Alinta Cogeneration (Wagerup) Pty Ltd

Alinta Wagerup Units 1 – 2

GREENHOUSE GAS ABATEMENT PLAN

- WP03100-EV-PL-0004
- Final – Rev 1
- October 2006

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Contents

1. Introduction

1.1 Background to the Project

Alinta Cogeneration (Wagerup) Pty Ltd (Alinta) proposes to develop two cogeneration units on the Alcoa World Alumina Australia (Alcoa) Wagerup Refinery site as part of its plan to continue delivering clean, reliable and competitively priced electricity to customers on the South West Interconnected System (SWIS). Each cogeneration unit is comprised of a gas turbine generator (GTG), which generates electricity, and a heat recovery steam generator (HRSG), which utilises hot exhaust gases from the GTG to produce high-pressure steam. By providing electricity to customers throughout the South West, as well as supplying steam for refinery purposes, cogeneration is an efficient use of a single fuel source.

In order to accommodate the timing of varying demands for the Alinta project, staged development of these facilities is required. Stage One of the development will involve the construction and operation of the GTGs for open-cycle peaking duty, producing electricity but not steam. Stage Two of the development will involve the construction of the HRSGs.

The timing of Stage One development is driven by Alinta's commitment to provide reserve capacity to the SWIS for the summer peak power demand period. This reserve capacity will ensure that an appropriate level of system security and reliability is maintained.

Stage Two of the development will meet Alcoa's increased steam demands should the Alcoa Wagerup Refinery expansion proceed. However, should the refinery expansion not proceed the cogeneration project will progress when required to meet base-load demand from contestable customers on the SWIS. As the Alcoa Wagerup Refinery has a finite demand for steam, under this scenario the steam supplied from the Alinta cogeneration facility will replace steam currently provided by Alcoa's existing boilers.

A transition phase will be required between Stage One and Stage Two operation. During this phase the operating hours of the GTGs will increase as the HRSGs and other Stage Two equipment is being designed, built and commissioned, but no steam will be produced.

As a part of the Project environmental impact assessment process, annual greenhouse gas emissions were estimated for both Stage One and Stage Two operation as well as for the transition phase. A summary of predicted emissions is provided in the Environmental Impact Statement (EIS) (SKM, 2006).

1.2 Greenhouse Gases and Climate Change

The greenhouse effect is the mechanism by which the temperature at the Earth's surface is increased by the presence of greenhouse gases. These gases absorb heat energy radiating away from the Earth's surface and reflect it back towards the Earth, thereby increasing the temperature experienced at the surface. There is a consensus in the scientific community that the anthropogenic emission of large quantities of greenhouse gases since the beginning of the industrial revolution has resulted in an abnormally accelerated increase in the mean surface temperature of the Earth's atmosphere and oceans and has caused changes in the Earth's climate system. The global surface temperature has risen by 0.6°C since 1861 and is likely to increase by 1.4–5.8°C over the period 1990–2100 and sea levels are predicted to rise by 0.09–0.88 metres over the same period (IPCC, 2001).

The greenhouse gases covered by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), perfluorocarbons (CF_x), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF_6) and nitrous oxide (N_2O) (CoA, 1998). Whilst the Federal Australian Government has not ratified the Kyoto Protocol, it has signalled its intention to meet the target set at Kyoto, which was to increase emissions by no more than 8% above 1990 levels to be achieved over the years 2008–2012. In order to meet this target it is necessary to document predicted greenhouse gas emissions from proposed projects and present strategies for reducing these emissions, applying best practice standards and techniques. Accordingly, the EPA has recommended that a 'Greenhouse Gas Abatement Program' be developed as a condition of approval for the Alinta Wagerup Cogeneration Project.

1.3 Purpose of Document

This 'Greenhouse Gas Abatement Plan' (GGAP) is provided in response to the Ministerial Conditions of approval for the Wagerup Cogeneration Project, which make specific reference to the need for the proponent to prepare a Greenhouse Gas Abatement Program.

