

National Greenhouse and Energy Reporting Regulations Discussion Paper

Technical Guidelines for the Estimation of Greenhouse Emissions and Energy at Facility-Level

Submission by ExxonMobil Australia Pty Ltd



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Introduction

Globally, Exxon Mobil Corporation is the world's largest publicly quoted oil and gas company and the world's largest corporation in terms of market capitalisation.

¹ExxonMobil Australia Pty Ltd ("ExxonMobil"), through its subsidiaries, Esso Australia Pty Ltd and Mobil Oil Australia Pty Ltd has been operating in Australia for over 100 years and is the largest integrated oil and gas company with a total investment of over A\$13 billion.

ExxonMobil is a major producer of oil and gas and a marketer of petroleum products in Australia. Through our operations most notably in Bass Strait in our Joint Venture with BHP Billiton, we have produced approximately two-thirds of the country's cumulative oil production and almost one-third of gas production. In addition, ExxonMobil is seeking to become a major producer of gas in the Carnarvon Basin off Western Australia.

In our downstream business we have extensive fuels and lubricants marketing operations, including the supply of petroleum products to a network of approximately 800 Mobil branded service stations and we are the owner and operator of the Altona Refinery.

Background

In previous submissions to government ExxonMobil has indicated its strong support for the proposal to use verified emissions data from a mandatory national scheme as proposed under the new National Greenhouse and Energy Reporting (NGER) Act.

A key strength of the NGER Act is that it provides for a single streamlined national scheme and data source and overrides state based schemes that utilize different methodology and reporting guidelines.

In addition it should provide a robust and transparent basis of emissions estimates for eventual linkage with the Australian Emissions Trading Scheme (AETS).

ExxonMobil as a member of the Australian Petroleum Producers and Explorers Association (APPEA) is supportive of the APPEA submission regarding the NGER Technical Guidelines. In addition to the APPEA submission, ExxonMobil provides the following comments in this submission.

¹ExxonMobil Australia Pty Ltd is a subsidiary of Exxon Mobil Corporation. ExxonMobil Australia Pty Ltd has a number of subsidiaries with assets and operations in Australia many with names that include ExxonMobil, Exxon, Esso and Mobil. For convenience and simplicity in this submission those terms and the terms corporation, company, our, we and its are sometimes used as abbreviated references to a specific subsidiary or groups of subsidiaries in the ExxonMobil Australia Group of companies.

Reporting Greenhouse Gas Emissions

ExxonMobil is committed to reporting greenhouse gas emissions from our operations, and we have reported our emissions globally since 1998 – and from our Australian operations since 1997.

Calculating and comparing GHG emissions globally is complex, not least because:

- Emissions from petroleum production and refining operations can vary widely due to differing geological circumstances, the number and type of unprocessed or semi-processed gases used as fuels, natural resource characteristics such as sulfur levels in crude oil, the range of end-product specifications required in different regions, countries, or even local markets and the different configuration of process units or 'hardware' in refineries.
- Oil and gas processing plants and refineries utilise unprocessed or semi-processed gases as fuels. These fuels are sourced from multiple offtakes at various points in the process and therefore can have a variety of compositions. In addition, these fuels are not subject to 'custody transfer' accuracy metering.
- The safety features of oil and gas processing plants and refineries also include flares to dispose of hydrocarbon gases to prevent equipment overpressure and protect people during process upsets or emergency situations. Metering of flares is technically difficult as flow rates vary widely.
- N₂O and fugitives such as methane cannot be directly measured and therefore estimates must be based on calculations using factors. This also means that it is not possible to reduce the estimated emissions through traditional emissions reduction projects.
- When utilising higher order methods and estimation techniques to calculate greenhouse emissions, rather than applying emissions factors to standard fuels, care must be taken regarding metering accuracy requirements, sampling requirements and calculation methodology. Sufficient detail is required to ensure that no industry is disproportionately disadvantaged compared to other industries. However, the practicalities of installing and maintaining large numbers of meters, meter accuracy and sampling frequency also need to be taken into account.

Addressing the Dual Aims of the NGER System

The NGER Act is intended to achieve dual aims of streamlining greenhouse emissions reporting and underpinning the AETS. ExxonMobil is strongly supportive of streamlining greenhouse gas emissions reporting and believes that NGER is an appropriate vehicle. However, ExxonMobil is unclear of the intended interaction of NGER and the proposed AETS. Moreover, ExxonMobil is concerned that the Technical Guidelines do not adequately address metering and accuracy concerns sufficiently to ensure a level playing field for companies participating in an AETS. Specific concerns are discussed below.

