



# Submission

Prime Minister's Task Group on Energy Efficiency  
Issues Paper

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## 1.0 EXECUTIVE SUMMARY

Chevron Australia Pty Ltd (Chevron) supports the policy objective of improving Australia's energy efficiency and welcomes the opportunity to provide input into the Prime Minister's Task Group on Energy Efficiency Issues Paper.

Chevron's submission focuses on the following key themes:

***Chevron is an Energy Company:*** Chevron knows a lot about producing energy. But we're also a big consumer of energy, so we've also made it our business to save energy. Energy is an input cost for every Australian business; as a result, industry (particularly energy intensive industry) has a very real incentive to increase energy efficiency. Chevron is actively seeking opportunities to increase energy efficiency and has improved our energy efficiency by 30% since 1992 through our Energy Management Systems and initiatives such as the Chevron Energy Index and Chevron Energy Solutions.

***Measuring Energy Efficiency:*** Energy efficiency is difficult to define, making the task of measuring energy efficiency challenging. In complex industrial sectors like LNG an assessment is considerably more complex than an assessment of energy intensity alone. There are a range of external factors in the LNG industry which can have an impact on the energy intensity of a plant including climate and the composition of gas. Any meaningful assessment of energy efficiency in the LNG industry will need to take into account these external impacts. The difficulty in assessing energy efficiency in this one industry highlights the need for caution in choosing meaningful metrics for "energy efficiency" across the economy more broadly.

***Policy Objectives:*** Government's have identified a range of energy policy objectives including reducing greenhouse gas emissions, supporting the development of technological solutions, improving economic efficiency and productivity, reducing energy consumption, and increasing energy security. These are each important policy objectives but while they are largely complementary, from time to time they can also be in conflict. A comprehensive energy policy for Australia must seek to balance these objectives.

***Policy Principles:*** Any proposed policy measures will need to be considered in the context of the government's climate change policies, specifically the *Carbon Pollution Reduction Scheme (CPRS)* and the Council of Australian Governments' (COAG) *Complimentary Principles for Climate Change Mitigation Measures*. Any new policy proposals should meet the principles of equity, economic efficiency, and administrative simplicity and should be targeted at market failures not addressed by the CPRS.

***Energy Efficiency Solutions:*** Chevron supports the increased use of natural gas in electricity generation and the move to a more distributed model for electrical power generation, incentives to encourage investment in energy efficient technology through changes to current tax rules relating to depreciation of long-life industrial plant, increased and R&D funding for emerging technologies. Chevron also supports improvements in urban planning to minimise the energy impact of transport.

## **2.0 ABOUT CHEVRON**

### **2.1 Chevron Corporation**

Chevron is one of the world's leading integrated energy companies, with around 62,000 employees and subsidiaries that conduct business around the world and operate across the energy spectrum, we explore for, produce and transport crude oil and natural gas; refine, market and distribute transportation fuels and other energy products; manufacture and sell petrochemical products; generate power and produce geothermal energy; provide energy efficiency solutions; and develop and commercialise the energy resources of the future, including biofuels and other renewables.

### **2.2 Chevron Australia**

Chevron has been present in Australia for more than 50 years. As a participant in, and technical advisor to West Australian Petroleum Pty Ltd (WAPET), Chevron was involved the discovery of Western Australia's first flowing oil at Rough Range in 1954.

Chevron Australia operates the Gorgon Project, the Wheatstone Project and the Barrow and Thevenard Island oilfields. The company is a foundation partner in the North West Shelf Venture and the Browse LNG development, as well as a significant investor in exploration and appraisal activities offshore north-western Australia, one of four global focus areas for Chevron's exploration efforts.

As the largest holder of discovered gas resources in Australia, Chevron Australia is aggressively developing the Gorgon and Wheatstone Projects which are critical to Chevron's global natural gas commercialisation strategy. Chevron looks forward to a long and fruitful relationship with the Western Australian and Australian governments.

The \$43 billion Gorgon Project is Australia's single largest resource project. The Greater Gorgon gas fields contain resources of approximately 40 Tcf of natural gas – enough energy to power a city the size of Perth for 800 years.

