1)(g) and Schedule 2, paragraph 2 Regulation 8(1)(h) and Schedule 2, paragraph 3(1) to (5)
9.6	requirement to notify the authority in the case of leakages or significant irregularities the approved corrective measures plan and the obligation to implement the plan in the event of leakages or significant irregularities	Regulation 8(1)(h) and Schedule 2, paragraph 3(6) and (7) Regulations 7(6) and 8(1)(j) and Schedule 2, paragraph 6
9.7	conditions for closure approved provisional post-closure plan	Regulations 5, 8(1)(k), and Schedule 1, paragraph 2 Regulation 8(1)(l) and 13(2)
9.8	any provisions on changes, review, updating and withdrawal of permit	Regulations 8(1)(i) and 10, and Schedule 2, paragraphs 4 and 5
99	Requirement for financial security	Regulation 8(1)(m) and Schedule 2, paragraph 7
10	**Commission review of draft storage permits**	
10.1	Procedure for obtaining the Commission's opinion on draft storage permits	Regulations 6(4) and 7(7)
10.2	Obligation of authority to notify final decision to the Commission, and state reasons where it departs from the opinion	To be Implemented administratively
11	**Changes, review, update and withdrawal of storage permits**	
11.1	Operator to notify the authority of changes; where appropriate the authority must update the permit or permit conditions	Regulation 10(1) and Schedule 2, paragraph 4;
11.2	No substantial change may be implemented without a new or updated storage permit	Regulation 10(2)
11.3	The authority must review and where necessary update or (as a last resort) withdraw the storage permit if:	

(a)	it is notified or made aware of leakages or significant irregularities under Article 16(1)	Regulation 10(5)(a), (6) and (7)
(b)	reports or inspections show non-compliance with permit conditions or risks of leakage or significant irregularities	Regulation 10(5)(a) and (b), (6) and (7)
(c)	it is aware of any other failure to meet permit conditions	Regulation 10(5)(b), (6) and (7)
(d)	it appears necessary on the basis of scientific findings and technological progress	Regulation 10(5)(c), (6) and (7)
(e)	in any event after 5 years of issue of permit and then every ten years	Regulation 10(6)(b) and (7)
11.4	Consequences of withdrawal of storage permit:	
	Authority must issue new permit or close the storage site	Regulation 11(2) and (3)
	Until new permit issued, the authority is deemed to be the operator with responsibility for injection criteria, monitoring and corrective measures, and liabilities under Articles 5(1) and 6(1) of the Environmental Liability Directive and under ETS Directive[2]	Regulation 11(4)
	If site is closed, Article 17(4) applies	Regulation 11(5)
	The authority shall recover costs incurred from the former operator, including by drawing on financial security	Regulation 11(6) and Schedule 2, paragraph 7(5)
12	**CO_2 stream acceptance criteria and procedure**	
12.1	The stream is to consist overwhelmingly of CO_2: no waste may be added but it may contain incidental and added trace substances below the levels that would	Schedule 2, paragraph 1(1) and paragraph 1(2)(a) paragraph 1(2)(b) and (3)

	(a) adversely affect the integrity of the site or transport infrastructure (b) pose a significant risk to environment or health (c) breach applicable legislative requirements	paragraph 1(2)(b)(i) paragraph 1(2)(b)(ii) paragraph 1(2)(b)
12.2	The Commission shall if appropriate adopt guidelines	
12.3	The operator must: (a) carry out an analysis and risk assessment of the CO_2 stream; and (b) keep a register of the quantities and properties of the streams delivered and injected	 Schedule 2, paragraph 1(4) and paragraph 1(5)
13	**Monitoring**	
13.1	The operator must monitor injection facilities, storage complex (including where possible the CO_2 plume) and where appropriate the surrounding environment, for the purposes listed in (a) to (g)	Schedule 2, paragraph 2(1) and (2) paragraph 2(3)(a) to (g)
13.2	Monitoring must be based on a monitoring plan drawn up in accordance with Annex II and with guidelines under the ETS Directive, and approved by the authority under Articles 7(6) and 9(5) The plan must be updated in accordance with Annex II and in any case every 5 years, and re-submitted for approval	Regulation 6(3)(e) and Schedule 2, paragraph 2(4) and paragraph 2(5) to (7)
14	**Reporting by the operator**	

