WWF for a living planet®

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Committee Secretary
Standing Committee on Primary Industries and Resources
PO Box 6021
House of Representatives
Parliament House
CANBERRA ACT 2600

By email: pir.reps@aph.gov.au

2 July 2008

Dear Committee Secretary,

Inquiry into the Draft *Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill*

Please find enclosed WWF's submission to Inquiry into the Draft *Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill.*

Please do not hesitate to contact me if you have any queries.

Yours faithfully

Paul Toni
Program Leader Development and Sustainability

WWF submission on the draft *Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill*

1. ABOUT WWF

WWF-Australia is part of the WWF International Network, the world's largest and most experienced independent conservation organisation. It has five million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity;
- ensuring that the use of renewable natural resources is sustainable; and
- promoting the reduction of pollution and wasteful consumption.

With over 90,000 supporters, and active projects in Australia and the Oceania region, WWF works to conserve Australia's plants and animals, by ending land clearing, addressing climate change and invasive species, and preserving and protecting our fresh water, marine and land environments.

WWF achieves this by working on the ground with local communities, and in partnership with government and industry, using the best possible science to advocate change and effective conservation policy.

2. INTRODUCTION

To avoid dangerous climate change humanity must reduce global greenhouse gas emissions sufficiently to avoid a warming of 2 degrees or more in global average surface temperature.

To do this the world must simultaneously reduce per capita energy consumption and become more energy efficient, halt and reverse loss and degradation of forests, and replace traditional fossil fuels with zero and low emission technologies.

With respect to energy technology, WWF's *Climate Solutions*[1] report found that we must rapidly and concurrently deploy a range of renewable and low emissions technology, including carbon capture and storage (CCS). This opinion is also reflected in reports by the United Nations' Intergovernmental Panel on Climate Change[2] and the International Energy Agency[3].

Climate Solutions found that CCS of fossil fuels could account for about 26% of global energy supply by 2050, avoiding emissions of 3.8 Giga tonnes (3.8 billion) of CO_2 per year. *Climate Solutions* also found that if one or two of the zero or low emission technologies fail to work or their deployment is delayed, including CCS, the likelihood of staying below 2 degrees is reduced significantly.

To this end, WWF supports rapid demonstration of CCS to determine if it is going to be part of the solution to climate change.

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[1] WWF (2007) Climate Solutions: WWFs Vision for 2050, www.wwf.org.au/publications/gefreport/
[2] IPCC (2007) Fourth Assessment working group III climate change mitigation report Chapter 4 Energy supply, pg 255
[3] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations, pg. 3.

The creation of clear legal rights to explore for geological storage formations and to store carbon dioxide, as well as an efficient, transparent and credible regime for its assessment, approval and operation, are necessary for investment in CCS in the long term[4].

However equally important is the creation of a clear framework for risk reduction, monitoring and verification and point of liability for stored carbon dioxide. Certainty in relation to these issues are essential to provide confidence that CCS is safe and ecologically sustainable, and these in turn are prerequisites to ensure broad public acceptance and support of the technology.

WWF believes that the draft Bill puts more emphasis on the creation of legal rights to explore and store carbon dioxide rather than the creation of a clear risk, monitoring, verification and liability framework in circumstances where equal priority should be accorded to both sets of issues. WWF submits that, subject to the remarks in WWF's submission to the Discussion Paper, the Victorian Government *Discussion Paper: A Regulatory Framework For The Long-Term Underground Geological Storage Of Carbon Dioxide In Victoria* (the Victorian Discussion Paper) appropriately balances investor certainty and environmental and public safety. A copy of WWF's submission in relation to the Victorian Discussion Paper is Appendix 1 to this submission.

Given that the objective of injecting and permanently storing greenhouse gas emissions is to prevent these pollutants from entering the atmosphere and contributing to dangerous climate change is very different from the objective of facilitating the extraction of petroleum, the Bill must have a greater focus on environmental and public safeguards than it has at present.

In the submission by the Australian Network of Environmental Defender's Offices Inc (ANEDO), ANEDO notes that greater environmental and public safeguards can be achieved through "*the incorporation of a rigorous independent assessment process, an ongoing monitoring regime, and strict adherence to the principles of ecologically sustainable development*". WWF adopts those recommendations and adds that the inclusion of clear objectives, guiding principles, a definition of "public interest" and a "national interest" test would also assist in achieving those goals.

The Bill has been tabled without the accompanying regulations, which will provide much of the detail of the regulatory scheme. It is difficult to respond to the Terms of Reference of this Inquiry without being able to analyse the regulations. WWF would appreciate an opportunity to make submissions in relation to the regulations when they are complete.

WWF further notes that the Environment Protection and Heritage Ministerial Council and the Ministerial Council on Mineral and Petroleum Resources are jointly developing environmental guidelines for CCS, which is yet to be completed and which has therefore not been considered in the course of developing the draft Bill.

- ***Recommendation 1*** *- WWF recommends that debate of the Bill be delayed until the public has had an opportunity to comment on the regulations and the environmental guidelines being developed by the Environment Protection and Heritage Ministerial Council and the Ministerial Council on Mineral and Petroleum Resources.*

Before CCS becomes fully commercialised a number of demonstration projects will be undertaken in partnership with research organisations, private investors and other Governments. Demonstration projects like the Otway Project in Victoria will provide important information on geological storage site suitability, the development of monitoring and verification protocols and regulatory legislation. The International Energy Agency has remarked "*the apportionment of long-term legal*

[4] Victorian Government (2008) Regulatory Framework for the Long-term Storage of Carbon Dioxide in Victoria: Discussion paper January 2008.

responsibility between governments and project proponents will take some time to resolve, and probably only after demonstration projects have produced results"[5].

WWF notes that the Bill does not refer to demonstration projects and assumes that the Federal Government intends for demonstration projects to be subject to the proposed legislation. WWF believes that a case can be made for Government-approved demonstration projects to receive special treatment in relation to monitoring and liability provided that safety and environmental integrity are not compromised[6]. For example, WWF submits that, in the case of demonstration projects, the Government jointly with the other project proponents accept the primary obligation to monitor and verify injection and retention operations from the commencement of operations to avoid delaying demonstration projects and to gather and place in the public domain learnings from the project.

- ***Recommendation 2*** *– WWF recommends that the Government considers and outlines how demonstration projects are dealt with by the proposed legislation.*

The development of CCS will require significant new infrastructure at capture sites, for transport and at storage sites. In order to facilitate economic, environmentally and socially-sound and efficient demonstration and commercialization of CCS, consideration should be given to developing a national interest criterion for selection of storage sites to be licensed for injection. A national interest criterion could include consideration of: distance of storage site from power capture sites or hubs, existing pipeline routes or potential route, quality of the site, potential size of reservoir, access to alternative storage locations, and impact on environmental and culturally sensitive areas.