Condition 6-1 of the Ministerial Statement of approval for the project states that:

"*prior to commencement of construction, the proponent shall develop a Greenhouse Gas Abatement Program to:*

- *ensure that the plant is designed and operated in a manner which achieves reductions in 'greenhouse gas' emissions as far as practicable;*
- *provide for ongoing 'greenhouse gas' emissions reductions over time;*
- *ensure that through the use of best practice, the total net greenhouse gas emissions and/or 'greenhouse gas' emissions per unit of product from the project are minimised; and*
- *manage 'greenhouse gas' emissions in accordance with the Framework Convention on Climate Change 1992, and consistent with the National Greenhouse Strategy."*

Table 1 provides a summary of the requirements of the Greenhouse Gas Abatement Program as identified in the Ministerial Statement and directs the reader to relevant sections of this document where these requirements are addressed.

Table 1 Requirements for the Greenhouse Gas Abatement Program as specified in Ministerial Condition 6-1.

Number	Condition	Description	Refer to
6-1(1)	Greenhouse Gas emissions calculations	Calculation of the greenhouse gas emissions associated with the project in accordance with the EPA document "*Minimising Greenhouse Gas Emissions, Guidance for the Assessment of Environmental Factors, No 12 (EPA October 2002):*	Section 2
6-1(2)	Minimise Greenhouse Gas emissions	Specific measures to minimise the total net greenhouse gas emissions and/or greenhouse gas emissions per unit of product associated with the project using a combination of "no regrets" and "beyond no regrets" measures.	Section 3
6-1(3)	Greenhouse offset strategies	Implementation and ongoing review of greenhouse gas offset strategies with such offsets to remain in place for the life of the project.	Section 4
6-1(4)	Greenhouse Gas efficiency	Estimation of the greenhouse efficiency of the project (per unit product and/or other agreed performance indicators) and comparison with the efficiencies of other comparable projects producing a similar product, both within Australia and overseas.	Section 5
6-1(5)	Thermal efficiency	Implementation of thermal efficiency design and operating goals consistent with the Australian Greenhouse Office Technical Efficiency guidelines in design and operation management.	Section 6
6-1(6)	Reporting	Actions for the monitoring, regular auditing and annual reporting of greenhouse gas emissions and emission reduction strategies	Section 7
6-1(7)	Greenhouse Gas emission targets	A target set by the proponent for the progressive reduction or abatement of total net greenhouse gas emissions or greenhouse gas emissions per unit of product, through the implementation of on-site or off-site offsets and/or the use of renewable energy sources such as solar, wind or hydro power and annual reporting of progress made in achieving this target.	Section 8
6-1(8)	Greenhouse Gas emission reduction Program	A program to achieve a reduction or abatement in greenhouse gas emissions, consistent with the target referred to in (7) above.	Section 8
6-1(9)	Participation in the Greenhouse Challenge	Entry, whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate, into the Commonwealth Government's "Greenhouse Challenge" voluntary cooperative agreement program.	Section 9
6-1(10)	Reviewing	Review of practices and available technology	Section 7
6-1(11)	Continuous improvement approach	Continuous improvement approach so that advances in technology and potential operational improvements of plant performance are adopted.	Section 7

2. Greenhouse Gas Emissions Calculations

2.1 Introduction

Ministerial Condition 6-1(1) states that the GGAP shall include:

"calculation of the "greenhouse gas" emissions associated with the proposal, as advised by the Environmental Protection Authority"

Condition 6-1 requires Alinta to calculate greenhouse emissions in accordance with the document: *Guidance for the Assessment of Environmental Factors No. 12 - Guidance Statement for Minimising Greenhouse Gas Emissions* (EPA, 2002). Guidance Statement 12 specifies that emissions calculations should be performed using the relevant National Greenhouse Gas Inventory (NGGI) workbook. As such, the Australian Greenhouse Office (AGO) Factors and Methods Workbook (AGO, 2005) for emissions calculations (Section 1.1- Stationary energy emissions section) was used in calculating the emissions for the project.

2.2 Predicted Emissions

Electricity generation from fossil fuels is a major source of greenhouse gas emissions. The principal greenhouse gas emitted by the Alinta Wagerup Cogeneration project will be carbon dioxide (CO_2). The estimation of greenhouse gas emissions relies upon multiplying the amount of energy used (taking into account various fuels) by appropriate factors. The AGO full fuel cycle methodology uses the following factors:

1 GJ of energy used = 60.0 kg CO_2 equivalents for natural gas; and
1 GJ of energy used = 81.4 kg CO_2 equivalents for distillate fuel.

Predicted emissions for the Stage One and Stage Two development as well as during the transition phase are provided in **Table 2**.