	At a frequency to be determined by the authority (but in any event at least once a year) the operator must submit the following information:	Schedule 2, paragraph 3(1) to (4)
14.1	results of monitoring, including technology employed, in the reporting period	paragraph 3(1) and (5)(a)
14.2	quantities and properties of the CO_2 streams	paragraph 3(1) and (5)(b)
14.3	proof of financial security	paragraph 3(1) and (5)(c)
14.4	any other information the authority considers relevant	paragraph 3(1) and (5)(d)
15	**Inspections**	To be implemented by separate instrument
16	**Measures in case of leakages or significant irregularities**	
16.1	The operator must immediately notify authority in case of leakages or significant irregularities and take necessary corrective measures, including measures related to human health; in the case of leakage or risk of leakage the operator must also notify the Emissions Trading Scheme authority	Schedule 2 paragraph 3(6) paragraph 6(1) paragraph 3(7)
16.2	The measures the operator must take, at a minimum, shall be on the basis of a corrective measures plan approved by the authority	Regulation 7(6) and Schedule 2, paragraph 6(2)
16.3	The authority may require corrective and health protection measures to be taken at any time These may be different or additional to those in the corrective measures plan The authority may at any time take such measures itself	Regulation 9(2)(a) Regulation 9(3) Regulation 9(4)(a)

16.4	If the operator fails to take the required measures, the authority must do so itself	Regulation 9(2)(b)
16.5	The authority's costs must be recovered from the operator	Regulation 9(4)(b) and (5)
17	**Closure and post-closure obligations**	
17.1 **(a)** **(b)** **(c)**	A storage site must be closed— if the relevant permit conditions have been met; on application by the operator; if the authority decides to close the site following withdrawal of a storage permit	 Schedule 1, paragraph 2(1) and paragraph 2(2)(a) and (3) Regulation 11(2) and (3)
17.2	Until liability is transferred to the authority, the operator remains responsible (in cases (a) and (b) above) for— monitoring, reporting and corrective measures liabilities under the ETS Directive and Articles 5 to 8 of Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage ("the Environmental Liability Directive") The operator is also responsible for sealing site and removing the injection facilities	Schedule 1, paragraph 1 and paragraph 4(1) Schedule 1, paragraph 4(1) Regulation 13, Schedule 1, paragraph 4(3)
17.3	Those obligations must be fulfilled on the basis of a post-closure plan in accordance with the requirements in Annex II For that purpose, the provisional post-closure plan must (prior to closure) be—	Schedule 1, paragraph 2(4) and paragraph 4(2)

(a) **(b)** **(c)**	updated in the light of risk analysis, best practice and technological improvements submitted for approval, and meet the approval of the authority	Schedule 1, paragraph 3 Schedule 1, paragraph 3(1) Regulation 12(3)
17.4	After a site has been closed following withdrawal of the permit— the authority must assume responsibility for monitoring and corrective measures, and liabilities under Articles 5(1) and 6(1) of the Environmental Liability Directive and under Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance ("the ETS Directive") the post-closure obligations shall be fulfilled by the authority on the basis of the provisional post-closure plan Post-closure responsibilities to be fulfilled by the authority on the basis of the provisional post-closure plan, updated as necessary	 Regulation 11(5), Schedule 1 paragraph 1 Regulation 12(4)
17.5	The authority shall recover from the operator the costs incurred in relation to the Article 174 measures, including by drawing on financial security	Regulation 11(6) and Schedule 2, paragraph 7(5)(b)
18	**Transfer of responsibility**	To be implemented by separate instrument
19	**Financial security**	
19.1	Proof of financial security or equivalent to be presented as part of an application for a storage permit This is to ensure that all obligations under the	Regulation 6(3)(i) Schedule 2, paragraph 7(1)(a) and (5) and

