Australian Productivity Commission: Regulatory Burden in Australia's Offshore Petroleum Sector

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INQUIRY INTO REGULATORY BURDEN IN THE UPSTREAM OIL AND GAS SECTOR

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AUSTRALIAN PRODUCTIVITY COMMISSION: REGULATORY BURDENS IN AUSTRALIA'S OFFSHORE UPSTREAM PETROLEUM SECTOR

Scope of this submission

This submission to the Productivity Commission considers a narrow area of the Commission's report. It addresses draft finding 5.2:

> *'The underlying policy intent and the rationale for the government intervention on managing the method and timing of extracting petroleum is not unambiguously stated. The existence of a divergence of interests between public and private objectives is not clearly established, and further, government agencies do not appear to have superior technical knowledge to that of the private sector, it is not clear that the benefits from government intervention outweigh the costs.'*[1]

The objective of this report is threefold:

1. to establish that divergence between public and private objectives exist and are critical in the development of petroleum resources;
2. as owner of petroleum resources, the government has the right and obligation to control petroleum extraction method and rate, with the governments level of knowledge assisting in the decision making process; and
3. The government's management of petroleum depletion is necessary for the sustainable development of Australia's petroleum resources.

In order to address each of these areas, this report will address the Australian position and possible solutions. It will also examine the Norwegian position to provide clarity and illustration where required

Ownership of the resources

Ownership of Australia's petroleum resource is not clear in the report. The report notes that non-renewable resources are owned by the Crown, with the government playing a stewardship role in petroleum resource management on behalf of the community.[2] However, in chapter 5 of the report the Commission inaccurately identifies the community as owner of the resource.[3] To clarify, in Australia,

[1] Productivity Commission, *Review of the Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector: Draft Research Report* (2008), XLVII.

[2] Productivity Commission, above n 1, 19.

[3] Productivity Commission, above n 1, 80

ownership of all mineral resources is vested in the State. As such, the Australian government is owner of the offshore petroleum resources seaward of the 3nm limit. It develops these resources as an agent of the Australian people,[4] therefore assuming a stewardship role. In that role, the Australian government has the responsibility for developing Australia's petroleum resources for the benefit of the Australian people.

Importance of petroleum resources

Australia is not a player in global petroleum. It has proved petroleum reserves of 4.2 billion bbl, only 0.3% of the total global proved reserves.[5] Petroleum plays an important part in the Australian economy. The upstream petroleum sector contributes 2% to Australia's GDP,[6] directly employing 15,000 people with a further 20,000 employed indirectly.[7] The export of petroleum was the second largest income earner in 2006, behind coal.[8] Importantly, LNG exports are increasing rapidly, from $5 billion in 2006 to an estimated $8.5 billion by 2011.[9] As a source of import expenditure, crude oil is Australia's largest import in dollar terms, approximately 6.2% in 2006.[10]

Australia has been in a petroleum trade deficit position since 2003/04, which could rise to exceed $20 billion per annum[11] within the next decade if new reserved of petroleum are not found and exploited. Australia experienced a major petroleum deficit in 2007/8, exporting 100.6 million barrels of crude oil and condensate and importing 163.5 million barrels for refinery feedstock. Similarly, imports of petroleum exceeded imports by 33%, with exports of petroleum and petroleum products valued at $20 billion for 2007/08, while imports were valued at $30.4 billion. [12]

As noted by the Productivity Commission, Australia's petroleum resources are in decline, leading to a likely decrease in the economic contribution of petroleum to the Australian economy. As production declines and imports increase, Australia will need to import a greater percentage of its petroleum for energy use. A major objective for Australia is to increase petroleum production to ensure that it does not have continue to import high levels of petroleum to meet domestic energy needs. To meet this objective, Australia needs to recover the greatest amount of petroleum as possible, since the greater the

[4] The concept of the government as an agent of the principal, the citizens is considered in Joseph Stiglitz, 'What is the role of the State' in Macartan Humphreys, Jeffrey D Sachs and Joseph E. Stiglitz (eds), *Escaping the Resource Curse* (2007),

[5] As at end of 2007, as defined in BP, *BP Statistical Review of world Energy June 2008* (2008), 6.

[6] Productivity Commission, above n 1, XXI.

[7] APPEA, *Fast Facts* (2008) http://www.appea.com.au/index.php?option=com_content&task=blogcategory&id=175&Itemid=295 at 29 January 2009.

[8] APPEA, *Platform for Prosperity: Australian Upstream Oil and Gas Strategy* (2007), 4.

[9] APPEA ibid.

[10] Productivity Commission, above n 1, 12.

[11] APPEA, above n 8, 4.

[12] APPEA, ibid,

recovery of resources, the greater the economic contribution of the petroleum sector to Australia. This concept, know as value creation, means that the extraction of petroleum resources are directed by the State to ensure that the greatest value and benefit of the petroleum resources are extracted for the benefit of society.

