



Moreland
Energy
Foundation

Enabling standardised local aggregated energy consumption data: repository and communication

Project Report

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Final draft for Consumer Advocacy Panel review

This study was conducted by the Moreland Energy Foundation Ltd (MEFL) a not-for-profit organisation dedicated to sustainable energy that has been operating in Moreland since 2000. We undertake community engagement, research, consulting, professional development and advocacy on energy efficiency, renewable energy and related policy and planning issues.

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Jemena Electricity Network
AusNet Services
United Energy/Multinet Gas

Research bodies

Australian Urban Research Infrastructure Network (AURIN)
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Contents

<u>1</u>	<u>Project overview</u>	<u>5</u>
1.1	Project context	5
1.2	Project objectives	7
1.3	Approach and methods	8
1.4	Project outputs	8
<u>2</u>	<u>Findings</u>	<u>10</u>
2.1	Literature review	10
2.2	The NAGA project	11
2.3	Other approaches to data provision	12
2.3.1	Web portals	12
2.3.2	The Australian Urban Research Infrastructure Network	13
2.4	Key stakeholder consultation	14
2.4.1	NAGA project stakeholders	14
2.4.2	Distribution business representatives	19
2.4.3	Consumer advocates	22
2.4.4	CSIRO/Melbourne University (AURIN project)	22
2.5	Regulatory review	24
2.5.1	The current regulatory framework	24
2.5.2	Current Australian legislative enablers	25
<u>3</u>	<u>Discussion</u>	<u>29</u>
3.1	Considering the options	29
3.2	Specifying data standards	30
3.3	Benefits, weaknesses and cost implications	31
3.4	Advocacy	34
3.4.1	Advocacy plan	34
3.5	Communications	36
3.5.1	Communications plan	36
<u>4</u>	<u>Conclusions and recommendations</u>	<u>37</u>
4.1	Data is increasingly important	37
4.2	Improve data availability and quality	38
4.3	Consider the value of regulatory support	39
4.4	Summary of recommendations	40
<u>5</u>	<u>Bibliography</u>	<u>41</u>
<u>6</u>	<u>Appendices</u>	<u>42</u>
6.1	Appendix 1: Municipal energy profile (example)	42
6.2	Appendix 2: Proposed administrative fields for data specification	Error!
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List of Acronyms

MEFL	Moreland Energy Foundation Limited
NAGA	Northern Alliance for Greenhouse Action
LEIH	Local energy information hub
DNSP	Distribution Network Service Provider
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CAP	Consumer Advocacy Panel
AURIN	Australian Urban Research Infrastructure Network
AEMC	Australian Energy Market Commission
NEM	National Electricity Market
PV	Photovoltaic solar cells

1 Project overview

1.1 Project context

This project aims to analyse approaches to gather, store, process and provide access to locally aggregated energy consumption data.

In order to do this, the project considers relevant local and international experience in aggregated energy data provision; it canvasses stakeholder views and considers the regulatory context for establishing a local energy information hub (LEIH)¹. The project also aims to build a broader understanding of, and support for, the value of a platform such as a LEIH.

The starting point for this project is the proposition that aggregated local energy data can lead to a range of benefits at a range of scales; from the individual consumer through to the network level. For example, stakeholders can use the locally aggregated energy data to better understand the potential for more effective demand side responses at the network, regional, sub-regional and individual consumer scales. It is also considered that the provision of aggregated local energy data can lead to energy cost reductions and a range of other consumer and community benefits, such as energy efficiency program development and delivery, planning for more sustainable energy supply and building the energy literacy of energy customers, amongst other benefits. This project explores these types of considerations.

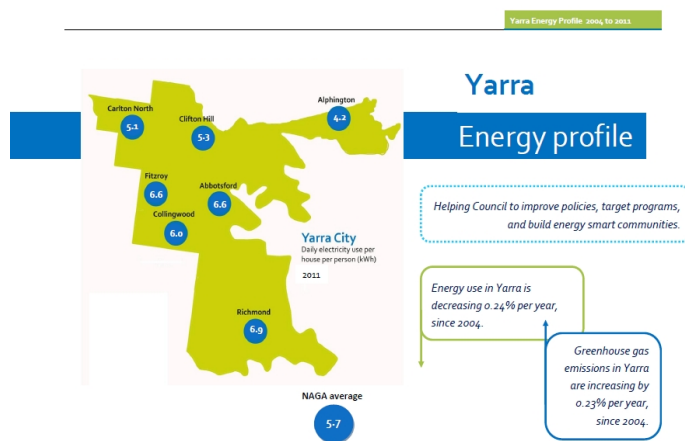


Figure 1: Extract from a NAGA municipal energy profile (average household use, by suburb (kWh))

Municipal energy use profiles are produced for each of the local government members of the Northern Alliance for Greenhouse Action (NAGA)

Refer to Appendix 1 for an example of a complete profile.

The Moreland Energy Foundation Limited (MEFL), in partnership with the Northern Alliance for Greenhouse Action (NAGA), has obtained aggregated local energy consumption data

¹ A 'local energy information hub' (LEIH) is the term used in this report to describe a vehicle to aggregate, store and provide access to energy consumption data at the local scale, (for example postcode).

from Victorian distribution network service providers (DNSPs) on a voluntary basis since 2008. The data has been compiled into profiles for each of NAGA's local government areas², in an effort to track changes in both the amount and share of energy consumption within and across municipalities. Year- to-year comparisons can be used to show changing patterns of energy use at a household sector level and on a per capita basis within a geographical area. Business and industry sector energy use and trends are also shown. While this data itself can provide rich information, it can also be correlated with demographic, land use and other socio-economic variables to provide powerful information for planning and delivering programs and services at the local scale.

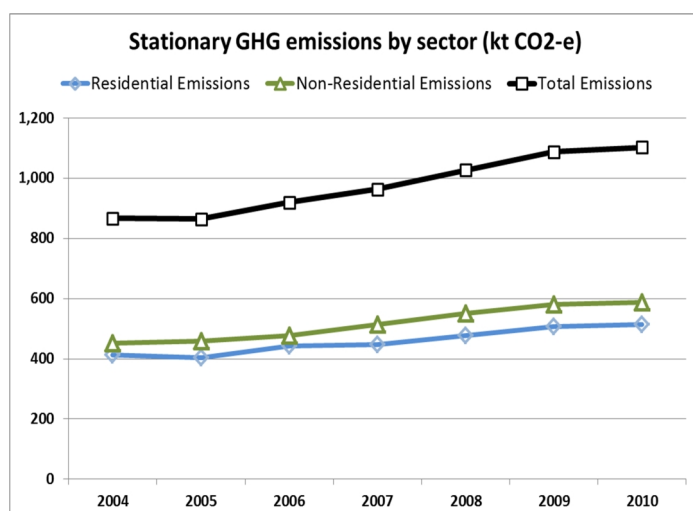


Figure 2: Extract from a municipal energy use profile produced for each of the local government members of the Northern Alliance for Greenhouse Action (NAGA)

Refer to Appendix 1 for an example of a complete profile.

Figure 2: Extract from a NAGA municipal energy profile (greenhouse emissions by sector)

As a result of this work (referred to in this report as ‘the NAGA project’) NAGA’s local government members have sought to use these profiles to monitor annual consumption, to better understand changes and trends over time, to evaluate sustainable energy program design and delivery, for community engagement purposes, and to contribute to planning for better targeted programs and services. The experience of accessing, collating and presenting this data into useful formats reveals inconsistencies, data access barriers and a range of other issues. This experience underpins the development of this project and informs the design and approach to exploring the potential for establishing a local energy information hub.

In previous projects the municipal energy profiles (see Appendix 1) have been used as a basis for a series of information products, providing benchmarks and locally contextualised household targets which have been trialled with households across the northern Melbourne metropolitan region.

For example, the “Go5” campaign was developed to inform residents about how much electricity an average household in their postcode area uses. Go5 proposes that householders reduce electricity use to the target of 5 kWh of electricity per person per day, or better. The goal was conceived to help householders understand and take control of their energy use, to help them conserve energy, and to reduce greenhouse gas emissions. (The

² The members of the Northern Alliance for Greenhouse Action include the Victorian municipalities of Melbourne, Yarra, Darebin, Moreland, Manningham, Banyule, Nillumbik, Hume and Whittlesea, as well as the Moreland Energy Foundation.






selection of 5kWh was based on what is achievable for most Victorians.) The target aims to alert high electricity users to their high levels of consumption, while increasing energy literacy overall.



Case study: “Go5” Campaign

The “Go 5” campaign aims to address the lack of knowledge around energy use by testing a benchmark for electricity use, informing households how much electricity an average home uses and how to take control of their own electricity usage. Pilots in several diverse municipalities tested the effectiveness of the “Go 5” campaign in generating awareness around electricity use and the potential to create a new social norm.

The target of 5kWh per person per day was established through detailed industry analysis and electricity use data provided by Victorian energy distribution companies to the Northern Alliance for Greenhouse Action (NAGA) and the former Department of Sustainability and Environment, with technical input from project partners the Moreland Energy Foundation and Energy Return.

Average daily electricity use		
People per home	Homes - with gas	Homes - no gas
	5kWh	8kWh
	10kWh	16kWh
	15kWh	24kWh
	20kWh	32kWh
	25kWh	40kWh

Box 1: The Northern Alliance for Greenhouse Action “Go5” campaign (<http://www.go5.org.au>)

In Go5 pilot-testing projects, consumers have been very receptive to locally aggregated information, which enables them to compare their consumption with their suburb’s average and to an energy efficient household target. According to pilot project managers:

People were very focussed on what their suburb was doing. People became curious.

Local data gave the target a local framing. People identify with where they live.

Local information has the potential to support consumers’ capacity for self-managed energy consumption. It can facilitate more effective participation in changing energy markets, including via smart meters, time of use tariffs, the ‘smart grid’ and small scale energy generators, enabling more effective participation in the energy market as active not passive consumers, and as decentralised generators as well as consumers. Local aggregated information also enables local governments and other service providers to better design and target support and delivery of services. All stakeholders would have access to data sets that can inform and underpin more effective network planning and demand management.

In the NAGA project to date it has not been possible to achieve timely data provision or to establish uniform agreement regarding data parameters and definitions on a voluntary basis, and the processes are unnecessarily resource intensive.

Establishing an ongoing, secure and accessible aggregated local data repository would allow for ongoing access, development and strategic utilisation of locally relevant energy information.

1.2 Project objectives

This project advocates for strengthening the institutional and regulatory mechanisms, as well as the stakeholder relationships, that can better enable the provision of locally aggregated energy consumption data. The project aims to foster a better understanding of the costs and benefits for stakeholders that would arise from the provision, management and application

of locally aggregated data. It also seeks to build engagement and support for provision of aggregated local energy data amongst consumer groups, local government, the energy industry and regulators, and other stakeholders.

1.3 Approach and methods

This project employed a range of methods in order to discern options for a local energy information hub (LEIH) and to articulate the functional requirements and operational features that such a platform would ideally include.

Method	Description
1. Literature review	A review of relevant literature was undertaken to provide context for the research and analysis. The literature review was also important in determining the establishment, operational and functionality specifications of a LEIH.
2. Direct advocacy and communications	A range of stakeholders was engaged to discuss the merits of, and give their views about, the notion of a LEIH. Advocacy and Communication Plans have been produced as part of the project.
3. Key stakeholder survey	A survey of key potential users was undertaken to determine their view on the value, form and function of a proposed LEIH.
4. Targeted interviews	Key stakeholders from across sectors were interviewed to canvass their views on the value, operation and costs and benefits of a proposed LEIH.
5. Cost-benefit analysis	A high-level cost benefit assessment was compiled in order that an overview of the key costs and benefits of establishing an LEIH could be determined and used to inform the recommended structure of the LEIH and its operational attributes.
6. Regulatory review	A review of the relevant legislative and regulatory context within which the proposed LEIH would operate was undertaken to inform the proposed structure of the LEIH and its operational requirements from a regulatory perspective.

The outcomes from these activities are reported in section 2: Findings.

1.4 Project outputs

The principal outputs of the project are:

1. This report, which provides:
 - a) An overview of the institutional and regulatory options available to create national data access through the NEM
 - b) An outline of data standardisation requirements/guidelines
 - c) High level costs and benefits assessment
 - d) An overview of stakeholder concerns and suggestions
 - e) Recommendations regarding:
 - i) The preferred design of the proposed data repository
 - ii) Optimisation of the function of the data repository
 - iii) Any regulatory support required to facilitate establishment and operation of the proposed data repository

2. Advocacy strategy with planned and executed implementation actions
3. Communications strategy with planned and executed implementation actions

The report will be published online via the websites of the Moreland Energy Foundation (MEFL) and the Northern Alliance for Greenhouse Action (NAGA) and a limited number of printed hard copies will be circulated to key audiences. The findings will also be presented at a variety of industry, federal, state and local government and consumer forums and used as a basis for further consultation and engagement on the topic.

The project outcomes will be applicable across jurisdictions; the report and project outputs will be made available to other jurisdictions via web publishing and through conferences and direct presentations. MEFL and NAGA will seek opportunities for ongoing participation in key forums and processes that are likely to provide opportunities to build understanding and support for the establishment of an accessible, effective and up-to-date local energy information hub.

2 Findings

2.1 Literature review

The Future Grid Forum, a project led by CSIRO and jointly funded by electricity industry stakeholders, investigated possible future directions that the electricity system may take in response to the current market context. The contextual factors cited include climate change, cost, technological developments, the recent decline in demand and consumption, amongst a range of other factors. The Forum undertook a literature review of relevant material and in their assessment, concluded, in summary:

- Although now changing somewhat due to electricity price rises and the accelerated uptake of solar power systems “electricity use was invisible to the residential consumer, resulting in a lack of awareness, knowledge and incentives to participate” (CSIRO, 2013, p. 31). Further, it was surmised that residential electricity consumers are interested in better understanding and taking control of their energy use, although they remain sceptical that emerging technologies and their associated benefits will be realised.
- Residential consumers tend to exhibit contrary behaviour in that while claiming a willingness to act to reduce their energy bills, many continue to maintain high levels of use and do not adopt energy conserving behaviours. The literature suggests this mismatch may be due to factors such as social norms or ingrained habits (CSIRO, 2013, p. 32).
- Thirdly, the review concluded that the quality of information provided to consumers is important: “Information and feedback need to be clear, accessible, appealing, relevant and timely. What made implementation programs ...successful includes consumer involvement through engagement, education, consumption feedback and supporting technology” (CSIRO, 2013, p. 32).

