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RP1032 Final Project Report

Facilitating End User Deployment Of Off-Site
Renewable Generation

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Executive Summary

Internationally, there is a trend towards end users procuring electricity from offsite Renewable Energy (RE) facilities located at physical premises distinct from the point of end use. In 2015, end user Power Purchase Agreements (PPAs) in the United States underpinned more new wind capacity than renewable energy portfolio standards (RPS). First mover companies such as Google, Amazon, Facebook, and Microsoft are now being joined by manufacturing and retail businesses like Ikea, Volkswagen, General Motors, and Dow Chemical [1].

This report reviews the potential for a new Australian market to emerge with respect to offsite RE procurement by corporate and institutional entities. It considers what this new market may look like, who may participate, the preferences and views of potential participants, and provides some initial guidance as to how participants may interact with such a market. It intended to provide practical and actionable insights supporting end user decision making in procuring specific offsite renewable energy (RE); provide information that can reduce transaction costs, contribute to market development; and characterise the current status of Australian offsite RE procurement including the values, drivers, barriers, and preferences of potential market participants.

Procurement of RE has traditionally been divided between the purchase of Greenpower™ and the use of behind the meter (BTM) solutions. These solutions operate at different points on the spectrum of RE procurement, but both have characteristics that may make them unsuitable for some users. The development of offsite RE procurement can be viewed as expanding the set of choices available to end users in meeting their organizational needs.

The uptake of offsite RE can be considered as the development of a new marketplace between end users, their agents, electricity retailers, and RE project developers. The process through which end user preferences are translated into outcomes is characterized as involving the following three stages:

- Market Structure – the interaction through which parties on both the supply and demand side match according to the alignment of their individual preferences and objectives;
- Business Model Structure – business model structures involve the division of roles, rights, and obligations between the different parties involved in an offsite RE deal; and

- Contract Structure – representing the specific contractual provisions including the term of the agreement, arrangements for pricing, settlement of financial transfers, and dispute resolution provisions.

The first stage is the market structure stage, which involves matching of supply and demand. Outcomes can be expected to reflect the views of the three key market participant groups: end users, electricity retailers, and RE project developers.

End users generally noted insufficient information and in-house skills as a barrier to evaluating the opportunities and risks associated with an offsite RE procurement deal, in addition to their desire to retain as much supply flexibility as possible.

Electricity retailers may facilitate the pass through of generation value from an RE facility to an end user, provide balancing supply, and risk management services in respect of generation intermittency. Smaller and mid-size electricity retailers were more open to facilitating offsite RE procurement by end users, noting potential customer acquisition, retention, and market differentiation as value streams for their businesses.

Project developers were interested in end users as a new type of off taker which would increase the diversity of their effective customer base. They reported their fundamental constraint to be financier requirements, and that debt availability is determined by the size and length of any off-take agreement underpinning a project.

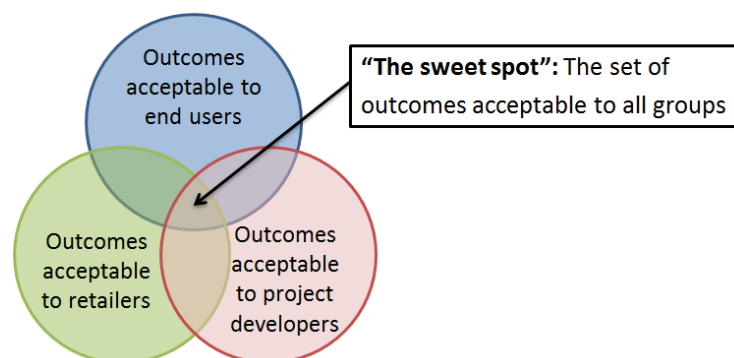


Figure 4 – Venn-diagram model illustrating the set of outcomes acceptable to all groups

A market requires mutually beneficial exchange between parties in order to function. As each participant group brings their own perspectives, preferences, and objectives to the process of market matching, the offerings emerging in a mature market

will be those which see the preferences and objectives of each participant group acceptably satisfied.

The market to this point has been driven through a solution led approach to offsite RE procurement which involves the end user engaging with the supply side in order to seek out specific, bespoke, solutions which meets their needs. A significant number of respondents, considered a limited number of end users to be sophisticated enough, and willing to bear the transaction costs of putting an offsite RE deal together via a solution led approach.

As a result, market development beyond a very limited niche was considered to require the supply side (electricity retailers and project developers) to effectively bear the upfront contracting and implementation costs on behalf of end users through a product development process. Products may vary in the level of standardization and actual market development could see a mix of products and solutions, potentially as a hybrid ‘menu’ of options ranging in degrees of standardization.