	permit and the ETS Directive can be met The security must be valid and effective before commencement of injection	 paragraph 7(1)(b)
19.2	The security is to be periodically adjusted in light of changes in risks and estimated costs	Schedule 2, paragraph 7(3) to (5)
19.3	Security is to remain in force—	
(a)	after the site is closed and until transfer of responsibility;	Schedule 2, paragraph 7(1)(c)
(b)	after withdrawal of the permit— until a new permit is issued or where the site is closed, until transfer of responsibility, provided that the financial contribution obligation under Article 20 is fulfilled	 Schedule 2, paragraph 7(2) Para 7(6)
20	**Financial mechanism**	To be implemented in a separate instrument
21	**Third party access to transport network and storage sites**	To be implemented in a separate instrument
22	**Dispute settlement**	To be implemented in a separate instrument
23	**Competent authority**	
	Member States must establish or designate the competent authorities under this Directive Where more than one is designated, coordination arrangements must be established	Section 18 Licensing functions may also be transferred under section 34 These will be established by a concordat between the licensing authorities in different parts of the UK
24	**Transboundary cooperation**	
	In the case of transport, storage sites or storage complexes which cross boundaries, the competent authorities must jointly meet the requirements of the	To be considered when issue becomes relevant (implementation may be administrative)

	Directive	
25	**Registers**	
25.1	Competent authority to establish and maintain the following registers:	Section 29 The register will be maintained by the Secretary of State for the whole of the UK
25.2	Registers to be taken into consideration in other planning and permitting decisions in connection with activities in registered storage sites	To be implemented administratively
26	**Information to the public**	No further provision required
27	**Reporting by Member States**	To be Implemented administratively
28	**Penalties**	
	Member States must lay down effective, proportionate and dissuasive rules on penalties for breach of national provisions adopted to implement the Directive and take all measures necessary to implement them and must notify them to Commission	Sections 22, 23 and 25 and 27(5) Section 28 and to be implemented administratively To be Implemented administratively
29	**Amendments of Annexes**	
30	**Committee procedure**	
31	**Amendment of Directive 85/337**	[ ]
32	**Amendment of Directive 2000/60**	No new provision required
33	**Amendment of Directive 2001/80**	To be implemented administratively
34	**Amendment of Directive 2004/35**	[ ]
35	**Amendment of Directive 2006/12**	To be implemented in a separate instrument
36	**Amendment of Regulation 1013/2006**	No transposition required
37	**Amendment of Directive 2008/1**	To be implemented by a separate instrument
38	**Review by the Commission**	
39	**Transposition and transitional measures**	

39.1	Transposition to be by 25 June 2011 Measures to be communicated to Commission Measures must contain or be accompanied by a reference to the Directive	Regulation 1 Further implementing instruments will be made before the transposition deadline Implemented administratively Regulation 1(3)
39.2	Other main provisions in field covered by Directive to be communicated to Commission	To be implemented administratively
39.3	Transitional provisions for existing storage sites	There are no existing sites.
40	Entry into force of the Directive	
41	Addressees	
Annex I	Criteria for assessment of storage complex	Regulation 7(1)(a)
Annex II	Criteria for monitoring plan, and post-closure monitoring	Regulation 6(3)(e) and Schedule 2, paragraph 2(5) Regulation 13(1)(b)

BUSINESS REGULATORY IMPACT ASSESSMENT

THE STORAGE OF CARBON DIOXIDE (LICENSING ETC.) (SCOTLAND) REGULATIONS 2011 (SSI 2011/24)

Issue

1. To implement the requirements of the EU Directive 2009/31/EC on the geological storage of carbon dioxide by introduction of an offshore carbon dioxide storage licensing regime by exercising powers conferred by the Energy Act 2008. The licensing regime is intended to ensure that there is a clear; fit-for-purpose regulatory framework to permit the development, and enable investment in, carbon capture and storage (CCS) projects.

2. The Department of Energy and Climate Change of the UK Government have carried out a full and comprehensive Business Regulatory Impact Assessment of the offshore carbon dioxide storage licensing regime. This assessment will also be relevant to the implementation of the regime in Scotland. Scottish industry views have been incorporated in this through the UK wide consultation, 'Towards Carbon Capture and Storage' supported by the Scottish Government.

Objectives

3. There are a number of objectives for the Scottish Government associated with the Directive:

- To realise economic opportunities for the development of a CCS based industry in Scotland. There is the potential for a whole new industry to emerge in Scotland, which could support up to an estimated 10,000 new jobs in the next 15–20 years. In the longer term, CCS is expected to develop into a multi-billion pound market with some 23,000 thermal generation plants globally, potentially requiring replacement or retrofit with CCS.

- To implement a fit for purpose licensing regime in Scotland so that CCS projects can proceed. The regime will enable the safe and economic long term storage offshore of carbon dioxide in Scottish territorial waters.