- ***Recommendation 3*** *– WWF recommends that a national interest test be developed for the selection of storage sites to be licensed for injection.*

CCS is novel, technically complex and has the potential to do considerable damage to human settlements and the environment. In such circumstances the Government should have the power to enter relevant land, access all transportation, injection, monitoring and verification records and any other relevant records, test all equipment and, in the case of demonstration projects, have joint responsibility for monitoring and verification of CCS capture, injection and storage operations.

- ***Recommendation 4*** *– WWF recommends that the Government has the power to enter land/site location, access records and undertake monitoring & verification activities and any other works.*

[5] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations.

[6] Special laws for demonstration projects were addressed in the state of Texas in the United States, where the legislature enacted a law that makes the state liable for long term storage issues associated with the FutureGen project (FutureGen Texas, 2007). Similar legislation is pending in the state of Illinois. In both cases, this legislation addresses liability only in respect to FutureGen project activities, not to CO2 storage activities generally (IEA, 2008)

The following additional comments and recommendations address the inquiries terms of reference. In many cases this submission adopts the recommendations of the Australian Network of Environmental Defender's Offices Inc (ANEDO) submission to the Committee, and repeats many of the reservations about process expressed in it.

3. ESTABLISHES LEGAL CERTAINTY FOR ACCESS AND PROPERTY RIGHTS FOR THE INJECTION AND LONG-TERM STORAGE OF GREENHOUSE GASES (GHGS) IN OFFSHORE COMMONWEALTH WATERS

The CO2CRC noted in its submissions to this inquiry, the difficulties it faced with respect to long-term liability in establishing Otway Project. The CO2CRC argues that lack of acceptance of long-term liability by Government could be a significant impediment to the deployment of CCS offshore. ANEDO notes that situations arise whereby corporations directly responsible for damage may no longer exist and that the Bill proposes that the long-term risk will pass to the public purse.

WWF supports the ANEDO recommendations that the Bill should be amended to:

- Clearly identify the various long and short term liabilities of the operator and Commonwealth in the Bill (***WWF recommendation 5***)
- identify with whom the ownership of the injected carbon dioxide falls (***WWF recommendation 6***)

In addition, WWF recommends that a two-stage approach to GHG storage liability as recommended by *MIT*[7] and similar to recommendations by *Government of the United Kingdom* and the *United States Centre for the Study and Improvement of Regulation*, which would result in the Commonwealth accepting liability after (say) 30 years. WWF proposes that once certain validation criteria are met, the Government would then assume financial responsibility, funded by industry insurance mechanisms and perhaps reserves of carbon credits equal to a percentage of the amount of CO2 stored in the geological formation.

- ***Recommendation 7*** *– WWF recommends that liability follow a two stage approach, with the Commonwealth Government taking over responsibility for long-term liability.*
- ***Recommendation 8*** *– WWF recommends that Commonwealth Government long-term liability responsibilities be funded by an industry-funded scheme.*

Consideration should also be given to requiring GHG storage operators to hold third party insurance. In Victoria under the *Petroleum Act 1998* (Vic) a petroleum operator is required to obtain and maintain insurance against expenses or liabilities which may arise in connection with or as a result of the carrying out of petroleum operations, including the expenses of complying with directions with respect to the clean-up or other remedying of the effects of the escape of petroleum. This is also the case under Victoria's Environment Protection Authority which requires landfill operators to obtain third party liability insurance and to provide evidence of such insurance at the time of applying for a works approval or licence.

[7] MIT (2007) The Future of Coal http://web.mit.edu/coal/The_Future_of_Coal_Chapters_4-5.pdf, pg 58

- ***Recommendation 9*** *- WWF recommends that parties responsible for injection should be required to hold third party insurance.*

4. PROVIDES A REGULATORY REGIME WHICH WILL ENABLE MANAGEMENT OF GHG INJECTION AND STORAGE ACTIVITIES IN A MANNER WHICH RESPONDS TO COMMUNITY AND INDUSTRY CONCERNS

WWF does not believe that the Bill as it is currently drafted will enable management of GHG injection and storage in a manner that would respond to community concerns. WWF believes that the Bill's environmental impacts, risk assessment, risk management and monitoring activities are too uncertain and rely too heavily on Ministerial discretion.

- ***Recommendation 10*** *– WWF recommends that the Bill include more detail on requirements around environmental considerations, risk assessment, risk management and monitoring activities.*

WWF submits that the Bill requires a greater focus on environmental and public safeguards and that inclusion of clear objectives, guiding principles, definition of "public interest" and "national interest test" would be beneficial. WWF supports the ANEDO comments and recommendations that the Bill should be amended to include:

- Objects consistent with the principles of Ecologically Sustainability Development (***WWF recommendation 11)***
- A definition of public interest ***(WWF recommendation 12)***

WWF notes that in addition to objectives, the Victorian Government is considering including Guiding Principles in their GHG storage legislation.

The IEA notes that in addition to legislation and regulation, future CCS liability rules will derive from case law, particularly in view of the immaturity of carbon dioxide storage technology, and decisions will result from judicial interpretation of legislative language[8].

Given the environmental, health and safety concerns relating to CCS and CCS's role in reducing greenhouse gas emissions, WWF submits that a set of Guiding Principles be included to provide courts, policy implementers and the public with a clear indication of the intention of the legislature.

- ***Recommendation 13*** *- WWF recommends that guiding principles, consistent with the principles of Ecologically Sustainability Development, be included in the Bill.*

[8] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations.

With respect to monitoring, measurement and verification (MMV), WWF supports the ANEDO recommendations that the Bill be amended to:

- *Include a mandatory MMV period [for GHG operators of 30 years prior to site closure certificate being granted], **(WWF recommendation 14)***
- *Establish an industry funded, Commonwealth held trust fund for ongoing [Commonwealth] MMV and remediation works **(WWF recommendation 15)***
- *A more regulated program for post operation MMV **(WWF recommendation 16)**,*
- *The inclusion of independent expert committee [to determine suitability for site closure certificate], **(WWF recommendation 17)***
- *The independent approval of a site specific MMV program **(WWF recommendation 18)**,*
- *Increased reporting requirements [via proposed register of Greenhouse gas formations] **(WWF recommendation 19)***

WWFs also notes that no provisions have been included in the draft Bill in relation to petroleum operators involved in enhanced oil and gas recovery. However although petroleum operators have been injecting CO_2 as part of enhanced oil and gas recovery for decades and have not been subject to requirements to MMV and liability laws, they have been doing so in an era where leakage of CO_2 has been consider minor or irrelevant. This has now changed. WWF submits that all firms and Governments involved in injecting CO_2 should be subject to regulation. WWF's understand that the Queensland Government proposes to subject companies injecting and storing $CO_{2\ for}$ enhanced oil and gas recovery to GHG storage legislation.

WWF also notes that many petroleum operators can and will benefit from injecting and storing CO_2 whether as a part of enhanced oil recovery or as part of a CCS project by claiming carbon credits. The integrity of the market requires that their operations be subject to regulation.