The Gorgon and Wheatstone Projects are expected to deliver significant benefits to Australia including direct and indirect employment, economic growth, opportunities for local goods and services and diversity of natural gas supply. The boost to government revenues through these indirect inputs and via direct project revenues is substantial.

The Gorgon Project is expected to provide a major and sustained boost to the Western Australian and Australian economies, creating thousands of jobs and opportunities. Based on 30 years of operations, key economic findings from independent research<sup>1</sup> include:

- Peak construction employment in Western Australia of around 10,000 with more than 3,500 direct and indirect jobs throughout the life of the project
- The net present value of Australia's gross domestic product is expected to be boosted by \$64 billion
- Locally purchased goods and services (local content) of \$33 billion
- Government revenue of about \$40 billion in today's dollars

In addition, Chevron is currently undertaking its largest drilling campaign in Australia spending hundreds of millions of dollars on exploration and appraisal activities in offshore northwest Australia.

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<sup>1</sup> Modelling undertaken by ACIL Tasman

### **3.0 CHEVRON IS A LEADING ENERGY COMPANY**

Chevron knows a lot about producing energy. But we're also a big consumer of energy, so we've also made it our business to save energy.

In 2008, Chevron spent approximately US\$7.6 billion on energy costs with operated assets consuming approximately 270 gigawatt hours of energy.

In 1992, Chevron established the Chevron Energy Index to assist in quantifying energy efficiency/intensity gains across the organisation. Since then we have increased the energy efficiency of our global operations by 30 percent and lowered our annual energy costs by more than \$US 2 billion.

LNG projects like Chevron's Gorgon and Wheatstone Projects are energy intensive. This is because while Australia has enormous quantities of natural gas, much of it is in areas which are remote from gas customers. In order to transport this source of energy to customers in North Asia, natural gas is converted into liquefied natural gas (LNG).

LNG is natural gas that has been cooled to approximately  $-162^{\circ}\text{C}$ , changing it from a gas into a liquid 1/600<sup>th</sup> its original volume. This dramatic reduction in size allows it to be shipped safely and efficiently aboard specially designed LNG vessels. After arriving at its destination, LNG is warmed to return it to its gaseous state and delivered to natural gas customers through local pipelines.

While the liquefaction process is energy intensive, the fuel used to power the liquefaction plant and facilities, and power LNG vessels is derived from the natural gas itself. Therefore energy efficiency measures in the LNG industry not only reduce the costs of production but also maximise the amount of gas available for export.

Some examples of how Chevron has improved the energy efficiency from its operations include:

- Investing in projects to reduce the amount of energy used in Chevron's operations, such as providing the maintenance that keeps equipment running smoothly and reliably, to more complex projects, such as building new power plants to replace older less efficient plants
- Worldwide, Chevron operates cogeneration units at its refineries, production facilities and other sites, with a combined electrical generating capacity of about 3,500 megawatts. These units generate energy about twice as efficiently as the average power supplied by the local energy utility company.
- In Australia, Chevron is committed to applying best practice technology to minimise energy use and to reduce emissions. Chevron's Gorgon and Wheatstone Projects will make extensive use of cogeneration technology to provide mechanical power and process heat.

Further information on the Chevron Energy Index can be found in Chevron's Corporate Responsibility Report at: <http://www.chevron.com/globalissues/corporateresponsibility/2008/>

### **3.1 Chevron Energy Solutions**

Chevron recognises the need to identify opportunities to address the complex energy challenges impacting Australia and the rest of the world.

Chevron is actively participating in the solution through Chevron Energy Solutions Co. (CES), a unit of Chevron Corporation. CES operates in the United States of America as a recognised leader in innovative, clean energy development.

Chevron Energy Solutions designs and builds sustainable energy projects that increase energy efficiency and renewable power, reduce energy costs, and ensure reliable, high-quality energy for government, education and business facilities. Since 2000, Chevron Energy Solutions has developed hundreds of projects involving energy efficiency and renewable energy for government, education, and business customers.