- To help deliver the climate change commitments of Scotland and the UK, and facilitate those CCS projects currently being progressed. Without the regime we would be open to infraction proceedings for not implementing the EU Directive on geological storage of carbon dioxide.

Responsibility

4. The provisions of Chapter 3 of Part 1 of the Energy Act 2008 ("the Act") prohibits the storage of carbon dioxide without a licence. Scottish Ministers are the licensing authority for Scotland out to the Scottish 12 mile territorial sea. The Secretary of State for the Department of Energy and Climate Change licenses the offshore area beyond the 12 mile limit. Scottish Ministers are therefore required to implement a licensing regime.

Consultation

5. A consultation carried out by BERR in June 2008 "Towards Carbon Capture and Storage" sought views on further steps that could be taken to prepare for and support the deployment of CCS technologies. The consultation was largely based on the proposals for the Directive on the Geological Storage of Carbon Dioxide (Directive 2009/31/EC). The Scottish Government supported this consultation across the UK on the basis that Scottish industrial stakeholders had expressed a preference for one single UK consultation and Scottish Ministers have been informed of the views expressed. In addition it was agreed through the LCM (LCM(S3) 12.1 Session 3, 2008) to ensure wherever possible identical regulations and consultations to be set jointly throughout the UK.

Financial and administrative effects

7. The majority of DECC's BRIA has been conducted on the basis of current known proposals on CCS development and deployment. The costs outlined in this are likely to be applicable UK wide and therefore a similar situation is expected in Scotland (with the exception to the licensing authority for Scottish territory as detailed in point 4 above). As stated in the assessment it is possible there will be additional cost incurred as details are finalised at EU level. Scottish Ministers are fully supportive of the evidence base presented in DECC's BRIA attached at Annex A.

Implementation

8. The EU Directive will come into effect on 25 June 2011. The Scottish Government will lay regulations, similar to those outlined by DECC, to enforce this Directive.

Annex A

Summary: Analysis & Evidence

Policy Option: 1	Description: Licensing Regime for the offshore storage of CO_2

COSTS

ANNUAL COSTS		Description and scale of **key monetised costs** by 'main affected groups' Estimated costs per Licence application total £690,000. Estimated annual costs of monitoring and inspection are £132,000–£237,000 per project. (All in 2009 prices).
One-off (Transition)	**Yrs**	
£ 0	44	
Average Annual Cost (excluding one-off)		
£ 495,000–816,000		**Total Cost** (PV) £ 11–19 million

Other **key non-monetised costs** by 'main affected groups' Financial security will be required to cover the cost of compliance with the storage permit, including maintenance of the site and remediating any significant irregularities. There is also a contingent liability to buy EUAs under the EU ETS. The exact requirements are not yet known so a quantified estimate is not possible..

BENEFITS

ANNUAL BENEFITS		Description and scale of **key monetised benefits** by 'main affected groups'
One-off	**Yrs**	
£		
Average Annual Benefit (excluding one-off)		
£		**Total Benefit** (PV) £

Other **key non-monetised benefits** by 'main affected groups' The licensing enables safe and secure storage of CO_2. This will enable the benefits from CCS demonstration to go forward which are attributed to 'A framework for the development of clean coal'; see evidence base for more information.

Key Assumptions/Sensitivities/Risks These figures are based on 4 CCS (demonstration) projects going ahead with storage operations commencing in 2014, 2015 and 2018 (2). There would be additional costs if further projects go ahead.

Price Base Year 2009	Time Period Years 44	**Net Benefit Range** (NPV) £ -11 millon–£-19 million	**NET BENEFIT** (NPV Best estimate) £ -15 million

What is the geographic coverage of the policy/option?			Offshore UK	
On what date will the policy be implemented?			Apri l2010	
Which organisation(s) will enforce the policy?			DECC	
What is the total annual cost of enforcement for these organisations?			£	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			No	
What is the value of the proposed offsetting measure per year?			£ n/a	
What is the value of changes in greenhouse gas emissions?			£ 0	
Will the proposal have a significant impact on competition?			No	
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ 31,000 Decrease of £ **Net Impact** £ 31,000

Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

Strategic Overview

The Government is committed to making the UK a leading player in carbon capture and storage (CCS). Creating an effective fit for purpose licensing regime is necessary to ensure the safe long-term storage of carbon dioxide and therefore a necessary condition for the effective deployment of CCS and achievement of the UK's objectives.