- **Table 2 Predicted Annual Greenhouse Gas Emissions using AGO Full Fuel Cycle Emission Factors**

Description	Fuel	Quantity used (GJ)	Emission factor (kg $CO_{2\text{-}e}$ / GJ)	$CO_{2\text{-}e}$ Emissions (tonnes)
Stage One				
Peaking (900 hours)	Natural Gas	3.393×10^6	60.0	203,600
Peaking (100 hours)	Distillate	0.3910×10^6	81.4	31,830
				235,430
Transition Phase				
Averaged over three years (6,167 hours)	Natural Gas	21.91×10^6	60.0	**1,315,000**
Stage Two				
Baseload (8,760 hours)	Natural Gas	31.77×10^6	60.0	**1,906,000**

2.3 Emissions Apportioning

As a cogeneration power plant produces two outputs (electricity and steam) from the same fuel supply, total $CO_{2\text{-}e}$ (carbon dioxide equivalent) emissions need to be apportioned between the different generated energy streams. There are many different methods available for apportioning emissions, with the emissions attributed to electricity generation varying considerably depending on the particular methodology utilised. Estimated emissions from the proposed Wagerup Cogeneration Project have been apportioned using the 'equivalent electricity (kilowatt lost) method' to maintain consistency with cogeneration projects previously assessed by the EPA, namely the Pinjarra Cogeneration Project (EPA Bulletin 1081) and the Worsley Cogeneration Project (EPA Bulletin 1189).

The equivalent electricity (kilowatt lost) method translates the steam produced from the cogeneration plant into an equivalent amount of electricity that would be produced by a steam turbine generator (STG) in a combined-cycle power plant. This method assumes that the energy used to produce steam would produce at least as much electricity in a STG. The basis of the equivalent electricity (kilowatt lost) method is the calculation of the equivalent plant net heat rate (fuel consumption per unit of electrical energy), derived by dividing the estimated total annual fuel consumption by the estimated total electrical output of an equivalent combined cycle plant. The key assumption in this methodology is the estimated net STG electrical power.

Based on a nominal electricity output of 345MW and a high-pressure steam production of 460t/hr (72bar, 485^{o}C) for the proposed plant at Wagerup, it is estimated that the steam output would generate an additional 135MW of electricity if in combined cycle format, making the total

equivalent output of electricity 480MW. As seen in **Table 2** the estimated total annual fuel consumption in Stage Two is 31.77 x 10^6 GJ. The equivalent plant net heat rate is therefore:

$$= \frac{\text{Fuel consumed}}{\text{Equivalent electrical energy produced}} = \frac{31.77 \times 10^9 \text{ MJ}}{(480\text{MW} \times 8760\text{h})} = 7{,}556\text{MJ/MWh}$$

The share of fuel energy attributed to electricity production is then determined by applying the equivalent plant net heat rate to the electrical energy produced by the GTG in the cogeneration plant:

$$= (345\text{MW} \times 8{,}760\text{h}) \times 7{,}556\text{MJ/MWh} = 22.84 \times 10^9 \text{ MJ/y}$$

The fuel energy attributed to both electricity and steam production is then used to apportion the total $CO_{2\text{-}e}$ emissions, as presented in **Table 3**.

Table 3 Allocation of Annual Emissions during Stage Two Operation (Calculated based on AGO Full Fuel Cycle Emission Factors)

Description	Annual fuel consumption (GJ)	Emissions factor (kg $CO_{2\text{-}e}$/GJ)	$CO_{2\text{-}e}$ emissions (t $CO_{2\text{-}e}$)
Electricity	22.84x10^6	60.0	1,370,000
Steam	8.93x10^6	60.0	536,000
Total	*31.77x10^6*	*60.0*	*1,906,000*

3. Greenhouse Gas Emissions Minimisation

3.1 Introduction

Ministerial Condition 6-1(2) specifies that the GGAP shall include:

"specific measures to minimise the total net "greenhouse gas" emissions and/or the "greenhouse gas" emissions per unit of product associated with the proposal using a combination of "no regrets" and "beyond no regrets" measures."

3.2 Minimisation Strategies

By its very nature, the Wagerup Cogeneration Project serves to minimise the greenhouse gas emissions associated with the generation of electricity.

Natural gas has the lowest carbon intensity compared with fossil fuel alternatives such as distillate and coal. Alinta's commitment to minimising greenhouse gas emissions is demonstrated through the use of natural gas as the predominant fuel source, with minimal use (up to 100 hours per unit per annum) of distillate fuel as back-up.