- ***Recommendation 20** - WWF recommends that companies injecting C02 for enhanced oil recovery be subjected to the Bill.*

5. PROVIDES A PREDICTABLE AND TRANSPARENT SYSTEM TO MANAGE THE INTERACTION BETWEEN GHG INJECTION AND STORAGE OPERATORS WITH PRE-EXISTING AND CO-EXISTING RIGHTS, INCLUDING, BUT NOT LIMITED TO, THOSE OF PETROLEUM AND FISHING OPERATORS, SHOULD THESE COME INTO CONFLICT

As noted in the ANEDO submission to this Inquiry, the current draft Bill focuses on the rights of those parties wanting to store GHGs in relation to the existing and potential rights of others involved in fossil fuel exploration and extraction and makes no reference to conflicts with the environment. To this end, WWF supports the ANEDO recommendations that the Bill should be amended to include:

- *An environmental impact assessment prior to the issuing of any exploration, injection and storage operation* ***(WWF recommendation 21)***
- *Designated "no-go zones" for CCS activities and associated infrastructure* ***(WWF recommendation 22)***
- *Extensive environmental buffers around protected and or vulnerable marine areas* ***(WWF recommendation 23)***
- *Extensive environmental buffers around offshore islands* ***(WWF recommendation 24)***

WWF believes that the Bill may provide existing and potential petroleum title holders with the power of veto over GHG storage.

The Bill states that with respect to "Pre-commencement Petroleum Titles" the Minister must not approve Key GHG Operations if there is a significant risk of a significant impact on petroleum operations unless the petroleum title holder has agreed to the GHG operations and the terms of agreement are not contrary to public interest. With respect to "Post-Commencement Petroleum Titles", the Minister must have regard to the impact on petroleum exploration and recovery operations on existing and future petroleum tenure, any agreements between GHG and petroleum operators, and public interest (which is not defined).

The CO2CRC notes in their submission to this Inquiry that "*it is likely that many holders of an existing E&P license would oppose any move to undertake storage activities in their E&P area, thereby effectively blocking CO2 storage*".

WWF believes that high quality storage sites may be rejected by petroleum title holders with the result that injection will occur in poorer quality storage sites. WWF proposes that the existing provisions be replaced by the principles identified in the Victorian Government *Discussion Paper: A Regulatory Framework For The Long-Term Underground Geological Storage Of Carbon Dioxide In Victoria*, with the modifications to those principles identified in WWFs submission in relation to the Victorian Discussion Paper (see Appendix 1 to this submission). In summary the principles proposed in the Victorian Government Discussion Paper are that the Victorian legislation regulating the injection and long-term storage of carbon dioxide can:

- Restrict either CCS or other activities in an area;
- Permit an existing titleholder and a CCS proponent to enter into a commercial agreement to enable access to the area;
- Allow for the compulsory acquisition of the interests of an existing titleholder to enable a CCS project to proceed; and
- Enable the Minister to determine whether preference be given to a CCS or other competing resource development where there may be a potential conflict.

And WWF has – in addition – proposed that:

- CCS projects should be given priority if it is the national interest and:
    - Quality of the site is high – meaning that the likelihood of permanent storage is high and risk of leakage is very low
    - Location of site is optimal – meaning close to capture sites, and
    - Environmental disruption is low compared to other sites

- ***Recommendation 25*** *– WWF recommends that the Bill be amended as outlined above.*

6. Promotes certainty for investment in injection and storage activities

As stated above, WWF believes that the Bill fails to provide certainty for investment in a number of areas:

- failure to provide draft regulations;
- uncertainty around objectives and guiding principles of the legislation;
- uncertainty as to definition of public interest;
- uncertainty around MMV requirements;
- uncertainty around long-term liability;
- power of veto of existing and potential petroleum operators.

These issues should be addressed to provider greater certainty for investment in GHG storage operations.

7. Establishes a legislative framework that provides a model that could be adopted on a national basis.

WWF supports the development of national legislation and the creation of a national task force to facilitate its development. WWF notes that national legislation could be either legislation enacted by the Commonwealth Parliament or legislation enacted by one of the states or territories and adopted by the others (as, for example, has been done in the case of corporate and consumer credit laws). At the very least State and Federal legislation should be consistent.

Unless the current inadequacies highlighted through this submission are addressed, WWF believes that the Bill in its current form is not suitable as a model to be adopted on a national basis.

Appendix 1 – WWF Submission to Victorian Government Discussion Paper: A Regulatory Framework For The Long-Term Underground Geological Storage Of Carbon Dioxide In Victoria.

Introduction

To avoid dangerous climate change humanity must reduce global greenhouse gas emissions sufficiently to avoid a warming of 2 degrees or more in global average surface temperature.

To do this the world must simultaneously reduce energy consumption and become more energy efficient, halt and reverse loss and degradation of forest, and replace traditional fossil fuels with zero and low emission technologies.

With respect to energy technology, WWF's *Climate Solutions*[9] report found that we must rapidly and concurrently deploy a range of renewable and low emissions technology, including carbon capture and storage (CCS). This opinion is also reflected in reports by the United Nations' Intergovernmental Panel on Climate Change[10] and the International Energy Agency[11].

Climate Solutions found that CCS of fossil fuels could account for about 26% of energy supply by 2050, avoiding emissions of 3.8 Giga tonnes (3.8 billion) of CO_2 per year. *Climate Solutions* also found that if one or two of the zero or low emission technologies fail to work or their deployment is delayed, including CCS, the likelihood of staying below 2 degrees is reduced significantly.

To this end, WWF supports rapid demonstration of CCS to determine if it is going to be part of the solution to climate change.

WWF recognises that the creation of clear legal rights to explore for geological storage formations and to store carbon dioxide, as well as an efficient, transparent and credible regime for its assessment, approval and operation, are necessary for investment in CCS in the long term[12]. Equally important is the creation of a clear framework for risk reduction, monitoring and verification, and liability of stored carbon dioxide to provide confidence that storage is safe and ensure broad public acceptance and support.

WWF congratulates the Victorian Government on preparing a comprehensive discussion paper in a field that has very little national or international legal precedent.

Comments of general application

1. **National or at least nationally consistent, state and Commonwealth legislation**: WWF supports the development of national legislation and the creation of a national task force to facilitate its development. WWF notes that national legislation could be either legislation enacted by the Commonwealth Parliament or legislation enacted by one of the states or territories and adopted by the others (as, for example, has been done in the case of corporate and consumer credit laws). At the very least state and Federal legislation should be consistent.

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[9] WWF (2007) Climate Solutions: WWFs Vision for 2050, www.wwf.org.au/publications/gefreport/

[10] IPCC (2007) Fourth Assessment working group III climate change mitigation report Chapter 4 Energy supply, pg 255

[11] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations, pg. 3.

[12] Victorian Government (2008) Regulatory Framework for the Long-term Storage of Carbon Dioxide in Victoria: Discussion paper January 2008.

National legislation or consistent state and Commonwealth legislation will facilitate the demonstration and commercialization of CCS at lowest cost and in the optimal location(s).

