



**CASE STUDY
ENERGY IMPACT -
GENERATION
ACCREDITATION**

Case Study – Accreditation of a Landfill Gas (LFG) Generating System with a Diesel-powered Peak Demand Unit

Name of Rule:	Greenhouse Gas Benchmark Rule (Generation) No.2 of 2003
Name of Applicant:	Energy Impact Pty Ltd
Name of Generating System:	Stapylton LFG Generator
Type of Project:	Landfill Gas Generating System with Diesel-powered Peak Demand Unit

Part One - Introduction

This case study outlines the process used to assess the application made by Energy Impact Pty Ltd for accreditation as a provider of abatement certificates from the Stapylton Landfill Gas (LFG) Generating System.

2.1 What is the Stapylton generating system?

The Stapylton Generating System consists of two generators. The first operates continuously, fuelled by LFG — a renewable fuel extracted from landfill sites and composed largely of methane. Compared to generation using conventional fuels, this generation results in reduced greenhouse gas emissions. It causes fugitive methane emissions to be avoided by combusting methane, which has a high global warming potential, and converting it into carbon dioxide, releasing energy for electricity generation. The second generator operates in peak periods only, to support the Queensland summer demand. It is a diesel-fuelled unit, operating for approximately ten hours per month.

The Stapylton Generating System is connected to the Energex distribution network in Queensland, which is interconnected with the NSW Distribution Network. The main generator commenced commercial operation in December 2002 and the diesel peak demand unit was installed in December 2003. The system has a nameplate rating of 2MW and is eligible to create Renewable Energy Certificates (RECs) under the Commonwealth's Mandatory Renewable Energy Target (MRET) Scheme



2.2 How was the application submitted?

Energy Impact applied for accreditation in respect of six LFG generating systems, including the Stapylton site, in November 2003.

After assessing the applications, the Scheme Administrator commissioned a pre-accreditation audit of these systems to verify that the record keeping arrangements met all requirements and were in keeping with the descriptions in the applications. The audit revealed that the diesel-fuelled peak demand unit, which hadn't been declared in the application due to timing issues, was installed at the Stapylton site.

As a result, Energy Impact withdrew the application for Stapylton and resubmitted it in February 2004, with the peak demand unit included. This case study describes the assessment process for the resubmitted application.

2.3 Which version of the Rule was used to assess the application?

The application for accreditation was assessed in accordance with the *NSW Greenhouse Gas Benchmark Rule (Generation) No.2 of 2003* (the Rule) which was gazetted on 3 October 2003. Please note subsequent to the accreditation, an amended Rule was gazetted on 11 June 2004.

Part Two – Assessing the Application

2.1 Does the application meet all relevant eligibility criteria?

The first issue the Scheme Administrator considered was whether the applicant met all of the relevant criteria to be eligible for accreditation as a provider of NGACs. These criteria are specified in the *Greenhouse Gas Benchmark Rule (Generation) No. 2 of 2003* (the Rule) and the *Electricity Supply (General) Regulation 2001* (the Regulation).

2.1.1 Is the applicant eligible to be an Accredited Abatement Certificate Provider?

Under Clause 5 of the Rule, the Scheme Administrator may accredit:

- (a) *Generators;*
- (b) *Deemed Retailers; and/or*
- (c) *Any person entitled to create NGACs under this Rule as Accredited Abatement Certificate Providers in respect of the generation of electricity in a manner that results in reduced emissions of Greenhouse Gases.*

According to Clause 6.2 of the Rule, when no person is registered with the National Electricity Market Management Company (NEMMCO) as the generator the owner of that generating system is considered to be the generator.

Under the National Electricity Code, generating systems with a nameplate rating of less than 5MW are exempt from applying for registration with NEMMCO. The Scheme Administrator verified that no person is listed on the NEMMCO website as the registered generator with respect to the Stapylton generating system.

