



PUBLIC REPORT TEMPLATE 2011

Please note that this template has been updated based on feedback from a number of Corporations during the recent review of regulations. It is not compulsory for you to use this Public Report template. You may wish to continue to use the previous template, or you may report in another format of your choice. Either is acceptable provided you report all the information required by the EEO Act and Regulations.

There is an explanatory document at pages 5-14 of this template that fully explains how to complete it. There is also some targeted guidance on the template itself.

Part 1 - Corporation Details

Controlling Corporation

Period to which this report relates

Insert the name of the Controlling Corporation exactly as it is registered with the EEO Program. The period to which the report relates is the total period of participation up to 30 June prior to when the report is due.

Woodside Energy Ltd.

From

1 July 2006

To

30 June 2011

Table 1.1 - Major Changes to Corporate Group Structure or Operations

Table 1.1 – Major Changes to Corporate Group Structure or Operations

In June 2010, Woodside divested its interests in the Otway Gas Plant. No further actions or updates on the opportunities of this plant are included in the Public Report.

Production from the Cossack Pioneer ceased in March 2011 when it was disconnected from the riser and the vessel turret. This vessel was replaced by a newer vessel, the Okha, in September 2011.

Table 1.2 – Aggregate energy assessed covered in this report

Total energy use covered by all assessments in this report	121,926,000	GJ
Total energy assessed as percentage of total energy use of the corporate group*#	92.7	%

* If this report covers only part of the corporate group, than the percentage should be computed on the total energy use for that part of the group covered in this report

Please note that corporations are required to assess 80% or more of their energy use in the first five-year assessment cycle and 90% or more in subsequent five-year assessment cycles. Accordingly, for those corporations with a 2005-06 trigger year (i.e. those corporations at the end of their first-five year assessment cycle), the value in "Percentage of corporation's energy use assessed" above, must be more than 80%.



Declaration

Declaration of accuracy and compliance

The information included in this report has been reviewed and noted by the board of directors and is to the best of my knowledge, correct and in accordance with the *Energy Efficiency Opportunities Act 2006* and *Energy Efficiency Opportunities Regulations 2006*.

Peter Coleman
CEO and Managing Director

Date 9/12/2014

Part 2a - Assessment Outcomes

Table 2a.1 – Assessment Details

It is compulsory to complete a separate table for each group member, business unit, or key activity that has been assessed

Name of group member or business unit or key activity

North West Shelf Venture

Total energy use in the last financial year

129,698,311 GJ

Energy use assessed in this entity as a percentage of total entity energy use*

>90 %

Energy use assessed in this entity as a percentage of total corporate energy use

>80 %

Accuracy of above estimates related to energy use assessed - only required if not $\pm 5\%$ or better

10 %

Typical fuel metering accuracy for Woodside facilities is within a range of 5-10%, with higher accuracies for custody transfer of products at sales point (1-2%). However, the bulk of Woodside's energy consumption is sourced from fuel gas taken as a utility side-stream from the main production of hydrocarbons. Due to different modes of plant operation, and changes in the production balance into facilities from different reservoirs, it is difficult to accurately measure the amount of energy contained in the fuel gas stream. As the fuel gas is not being sold to a third party, accurate metering for custody transfer has not been justified or provided in the original design.

Additionally, compositional variations in fuel gas can occur, due to plant operating modes (which may select alternative sources for fuel gas from different locations in the gas process) or due to variations in input production from reservoirs. The heating value or energy content of the fuel will also change as a consequence.

Woodside has assessed its facilities and met the accuracy requirements as agreed in their Assessment and Reporting Schedule of $\pm 10\%$.

Period over which assessment was undertaken

March 2007

June 2011

Description of the way in which the entity carried out its assessment

Most of the energy consumed by Woodside operations is from own-use fuel. A small amount of energy is sourced externally (approximately 0.1%). There is a significant economic driver to reduce fuel gas consumption, as this enables improved recovery of hydrocarbons to Liquefied Natural Gas (LNG), Domestic Gas and in some cases, oil products.

Most of the energy use reduction opportunities identified in the facility assessments below are related to gas and diesel fuel use. For these opportunities, the energy is attributed to the energy source from where the greatest reduction occurs.

Opportunities that increase production from a facility but do not increase energy consumption are considered efficiency opportunities. These are detailed separately to production enhancement initiatives, where the energy savings are determined relative to the amount of energy a facility had previously consumed to produce a specified quantity of product.