The concept of value creation in the exploitation of petroleum resources is not new. It is a part of the petroleum regulatory framework in Norway, and the concept of value creation directs all Norwegian petroleum activity.[13] Norway is a large player in the global oil market. It is the third largest petroleum exporter, and sixth largest producer, accounting for approximately 5% world crude market.[14] Petroleum is an important part of the Norwegian economy. It comprises 24% of GDP, 31% of State revenue, 23% of total investment and 48% of total exports.[15] The sector directly employs about 130,000 people.[16] Having this petroleum wealth and high percentage of export earnings arising from petroleum is difficult for a country, since there is always a risk of developing resources curse.[17]

Yet like Australia, Norway is characterised by declining production of known resources, few new discoveries that are ready for development and reserves that remain to be proven. The country has large mature provinces with highly developed infrastructure and declining fields. Yet Norway also has a number of frontier areas, particularly the Barents Sea area in northern Norway. As such, Norway faces a similar need for resource management of declining fields as well as frontier tracts, requiring a resource development strategy that encompasses these differing areas with the aim of value creation for the benefit of society.[18]

Australia has some mature fields, particularly in the south eastern Australia. However there are large tracts of frontier areas, particularly since Australia's submission for jurisdiction over an additional 2.5 million km^2 of seabed was confirmed by the United Nations Commission on the Limits of the

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[13] Ministry of Petroleum and Energy, *Oil and Gas Activities*: *Report no. 38 to the Storting (2001-2). Unofficial English Translation* (2002), 11.

[14] Ministry of Petroleum and Energy, ibid, 14.

[15] Ministry of Petroleum and Energy and Norwegian Petroleum Directorate, *Facts 2008: The Norwegian Petroleum Sector* (2008), 14.

[16] Ministry of Petroleum and Energy and Norwegian Petroleum Directorate, above n15, 14.

[17] Resource Curse (also known as the 'paradox of plenty') is the paradox of a country having an abundance of non-renewable natural resources such as oil and gas, yet fail to have economic growth as these resources are developed. Furthermore, often these resource rich countries are characterised by worse development outcomes than similar countries with fewer natural resources. This is hypothesized by Auty to occur due to a number of reasons, particularly the decline in the competitiveness of other economic sectors in the economy, which is caused by the appreciation of the real exchange rate as resource revenues accumulate in the country. Other causes include natural resource revenue volatility due to global commodity market variations, government mismanagement of the allocation of resource licences or contracts, or weak, ineffectual, unstable or corrupt institutions. For a discussion on the causes of resources curse, see Richard M Auty, *Sustaining Development in Mineral Resource Economies; The Resources Curse Thesis* (1993).

[18] Ministry of Petroleum and Energy, above n 13, 11.

Continental Shelf in April 2008.[19] These areas require exploration for realization of possible petroleum reserves. Both Australia and Norway face challenges in extracting petroleum resources in declining fields in order to meet its economic needs. Additionally, both nations seek energy security. For Australia that is security of supply. Similar to the USA who is also a net petroleum importer, Australia is vulnerable to sources of supply for petroleum, particularly at a time where 61% of all global petroleum supplies are contained in the politically unstable Middle East region.[20] This creates an imperative for Australia to maximise its extraction of petroleum.

Non-renewable nature of petroleum resources

A major challenge to the Australian government when exploiting petroleum is the non-renewable nature of the resource.[21] Once the resource is exhausted, it cannot be replaced, and there is no ongoing revenue stream. Thus these resources need to be exploited in a manner that provides financial benefits to both the oil companies and the State during petroleum production, otherwise oil companies will not want to exploit the resources. Consequently, it requires a petroleum regulatory framework which encourages oil companies to continue to participate in petroleum exploitation, whilst regulating the exploitation of these resources in a sustainable manner which ensures an appropriate return to current and future generations of Australians.

Once Australia exploits its petroleum resources, it liquidates the petroleum asset and will no longer have the revenue from these resources.[22] That is because like any other asset, once the petroleum is extracted and sold, it is permanently lost. This creates an enormous challenge for the Australian government: to create a regulatory framework that generates appropriate and adequate revenue, whilst at the same time

[19] Geoscience Australia, *Australia's Maritime Jurisdiction Extended* (2008) http://www.ga.gov.au/ausgeonews/ausgeonews200806/inbrief.jsp at 31 January 2008.

[20] BP, above n 5, 6.

[21] Natural Resources are defined as naturally occurring substances that are considered valuable in their natural form (see E F Schumacher, *Small is Beautiful* (1973). Therefore, natural resources encompass minerals, petroleum, fisheries and forestry. Non-Renewable (or exhaustible) natural resources are those that do not regenerate (such as oil or iron ore). Though the geologic processes that created most types of non-renewable resources in the past are still operating today, the time frames are too long compared with their rates of use to be considered renewable. See Jonathon E Snow, 'Theory of Exhaustible Natural Resources: Surprises for the Geologist' (2000) Inaugural Lecture for the *Habilitation* degree, University of Mainz, Germany, June 21 2000. http://www.mpch-mainz.mpg.de/~jesnow/MineralEcon/habil/index.html at 14 November 2007.

[22] The general concept behind the development of non-renewable resources is Hotelling's Rule, as defined in Jonathon E Snow, 'Theory of Exhaustible Natural Resources: Surprises for the Geologist' (2000) Inaugural Lecture for the *Habilitation* degree, University of Mainz, Germany, June 21 2000 *Extraction of Exhaustible Resources: Economic Theory* http://www.mpch-mainz.mpg.de/~jesnow/MineralEcon/habil/econ/econ.htm at 14 November 2007; Gerard Gaudet, 'Natural Resource Economics under the Rule of Hotelling' Presidential address delivered at the 41st meeting of the Canadian Economics Association, Halifax, June 2007; and Allen K Kneese, 'The Economics of Natural Resources' (1988) 14 *Population and Development Review* 281.

establishing appropriate incentives so oil companies are attracted to the petroleum province to develop the resources.