End user decision framework

There is a set of specific decisions to be made by end users when going through the process of offsite procurement. Table 1 presents a set of options with respect to 7 key end user decisions in this process. As such, it represents a decision support template which can guide end users in their interactions with potential suppliers.

The first three decisions in this framework model are relevant to the preferences which an end user will bring to the process of market matching. Once an end user has determined their preferences and engaged with market offerings, they will then need to make a set of decisions with respect to the business structure they wish to pursue. The business structure refers to the second level in the RE process, and involves the division of roles, rights, and obligations between the parties to an offsite RE deal.

The second stage in the decision making process, the business model structure stage, can be seen as addressing decisions four, five and six from the decision framework model and involves the division of roles, rights, and obligations between the parties to an offsite RE deal.

Decision Type	Options available		
Economic structure	Buy	Own	
Project type	New	Existing	
Form of RE procured	Green	Black	Bundled
Deal type	Exclusive		Aggregated
Counterparty	Retailer		End-user
Procurement approach	Physical		Virtual
LGC treatment	Sell	Surrender	Combination

Table 1 – Offsite RE procurement – decision framework

Case Studies

There are a wide range of potential options in structuring arrangements for end user procurement of offsite RE. In order to provide further guidance to potential market participants, a set of case studies were developed which investigate different approaches which have been utilized in the Australian context. Six case studies in varying stages of project completion are presented which reflect actual end user experiences in selecting their approach of choice and managing the process of implementing the arrangement. It should be noted that these case studies do not constitute an exhaustive report on the national offsite RE market activity, but do represent a significant fraction of the projects undertaken to date.

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Acronyms

AFSL	– Australian Financial Services Licence
ASIC	– Australian Securities and Investment Commission
BTM	– Behind the meter
C&I	– Commercial and Industrial
CDS	– Credit Default Swap
CFD	– Contract or Difference
CSR	– Corporate Social Responsibility
EPC	– Engineering, Procurement and Construction
GAAP	- Generally Accepted Accounting Principles
GHG	– Greenhouse Gas
IFRS	– International Financial Reporting Standards
LGC	– Large Generation Certificate
LRET	– Large Scale Renewable Energy Target
MW	– Megawatt
NEM	– National Electricity Market
NGO	– Non Government Organisation
PPA	– Power Purchase Agreement
RE	– Renewable Energy
REC	– Renewable Energy Certificate
RET	– Renewable Energy Target
RMI	– Rocky Mountains Institute
RPS	– Renewable Energy Portfolio Standards

Introduction

Internationally, there is an emerging trend towards end users seeking to procure supply from specific Renewable Energy (RE) generation facilities. In 2015, end user Power Purchase Agreements (PPAs) in the United States underpinned more new wind capacity than schemes like the Renewable Energy Target [1]. This represents a significant shift in the US market, and has diversified the types of off takers willing to enter into arrangements to underpin new RE developments. The first end users active in the US market were technology companies Google, Amazon, Facebook, and Microsoft, which are now being joined by manufacturing and retail businesses like Ikea, Volkswagen, General Motors, and Dow Chemical (Figure 1).

Long term prospects for growth in the end-user off take market are also considered to be good. While Figure 1 shows a reduction in investment between 2015 and 2016, this can be attributed to demand bought forward to 2015 by the expiry of a US tax incentive [2]. Nearly half of Fortune 500 and 60% of Fortune 100 companies have established aggressive climate and clean energy goals, Facebook aims to procure 50% RE by 2018 and Walmart has set a goal to procure 7 billion kWh of RE by 2020 on a longer term path to 100% [1]. Google is reportedly set to procure 100% RE during 2017 [3]. In addition, the RE100 is a collaborative, global initiative of major international businesses committed to 100% renewable electricity across their global operations, including in Australia [4].

Australia has been one of the leading jurisdictions globally in consumer uptake of RE. The uptake of solar PV by end users now exceeds 5 GW, which is largely made up of distributed behind-the-meter installations of less than 10kW [5]. To date, investment in both wind and solar has been underpinned by government policy incentives, in particular the Renewable Energy Target (large and small scale) and state government Feed in Tariffs for small solar. Thus far, however, Australia has not seen uptake of offsite RE by corporate and institutional entities at the scale realised in leading international

jurisdictions such as the US. This study aims to understand the potential for a significant market for offsite RE procurement by such players to emerge in Australia.

In this regard, a set of forward-looking questions arise including: What might an Australian market for offsite RE look like? Who would participate in this market? What are the preferences and views of potential market participants? And how should these participants approach their interaction with such a market? By addressing issues such as these, this study investigates the potential for end users to become a driving force underpinning new utility scale RE facilities in the Australian electricity market context.