Importantly, the Future Grid Forum analysis of future pathways for the Australian electricity industry are all hinged, to one extent or another on the degree to which consumers are enabled to proactively participate in the energy industry; access to timely and engaging data is central to the future of the electricity industry in Australia. Many of the Forum’s recommendations involved consumer and community education and information provision elements. The Forum also noted that a challenge to overcome is that fact that many utilities in Australia are not well regarded by consumers. This reinforces the value of involving more trusted sources of information such as local governments and community organisations.

Consultancy firm PwC released an occasional paper in April 2014 that considered likely future trends and factors that will shape the energy industry for utilities in Australia based on their experience. In a broad overview assessment of global and local trends, PwC predict a customer-led shift in the electricity sector:

Traditional large scale power utilities are losing relevance as customers take greater control of their own energy supply needs. To survive and prosper the ‘utility of the future’ will have to provide much more than reliable energy supply – it must respond to a diverse range of customer, business and community demands and do so in a rapidly changing regulatory and technological environment (PwC, 2014, p. 2).

The PwC paper proposes 5 values that will be fundamental to the future utility market and while several of them focus on a transition to a broader service and customer orientation, one in particular refers to the value of data: “Data will play a dominant role in the future energy value chain – new value will be found within the data underlying customer energy usage patterns” (PwC, 2014, p. 2).

The broad conclusion that the future of the energy sector will be quite different from our current industry structure is present in an increasing number of contemporary reviews and analyses. A common thread that runs through several of these is the importance of enhanced, informed and more effective customer (demand side) participation in the energy market. The Power of Choice Review (Australian Energy Market Commission, 2012) provides an analysis and recommended ways to more effectively empower the demand side of the energy market. The Review’s recommendations include several which are focused on improving consumer access to data and recognise that “consumers require tools – information, education, and technology, and flexible pricing options – to make efficient consumption decisions” (Australian Energy Market Commission, 2012, p. i). The Review also recognises the need for an extensive and coordinated information campaign to enhance customer participation in the market. A further related recommendation is for a “... framework which governs third parties (non-retailers and non-regulated network services) providing energy services to residential and small business consumers” (Australian Energy Market Commission, 2012, p. i). The Review recognises that the future energy market will include a range of new market participants and that provision needs to be made for their effective participation. It could be argued that the development and provision of locally aggregated energy consumption data to stimulate more sustainable energy use outcomes (by local governments for example) would be an example of this and has the potential to stimulate innovative approaches to unlock the value of effective, collective and local demand side responses to energy supply and use.

There is a role for specialist third parties to help consumers understand and manage their electricity usage. Regulatory and commercial arrangements need to be structured in such a way that makes it possible to harness the expertise and innovation of specialist sector businesses. At the same time, these arrangements need to ensure that consumers have access to appropriate technical and commercial protections (Australian Energy Market Commission, 2012, p. ix).

A recent future-oriented analysis of the emerging demand-side energy market, undertaken from a consumer perspective by the Consumer Action Law Centre (CALC) earlier this year cogently argued that:

Innovation is critical in this new market as it seeks to provide the products and services that will help consumers meet their needs for affordable energy and flexible products, while changing demand profiles and achieving demand reductions. Innovation must, however, be balanced with appropriate forms of consumer protection, to ensure that consumers can effectively engage with the marketplace and that the most vulnerable consumers do not get left behind (Consumer Action Law Centre, 2014, p. 7).

The CALC analysis provides a cautionary endorsement of the potential for informed and appropriately regulated demand side participation to provide consumer benefits as well as market efficiencies. It again points to the need for clear and accessible information products that allow for informed consumers and for the development of innovative approaches to managing our energy supply and demand requirements.

2.2 The NAGA project

The Moreland Energy Foundation (MEFL) working with the Northern Alliance for Greenhouse Action (NAGA) has obtained aggregated consumption data from Victorian

DNSPs through a voluntary arrangement since 2008. The data has been compiled into profiles for each of NAGA's nine local government areas (see Appendix 1 for an example). The methodology transforms the postcode-level source data provided by the DNSPs into consumption averages for municipalities, enabling tracking of changes in both the volume and share of energy consumption within and between municipalities.

Council officers can use this information to monitor their progress towards energy programs and targets, informing their current energy saving programs or planning future programs. Year-to-year comparisons can show changing patterns of energy use on a per household or per capita basis for a particular area. Business and industry sectors' energy use and trends can also be shown. Profiles can compare trends over time, and overlay maps can correlate energy with demographic, land use and other socio-economic variables.

In the NAGA project, data is provided voluntarily by DNSPs and although the MEFL project managers proposed a Memorandum of Understanding (MOU) to guide the terms and conditions of data provision (which included a specification to agree to data parameters) only one DNSP entered into the MOU.

Importantly, as the NAGA project achieved varying levels of co-operation from Victorian DNSPs, the project experienced delays in data provision of up to 2 years from a minority of DNSPs. For example, it was only in the second half of 2014 that the data for 2012 was received from all DNSPs, meaning that the provision of the municipal energy profiles was delayed by this extent because of the need to have data from all DNSPs in order to generate complete profiles. Further issues arising out of the NAGA project are elaborated upon in section 2.4.1 below.

The experience of accessing, collating and presenting the data into useful formats underpins the development of this project and informs the design and approach to exploring the potential for establishing a local energy information hub. It also informed the focus of the key stakeholder consultation undertaken and described in a following section (2.4).

2.3 Other approaches to data provision

2.3.1 Web portals

There is a range of approaches to the provision of data via web-based portals that have emerged over recent years. These were examined for some general features to understand the approaches currently being developed for use by consumers. The key systems evaluated include:

- midata (UK)
- Green Button (USA)
- Jemena Energy Outlook Portal (Australia)
- YourChoice, switchon and MyPower Planner (Victoria)

While three of the 4 systems focus exclusively on energy data disclosure and energy related topics, the UK's midata program also includes data provision for banking and telephony (see Box 3 on page 26 for more detail on the midata program). The Green Button program provides for customers to upload their own consumption data and provides information regarding PV and energy efficiency. Similarly, Jemena's Energy Outlook Portal allows customer to understand their consumption in the context of their local area, as well as compare different retailer tariffs. The Victorian range of sites (YourChoice, switchon and

MyPower Planner) provides information on various topics related to the Victorian energy market (for example on flexible pricing, billing rights, tariff comparisons and solar power).

Two of the sites have been initiated by governments, while the other 2 have been initiated by energy industry players; most are collaboratively supported and have ongoing stakeholder involvement in their development and deployment. The exception in the Jemena portal, which has been driven, developed and deployed by Jemena.

Although these portals have a variety of objectives and functionality, they demonstrate that the sorts of functions that are proposed broadly for a LEIH are feasible to develop and implement and they provide an instructive resource for considering the design of something such as a LEIH.



Case study: The US GreenButton program

The GreenButton program is focused at the individual consumer level, although both residential and commercial customers are able to participate. It enables individual consumers to download their consumption information directly to their own computers and also to upload the information to applications developed by third parties.

Green Button is a largely voluntary approach, which emerged following a White House “call to action”. It is notable however that a common approach to the data set and definitions is set out in a data standard released by the North American Energy Standards Board (NAESB).

The development of the standard appears to have been voluntary but through a process facilitated by the Smart Grid Interoperability Panel. The Panel is “a public private partnership that is facilitated by the National Institute of Standards and Technology (NIST).”³

Although it doesn’t currently, there is no theoretical reason why the project could not also facilitate the provision of aggregated local energy data.

Box 2: The US Green Button program (<http://energy.gov/data/green-button>)

2.3.2 The Australian Urban Research Infrastructure Network

The Australian Urban Research Infrastructure Network (AURIN) is an Australian Government initiative to provide an open access, distributed network of aggregated datasets and information services to understand patterns of urban development and to model urban growth for a sustainable future. AURIN works to coordinate the collection and filtering of information from a variety of data sources and to provide the mechanisms, protocols and tools by which the data can be accessed, interrogated and modelled. The intention is that this will enable and support research that addresses areas, such as energy, through multi-disciplinary research and facilitating partnerships with industry to help translate research outcomes into national benefit.

Importantly for the purposes of considering a local energy information hub, the AURIN project aims to develop and test nationally applicable protocols for the recording, storage,

³ See <http://energy.gov/data/green-button>. Accessed on 30 May 2014.

access and interoperability of supply and consumption datasets for the energy and water industries. The aspect of the project that relates to energy is being undertaken by CSIRO and Melbourne University and aims to create a platform to make datasets accessible to urban researchers, policy makers and others. Further the project aims to provide researchers, government agencies and interested community groups with a number of datasets via the AURIN portal for research and policy analysis. The project will develop standard information models and exchange formats to allow consistent and accurate aggregation of information across jurisdictions and data custodians in the urban energy and water industries.

An important element of the AURIN work is the focus on managing and communicating datasets and bringing together different streams of information in a single on-line mechanism for accessing, analysis, shaping and visualising urban data. To better understand effects on public, demographic, economic and environmental systems.

According to their website, AURIN works to facilitate a wide range of data from a wide range of sources; with the capability to integrate those data and to interrogate the data on-line using advanced open source statistical and spatial modelling e-research tools with visualization (see www.aurin.com.au).

The project seeks to deliver:

- A data hub based on CSIRO's own Spatial Information Services Stack technology
- A portal to provide open access to a number of energy and water consumption and supply datasets
- Community agreed consumption and supply of water and energy information models, and controlled vocabularies
- Formats for data encoding and exchange (CSIRO, 2014, p. 2).

In line with the experience of the NAGA project (see sections 2.2 and 2.4) the AURIN project has noted that:

...comparing and contrasting data in the energy and water industries presents a number of problems. For example, variability in formats, spatio-temporal granularity, access methods and differing semantic definitions hinder attempts to access, analyse, interpret, compare and combine datasets (CSIRO, 2014, p. 1).

2.4 Key stakeholder consultation

Stakeholders from local government, DNSPs, community based organisations and research institutes were interviewed or surveyed in order to better understand their views on the usefulness of aggregated local energy data generally and the prospect of a local energy information hub in particular. These consultations are reported on in the following groupings:

- NAGA project stakeholders (2.4.1)
- Distribution network service provider (DNSP) representatives (2.4.2)
- Consumer advocates (2.4.3)
- CSIRO/Melbourne University (AURIN project) (2.4.4)

2.4.1 NAGA project stakeholders

In order to gain insight from the development and application of the NAGA project, the NAGA project managers were interviewed, the local government profile users were surveyed and a workshop was held with local government project stakeholders.

2.4.1.1 NAGA project managers interview

The current situation with regard to data access for the NAGA project is instructive for considering the development of a LEIH. The range of issues experienced by the NAGA project can be summarised as:

- Channels to access
- Timeliness
- Data categorisations
- Sample intervals
- Number of users/connections
- Data integrity
- Geospatial allocations
- Comprehensiveness

Each is described in more detail in the following sections.

Channels to access

It is difficult for third parties to obtain locally aggregated energy data of any sort. Over the period of the NAGA project (from 2008), NAGA has been able to obtain the data that it does as a result of prolonged effort applied to establish and maintain relationships, and through a willingness to dedicate adequate resources to an ongoing communications effort in order that data is ultimately provided. Adding to the effort and resources required by third parties seeking data, each DNSP appears to have different requirements, and this is hard to manage; the NAGA project experience demonstrates that the internal DNSP channels for the supply of this information are inconsistent across the businesses, often tenuous (dependent upon specific staff) and generally opaque to third parties.

Timeliness

While all DNSPs provided data to the NAGA project, the timeliness varied considerably. While mostly co-operative and helpful, as there was nothing to compel DNSPs to provide data at all (let alone within any particular timeframe) the NAGA project experienced widely divergent timeframes with regard to the eventual receipt of the data. As a result, and because data was required from all Victorian distribution businesses to achieve a complete dataset across the NAGA region, the slowest data providers dictated how up-to-date the profiles could be. While some DNSPs were very timely in their provision of data, a data lag of up to 2 years has typically been experienced in the project. For example, it was only in the second half of 2014 that the data for 2012 was received from the final DNSP, so the 2012 profiles could only be produced towards the end of 2014.

Data categorisation

The parameters for allocating customers to particular categories (e.g. Residential, Commercial, Industrial) are unclear and may vary between DNSPs (although this is not certain). When supplying the data, some DNSPs do not provide categorisations by sector, and instead provide details on grid connection type or tariffing type. In these instances, it is up to the third party to determine an appropriate classification. It is unclear if these connection types are the parameters used by those DNSPs that do supply data already categorised, and if not, how they do make allocations to categories is not disclosed. This seems particularly to be the case when delineating between the *Commercial* and *Industrial* categories. In addition, there are indications that DNSPs vary category allocations over time; that is, a particular consumer may be allocated as *Commercial* one year and then *Industrial* the next. This may result from, for instance, a change in the customer's connection infrastructure.

Time/sample intervals

There is a high degree of variation with regard to the time intervals used to compile the data provided by the DNSPs, leading to uncertainty about the consistency between datasets and difficulties for third parties when it comes to confident analysis. The NAGA project experience is that the time intervals applied by the DNSPs to structure the datasets can vary between 1 month, 6 months and 12 months (with 12 month intervals including both calendar and financial years). It is not entirely clear how time intervals are determined (as in, which specific interval of time the consumption data provided by DNSPs relates to). It is assumed that in some instances DNSPs provide figures that are estimated to correlate to particular time intervals, however if this is the case, it is unclear what method of estimation is being used, as this is neither prescribed nor disclosed.

In several instances, through examination of the data provided, it is apparent that reported consumption correlates to instances of billing, but the extent to which that consumption relates to a particular time period (wholly or partly) is not clear. For example, suppose that the month of January 2012 has X MWh of consumption with Y connections and total billing days of Z. Is it the case that all of this consumption took place in January, or is that just the month that the Y connections are billed for their consumption (which may actually account for the previous 3 months of consumption)?