Use of Existing Reporting Protocols

ExxonMobil recognises the benefits of building on existing reporting protocols such as the AGO Factors and Methods Workbook and is particularly supportive of the use of the American Petroleum Institute Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry.

Metering

The NGER Technical Guidelines focus on the use of emissions factors to estimate greenhouse emissions from the combustion of carbon based fuels. However, no detail is given regarding the required levels of uncertainty of the greenhouse gas emission estimates which is crucial in order to ensure that no company or industry is disproportionately disadvantaged under an AETS. The uncertainty is the combined impact of measuring the quantity of fuel and its composition.

Note also that early definition of minimum standards is crucial as industry will require time to design and implement the necessary hardware and system changes some of which may require the plant to be shutdown. Some changes may not be able to be implemented until the next scheduled maintenance shutdown which could be several years away.

ExxonMobil notes that the Guidelines refer to the AGO Generator Efficiency Standards - Technical Guidelines, however, these standards are not appropriate for the Oil and Gas Industry where a wide range of gases in particular are used as fuel. Similarly, the Guidelines note that Section 3.5 Gaseous Fuels may be extended to all gas fuels. However, the requirements under this section are not appropriate for own-use-fuel or consumption of unprocessed, or partially processed gases which do not have or require 'custody transfer' accurate metering.

ExxonMobil suggests that a standard similar to the AGO Generator Efficiency Standards, based on the API Compendium of Greenhouse Gas Estimation Methodologies should be written and utilised for the Oil and Gas Industry and looks forward to being involved in the process. We note that uncertainty requirements need to meet practicality and cost considerations, consistent with the intent of the regulations and the nature of the industry.

Section 3.5.1 requires that in the event Reporters choose to measure activity data directly, the overall accuracy of metering equipment shall comply with the requirements set forth in regulations under the relevant gas Acts. It is not clear which specific Acts are referred to and it is considered likely that such Acts are concerned with "pipeline quality natural gas" which as noted above is not relevant to non-standard own-use gases used extensively by the Oil and Gas industry.

Sampling

In order to establish an emissions factor using 'higher order methods', the composition of the fuel must be understood. This is acknowledged in the Technical Guidelines, however,

requirements for sampling frequency are vague and not linked to fuel types. ExxonMobil supports representative sampling of fuels with consideration given to composition variability and ease of sample collection, rather than proscribed sampling frequencies. Sampling requirements may need to be strengthened under an AETS to ensure that no company or industry is disproportionately disadvantaged.

Flaring

Flaring in the Oil and Gas Industry is primarily a safety feature of processing plants and refineries. Flare systems are designed to avoid overpressure of vessels and to protect people and equipment in the event of process upsets or other emergency situations. Flaring is less frequently used to dispose of hydrocarbons from mobile drilling rigs during production tests on newly discovered reservoirs.

Flaring is a combustion process and therefore should not be grouped with fugitives in the Technical Guidelines. In terms of calculation methodology, a similar equation to that for fuel combustion should be used, taking into account the wide variation in composition and quantity typical in most flares.

It should be noted that metering of flare streams cannot achieve the same accuracy as that for fuel streams due to the technical limitations of metering over the wide ranges of flow rates required for flares.

Reporting by Equipment Type

Reporting energy use (fuel and electricity) and greenhouse emissions by equipment type is not practical in the Oil and Gas Industry. Such reporting would require large numbers of meters to be installed in processing plants which are not otherwise needed. Energy use in processing plant is already adequately addressed through the Energy Efficiency Opportunities program, administered by the Federal Department of Resources, Energy and Tourism.

Unlike other air emissions (eg. NO_x, SO_x), CO₂ emissions are only affected by the quantity and type of fuel and not the equipment consuming the fuel. The equipment type may affect the very small quantities of N₂O produced and hence has a small effect on the total greenhouse gas emissions expressed as CO_{2-eq}. In the case of large industrial boilers and heaters, the equipment type has an insignificant impact on the total greenhouse gas emissions and the level of detail requested is unwarranted. In general, many large energy users do not have this information available.

Ratings Framework

Appendix 3.1 does not recognise the use of non-standard own-use-fuel or consumption of unprocessed, or partially processed gases, which is common practice in the Oil & Gas Industry. Note that this is not the same as Refinery gas as defined in Appendix 3.2.