The Issue

Introduction of a licensing regime for offshore storage of carbon dioxide.

Objectives

The policy objectives are to:

- create an effective fit-for-purpose licensing regime to ensure the safe long-term storage of carbon dioxide; and
- thereby implement the EU Directive on geological storage of carbon dioxide.

Successful implementation of the regime in October 2010 and a successfully licensed and operational CCS development as a result of the Government's competition exercise for a demonstration project would be a clear indication of success.

Options Identified

- "Do nothing". Do nothing was not a practical option as that would have led to infraction proceedings for not implementing the EU Directive.
- The chosen option, to implement a licensing regime which is in line with agreed government policy as set out in the Energy Act 2008 provisions for lease and licence arrangements and by the requirements of the EU Directive on geological storage of carbon dioxide. The parameters of the Act and the Directive allowed scope for only one regime.

Summary of the Licensing Regime

- To undertake offshore storage, developers will need to obtain an Offshore Carbon Dioxide Appraisal and Storage Licence from DECC and obtain a lease from The Crown Estate for the offshore area they wish to exploit for storage. The lease will define the co-ordinates of the area initially for the appraisal activity and the licence will reference these co-ordinates as the parameters of the Licence.
- The Licence acts as a framework which covers the development from the appraisal phase; operational phase though to the post closure period.
- Under the licence, once appraisal activity has been completed, developers will be required to submit a Storage Permit within the meaning of the Directive for approval of the project by DECC's engineers and specialists. This is similar to how the petroleum licence works.
- Approval of the Permit constitutes development consent and allows construction to proceed
- Additionally a "Corrective Measures Plan" in case of significant irregularities or leakages; a "Monitoring Plan"; a "Post Closure Plan" and a "Financial Security Agreement" will be part of the Permit approval.

- The Licence will stay in place with the developer for a benchmark period of 20 years after injection has ceased (the post closure period) until the Competent Authority is satisfied that the CO_2 is permanently contained and its acceptable for responsibility to transfer to the Sta
- At this point the Licence may be surrendered by the Licensee.

Cost Benefit Analysis

The monetised costs arising from the licensing regime are:

- Costs of licence and storage permit applications (borne by licensees and government);
- Costs of site monitoring (borne by licensees); and
- Costs of inspection (recovered from licensees).

These figures are based on 4 CCS (demonstration) projects going ahead with storage operations commencing in 2014, 2015 and 2018 (2). There would be additional costs if further projects go ahead.

Other costs which cannot be estimated at this stage will also be incurred. These are described in an Annex on Other Costs and will arise, in particular, from the need for Financial Security Agreements, details of which have not yet been finalised at the EU level.

The licensing regime enables benefits from CCS, as assessed in the Impact Assessment of 'A framework for the development of clean coal'.

Costs

Licence and Storage Permit application

The 2006 "Business Burdens" exercise calculated that submission under a Petroleum Licence of a field development plan (which is similar to a carbon dioxide storage permit programme) incurred a resource cost (including internal staff costs and use of consultants) to the Licensee £306,000 plus £34,000 for other costs such as seeking drilling consents. These are one-off costs for each project that goes ahead. Additionally the initial Licence application will cost the licensee £2,100. The evidence of cost calculated and submitted as part of the 2006 exercise have been relied upon as the Admin Burdens database is unable to produce evidence due to technical problems.

A large degree of resource input will be required from DECC in helping a developer progress a Storage Permit application to a degree that DECC feels it is in a form that can be consented to As this type of work has never been undertaken by the Department before it is difficult to gaug how much resource input that will require. In time, and with experience, DECC intends to mak a fees and charges assessment under Treasury Fees and Charges Guidelines to determine a fee for the application of a storage permit. A fees and charges assessment in 2002 (as part of proposed charging regime never implemented) calculated that DECC costs of assessing each field development plan was £20,000.

Based on an estimated doubling of both the Licensees' and DECC's resource input to facilitate the requirements of the Directive (which are over and above those for normal field developmer plans), the cost to the developer for preparing a storage permit application is estimated to be £612,000 plus a £40,000 charge by DECC for considering the storage permit application. This doubling of the developer's and DECC's input over that of a petroleum field development plan will be caused by the additional work needed to understand, and be assured by, the storage sites geological integrity to store the CO_2 permanently and by working with the developer to produce a sensible monitoring plan and corrective measures plan in case of significant irregularities. There is in addition an estimated £34,000 for other costs such as drilling consent plus the assumed cost of the Licence (£2,100). This gives an estimated cost to the developer around £650,000 to gain approval for the development (rising to £690,000 after the first application).