Energy Impact provided the Scheme Administrator with a copy of the connection agreement it has with Energex Limited. The connection agreement states that Energy Impact is the owner of this system.

As no one was registered with NEMMCO as the Generator and Energy Impact is the owner, the Scheme Administrator was satisfied that Energy Impact is eligible to be an accredited as the generator.

2.1.2 Does the project meet connectivity requirements?

Under Clause 5 of the Rule, the Scheme Administrator may accredit a person with respect to a generating system that:

supplies any electricity at a Connection Point connected to the NSW Electricity Network or a transmission or distribution network interconnected with the NSW Electricity Network.

In effect, this means generating systems connected to the main transmission networks of the National Electricity Market (NEM), or to distribution systems currently connected to those

networks in NSW, the ACT, Queensland, Victoria and South Australia are eligible for accreditation.

The application included documentary evidence that the Stapylton generating system is connected to the Energex distribution network, which is interconnected with the NSW Electricity Network. This evidence included a connection agreement and network diagrams of both the Stapylton site clearly illustrating the connection to the NSW network.

These documents satisfied the Scheme Administrator that the connectivity requirements are met.

2.1.3 Does the project have appropriate metering equipment?

Clause 73G(1)(b) of the *Electricity Supply (General) Regulation* states that the Scheme Administrator may accredit a person with respect to an activity if:

the generating system is equipped with metering equipment approved by the Scheme Administrator.

The Scheme Administrator has indicated that it will determine the appropriateness of metering equipment on a case-by-case basis, using the requirements of the National Electricity Code as a guide.

Energy Impact provided two site plans and a detailed description, including the accuracy classes of the metering equipment used (two current transformers, a voltage transformer and the tariff meter).

The documents submitted showed that the diesel generating unit has auxiliary metering, separate from the LFG generating unit. Based on the line diagram provided in the application, the Scheme Administrator was satisfied this is adequate to differentiate the generation from the two units.

The metering arrangements outlined in the application satisfied the Scheme Administrator that Stapylton's metering equipment is adequate to meet the requirements of the Regulation.

2.1.4 Are appropriate record keeping arrangements in place?

Clause 73G(1)(c) of the Regulation states that to be eligible for accreditation, a person must have appropriate record keeping arrangements. To be appropriate, these arrangements need to:

- be consistent with the Scheme Administrator's *Guide to Record Keeping for Abatement Certificate Providers*;
- meet the requirements set out in 73IF of the Regulation; and
- provide sufficient data to support the applicant's proposed approach for calculating the number of NGACs it can create (as outlined in the application form).

Energy Impact provided a detailed description of the record keeping arrangements, including the internal procedures for collating, storing and accessing data. Three variables are relevant to

Energy Impact's calculation of NGACs. These are Net Sent Out Generation, Net Electricity Generated and the number of RECs created.

The application stated that:

- with regard to the generation records, the LFG and diesel units are separately metered. Generation records are sourced from metering data provided by the Meter Data Agent; and
- the number of RECs created is accessed directly from the ORER website and transposed into the NGAC creation spreadsheets.

Records are retained in both hard and soft copy format for a minimum period of seven years.

The Scheme Administrator was satisfied that Energy Impact's record keeping arrangements capture the data needed to accurately calculate the number of NGACs it is entitled to create. The audit undertaken prior to the resubmission and assessment of this application provided positive assurance that these arrangements meet the requirements of the Clause 73IF of the Regulation and the Guide to Record Keeping Arrangements. The Scheme Administrator therefore considered that the record keeping arrangements were appropriate.

2.2 Has the applicant correctly identified the project's generation category and NSW Production Baseline?

The second issue the Scheme Administrator considered was whether the applicant had correctly identified the project's generation category, and therefore its NSW Production Baseline. These factors influence what method the applicant should use to calculate the number of NGACs it can create, and determine what proportion of its electricity production is eligible for creating NGACs.