Table 1 summarises the approach in addressing the six key elements of the EEO legislation. This documentation is retained in each facility's verification folder.

Table 1: Woodside approach to Key Elements of the EEO legislation

Key Element	How EEO assessments are completed
1 – Leadership	<ul style="list-style-type: none"> - Scoping document - Woodside's Greenhouse Policy - Communications Plan - Allocation of Budget
2 – People	<ul style="list-style-type: none"> - Scoping Document - Communications Plan - Background Paper
3 – Information, data and analysis	<ul style="list-style-type: none"> - Communications Plan - Use of Production Accounting System (PAS) and Process Historian Database (PHD) - Background Paper
4 – Opportunity Identification and Evaluation	<ul style="list-style-type: none"> - Background Paper - Opportunity Identification Workshops - Opportunity Register - Use of PAS and PHD - Opportunity Realisation Process (OPREP) - Key Decision Logs - Opportunity Assessment Reports
5 – Decision Making	<ul style="list-style-type: none"> - Opportunity Tracking Spreadsheet - Opportunity Assessment Reports - OPREP - Key Decision Logs
6 – Communicating Outcomes	<ul style="list-style-type: none"> - EEO Government Report - EEO Public Report - Woodside Sustainable Development Report (early 2011) - Board Meeting Agenda Item and Minutes (early 2011)

Throughout this report, the business responses to opportunities in the tables are provided at the date of this report. The energy saving and financial data are valid as at the facility assessment dates.

Woodside has assessed its energy consumption and reported according to the accuracy requirements as per its Assessment and Reporting Schedule. All facilities meet the $\pm 10\%$ accuracy requirement.

* Please note that, for individual sites that use more than 0.5PJ of energy, all energy use must be assessed (less a small proportion for non integral energy use).

Table 2a.2 - Energy efficiency opportunities identified in the assessment

It is compulsory to complete a separate table for each group member, business unit, or key activity that has been assessed

Table 2.2 – Energy efficiency opportunities identified in the assessment									
Status of opportunities identified to an accuracy of better than or equal to $\pm 30\%$		Total Number of opportunities	Estimated energy savings per annum by payback period (GJ)						Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – ≤ 4 years		> 4 years		
			No of Opportunities	GJ	No of Opportunities	GJ	No of Opportunities	GJ	
Business Response	Implemented	23	17	2,312,044	4	162,882	2	991,278	3,466,227
	Implementation Commenced	2	2	9,690,786	0	0	0	0	9,690,788
	To be Implemented	8	5	425,364	0	0	3	241,101	666,473
	Under Investigation	3	3	2,803,726	0	1,627	0	0	2,805,356
	Not to be Implemented	13	7	1,476,592	2	6,240,300	4	3,520,829	11,237,734
Outcomes of assessment	Total Identified	49	34	16,708,511	6	6,404,809	9	4,753,208	27,866,578
Status of opportunities identified to an accuracy of worse than $\pm 30\%$									
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented	5	2	93,031			3	250,960	343,991
Outcomes of assessment	Total Identified	5	2	93,031	0	0	3	250,960	343,991

Please note that Corporate Groups are not required to report opportunities with a payback greater than 4 years. Reporting this data is voluntary.



Table 2a.3 - Details of significant opportunities identified in the assessment

Corporate Groups are required to provide at least 3 examples of significant opportunities for improving the energy efficiency of the group that have been identified in assessments.

Karratha Gas Plant – Turn off Thermal Combustion Unit (TCU)

The KGP has a shared TCU for LNG Trains 4 and 5. The TCU combusts volatile organic compounds (in particular benzene, toluene and xylene, (BTEX)) that would otherwise be vented to the atmosphere.

The Acid Gas Removal Units that produce the BTEX have undergone solvent upgrades on all LNG trains and now produce 85% less BTEX. Switching off the TCU has resulted in result in significant fuel gas and energy savings.

Cossack Pioneer – Flare and Vent Recovery System

The Flare and Vent recovery opportunity uses a compressor to capture some of the vented and flared hydrocarbons that were previously not technically feasible to recover. This design includes a bullet ignition system and removes the need for a continuous flare purge. It will be the first of its kind within Australia. This opportunity has been recommended for implementation in the new facility design.

All savings are estimated and will be evaluated once the Okha has commenced production.

Goodwyn – Reduce Stripping Gas Flowrate

The EEO assessment workshop identified the opportunity to reduce the rate at which stripping gas was flowing to the surge drum. This resulted in reduced facility flaring and improved resource recovery. This opportunity only required minimal changes to the facility operation and resulted in a quick return on the investment.