Summary Table for first application

Licensing Stages	Activity	Cost to developer	Cost to Government
Stage 1	Applying for General Exploration Licence	£500	Minimal, small admin effort.
Stage 2	Applying for a carbon storage licence	£2,100	Zero, covered by Licence fee (£2,100)
	Other costs such as consent to drill an exploration well.	£34,000	Negligible
Stage 3	Development of Storage Permit for approval	£612,000	£40,000 (until fees and charges regulations introduced to cover this cost)
Stage 4	Ongoing Monitoring		
Total per application (assuming all 4 stages are undertaken)		£648,600	£40,000

Monitoring

The licence will require monitoring of the site to ensure there are no leaks. The exact requirements and so costs of this are still to be determined. The IPCC special report on CCS gives life-cycle monitoring costs for two different monitoring packages: "basic" includes periodic seismic surveys, microseismicity, wellhead pressure and injection-rate monitoring; the "enhanced" version adds periodic well logging, surface CO_2 flux monitoring and other advanced technologies. The undiscounted cost for the basic package is £0.08–£0.09/tCO_2, for enhanced £0.14–£0.15/tCO_2.

It is assumed here that each CCS project stores 1.5 MtCO_2 per year (as discussed in footnote 2 below), and so annual monitoring costs are estimated at £120,000-£225,000 per project. While these estimates are based on "periodic", and not necessarily annual, surveys, the gradual phasing-out of monitoring should mean that the number is not significantly different.

The cost of periodic checking of observation wells to detect small leaks needs further research, but is suggested by the British Geological Survey to be low on the grounds that it is routinely done for North Sea wells.

Inspection Regime

Depending on what is agreed, the competent authority will be required to carry out annual routine inspections for a number of years during the operational and possibly the post-closure period. This will be for the purposes of checking and promoting compliance with the requirements of the Directive and of monitoring the effects on the environment. For offshore stores this will require sending out a helicopter for a minimum 3 hour trip at a cost of around £4,000 per hour, estimated at £12,000 per project per year.

Non-routine inspections will be carried out in instances of leakages or significant irregularities, non-compliance with permit conditions and at the discretion of the competent authority. Each inspection will need to be followed with a publicly available report within two months.

The expectation is that permitting of existing sites will be largely undertaken using existing resources. We therefore do not expect significant additional enforcement costs. The intention is that the permitting costs will be recovered from the operator by way of fees. These fees will be charged on a cost-recovery basis.

Costs not included

The scope of this Impact Assessment is restricted to the new licensing regulations. The costs of complying with environmental legislation or agreeing a Crown Estate Lease, which will also be required, are therefore not included.

See also the Annex on Other Costs not directly attributable to the licensing regime which is the subject of this Impact Assessment. These are costs of CCS, which were not included in the Impact Assessment of 'A framework for the development of clean coal' but will be included in an Impact Assessment accompanying secondary legislation on CCS, to be consulted on later this year.

Benefits

The benefit of the licensing regime is its contribution to allowing CCS projects to be developed and effectively regulated, building confidence in this low carbon technology.

The benefits from CCS projects in the UK are accounted for in Impact Assessment of 'A framework for the development of clean coal' and are described here as background information to show the benefits that are being enabled by the introduction of the offshore carbon storage licensing regime. The CCS projects will allow to be permanently stored below the seabed carbon dioxide that would otherwise be released to the atmosphere in a way that protects the local environment and other uses of the sea and seabed. The benefits from CCS projects, if successful, are as follows: they reduce the costs of carbon mitigation and increase the probability of achieving stabilisation goals; they contribute to security of supply; and they contribute value to the UK economy through the growth of CCS industries and international leadership. The total amount of carbon dioxide that is stored from this type of power generation will depend on the success of the demonstration project and whether the technology is then taken forward by potential developers.

Administrative Burdens

The Stage 2 Cost to the developer of £34,000 in the "Summary Table for the first application" is the same as the £31,000 Net Impact burden identified in the "Summary: Analysis and Evidence" table adjusted for inflation.