This principal method for ensuring the sustainable development of petroleum resources is through government control on the rate and method of petroleum production. The efficiency and effectiveness of this is demonstrated by a number of countries, most notably Norway,[23] but also Malaysia.[24] An assessment of the present regulatory framework in Australia has concluded there are a number of identified regulatory issues that are preventing or restricting oil companies' from exploiting the petroleum resources.[25] However, it also concludes that the policy intent and rationale for government intervention in management of method and timing of petroleum extraction is ambiguous.

Resource management and State goals

> *Under Australian law petroleum resources are owned by the Crown and the rights to these resources are vested in the government rather than private individuals. Government plays a 'stewardship' role in petroleum resources management, on behalf of the community.*[26]

Resource management is defined by the Productivity Commission as comprising the allocation of secure title, managing timing and method of extraction, and ensuring appropriate return to the community for extracting non-renewable resources to the community through PRRT.[27] Although resource management is not clearly articulated in the petroleum legislation, the basis for resource management arises from general resource management literature, embodied in the concept of sustainable resource development.[28] The basis of petroleum resource management in Australia is outlined by the Australian

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[23] There is a plethora of literature that outlines the policy of Norway and its impact. See for example Oystein Noreng, *The Oil Industry and Government Strategy in the North Sea* (1980); International Energy Agency, *Energy Policies of IEA Countries* (2004); Bernard Taverne, *Petroleum Industries and Governments: A Study of the Involvement of Industry and Governments in the Production and Use of Petroleum* (2nd ed. 2008); Brent F Nelsen, *The State Offshore: Petroleum, Politics and State Intervention on the British and Norwegian Continental Shelves* (1991); Jerome Davis, *Does One Size Fit All? Reflecting on Governance and North Sea Licensing Systems* (2004) Paper given at BC Offshore: Potential and Problems: A MASC Workshop for Lawyers March 18-21, 2004. British Columbia; and M Devaraj, 'Government Policies Concerning the Discovery and Development of New Offshore Oil Provinces, with Focus on India and the North Sea' (1983) 8 *Ocean Management* 251.

[24] Jeffrey R Vincent, 'Resource Depletion and Economic Sustainability in Malaysia' (1997) 2 *Environment and Development Economics* 19.

[25] As identified in the Australian Productivity Commission's Report *Review of the Regulatory Burden in the Upstream Petroleum (Oil and Gas) Sector* (2008) www.pc.gov.au at 12 August 2008.

[26] Productivity Commission, above n 1, 31

[27] Productivity Commission, above n 1, 70.

[28] The World Commission on Environment and Development defines sustainable development as '*development which meets the needs of the present without compromising the ability of future generations to meet their own needs'* (Jeffrey Davis, et, al, *Stabilisation and Savings Funds for Non-Renewable Resources: Experience and Fiscal Policy Implications* (2001)). At the heart of sustainability is inter-generational equity. *Intergenerational equity*, is defined in the Australian Intergovernmental Agreement

government in the annual *Overview for Applicants: Release of Offshore Petroleum Exploration Areas*, and the accompanying *Guidance Notes for Applicants: Release of Offshore Petroleum Exploration Areas*.[29] In particular, the *Overview for Applicants* outlines the roles and responsibilities of the government. It defines the role of the government in relation to petroleum in Australia include establishing broad economic policy; provide a regulatory framework for exploration, development, production and taxation; and encourage industrial competitiveness.[30]

The role of the government in developing petroleum resources is articulated in Australia's petroleum policy.[31] In addition, it is supported by the Western Australia Department of Mines and Petroleum (DMP), who notes in their submission to the Productivity Commission that the key reason for government management of petroleum resources is the long-term benefit of the community, and not just private commercial benefit.[32] The DMP includes efficient and equitable intergenerational benefit as a key benefit in the extraction. The author agrees with the view of the DMP, and sees the role of the government to sustainably develop Australia's petroleum resources to provide significant income through value creation and maximisation of recovery.

Divergence of interests between companies and government

> *The underlying rationale for government intervention in petroleum resource extraction seems to be a perceived divergence between private and public objectives, based on symmetry of incentives, or of information, between government and industry or both. …'the implied assumption of divergence of public and private sector incentives with respect to extraction method seems to be unsupported. It would seem reasonable to assume that through the commercial profit, motive, industry would normally aim to employ the optimal extraction technology without direction from government.*[33]

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on the Environment (IGAE) as a concept where *'the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations'* (Australian Government, Department of the Environment and Water Resources, *Intergovernmental Agreement on the Environment*(1990) http://www.environment.gov.au/esd/national/igae/index.html at 18 November 2007). In a broader context, Sustainable development includes the development of resources in a responsible manner for the optimisation of the use of the resources.

[29] These documents are available at www.dret.gov.au/petroleum .

[30] Department of Resources, Energy and Tourism (DRET), *Overview for Applicants: Release of Offshore Petroleum Exploration Areas* (2008), 10-11.

[31] Australia's resources policy is defined on the Department of Resources, Energy and Tourism: *'The Australian Government is committed to creating a policy framework to expand Australia's resource base, increase the international competitiveness of our resources sector and improve the regulatory regime, consistent with the principles of environmental responsibility and sustainable development.'* See http://www.ret.gov.au/resources/Pages/Resources.aspx .