Some of the ways Chevron Energy Solutions has assisted other organisations utilise new energy technologies and improve energy efficiency include:

- Central Dauphin School District in Pennsylvania: upgrade of four buildings, with a floor space of over 46 000 square metres, with lighting and mechanical retrofits, an emergency generator, and water conservation improvements. Chevron Energy Solutions provided the design and construction, ongoing operator training, monitoring and verification. Over the 15-year performance contract with the school district, CES is guaranteeing energy and operating cost reductions of more than US\$275,000 per year.
- An extensive six-year upgrade project to more than 20 state government buildings in Colorado to improve the energy efficiency. These improvements are expected to reduce facility energy costs by 25 percent to 30 percent and taxpayers' energy and operating costs by more than US\$20 million over the next two decades.
- Developed and installed California's first megawatt-class hydrogen fuel cell cogeneration plant, at Alameda County's Santa Rita jail. The 1-megawatt project is designed to provide half of the facility's annual power needs, saving county taxpayers more than US\$260,000 per year. By reducing the facility's demand for utility-provided power, the fuel-cell plant can offset more than 3,000 tonnes of greenhouse gas emissions each year.

Chevron Energy Solutions provides Chevron a unique synergistic opportunity. While Chevron invests in emerging energy technologies, Chevron Energy Solutions can apply the proven technologies that customers will benefit from for decades.

Further information on Chevron Energy Solutions can be found at: <http://www.chevronenergy.com/>.

### **3.2 Energy Management Capability**

Chevron has made energy efficiency and conservation an important business strategy.

We have developed and implemented energy management policies, systems and measurement indicators to support our business.

Chevron is committed to protecting the safety and health of people and the environment, and to conduct our operations reliably and efficiently. Chevron's Operational Excellence Management System is Chevron's standard approach for the systematic management of safety, health, environment, reliability and efficiency to achieve world-class performance.

Chevron's commitment to Operational Excellence is embodied in The Chevron Way value of Protecting People and the Environment, which places the highest priority on the health and safety of the organisation's workforce and protection of its assets and the environment.

This approach is supported through the disciplined application of Chevron's Operational Excellence Management System which comprises three components:

- Leadership Accountability;
- Management Systems Process; and
- Operational Excellence Expectations.

The Operational Excellence Expectations are organised under 13 elements and spell out specific requirements for the management of particular issues. The expectations are met through processes and procedures put in place by local business unit management. Amongst other matters, these expectations require that processes are in place to conserve natural resources, to inventory all emissions, releases and wastes and to mitigate and manage significant potential risks and impacts to human health and the environment.

The Operational Excellence Management System as applied by Chevron Australia identifies 34 Operational Excellence processes. Of these, the following processes are relevant to the management of energy efficiency:

- Environmental Stewardship
- Surface Equipment Reliability Improvement
- Surface Facilities Optimisation
- Integrated Production Systems Optimisation
- Facilities Design and Construction.

Complementing Chevron's comprehensive procedures and processes, Chevron has created the position of Corporate Energy Coordinator specifically to lead the company's energy-efficiency efforts. The coordinator develops and improves best practices that can be shared among business units and conducts energy reviews to assist in prioritising conservation opportunities across the company. In Australia, Chevron Australia's Advisor – Climate Change is the Energy Efficiency Champion for Chevron's Australian operations.

## 4.0 ENERGY EFFICIENCY

### 4.1 Measuring Energy Efficiency

Using energy more efficiently makes sense for many reasons:

- it can help reduce carbon emissions
- it lowers the costs of production
- it conserves the supplies we have

As the Task Group has acknowledged, “energy efficiency” is difficult to define, making the task of measuring energy efficiency all the more complex.

Energy efficiency is sometimes equated with energy intensity. While this can be a useful indicator when measuring a single piece of equipment or process, it is not a credible way to measure energy efficiency in more complex industries like LNG.

The International Energy Agency has made this point, noting that most energy-intensive industrial sectors are complex, involving multiple process steps and producing a wide variety of products, and therefore it is not possible to capture this complexity through a single energy efficiency indicator. It recommends the use of a number of different indicators to give a full picture of energy efficiency.<sup>2</sup>

In the LNG industry there are a range of factors which can have an impact on the energy intensity of a plant.

One of the most significant factors contributing to energy intensity is climate. As the liquefaction process requires the cooling of natural gas, the air temperature at an LNG facility will have an impact on the energy required to cool and liquefy the gas. For example, LNG facilities operating in warmer climates, such as the Pilbara region or Darwin, will require more energy to produce a tonne of LNG than a facility using the same technology but operating in a cooler climate, such as Norway.