2. **Special treatment for demonstration projects**: The International Energy Agency notes that the apportionment of long-term legal responsibility between governments and project proponents will take some time to resolve, and probably only after demonstration projects have produced results[13]. For this reason, WWF recommends that demonstration projects receive special treatment in relation to this issue (though without compromising safety and environmental integrity).

3. **National interest type criteria for site selection:** The development of CCS will require a massive amount of infrastructure at capture sites, for transport and at storage sites. In order to facilitate economic, environmentally and socially sound and efficient demonstration and commercialization of CCS, consideration should be given to developing a national interest criterion for selection of storage sites to be licensed for injection. A national interest criterion could include consideration of: distance of storage site from power capture sites or hubs, existing pipeline routes or potential route, quality of the site, potential size of reservoir, access to alternative storage locations, and impact on environmental and culturally sensitive areas.

4. **Government power to enter land, access records and undertake monitoring & verification activities and any other works:** CCS is novel, technically complex and has the potential to do considerable damage to human settlements and the environment. In such circumstances the Government should have the power to enter relevant land, access all transportation, injection, monitoring and verification records and any other relevant records, test all equipment and, in the case of demonstration projects, have joint responsibility for monitoring and verification of CCS capture, injection and storage operations.

[13] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations.

RESPONSE TO THE QUESTIONS IN THE DISCUSSION PAPER

WWFs response to the questions in the discussion paper is set out in the following table. While WWF supports many of the positions advocated by the discussion paper, WWF notes that because the regulation of carbon dioxide storage is an evolving field, the responses in this submission reflect its position at the time of writing. WWF reserves its right to modify its position as more information comes to hand.

Response to list of issues for comment

Discussion paper issue for comment	**WWF response**
1. Should legislation regulating the injection and long-term underground geological storage of carbon dioxide be created as stand-alone legislation? Part 3.2	WWF supports the Victorian Government's proposal to create stand alone legislation for the regulation of injection and long-term storage of carbon dioxide. WWF supports the points made in the discussion paper, and note that although petroleum legislation provides a useful model for the development of CCS legislation, there are critical differences - petroleum legislation deals with a resource where as CCS legislation will deal with a waste that will involve unique and very long-term legal and liability issues. Separate legislation is more likely to lead to greater public confidence in CCS for the reasons stated. However, WWF will not object to combined CCS and petroleum legislation as long as the key issues are treated appropriately (see further below).
2. Is there a need for Victorian legislation regulating the geological storage of carbon dioxide to expressly classify or define the stored carbon dioxide as a resource or a waste? Part 4.1	WWF does not support defining stored carbon dioxide as a resource. WWF supports classifying stored carbon dioxide as either a waste or pollutant or a similar term that reflects the harm it will inflict upon the environment if released in large quantities. As the purpose of the legislation is to provide a long-term legal framework for the storage of large quantities of carbon dioxide to avoid environmental harm (in particular human-induced global warming), it would be misleading to classify it as a resource. Stored carbon dioxide should not be defined as a "regulated substance" because it also misrepresents the nature of the substance in the circumstances at hand; it is a pollutant or harmful waste. The discussion paper itself notes that international laws define carbon dioxide as waste, "At international law, the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* and the *1992 Convention for the Protection of the Marine Environment of the North East Atlantic* include carbon dioxide as a category of waste or other matter which may be

	considered for dumping in the sub-seabed, where certain conditions are met."[14] Other State laws can be modified to accommodate the proposed new legislation; this is a common practice when new laws are created.
3. Should Victorian legislation regulating the long-term underground geological storage of carbon dioxide include the following statement of purpose: *To regulate the injection and long-term underground geological storage of carbon dioxide in Victoria, as part of CCS activities, including exploration for storage sites?* Part 4.2	WWF supports the proposed statement of purpose.
4. Is there a need for legislation regulating the long term underground geological storage of carbon dioxide to have a statement of objectives? Part 4.2	WWF supports the Victorian Governments proposal to include a statement of objectives. The statement of objectives should include but are not limited to the following: To provide for the safe long-term storage of carbon dioxide generated from CCS activities by providing: ▪ An orderly, fair and competitive system for granting authorities enabling CCS exploration and injection; ▪ Clear and effective administrative frameworks for organising CCS storage activities; ▪ Clear and effective framework for reducing risks and for the monitoring, verification and liability of CCS storage activities. In encouraging CCS exploration and injection, this Act seeks to have regard to environmental, social and economic interests by ensuring that: ▪ safe and efficient exploration for, and injection of, carbon dioxide; ▪ site selection for injection is in the national interest; ▪ the impacts on individuals, public amenity and the environment as a result of CCS storage activities will be minimised or eliminated as far as is practicable; ▪ appropriate monitoring and verification regime is in place including full public disclosure; ▪ land affected by CCS storage activities is rehabilitated; ▪ there will be just compensation for access to, and use of, land; and

[14] Victorian Government (2008) Regulatory Framework for the Long-term Storage of Carbon Dioxide in Victoria: Discussion paper January 2008.

	▪ CCS explorers and injectors will comply with all authority conditions that apply to them.
5. Should Victorian legislation regulating the geological storage of carbon dioxide include guiding principles? If yes, what principles should be included? Part 4.3	The IEA notes that in addition to legislation and regulation, future CCS liability rules will derive from case law [especially because of the immaturity of carbon dioxide storage application] and decisions will result from judicial interpretation of legislative language[15]. Given the environmental, health and safety concerns relating to CCS and CCS's role in reducing greenhouse gas emissions it is appropriate that a set of guiding principles are included to provide clear signals to courts, decision makers and the public about how the provisions of an Act should be interpreted. Given the potential importance of the principles, WWF would like to be consulted in the course of preparing them.
6. Should the term "CCS stream" (or similar) be used to describe carbon dioxide injected into a geological formation for storage as part of CCS operations? Part 4.4.1	So long as CCS stream is defined as a waste, WWF supports the use of the term "CCS stream" or similar to describe carbon dioxide injected into geological formation for the purpose of avoiding the release of carbon dioxide to the atmosphere. Carbon dioxide used in enhanced oil and gas recovery should be included in the term "CCS stream" (or similar). There are several petroleum companies using or considering the use of carbon dioxide captured from CCS processes as part of enhanced oil/gas recovery operations and significant volumes of CO_2 may be involved so the CCS storage legislation should cover this type of operation. WWF also supports similar wording to the *London Protocol* and *OSPAR Convention* that prevents other waste or other matters being added to the carbon dioxide stream [unless expressly covered by the legislation i.e. The "carbon dioxide stream" must consist overwhelmingly of carbon dioxide, although it may contain incidental associated substances derived from the source material and the capture and sequestration processes used].
7. Should other greenhouse gases be covered by the term "CCS stream" (or similar)? Part 4.4.1	WWF would not object to small amounts of other greenhouse gases included in the term if they were incidental substances derived from the CCS process and their ability to stay underground without harming the surrounding substrate were known. The inclusion of other greenhouse gases in the term would depend on scientific advice and evidence; and environmental, health and safety risks.