2.2.1 In which generation category does the project belong?

Energy Impact identified Stapylton as a Category D generating system. Clause 7.4 of the Rule defines Category D Generating Systems as:

those Generating systems that are not classified as Category A,B or C.

The Scheme Administrator was satisfied that Stapylton cannot be classified as any other category as it:

- does not satisfy the definition of Category A under the Emissions Workbook and is not listed in Schedule C of the Rule;
- is not listed in Schedule B and therefore it is not a category B generating system; and
- is not category C as it:
 - uses renewable fuel, has a nameplate rating of less than 30MW and commenced commercial operation after 1 January 2002; and

- also uses fossil fuel, has a nameplate rating of less than 30MW and commenced commercial operation after 30 June 1997.

Therefore, the Scheme Administrator was satisfied that Stapylton is a Category D Generating System.

2.2.2 What is the project's NSW Production Baseline?

Under Clause 8.4 of the Rule, all Category D Generating Systems have a NSW Production Baseline of zero. This means that all of Stapylton's electricity production is eligible to be used for the creation of NGACs.

2.3 Is the applicant's proposed method for calculating NGACs appropriate?

The final issue the Scheme Administrator considered was whether the applicant has proposed to use the correct method to calculate the number of NGACs it is eligible to create, and has used this method correctly to determine this number.

As the Stapylton generating system uses two types of fuel, different equations are required under the Rule.

With respect to the diesel generating unit, Energy Impact proposed to create NGACs using the NSW Production Baseline approach through Equation 1:

$$\text{Number of NGACs} = \text{Eligible Generation} \times (\text{NSW Pool Coefficient} \times \text{Emissions Intensity Adjustment Factor} - \text{Emissions Intensity})$$

As part of this approach:

- Eligible Generation is calculated using Equation 2:

If Net Electricity Sent Out – NSW production Baseline – RECs Created is >0, then:

$$\text{Eligible Generation} = \text{Net Electricity Sent Out} - \text{NSW Production Baseline} - \text{RECs Created}$$

- Emissions Intensity is calculated using Equation 4:

$$\text{Emissions Intensity} = \text{Total Greenhouse Gas Emissions} / \text{Net Electricity Generated},$$

Total Greenhouse Gas Emissions are calculated using Equations 7, 8 and 9.

In calculating *Total Greenhouse Gas Emissions*, Energy Impact proposed to use the 30% default efficiency value to estimate the energy content of the diesel fuel. As this approach is not allowable under the Rule, the Scheme Administrator requested that Energy Impact use actual data to recalculate this value. The applicant made this adjustment and resubmitted its calculations.

With respect to the LFG generating unit, Energy Impact proposed to create NGACs under Clause 9.5 of the Rule. With this approach, where RECs have already been created for electricity generated from methane combustion, additional NGACs may be created using Equation 6:

$$\begin{aligned} & \text{Number of additional} \\ & \text{NGACs that may be created} = \text{Number of RECs created} \times (\text{NSW Pool Coefficient} \times \\ & \qquad \qquad \qquad \text{Emissions Intensity Adjustment Factor} - \text{NSW Pool} \\ & \qquad \qquad \qquad \text{Coefficient} - \text{Emissions Intensity}) \end{aligned}$$

As part of this approach, Emissions Intensity is calculated using Equation 4. Total Greenhouse Gas Emissions is calculated using Equations 7, 8, 9, 14, 15 and 16. Energy Impact proposed to use the 30% energy efficiency factor in Equation 16.

Energy Impact included calculation spreadsheets in the application. The Scheme Administrator reviewed these and considered that Energy Impact had used an appropriate approach to calculate NGACs. After Energy Impact had rectified a number of minor errors, the Scheme Administrator approved its calculations of the number of NGACs.

