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August 24, 2012

**Yma ten Hoedt**

Principal Program Officer, Built Environment Section  
**Office of Environment & Heritage, Department of Premier & Cabinet**  
59 Goulburn Street  
Sydney, NSW 2000

Dear Yma,

**Response to Consultation Position Paper re Review of the NABERS Ruling 'Proportioning of Energy used by Cogeneration or Trigeration Systems'**

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Dalkia is pleased to provide its response to the consultation position paper issued to the Industry on the 25/07/2012 regarding the NABERS ruling 'proportioning of energy used by cogeneration or trigeration systems'.

It is my pleasure to confirm that the proposed positions align with Dalkia's global vision and that Dalkia will support the proposal. As indicated in our last submission, Dalkia is very supportive of the NSW Government for the continued deployment and leadership of the NABERS suite of products for the sustained growth of our industry.

Dalkia, as a significant global operator of decentralised energy systems, has sought the opinion of the World Alliance for Decentralised Energy for the approach taken in the consultation paper. Dalkia has received a verbal endorsement for the position from this well recognised and leading organisation for our industry, and Dalkia believes it would be of value for OEH to contact WADE directly to receive this. By way of background, WADE works to accelerate the worldwide development of high efficiency cogeneration, onsite power and decentralised renewable energy systems that deliver substantial economic and environmental benefits. In an effort to raise the profile of cogeneration as a climate change mitigation strategy in the 1997 UNFCCC climate change negotiations the International Cogeneration Alliance was founded. In 2002 the group changed its name to WADE and broadened its scope to include all manner of Distributed Energy technologies.

I hope this response to the consultation request adequately conveys Dalkia's support of the direction being taken by OEH, and is of value. I look forward to continuing our support in growing a commercially and technically sound industry.

Yours Sincerely

A handwritten signature in blue ink, appearing to read 'Arnaud PEREZ', is written over a faint blue line.

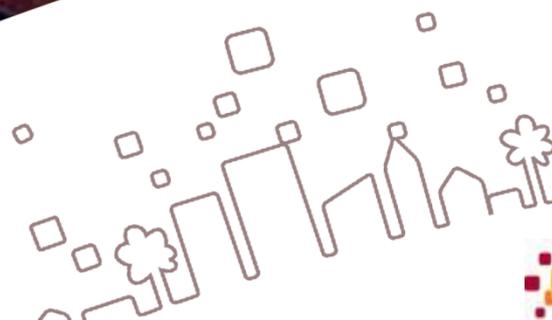
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# RESPONSE TO CONSULTATION POSITION PAPER

## REVIEW OF THE NABERS RULING 'PROPORTIONING OF ENERGY USED BY COGENERATION OR TRIGENERATION SYSTEMS'



This document follows Dalkia's prior submission to the previous consultation paper submitted to the Office of Environment and Heritage. It lays out the vision of the underlying benefits of decentralised energy associated with combined heat and power and the fundamentals required to achieve a proper energy and carbon allocation with a view to providing relevant information in a NABERS rating environment.

The proposed Position Paper reflects the fundamental principle of an objective energy balance for co/trigeneration systems that impact across building boundaries, whilst retaining a simplified approach where the system is contained within a single building boundary. Dalkia is very supportive of the pragmatic approach taken by the NABERS team.

## Introduction

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In order to achieve an effective reduction of carbon emissions in a high density urban context, the development of Community or District Energy Systems presents numerous advantages in comparison with traditional decentralised energy production. When Combined Heat and Power (CHP) is the primary energy source, environmental benefits can be significant with reduced primary energy usage, realising a reduction in carbon dioxide emissions. In the Australian context where the primary fuel for electricity production is coal, the emissions reduction achieved through the fuel switch is even more emphasised when applied to high quality installations.

## Key considerations regarding district energy and combined heat and power in light of NABERS

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Carbon efficiency and energy efficiency are not always the same thing; a very energy inefficient building that uses 100% renewable energy is very carbon efficient, however, the underlying economics of its carbon effectiveness is very different to an energy efficient building that has a lower carbon efficiency due to a different energy supply strategy.