[15] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations.

	WWF would support specification of concentrations of impurities and other greenhouse gasses that could be co-captured with carbon dioxide based on scientific advice and subsequent amendments to legislation based on emerging evidence.
8. Should the term "CCS operation" be used to describe CCS activities? If so, what activities should the term cover? Part 4.4.2	As the legislation relates to the injection and long-term underground storage of carbon dioxide, WWF supports the narrower term "carbon dioxide injection and storage operation" suggested on page 20 of the discussion paper and not "CCS operation" which could be interpreted as including the capture and transport of carbon dioxide. It is envisaged that capture and transport of carbon dioxide will be dealt with under different legislation (such as the *Pipelines Act*).
9. Is there a need for the term "CCS exploration" to be expressly defined? If so, are there any activities additional to the conducting of geological, geophysical and geochemical surveys, the making of wells and the taking of samples for the purposes of chemical or other analysis, that the term should cover? Part 4.4.3	Yes there is a need for "CCS exploration" to be defined. Additional activities should include, but are not limited to the following: ▪ Geological, geophysical, geochemical and hydrogeology surveys should include: analysis of trapping mechanisms, ground water chemistry and flows; rock structure including type of rock, thickness and extent of cap rock (primary seal) and rock formations above cap rock (secondary seals); depth of storage formation; storage capacity; faults and fracture zones. ▪ Seismic activity or potential for induced seismicity. ▪ Location of useable/drinking water and seals between storage formation. ▪ Location of active or abandoned wells. ▪ Leakage risk assessment – determination of potential risk of physical leakage, modeling to predict carbon dioxide movement over time and identification of specific locations where leaks may occur. ▪ Analysis of baseline carbon dioxide levels. ▪ In the case of coal seams, additional data such as understanding of transmissivity between fracture and matrix pore networks may be needed. ▪ In the case of depleted oil fields additional data such as well-bore integrity analysis and capillary entry pressure data may be needed. Because of the differences between storage types (i.e. depleted oil and gas wells, saline aquifers, unminable coal seams) the regulatory framework may need to be tailored to different classes of sites[16] and may need to be amended as demonstration projects provide more information.
10. Is there a need for the term	Yes there is a need for "CCS injection" to be defined. As

[16] MIT (2007) The Future of Coal. http://web.mit.edu/coal/The_Future_of_Coal_Chapters_4-5.pdf

"CCS injection" to be expressly defined? If so, are there any activities additional to the injection and storage of carbon dioxide for long-term geological storage that the term should cover, for example monitoring and verification activities? Part 4.4.4	suggested in the discussion paper activities should be expanded to include monitoring and verification and could include actions outlined by MIT in their paper *The Future of Coal*[17]: ▪ **Baseline monitoring:** Before injection takes place, baseline surveys must be collected to understand the background and provide a basis for difference mapping ▪ **Operational monitoring:** During injection, injection wells are monitored to look for circulation behind casing, failures within the well bore, and other operational problems or failures. ▪ **Array monitoring during and after injection:** This phase will involve active surface and subsurface arrays, with the potential for additional tools around high-risk zones.
11. Is there a need for Victorian legislation regulating the underground geological storage of carbon dioxide to clarify who owns the stored carbon dioxide? If yes, is it appropriate for the legislation to specify that (a) on injection and until surrender or cancellation of the CCS injection license, the stored carbon dioxide is the property of the CCS operator, and (b) on surrender or cancellation of the CCS injection license, the stored carbon dioxide becomes the property of the State? Part 5.1	WWF supports clarification of who owns the stored carbon dioxide and the approach suggested in issue 11 of the discussion paper. However, WWF questions the appropriateness of the term CCS operator, and suggests that CCS injector or CCS storer may be more appropriate, unless CCS operator was clearly defined (see response to issue 8).
12. Should Victorian legislation regulating the underground geological storage of carbon dioxide expressly provide for ownership of the storage formation? If yes, is it appropriate that the legislation expressly provide that ownership of the underground geological storage formation vests in the Crown? Pt 5.2	WWF supports ownership of underground geological storage remaining with the Crown.
13. Should legislation regulating the injection and long-term underground geological	WWF supports legislation regulating the injection and long-term underground geological storage of carbon dioxide to enable the grant of separate rights in relation to a sub-

[17] MIT (2007) The Future of Coal. http://web.mit.edu/coal/The_Future_of_Coal_Chapters_4-5.pdf

storage of carbon dioxide enable the grant of separate rights in relation to a sub-surface stratum of land? Part 5.2	surface stratum of land.
14. Is it appropriate that the tenure system for underground geological storage of carbon dioxide be based on the existing Victorian regime for petroleum operations? Part 6	WWF supports the tenure model proposed by the MCMPR regulatory guiding principles, to be used by the Commonwealth and Queensland.
15. Is the proposed duration of the CCS exploration permit (5 years, with the option of renewal for a further 5 years) appropriate? Part 6.1.2	WWF supports a 5 year period for duration of CCS exploration permit. To prevent the warehousing of potential sites, WWF also recommends that on application for extension that the applicant submit a storage plan, as is proposed at a Commonwealth level[18].
16. Should legislation regulating the injection and storage of carbon dioxide impose any constraints on the power of the Minister to give directions to a CCS exploration permit holder where a CCS storage formation is discovered? Part 6.1.3	No. The Minister's power should be unfettered except by ordinarily principles of administrative law.
17. Where a CCS exploration permit holder discovers petroleum or a petroleum exploration permit holder discovers a geological formation suitable for the long-term storage of carbon dioxide, should there be an obligation for the explorer to report that discovery to the State? Part 6.1.4	Yes there should be an obligation for the petroleum exploration permit holder to report the discovery of CCS geological formation or vice versa to the State and, in view of the importance of the issue, the penalty for failing to comply should be significant (and include loss of the permit).
18. Should the legislation allow a CCS or petroleum exploration permit holder to enter into an arrangement with an applicant for a production or injection license over the same area, to enable the carrying out of that other activity? If yes, what constraints, if any, should be	WWF supports inclusion of a clause to allow a CCS or petroleum exploration permit holder to enter into an arrangement with an applicant for a production or injection license over the same area, to enable the carrying out of that other activity. Constraints should include: ▪ Requirement to submit an analysis to demonstrate that one activity won't jeopardise or contaminate the objectives and obligations of the other activity

[18] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations, pg 32.

