AUSTRALIAN MEAT PROCESSOR CORPORATION

Opportunities for Red Meat Processors under the Emissions Reduction Fund

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Executive Summary

The first auction under the Australian Government's Emissions Reduction Fund (ERF) was held in April 2015. A total of $660 million of contracts for Australian Carbon Credit Unit (ACCU) delivery were awarded to registered greenhouse gas (GHG) emissions reduction projects by the Clean Energy Regulator (CER).

New projects are registered under 'methodologies' which set out eligibility requirements and abatement calculations. Two newly developed methodologies have opened the door to red meat processors to participate in the ERF auctions, namely:

- Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015
- Carbon Credits (Carbon Farming Initiative—Industrial Electricity and Fuel Efficiency) Methodology Determination 2015.

The intent of the domestic, commercial and industrial wastewater methodology is to recognise the reduction in emissions from wastewater treatment arising from the replacement of deep open anaerobic lagoons with new anaerobic digesters. An anaerobic digester can include a covered anaerobic lagoon or an engineered in-vessel biodigester.

The intent of the industrial electricity and fuel efficiency methodology is to account for real and additional to business-as-usual industrial emissions reductions arising from reduced energy consumption or increased energy efficiency. The scope of the activities include changing the energy sources or mixture of energy sources used by existing energy-consuming equipment, such as using biogas to replace natural gas as a boiler fuel.

A preliminary assessment of potential ERF projects for abattoirs found the highest potential GHG emissions abatement for red meat processors is most likely to come from waste water treatment projects (involving methane capture and reuse/destruction), followed by fuel switching (particularly in the case of biogas for process heat or cogeneration), and energy efficiency (both heat and electricity).

Australian abattoirs have the opportunity to register projects with the CER, and apply to participate in ERF auctions to secure a contract to deliver ACCUs for up to a seven-year period. This briefing paper provides an overview of the methodologies in addition to the next steps required for ERF participation.

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1.0 Introduction

The Emissions Reduction Fund (ERF) has created incentives for eligible greenhouse gas (GHG) abatement projects. However in order to participate in the ERF, abatement projects will need to address ERF eligibility issues in addition to having an ERF methodology for project carbon accounting.

Corporate Carbon have been working with the Department of Environment during the development of the various ERF methodologies that have enabled participation in the ERF auction process. This work has been completed and abattoirs are able to utilise these methodologies to register their abatement projects (within the scope of the methodologies developed to date).

The six key objectives of this project include:

1. Review key ERF documents and potential Red Meat Processing Industry abatement options and prepare a briefing paper for AMPC. This briefing paper is available on the AMPC website
2. Engage with AMPC to select the most promising abatement activity for ERF participation. This has been completed
3. Engage with the Department of Environment (DoE) and the Emissions Reduction Assurance Committee (ERAC) to build a collaborative effort around methodology development. This has occurred through the Department of Environment's ERF Technical Working Groups
4. Prepare a method statement proposal for DoE and ERAC. This has been completed and methodologies for wastewater and industrial energy efficiency have been released by the Department of Environment
5. Liaise with DoE and ERAC to deliver an approved methodology suitable for Industry use. The approved methodologies are summarised in the briefing paper
6. Prepare a snapshot and conference presentation to advise industry of the resulting ERF opportunity.

2.0 Domestic, commercial and industrial wastewater methodology

The Minister for the Environment determined the methodology for domestic, commercial and industrial waste water treatment on 26 March 2015 (available at www.comlaw.gov.au/Details/F2015L00352).

The intent of the methodology is to recognise the reduction in emissions from wastewater treatment arising from the replacement of deep open anaerobic lagoons with new anaerobic digesters. (Note: that an anaerobic digester can be a covered lagoon as well as an engineered biodigester).

2.1 Wastewater emissions

Biogas is generated when organic waste is treated in open anaerobic lagoons (in other words, operating without oxygen). This biogas contains approximately 55-70 per cent methane which has a global warming potential 21 times greater than carbon dioxide (CO_2).