Offsite RE procurement requires end users to interact with electricity market arrangements quite differently than when procuring behind-the-meter RE. This creates a new set of challenges, not only for end users, but also other electricity market participants (electricity retailers and project developers) who are not familiar with end user needs and preferences in this area. This report aims to bring some clarity to the nature of these challenges but is not the first to do so. A number of relevant reports have been produced recently, such as World Wildlife Foundation's 'Helping Business – Pathways to Purchase Renewable Energy' [6], Baker & McKenzie's 'Rise of the Corporate PPA' [7] and World Business Council for Sustainable Development's 'Corporate Renewable Power Purchase Agreements' [8]. These reports have provided a useful high level introduction to the concept of offsite RE procurement by end users, focusing on markets in the United States.

This study complements and extends previous work by



Corporate Renewable Deals 2010 – 2016

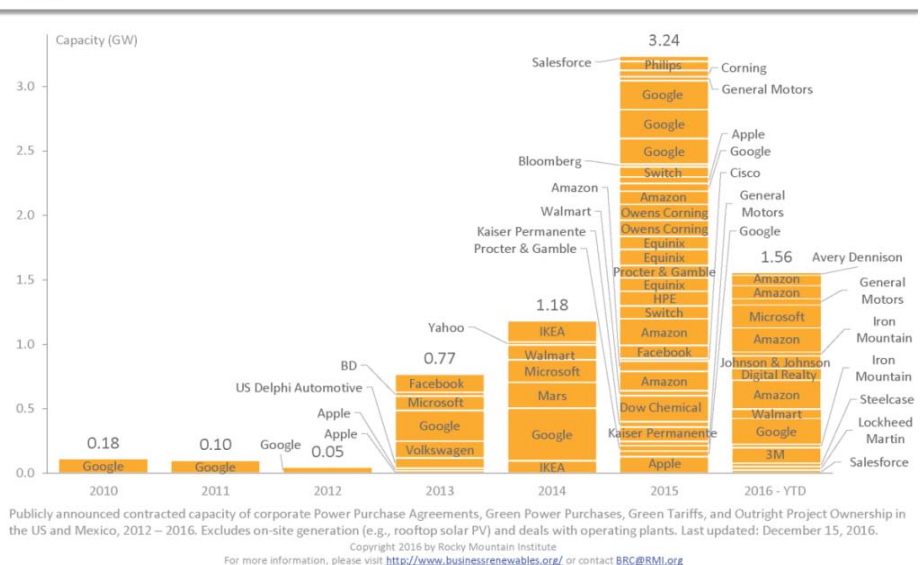


Figure 1 US Corporate renewable energy deals 2010-2016

exploring specific issues for the emergence of an offsite RE market in Australia. It details some of the complexity associated with offsite RE procurement and also aims provide practical advice by:

- providing practical and actionable insights supporting end user decision making when procuring source specific offsite RE;
- providing information that can reduce transaction costs, and therefore contribute to market development;
- characterising the current status of the market for offsite RE procurement including the values, drivers, barriers, and preferences of potential market participants; and
- contributing to a conceptual understanding of the context for, and implications of a new source of demand underpinning ‘in-front of the meter’ RE development in Australia.

First, it is necessary to define offsite RE procurement in relation to other approaches and mechanisms for end user procurement of RE in general.

“An economic relationship between an end user of electricity and a renewable energy generation facility for the transfer of electricity generation, and/or environmental certificate value. The renewable energy generation facility is located on physical premises distinct from the location of end use.”

This definition intentionally takes a broad view. In particular, it includes the procurement of RE through environmental certificates, specifically Large Scale Renewable Energy Certificates (RECs), as well as the pass through of electricity generation value from the RE facility to the end user. It also covers end user ownership of an offsite facility as well as the purchase of RE generated by third parties through Power Purchase Agreements (PPAs). Such a broad view is chosen to provide as much visibility on the set of

users to procure RE in general. The two procurement approaches which have historically been available in Australia have been GreenPower™ (GreenPower) purchased through standard retail arrangements, and the installation of behind the meter RE, usually photovoltaic solar on a roof for the direct use in that building. Figure 2 shows these two approaches as defining the ends of a spectrum with GreenPower at one end and behind-the-meter RE at the other.