Number of users/connections

The number of users and/or connections is not clear, and it is possible this allocation varies across DNSPs. The number of connections will vary over time so that the number of connections at the beginning of a period may not equal the number at the end of the period. Each DNSP's approach to determining the figure supplied for each period and location is neither prescribed nor disclosed and is assumed likely to vary, again introducing potential inconsistency into data analysis.

Data integrity

As there is no access to the raw interval data, the NAGA project is not in a position to corroborate the integrity of the data provided. It is possible that errors in the dataset may occur internally within a DNSP but as there is no real transparency with regard to the processes used to aggregate the data, the nature and extent of any errors remains unknown. In the absence of a documented and transparent process, there is no understanding if steps to ensure data integrity are being employed consistently across all distributors, or at all.

Geospatial allocations

Geospatial allocation refers to the methods employed by the DNSPs to allocate consumer data to geographical areas. The areas that are used in the NAGA project by all distributors are based on postcodes. Postcode delineations are stipulated by Australia Post and while it is understood that they are updated monthly, it is not clear how the geographical delineations are used by the distributors; if these delineations are contemporary to each other or even how the DNSPs determine if a particular connection is allocated to a particular postcode.

Comprehensiveness

In several instances, DNSPs have not disclosed the consumption of all users within their distribution area. This is typically due to certain areas having relatively low numbers of certain users (generally commercial or industrial), if data was to be provided for these areas it would be plausible that third parties could identify particular individual users. It would be very advantageous if this commercial concern could be addressed, as third parties do not have a method to determine the comprehensiveness of the data sets provided by distributors. Importantly, it is clear that users that are being omitted on these grounds are exceptionally large consumers, which means that there is a large discrepancy between data provided to third parties and actual consumption as recorded by the DNSP.

2.4.1.2 Stakeholder workshop & survey

A workshop was held with NAGA council officers to discuss the usability and canvass modifications to the layout, content and format of the local energy data profiles and to feed into specifying the form and functionality of a potential LEIH. Feedback from the workshop reinforced many of the points officers made through the survey, some of the points of agreement and emphasis include:

- The importance of clarity regarding the data quality and limitations, calculation methodologies, data cleaning approaches and aggregation methodologies
- That trend information needs to be considered with the full knowledge of the data limitations and treatments
- The potential usefulness of having state-wide data as a context for considering local data
- The potential to include a variety of other parameters including such things as solar installations and generation, GreenPower purchase, amongst others (including non-energy elements).

In addition to the workshop, a survey of representatives from all of the NAGA member councils was undertaken. It should be noted that the majority of the council officers targeted for the survey are employed in the sustainability/planning or community development areas of council and are active participants in the NAGA network. There are 9 NAGA member Councils, a response was received from all 9 member Councils, with 2 responses coming from 1 Council (n=10). All but 2 of the respondents had previously used the municipal profile material. While the majority (9) had not read the profile of other municipalities, half (5) indicated that they would like to. It should be noted that each municipal profile contains regional data to provide context for local data (see Appendix 1).

The themes which emerged from survey respondents are reported below. In terms of the uses to which the officers put the profiles, the most popular responses included:

- Engaging with the community (7)
- Reporting to Council (6)
- Planning my projects (5)
- Measuring local impacts (4).

A variety of other responses indicated the value of the profiles in reporting to various other stakeholders. The majority of the respondents found the material in the reports easy to understand (8) while the other 2 respondents indicated that it was not easy, but understandable.

Council officers were asked about the relative usefulness of the various types and scales of data provided in the profiles; including about time periods (whether current or historical data is preferred), geographical scale and data user category. The following were ranked as the most useful data categories:

- Current energy usage
- Residential energy usage
- By postcode
- Per person
- CO2 emissions
- By household.

The usefulness of the various data types was ranked relatively highly by the respondents; all of those listed above were ranked as either +2 or +1 (on a scale of +2 to -2). The remaining

categories (historical; commercial; industrial; and by whole municipality) were ranked either +1 or +2 by 9 of the 10 respondents each, so clearly all of the data types are considered very useful in the experience of these council officers.

When asked whether there was any other sectors or metrics that should be included and reported, half of the respondents (5) nominated additional areas including water, renewable energy generation, transport, peak demand, amongst other metrics.

The final question relating to the municipal energy profiles provided to each NAGA local government asked for any “other comments” with respect to the profiles and revealed several issues related to the consideration of developing a local energy information hub:

- The time lag of up to 2 years with regard to data provision from the DNSPs meant that the profiles were less useful for timely reporting to Council
- The need for greater clarity with regard to how customers are categorised
- A request for disclosure with regard to how various calculations are made
- The ability to make direct comparisons with other areas or municipalities
- Various other comments regarding layout, interpretation and the commentary provided on the profiles (which are being addressed in future versions of the profiles).

Feedback on local energy information hub features

Respondents were asked to indicate the categories of energy data that were important for them from amongst those provided in the municipal profiles. Eighty percent of respondents indicated “all of the above” while some singled out domestic energy use as the most important to them. When asked if there were additional sectors or sub-sectors of data that they would like to see included, most (60%) indicated that there was not, while the remainder nominated a variety of possible sub-sectors of interest (retail, small commercial, pensioner households, amongst others).

When asked to nominate their preferred geographical scales for data aggregation, the following rank order emerged (note that multiple selections were possible):

1. Suburb/post-code
2. Municipality, per person (based on household average occupancy)
3. Household (average for households, not specific addresses)
4. Street level.

There was also a suggestion to align the data with the ABS Statistical Areas, if possible. This would have the obvious advantage of layering the information with a wide variety of other demographic, social and economic data that ABS collects at this particular granularity.

In terms of the preferred time scale/s the following rank order emerged (note that multiple selections were possible):

1. Most current-monthly, most current-yearly, historically-yearly
2. Historically-monthly
3. Most current-hourly, most current-seasonally
4. Most current-daily, most current-weekly, historically-daily, historically-weekly, historically-seasonally
5. Historically-hourly.

In terms of historical data, provision of 5 years of historical data was the most popular time period nominated (70%) followed by 2 years (20%).

With regard to how a LEIH would assist council officers to deliver their roles and responsibilities, the following rank priorities emerged (note that multiple selections were possible):

1. Engaging with the community
2. Measuring local impact, targeting high consuming households
3. Planning for projects, reporting to Council
4. Reporting to management
5. Program planning for work unit
6. Business planning for Council.

Finally, respondents were asked to provide any other comments regarding the development and provision of a local energy information hub, comments included:

Data from the various sources (CitiPower, Jemema etc.) appears to be inconsistent in relation to reporting categories of use.... It would be useful if data could be uniform to eliminate the need for interpretation. In addition it would be useful to [know] what assumptions (if any) have been made by the suppliers in relation to data collection

- Two respondents commented that the usefulness of the data depended on Council's current strategic priorities
- One nominated the value of being able to (potentially) compare local data with that from other municipalities with similar socio-demographic profiles
- Another nominated the desire to be able to access the raw data so that they could tailor the analysis to more closely suit their priorities.

2.4.2 Distribution business representatives

An interview was requested of representatives from all of the distribution network service providers that operate in Victoria. Representatives from AusNet Services, United Energy/Multinet Gas and Jemena Energy Network provided interview responses for the project. The themes emerging from those interviews are summarised below:

2.4.2.1 Frequency and types of data requests

DNSP representatives all reported that they are more frequently fielding requests for data of the type requested by NAGA for the municipal profile project. The requests are from parties including:

- Consultants
- Australian Bureau of Statistics
- Greenhouse alliances⁴
- Regulators
- Government agencies.

One respondent reported significant growth in data requests over recent years:

Last year we would have fielded 4 or 5 requests; [by June] this year we have fielded 10 or 15 already

⁴ In Victoria there are several greenhouse alliances, comprising local governments and other stakeholders. The Northern Alliance for Greenhouse Action (NAGA) has lead the sourcing of data from DNSPs in Victoria, and other alliances are now following suit.

2.4.2.2 Regulatory requirements for data

All 3 respondents from DNSPs agreed that there are regulatory requirements for data that includes the types of data that is requested by NAGA for the purposes of producing municipal energy profiles. This was reinforced by the rule made in March 2014 by the Australian Energy Market Commission (AEMC), Rule 5.13A (Distribution zone substation information) which introduced an amendment to the National Electricity Rules to the effect that DNSPs make historical zone substation information on electricity loads publicly available to interested parties.

In summary, Rule 5.13A requires that:

- The DNSP is obliged to provide information in the form of an annual zone substation report or a ten year zone substation report, including the following information, for each zone sub-station:
 - Name/identifier
 - Date and time interval for which load data is available and corresponding data in kW or MW
 - Any additional information the DNSP wishes to disclose
 - Exclusions and reasons for exclusions.

The Rule makes it clear that the information to be provided by DNSPs is not required to be analysed or verified. Further detail regarding Rule 5.13A is provided in section 2.5.2.3, page 25.

2.4.2.3 DNSP capacity to provide data

Since looking to source data from DNSPs, one of the most often cited barriers to the provision of data is the inability of the DNSP's information management platforms to easily assemble and provide the data. Now that the data request has been underway for several years, all DNSP respondents acknowledged that data provision of the type requested by the NAGA project is much more straight-forward:

Once a query is established, it takes about half an hour to provide

One DNSP respondent indicated that their relevant platforms are ahead of the rest of the sector, while another acknowledged that while their current system is a challenging platform for easy provision of the data, this is being resolved through current information system upgrades. All mentioned that developments such as the introduction of Rule 5.13A means that there will need to be a greater focus on the assembly and provision of this type of data and that once information management systems are set up to provide the data, it is then a matter of internal prioritisation with regard to the data request:

the granularity that the regulator requires covers off NAGA's data requests. It's simply a database query; it's more an issue of prioritising

One respondent related that it would not be onerous to provide the data on a monthly (billing cycle) basis as a "stock query". Further, that respondent felt that their IT platform was evolving in a manner that would make more granular geographical scales (region, postcode, zone substation) easier to provide and to include energy generation data as well as energy use data.

It's in the early stages, but we envision that it would be easy to provision in these ways

2.4.2.4 Value of a local energy information hub

One DNSP respondent provided some neutral comments to the effect that a local energy information hub would not provide any additional benefit because companies run their own analyses as a matter of course. Another agreed that they need to do their own analysis but

saw benefit in potential collaboration on how to best approach this task, particularly with the prospect of capturing the benefits of cost sharing.

If you were to look at setting up an aggregation system for data, we [DNSP] would be greatly interested. The problem at the moment is that if all DNSPs go down their own paths the costs are duplicated and they end up being passed on to customers. If there was an aggregation service this would reduce the costs and would enable more people to get access to the data (as data provision would be at cost recovery, the lower the total cost the lower the cost per request).

In one DNSP respondent's view, it would be cost prohibitive to establish a central data repository to enable storage and access to all Victorian, and possibly national, electricity and gas consumption data. This respondent questioned who would pay for and manage a LEIH? This respondent related his summary of the deliberations surrounding the development of Rule 5.13A and noted that:

Recently the generators' association requested energy data at a zone substation level on behalf of all large generators nationally. The outcome was the industry agreed to provide the data to the association (in varying data formats between distributors) and it will be up to the association to reformat the data according to their needs. The regulator was keen to make sure the DNSPs do not incur significant costs, because ultimately the costs will be passed on to end-users.

Future data provision

All DNSP respondents agreed that the costs associated with responding to data requests are largely incurred in the set-up of the data query; once established in the system, providing the data requires relatively minimal resources. Notwithstanding this, one DNSP indicated that they were dealing with broader data system issues that prevented timely data provision, but that these issues would be resolved in the near term (by end of 2014) so that data provision would then be more routine (and presumably more timely). While none of the DNSPs have required payment to service the data provision request from NAGA to date, all acknowledged the possibility for cost recovery should data requests become more onerous.

If data requests were to increase significantly it may require a full-time resource to handle which would increase costs significantly. May require cost recovery or a licensing fee to cover costs. At the moment it is spread across the base as an overhead and there are no tangible extra costs.

One DNSP proposed that they were considering the establishment of a data portal so that stakeholders could request and download data from a central repository. They have received a cost estimate from a consultant of \$6000/year, although they believe that they can do it cheaper in-house, so are investigating an internally developed solution.

Another DNSP respondent expressed that it was much more efficient to establish an approach that meant they provided the same data to everyone as far as possible. Now with interval data available from smart meters, particularly in Victoria, government is requesting more detailed data to generate load profile information and this generates more data handling requirements. It represents a significant increase in the magnitude of data involved when considering interval meter data. In addition,

Some government requests require up to 30 tariff classes, whereas NAGA only requires 3 tariff classes – much simpler.

DNSP systems are evolving so that data handling and provision is becoming much more straightforward, this is partly in response to government requirements and also partly due to the need to update systems that are 'legacies' from previous companies so that they can better meet their general business needs. Data management has become more of a focus, with respondents indicating that they are willing to maintain the data provision for the NAGA

project under current arrangements, but they are wary of committing to any more stringent requirements.

We are happy to provide the data to the Moreland Energy Foundation as per our current arrangement – i.e. in a consolidated format due to privacy considerations. We are happy to include energy generated in addition to the load data, if required.

2.4.3 Consumer advocates

The two respondents from the consumer sector offered their views about the provision of aggregated local energy data and the establishment of a local energy information hub. These respondents are broadly supportive of the concept of a LEIH and could see that there would be value in it for their programs and their constituencies, particularly, as one noted, as they run their own analysis (of a related nature) and a centralised repository would reduce duplication and save resources. Further, one had supported a particular DNSP in their efforts to establish a portal which provides data aligned with the proposed LEIH. They support this because:

We need to understand what the data is telling us – there is a lack of analysis from the customer perspective. We are very interested to see what is happening to demand in local areas and to better understand the impact of measures such as solar... so that the consumer response can be more informed and more effective.

From the consumer sector respondents' perspective, the starting point is that for the effective development of the energy market, there needs to be more support to enable effective customer participation and to establish systems that can more effectively inform consumers. Similarly, both respondents commented that the benefits of innovations and developments in the energy industry are yet to materialise as tangible consumer benefits, in any clear and demonstrable way. Indeed, one asked in reference to developments such as the smart meter roll-out in Victoria: "What are the benefits back to the consumers? Where is the evidence that the investment has worked?" Her view is that initiatives such as establishing a LEIH, with the result of providing more information to the "customer side" of the market is an opportunity to deliver some of the benefits that should be available as a result of investments such as the smart meter roll-out, smart grid developments and related technologies.