The impact of these two scenarios upon the value of a building needs to be clearly understood by building valuers and any party in all renting or buying / selling transaction.

As summarised in the Position Paper, the fundamental principle of NABERS in measuring the energy consumed at the boundary of any qualifying building to determine the carbon rating of that building due to its energy consumption is sound and simple. It does this through applying the greenhouse gas coefficients ascribed to each source of energy used by the building, and then applying a star rating system to identify its performance. The more stars achieved the more carbon efficient the building is.

NABERS enables a building owner or user to combine efficient operation of an asset (demand side) with low carbon energy procurement (supply side) to boost its global rating and demonstrate market leadership in the sustainability field for the subject asset through demonstrable performance benchmarking.

The Commercial Building Disclosure Act (CBD) restricts this ability by only utilising the demand side carbon performance to reflect the underlying performance of the asset, irrespective of any carbon offset strategy employed by the user; this strategy remaining external to the intrinsic performance of the asset, with its own dynamics and fundamentals.

The use of distributed energy in itself does not make a building any more energy efficient. That is governed by the building design, the engineering services and control systems that allow it to operate, and the equipment contained within it.

As previously mentioned, the carbon density of the raw energy purchased for use within the building will determine its NABERS performance, consequently the carbon density of a DE scheme should be calculated based upon the energy outflows of the system compared to the energy input into the DE system. In other words an auditable carbon balance is necessary to avoid the situation that currently exists in NABERS whereby there is zero carbon associated with the thermal component of a combined heat and power system.

NABERS is an individual building rating, and the Mandatory Disclosure legislation removed the ability to combine underlying asset energy performance and carbon offset strategy through renewable energy procurement to improve the apparent efficiency. Similarly this principle should be used for a building supplied from a Distributed Energy system, thereby maintaining the tenet that a building is not considered or rated energy efficient when it uses unnecessarily large volumes of low carbon density energy and thereby achieves a better carbon rating.

The creation of a NABERS Precinct Energy rating could address this, but the current NABERS building mechanism is not designed for this allocation and this is therefore the key component in the NABERS cogeneration ruling that needs reconsideration.

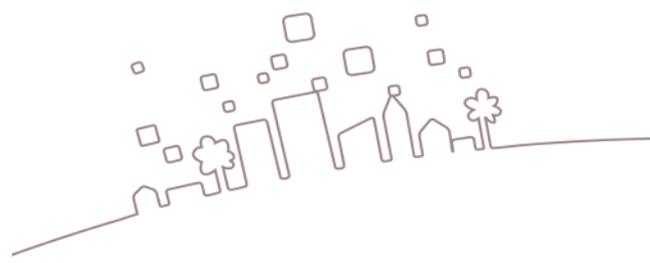
Dalkia believes the primary engineering focus for commercial buildings should be to:

1. require less energy to provide the functions for which they are designed or being used, through maximising the use of cost effective measures in terms of efficient design and use of the most energy efficient technologies;
2. promote retrofits that substantially reduce energy requirements and at the same time improve the built environment within which people work and live;
3. promote the use of auditable schemes that demonstrate the performance of energy efficient energy sources. For example, creating or adapting schemes such as the UK based CHPQA for use in the Australian market (adequate capture of cooling production), considering that dumping waste heat from gas fired generation is no more efficient than dumping heat from a coal fired power station; though it is a less carbon intense form of waste;
4. use robust and innovative technologies to minimise the cost of carbon abatement;
5. maintain, or educate, the business community in clearly understanding the subtle difference between energy efficiency and carbon efficiency in relation to primary fuel sources and building energy requirements.

In summary, for Decentralised Energy schemes:

1. In relation to NABERS:  
The carbon density ( $\text{kg CO}_2/\text{kWh}$  or  $\text{kg CO}_2/\text{GJ}$ ) of each metered energy supply from the DE system should be calculated and attributed to the appropriate volume of energy each building uses, so that the rating will adjust accordingly.
2. In relation to Building Energy Efficiency Certificates:  
Off site distributed energy should be treated in the same manner as off site GreenPower purchase. The BEEC declares how energy efficient a building is in terms of carbon when connected to “conventional” energy supplies and any contribution from an off site renewable energy source is discounted.