placed on the arrangement? Part 6.1.4	▪ Public interest test
19. Given the Commonwealth Government's commitment to the introduction of a national emissions trading scheme by 2012, is it appropriate that a CCS retention lease be subject to a commercial viability requirement? Part 6.2	WWF support the proposal to subject a CCS retention lease to a commercial viability requirement. WWF note that the Commonwealth have committed to an emissions trading scheme by 2010.
20. Is 15 years an appropriate time period for the duration of a CCS retention lease? Part 6.2	WWF believes that 15 years is too long a period for a retention lease, and believe Five years is a more appropriate time frame in view of the need to demonstrate and commercialise this technology.
21. Should the Minister be able to release areas for CCS injection and storage without requiring the area first be subject to a CCS exploration permit? Part 6.3.2	The Minister should only be able to release areas for CCS injection and storage without requiring the area first be subject to a CCS exploration permit if ▪ If the Government has undertaken similar activities outlined under a CCS exploration license, or ▪ Before injection can occur there is a requirements in legislation that the licensed injector must undertake the activities outlined under a CCS exploration permit and injection permit.
22. What factors should a decision maker have regard to in determining whether to grant a CCS injection license? Part 6.3.2	In addition to the assessments outlined in the discussion paper on page 34[19], additional factors should include: ▪ The proposed grantee has completed an operational/injection development plan; ▪ An above-surface environmental impact assessment has been completed and ways to reduce the impacts identified and adopted by the proposed grantee; ▪ Plans for baseline monitoring have been approved by the decision-maker: Before injection takes place, baseline surveys must be collected to understand the background and provide a basis for difference mapping ▪ Plans for operational monitoring have been approved by the decision-maker: During injection, injection wells are monitored to look for circulation behind casing, failures within the well bore, and other operational problems or failures. ▪ Plans for array monitoring during and after injection have been approved by the decision-maker: This phase will involve active surface and subsurface arrays, with the potential for additional tools around high-risk zones[20].

[19] In applying for CCS injection license, the CCS proponent should be required to submit following assessment:
- Details of the physical, geological, chemical and biological conditions at the proposed site, sufficient to enable a baseline for management and monitoring;

23. Is it appropriate for the CCS operator to have the onus of showing that an underground geological formation is suitable for the long-term storage of carbon dioxide, particularly given the proposals for long-term liability as set out in **Part 15** of this paper? Part 6.3.2	Yes it is appropriate for the CCS operator to have the onus of showing that an underground geological formation is suitable for the long-term storage of carbon dioxide.
24. Should legislation regulating the injection and storage include restrictions on the area to which the CCS injection license applies? Part 6.3.3	Yes legislation regulating the injection and storage should include restrictions on the area to which the CCS injection license applies
25. Is it appropriate for a CCS injection license to be issued for an indefinite term or should it be limited by time period or by volume of carbon dioxide injected? Part 6.3.3	WWF is not in a position to express a view on this issue at this point in time. However, WWF believes that factors that should be taken into consideration include: ▪ investment certainty ▪ responsibility for adequately monitoring and verification ▪ management of liability ▪ national storage strategy Given the factors above, it may be most appropriate to grant the license until the storage site has reached capacity.
26. What factors should a CCS injection development plan be required to address? Part 6.3.5	WWF support the factors for inclusion in a CCS injection plan as outlined in the discussion paper on page 36[21], but reserve the right to consider additional factors in the future.
27. Should a CCS proponent who wishes to utilise a storage reservoir in a petroleum	Yes a CCS proponent who wishes to utilise a storage reservoir in a petroleum production license area for long-term storage of carbon dioxide should be able to apply to

- An assessment of the processes and pathways of potential migration of the carbon dioxide from the geological storage formation and leakage to the environment;
- An assessment of the effect of any potential leakage on human health, the environment and other resource uses;
- An estimate of the likelihood of adverse impacts in both the near-term, during the operational phase, and the longer-term, after site closure; and
- A proposed risk management plan, including definition of the requirements for monitoring during and after injection, and details of how any adverse event would be managed in order to prevent it leading to significant adverse consequences for human health, the environment and other legitimate uses of the area.

[20] MIT (2007) The Future of Coal. http://web.mit.edu/coal/The_Future_of_Coal_Chapters_4-5.pdf

[21]

- Characterisation of the carbon dioxide/CCS stream;
- Conditions at the proposed injection/storage site;
- Preventative and/or mitigating measures (with appropriate performance standards);
- Inject rates and techniques;
- Potential leakage rates and exposure pathways;
- Potential impacts on environment, health and other uses of the area; and
- The nature temporal and spatial scale and duration of expected impacts.

production license area for long-term storage of carbon dioxide be able to apply to the Minister for the excision of that area where the consent of the petroleum operator, is unable to be obtained? If yes, is there a need for the criteria for assessing whether third party access to the storage reservoir should be granted to include a public interest test? Part 6.3.6	the Minister for the excision of that area where the consent of the petroleum operator, is unable to be obtained. The Minister should be able to asses whether granting the license is in the public interest. Criteria to make this assessment could include but is not limited to: ▪ Quality of the site – permanence is high and risk of leakage is very low ▪ Location of site – close to capture sites ▪ Environmental disruption low compared to other sites.
28. Where a CCS storage reservoir extends over a number of areas that legally entitles more than one CCS injection license holder to inject carbon dioxide/ CCS stream, should the Minister be able to require the CCS operators affected to enter into a cooperative arrangement for injection and storage of the carbon dioxide so as to inject the carbon dioxide as effectively as possible and/or to keep disruptions to the environment to a minimum? Part 6.3.7	Yes. However, consideration should be given to whether the storage sites are able to remain separate for the purpose of monitoring and verification, and liability issues.
29. Should pipelines situated wholly within a CCS injection license area be able to be exempted from the requirements of the *Pipelines Act 2005* (Vic)? Part 6.3.8	WWF does not wish to make submissions on this issue.
30. How should resource use conflicts be managed? Part 7	To resolve resource conflicts WWF supports the criteria outlined in the discussion paper on page 39[22], and notes that as in 27 above CCS project should be given priority if it is the national interest and: ▪ Quality of the site is high– permanence is high and risk

[22] Criteria to enable multiple use of storage reservoir:
- Restrict either CCS or other activities in an area;
- Permit an existing titleholder and a CCS proponent to enter into a commercial agreement to enable access to the area;
- Allow for the compulsory acquisition of the interests of an existing titleholder to enable a CCS project to proceed; and
- Enable the Minister to determine whether preference be given to a CCS or other competing resource development where there may be a potential conflict.