In particular, these respondents were concerned to emphasise that the market framework that underpins our energy industry needs to be set in the broader context of the consumer market and any associated market failures. The free and accessible flow of relevant data is an important element of this. Further, with regard to vulnerable consumers, there needs to be concerted effort to ensure that the benefits that should flow from investments in the market are inclusive of vulnerable consumers, particularly as they are less likely to be able to afford the costs associated with the emerging technologies that may facilitate those benefits.

Finally, these respondents see that there would be no concern from a customer privacy perspective as the data is aggregated and individual consumers cannot be identified. Indeed, one respondent nominated that she could see a range of benefits related to consumer welfare through this information through supporting strengthened local government and community sector planning regarding demand side measures and programs to address related issues such as better understanding heat wave impacts and responses.

2.4.4 CSIRO/Melbourne University (AURIN project)

A meeting with representatives of the Australian Urban Research Infrastructure Network (AURIN) project was held to get a better sense of the status of their project and how it might relate to the establishment of a LEIH. The AURIN project is working to establish a platform to

make datasets, including energy, accessible to urban researchers, policy makers and others. The project also aims to develop and test nationally applicable protocols for the recording, storage, access and interoperability of supply and consumption datasets for the energy industry.⁵

It is clear that the notion of a LEIH and the AURIN energy project have very strong alignment. The NAGA project experience is of practical interest to the AURIN project as they are just now beginning to liaise with DNSPs and work through the process of data access. The broader objectives of the AURIN project and the focus on providing open source, open access datasets, including energy, on a sophisticated and user-friendly platform matches the needs of a LEIH very well. The Moreland Energy Foundation is now working with the AURIN project to combine efforts towards establishing a pilot project on the AURIN platform. One of the DNSPs that contribute to the NAGA project has agreed that the NAGA project can supply their dataset to AURIN for the purposes of testing it's suitability to the AURIN project and their platform.

⁵ See www.aurin.com.au for more detail about this project

2.5 Regulatory review

A regulatory analysis was undertaken in order to clarify the policy and regulatory context within which a local energy information hub (LEIH) could be established. It is relevant to examine the current regulatory framework for energy to identify whether the framework contains any inhibitors or enablers to establishing an LEIH, and to consider whether any further support could be provided. In this context, the concept of 'regulatory framework' is used in the broad sense to encompass not only legislative but potential co-regulatory solutions. A consultant with experience and understanding of the relevant regulatory arena was engaged to undertake the analysis. The analysis is relevant across a range of jurisdictions, including within Victoria, across the national energy market (NEM), and more broadly in the Australian context.

2.5.1 The current regulatory framework

2.5.1.1 National energy regulation

An obvious current barrier to establishing a data repository at a national scale is the fragmented approach to energy (electricity and gas) regulation nationally. However this commentary is written from the perspective that in the short to medium term, the national regulatory framework will be realised for the majority of Australian jurisdictions.

Beyond this temporal inhibitor, no barriers to data provision have been identified within the national energy regulations. Neither however are there significant enablers. This is discussed further below.

The regulatory framework itself is enacted by a range of instruments, which cascade from the overarching pieces of legislation, the *National Electricity (South Australia) Act 1996* and the *National Gas (South Australia) Act 2008*. The framework is described by the Australian Energy Regulator on its website as follows:

- The *National Electricity Law*, a Schedule to the *National Electricity (South Australia) Act 1996*, establishes obligations in the National Electricity Market and for electricity networks. The Law is supported by the National Electricity Rules and National Electricity (South Australia) Regulations.
- The *National Gas Law*, a Schedule to the *National Gas (South Australia) Act 2008*, establishes obligations for gas pipelines, gas wholesale markets and a gas market bulletin board. The Law is supported by the National Gas Rules and National Gas (South Australia) Regulations.
- The *National Energy Retail Law*, a Schedule to the *National Energy Retail Law (South Australia) Act 2011*, regulates the supply and sale of energy to retail customers. The Law is supported by the National Energy Retail Rules and [regulations].⁶

2.5.1.2 Victorian regulation

As with national regulation, the Victorian framework for energy regulation contains few if any inhibitors to aggregated data provision. In order to arrive at this conclusion, examination of both the legislative and code frameworks was undertaken. This is due to the significant regulatory detail contained within the Victorian energy codes, applying to both electricity and gas retailing and distribution.

For example, the provisions of the Victorian Energy Retail Code apply as conditions of the grant of retail licences pursuant to section 36(1)(b) of the *Electricity Act 2000* and section 43

⁶ <http://www.aer.gov.au/australian-energy-industry/energy-legislation>. Accessed on 30 May 2014.

of the *Gas Industry Act 2001* and are deemed by the Essential Services Commission to form part of consumer contracts pursuant to those sections.

There is more detailed discussion of any enablers contained in these instruments below. For this aspect of the discussion it is sufficient to note that the framework places obligations on energy businesses to provide information to customers. The framework:

- gives rights to customers and not intermediaries or third parties
- places obligations to supply consumption information on retailers not distributors; and
- only requires the provision of data in electronic form where the customer has a smart meter installed.⁷

Whilst theoretically these could inhibit the provision of aggregated usage data by distributors to projects such as the NAGA project, this has not proved to be the case in practice.

2.5.1.3 Privacy Act 1988

It is worth noting that, assuming that current voluntary approaches would be to some extent replicated in any regulatory solution, issues of interaction with privacy regulation do not arise. At present data is collected at the feeder level. This is therefore aggregated consumption data for several hundred households, in effect negating the possibility that particular households or individuals could be identified due to outlying consumption at either the high or low end.

This is because the *Privacy Act* defines ‘personal information’ as:

Information or an opinion about an identified individual, or *an individual who is reasonably identifiable* (emphasis added):

- a. whether the information or opinion is true or not; and
- b. whether the information or opinion is recorded in a material form or not.

The position is somewhat different for businesses given separation of commercial and industrial sectors from residential. This will be particularly the case where there may be one or a small number of businesses within each class in a feeder area. It is important to remember that privacy rights attach to individuals only.⁸ Nevertheless where there is only a single business within a particular tariff class it may be necessary to consider commercial in confidence issues. Otherwise, it is suggested that a feeder area average is not the same as actual consumption (which may be commercial in confidence).

2.5.2 Current Australian legislative enablers

2.5.2.1 National Electricity Law

Clause 9.4 of the Model Contract provided for in the National Energy Rule provides for individual access to their data.⁹ However, whilst it makes this provision it does not contain provision for electronic access to data, access to aggregated data by third parties or outline a process by which such data may be defined and obtained.

⁷ See for example clause 27.2 Energy Retail Code 2012 and Electricity Distribution Code January 2011.

⁸ See section 2A of the Privacy Act 1988 which sets out the objects of the Act which include to “to promote the protection of the privacy of individuals.”

⁹ See section on National regulatory framework inhibitors for an explanation of how the Rules fit within the national regulatory framework.

2.5.2.2 Victorian Energy Retail Code

As noted above, like the NEL, Clause 27.2 of the Victorian Energy Retail Code provides for access to consumption data by individuals. Amongst other things, the Code provides that retailers must retain customer historical billing and metering data for at least two years¹⁰ and that such data must be provided to the customer on request.¹¹ The obligation persists even where a customer has ceased to be a customer of the retailer.¹²

It is noteworthy that the requirement to provide the data in electronic form only applies where the customer in question has a smart meter installed.¹³ Other than this requirement, the Code contains neither equivalent provision regarding access to aggregated data nor any specification as to the form in which data should be provided or relevant definitions of terms. It does require that the information should be in a form that is understandable by a customer.¹⁴

2.5.2.3 National Energy Rule 5.13A

In March 2014 (Rule 5.13A), the Australian Energy Market Commission (AEMC) made a rule that requires Distribution Network Service Providers (DNSPs) to make historical zone substation information on electricity loads publicly available to interested parties. “The information may inform interested parties’ investment decisions and analyses of future electricity supply and demand.”¹⁵

The Commission considers the rule will add to transparency of information, and

...will allow interested parties to undertake empirical analysis and prepare forecasts of electricity demand at the sub-regional level, should they wish to do so. This could lead to more informed decision-making and timely and efficient investments which would be in the long term interests of consumers with regards to the operation and use of electricity services.¹⁶

Zone substations form part of the electricity distribution system and connect the higher voltage sub-transmission network with the lower voltage distribution network. The National Generators Forum (NGF) requested the rule change to amend the National Electricity Rules (NER) and require DNSPs to publish historical electricity load data at half-hourly intervals, for all zone substations within their networks. The NGF proposed that zone substation data be provided on an annual basis and, where available, for each of the preceding ten years.

The key provisions of the rule determine that:

- DNSPs are required to provide historical zone substation load information in its raw form, where this data is available
- DNSPs are required to publish on their websites information on how a person may request historical zone substation load information
- interested parties are able to request from DNSPs historical zone substation load information as:
 - a once-only report, providing data for the preceding ten years from the commencement date of the final rule; and/or

¹⁰ Clause 27.1 Energy Retail Code.

¹¹ Clause 27.2(a) Energy Retail Code.

¹² Clause 27.2(b) Energy Retail Code.

¹³ Clause 27.2(e) Energy Retail Code.

¹⁴ Clause 27.2(e) Energy Retail Code.

¹⁵ <http://www.aemc.gov.au/getattachment/a989071c-e60c-434b-929f-3eb78aafef25/Final-rule-determination.aspx>

¹⁶ Ibid

- an annual report, providing data for the most recently completed year for which data is available
- DNSPs are not required to provide data, if in the reasonable opinion of the DNSP, that information is confidential or commercially sensitive to a third party
- Data recipients are required to acknowledge that:
 - any zone substation information provided by DNSPs is provided as raw data;
 - DNSPs have not analysed, assessed or validated the quality or accuracy of the historical data; and
 - DNSPs make no warranty or guarantee as to the data's quality or suitability for any particular purpose
- DNSPs are able to charge a fee for the provision of the data, which must not exceed the reasonable costs anticipated to be incurred by a DNSP in providing the data.

Case study: The midata¹⁷ project

The midata¹⁸ project in the United Kingdom is a government led project and involves a range of businesses such as energy providers, banks and telecommunications providers. midata is focused on the provision of consumption or usage data at an individual level and the development of applications for smart phones and other devices that enable the raw data to be easily translated into simple and useable forms for consumers.

Whilst focused at the individual consumer level, the underpinning regulatory approach is instructive.

Part 6 of the *Enterprise and Regulatory Reform Act 2013* sets out a range of provisions relating to the supply of customer data. Points to note are:

- The Act applies to businesses that provide a range of consumer services, including electricity, gas, mobile phone services, transaction accounts and credit cards. Application can also be extended to other consumer services by specifying those services in regulations.¹⁹
- The Act applies only to data held in electronic form ie does not require business to provide historical data that may be held in other forms.²⁰
- The Act provides that the form in which customer data is to be provided and the frequency with which it is provided may be prescribed by regulation.²¹
- Any regulations can set out different requirements for different types of customers.²²
- The Act empowers the Information Commission or other bodies specified in regulation to enforce the requirements regarding provision of customer data.²³

It is also noteworthy that to date, it has not been necessary to enact the type of regulations provided for in the Act. This is because agreement regarding participation by business and the nature of data provided has been subject of voluntary agreement. Those involved in the midata project credit both the businesses involved and the availability of legislative options in the background for this outcome.²⁴

Specifically, the relevant data sets and definitions were agreed through a committee process, chaired by Professor Nigel Shadbolt, an open data pioneer and the overall chairman of the midata programme and involving representatives of the distribution businesses.

The effectiveness of the midata project, including the voluntary approach is currently the subject of a review, due to be released later this in 2014. There is no theoretical reason why the project could not also encourage the development of aggregated tools.

Box 3: The UK midata programme (<https://www.gov.uk/government/news/the-midata-vision-of-consumer-empowerment>)

¹⁷ See for example www.midata.gov.uk

¹⁸ See for example www.midata.gov.uk

¹⁹ Section 89(2) Enterprise and Regulatory Reform Act 2013

²⁰ Ibid section 89(3)(1).

²¹ Ibid section 89(4).

²² Ibid section 89(8)(c).

²³ Ibid section 90.

²⁴ See for example interview with Dr David Rawlins, Programme Leader - midata Consumer and Competition Policy, Department for Business, Innovation & Skills, National Consumer Congress 2014.

3 Discussion

3.1 Considering the options

The following scenarios have been developed as a basis for considering the benefits, weaknesses and cost implications associated with the provision of aggregated local energy data and the development of information based on the analysis of that data. Costs and benefits are approximate if stated in dollar terms and are based on feedback from project respondents. Benefits, weaknesses and cost implications are often notional and/or qualitatively expressed, because an estimation in dollar terms would be too approximate to be useful.

Scenario 1 represents current practice, while scenarios 2-4 are based on the provision of validated, consistent data from DNSPs. The scenarios are described below:

1. **Business as usual:** This represents the current situation; data provision as required by Rule 5.13A and also based on the experience of the NAGA project. Under this scenario, third parties would undertake analysis of the raw data (not validated) to suit their purposes and interests.
2. **Specification-based validated, consistent data provision from DNSPs:** In this scenario, DNSPs would provide data that is verified, consistently assembled across all DNSPs and consistent in format, based on an agreed specification or code.
3. **Web portal²⁵ housing specification standard data:** Under this scenario, DNSPs make specification-based data available to load (or load directly themselves) onto a central data repository for third parties to access and download as required. Third parties would analyse data to suit their purposes and interests.
4. **Local energy information hub²⁶:** A web-based hub would house specification-based data, and analyse and present information for access by third parties.

Note that scenario 1 is the only scenario that incorporates unverified data. It is not considered useful, given the short-comings of current data provision (process and content) to the NAGA project, to incorporate this data into a portal or hub without consideration of the quality, timeliness and methodologies associated with the data.