The use to be made of the Ratings Framework in the AETS is unclear. We point out the need to consider practicality and cost in the event that specific ratings levels become required. For example, offshore oil and gas installations have limited potential for cost effectively achieving a ratings equivalent to onshore custody transfer installations.

Other issues related to an AETS

There are many design issues that have not been finalised with the proposed AETS and the reporting requirements and methodology under NGER will need to be reviewed and possibly revised once the design is finalised.

Currently there is a proposal that fuel suppliers purchase permits for fuel sales and that large users (> 25,000 tonnes CO₂-eq per annum) should also be responsible for permits of purchased fuels. As such, if this proposal is adopted by the current government, there is likely to be considerable administrative and reporting burden placed on companies that sell fuels and /or are large users. There is also the potential for double counting or omitting emissions / permits from purchased fuels. Reporting requirements under the NGER will need to consider these issues as the AETS design develops.

Specific Comments

- The referenced standards and test methods (AS, ISO and ASTM) throughout the discussion paper should not include the year or version unless that particular version of the standard or test is required and not the latest version. For example, ASTM 2649:1983 should be shown as ASTM 2649. If not, either companies will be unable to use the latest version or the Technical Guidelines will need to be continuously updated to reflect the latest versions as they are approved.
- Section 3.9.1 Petroleum Refining:
 - This section seems to be in the wrong place. Section 3.9 is relevant for "Industries with non-energy uses of fossil fuels" and yet the energy from the coke burned off the cracking units (FCC) are used within the refinery process. The FCC is a major source of energy with refineries.
 - The method attributed to the American Petroleum Institute (API) Compendium for determining the amount of coke from cracking and other catalysts is incorrect. Section 5.2.1 of the API Compendium details two methods for determining coke on cracking catalysts and neither is a mass balance. Neither is the method outlined in the discussion paper suitable for determining CO₂ emissions from a refinery, particularly if default carbon content of crude oils and the numerous products are used. A mass balance can only be used if extensive testing of the carbon content of all the feedstocks and products is carried out on a routine basis. Even then, closure of a carbon balance is extremely difficult to achieve.

- As mentioned in general comments above, Oil and Gas Processing should be addressed under a separate section in the Technical Guidelines with reference to appropriate specific guidelines on metering, sampling and calculation methodology.
- Section 3.9.1 NGA Default method - the carbon content factors cited in sections 3.4 to 3.6 are too inaccurate for use in a carbon mass balance calculation. Refineries utilise "higher order" methods.
- Oil refineries should either be included in Section 4 by expanding the section to include refining or in Section 5, Industrial Processes. It should not have some aspects of refining included in both sections as this is confusing.
- "Natural gas - unprocessed" should be added to the list of produced / consumed fuels (Tables 18 and 23) to allow adequate reporting by the Oil and Gas Industry.
- "Ethane" should be added to the list of energy production for feedstocks in addition to ethene (Tables 19 and 23).
- Table 18 "Consumption of fuels ..." - The units specified for the both entries under "Consumption of fuels for the purpose of international transport" are incorrect. Gigajoules per unit quantity are energy contents and not quantities. The units should be tonnes, thousand litres or cubic metres.
- Emissions factors for transport diesel only refer to road transport. Similar factors should be developed for boat transport or some comment provided regarding the applicability of the road transport numbers to boat use.
- Table 33 regarding fugitive emissions appears to be a direct copy of Table 29, however it is not generally the case that fixed or floating roof tanks are used in the production and storage of natural gas.
- The numbering in Section 4 is inconsistent. Section numbers 4.3.2.1 and 4.3.2.2 are used repeatedly (see pages 80-82).
- Appendix 3.3: Standards for Sampling and Testing Fuels:
 - "ASTM 4259:2006 and ASTM 6300-06" have no relevance and should be deleted from the entire document. They are used to determine the precision and bias of test methods and dispute resolution. Precision and Bias are known for all of the Methods and Standards and the results are listed in the Test Methods themselves. They do not need to be determined by anyone in industry or government. These Standard are only relevant if the government is going to allow companies to develop their own test methods and standards. When new Standards are developed or revised, this work is done before they are published.
 - ASTM D5291-02 can not be used on any volatile hydrocarbon and therefore can not be used for testing aviation gasoline and many organic solvents.