In addition, by building the plant at Alcoa's Wagerup Refinery, Alinta is able to take advantage of the cogeneration opportunity presented during Stage Two operation. Cogeneration is a very efficient use of a single fuel source and thus provides environmental benefits. With one input there are two outputs – electricity and steam. This results in comparatively low greenhouse gas emissions intensities attributable to electricity generation.

Further detail on greenhouse gas efficiency is provided in **Section 5**.

4. Greenhouse Offset Strategies

4.1 Introduction

Ministerial Condition 6-1 (3) requires the GGAP to include:

"*the implementation and ongoing review of 'greenhouse gas' offset strategies with such offsets to remain in place for the life of the proposal.*"

Greenhouse offsets are required where a project is producing power at a greenhouse efficiency lower than the best practice method available. The determination of the best practice method includes consideration of factors such as the power generation technology chosen, fuels used and type of power demand the project is proposed to meet.

4.2 Offset Strategies

As described in **Section 1.1**, the Wagerup Cogeneration Project will be developed in two stages. During Stage One the plant will operate as an open cycle peak load power station. During Stage Two the plant will operate as a cogeneration base load power station. A transition phase, between Stage One and Stage Two, will be required to enable Alinta to gradually increase its supply of power to the SWIS from peak load to base load supply.

As stated in EPA Position Statement 9 *Environmental Offsets* (EPA, 2006), until an agreed international or national position regarding the offsetting of greenhouse gas emissions is determined, the EPA will continue to ask proponents to address the mitigation of greenhouse gas emissions for levels above a best practicable technology benchmark. Stage One operation is considered by the EPA to represent best practice in meeting peak load demand. Stage Two operation is also considered by the EPA to represent best practice in meeting base load demand. The transition phase, however, is not considered by the EPA to represent best practice in meeting mid-merit demand and, as such, requires a greenhouse offset strategy.

To meet this requirement Alinta will, before the transition phase commences, identify appropriate on-site or off-site greenhouse offsets and/or the use of renewable energy sources to reduce the project's net contribution to greenhouse emissions during the transition phase. While offsetting the entire amount of greenhouse gas emissions above best practice is an ideal objective, the establishment of a total offset is often not practicable and is not commonly associated with power generation projects in Western Australia. Alinta will offset a proportion of the emissions generated during the transition phase to the extent that the annual operating hours exceed 1,000 hours per unit, as approved during Stage One operation.

An understanding of an appropriate direct (primary) offset activity will require research, investigations and dialogue with key stakeholders. Direct offsets to be considered by Alinta shall

include, but are not limited to, the establishment of harvestable tree plantations or the establishment of non-harvested forest. Contributing (secondary) offset activities shall also be considered as part of a combined approach with direct offset activities. Contributing offsets to be considered by Alinta shall include, but are not limited to, the implementation of environmental education programs, the funding of research bodies or on-going management activities.

In the absence of an agreed international or national position regarding the offsetting of greenhouse gas emissions, Alinta commits to developing an offset strategy, to the approval of the Department of Environment and Conservation, prior to entering the transition phase.

5. Greenhouse Gas Efficiency

5.1 Introduction

Ministerial Condition 6-1(4) states that the GGAP shall include:

"estimation of the greenhouse efficiency of the project and comparison with the efficiencies of other comparable projects producing a similar product, both within Australia and overseas."

This section presents the greenhouse intensity values (t $CO_{2\text{-}e}$/GWh) of the project, using the technique outlined in the Generator Efficiency Standards (GES) (AGO, 2001). The greenhouse intensity for the project is also compared with similar projects to complete the requirements set out in condition 6-1(4).

5.2 Emissions Intensity

The emission intensity associated with electricity generation is calculated by dividing the total $CO_{2\text{-}e}$ emissions from the project attributed to electricity production by the total amount of electricity produced. Emissions intensities for the Stage One and Stage Two development as well as for the transition phase are provided in **Table 4.**

Table 4 Predicted Emissions Intensity for Alinta Wagerup Cogeneration Project (Calculated based on AGO Full Fuel Cycle Emission Factors)

Description		Emissions (t $CO_{2\text{-}e}$)	Power Output (GWh)	Emissions Intensity (t $CO_{2\text{-}e}$/GWh)
Stage One	Natural Gas	203,600	316.60[1]	643
	Distillate	31,840	35.16[1]	905
Transition (averaged over three years)	Natural Gas	1,315,000	2,127.6[2]	618
Stage Two	Natural Gas	1,370,000	3,022.20[2]	453

Note: 1) Based on average operating conditions of 41°C ambient temperature and 40% relative humidity.
2) Based on average operating conditions of 18°C ambient temperature and 70% relative humidity.