[32] Western Australian Department of Mines and Petroleum (WADMP), *Productivity Commission Draft Research Report: Comments from the Western Australian Department of Mines and Petroleum* (2009) www.pc.gov.au/projects/study/upstreampetroleum at 29 January 2009.

[33]Productivity Commission, above n 1, 81-2.

This relationship between the government and private oil companies is one of interdependence with diverging interests, needs, perceptions and demands, since each participant has different goals in the development of the petroleum, yet requires the participation of the other to accomplish their goals.[34] The State's[35] primary focus is to satisfy national objectives as defined in the State's petroleum policies. Often these objectives are focused on the development of petroleum resources for the benefit of present and future generations, and include generating revenue as well as economic diversification to assist associated industry development. For oil companies, the goal is to exploit petroleum resources to maximise profit for the company and its shareholders. The difficulty for states is that there are so many objectives to fulfil, whilst the private oil company seeks only to maximise profit.[36]

The control over exploitation of a national asset is given to a profit- maximising private enterprises which seeks to minimise what they give the government for the right to control the use of the petroleum.[37]This has the capacity to cause tension between the two parties in the exploitation of petroleum. If the objective of the private oil companies is not being realised, or threatened in any way, it is possible that the oil company will withdraw from petroleum activities in that jurisdiction. Australia has an active policy to attract international investment, and seeks to encourage and retain investment from international oil companies.

This desire to attract majors is demonstrated by the JAs response to the default on the Cornea field by a Shell-Chevron Joint Venture ('Shell') in 1997. Shell (the operator) was awarded an exploration permit over blocks WA-265-P and WA-266-P in Western Australia, contiguous to the Cornea structure in block No WA-241-P, also held by the Shell consortium.[38] They later defaulted on the primary work program, which should have affected their good standing provisions for the future award of offshore petroleum licences in Australia. However, in October 1999 Shell and Chevron, in separate negotiations, concluded agreements with the then Federal Minister for Industry, Science and Resources to maintain its good standing with the Commonwealth and West Australian governments, despite the cancellation of the licences. These agreements were subject to the completion of exploration work in areas not taken up in recent releases.[39] The outcome of these negotiations then became embodied in legislation as part of an amendment to the PSLA in 2000. These legislative amendments enabled the JA to rank multiple applicants based on its opinion, and could exclude an applicant that is not deserving of the grant of an exploration permit.[40]

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[34] Oystein Noreng, *The Oil Industry and Government Strategy in the North Sea* (1980), 19.

[35] Within the confines of this report *the State* refers to the government (a self governing political entity) of a country that exercises effective sovereignty over its territory and its population as defined in *Merriam-Webster Online Dictionary* http://www.merriam-webster.com/dictionary/State on 12 January 2009. The term *state* within the confines of this report refers to the six individual government areas (states) of Australia (note the capitalization).

[36] Kamal Hossein, *Law and Policy in Petroleum Development: Changing Relationships Between Transnationals and Governments* (1979), 58.

[37] Stiglitz, above n 4, 29-34.

[38] David Maloney, 'Australia's Offshore Petroleum Work Program Bidding System' (2008) 21 *Journal of Natural* Resources 127.

[39] David Maloney, ibid.

[40] Now embodied in s84 (2) OPA

In introducing the 'good standing' provisions as a result of the default by the Shell consortium, the Commonwealth government introduced discretion into the award of licences in Australia. No longer is a company precluded from other exploration licences if they are in default of work programs, or have had previous licences cancelled.[41] Instead, a company is now able to default on its work program conditions but still maintain its good standing.[42] The company needs only to demonstrate to the government that that it has made a significant attempt to assess the petroleum potential of the permit area (at least conduct seismic surveying commitments)[43] and 'spend an amount equal to the *agreed monetary value* of the outstanding work commitments on qualifying work in permits over re-released area'[44]

There is no doubt that governments require private oil companies to develop petroleum resources. However it is the view of the author that the Australia government is failing to get the full value of the petroleum resources of Australia. The key reason for this, as Joseph Stiglitz notes, is because governments rely on private sector companies to extract their resources.[45] These companies have the goal to maximise their revenues, and to minimise those accruing to the country. This results in an inevitable conflict of interest. Hence the challenge for the Australian government is to attract and retain oil companies to exploit petroleum resources, but also maximise its return.

As noted by the Productivity Commission, g*overnments cannot compel private businesses to invest.*[46] There is no legislative provision in the Australian petroleum framework that compels a company to invest in Australia's industries. However, by regulating the method of extraction of petroleum, requiring greater recovery of petroleum through Increased Oil Recovery Techniques (IOR), governments can establish regulatory requirements to develop technologies to enhance oil recovery. The natural result of this requirement is that if a company wishes to remain competitive and continue be awarded licences in that jurisdiction, the company will need to access and utilise technologies that assist in enhanced oil recovery. Otherwise, companies have a desire to extract the 'easy oil', that is oil that can be easily recovered using primary and secondary oil recovery techniques, which typically require less investment.

This strategy has been used successfully on the Norwegian Continental Shelf, where stringent requirements for enhanced oil recovery has forced companies to engage in research in oil recovery techniques to meet the conditions attached to the award of licences in Norway.[47]

[41] DRET, above n 30, 4. *See also Guide for Applicants*, 10-11.

[42] DRET, ibid.

[43] DRET, ibid, 10-11.

[44] DRET, ibid. Emphasis added by author.

[45] Stiglitz, above n 4, 23.

[46] Productivity Commission, above n 1, XXVIII.