North Rankin – Installation of a Compabloc Heat Exchanger

The North Rankin A facility is planning to install a Compabloc compact heat exchanger. This unit will improve the efficiency of heat exchange in the hot oil heaters which are major users of energy. Through improved heat exchange there will be more heat transfer and a lower demand on the Tempered Water / Sea Water system.



Part 2b - Assessment Outcomes

Table 2b.1 – Assessment Details

It is compulsory to complete a separate table for each group member, business unit, or key activity that has been assessed

Name of group member or business unit or key activity

Australia Oil

Total energy use in the last financial year

10,485,444

GJ

Energy use assessed in this entity as a percentage of total entity energy use*

11.2%

%

Energy use assessed in this entity as a percentage of total corporate energy use

>90%

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

10

%

Please see the response under Part 2A for the North West Shelf Venture. Woodside approaches EEO consistently across all business units and facilities.

Period over which assessment was undertaken

September 2007

December 2010

Description of the way in which the entity carried out its assessment

Please see the response under Part 2A for the North West Shelf Venture. Woodside approaches EEO consistently across all business units and facilities.

* Please note that, for individual sites that use more than 0.5PJ of energy, all energy use must be assessed (less a small proportion for non integral energy use).

Table 2b.2 - Energy efficiency opportunities identified in the assessment

It is compulsory to complete a separate table for each group member, business unit, or key activity that has been assessed

Table 2.2 – Energy efficiency opportunities identified in the assessment									
Status of opportunities identified to an accuracy of better than or equal to ±30%		Total Number of opportunities	Estimated energy savings per annum by payback period (GJ)						Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – ≤ 4 years		> 4 years		
			No of Opportunities	GJ	No of Opportunities	GJ	No of Opportunities	GJ	
Business Response	Implemented	23	19	1,271,471	2	0	2	102,961	1,374,432
	Implementation Commenced	0		0		0		0	0
	To be Implemented	16	16	278,964		0		0	278,964
	Under Investigation	0		0		0		0	0
	Not to be Implemented	3	1	31,649		0	2	176,000	207,649
Outcomes of assessment	Total Identified	42	36	1,582,084	2	0	4	278,961	1,861,087
Status of opportunities identified to an accuracy of worse than ±30%									
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented								
	Under Investigation	1		0		0	1	1,304,045	1,304,045
	Not to be Implemented	6	2	26,648	0	0	5	>4 years	26,648
Outcomes of assessment	Total Identified	7	2	26,648	0	0	6	1,304,045	1,330,701

Please note that Corporate Groups **are not required** to report opportunities with a payback greater than 4 years. Reporting this data is voluntary.



Table 2b.3 - Details of significant opportunities identified in the assessment

Corporate Groups are required to provide at least 3 examples of significant opportunities for improving the energy efficiency of the group that have been identified in assessments.

Northern Endeavour – Reduce Stripping Gas Flowrate

The Northern Endeavour FPSO utilises glycol to remove water from raw gas streams, in order to prevent corrosion in piping and other critical systems. Once saturated with water, glycol is dehydrated via contact with stripping gas which must then be flared. The EEO assessment workshop identified an opportunity to reduce the volume of stripping gas which used in the dehydration process. As stripping gas is flared, decreasing usage lead to corresponding decreases in facility flaring rates and therefore improved resource recovery. This opportunity only required minimal changes to the facility operation and resulted in a rapid return on the investment.

Maersk Ngujima-Yin – Reduced flaring from low pressure separator

The FPSO uses a series of separators on well fluids, which output oil, gas and water. The low pressure separation compressor recovers produced gas to fuel or for reinjection into the reservoir, but this has not been necessary to operate. When the facility recommences reinjection in 2011 the low pressure compressor is proposed to be commissioned, saving about 30,400 GJ of fuel gas per annum.

Nganhurra – Fuel Gas Return Line

The Nganhurra facility reinjects the gas associated with the oil it produces from the reservoir (associated gas). This avoids flaring the gas, in turn reducing the greenhouse footprint. The associated gas is reinjected into the existing gas cap of the oil reservoir.

An opportunity was identified to enable the use of the gas from this gas cap instead of using diesel during process disruptions. The energy savings would result from the lower consumption of fuel due to the higher energy content of fuel gas relative to diesel, which must be refined and transported to the facility. The opportunity is estimated to save 190,000 GJ per year.