²⁵ For the purposes of this project, a data portal is defined as a web-based repository that brings together data from all DNSPs in a uniform way so that a variety of users can access the data for their own purposes

²⁶ For the purposes of this project, a local energy information hub includes the function of a data portal and would also provide generic or tailored analysis and information products based on the data from DNSPs

3.2 Specifying data standards

As noted earlier, the elements that require attention with regard to data provision include:

- Administrative elements such as roles and responsibilities (key contacts) and timing of provision
- Process documentation outlining approaches to categorisations, time/sampling intervals, calculating customer numbers and geospatial allocations
- Data integrity: detail regarding the comprehensiveness of data and the approach to testing of error levels in the data generally

A specification including a documented process would bring predictability, transparency and certainty to the data provision exercise. Consistently applied methodologies and provision of standard datasets across distribution network service providers would maximise confidence in data analysis and the associated conclusions reached and information produced.

The sorts of dimensions that should be included in a specification are presented in the table below (aligned with the scenarios). Some suggested administrative fields that could be included in a specification are provided at Appendix 2.

Scenario	Specifications
Business as usual (reflecting a mix of data specification for the NAGA project and the requirements of Rule 5.14A)	<p>Data includes, but is not limited to, the following aggregated information provided annually for all monthly observations:</p> <ul style="list-style-type: none"> ○ unique installation numbers or numbers of customer account (by postcode) ○ total number of unit records ○ customer account type ○ owner characteristics, including concession status ○ property classification ○ energy consumption in (specify units) ○ industry code ○ Rule 5.13A requires that DNSPs “must provide the report(s) as soon as practicable but, in any event, within 30 business days of the date of the request”
Specification-based validated, consistent data provision from DNSPs	<p>Need to include:</p> <ul style="list-style-type: none"> ○ liaison processes and protocols ○ agreed timeframes for provision ○ agreed and consistent parameters for data allocation to classes ○ agreed and consistent methodology for allocating consumption to time periods ○ agreed and consistent protocols for reporting key measures such as “number of connections” ○ agreed and consistent protocols for geospatial divisions and allocations ○ data validation processes and outcomes ○ any exclusions and their magnitude relative to postcode
Web portal housing specification-standard data	<ul style="list-style-type: none"> ○ provision for data file uploading and downloading ○ provision for universal and common file formats ○ provisions regarding security, access and permissions for uploading and downloading
Local energy information hub	<ul style="list-style-type: none"> ○ website functionality, including provision for information products download

3.3 Benefits, weaknesses and cost implications

An assessment of the benefits, weaknesses and cost implications has been derived, primarily from the consultation with stakeholders undertaken in the project. The information is presented in Table and framed by the 4 scenarios (see section 3.1).

Scenario	Stakeholder	Benefits	Weaknesses	Cost implications
1. Business as usual (Rule 5.13A and the NAGA project)	Third party	<ul style="list-style-type: none"> ○ Rule 5.13A establishes a consistent minimum basis for local aggregated data provision to third parties by all DNSPs where there was none before; this should reduce data access costs for third parties. ○ Rule 5.13A should also lead to more consistency and timeliness with regard to basic data provision from DNSPs. ○ All DNSPs have ultimately provided data to the NAGA project (on a voluntary basis). ○ Analysis of data provides a rich context for sector stakeholders (including DNSPs) both within and between geographical areas. 	<ul style="list-style-type: none"> ○ Requirements under Rule 5.13A are very basic and do not include parameters such as tariff class, location (etc.) so this limits its usefulness to third parties. ○ Data cleaning, clarifying, interpreting and normalising is required in order to align data from different DNSPs so that datasets can be assembled and analysed across jurisdictions. Third parties do not have adequate information to do this effectively, efficiently or comprehensively. ○ Timeliness of data provision varies markedly between DNSPs; if data is required from multiple DNSPs, the slowest provider then determines the eventual timing for data compilation and analysis. ○ The process is administratively resource intensive for third parties. 	<ul style="list-style-type: none"> ○ To date, DNSPs have not charged for data provision to the NAGA project. ○ There is not much experience with accessing data via 5.13A yet (at the time of consultation), but it is likely to require more data management than the NAGA project. This is because the data required to be provided under 5.13A is very high level, whereas the NAGA project receives data provided by customer category and postcode. ○ In the NAGA project, the cost of cleaning, clarifying, interpreting and normalising data is estimated at approximately \$5000/year). ○ Significant third party staff time is required to establish and maintain relationships with each DNSP in order to obtain data. (In the NAGA project, this exercise is estimated to cost approximately \$5,000/year).
	DNSP	<ul style="list-style-type: none"> ○ Data is required to be assembled for regulatory purposes anyway, so minimal extra effort is required to assemble data. ○ Minimal data analysis is currently performed by DNSPs in order to meet the NAGA project data request. ○ DNSPs are familiar with request parameters and it is becoming a 'stock query'. ○ The voluntary arrangement to provide data in the NAGA project means that DNSPs determine priority and resourcing. 	<ul style="list-style-type: none"> ○ DNSPs are fielding an increasing level of requests for data from a variety of stakeholders. 	<ul style="list-style-type: none"> ○ DNSPs may charge a fee to third parties for the provision of data. ○ Presumably DNSPs will not incur significant additional costs when providing data under Rule 5.13A, because it is high level and not required to be validated or analysed); the NAGA project requirements are familiar and becoming a 'stock query' in many cases - making it simple and low cost. ○ The voluntary nature of the NAGA project means that DNSPs minimise costs through

Scenario	Stakeholder	Benefits	Weaknesses	Cost implications
				timing and structuring the data provision according to their own priorities and timelines.
2. Specification-based validated, consistent data provision from DNSPs	Third party	<ul style="list-style-type: none"> ○ Significant reduction in the amount of time and resources required by third parties in cleaning, interpreting and verifying data. (More efficient for DNSPs to drive the verification process as they generate the data and have direct understanding of the processes, assumptions and methods that are used to compile the data.) ○ Reduction in administrative burden of liaison and negotiation with each DNSP regarding data provision. ○ Clear expectations on DNSPs so that data quality, transparency and timeliness may improve. ○ An agreed specification would reduce the likelihood of data inconsistencies between DNSPs and provide a strong basis for resolving data anomalies and uncertainties (improve data quality over time). ○ The benefit to third parties is increased the more DNSPs that they have to deal with. 	<ul style="list-style-type: none"> ○ If each third party deals with DNSPs in isolation from others, the possibility of synergies and efficiencies through collaborative work may not be identified and/or realised. 	<ul style="list-style-type: none"> ○ A specification would provide a consistent basis for data requests; the cost associated with preparing a specification of data requirements can be minimised as it can be based on current instruments used by third parties for data requests. ○ If (as recommended) and industry-stakeholder process is commenced to establish an agreed specification, the key cost will be associated with time commitments from stakeholders. ○ Ultimate costs will also depend upon the scope and coverage of specification; the cost of meeting a specification will depend upon the baseline conditions of each DNSP's processes and systems, which are variable between DNSPs. ○ The DNSPs may recover costs for data provision on a cost recovery basis. ○
	DNSP	<ul style="list-style-type: none"> ○ Clear expectations on DNSPs will increase the efficiency of providing aggregated local data ○ The provision of more consistently assembled local data by DNSPs could provide a useful platform to build stronger stakeholder relationships ○ DNSPs may charge a fee to third parties for the provision of data. 	<ul style="list-style-type: none"> ○ Any additional data manipulation, verification and/or analysis will lead to each DNSP incurring additional costs. ○ Increased requirements on DNSPs for the assembly and provision of data. 	
3. Web portal housing specification-	Third party	<ul style="list-style-type: none"> ○ Significant reduction in the administrative resources required for managing data provision arrangements with each DNSP 	No significant additional weaknesses.	<ul style="list-style-type: none"> ○ One DNSP respondent estimated the cost of establishing their own portal for third party data access at up to \$6000 (this would then

Scenario	Stakeholder	Benefits	Weaknesses	Cost implications
standard data		separately. ○ Facilitates the free flow of data across the energy market.	As above	be per DNSP per year). ○ The cost of establishing and managing a portal would depend on the capacity, nature and functionality of a repository. ○ Assuming basic functions include data upload and download mechanisms for DNSPs and third parties, an estimated minimum cost of approximately \$30,000 to establish, along with on-going management costs.
	DNSP	○ Easy access for DNSPs to data from across the market. ○ DNSPs would not have to field individual responses to data requests; rather third parties could access this from the portal directly in their own time with their own resources.		
4. Local energy information hub	Third party	○ In the NAGA project (for example) analysis provides a regional context for comparing energy and greenhouse parameters, by postcode, across high level tariff types. (Could be broader with broader stakeholder collaboration, cooperation and resourcing). ○ Potential for tailored information outputs to be produced to address the particular communications needs and priorities of third parties. ○ More likely to generate a collaborative context where third parties can share analyses, data and information and identify where interest align. ○ Facilitates the free flow of information and analysis across the energy market.	No significant additional weaknesses.	○ The cost of establishing and managing an information hub would depend on the scope, nature and functionality of the site. It is estimated that at a minimum the hub would require web based information presentation and management capacity, as well as incorporate the upload/download functionality of the web portal. Establishment cost of \$50,000 minimum, with on-going management costs.
	DNSP	○ Easy access for DNSPs to information and analyses from across the market. ○ More likely to generate a collaborative context between DNSPs and third parties. ○ DNSPs would not have to field individual responses to information requests; rather third parties could access this from the hub manager directly in their own time with their own resources.		

3.4 Advocacy

A key part of this project has been advocacy with regard to the establishment of a local energy information hub (LEIH), or similar. Through engaging with stakeholders and discussing their views and seeking their expertise, the case for the establishment of a LEIH has been promoted, progressed and strengthened. The findings and conclusions of the project provide a more detailed platform for further advocacy activity.

Ongoing advocacy actions will be targeted at key stakeholders ranging from consumer and welfare advocates, state government, energy market participants, local government representatives, regulators and other relevant stakeholders.

For the purposes of the advocacy plan, activities are grouped into 3 categories:

Policy and practice: Activities designed to result in a direct change in policy and practice with regard to the provision of data and the establishment of a local energy information hub (LEIH), or similar.

Capacity: Advocacy activities designed to build the capacity for future advocacy, for example through the development of strategic relationships amongst stakeholders or more effective internal advocacy processes and capacity in stakeholder organisations.

Space: The project will create an advocacy “space” in which to achieve ongoing stakeholder liaison with government, regulators and the energy industry, including distribution businesses, and third party service providers.

3.4.1 Advocacy plan

Focus	Target	Target process	Desired outcome(s)
Policy & practice:	Distribution Network Service Providers (DNSPs)	Relationships based on current aggregated energy data provision Present and discuss the findings of this research to key DNSP (and related) contacts	Build commitment to ongoing improvement in all aspects (quality, timing, etc.) of the data provided to MEFL for the NAGA project, and to the AURIN project
	Australian Energy Market Commission (AEMC)	Investigate requirements for the creation of a rule to facilitate the provision of more timely, accurate and transparent aggregated energy data	Build on Rule 5.13A or propose an alternative rule to require more timely accurate, consistent and verified local energy data to third parties
	AURIN project	Existing MEFL/NAGA relationship with DNSPs; emerging relationship with AURIN	Work with the AURIN project and DNSPs to further develop specification that will underpin high quality, timely data provision so that AURIN project is able to use DNSP data sets on their portal
	Victorian Energy Minister and (new) Departmental officers	Prepare briefing for Ministers’ offices	Establish political support for the provision of aggregated local data
	Government agencies, including regulatory agencies	Any relevant policy or regulatory process open for comment	Strengthened support and recognition for the value of an LEIH (or similar) across relevant government areas
Capacity:	NAGA members	Brief NAGA’s advocacy working group	NAGA Councils in joint advocacy for key changes required for strengthened data provision

Focus	Target	Target process	Desired outcome(s)
	Other local governments Consumer groups, other community-based org's.	Produce and disseminate fact sheets and briefing materials based on project to key stakeholders and relevant forums	Build detailed understanding and support for the findings and conclusions of this report. Key stakeholders advocating into their networks for the provision of local energy data
Space:	Industry advisory committees	DNSP customer consultative committees (CCCs), or similar	Establish aggregated data provision as an issue on the agendas of CCCs
	Broad stakeholder groups	Other industry and regulatory forums, seek advice from stakeholder partners	Include aggregated data provision as an issue on industry and regulatory policy and program forums as appropriate

3.5 Communications

The role of information is central to this project and key insights have been highlighted through the research:

- Information is critical to drive better market outcomes, including for vulnerable consumers
- Information and feedback needs to be clear, accessible, appealing, relevant and timely if it is to have an impact
- Successful programs must include consumer involvement through engagement, education, consumption feedback, and supporting technology
- Local government, as a trusted source of information for its residents, can play an effective role in communicating information and strategies

While these insights apply to the provision of aggregated energy data, they are also important considerations in constructing a Communication Plan for the project outcomes overall. The Plan will focus on building on the relationships established through the project, as well as engaging other stakeholders through communicating the outcomes of the project, when opportunities arise and resources permit.

3.5.1 Communications plan

Objective	Target	Communications vehicle	Desired outcome(s)
Strengthen existing stakeholder engagement	<ul style="list-style-type: none"> ○ NAGA Councils ○ DNSPs (those already engaged) ○ AURIN and partners ○ Consumer/welfare groups (those already engaged) ○ MEFL partners/networks ○ NAGA partners/networks ○ Government departments and regulatory agencies (those already engaged) ○ Relevant politicians 	<ul style="list-style-type: none"> ○ Hard copy report ○ Presentation/workshop ○ Summary document ○ Website publication and link ○ Article for partner newsletters 	Strengthen understanding and support for the key conclusions and recommendations of the research
Build new strategic relationships and support	<ul style="list-style-type: none"> ○ Local governments (non-NAGA) ○ Other regional alliances of local governments ○ DNSPs (those not already engaged) ○ Consumer/welfare groups (those not already engaged) ○ Government departments and regulatory agencies (not already engaged) 	<ul style="list-style-type: none"> ○ Hard copy report ○ Presentation/workshop ○ Summary document ○ Website publication and link ○ Article for partner newsletters ○ Industry journal article ○ Industry conference papers 	Build a broader coalition of stakeholders who are supportive of more effective local aggregated data provision
Build broader community understanding and support	<ul style="list-style-type: none"> ○ MEFL members ○ MEFL community networks ○ General community ○ NAGA Councils communities ○ Stakeholder/partner public networks 	<ul style="list-style-type: none"> ○ Media article ○ Text for use by other networks ○ Integrate into existing community engagement materials and forums (where relevant) 	Build capacity to appreciate and understand the key concepts and their benefits more broadly across the community

4 Conclusions and recommendations

4.1 Data is increasingly important

Accurate local energy data, based on actual levels of energy generation and use, can be transformed into powerful information. Such information can guide actions to reduce energy costs, drive new energy management approaches tailored to particular areas and help drive the transition to a socially, environmentally and economically sustainable energy market. The underlying objective of this project is to create a more transparent energy market from which all energy market participants can derive benefit.