Another important external factor includes the composition of the gas field being developed. Compositions that require additional processing (for example where there is a relatively high CO<sub>2</sub> content in the gas being processed) will generally use more energy than those that do not.

An assessment of the relative energy efficiency of Australian LNG plants based on relative energy intensity would amount to a comparison of apples and oranges. To ensure that the comparison is ‘like-for-like’ these external factors would need to be taken into account.

The difficulty in assessing energy efficiency in this single industry highlights the need for caution in choosing meaningful metrics for “energy efficiency”.

### 4.2 Conflicting Energy Policy Objectives

Just as energy efficiency is only one of a number of factors that impact energy use, energy efficiency is only one of a number of energy policy objectives for Governments and Industry.

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<sup>2</sup> *World Trends in Energy Use and Efficiency: Energy Indicators, IEA, 2008*

Reducing greenhouse gas emissions, supporting the development of technological solutions to reduce emissions, improving economic efficiency and productivity, reducing energy consumption, increasing energy security are all important policy objectives which while often complementary, can often also be in conflict.

For example, access to low cost energy through the use of fossil fuels such as coal has been critical to Australia's prosperity and continues to underpin our economy. However, the continued use of coal is in conflict with the policy objectives of reducing greenhouse gas emissions, and improving air quality.

It is also important to note that there are sometimes strong policy reasons for adopting policy positions which have the effect of reducing energy efficiency. For example:

- Carbon capture and storage projects like the CO<sub>2</sub> injection component of Chevron's Gorgon project can significantly reduce Australia's greenhouse gas emissions by permanently storing potential emissions underground and avoiding their release into the atmosphere. The policy trade-off is that storage process increases the energy intensity and reduces the energy efficiency of such projects.
- The introduction of new standards for transport fuels which limit the levels of sulphur in fuel have reduced air pollution, but the removal of sulphur from fuel requires more energy, increasing the energy intensity of oil refineries and decreasing energy efficiency.

A comprehensive energy policy for Australia must seek to balance these objectives.

## 5.0 POLICY PRINCIPLES

### 5.1 Climate Change Agenda

The Prime Minister's announcement of the establishment of the Task Group on Energy Efficiency highlights that "*Energy efficiency is a key plank of the Rudd Government's climate change agenda.*"<sup>3</sup>

Any proposed policy measures will need to be considered in the context of the government's climate change policies, specifically the *Carbon Pollution Reduction Scheme (CPRS)* and the Council of Australian Governments' (COAG) *Complimentary Principles for Climate Change Mitigation Measures*<sup>4</sup> as acknowledged in the Task Groups Terms of Reference.

Chevron has outlined in detail its position on climate change in a range of written submissions to the Australian Government and the Australian Parliament.<sup>5</sup>

### 5.2 Administrative Efficiency

Key criteria for public policy-making include equity, economic efficiency, and administrative simplicity (administrative efficiency). These underpin the Australian Government's guidelines for regulatory best practice (Office of Best Practice Regulation, 2007)<sup>6</sup>.

The Terms of Reference outline that the Task Group will be reporting on mechanisms to deliver a step-change in improvement in Australia's energy efficiency. To achieve the appropriate policy settings necessary for Australia's economic prosperity, Chevron encourages the Task Group to apply best practice and following the principles below in developing their recommendations:

- Any proposed policy measures should be targeted at market failures that are not addressed by the existing policy framework, specifically the CPRS;
- Provide evidence to support the identification of a market or policy failure and articulate how the proposed policy measure would address the failure;
- Demonstrate that the proposed policy measure provides net economic and public benefits;
- Ensure that the proposed policy measure is consistent and does not duplicate existing policies;
- Any new energy efficiency measures should adhere to the principles of efficiency, effectiveness, equity and administrative simplicity and should be subject to regularly review to ensure these principles are being met.