Wastewater treatment emissions can be minimised by replacing deep open anaerobic lagoons with anaerobic digesters and an associated combustion system. The anaerobic digester must include a closed digester unit, biogas collection system, and a combustion device (such as a flare, boiler or power generator). Examples of closed digesters include covered lagoons and in-vessel biodigesters.

Precedence exists under the Carbon Farming Initiative (CFI) for digesters (refer to piggery and dairy waste water methodologies), however the Methodology under the ERF is quite different.

2.2 Overview of wastewater methodology

The methodology sets out how to reduce emissions by replacing a deep open anaerobic lagoon (greater than 2 metres in depth) with an anaerobic digester. The rules have been designed to reflect the requirements of offsets integrity standards and to ensure that emissions reductions are real and additional to business as usual activities. Projects must meet:

- the newness requirement (must not be implemented before registration with the Regulator)
- the regulatory additional requirement (must not be implemented to satisfy regulatory requirements)
- the government program requirement (not likely to be carried out under another Commonwealth, state or territory government programme in the absence of the ERF).

The lagoon to be replaced must be a deep open anaerobic lagoon over 2 metres in depth that treats any combination of domestic, commercial or industrial wastewater. This methodology is not applicable to upgrading existing anaerobic digesters.

2.3 Key definitions

Anaerobic digester: refers to a system used to promote anaerobic digestion of wastewater, collects the biogas that is produced and a combustion device.

Baseline emissions: The carbon dioxide equivalent net abatement amount for the reporting period is worked out by calculating baseline emissions and then subtracting project emissions from that result. The methodology estimates baseline emissions via one of two options:

- using sampling from the operation of a deep open anaerobic lagoon in the 12 month period or for 10 consecutive days before an application is made (this options is called 'Subdivision B'), or
- using the amount of methane sent to a combustion device, that is, based on the amount of methane after the new system is installed (this options is called 'Subdivision C').

Deep open anaerobic lagoon: refers to an existing wastewater treatment lagoon. Deep is defined as being of a depth greater than two metres. The NGER (Measurement) Determination states that anaerobic lagoons greater than two metres deep have the same methane generating output as

anaerobic digesters. The methodology requires that the lagoon being replaced must be a deep open anaerobic lagoon. This ensures that no extra methane is generated simply as a result of replacing an open anaerobic lagoon with an anaerobic digester. This helps guarantee that any emissions abated by the project would have occurred in the baseline, and therefore the abatement is genuine.

Eligible wastewater: is any industrial, domestic or commercial wastewater which is from a source that is consistent with the historic source. The wastewater must be consistent with the historic source of wastewater to ensure that estimates of baseline emissions accurately reflect what would have occurred in the absence of the project.

Historic source: refers to the source(s) of wastewater treated at the facility in the 12 months or for 10 consecutive days before an application is made for the declaration of a project as an eligible offsets project. These sources need to be documented and must represent either industrial, domestic or commercial wastewater.

Monitoring requirements: the methodology outlines the parameter monitoring requirements. Some parameters of note are:

- amount of biogas sent to the combustion device in cubic metres (m^3) is recommended to be measured continuously at the point of combustion at standard conditions in accordance with the NGER Determination Division 2.3.6, Section 2.31 (e.g. an appropriately calibrated orifice plate or turbine meter); further details are available in the NGER Determination
- wet weight of digestate to be measured 'in accordance with appropriate measuring requirements' (note that no additional or specific details are provided in the methodology, but reference is made to the NGER Determination which calls upon measurements to be made in accordance with industry standard).

Net abatement: the baseline emissions minus the project emissions (see below).

Project emissions: the sum of emissions due to fossil fuel usage (e.g. diesel for excavators), electricity (e.g. pumps and fans), digester leakage or venting events, combustion of biogas (CH_4 and N_2O only), and end management (i.e. treatment, processing or disposal) of digestate (CH_4 and N_2O only).

3.0 Industrial electricity and fuel efficiency

The Minister for the Environment determined the methodology for the industrial electricity and fuel efficiency on 25 March 2015 (available at www.comlaw.gov.au/Details/F2015L00346).