Part Three – Obtaining Audit Assurance

3.1 What scope of audit is required prior to approval?

3.1.1 Audit scope

When Energy Impact submitted its original application in respect of the Stapylton generating system, the Scheme Administrator commissioned an audit to provide assurance that in all material respects:

That the applicant's record keeping arrangements are adequate to:

- meet the requirements of 73IF of the *Electricity Supply (General) Regulation 2001*;
- be consistent with the Guide to Record Keeping for Abatement Certificate Providers; and
- support the creation of NGACs using the approach outlined by the applicant in the application form and demonstrate the ability to achieve on-going compliance with the Rule for the purpose of certificate creation.

3.1.2 Sites included in the audit

The Secretariat, after discussions with the applicant, believed it was appropriate to commission a single accreditation audit which covered all six applications which were submitted by Energy Impact in November 2003. This decision was based on:

- the similarity of the applications, in that all generating systems were landfill gas power plants using similar technology and employing identical calculation methodologies (Equation 6 under Clause 9.5 of the Rule);
- the record-keeping process being centralised in Energy Impact's head offices in Brisbane and being (essentially) common to all six applications; and
- the objective of minimising the audit costs for the applicant where possible.

3.1.3 Auditor selection and cost of audit

The Scheme Administrator requested that three members of the Audit and Technical Services Panel provide a quote to perform this audit, including a detailed draft of the scope of work involved. Based on these quotes, it selected an auditor and gained Energy Impact's approval. Energy Impact was required to meet the cost of this audit, which was approximately \$16,000, including GST. This amount included positive assurance over the record keeping of six generating systems and site visits to four generating systems in Queensland and two in Victoria at the Scheme Administrator's request.

3.2 What were the results of this audit?

In respect of the record keeping arrangements, the auditor found that:

Record keeping arrangements are considered adequate to:

- *meet the requirements of 731F of the Electricity Supply (General) Regulation 2001;*
- *be consistent with the Guide to Record Keeping for Abatement Certificate Providers; and*
- *support the creation of NGACs using the approach outlined by the applicant in the application form and demonstrates the ability to achieve on-going compliance with the Rule for the purpose of certificate creation.*

Part Four – Making a Final Decision

4.1 Did the audit provide the necessary assurance?

The auditor's findings satisfied the Scheme Administrator that the applicant's record keeping arrangements are sufficient:

- to support the creation of NGACs; and
- be consistent with the Guide to Record Keeping for Abatement Certificate Providers.

The Scheme Administrator considered that no further audit assurance was required and therefore decided to accredit Energy Impact with respect to the Stapylton system.

4.2 What special conditions and on-going audit and reporting conditions should accreditation be subject to?

In addition to the standard accreditation conditions applying to generators, the Scheme Administrator imposed two special accreditation conditions that require Energy Impact to:

- undergo an annual audit of certificate creation, to provide assurance that:
 - NGACs are created in accordance with the Act, Regulation and Rules; and
 - the record keeping arrangements described in the application remain in place and operational.
- provide an annual written report to the Scheme Administrator enabling it to:
 - assess ongoing eligibility under the Scheme and compliance with the accreditation conditions; and
 - confirm that the generating system has not materially changed since the application was approved.

Part Five - Summary

Assessment of Application		Accreditation audit scope and findings	Accreditation conditions
Project Description	<ul style="list-style-type: none"> ■ Generating System consisting of two generating units, one operating continuously and one operating in peak demand periods only ■ Main generator fuelled by methane extracted from LFG ■ Peak demand unit fuelled by diesel ■ Each generating unit has a nameplate rating of 1MW 	<ul style="list-style-type: none"> ■ Audit assurance sought over the record keeping arrangements. ■ Audit results satisfactory. 	<ul style="list-style-type: none"> ■ General conditions of accreditation for Generators ■ Annual audit of abatement certificate creation ■ On-going annual reporting
Eligibility as the Generator	<ul style="list-style-type: none"> ■ Energy Impact is the owner of Stapylton Generating System and is eligible for accreditation as the Generator 		
Connectivity and supply of electricity	<ul style="list-style-type: none"> ■ Connected to Energex distribution network (ion Queensland which is interconnected with the NSW Electricity Network 		
Category of Generating System	<ul style="list-style-type: none"> ■ Category D 		
NSW Production Baseline	<ul style="list-style-type: none"> ■ As a Category D Generating System, the NSW Production Baseline is zero 		