Emissions intensities for other existing and proposed plants in Western Australia are provided in **Table 5** for comparison. As can be seen in **Table 5**, when operating on natural gas during both Stage One and the transition phase, the proposed plant compares favourably to coal fired power stations and is below the SWIS average. When operating on distillate during Stage One the proposed plant is marginally above the SWIS average. During Stage Two operation the estimated emissions intensity compares favourably to other cogeneration plants.

Table 5 Emissions Intensity of Existing and Proposed Power Plants in Western Australia (Calculated based on AGO Full Fuel Cycle Emission Factors)

Power Station	Type	Emissions Intensity ($t CO_{2-e}$/GWh)
Proposed Alinta Cogeneration Plant	Stage One: Natural Gas	643
	Distillate	905
	Transition	618
	Stage Two	453
SWIS[1]	Total	900
Muja A-B[2]	Coal – mid merit	1,205
Collie A[2]	Coal – base load	950
Cockburn 2 Combined-Cycle Gas Turbine[3]	Natural gas – base load	398
Worsley Cogeneration[4]	Natural gas – base load	490
Alcoa Pinjarra Cogeneration[5]	Natural gas – base load	489
Kemerton (Open-Cycle)[6]	Natural gas / distillate - peaking	648 / 843

Note:
1) Western Power, 2005. Annual Report;
2) SKM, 2002. Collie Power Station Expansion SER:
3) Western Power, 2002. Cockburn 2 Combined Cycle Gas Turbine;
4) Strategen, 2005a. Proposed New Gas-fired Cogeneration Facility;
5) ENVIRON, 2002. Pinjarra Cogeneration Project.;
6) ATA Environmental, 2003. Kemerton Power Station Referral.

6. Thermal Efficiency Design and Operating Goals

6.1 Introduction

Ministerial Condition 6-1(5) requires that the GGAP includes:

"*implementation of thermal efficiency design and operation goals consistent with the Australian Greenhouse Office Technical Efficiency guidelines in design and operational management*."

6.2 Estimated Thermal Efficiency

The design of the Alinta Wagerup Cogeneration Project serves to optimise thermal efficiency through the recovery of exhaust heat in order to generate steam. This fundamental concept makes a greater difference to optimal thermal efficiency than engineering controls on a less efficient technology.

The thermal efficiency of the plant was calculated using GTPro/GTMaster heat balance models, and in accordance with the methodology provided in the AGO's GES.

When operating in open cycle, the thermal efficiency ranges between 30%[1] and 32%[2] depending on the operating conditions assumed. When operating as a cogeneration plant, with one GTG and HRSG operating fully fired, the thermal efficiency is estimated to be 74%[3].

1 Net Efficiency (HHV) @ 41^{o}C

2 Net Efficiency (HHV) @ 18^{o}C

3 Net Efficiency (HHV) @ 18^{o}C

7. Reporting, Reviewing and 'Continuous Improvement Approach'

7.1 Introduction

Ministerial Condition 6-1(6) states that the GGAP shall include:

"*actions for the monitoring, regular auditing and annual reporting of greenhouse gas emissions and emission reduction strategies.*"

Also discussed in this section are conditions 6-1(10):

"Review of practices and available technology,"

and 6-1(11):

"'Continuous improvement approach' so that advances in technology and potential operational improvements of plant performance are adopted."

7.2 Emissions Calculations and Reporting

In order to calculate and report greenhouse gas emissions over the lifespan of the project, Alinta will measure fuel consumption and obtain fuel composition information from the supplier. This will allow the greenhouse gas emissions of the project to be calculated and reported in the project Annual Environmental Report. The project's greenhouse intensity (emissions per unit of steam and electricity output) will be calculated annually based on measurements of sent-out electricity and steam produced.