[47] Ministry of Petroleum and Energy, above n 13, 11-15.

Rationale for directing methods and rates of extraction

> *The rationale for directing the method and rates of extraction appears weak, and it seems questionable, whether in most cases, benefits are likely to exceed costs.*[48]

There is a very clear rationale for the government management of petroleum extraction. As owner of the resources, the government has the right to decide how and when its resources will be extracted. As noted by the Ministry of Petroleum and Energy in Norway, 'petroleum resources represent a community asset which the government wishes to manage in a way that the whole of Norwegian society benefits in a long term perspective'.[49]

If the government were to extract the resources by itself, without the assistance of oil companies, the government would regulate the extraction, as it would regulate any other government activity. However the government is compelled to utilise oil companies for the development of the resources, since it lacks the competence and skill to develop the resources, and is reluctant to invest public capital into high risk exploration ventures.[50] Each party requires the other for petroleum exploitation to occur. The oil companies need the State since the State is the owner of the resource the companies wish to exploit. The State requires the oil companies to contribute the financial strength and technology needed to explore the resources, and assume the exploration and production risk.

An effective regulatory framework is one which unites the divergent interests of the participants, creating a balanced relationship where each of the parties is able to fulfil their objectives. The divergent interests of these two parties are reconciled through the legal regulatory framework, which is established by the State to implement the policy objectives for the exploitation of petroleum. For Australia, that means that the regulatory framework should assist the government in the sustainable development of the petroleum resources whilst attracting overseas investment. For the oil companies, the regulatory framework should assist in maximising profits.

It is important for States to periodically assess the effectiveness of the framework which manages the petroleum resources. Even countries such as Norway that excel at petroleum production are questioning the system of regulation that is used to manage petroleum resources.[51] Countries must be prepared to re-evaluate policies and regulatory framework to create the right incentives for enhanced resource development. As noted by the Norwegian Ministry of Petroleum and Energy, 'governments must be willing to consider whether established principles and the prevailing policy framework create the right incentives for enhanced value creation, and possibly adapt policies to ensure resources are not wasted.'[52] There is a defined need for Australia to review its regulatory framework for petroleum exploration and

[48] Productivity Commission, above n 1, XXIX.

[49] Ministry of Petroleum and Energy, above n 13, 8-9.

[50] Oystein Noreng, above n 34, 19.

[51] Ministry of Petroleum and Energy, above n 13, 19.

[52] Ministry of Petroleum and Energy, ibid.

production, including the method for the award of licences, legislative provisions, particularly relating to sustainable development of petroleum, and the regulatory body. The Productivity Commission is addressing many of these areas.

Commitment to value creation is demonstrated by the alternative scenarios proposed by the Norwegian government for the development of proved petroleum resources on the Norwegian Continental Shelf. It developed two possible scenarios for the development of Norwegian offshore petroleum resources. Option one (decline scenario) utilises current trends in operation on the Norwegian Continental Shelf where the industry and government rests on the developments achieved and current policies. Both parties reap the returns made from investment, and there is a relatively rapid (20 years) decline with the industry phased out during this period.[53] The long-term scenario proposed in option two involves an aggressive policy of resource development through technological developments, skilling and enhanced expertise.[54] This option requires the support of, and significant contributions from, companies and government with both parties committed to efficient exploration of the resource base.[55]

The long-term scenario has been embraced by the Norwegian government. The principal behind this scenario is that major petroleum assets would otherwise be lost to the community if the government failed to exploit them while they have them.[56] It is suggested that if the fields currently on stream on the Norwegian Continental Shelf cease production in line with current production plans, more than 31 billion barrels of oil will be left behind.[57] These resources can be recovered through the use of IOR techniques, at the insistence of the Norwegian government, as part of the Plan for Development and Operations (PDO).

Thus the Norwegian government sees its role as driving the recovery of these resources that it owns through an extraction policy which is premised on sustainable development, creating coexistence between government, industries and the environment. This enhanced recovery has both policy perspectives as well as practical issues, including technology, field development and market conditions. This assessment of alternative development scenarios undertaken by Norway demonstrates that it is profitable for the State to control the extraction of petroleum. In monetary terms, the difference between revenue from the value creation from the long-term scenario and the decline scenario has been estimated to be 2000 billion NOK.[58] The task is difficult and expensive to realise this potential, and requires development and use of new technologies, and the partnership between government and industry.

[53] Ministry of Petroleum and Energy, ibid, 8.

[54] Ministry of Petroleum and Energy, ibid.

[55] Ministry of Petroleum and Energy, ibid.

[56] Ministry of Petroleum and Energy, ibid, 9.

[57] NPD, 'Recovering Progress on IOR' (2008) 2 *Norwegian Continental Shelf 9*, 10.

[58] Ministry of Petroleum and Energy, 8. 2000 billion NOK converts to approximately AU$550 billion.

Government's role in managing the method and rate of extracting petroleum resources is unclear and does not seem likely in most cases to provide a net benefit[59]

The role of the government in managing the method and rate is very clear. As resource owner, and manager of the petroleum resources (stewardship as the Productivity Commission report defines), the government has a role to achieve desired policy outcomes. These outcomes are defined by the Department of Resources, Energy and Tourism to be '*creating a policy framework to expand Australia's resource base, increase the international competitiveness of our resources sector and improve the regulatory regime, consistent with the principles of environmental responsibility and sustainable development*'.[60] This policy aim of Australian petroleum resource development is a clear mandate to manage resource extraction. Evidence from the Norwegian Continental Shelf demonstrates that control of the method production by the Norwegian government as the driver will realise an additional 31 billion barrels of oil through IOR, and provide AU$550 billion in additional value creation. This clearly established the possibility of a net benefit from the government managing the extraction of petroleum resources.