Based on these premises, Dalkia has considered the different issues of the Consultation Position Paper and our comments are as follows:



## RESPONSES TO CONSULTATION POSITION PAPER

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### 4. Definitions:

#### Trigeneration System:

*“A trigeneration system is a cogeneration system that also uses some of the heat to operate an absorption chiller, which produces chilled water. This system includes the generator and pumps for the transport of heat from the system to the building systems, the absorption chiller and associated pumps for the transport of chilled water to the internal building systems, but excludes the supplementary boilers and chillers used to boost the heat or chilled water outputs.”*

**Dalkia’s View:** The Definition should be expanded to include the cooling towers, condenser water pumps, and any other plant or equipment providing the heat rejection associated with absorption chillers connected to the thermal outputs of the engine.

#### Auxiliary Energy:

*“Auxiliary energy is the energy required for control equipment and other devices directly attached to cogeneration or trigeneration system components.  
Energy inputs included within the auxiliary energy for cogeneration or trigeneration systems include, but are not limited to:*

- *Jacket heating to the generator.*
- *Pumps used to reject heat from the generator and absorption chiller for both utilised and rejected heat streams.*
- *Pumps required to circulate/transport waste/heat or absorption chiller output from the cogeneration or trigeneration plant to internal building users or to export energy to another end user.*
- *Electrical inputs to the absorption chiller.*
- *On-board controls and variable speed drives (VSDs) for cogeneration or trigeneration plant items.*

*Auxiliary energy excludes:*

- *Energy consumption associated with the building management system*
- *Supplementary fuels used to boost the waste heat or absorption chiller outputs. “*

**Dalkia’s View:** The definition should be expanded to include the cooling towers, condenser water pumps, and any other plant or equipment providing the heat rejection associated with absorption chillers connected to the thermal outputs of the engine. Auxiliary Energy could also include plant room light and power, for example, if that is light and power that would not otherwise be used if a co/trigeneration system were not present.

#### Request for an Additional Definition for Waste Heat:

Dalkia believes the term “Waste Heat” when used in relation to a co/tri generation system should be clearly defined.

Industry often refers to the use of the thermal energy from a gas (or other fuel source) generator as using or recovering waste heat. For a Combined Heat and Power system the term “Waste Heat” could perhaps be changed to **Waste Energy, Non Usable** (as suggested in the Consultation Paper) or **Non Recovered** and defined as the energy that is not used for either electrical or thermal purposes.

**Issue 1: Potential double counting of emissions and corresponding double benefit under NABERS when the co/trigenerated electricity is delivered via the grid.**

Some stakeholders were concerned that the low emissions energy produced by co/trigeneration systems connected to the grid was already being taken into account in the grid electricity National Greenhouse Accounts (NGA) Factors 1. This could result in a possible double counting of emission savings under a NABERS rating.

This issue has been investigated with the Department of Climate Change and Energy Efficiency (DCCEE) who administer the NGA. They have advised that, at this stage, it is not possible to double count the emissions benefit from co/trigeneration.

At present, emissions from fuel combustion by small generating units are allocated to the facility sector. The emissions are not accounted in the electricity sector and are therefore not accounted in the scope 2 NGA factors for grid electricity.

DCCEE advised that as the number of minor sources of electricity increase they will continue to review their current methods and investigate new data sources to ensure maximum coverage in the scope 2 calculations.

**NABERS Position:**

Currently, no double counting occurs when electricity generated by co/trigeneration systems (low emissions electricity) is delivered to other buildings via the grid. No change is required to the July Ruling in this regard.

**Dalkia's view:**

Dalkia agrees with NABERS position.

**Issue 2: How should on-site energy generation be treated within a NABERS rating?**

**NABERS Position:**

Retain the current July Ruling position that allows for all the energy supplied to an onsite co/trigeneration system to be allocated to the electricity generated for the building/and its tenants (where applicable). No externally supplied energy is required to be allocated to the internally used thermal energy or the non usable thermal energy. The on-site generation of electricity and thermal energy for use by the base building is considered to affect both the energy efficiency and environmental performance of the building. Therefore this energy will be included in the NABERS rating disclosed through the Commercial Building Disclosure program (CBD).