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<sup>3</sup> Media release "Prime Minister appoints energy efficiency advisory group", Prime Minister's website, 30 March 2010

<sup>4</sup>COAG website:

[http://www.coag.gov.au/coag\\_meeting\\_outcomes/2008-11-29/docs/20081129\\_complementarity\\_principles.pdf](http://www.coag.gov.au/coag_meeting_outcomes/2008-11-29/docs/20081129_complementarity_principles.pdf)

<sup>5</sup> Chevron Submission to the Senate Standing Committee on Economics Inquiry into the exposure drafts of the legislation to implement the CPRS, 25 March 2009

Chevron Submission to the Senate Select Committee on Climate Change, 8 April 2009

Chevron Submission to the Department of Climate Change on the Exposure draft of the CPRS legislation, 14 April 2009

Chevron Submission to the Proposed Modifications to the CPRS, September 2009

<sup>6</sup> Office of Best Practice Regulation (2007), *Best Practice Regulation Handbook*, Canberra: Commonwealth of Australia, August 2007

## **6.0 ENERGY EFFICIENCY SOLUTIONS**

### **6.1 Increased Use of Natural Gas**

Chevron supports the move to a more distributed model for electrical power generation and in particular the desire for efficient co- and tri-generation energy conversion devices.

The increased use of natural gas is well suited for use in distributed power generation devices. The technology to construct medium size gas fired co- and tri- generation units in close proximity to demand centres exists today and is being installed in many of Chevron's operations. One can envisage a natural evolution of this trend where major buildings, or industrial centres have dedicated systems providing electricity, heat and cooling all powered by natural gas. Such systems may also provide lower greenhouse gas emissions and reduced atmospheric pollutants compared to traditional electric power generation from coal.

The principle barrier to the wider uptake of these technologies is the cost differential when compared to centralised electrical power generation from coal. Putting aside the issues associated with climate change, the economic benefits of a low cost centralised energy supply model likely outweigh the benefits to be gained through improved energy efficiency. Chevron anticipates that as climate change externalities are addressed, through policies such as the CPRS, there will be a move to a greater distributed power generation model.

### **6.2 Efficient Plant and Equipment**

There is little doubt that advances in technology mean that an LNG plant installed today is more efficient than its predecessors. This is evident when comparing the first three LNG processing trains installed by the North West Shelf Venture in WA with the recent development of trains four and five. Despite processing similar natural gas and being located in a similar environment, technology advances have resulted in reduced greenhouse gas emissions for trains four and five.

Retiring the first three processing trains at the North West Shelf facility and replacing them with equally or more efficient trains than trains four and five would reduce total energy demand while still allowing the processing of a similar volume of liquefied natural gas. This would result in energy efficiency improvements, however; it would require the early retirement of a processing plant that has potentially a further 10 to 20 years effective operating life and replacement with a facility that might only be used for half of its potential operating life. Hence, the desire to achieve improvements in energy efficiency can be outweighed by drivers in economic productivity.

While decisions about the retirement and replacement of plant are best left to industry, government policy settings may assist industry in making such decisions. For example, current tax rules relating to depreciation of long lived plant works against the early retirement of an existing plant and its replacement with a more energy efficient plant.

Policies that mandate improvements in energy efficiency may require the retirement and replacement of an existing plant before such actions would normally be contemplated by industry. While such actions would improve energy efficiency they come at great economic cost and would undermine Australia's economic prosperity.

### **6.3 Research and Development**

It is widely recognised that there are market failures associated with research, development and commercialisation of new technologies. To improve the development of new and more energy efficient options, increased government funding is required across a broad range of emerging energy efficient technologies such as (but not limited to):

- co- and tri-generation conversion technologies suitable for small scale but highly distributed power supply systems;
- improved design of energy conversion devices;
- large scale energy storage (to support the further deployment of intermittent renewable power);
- improved vehicle traffic management systems for our major cities

A degree of complexity associated with government funding of Research & Development is in determining at what point in the development of a particular technology has the market failure been addressed (i.e. when does government cease funding the demonstration of the technology and leave it to the market to drive deployment).

### **6.4 Transport**

Meeting the transportation needs of Australia provides opportunities to improve the nation's energy efficiency. Central to this is a requirement to improve urban planning in order to minimise transportation distances, and where travel is undertaken, to ensure that it occurs as efficiently as possible.

Policies such as promoting urban infill, the provision of public transport and better roads have the potential to contribute to a reduction in energy demand from the transport sector. New policies in these areas can be justified on the grounds of addressing weaknesses in existing planning policy.