Details of the systems relevant to emissions calculations are as follows:

- **Fuel Gas Metering**
  The two gas turbine generators (GTG) will be fitted with a fuel gas flow meter to measure the flow rate of gas entering each GTG at an accuracy of 1%. The flow rate of gas will be corrected for temperature and pressure, which will be measured directly.
- **Electricity Metering**
  All sent-out electricity will be metered at the point of connection to Western Power's Landwehr terminal substation. The meter will be supplied and installed by Western Power, with metering accuracy to at least AS1675 Class 0.2M (+/-0.2%).
- **Steam and Condensate Measurement**
  While detailed engineering design for Stage Two is yet to be undertaken, it is anticipated that the main steam interconnection piping will measure flow rate and have continuous temperature

and pressure monitoring. It is also anticipated that the condensate return from Alcoa will have continuous temperature monitoring.

7.3 Reviewing

A review of practices and available technology relevant to the mitigation of greenhouse gas emissions will be undertaken and included in the Annual Environmental Report.

7.4 'Continuous Improvement Approach'

A 'continuous improvement approach' will be adopted, with advances in technology and potential operational improvements of plant performance assessed on an annual basis and reported in the Annual Environmental Report. The type of improvements that can be assessed annually will include:

- Appropriate maintenance of equipment to maintain or improve greenhouse efficiency;
- The use of up to date technology (with a focus on greenhouse efficiency) when sourcing components for maintenance and overhaul activities;
- Minimisation of vehicle use; and
- Minimisation of distillate fuel use.

8. Greenhouse Gas Emissions Targets

8.1 Introduction

Ministerial Condition 6-1(7) requires that the GGAP includes a

"target set by the proponent for the progressive reduction or abatement of total net greenhouse gas emissions/or greenhouse gas emissions per unit of product, through the implementation of on-site or off-site offsets and/or the use of renewable energy sources such as solar, wind or hydro power and annual reporting of progress made in achieving this target."

Ministerial Condition 6-1(8) states that the GGAP shall include:

"*a program to achieve reductions in "greenhouse gas emissions", consistent with the targets referred to in (7) above*."

8.2 Emissions Targets

The Alinta Wagerup Cogeneration Plant is designed to minimise greenhouse gas emissions intensity and optimise thermal efficiency. The long-term targets for the cogeneration plant are to maintain efficiency and ensure that the plant is operated at best practice by conducting regular maintenance.

Annual greenhouse gas emissions for each stage of the project are provided in **Table 2.** Stage One operation is considered by the EPA to represent best practice in meeting peak load demand. Stage One will have an annual emissions target of 235,430 t $CO_{2\text{-}e}$

The transition phase is not considered by the EPA to represent best practice in meeting mid-merit demand. The predicted total annual greenhouse gas emissions for the transition phase (averaged over three years) is 1,315,000 t $CO_{2\text{-}e}$. As discussed in **Section 4**, Alinta will, before the transition phase commences, identify appropriate on-site or off-site greenhouse offsets and/or the use of renewable energy sources to reduce the project's net contribution to greenhouse emissions during the transition phase. Emissions targets for the transition phase will therefore be established at this time.

Stage Two operation is considered by the EPA to represent best practice in meeting base load demand. The current Stage Two annual emissions target is 1,906,000 t $CO_{2\text{-}e}$. However, through the reporting, reviewing and continuous improvement approach discussed in **Section 7,** opportunities to review this target may exist in the future. The timing and magnitude of potential reductions can not be reasonably established at this time as the development of technology is unpredictable.

9. Participation in the 'Greenhouse Challenge'

9.1 Introduction

Ministerial Condition 6-1(9) requires

"entry, whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate, into the Commonwealth Government's 'Greenhouse Challenge' voluntary cooperative agreement program."

9.2 The Greenhouse Challenge

The Commonwealth Government's *Greenhouse Challenge Plus* program is designed to enable Australian companies to form working partnerships with the Australian Government to improve energy efficiency and reduce greenhouse gas emissions. The program builds on the Greenhouse Challenge through the establishment of a single industry program. The *Greenhouse Challenge Plus* program is designed to:

- reduce greenhouse gas emissions;
- accelerate the uptake of energy efficiency;
- integrate greenhouse issues into business decision-making; and
- provide more consistent reporting of greenhouse gas emissions levels.

Alinta is already an existing member of the *Greenhouse Challenge Plus* program.

With respect to this project, Alinta is committed to expanding its existing involvement in the *Greenhouse Challenge Plus* program through either:

- an increase in the scope of the current participation; or
- separate entry on a project-specific basis.

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