In its standard form, GreenPower is mechanism for supporting RE additional to the RET in the Australian National Electricity Market (NEM), via voluntary surrender of certificates created under the RET. GreenPower can be simply purchased through accredited electricity retailers but does not provide the end user with their choice of RE facility, easy scope for facility ownership, or acquisition of energy generation value from a particular RE facility [9]. In contrast to a certificate based mechanism, behind-the-meter RE is highly tangible in the sense that end users can identify the source of generation, capture physical generation, its value, and the value of the RECs associated with that generation. Offsite RE can be viewed as a set of options existing on this spectrum between GreenPower and behind-the-meter RE. As such, offsite RE procurement can be viewed as reflecting a ‘missing middle’ in the set of RE procurement options available to end users.

It should be noted that this report does not present offsite RE as a superior to either GreenPower or behind-the-meter options. Instead it explores the potential for offsite RE solutions to complement and enhance the choice available to end users in achieving their individual organisational goals with respect to RE procurement in general.

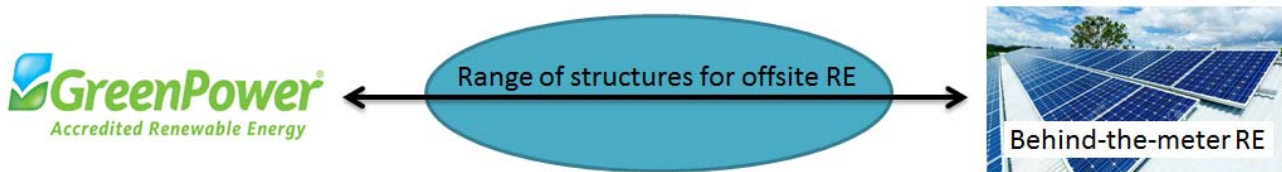


Figure 2: Renewable energy procurement spectrum

options available as possible given the scope of this study.

The development of a market for end user procurement of offsite RE, through any mechanism, represents an evolution in the options available for end

Study Approach

This study adopts an: 1) exploratory; 2) descriptive; and 3) explanatory approach in achieving its objectives of:

- describing how end users procure offsite source specific RE;
- understanding why end users may wish to procure source specific offsite RE;
- characterising who potentially makes up the market for offsite RE procurement; and
- appreciating what factors enable and inhibit market participants to effectively provide offsite RE procurement services to end users.

Qualitative methods were used to achieve these objectives through engaging with existing and potential market participants. In particular:

- **Survey methods** were used to distil market participant values, drivers, and preferences with respect to procurement options and structures. Survey methods were used to develop the decision making framework for offsite RE procurement, characterise the offsite RE market, describe the different approaches available to end users for procuring offsite RE, and illustrate the broader set of issues associated with the development of this new market in Australia's electricity industry context.
- **Case studies** were used as a means of distilling the experience and learning of entities that have put together offsite RE procurement deals. A set of case studies in the Australian context were chosen to illustrate a subset of the different options available to end users.
- **Workshops** were utilized to explore potential market participant views in a group context through discussion of issues regarding different approaches to procuring offsite RE.

The case studies complement the survey by capturing the richness of the context and decision making in actual deals which have occurred. Given the large number of possible deal structures, case studies were chosen to explore a set of archetype approaches which illustrate the range of available options. The survey complements the case studies by distilling the drivers, barriers, and preferences of a range of market participants across different stakeholder groups (end users, utilities, financiers and intermediaries) who have not yet been involved in an offsite RE procurement deal. Therefore, the survey is prospective in that it

primarily considers the potential for future outcomes, rather than the case studies which consider outcomes which have already occurred.

The survey and case-studies both utilised a qualitative semi-structured interview process through which participants were encouraged to speak freely as to their views, both personal and with respect to their organisation. Interviews were generally recorded with transcribed views then coded in NVivo10. The process of coding interview responses allowed themes to be identified across different respondents and respondent groups. The themes that emerged through this process were then used to structure this report. A narrative style is adopted throughout which uses respondent views to explore, describe, and explain the different options, drivers, and perspectives of potential market participants. The survey was conducted in line with UNSW ethics requirements with all survey respondents being de-identified to maintain confidentiality.

Study participants

Potential survey participants were initially identified through a range of sources, with a proportion of those approached then electing to participate. This report reflects the responses of those who participated and therefore results cannot be assumed to represent the views of all potential market participants. While such selection bias is an issue for quantitative surveys, a qualitative interview approach is used here to distil themes, rather than make statistical inferences with respect to wider populations. As such, outcomes described here should be understood to reflect the views of likely early participants in the market for offsite RE procurement in the Australian context.

Overall there were two workshops conducted and 53 interviews performed. End users from a range of different industry groups were interviewed including commercial businesses, manufacturing organisations, property sector entities, local government, universities, and water utilities. On the supply side, 17 electricity retailers, project developers, and intermediaries were interviewed. Table 1 provides the breakdown of participants by group.