The basic regulatory structure to direct the depletion rate already exists in the Australia petroleum legislation. As noted by the Productivity Commission, section 162 of the OPA enables the JA to direct rate of extraction so long as not contrary to good oilfield practice.[61] In particular, s162 (1) enables the JA to direct the licencee to take all necessary and practical steps to increase or reduce the rate of petroleum recovery. It is possible to amend this section to enable the JA to direct the licencee to take all necessary steps to increase the rate of recovery of petroleum.

The Productivity Commission answers its own question regarding what is the role of the government in directing the method and rate of petroleum extraction. In the draft report, the Productivity Commission notes that the overarching objective of regulation *should be to achieve desired outcomes more efficiently that would be achieved more efficiently than would be achieved by alternatives, including no regulation* (PC 2002). [62] Further, it notes that …'*in promoting government objectives, most regulations will also impose costs…Best practice regulation imposes the least regulatory burden necessary to achieve the underlying policy goals, bringing the greatest possible net benefit to the community*.[63] Should the Australian government wish to accomplish its stated policy goals of *creating a policy framework to expand Australia's resource base*' it needs to direct the method and rate of extraction. The net benefit will be the greater recovery of petroleum resources which will provide revenue for the government and oil companies alike. It will cost money to realise these resources, however evidence from the Norwegian Continental Shelf shows that it will also provide net benefits.

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[59] Productivity Commission, above n 1, XXXVIII.

[60] Department of Resources, Energy and Tourism, *Resources* (2009) www.ret.gov.au/resources/Pages/Resources.aspx at 2 February 2009.

[61] Productivity Commission, above n 1, XXXVIII.

[62] Productivity Commission, *Price Regulation of Airport Services* (2002).

[63] Productivity Commission, above n 1, 34.

It is not only regulators that claim that government intervention is necessary for the development of petroleum resources. Joseph Stiglitz, Nobel Prize winning economist, notes that the most successful approaches to the management of natural resources has been where a county has decided to regulate the resource depletion, as well as participate in the extraction of the resources. These countries have learned the requisite skills from a range of oil companies, and used the knowledge to maximise the development of the petroleum for the benefit of the country.[64] Furthermore, he notes that full privatization has seen governments get the worst deal in realizing the real value of the oil.[65] In particular he notes that 'Norway's story is important, because it destroys the shibboleth that efficiency and welfare maximisation can be obtained only through maximisation.'[66]

The goal of regulation should be to realizing policy objectives to achieve desired outcomes. It must be remembered that regulation is not just about realizing economic incentives. If one examines the recent collapse of the financial industry, it is apparent that the lack of regulation that was seen as economically efficient has created havoc in the financial system.

As a non-renewable resource that belongs to the State, the regulation of petroleum should occur to maximise the development of the resource and to ensure that the greatest amount of petroleum is recovered.

Knowledge and technology

> *By directing rates of extraction, it appears governments assume that businesses either lack the incentives to develop reserves in a socially optimal manner, or lack the technical capabilities to determine optimal extraction rates.*[67]

The optimal extraction rate for any oil field is 100% extraction. This rate of extraction does not occur, as a consequence of reservoir structure. Typically oil recovery rates are a function of recovery techniques used. To *optimise* the recovery of petroleum, it is often necessary to employ IOR techniques. These techniques include microbial solutions, as employed on the Snorre field in Norway, combined foam and gas injection, water/surfactant solutions and directional drilling.[68] These techniques have been developed in Norway in State-directed research in IOR, leading to some of the highest recovery rates in the world.[69]

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[64] Stiglitz, above n 4, 43.

[65] Stiglitz, ibid.

[66] Joseph Stiglitz, 'What is the role of the State' in Macartan Humphreys, Jeffrey D Sachs and Joseph E. Stiglitz (eds), *Escaping the Resource Curse* (2007), 30.

[67] Productivity Commission, above n 1, XXVII.

[68] NPD, 'Big Assets in Small Pores' (2008) 1 *Norwegian Continental Shelf* 7-8.

[69] Recovery rates in some offshore Norwegian Continental Shelf fields are well above average and include Draugen – 66%; Statfjord - 65.6%; Oseberg – 60%, and Gullfaks – 59.8%. See NPD, 'Big Assets in Small Pores' (2008) 1 *Norwegian Continental Shelf* 7.

Recovery rates from fields are not a function of the recovery methods that the companies choose. Rather, they are a function of recovery methods that companies do not choose. Typically, oil recovery occurs in two stages. Primary production occurs where oil flows out under its own pressure. Secondary production occurs where oil recovery is assisted. Together these two methods of extraction typically realise one third of the oil in the field.[70] Moreover, these methods use well defined techniques that are industry standard and relatively cheap to apply to a field.

Greater recovery rates are generally only able to be achieved only through enhanced oil recovery techniques.[71] As noted above, these techniques are expensive, and rely on the development of specialist technologies and expertise that are expensive for companies to develop. It is unlikely that companies are going to implement expensive, specialized technologies that are likely to only recover a further few percent of residual oil. Further, the likelihood of the use of IOR is a function of global oil prices, where the lower the price, the less likely that IOR techniques are going to be employed, since there is much less profit to be realised. Rather, companies are likely to declare such fields as marginal and abandon the fields.