Monitoring and evaluation

The licensing regime will be reviewed in 2015 after some experience of the CCS demonstration projects.

Specific Impact Tests

Competition Assessment

Whilst not strictly part of the regulatory arrangements, the Energy Act 2008 awards exclusive rights to The Crown Estate to lease sites to store carbon dioxide in the offshore area. This makes The Crown Estate a monopoly supplier of carbon dioxide storage sites in the UK. However, there is a statutory bar on The Crown Estate exploiting this monopoly position in section 3(1) of The Crown Estate Act 1961. We believe this provides sufficient protection for developers against The Crown Estate exploiting its monopoly position.

Small Firms Impact Test

The expected nature of carbon dioxide storage means that only a few carbon dioxide storage sites are likely to operate in the UK. It is possible, although unlikely; that in the demonstration stage of the technology these could be operated by SMEs. The regulatory arrangements will not impact differentially on small businesses. Given the purpose of the regulations is to provide a minimum standard of protection to the environment, human health and other economic uses, it would not be appropriate to impose lesser standards on SMEs.

It is likely that a discretionary approach to requiring a financial guarantee from operators would have an additional impact on small firms compared with large firms. This is because it is (very) large firms that are likely to have sufficient funds available to cover liabilities without recourse to

an independent financial guarantee and the additional costs of a guarantee would therefore be avoided.

Carbon Assessment

The licensing regime will not of itself impact on the potential emissions of CO_2, but will permit the permanent storage of carbon dioxide.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	Yes	No
Small Firms Impact Test	Yes	No
Legal Aid	No	No
Sustainable Development	No	Yes
Carbon Assessment	Yes	No
Other Environment	No	No
Health Impact Assessment	No	No
Race Equality	No	Yes
Disability Equality	No	Yes
Gender Equality	No	Yes
Human Rights	No	No
Rural Proofing	No	No

Annexes

Other Environment

None applicable

Race Equality

The legislation will not impact on race equality as it will not affect individuals and it will impact equally on all organisations.

Disability Equality

The legislation will not impact on disability equality as it will not affect individuals and it will impact equally on all organisations.

Gender Equality

The legislation will not impact on gender equality as it will not affect individuals and it will impact equally on all organisations.

Human Rights

Not applicable

Rural Proofing

Not applicable

Sustainable Development

From a sustainable development viewpoint the proposal enables positive impacts in terms of air quality, use of new technologies and GHG emissions. We are confident that the legislative framework will minimise any negative impacts in other areas.

Other Costs

Financial security

Article 19 of the EU Directive requires financial security to cover the cost of compliance with the storage permit, including maintenance of the site and remediating any significant irregularities. In addition, the Directive also requires the financial guarantee arrangements to cover contingent liabilities that arise under the EU ETS. These will arise only in the event of a leak of carbon dioxide to the biosphere. There is a very low probability of such a leak, but the potential financial consequences could be high.

In relation to the costs to be identified and required as part of the Financial Security Agreement, the Directive indicates in broad terms what matters are to be covered by the Financial Security, but not how the security is to be provided. It is possible that part, at least of the security could be provided by some form of insurance, but there is no information presently available on the likely costs of such insurance. The European Commission will be publishing guidance on acceptable forms of security in Autumn 2010 on current estimates.

Below we provide indicative estimates of the resource costs of the matters to be covered by the Financial Security. The financial costs, borne by CCS operators, of the Financial Security will vary between projects. It is therefore not possible at this stage to provide quantified estimates of the costs of Financial Security.

Maintenance and operating costs for CCS platforms could cover a very large range, depending on the manning assumptions. Using figures from recent Stewardship returns for oil and gas fields we can illustrate this. For an unmanned platform with minimal facilities that needs a few day visits each year for routine maintenance, costs could be circa £1 million per annum. However, some of these platforms benefit from shared logistics (helicopter, standby boats, supply boats) with other nearby platforms. As soon as more visits are needed to deal with repairs, minor upgrades, etc, costs can increase steeply – in the order to £3 million to £6 million

per annum. A significant upgrade or problem on the platform could increase costs further. For a platform manned all year round, costs can be £20 million per annum or more. A best estimate of the costs for a platform likely to be used for CCS (medium sized, shallow water with very little onboard processing and minimal manning) would therefore be £1 million–£5 million per annum.