Distribution network service providers forecast energy demand and provide network capacity assessments in their 5-year planning horizons. They are also required to assess cost-effective opportunities for demand side management that might defer more costly network augmentation. The availability of locally aggregated energy data, in useful formats and scales, provides opportunities for third parties, including those not directly from the energy industry, to consider and propose cost-effective demand side energy solutions.

Data reflecting local energy patterns and trends can also help inform new approaches to achieve demand management and address peak demand, the major driver of large network investments and higher charges for consumers. Across the national energy market, there is an estimated \$11 billion of network infrastructure. This infrastructure has been built to service maximum peak demand, which occurs for the equivalent of four days a year²⁷. Understandably, greater attention is now being paid to the influence of peak demand on energy prices.

Beyond the energy industry, local governments and other non-energy industry players are at the forefront of activity on a wide range of issues associated with the operation of the energy market. These third parties focus on issues that range through diverse areas including action on greenhouse gas emissions, energy affordability, the welfare of vulnerable consumers, renewable energy supply, adaptation to climate change impacts and the future of energy infrastructure and energy networks generally. Energy data is critical to inform effective responses in these areas as well.

The literature review (section 2.1) considers authoritative recent analyses that explore energy market developments and indicates that information derived from energy data analysis will be an increasingly important feature and driving force behind the successful operation and development of our energy market. This will be particularly so as consumers become more active in their relationship with energy companies, and as energy companies evolve to become more service oriented; enabling the services that energy provides, rather than narrowly focussing on the sale of energy *per se*. For example, the CSIRO-led analysis (CSIRO, 2013) characterises an emerging group of consumers as 'pro-sumers' and highlights the centrality of data and information under this future scenario.

Similarly, while there is recognition that time-of use pricing can play an important role in achieving peak demand reduction, if adoption of cost-reflective tariffs is not widespread, then the system benefits may be minimal. Achieving widespread benefits will require an effective information

²⁷ <http://www.ena.asn.au/wp-content/uploads/2013/04/ENA-media-release-AEMO-Report-29-June-2012.pdf>

campaign; there will be a real need to raise consumer awareness about the benefits of peak demand reduction and cost-reflective pricing and how to achieve these benefits. The use of aggregated local data could inform a broad campaign and may also provide the basis for third parties to contribute credibility to such a campaign through their community legitimacy, networks and resources.

The Australian Urban Research Infrastructure Network (AURIN) project recognises the value of urban scale energy data to stakeholders such as planners, managers, researchers and others and emphasises the importance of providing open access to data and information related to energy and other key dimensions of our urban infrastructure.

A broad conclusion of this report is that information, such as that derived from aggregated local energy data, needs to be 'freed up' in the energy market in order for the market to evolve and to empower a greater level of participation in the market, particularly from consumers and the range of third parties that represent consumer and community interests.

Recommendation: Work with the AURIN project to better understand how energy data (including aggregated local energy data) can be integrated with the other datasets included in the AURIN platform to generate new information resources.

Recommendation: Work with the AURIN project to evaluate the extent to which the DNSP data provided to the NAGA project matches the purpose and requirements of the AURIN platform. Based on this assessment, propose improvements regarding the assembly and provision of data to better match the requirements of the AURIN platform.

4.2 Improve data availability and quality

Earlier parts of this report outline and consider the benefits to be gained from access to aggregated local energy data. In a broad sense, the existence of these benefits is demonstrated by the fact that the Moreland Energy Foundation (MEFL) and the Northern Alliance for Greenhouse Action (NAGA) have worked with Victorian distribution network service providers to secure data in order to produce information for their members since 2008.

The development of Rule 5.13A in 2014 further demonstrates that aggregated local energy data is useful for informing energy market stakeholders about potential investment decisions and for fostering a deeper understanding of the energy industry. In this case, the National Generators Forum made the rule change request based on their proposition that there was insufficient published detail available to enable third parties to formulate their own assessments and participate in the energy market as effectively as they might.

In this project, participants in the NAGA project confirmed the benefits of applying information from the analysis of locally aggregated energy data; benefits ranging from tools for community engagement through to enabling the design and monitoring of their sustainable energy programs. Other respondents, including one each from a DNSP and a consumer welfare group indicated that they also run their own analyses of this type of data and that there would be benefit in a centrally managed process for data assembly and analysis as it would reduce duplication of effort.

Importantly however, the respondents from the NAGA project clearly noted the reduced value of the data (and derived information) because of the significant time delays experienced in securing a full set of data and the lack of transparency with regard to the definitions, assumptions and methodologies applied in assembling the data by the various DNSPs. This reduces the capacity to act on the data and the derived information confidently and in a timely manner.

While Rule 5.13A is a welcome regulatory development, and while it does include specific requirements with regard to the key issue of timeliness of data provision, it does not address the other issues experienced in the NAGA project, such as:

- The several areas where the data assembly approach is uncertain and unclear, and

- Consistency of approaches across DNSPs.

Rule 5.13A stipulates that data is not required to be validated or analysed. While this is understood to be a measure that reduces the burden on DNSPs, it will do little to improve the quality of data provided, particularly for data requests such as the NAGA project, where the parameters that are included go beyond those specified in 5.13A (such as customer allocations to tariff and location). The NAGA project is effectively beyond the scope of 5.13A and so remains a voluntary arrangement between NAGA and the DNSPs and will not benefit from the timing provision of the rule.

Recommendation: Engage with the regulator to propose establishment of a forum to develop a Code for the assembly and provision of aggregated local energy data. The Code should be built through a collaborative approach that strengthens stakeholder commitment, minimises cost imposts on stakeholders and agrees the key data parameters and data assembly requirements.

Recommendation: In line with the Communications Plan (section 3.5) prepare an information bulletin that communicates the key conclusions and recommendations of this report and strengthens support amongst key stakeholders regarding the value of aggregated local energy information in the energy sector.

4.3 Consider the value of regulatory support

According to the regulatory analysis undertaken in the project, the general (Federal and Victorian State) regulatory context presents no significant inhibitors to the provision of aggregated energy data. On the other hand, the regulatory environment provides no particularly strong enablers for the establishment of an effective local energy information hub either. While Rule 5.13A provides a relevant instrument to support the provision of aggregated local energy data to third parties, the requirements of the Rule would not resolve the issues associated with the current voluntary arrangements, particularly in regard to data consistency and transparency.

As is evident from the examination of approaches taken in other jurisdictions, beyond the current approach in Australia, there are other options to consider in designing a more effective framework for the provision of aggregated energy data. Which approach is to be preferred should be measured against the capacity to achieve the improvements in timeliness, transparency and consistency required.

A regulated approach could see not only the requirement to provide aggregated data, but also standards as to data and format, set out in legislation. Whilst such an approach has the benefit of certainty, down sides include potential industry resistance and inflexibility in the face of potentially fast moving changes in the types and nature of data available and possible applications (as we appear to be seeing at the moment).

A blended approach combines a legislative and voluntary approach – in essence setting out a high level obligation to provide aggregated data in legislation, with a mechanism for making more detailed regulation as to data timing and content also provided. The ‘blend’ could take a number of forms. For example, provision could be made within the NEL that creates the (ultimately enforceable) obligation to provide data, together with provision to specify the form and frequency of data provision by regulation if voluntary agreement cannot be reached. This approach borrows from the UK midata approach, which appears to have been highly successful in securing voluntary agreement in the context of an existing legislative obligation.

Alternatively, provision could be made within the NEL for the creation of enforceable codes, together with the expression of an intention that a code relating to data provision be developed. Examples of code frameworks exist within the Victorian energy regulatory framework and are also contemplated within national regulatory frameworks. Both the Competition and Consumer Act and the Australian Securities and Investments Commission Act contemplate the development of codes that are enforceable by the regulator.

Code development in the Victorian framework has been highly successful where the regulator has hosted stakeholder workshops involving both industry and consumer representatives in the development of code parameters and provisions.

A voluntary approach would in effect continue the present approach but seek to reflect an agreement as to time and scope of data provision in an instrument such as a code or standard. The development of a co-regulatory (blended) approach would provide an effective framework for driving increased timeliness, accuracy and consistency in the data provided by the DNSPs. This approach would have the benefit of flexibility; however experience to date suggests that without legislative backing, similar problems in arriving at an agreed data set and definitions across multiple businesses (that presently take different approaches) are likely.

Recommendation: Approach the regulator to propose that the Code for the provision of aggregated local energy data (once developed) is embedded into a co-regulatory framework that commences with a voluntary compliance approach but also includes the potential for a more prescriptive, regulated approach if reasonable progress cannot be achieved voluntarily.

Recommendation: In line with the Advocacy Plan (section 3.4) prepare a policy proposal that reflects the key conclusions and recommendations of this project and provide to government stakeholders, regulatory agencies and relevant peak bodies.

4.4 Summary of recommendations

1. Work with the AURIN project to evaluate the extent to which the DNSP data provided to the NAGA project matches the purpose and requirements of the AURIN platform. Based on this assessment, propose improvements regarding the assembly and provision of data to better match the requirements of the AURIN platform.
2. Work with the AURIN project to better understand how energy data (including aggregated local energy data) can be integrated with the other datasets included in the AURIN platform to generate new information resources.
3. Engage with the regulator to propose establishment of a forum to develop a Code for the assembly and provision of aggregated local energy data. The Code should be built through a collaborative approach that strengthens stakeholder commitment, minimises cost imposts on stakeholders and agrees the key data parameters and data assembly requirements.
4. Approach the regulator to propose that the Code for the provision of aggregated local energy data (once developed) is embedded into a co-regulatory framework that commences with a voluntary compliance approach but also includes the potential for a more prescriptive, regulated approach if reasonable progress cannot be achieved voluntarily.
5. In line with the Advocacy Plan (section 3.4) prepare a policy proposal that reflects the key conclusions and recommendations of this project and provide to government stakeholders, regulatory agencies and relevant peak bodies.
6. In line with the Communications Plan (section 3.5) prepare an information bulletin that communicates the key conclusions and recommendations of this report and strengthens support amongst key stakeholders regarding the value of aggregated local energy information in the energy sector.

5 Bibliography

Australian Energy Market Commission. (2012). *Power of choice review*. Sydney: AEMC.

Australian Energy Market Commission. (2014). *National Electricity Amendment (Publication of Zone Substation Data) Rule 2014 No.1*. Sydney: AEMC.

Consumer Action Law Centre. (2014). *Smart Moves for a Smart Market*. Melbourne: CALC.

CSIRO. (2013). *Future Grid Forum: change and choice for Australia's electricity system*. Newcastle, Australia: CSIRO.

CSIRO. (2014). *Data standards for water and energy consumption and supply*. Retrieved November 12, 2014, from AURIN: http://aurin.org.au/wp-content/uploads/2014/10/Factsheet_6-2_WEB_140128.pdf

PwC. (2014). *Utility of the future*. Melbourne: PwC.

Other references are provided in footnotes throughout the report.

6 Appendices

6.1 Appendix 1: Municipal energy profile (example)



NORTHERN
ALLIANCE FOR
GREENHOUSE
ACTION

Hume

Energy Profile

Helping Council to improve policies, target programs, and build energy smart.

Municipal Energy Profile

Introduction

This Municipal Energy Profile provides a comprehensive overview of energy (gas and electricity use) and associated emissions in the municipality. It shows the trends in energy consumption for residential, commercial and industrial sectors with totals for each suburb. The profile draws upon energy data for the period 2004-2012.

Background

Since 2008 the Northern Alliance for Greenhouse Action (NAGA) has been working to obtain local energy data with the aim to further support the development of innovative projects focused on a low carbon future. Information provided by Victorian electricity and gas distributors to NAGA forms the basis of the profiles.

MEFL has developed a detailed municipal data tool to record raw energy consumption data. This data has been used to construct energy profiles for each of the councils and presents the most comprehensive set of local level energy information produced in Australia.

The profiles demonstrate NAGA's commitment to local leadership in climate change action.

Every attempt has been made to verify the data, however it should be noted that this report is intended to be iterative and your feedback is welcome. The detailed data on which this profile has been developed is located within the municipal data tool; for more information contact NAGA for details.