It is profitable for oil companies to extract the maximum petroleum. The realisation of potential resource value will reap financial benefits to all parties, however it will involve greater expenditure by oil companies to develop resources. If oil companies are left undirected in the requirements for method of oil recovery, the decisions for extraction will be governed by the cost of extraction method.

Therefore it is not that a company is likely to choose the extraction methods that will lead to poor extraction rates. Rather, it is likely that companies will not employ additional extraction rates necessary to maximise resource extraction unless directed to by the resource owner.

> *As the private sector is likely to have both the incentive to employ optimal extraction technology and access appropriate technical expertise, then the rationale for government intervention appears related more to the timing of the extraction.*[72]

The private sector has neither the incentive nor the technology to employ optimal extraction techniques. IOR costs money to employ, typically $0.5-$8.0 per bbl. Added to this is the high research and development costs associated with developing IOR techniques that will optimise field yields. Companies will employ traditional techniques to recover a reasonable percentage of easy oil, abandoning a field when it becomes economically marginal.[73] The field may become economically marginal as a result of field geology and structure leading to decreased recovery, the impact of lower oil prices, or a combination of the two.

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[70] NETL, *Exploration and Production Technologies: Improved Recovery: EOR* (2008) www.doe.gov at 2 February 2009.

[71] NETL, ibid.

[72] Productivity Commission, above n 1, 82

[73] Refer to Stiglitz, above n 4, chapter 2-3.

The Norwegian State recognises that technological developments are expensive for companies to develop the technologies it requires to satisfy its policy objectives of value creation and resource maximisation.[74] Consequently, since it is the State that requires the optimisation of oil recovery, then the State sees its role as the driver of research in that area. In earlier petroleum licensing rounds, the Norwegian government attached research conditions to the award of licences, in order to achieve research strategies. Today, this State driven research acts as a 'push' effect. The government develops new techniques in conjunction with industry, and 'pushes' the resultant techniques onto Operators as part of the overall Norwegian Continental Shelf management strategy. This effectively forces licence applicants to utilise the existing technology to develop new and existing fields (the 'pull' effect). The sum of the 'push-pull effect' is that the Norwegian government plays a leading role in developing technology that maximises production on the Norwegian Continental Shelf, forcing companies to utilise the technology if they wish to remain competitive in the award of production licences.

Commitment to the development of technological solutions for extraction is essential for the optimisation of petroleum resources. Companies cannot do this alone, as they already bear the risk in exploration.

As resource owner, the Australian government has a long term interest in technologies and will gain from potential technological innovations for oil recovery. Thus the government needs to create opportunities for government led research into resource maximisation through recovery of residual oil in offshore fields.

> *'Therefore, government playing a valuable role in approving resource extraction method (thus avoiding resource sterilization) suggests the technical knowledge of government is superior to that of industry. It is not clear why government would have better technical knowledge.*[75]

In the event of multiple applicants for the award of an offshore petroleum licence, the JA has the authority to award petroleum licence to whichever applicant *in the Joint Authority's opinion, is the most deserving of the grant of the exploration permit.*[76] Thus, the JA has conferred upon it exclusive powers to award a petroleum licence based on its opinion. In formulating that opinion, it is assumed that the JA would have the technical knowledge and expertise to determine the *most deserving* out of the pool of applicants. To determine the most deserving applicant, the JA would need to assess the proposed work program, which includes proposed wells and seismic survey.[77]

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[74] As the Norwegian government notes … '*development of the remaining resources base must be based to a great extent on technologies which are not available today and which have to be created. That will make it possible to produce oil and gas from ever more challenging fields…As the resource owner, the government has a substantial interest in ensuring the maximum value creation from the industry in the future. The resource base provides the greatest opportunities, but these require that major technologies and expertise related challenges in developing oil and gas resources are resolved.*' See Ministry of Petroleum and Energy, above n 13, 14-15.

[75] Productivity Commission, above n 1, 82

[76] *Offshore Petroleum Act 2006* (Cth), s84 (2)

[77] DRET, above n30 10-11; DRET, *Guidelines for Applicants: Release of Offshore Petroleum Exploration Areas* (2008).

These provisions of the OPA assume, and bestow upon the JA, a level of technical knowledge and expertise equivalent to or superior to that of oil companies. Otherwise, what would be the utility in enabling the JA to award a petroleum licence to an oil company if the awarding body did not have the necessary knowledge and expertise to assess the applicants and award the licence? Further, if the JA has the technical knowledge and expertise to award a licence, then it is reasonable to assume that the JA would have the skills to assess the development of a field. Further, by the Productivity Commission's own admission, should an oil company not possess expertise in an area, then the company can source the required expertise from petroleum service companies. The JA can source expertise from these same companies should they require the technical expertise to analyse field extraction techniques.