Assessment of Application	Accreditation audit scope and findings	Accreditation conditions
NGAC calculation methodology		
<p>Two types of fuel used, requiring different equations under the Rule:</p> <ul style="list-style-type: none"> ■ For diesel fuelled unit: <ul style="list-style-type: none"> - NGACs created to be calculated using Equation 1; - Eligible Generation calculated using Equation 2; - Emissions Intensity calculated using Equation 4; - Total Greenhouse Gas Emissions calculated using Equations 7, 8, and 9; and - Energy content of diesel fuel from actual data. ■ For LFG-fuelled unit: <ul style="list-style-type: none"> - NGACs (additional to RECs) already created are calculated using Equation 6; - Emissions Intensity calculated using Equation 4; and - Total Greenhouse Gas Emissions calculated using Equations 7, 8, 9, 14, 15 and 16. 		
Metering		
<ul style="list-style-type: none"> ■ Separate metering for main generator and diesel-fuelled peak supply generator ■ Metering arrangements adequate to comply with the Regulation 		

Assessment of Application	Accreditation audit scope and findings	Accreditation conditions
<p>Record Keeping Arrangements</p> <ul style="list-style-type: none"> ■ Three records relevant to NGAC creation: <ul style="list-style-type: none"> - Net Sent Out Generation; - Net Electricity Generated; and - Number of RECs created. ■ Positive assurance over record keeping arrangements provided by audit undertaken prior to resubmission and assessment of application 		

Part Six – Terms and Definitions

Term	Definition
Abatement Certificate	A certificate represents one tonne of carbon dioxide equivalent of greenhouse gas emissions, the release of which into the atmosphere was avoided, or which was removed from the atmosphere by the activity in respect of which it was created
Abator	The person contractually liable for the energy consumed in the installation or site that is the subject of a greenhouse abatement activity, or the person nominated to be the abator in respect of greenhouse abatement activity by written agreement. This particularly applies for demand side abatement activities
Accreditation	Authorisation given by the Scheme Administrator to an abatement certificate provider to create abatement certificates in respect of a specified activity, once eligibility against the Greenhouse Gas Benchmark Rules is satisfied
NSW Pool Coefficient	The average emissions per unit of electricity delivered at transmission nodes for all generating systems supplying the notional NSW pool, as determined in accordance with the Compliance Rule; this factor is announced by the Tribunal by 30 November each year.
Demand side abatement	Activities that reduce emissions by reducing electricity consumption through increased efficiency of electricity consumption, eligible on-site electricity generation, and substitution of sources of energy for electricity or substitution of electricity for other sources of energy
Financial Assurance	This may be required by the Scheme Administrator to secure or guarantee an abatement certificate provider's compliance with the surrender of any certificates against any breach of accreditation conditions or the improper creation of certificates
Greenhouse gas	A generic term for gases such as carbon dioxide, methane, nitrous oxide, perfluorocarbon or sulphur hexafluoride, as defined in the Act and the Regulation
Greenhouse Gas Abatement Program (GGAP)	An environmental initiative administered by the Commonwealth Government's Australian Greenhouse Office to reduce Australia's net greenhouse gas emissions by supporting activities that are likely to result in substantial emission reductions or substantial sink enhancement
NGAC	A NSW Greenhouse Abatement Certificate; a transferable certificate in the scheme
Office of the Renewable Energy Regulator (ORER)	The Commonwealth Regulator of the Mandatory Renewable Energy Target Scheme
Scheme administrator	The body administering functions such as accrediting abatement certificate providers, verifying abatement activity and maintaining a registry of certificates; this is IPART, in the first instance

For a complete list of terms refer to the Glossary of terms on the Scheme website.