The methodology is intended to account for real and additional business-as-usual industrial emissions reductions arising from reduced energy consumption or increased energy efficiency. Emissions reductions can be 'direct' (Scope 1) or 'indirect' (Scope 2). Direct emissions reductions can be from equipment used to generate electricity, undertake useful physical work (such as shaft power, chemical energy storage, pumping water, or gas compression), or provide cooling, heating or steam (on- or off-site). Indirect emissions reduction relate to equipment that consume electricity.

The methodology is based on a similar method under the New South Wales Energy Savings Scheme. However, this methodology has a number of differences in design and coverage. For example, fuels other than electricity are included, as the purpose of the ERF are emissions reductions from a range of sources and not just electricity as is the case with the NSW scheme.

3.1 Industrial applications

Greenhouse gas emissions arise from industrial activities such as fuel combustion in boilers, furnaces and generators (called direct or Scope 1 emissions), as well as from electrically powered systems such as motors, pumps and compressed air (called indirect or Scope 2 emissions).

There are a range of opportunities to reduce these emissions. For example, replacement or modification of boilers or heating systems; heating, ventilation and cooling (HVAC) systems; control systems and process improvements; waste heat capture and re-use; crushing or grinding equipment efficiency improvement; low efficiency motor, fans or pumps replacement; variable speed drives (VSDs) installation; compressed air process improvement; and fuel switching.

3.2 Overview of industrial fuel and energy efficiency methodology

The methodology provides a high-level, activity-neutral (in other words, suitable for all businesses) framework for calculating abatement. The intent is to provide flexibility around what fuel or energy efficiency activities are most appropriate for each site. Specific activities listed in the methodology include:

a) modifying, removing or replacing existing energy consuming equipment

b) installing energy consuming equipment as part of replacing, modifying or augmenting existing energy consuming equipment

c) changing the way existing energy consuming equipment is controlled or operated

d) changing the energy sources or mix of energy sources used by existing energy consuming equipment

e) modifying, installing, removing or replacing equipment that affects the energy consumption of existing energy consuming equipment

f) installing equipment that generates electricity at a location where existing energy consuming equipment consumes electricity obtained from an electricity grid and the electricity generated by the installed equipment will be used in substitution for the electricity obtained from an electricity grid.

'Greenfield' plants and substantial plant expansions (e.g. new equipment with no baseline) are excluded. The Explanatory Statement for the methodology states: 'The installation of new equipment, where the installation is not to replace, modify or augment existing equipment, or does not involve the installation of electricity producing equipment that offsets another existing source of electricity, is not an eligible activity. The purpose of this exclusion is to make it clear that the methodology does not provide for calculating emissions reductions from installing new equipment in circumstances where there is no baseline data, such as 'greenfield' plants or substantial plant expansions.' Other exclusions include large electricity generators (over 30 MW) and renewable electricity generation that receives support from other government programs (such as *Renewable Energy (Electricity) Act 2000*).

The level of abatement is calculated by comparing baseline emissions with project emissions (those that occur post installation). Baseline emissions are estimated using a modeling approach to work out what the emissions would have been in the absence of the project. Importantly, the level of emissions before project implementation is adjusted based on highly correlated variables (for example, energy consumed per unit of production) to allow appropriate crediting of abatement delivered by project activities even if production increases or decreases.

Project emissions are estimated by either monitoring fuel and/or electricity use and applying standard emissions factors to estimate emissions or through the use of an operating emissions model, which allows monitoring of variables that correlate with emissions instead of monitoring direct energy use.

With reference to the modelled baseline emissions, one example for energy efficiency is to correlate the amount of natural gas consumed (dependent variable) to steam (independent variables of steam tonnes per hour generated, steam pressure and temperatures). Within the heat process sector, efficiency could be modelled by comparing natural gas consumed per day (dependent variable) to head per day or HSCW tonnes per day.