The NABERS Tenancy Energy Rating Certificate and accompanying Rating Report will identify the amount of low emissions electricity that has been used by a tenancy.

The July Ruling is to be amended to include a definition of 'on-site' energy generation, as follows:  
Definition:

Energy generation is considered as being "on-site" if:

1. All of the process of energy conversion (e.g. solar-electricity, fuel-electricity) occurs within the legal boundaries of the building and its grounds; and
2. The generated electricity is connected on the user side of the meter; and 3. No usable energy is exported beyond the building and its grounds (off-site).

More complex situations may arise where electricity or thermal energy is being provided to a non-office use within the building, which can be excluded under the NABERS Rules, if appropriately sub-metered. Metering and record keeping required for the apportioning of on-site generation are detailed in the July Ruling and are to be retained. In this situation the non-office use will be treated as receiving a proportion of the energy input and this can be excluded from the rating.

**Dalkia's view:**

Dalkia agrees with NABERS position. Dalkia also suggests the Example diagram is modified to show thermal energy as well as electrical energy in order to reflect all of the principles described in the preceding text.

**Issue 3: How should usable energy generated by co/trigeneration systems and exported off-site be treated within a NABERS Energy rating?**

**NABERS Position:**

NABERS is a single building rating tool, to measure the operational performance of existing buildings. Under NABERS, treatment of exported energy from building co/trigeneration systems, whether this is electricity or thermal energy, is to be accounted for in the NABERS rating, irrespective of whether it is exported via public or private networks. Therefore, all useful energy exported off-site from a building, (including electricity, hot water or chilled water), for the purposes of supplying energy to a third party end user, will be proportionately allocated a generation emissions value.

When a building exports thermal energy off-site, it will need to meter both its exported and internal thermal energy use to enable the accurate apportioning of energy generation inputs.

The externally supplied energy used by on-site co/trigeneration systems to produce export electricity or export useable thermal energy can be excluded from a NABERS Energy Base Building Rating.

It is recommended that the July Ruling be amended to account for the allocation of generation energy inputs to usable thermal energy exported off-site. This will require working with industry and government to determine an appropriate apportioning calculation methodology.

**Dalkia's view:**

Dalkia fully supports this view and believes this to be an important modification that enables the consideration and development of district energy schemes only where the efficiency of the scheme can be correctly captured, and applies irrespective of the technology used to generate the thermal energy. The apportionment is a good way to incentivise high efficiency schemes proving their effective displacement of primary energy.

Dalkia will be happy to contribute to the definition of the apportioning calculation methodology. In doing so Dalkia believes it will be able to bring the experience it has gained from a wide range of operations using internationally comparable carbon and efficiency measurement accounting methodologies.

It is also suggested that the Example diagram is modified to include the off-site private wire scenario described in the preceding words.

**Issue 4: How should low/zero emissions energy externally supplied to a building be treated in a NABERS Energy rating?**

**NABERS Position:**

NABERS supports the creation of an industry/government accreditation standard to account for the apportioning of generation and network supply emission values to thermal energy products and electricity. Once third party verifiable invoices / bills are available that clearly show the energy purchased and its emission value, this low emissions externally supplied energy can be included within a NABERS Energy rating. The amount of low emissions electricity will be identified in the NABERS Energy Rating Certificate and accompanying Rating Report (similar to GreenPower).

Until such a standard is developed co/trigeneration electricity supplied via the grid/network will be allocated standard grid emission values. Imported thermal energy will be considered by the NABERS National Administrator on a case-by-case basis.

**Dalkia's view:**

Dalkia supports this view and encourages the structuring of a working group that is representative of the industry and the community to conceive the accreditation standard as soon as reasonably practical, with a strong commitment from Government to attract the relevant parties for the success of the process. The transitional arrangements are acceptable, provided a timeframe is defined, communicated publically and reported upon to ensure visibility for project developers.