Multiple uses

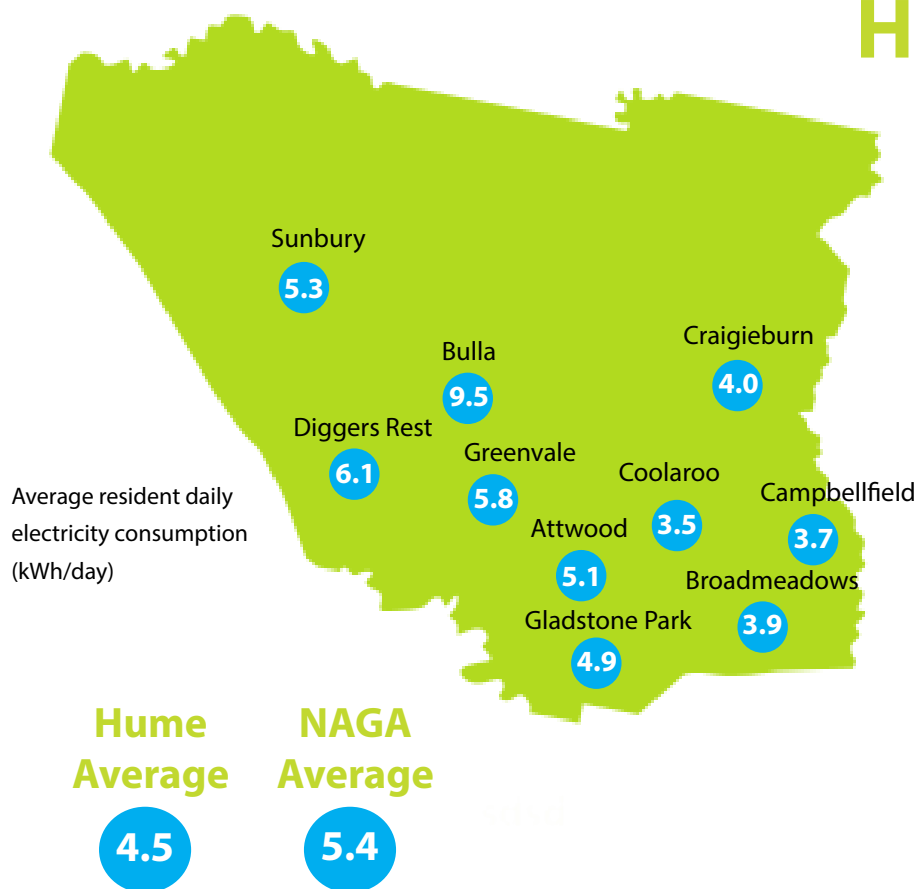
The availability of local information on energy consumption and trends enables councils to:

- » improve targeting of policies, programs and incentives to reduce energy demand by knowing where consumption and emissions are highest;
- » communicate to create a better informed community on energy use, carbon pollution and costs; and
- » monitor the effectiveness of energy saving and emission reduction programs and progress towards local, regional or state targets.

Acknowledgements

The Municipal Energy Profile was originally developed for NAGA by Moreland Energy Foundation, with funding from the Victorian Government. NAGA acknowledges Victoria's gas and electricity distributors for providing data used to develop this profile.

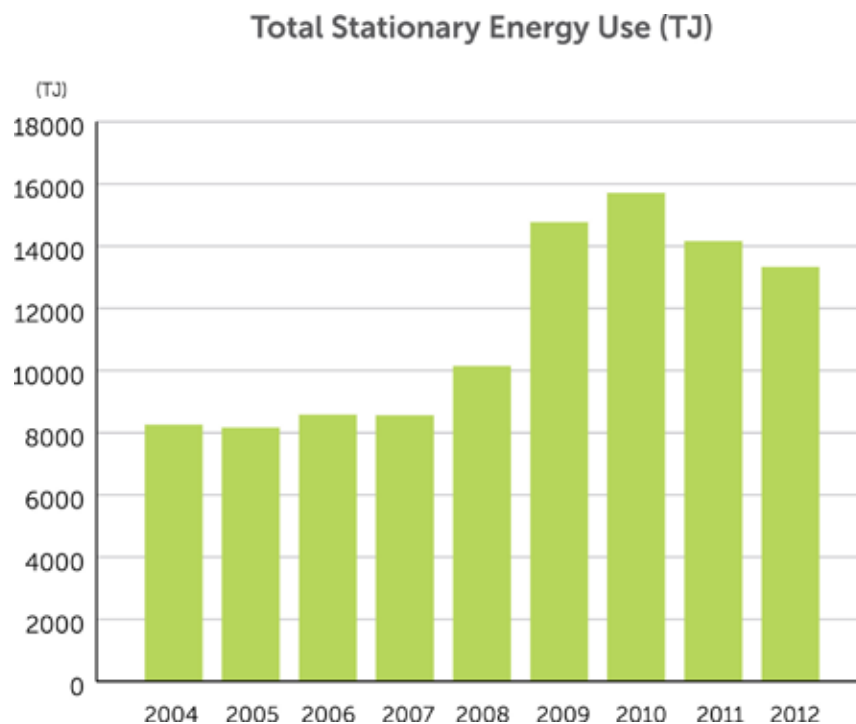
Hume



Changes from 2009 to 2012

	Hume Average	NAGA Average
Annual decrease in daily household electricity use	-4.86%	-4.32%
Annual decrease daily household gas use per year	-1.21%	-0.63%
Annual decrease in daily household GHG emissions	-3.84%	-3.63%

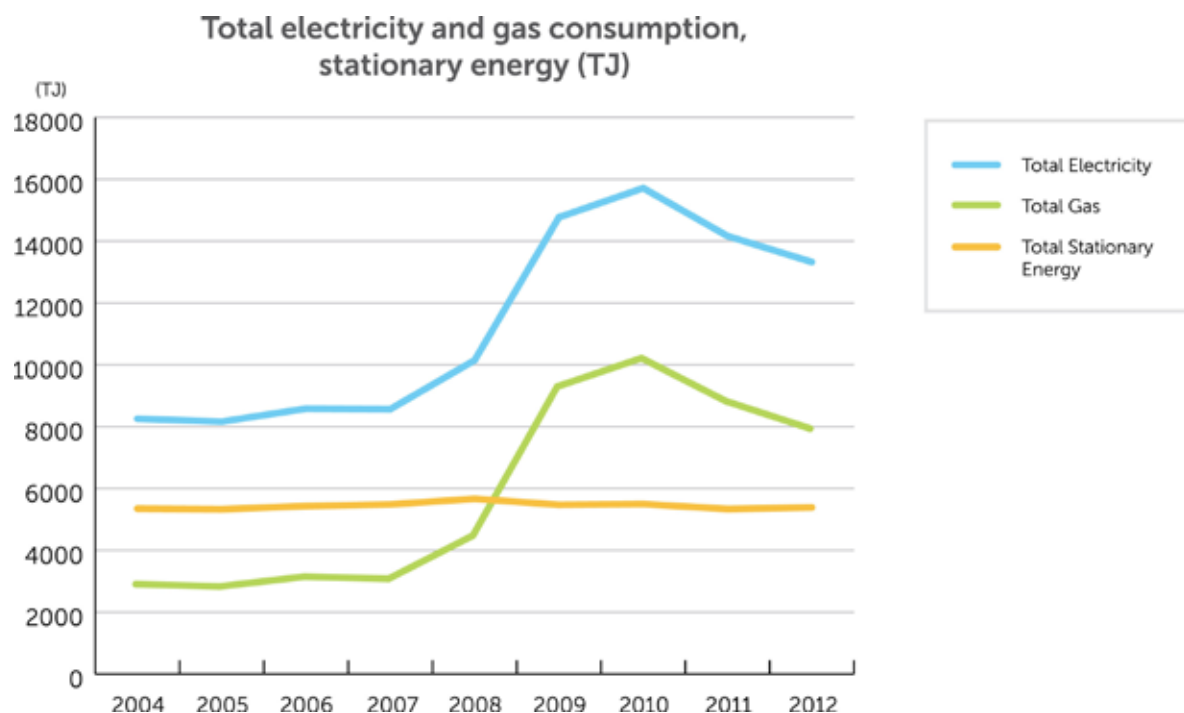
Hume's energy consumption



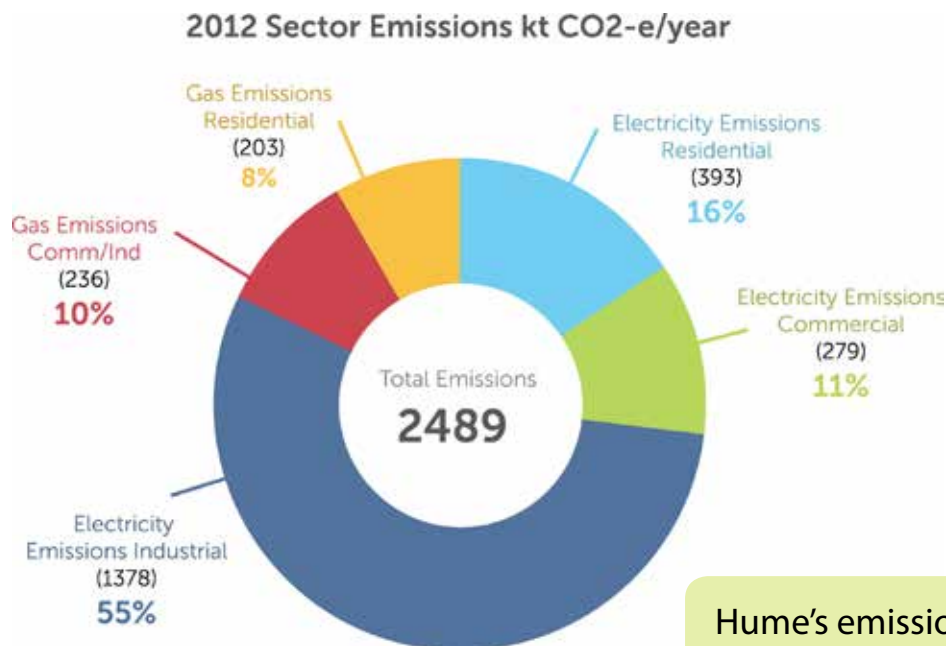
The total stationary energy consumption for the municipality combines gas and electricity used in residential, commercial and industrial sectors.

For electricity, megawatt hours (MWh) have been converted to terajoules (TJ). Note that in 2009 there is a significant increase in gas use recorded in the commercial and industrial sector due to a gas distributor providing previously-undisclosed information about industrial gas use.

Hume's average daily household usage of electricity is slightly lower than the NAGA average

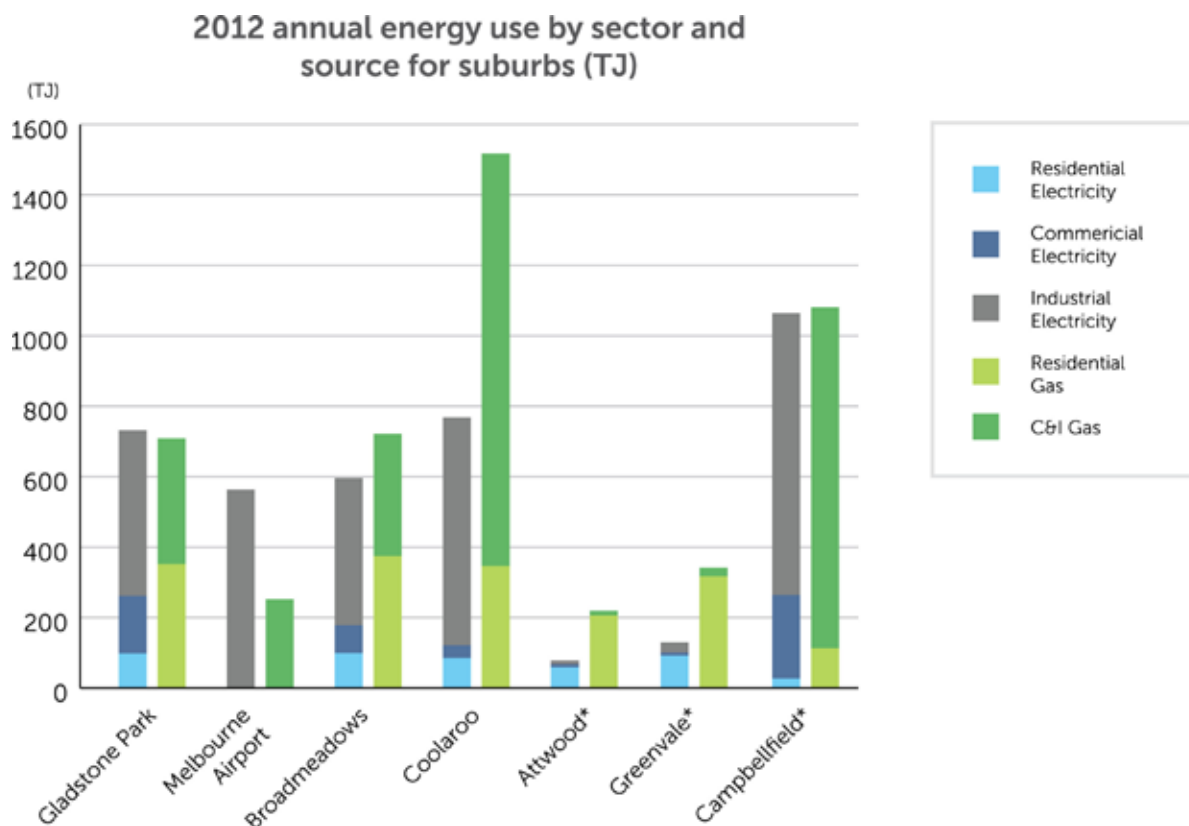


Energy consumption by sector

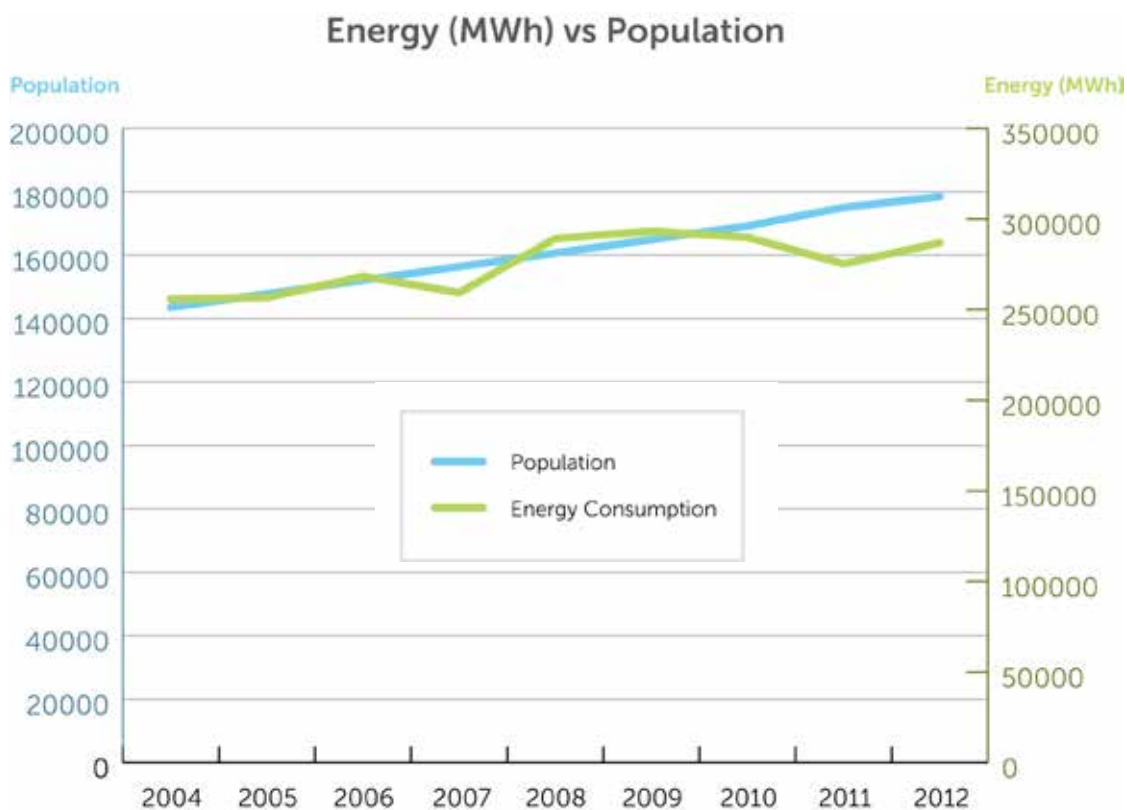


The electricity and gas totals have been separated for residential, commercial and industrial sectors, and then outlined according to across all suburbs in the municipality.