The two sub-methods for calculating the net abatement from the project are:

- Sub-method 1: the difference between the total modelled baseline emissions and the total ***measured*** operating emissions from the consumption of operating relevant energy for the implementation for the reporting period
- Sub-method 2: the difference between the total modelled baseline emissions and the total ***modelled*** operating emissions for the implementation for the reporting period.

3.3 Important notes for meat processing facilities

The critical rules to note for meat processing facilities are bullet pointed below, followed by commentary in square brackets for the use of biogas to generate process heat:

- if a project proponent uses a sub-method to work out the emissions abated by the implementation for the first reporting period and then uses an alternative sub-method to work out the emissions abated by the implementation for a later reporting period, the alternative sub-method must be used for all subsequent reporting periods [sub-method 1 is the likely method to be used in industry if all dependent variables can be directly measured]
- baseline must be a period that accounts for the typical range of operating conditions for the equipment and reasonably represent operating conditions for the equipment where, having undertaken the implementation, it is likely that the fuel or electricity consumption by the equipment would increase
- the same measurement time interval must be used for the baseline, measurement and reporting period [for example, a period of one standard operating year]
- an emissions model for an implementation must be developed using regression analysis to

relate independent variables to the dependent variable for the implementation with the following included as independent variables: output of equipment, service levels provided by the equipment, and variable output or quality or site constants

- minimum statistical requirements are required. For example, each independent variable coefficient must have a t-statistic that is greater than the value for the t-distribution at the 97.5 per cent single-sided confidence level for the number of degrees of freedom in the regression [equivalent to 95 per cent confidence in a two-sided distribution]
- baseline emissions from a model must reasonably reflect emissions that would have occurred if the implementation had not been undertaken
- the baseline and operating emissions model must be based on a period that covers at least one full operating cycle for the equipment and covers the full range of operating conditions for the equipment likely to exist during the crediting period [for example, a period of one standard operating year]
- timing: The project proponent must choose a start date and time and an end date and time for the baseline measurement period. The start date for the baseline measurement period must be no earlier than 24 months before the date the implementation commences. The end date for the baseline measurement period must be before the date the implementation commences
- an independent variable must be independent from any other independent variable used in the emissions model, vary over time, be measured or derived using a mathematical formula without loss of precision and explains changes in emissions from the consumption of relevant energy.

4.0 Participating in the Emissions Reduction Fund

There are four main steps to participation in the Emissions Reduction Fund covering registration, wining an ERF contract, reporting and audit, and delivery and payment. Project registration must be completed by meeting eligibility requirements set up by the relevant methodology. Contracts are awarded on a competitive basis according to price. Reporting is undertaken according to the calculations set out in the methodology and determines the number of ACCUs that will be issued. Delivery and payment is according to a schedule and price under contract to the Clean Energy Regulator.

4.1 Step 1: Market entry and project registration

The market entry and project registration process is essentially a two-step process. The first step revolves around the project participant and getting 'on-boarded' into the ERF's administrative system, while the second step involves providing information regarding the emissions reduction project itself. (Note that both steps can be undertaken concurrently). Forms and additional resources for these steps are available at www.cleanenergyregulator.gov.au/Emissions-Reduction-Fund/Forms-and-resources/Pages/default.aspx

The usual approach to entering the scheme is to apply to open an account in the Australian National Registry of Emissions Units (ANREU). An ANREU account is linked to the emissions reduction project and is where ACCUs will be received from the Regulator. Part of this process is demonstrating that the applicant is a 'fit and proper person' with no prior convictions or history of non-compliance under a range of laws. An Australian Federal Police national police check form is completed to fulfil these requirements.