**Issue 5: How should NABERS communicate the use of low/zero emissions electricity in a rating to assist industry in understanding both the environmental performance and energy efficiency of a building?**

**NABERS Position:**

NABERS will continue to communicate both the environmental performance and the energy efficiency of a building through its website, star Rating Certificate and accompanying Rating Report. Once an acceptable audit and verification system is in place to account for low emissions electricity externally supplied, these purchases can be considered in a NABERS Energy rating. Consistent with the treatment of GreenPower, the percentage of low/zero emissions electricity used by a building will be displayed on the Rating Certificate and Rating Report.

**Dalkia's view:**

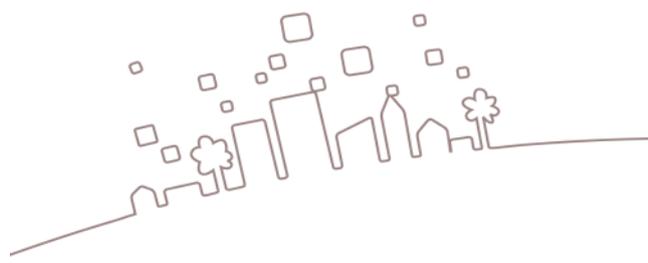
Dalkia agrees that maintaining the transparency and communication simplicity of NABERS is critical. The treatment of cogenerated electrical energy in a similar manner to green power is a logical progression; however, the treatment of thermal energy in a similar manner requires levels of assumption or calculation to determine the amount of grid energy (gas or electricity) that would have been necessary on site to provide the equivalent amount of thermal energy. This requires that the efficiency of plant and equipment that may not exist, or does exist and is not used, or is only partially used, be determined in some manner. It therefore may prove difficult to fairly and transparently ascribe and communicate a "without cogeneration" rating that is true and reflective of both thermal and electrical impact.

Currently there is not a requirement to determine the proportion of energy used for cooling or heating, unless there is a requirement to exclude energy to achieve a NABERS rating, therefore for most buildings (new or old) there is not a comparison or benchmark against which to demonstrate the carbon or energy value of remote thermal energy supply. This would be very complex to create in an equitable manner, therefore Dalkia is of the view that quite simply the rating does not need to demonstrate a without cogeneration thermal value, but merely the volume of thermal energy per sqm rated area supplied from a low carbon source, and the CO<sub>2</sub> volume associated with this. If green energy is used within the trigeneration system to lower the carbon intensity of that system then it should be declared by the district energy/third party operator on the monthly bill so that the proportion of green power, if any, gets recorded on the certificate by the NABERS Assessor.

An alternative rating measure is required because the carbon density of the source will be different to the national structure, and therefore the certificate needs to reflect the blended carbon intensity, possibly adjusted on an annual basis to reflect overall efficiency of the remote energy source.

Dalkia, therefore, supports the creation of an alternative rating measure that reflects the effective carbon intensity of the energies supplied by a district or community energy scheme and used by a building that is subject to a NABERS assessment.

As most of the transactions discussed in this paper are of a commercial nature, the requirements in terms of auditable metering accuracy, calibration protocols, and validation will also be critical.



## Conclusion

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Dalkia is of the view that NABERS should remain a transparent tool and a true reflection of the underlying energy performance of the buildings it targets. The market needs to receive intelligible information in terms of energy demand and corresponding supply strategy with the appropriate carbon intensity attached to it.

Embedded responses in buildings or connection to district energy schemes are different responses to the carbon challenge and Dalkia supports the initiative to ensure that accurate and relevant information is provided.

Energy and carbon allocation can be a complex matter but following key basic accounting rules supported by measured and verified data makes it accessible and possible to effectively integrate into the NABERS rating.

The modern and purpose designed reporting and data collection systems currently available greatly simplify this process.

Finally, once the proposed processes are developed and launched, the implementation of additional incentive programs to promote the development of cogeneration or precinct initiatives is simplified, based on proven efficiency measures.

Dalkia trusts the enclosed comments provide a balanced view and are of value, and welcome the opportunity for further discussion or input if required.

Response Compiled by

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