The main obligations on an operator of an offshore carbon dioxide storage facility are likely to be the cost of removing the facilities (such as pipelines and platforms) at the end of their useful life. Maintenance of facilities awaiting decommissioning and the cost of monitoring the stored carbon dioxide will be the other main costs (monitoring costs are discussed below). Our assumption is that the facilities used for storage are likely to be similar in most respect to those used for oil and gas production. Based on existing oil and gas structures of a type likely to be used for storage (medium sized shallow water with very little onboard processing and minimal manning with 4 wells), the cost of decommissioning an offshore facility used for the injection of carbon dioxide could be something of the order of £20 million, and the associated pipeline an additional cost of £4 million to £15 million. Taking all these obligations together it is possible that future obligations at the end of the post-injection period could amount to up to £35 million, although this is highly dependent on the cost of decommissioning the physical structures.

During the operational period of the storage licence (i.e. during the injection period) and during the post-closure period (i.e. after injection has ceased but transfer of responsibility has not passed to the state), in the event of leakage of CO_2 from a storage site the operator will be liable for the costs of purchasing the relevant volume of carbon permits under the EU ETS. The cost of this will depend on the amount of CO_2 that might be leaked as well the estimated carbon price at the time of a leakage. After transfer of responsibility for the storage site to the state has taken place, it will be the state that will be liable for costs of purchasing the relevant volume of carbon permits under the EU ETS..

The worst-case scenario is anticipated to be a borehole seal failure, which implies a leakage of CO_2 at the rate of injection. The IPCC report[1] comes to the conclusion that it is very likely that over 99% of the CO_2 would be retained in a store after 100 years. 1% of the total estimated UK storage capacity is 24 $MtCO_2$ and, while such a leak would incur costs under EU ETS due to the nature of the leak, these would be small on any annual basis and accrue over a long period of time. For example, if each CCS project stored 1.5 $MtCO_2$[2] per year, and there was a leak in 2020 of 1% of the total CO_2 stored in that year, the cost of the EU ETS allowances that would need to be purchased would be between £0.8 million and £1.9 million with a central estimate of £1.5 million.[3]

The Directive requires a non-discretionary financial security to be in place prior to the commencement of injections. This would mean that an operator would incur significant cost only once liabilities exist. In the oil and gas sector any form of financial security is acceptable (except parent company guarantees), so long as it meets the costs of decommissioning when required. In practice, however, letters of credit are the usual form of guarantee. The cost of this type of security is estimated at 0.5% to 3% of the value of the letter of credit depending on the creditworthiness of the company. Administrative and legal costs typically add perhaps 25% to this. Letters of credit also have an impact on a companies' ability to borrow and those with very limited resources may have to provide cash collateral to back a letter of credit. Taking all this into consideration, we estimate that the overall cost of a letter of credit could amount to around 10% of the face value per year.

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[1] IPCC Special Report on Carbon Capture and Storage: http://www.ipcc.ch/pdf/special-reports/srccs/srccs_wholereport.pdf.

[2] 1.5$MtCO_2$ abated per year is consistent with a CCS project storing 20$MtCO_2$ over a 15 year period which is consistent with the CCS Demonstration projects.

[3] Based on 4 projects using the DECC/HMT low, central and high assumptions for carbon valuation in the traded sector of £14, £25 and £31, respectively, per tCO_2 ("Valuation of energy use and greenhouse gas emissions for appraisal and evaluation", available at:
http://www.decc.gov.uk/en/content/cms/statistics/analysts_group/analysts_group.aspx).
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Transfer fee

Following the transfer of a storage site to the state, all responsibility for that site and long-term liabilities will rest with the state. This would include any liabilities under the EU ETS. The state would be required to carry out any remediation work following a leakage and would not be able to recover any costs from a previous operator except in cases of operator negligence or where the operator had provided false information which led to the state taking on responsibility for the site. Article 18 of the Directive stipulates that after the closure of the site (i.e. injection has ceased) the transfer to the State should not take place less than 20 years thereafter. However, if the competent Authority is satisfied that the conditions for transfer has taken place ahead of this time transfer to the State is permissible.

Article 20 requires the state to ensure that the operator of a storage site makes a financial contribution available to the competent authority that shall cover at least the cost of monitoring for a period of 30 years.