Hume's emissions have been decreasing on average 4.06% per year since 2009



Residential Energy



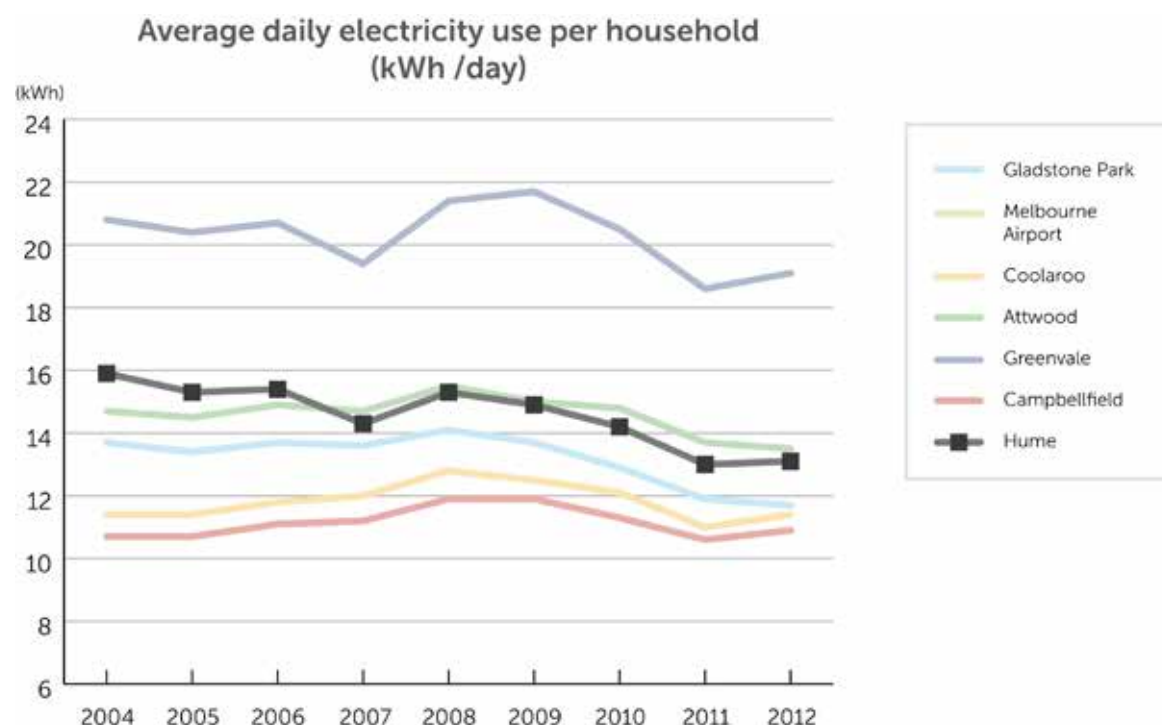
The population of Hume continues to grow, however since 2009 this growth has not seen a corresponding increase in electricity consumption.

Solar Energy

Installed solar photovoltaic capacity, by suburb

Suburb in 2012	Postcode	Installed PV kW
Gladstone Park	3043	1077
Melbourne Airport	3045	
Broadmeadows	3047	770
Coolaroo	3048	944
Attwood	3049	593
Greenvale	3059	1201
Campbellfield	3061	242
Somerton	3062	
Oaklands Junction	3063	69
Craigieburn	3064	4479
Diggers Rest	3427	238
Bulla	3428	83
Sunbury	3429	2864
Hume Total		12560

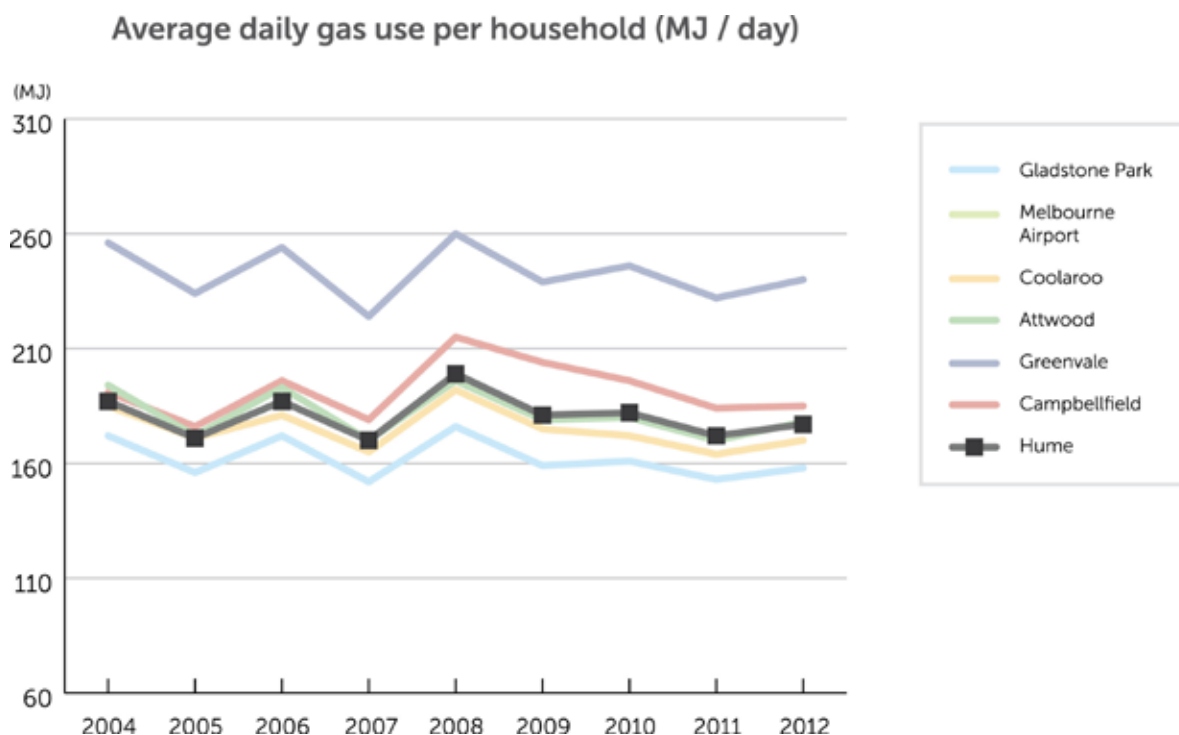
Residential Electricity



The population of Hume continues to grow, however since 2009 this growth has not seen a corresponding increase in electricity consumption.

Suburb in 2012	Postcode	Electricity kWh/hh/day	Electricity kWh/person/day
Gladstone Park	3043	11.7	4.9
Melbourne Airport	3045		
Broadmeadows	3047	11.0	3.9
Coolaroo	3048	11.4	3.5
Attwood	3049	13.5	5.1
Greenvale	3059	19.1	5.8
Campbellfield	3061	10.9	3.7
Somerton	3062		
Oaklands Junction	3063	18.4	6.5
Craigieburn	3064	12.7	4.0
Diggers Rest	3427	14.3	6.1
Bulla	3428	24.4	9.5
Sunbury	3429	13.7	5.3
Hume Average		13.1	4.5
NAGA Average		13.4	5.4

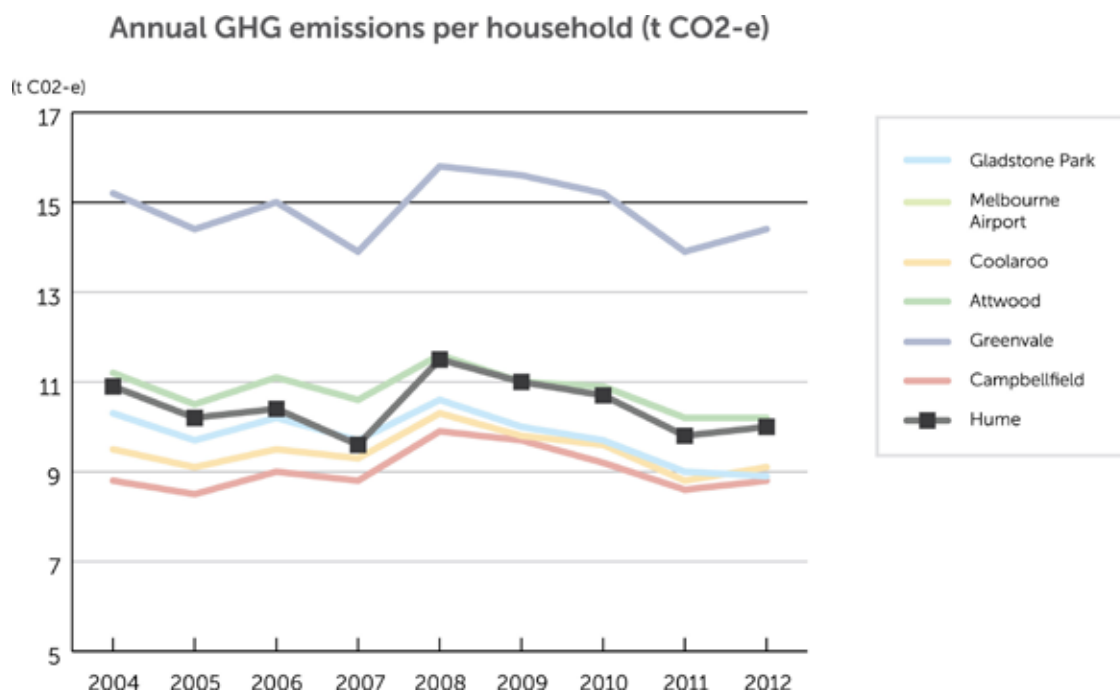
Residential Gas



The population of Hume continues to grow, however since 2009 this growth has not seen a corresponding increase in electricity consumption.

Suburb in 2012	Postcode	Gas Usage MJ/hh/day
Gladstone Park	3043	158
Melbourne Airport	3045	
Broadmeadows	3047	151
Coolaroo	3048	170
Attwood	3049	178
Greenvale	3059	240
Campbellfield	3061	185
Somerton	3062	6
Oaklands Junction	3063	
Craigieburn	3064	185
Diggers Rest	3427	143
Bulla	3428	
Sunbury	3429	175
Hume Average		177
NAGA Average		155

Residential greenhouse gas emissions



The population of Hume continues to grow, however since 2009 this growth has not seen a corresponding increase in electricity consumption.

Suburb in 2012	Postcode	CO ₂ Emissions tCO ₂ e/hh/year
Gladstone Park	3043	8.9
Melbourne Airport	3045	
Broadmeadows	3047	8.5
Coolaroo	3048	9.1
Attwood	3049	10.2
Greenvale	3059	14.4
Campbellfield	3061	8.8
Somerton	3062	
Oaklands Junction	3063	9.2
Craigieburn	3064	10.0
Diggers Rest	3427	9.2
Bulla	3428	12.2
Sunbury	3429	10.1
Hume Average		10.0
NAGA Average		9.4

Appendix 2: Proposed administrative fields for data specification

In gathering data for the NAGA municipal energy profiles project, a “deed for provision & use of energy consumption data” was developed, generally referred to as a Memorandum of Understanding (MoU). The rationale for developing a MoU was to facilitate the provision of consistent data from across distribution businesses and to therefore underpin comparable reporting across and within municipalities.

While one distribution business (Jemena) consented to enter into the MoU, others did not want to be bound to data provision in any regimented way and so declined to enter into the MoU although all provided data to the project.

Field	Content
Background	Overview of the parties, the agreement's context and the specific (high-level) roles of the parties to the MOU
Definitions	Meanings of key terms are outlined and their intended interpretation specified
Purpose of deed	Defined as to facilitate and manage the use by NAGA of the Data and to define the roles and responsibilities of NAGA and DB under the Deed
Co-operation and consultation	Outlines the intent to operate in a co-operative, consultative and transparent manner with regard to the provision and treatment of data
Term	Timing and duration
Provision of data	Specifies the mode of data transfer (electronic)
Use of data	Authorised purposes, publication procedures and requirements, and the personnel authorized to access the data
Disclaimer	Releasing DB of responsibility for the suitability and accuracy of data for the intended purpose and to disclaim DB from any liability for any loss or damage arising from the use of data
Privacy	Commits parties to abide by legislated privacy requirements
Intellectual Property	New IP vests with MEFL and is subject to royalty free license to use
Termination	Conditions, precursors and consequences of termination
Dispute resolution	Approach and process for dispute resolution, including timeframes and escalation pathways
Notice	Transmission and receipt of notices
General	Sub-clauses related to agency, survival, severability, counterparts, waiver, legal costs, amongst other general conditions.
Schedules	
Details	<p>Identifies representatives' contact details, and the specifics of the data to be provided</p> <p>Identifies data for inclusion: “Data includes, but is not limited to, the following aggregated information provided annually: (a) Total number of unit records; (b) unique installation numbers or customer account numbers (as applicable);(c) customer account type; (d) owner characteristics, including concession status; (e) property classification; (f) energy consumption in kWh; (g) industry code; for all monthly observation (Q1-Q4)”</p> <p>Specifies the authorised purposes and the authorised personnel</p>
Service area plan	Defines the service area
Acknowledgement	Wording for inclusion in any publication