The project registration process involves providing the Regulator the following information:

- the methodology under which the project will operate, a description of the project and how the project meets any of the stated requirements under the methodology
- meeting eligibility requirements such as the requirement for the project to be new (not started prior to registration), commercially ready (not R&D), not required under any law to be undertaken, and the legal right to conduct the project including all permits and approvals (or the ability to obtain these permits)
- forward abatement estimate from the project in tonnes of carbon dioxide equivalent, including qualifications of person making calculations, and any estimates of peak periods of abatement over the projects crediting period (for an emissions reduction project this will be seven years)
- other project related items, such as whether there are multiple participants in the project, appointment of an agent and project start date (default is project registration date)

Once a decision to register a project is made by the Clean Energy Regulator, the participant is notified in writing and the project's details published on the Emissions Reduction Fund Register. The Regulator will also notify the applicant once an ANREU account is established. There is also a

public register of ANREU accounts.

4.2 Step 2: Contracts and auctions

The Australian Government is the principal buyer of ACCUs under the Emissions Reduction Fund. Registered ERF projects can apply to enter into a forward carbon abatement contract with the Australian Government to sell ACCUs through a competitive reverse auction process. Note that it is not compulsory to enter the Auction. Participants can run their projects and be issued with ACCUs without a carbon abatement contract. The advantage of a contract is that it has the potential to provide a commercial underpinning to the project.

In order to be awarded a contract, registered project participants need to be qualified for auction, and make an offer to sell a fixed volume of ACCUs at an agreed delivery schedule and price. This offer then needs to be successful at an auction run by the Regulator.

The three key steps are:

- agreeing to the standard contract 'Commercial Terms' at least 20 business days before auction, and any conditions precedent to the project commencing
- providing 'Delivery Terms' (abatement volume and delivery schedule) 5 business days before auction
- offering in 'Financial Terms' while the auction is open (usually one business day). This is through a single-round, pay-as-bid, sealed-bid which details the price at which the participant will sell ACCUs to the Government.

The standard contract automatically commences if there are no conditions precedent and the bid is successful at auction. Success is determined by the price being below the undisclosed benchmark price that the Regulator sets, and also is within the cheapest 80 per cent of volume under the benchmark price. Successful participants are notified five days after the auction day.

Once the contract has commenced, participants need to operate their project and ensure that ACCUs are received in sufficient time to meet the contracted delivery schedule. The essential components to ACCU issuance is offsets reporting and audit.

4.3 Step 3: Report and audit

An 'offsets report' is required to be submitted to the Regulator in order for the project to be issued with ACCUs for a given reporting period (reporting periods can be from six months to two years in duration). The offsets report follows the calculations that are set out in the methodology, in addition to documenting other relevant project aspects. In general each carbon offset project report will cover:

- background to the project, including: a description of the project; regulatory requirements (if any), ERF administrative items (such as declaration of an eligible offsets project); relevant methodology description; and greenhouse gas assessment boundary
- calculating the emissions baseline for the project, which essentially is the emissions that

would have otherwise been released in the absence of the project

- calculating project emissions, including: emissions released from the combustion of any solid, liquid and gaseous fuels used in the operation of the project; emissions from electricity usage within the project; and any other methodology specific emissions
- calculating project abatement, including: total project baseline emissions less actual project emissions to give net greenhouse gas abatement for the reporting period
- supporting appendices as required.

The Regulator will provide each project with an audit schedule based on the amount of abatement the project is likely to deliver. The higher the abatement, the higher the number of audits. In general projects that are likely to deliver less than 50,000 tonnes of CO_2e are likely to require three audits over a seven year crediting period.

4.4 Step 4: Delivery and payment

The Clean Energy Regulator will review submitted offsets reports and any accompanying audit reports, and if satisfied, will issue ACCUs into the nominated ANREU. ACCUs then need to be delivered to the Australian Government in accordance with the delivery schedule. The Regulator will then transfer a cash payment within 20 business days according to the agreed price per ACCU into a nominated bank account.

Note that any mismatch between actual ACCU production volumes and fixed contracted volumes will need to be managed. Ultimately all contracted ACCUs will need to be delivered to the Regulator, with damages payable if this is not achieved. However there is some level of flexibility with timing of deliveries and managing minor variations in project ACCU creation. Surplus ACCUs over contracted amounts can be held as a buffer for future year contract delivery or sold into the secondary market (if there is demand from other projects that need to manage a contract shortfall).