	of leakage is very low ▪ Location of site is optimal – close to capture sites, and ▪ Environmental disruption is low compared to other sites.
31. Should legislation regulating the injection and storage of carbon dioxide provide for grant of a special access authorisation to enable a CCS operator to undertake exploration activities to gain geological information for their own use or for sale? Part 8	WWF supports provision for grant of a special access authorisation to enable a CCS operator to undertake exploration activities to gain geological information for their own use or for sale.
32. In relation to the grant of a CCS exploration permit, retention lease or injection license, is there a need for mandatory conditions? If yes, what matters should the mandatory conditions of a CCS exploration permit, retention lease or injection license address? Part 9.2	WWF submits that all significant regulatory obligations should be contained in the legislation.
33. In giving the Minister broad discretion to impose any additional conditions on a CCS exploration permit, retention lease or injection license he or she thinks fit, are there any discretionary conditions that should expressly be provided for in legislation? Part 9.2	Additional Ministerial discretional conditions on CCS exploration permit, retention lease or injection license should include, but not restricted to conditions: ▪ Relating to monitoring and verification ▪ Relating to liability for exploration and injection operations, including in relation to retention during injection (but not long-term retention) ▪ Relating to insurance ▪ Varying the existing conditions
34. Is it appropriate that transfer of a CCS title be subject to a best interest requirement? If yes, should the test to be applied be specific to the best interests of the people of Victoria? Part 9.3	WWF support transfer of a CCS title if the transferor and transferee have met all CCS exploration permit, retention lease or injection license requirements (as the case may be) and they have demonstrated that the transferee will be able to complete monitoring, verification and rehabilitation operations, and accept liability for any events for which the transferor is liable.
35. Should a CCS proponent be required to continue to undertake monitoring and verification activities for a specified period following completion of the injection phase of CCS operations,	Yes. WWF supports a requirement that a CCS proponent continue to undertake monitoring and verification activities for a specified period following completion of the injection phase of CCS operations, and before a CCS injection license may be surrendered. Determining the appropriate time frame for monitoring and

before a CCS injection license may be surrendered? If yes, for what period of time following completion of injection activities should a CCS proponent be required to undertake these monitoring and verification requirements? Part 9.4	verification is difficult given the lack of knowledge about CCS operations and potential differences of storage site types (i.e. depleted oil and gas wells, saline aquifers, unminable coal seams). The IEA notes that the likelihood of unexpected migration of injected CO2 is greatest in the early stages of a project, and that experience to date has shown that the longer the CO2 has been performing as expected, the lower the probability that it will start to behave unexpectedly.[23] However the IEA does not nominate a timeframe. WWF would recommend a 30 year period be considered at this stage and for it to be amended following experience with demonstration projects. WWF also supports the opinion expressed in the IEA report *Legal Aspects of Storage*, which states that "CO2 storage project M&V practices should be designed to provide timely, accurate and relevant public information that is independently verifiable". WWF submits that, in the case of demonstration projects, the Government accept the primary obligation to monitor and verify injection and retention operations from the commencement of operations to avoid delaying demonstration projects and to gather and place in the public domain learnings from the project . However the licencee should be required to also undertake some monitoring and verification to develop industry skills and knowledge in this area.
36. Following surrender of a CCS injection license, is there a need for ongoing monitoring and verification of the injection site? If yes, should responsibility for such monitoring and verification activities, including any remediation or rehabilitation required in the post-closure period be transferred to the State? Part 9.4	Yes. This should be undertaken by the State (and the CCS injection license fee should include a component to pay for ongoing monitoring and verification, at least for a reasonable period of time). Remediation and rehabilitation should be completed by the CCS operator before the license is surrendered, except in relation to damage as a result of long-term monitoring and verification equipment. Any rehabilitation and remediation undertaken by Governments should, as far as possible, be funded from CCS license, permit fees or other financial mechanisim.
37. In what circumstances should the Minister be able to cancel a CCS exploration permit,	In the case of CCS exploration permit or retention lease WWF supports the grounds for cancellation as outlined on page 46 of the discussion paper[24]. Additional grounds

[23] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations, pg 38.

[24] Grounds for cancellation of a permit, lease or license include:

- Failure to comply with the proposed work program or any condition of the grant of title;
- Failure to maintain insurance;

retention lease or injection license? Part 9.5	should include providing false or misleading information and denying authorized officers access to land, equipment or records. In the case of injection license, because of the cost of monitoring and verification, and liability issues, and the fact that cancellation of the license will transfer these to the State, cancellation should be only occur when only should only be undertaken where there are good grounds. Grounds could include: ▪ No longer commercially viable ▪ Storage site is at capacity ▪ Failure to comply with good injection practice ▪ Unexpected problems with the storage site have been identified or unexpected adverse impacts on the environment have occurred and injection should be ceased. In such circumstances the Minister should be able to direct the injection licensee to undertake monitoring and verification requirements for a specified period after the cancellation and former licensee should continue to be subject to liability for the term of the former license for damage for which they would have been liable during the currency of the license.
38. Should the Minister be able to issue directions to a CCS proponent where a CCS exploration permit, retention lease or injection license is to be surrendered or cancelled? For example, as a minimum should a CCS proponent be required to undertake monitoring and verification requirements for a specified period? Part 9.6	Yes the Minister should be able to issue directions to a CCS proponent where a CCS exploration permit, retention lease or injection license is to be surrendered or cancelled including requiring the CCS proponent to undertake environmental restoration and rehabilitation; monitoring and verification requirements for a specified period; and be subject to liability or pay a liability fee. The Minister should also be able to issue directions during the currency of a license in the circumstances outlined in 37 above.
39. Given the variety of legislation which may apply to a CCS injection and storage project, is there a need to streamline the approvals processes? If yes, how should this be achieved? Part 10	WWF supports the harmonization of laws to ensure that unnecessary duplication does not occur but does not support the existing substantive requirements being relaxed. CCS demonstration project should be fast-tracked but not given exemptions from applicable laws. Considerations should also be given to providing favorable treatment for CCS storage sites that are high quality, have large storage capacity and are particularly close to the CCS

- Causing an unexpected significant adverse impact on the environment
- Failure to observe good oilfield practices; and
- Lack of funds to carry out the proposed work program

	capture site to provide an incentive to use such sites.
40. How should planning approvals for CCS exploration and injection operations be managed? Part 11	If CCS exploration and injection operations are for demonstration projects or are in national priority area (high quality, large storage capacity and close to capture site) consideration could be given to excluding the operation from the Planning and Environmental Act 1998 where the proposed operation has been subject of an environmental effects statement as authorised under the Environmental Effects Act 1978 (Vic), as suggested in the discussion paper.
41. If planning approvals for a CCS injection and storage project are to be streamlined, should CCS operators be subject to a consent regime similar to that for petroleum operators as detailed in Part 9 of the *Petroleum Act 1998* (Vic)? Part 12	WWF broadly supports CCS operators be subject to a consent regime similar to that for petroleum operators as detailed in Part 9 of the *Petroleum Act 1998* (Vic), but reserves our right to see and comment on detail in draft legislation. WWF would like to see tighter restrictions or more stringent Ministerial criteria on land that has environmental (including for climate change adaptation and biodiversity protection) and aboriginal significance.
42. In preparing a CCS operation plan, what matters should a CCS proponent be required to address? Part 13	A CCS operational plan should include: ▪ Expected time frame and cost of the operation ▪ Storage capacity and time taken to estimated time it will take to reach capacity ▪ An assessment of potential extent and likelihood of injury or damage to any community, person, land user (including to any other CCS storage or petroleum reservoir), land, property or the natural environment posed or potentially posed by the CCS operation; ▪ Specifying the actions that the CCS operator will take to eliminate or minimize the risk of injury of damage; ▪ Specifying the actions that the CCS operator will take to eliminate, detect and repair leaks; ▪ Specifying the actions the CCS operator will take to rehabilitate the land that will be affected by the proposed CCS operation. ▪ Specifying the monitoring and verification activities to be undertaken and their duration; and ▪ In addition to monitoring and verification, such other precautions to be taken at project closure to ensure continued safe storage. ▪ The manner in which monitoring and verification information will be made available to the public (which should include access via the internet).
43. Section 165 of the *Petroleum Act 1998* (Vic) details specific obligations a petroleum operator must undertake in conducting any petroleum operation. Is there	WWF supports inclusion of general obligations on CCS operations which could include, but are not limited to: ▪ Prevent the escape of carbon dioxide into the atmosphere, ground water suitable for drinking, petroleum operations, and other CCS storage sites. ▪ Undertake comprehensive risk assessments