End-user interviewed	groups	Supply-side interviewed	groups
Commercial	8	Electricity Retailers	6

Local/State Govt	10	Project Developers	7
Manufacturing	4	Intermediaries	4
Property	6		
Universities	5		
Water Utilities	3		
Total: 53			

Table 1 – Study interview breakdown

This study should be viewed as a snapshot of Australia’s potential market for offsite RE as at 2016/17. Our sincere wish is that it will represent a step forward towards market participants, and society, realising benefits from the development of new markets enabling end user procurement of offsite RE.

Scope and Limitations

An exhaustive investigation of all aspects involved in offsite RE procurement was not possible given the limited resourcing and one year time frame for this study. Therefore, the investigation scope focuses on energy procurement related issues. While electricity network pricing and access are important issues for offsite RE, networks are monopoly entities with pricing that is determined by economic regulation. An investigation of network related issues would therefore be fundamentally different to one focused on market

procurement of energy. As a result, the scope of this study excludes detailed consideration of network issues and instead proposes them as an area for future work.

While there is significant interest from small end users in offsite RE, for instance in ‘community’ purchasing arrangements for retail customers; this study focuses on larger scale end users with surveys and case study interviews conducted exclusively with business, government, and other institutional entities. While some of the themes and mechanisms investigated here are relevant, the specifics of matching local generation to residential and community end users was not investigated.

This is a qualitative study which focuses on understanding the emergence of offsite RE procurement as a new market. As a result, it does not undertake quantitative investigation of economic issues associated with the business case for adopting offsite RE. Such investigations, although important, are also left for future work.

In addressing issues related to the procurement of energy in the context of Australia’s electricity industry arrangements, a range of topics are touched upon including risk management, investment decision making, licensing, and accounting related issues. Exhaustive consideration of these matters is also beyond the scope of this study. As a result, any discussion of such issues is of a general nature only. All potential market participants should ensure that they obtain appropriate legal, accounting, and other professional advice with respect to any decision to procure offsite RE.

Drivers for offsite RE procurement

Fundamental to this study is the question of why end users would want to procure offsite RE, particularly when they have access to existing procurement options through GreenPower and behind-the-meter RE. In addressing this issue in the Australian context, we categorized drivers from survey respondent views into three groups: 1) Drivers of a general nature which influence an end user's decision to procure RE from any source; 2) Drivers for RE procurement which may see an offsite RE solution satisfy end user preferences to a greater, or lesser, degree than other options; and 3) Barriers to other RE procurement options which then become drivers for end users to consider an offsite RE solution.

With respect to the first set of drivers which influence an end user's decision to procure RE from any source, the following themes emerged from end user interviews:

- **Environmental values** - Following cost, environmental targets and Corporate Social Responsibility (CSR) were the most significant drivers for organisations to procure RE at a general level. A number of end user respondents noted that their social license to operate required them to make a visible commitment to emission reduction. Respondents from the Australian arms of international organisations with commitments under global initiatives, such as the RE 100, were significantly motivated by global agreements such as COP21 in their initiatives.
- **Political/community values** - Institutional respondents (government, universities, and councils) were subject to a more general set of political drivers than the corporate social responsibility and social license to operate drivers noted by private sector respondents. Government decision making involves democratic processes with state owned corporation/institutional behavior also guided by policy which is at least indirectly political. Such factors were cited as providing a strong signal for these institutions to align their activities with broader community preferences and values with respect to energy procurement.
- **End user control** - Respondents noted that end users have pretty much no control over anything regarding electricity supply under standard agreements. Cynicism was expressed by a number of end user respondents over the extent to which standard retail competition simply resulted in receiving the same product from a different

supplier at a marginally better price. A perceived misalignment in values between end users and the traditional electricity industry, due to their opposition to the RET, was also noted as a factor behind end users seeking out alternative options. Respondents generally considered offsite RE to be another approach giving them greater control with respect to their procurement of energy in general.

- **Government policy vacuum** - Respondents nominated a lack of direction on climate change and renewable energy from government as a motivating factor behind them taking voluntary action in procuring RE in line with their individual preferences and goals. It was however also noted that, should a future government aggressively intervene to support renewable energy, companies may not experience the same drive to take individual action in this regard.

The second category of driver includes those which see an offsite RE solution satisfy end user preferences to a greater, or lesser, degree than other options. Offsite RE may not represent the optimal solution for all end users in this regard, but these drivers may contribute to an end user ultimately selecting offsite RE over other options.