Field coordination and field sterilisation

> *Some regulators claim (although it does not appear to be well documented) government intervention is necessary. Because left undirected, companies might employ extraction methods that could lead to reduced overall resource recovery. The remaining resource, unrecoverable in the future, is effectively 'sterilized' leading to losses for the community as owner of the resource.*[78]

There are many regulators that claim the need for intervention in field extraction. The Western Australian Department of Mines and Petroleum is one such regulator.[79] DMP has effectively outlined the role that regulator plays in field development management.[80] The Norwegian Petroleum Directorate employs a similar role in field development coordination.[81]

Government regulation of field extraction is essential. Companies extract petroleum from individual fields, often with little knowledge of the overall aquifer or regional field structure or rates of recovery from nearby fields. Extraction from one portion of a reservoir typically affects other sections of a reservoir. Therefore it is necessary for a coordinated approach to reservoir depletion, to ensure maximum recovery.[82] This regional view is essential to ensure that reservoir development is coordinated by a body that has the regional data and technical knowledge to assess the development, as well as the authority to implement changes where required.

Resource sterilization occurs when individual companies develop fields on an individual basis, but the combined effect is to strand some resources. These resources are unable to be developed due to reservoir geology (often subsistence), access to the field, or access to facilities for development. This is a well recognised problem in the mature provinces of the Norwegian Continental Shelf, resulting in the

[78] Productivity Commission, above n 1, 80

[79] WADMP, above n 34, 3-4.

[80] See WADMP, ibid, 3.

[81] NPD, Facts 2008.

[82] I refer to the excellent example provided by the West Australian Department of Mines and Petroleum in their submission to the Productivity Commission's Draft Research Report.

likelihood that production from these fields will be phased out unless special measures are adopted.[83] These measures are both technical and administrative. The Norwegian government sees itself as playing a pivotal role in the solution to resource sterilisation. In particular, the Norwegian government sees the need to harmonise and coordinate the use of existing facilities to ensure third party access to required facilities for the development of small or stranded fields.[84]

Sterilised fields are challenging, requiring timely development of fields if it is to be avoided.[85] This enables small discoveries and fields in production areas with large installations to be produced. However, fields and installations have a 'shelf life'. In particular, installations generally only have a field operating life of 20-30 years, after which they need to be decommissioned and removed. Many fields and installations are towards the end of their life, and if IOR or development of small and stranded fields is to occur, it needs to be when existing infrastructure is still in place. Otherwise, the infrastructure will be removed, and it will not be cost effective to develop small or stranded fields if new installations have to be constructed.

In an era of maturing fields and declining production from existing fields, there is a need for government coordination. The role of the government should be to effectively coordinate the development of such prospects, coordinating not only major installations, but also auxiliary resources such as pipelines, storage facilities and land based terminals.[86]

The Australian government is in a unique position as resource owner and regulator. As such they have the regional knowledge, expertise, incentive and authority to coordinate the efforts of individual companies to optimise the recovery of oil resources. To affect this, there may be a need to use a mix of technical expertise and knowledge and administration, to assess and develop new regulatory frameworks, and strengthen collaborative efforts across production licences if required.

Good oil field practice

All titleholders must carry out operations in accordance with 'good oilfield practice'[87]

There is no evidence to conclude that oil companies operating in the Australian offshore jurisdiction do not carry out operations according to good oilfield practice (GOP). However, there is a fundamental concern that GOP is viewed as a tool for the regulation extraction method and rate.

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[83] Ministry of Petroleum and Energy, above n 13, 19.

[84] Ministry of Petroleum and Energy, *On the Petroleum Activity*: *Report no. 38 to the Storting (2004). Unofficial English Translation* (2004), 5.

[85] Ministry of Petroleum and Energy, above n 13, 17.

[86] Similar to what is being required by the Norwegian Government as its Norwegian Continental Shelf fields mature. See Ministry of Petroleum and Energy, above n 13. 17-18.

[87] Productivity Commission, above n 1, 71.

GOP is defined as 'practices that are generally accepted in the international oil industry as being good, safe and efficient in the carrying out of exploration, or as the case may be, development operations and that and experienced reasonable and prudent operator engaged in similar activity under similar circumstances would use.'[88] Bunter notes that definition of GOP is ambiguous and is somewhat negative in application.[89] In addition, he points out that it is hard to determine what practices do conform to GOP. Furthermore, He sees a need for rigorous standards to determine what GOP is and promote GOP in oilfield operations.[90]

Good oilfield practice is defined in section 5 of OPA to be all those things that are generally accepted as good and safe in the carrying on of exploration for petroleum or petroleum recovery operations.[91] In the context of the OPA, GOP is concerned with all things 'good and safe' for the operation of petroleum operations. It fails to encompass optimal resource extraction for value creation for a community and the optimisation of petroleum production to ensure the sustainable development of a State's resources. Rather, is concerned with the physical aspects of production – the process of extracting the resource safely and without damage to the environment in the most economically efficient manner.

As the Productivity Commission rightly notes, *the commonwealth has a role in regulating the management of the resources to ensure that the recovery of petroleum is carried out in accordance with good oilfield practice in a way that is compatible with the long term recovery of the resource. It is important to ensure that this objective is present in all associated petroleum regulations.*[92] As such, the definition of good oilfield practice in s5 of the OPA needs to be expanded to encompass field recovery rates and optimizing recovery for the benefit of the community. Until this occurs, GOP as a yardstick for resource management will fail to assist in meeting national petroleum objectives.

[88] Michael Bunter, *The Promotion and Licensing of Petroleum Prospective Acreage* (2002), 309.

[89] Bunter, ibid.

[90] Bunter, ibid.

[91] *Offshore Petroleum Act 2006* (Cth) s6.

[92] Department of Industry, Tourism and Resources, *Report on the Consolidation of Regulations under the Petroleum (Submerged Lands) Act 1967* (2007), 24.