a need for legislation regulating the exploration for suitable underground geological formations and the injection and long-term storage of carbon dioxide to include similar general provisions? If yes, what matters should such a provision address? Part 13	▪ Provide baseline, operational and array monitoring ▪ Ensure monitoring and verification data is transparent and publicly accessible ▪ Prevent and fix damage to the environment ▪ Provide early warnings of failure near the reservoir ▪ Verify storage for accounting and crediting ▪ Obtain and maintain insurance
44. In determining whether compensation is payable for any loss or damage as the result of CCS operations over Crown land, is there a need for the Minister to take into account any benefits that may accrue to the people of Victoria from the CCS operation? Part 14	WWF does not have a strong position on the issue of compensation for loss of crown land.
45. Should legislation regulating the injection and long-term storage of carbon dioxide modify the common law liabilities of a CCS proponent? If yes, in what way should the common liabilities of a CCS proponent be modified? Part 15	WWF does not support modification of the common law liabilities of a CCS proponent and agrees with the discussion paper that this approach would help ensure that strong financial incentive remains for CCS proponents to conduct their operations in a manner that is safe to human health and the environment. Consideration of modification of common law liability could be considered in the case of demonstration projects.
46. Should liability be transferred to the State in the long-term? Part 15	Except in the case of demonstration projects which will need Government involvement in monitoring and verification and liability in from the beginning of the operation[25] [26], WWF supports an eventual shift to a two stage approach to managing long-term liabilities and post closure responsibilities associated with the geological storage of carbon dioxide. WWF broadly supports the sentiments reflected in the MIT report on *The Future of Coal* which suggests "that the industry takes financial responsibility for liability in the near-term, i.e. through injection phase and perhaps 10-20 years into the post-injection phase. Once certain validation

[25] Government involvement in providing independent scientific review and monitoring of geosequestration projects on a site- by-site basis with provision of full public disclosure of data should continue until there is confidence in technology and storage types.

[26] Special laws for demonstration projects were addressed in the state of Texas in the United States, where the legislature enacted a law that makes the state liable for long term storage issues associated with the FutureGen project (FutureGen Texas, 2007). Similar legislation is pending in the state of Illinois. In both cases, this legislation addresses liability only in respect to FutureGen project activities, not to CO2 storage activities generally (IEA, 2008)

[27] MIT (2007) The Future of Coal http://web.mit.edu/coal/The_Future_of_Coal_Chapters_4-5.pdf, pg 58.

	criteria are met, government would then assume financial responsibility, funded by industry insurance mechanisms, and perhaps funded by set-asides of carbon credits equal to a percentage of the amount of CO2 stored in the geological formation"[27].
47. Should a CCS proponent be required to obtain and maintain insurance against the expenses or liabilities which may arise as a result of CCS injection and storage activities? If yes, what type of insurance would be required? For what period of time should a CCS proponent be required to hold such insurance? Part 15.1	WWF supports requirement for CCS operator to obtain and maintain third party liability insurance. As noted by the IEA[28], there are no existing precedents for insurance instruments that provide liability protection for an occurrence after multiple decades or centuries. Given the time scales involved in geological storage of Carbon dioxide it is acknowledged that insurance instruments may be limited and that a range of financial instruments may be required to address the long-term risks associated with carbon dioxide. In the meantime WWF supports the time period currently applicable to landfill operators, which is 30 years. WWF recommends that the period of time for holding the insurance should be subject to amendment based on experience and knowledge gained from demonstration projects.
48. In requiring a CCS proponent to take out a bond or financial assurance, what matters should the bond or assurance cover? Part 15.2	WWF supports the requirement of a CCS operator to take out a bond or financial assurance for remedial action, site rehabilitation and site aftercare.
49. For what period of time should a CCS bond or financial assurance be held? Part 15.2	WWF supports the time period currently applicable to landfill operators, which is 30 years. WWF recommends that the period of time for holding the bond should be subject to amendment based on experience and knowledge gained from demonstration projects
50. If the State is to be responsible for long-term monitoring, verification and remediation of a CCS injection and storage site, how should such activities be funded? Part 15.3	Given the time scales involved in geological storage of Carbon dioxide it is acknowledged that a range of financial instruments may be required to address the long-term risks associated with carbon dioxide. As noted in the discussion paper and the IEA report[29] there are a number of options for the financing of long-term monitoring, verification and remediation including industry funded trust funds, bonds, rent and straight industry financial compensation. WWF does not have a preferred financial mechanism, so long as the mechanism is financial self supporting.
51. Should a CCS operator be	Given the precedent in Petroleum legislation WWF

[28] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations, pg 42
[29] IEA (2008) Legal Aspects of Storing CO2: Update and Recommendations.

charged rent for the storage of carbon dioxide in an underground geological storage formation? If yes, is it appropriate that the revenue raised be used to fund the long-term monitoring, verification and remediation of a CCS injection and storage site? Part 15.4	supports rent being charged to the CCS operator for the storage of carbon dioxide in an underground geological storage formation for the revenue raised be used to fund the long-term monitoring, verification and remediation of a CCS injection and storage site.
52. How should legal issues relating to the migration of stored carbon dioxide between different jurisdictions be addressed? Part 16	WWF supports the development of national legislation and the creation of a national task force to facilitate its development. WWF notes that national legislation could be either legislation enacted by the Commonwealth Parliament or legislation enacted by one of the states or territories and adopted by the others (as, for example, has been done in the case of corporate and consumer credit laws). At the very least state and Federal legislation should be consistent.
53. Is it appropriate that CCS proponents be subject to a geological information collection and dissemination regime? Part 17.1	WWF believe it is appropriate that CCS proponents be subject to a geological information collection and dissemination regime.
54. Is there a need for a mechanism to require the release of geological information from petroleum operators to CCS proponents in specified circumstances – for example where there is a risk that a potential CCS operation may impact on an existing petroleum operation? Part 17.1	WWF supports the creation of a mechanism to require the release of geological information from petroleum operators to CCS proponents in specified circumstances – for example where there is a risk that a potential CCS operation may impact on an existing petroleum operation.
55. Should legislation regulating the injection and long-term underground geological storage of carbon dioxide provide for the establishment of a CCS register?	WWF supports the establishment of a CCS register. The register should contain information including but not limited to, type of site, location of site, site storage capacity, monitoring mechanisms, and leakage data.