- **Cost Drivers** - Cost considerations were an overwhelming driver for all respondents in considering different options for procuring RE. A tension was however noted between cost and environmental objectives with respect to energy procurement. End users noted RE procurement as being generally divided between energy procurement teams, who are focused on cost minimisation and environmental/sustainability groups which are focused on activities meeting CSR/environmental targets. The organisational division between these different groups, in terms of their attitudes, was evident in some respondents. There was a general view that procuring RE should either be a lowest cost option or justify a small premium with respect to the marketing/CSR benefits. Views were generally conservative as to the extent to which an additional premium would be acceptable. There are clearly cost differences across the range of RE procurement options. GreenPower is a premium cost option while behind-the-meter renewables displaces consumption from standard supply thereby reducing overall electricity costs. Network costs were a significant issue for offsite RE relative to behind-the-meter options; however end users were still motivated to achieve energy cost savings through the potential for offsite

RE generation value to offset the cost of supply from standard sources.

- **Cost hedging** - The cost minimization objective involves electricity costs not just now, but also costs over time. As a result, respondents considered the opportunity to fix a proportion of electricity costs to be an attractive prospect. A significant number of end user respondents reported management attention as having been focused by recent increases in electricity costs. The prospects of further increases were of real concern and noted by some respondents as likely to erode their international competitiveness. Electricity prices were noted as 'going through the roof', with prices for the RET component having tripled in 2.5 years. The potential for a carbon price was also considered as being a driver of future electricity price increases which might be managed through the procurement of RE. Both behind-the-meter and offsite RE may energy hedging value in this regard.
- **Brand marketing value** - Marketing value arises from the extent to which a firm's procurement of RE aligns with the preferences and values of the participants making up the market in which the firm is operating. Respondents noted that Australia's largest firms are mining companies who participate in global commodity markets which are exclusively cost driven. In contrast, leading US and European firms are often consumer facing and therefore see an incentive to align their energy procurement arrangements with the environmental values of their customers. Respondent organisations with consumer brands were interested in the value of offsite RE as a means of protecting those brands. A reputational benefit was also noted from being a leader and implementing a new technology. The marketing value associated with RE procurement however was generally considered as being the 'ability to tell the story' around the source of the procured RE. Therefore marketing value was influenced by the source specific traceability of the RE being procured and the nature of the relationship between the end user and the RE facility.
- **Traceability/Tangibility** – Respondents considered a key benefit of on-site and source specific off-site RE as being able to point to a facility and say "this is powering our factory". The importance of source specificity for communication and marketing benefits was a significant theme in end user responses. While behind-the-meter RE was considered especially traceable and tangible, offsite RE was also considered traceable and tangible

depending on the commercial arrangements in place.

- **Flexibility for multi-site operations** - Offsite RE was noted as being a potentially simpler, single bullet, solution for an end user with a large number of sites who may wish to avoid the complexity and patchwork nature of site level behind-the-meter solutions. An offsite RE facility may neatly fit in to a strategic plan for renewable energy procurement by a large corporate in this regard.

The third category of driver involves barriers to behind-the-meter RE procurement options, and general attitudes towards GreenPower, both of which may then act as specific drivers for end users to consider an offsite RE solution.

Barriers to behind-the-meter renewables

End user respondents generally considered overall benefits from RE procurement to be maximised by investing in behind-the-meter RE installations. This was a clear preference, primarily due to the network cost component of an offsite RE solution. End user respondents however, noted a range of barriers to behind-the-meter installations which would then act as drivers for them to consider an offsite solution.

The simplest barrier to behind-the-meter RE installations was space. Depending on the nature of the site, behind-the-meter installations may not be a practical option. Commercial buildings in urban areas, including manufacturing facilities, were noted by respondents as having space constraints which made behind-the-meter RE either impractical or insufficient to achieve desired outcomes. In addition to space availability, a number of other facility related issues were noted by respondents. A number of end users cited the age and structural integrity of roofing, and the capacity of legacy electrical installations (switchgear), as issues acting as barriers to significant levels of behind-the-meter generation. In addition, space which may be otherwise used for behind-the-meter RE has an opportunity cost associated with its availability. Respondents noted the value that was placed on the flexibility of having space available for building services and free for facility re-configuration/re-building.

- Aside from physical facility related issues, a major barrier to behind-the-meter installations arose with respect to end users which occupy premises that are leased. The 'tenant-landlord problem' arises from the reluctance of a landlord to make investments which would benefit the tenant. The willingness of a landlord to invest in behind-the-meter generation when energy costs are the

responsibility of a tenant organisation falls into this category. While tenant-landlord related incentive issues can be resolved through a range of mechanisms, the associated negotiation and contracting costs can be significant. This was an issue for a number of very large end user respondents who noted landlord negotiation as a driver for them to consider an offsite RE option. Even if a landlord allows an end user to install (and own) behind-the-meter solar on a rooftop, the potential mismatch between long asset life and a shorter lease term was also considered a barrier.

- End user respondents were generally cool on GreenPower as an option for RE procurement. It was noted as being an artificial, abstract mechanism that lacks tangibility. A perception also existed amongst some respondents that GreenPower lacks integrity. This was generally part of a view around the acquisition of certificates which involved concerns about 'dodgy offsets'. The major issue with GreenPower in the eyes of end user respondents however, was the additional cost. This cost, which has risen significantly in recent years, was considered to make GreenPower an uneconomical option. Some respondents considered a 'do it yourself' GreenPower which involves acquiring Large Generation Certificates (LGCs) on the open market for voluntarily surrender would be a cheaper, more flexible option. GreenPower's lack of generation source specificity was also a major drawback in the eyes of some respondents, which was seen to substantially limit the marketing and communication value of RE procurement.
- While views were generally negative towards GreenPower there were some exceptions. Some end users were very positive about GreenPower

considering it a credible, administratively simple, option for procuring RE. These end users noted that GreenPower didn't involve additional contractual complexity and thereby needed far less management time than other options such as behind-the-meter or offsite RE. It was observed however, that the mechanism behind GreenPower was not well understood by many respondents.

With respect to selecting offsite RE over GreenPower, end user respondents indicated that it was a more tangible option with better marketing value, potentially lower cost with better electricity price hedging opportunity, and offered more control and choice particularly with respect to source. The potential to open up local offsite RE options was considered by some as providing a better alignment with local community/political drivers. In contrast, GreenPower was seen to be a simpler, less administratively complex option which doesn't require long term offtake agreements.

In respect to choosing offsite RE over behind-the-meter options, end user respondents expressed a clear preference for behind-the-meter solutions with respect to the financial benefits considering high (and increasing) network costs. The marketability and traceability of behind-the-meter options were also considered superior. The relative simplicity of a behind-the-meter solution at a contractual level, and the community/CSR value of behind-the-meter generation were also broadly seen as an advantage. Where respondents considered offsite RE to be a preferable option was in respect of the presence of physical or economic barriers to behind-the-meter generation and the potential for a single generation solution to cover activities across a large number of sites.

The offsite RE procurement deal process

Should an end user see a set of drivers which leads them to pursue an offsite RE procurement option, they will need to go through a process of: establishing preferences with respect to the type of offsite RE they wish to procure; engaging with potential suppliers and evaluating the options available to them; arriving at business (contractual) structures with chosen suppliers; and negotiating the contractual specifics around term, pricing, financial settlement and allocation of risk. This process will be iterative with end users and suppliers likely evolving their positions through interaction across each of these stages.

This section introduces two related models of this process. The first is divided into three discrete stages through which end user preferences are translated into specific 'deal' outcomes. The second model characterises the same process as a set of decisions to be made by an end user in choosing an offsite RE solution meeting their needs.

Process 'funnel' model of an offsite RE deal

The three level model presented in Figure 3 evokes the process through which market participants go in procuring offsite RE and is divided into the following stages.

- **Market Structure** – involves the interaction between parties on both the supply and demand side of the market depending on the extent to which their individual preferences and objectives align;
- **Business Model Structure** – the different value chain configurations which are available as options to the parties entering into a procurement arrangement. Business model structures involve the division of roles, rights, and obligations between the different parties involved in an offsite RE deal.
- **Contract Structure** – represents specific contractual provisions including the term of the agreement, arrangements for pricing, settlement of financial transfers, and dispute resolution provisions.

The cost of passing through these stages includes negotiation/legal costs, information costs, and

contracting costs amongst others. These are the transaction costs associated with putting a deal together. Depending on the approach, transaction costs can become an issue, particularly if there is significant contractual complexity. While transaction costs can be significant, they can also be expected to decline as the market matures and participants, and their advisors, become familiar with the process and options involved.

This study primarily considers issues at the top two levels of this process. Contractual specifics will vary widely and be a function of the specific circumstances of the parties involved.

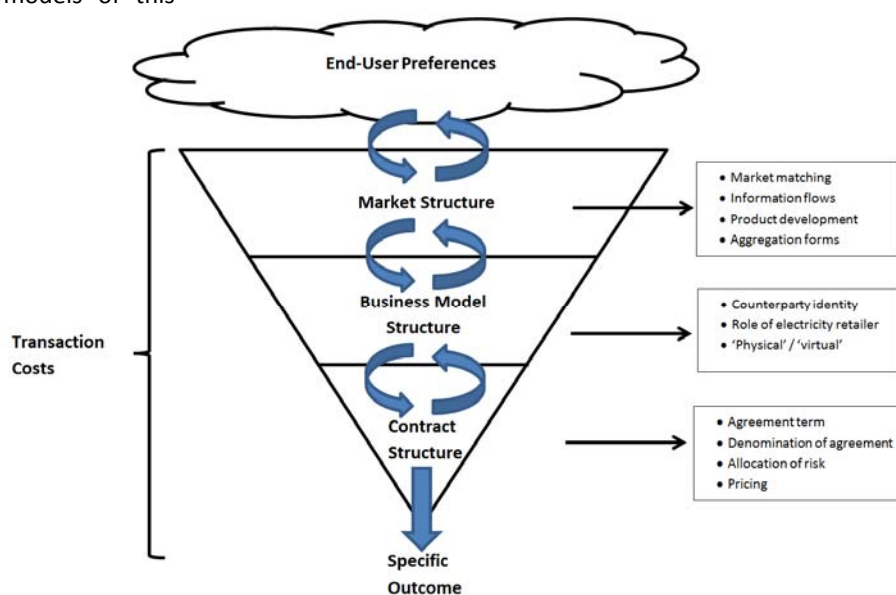


Figure 3 – Process 'funnel' model of an offsite RE deal

Decision framework model of an offsite RE deal

The 'funnel' model of an offsite RE deal provides a high level view of the process through which end user preferences are translated into outcomes. An alternate, more detailed view can be obtained by characterising the specific decisions made by end users going through this process. Table 2 presents a set of options with respect to 7 key end user decisions in this regard.

Economic structure	Buy	Own	
Project type	New	Existing	
Form of RE procured	Green	Black	Bundled
Deal type	Exclusive		Aggregated
Counterparty	Retailer		End-user
Procurement approach	Physical		Virtual
LGC treatment	Sell	Surrender	Combination

Table 2 – End user decision-option framework

These 7 decisions give rise to 288 possible combinations, each of which can be viewed as representing a distinct offsite RE procurement structure. Not all of these combinations are either feasible or desirable and a smaller subset can be expected to dominate as the market matures. The workshops and case studies investigated a set of structures which illustrate a range of possible archetypes from the set defined in Table 2.

End user preferences

End user preferences with respect to the offsite RE they wish to procure are represented by the first three decisions in Table 2. These preferences arise in respect of the drivers seen by each organisation, and will guide an end user’s interaction with potential suppliers at the market matching/structure phase of the deal process. The ultimate purpose of any market is to satisfy end user needs and desires in a manner which minimises transaction costs while acceptably sharing benefits across the value chain. Therefore, the preferences which end users bring to the process of market matching will play a major role in determining the mix of offerings in the market.

Economic structure	Buy	Own	
Project type	New	Existing	
Form of RE procured	Green	Black	Bundled

Table 3 – End user decision-option framework – End user preferences

This section distils end user views, as expressed by survey respondents, with respect to the first three end user decisions, specifically 1) Buy vs own, or whether the end user elects to own an offsite RE facility or enter into a contractual arrangement to purchase the output of a facility owned by a 3rd party provider; 2) New vs existing, involving whether the end user seeks to procure RE from an existing facility (either already built or yet to be built but financed) or one for which the investment is made specifically to meet their requirements; and 3) the form of RE procured, involving whether the end user is seeking to procure RECs as offsets to match electricity purchased under standard retail arrangements, or procure both electricity generation value and/or RECs from facility generation.

Economic structure - buy vs own

An end user can choose whether to enter into an arrangement with a third party provider to buy the output from an RE facility, or whether to own an offsite RE facility themselves. End users nominated capital, its availability, and cost as key determining factors behind their preference in this regard. Given the capital intensive nature of major forms of RE, the lowest overall cost outcome will come from the party with access to the lowest cost capital acting as the facility owner. Respondents noted that the source of financing and the opportunity costs associated with on-end-user-balance-sheet financing were important in this regard.

In addition to cost of capital issues, a major theme was the desire to focus on core business interests. Firms were reluctant to enter into endeavours outside their area of expertise. There was a view that risks outside of core business areas should be outsourced to experts and managed through contractual arrangements rather than bought in-house. Some respondents also noted legal and tax implications associated with their business structures which acted as barriers to owning non-core business related assets, such as electricity generation facilities. Respondents from Real Estate Investment Trusts were an example of such a group. Overall, respondents from private sector organisations expressed a preference to buy output from a third party rather than own a facility themselves. The exceptions were those organisations with land holdings in locations other than their main end use facility. Those respondents saw opportunity to use these land holdings to host offsite RE facilities that they may then own.

While some firms were keen to focus on core business and outsource RE procurement to 3rd parties, entities which had EPC capabilities and experience owning and

operating utility systems were more comfortable acting as the owner of an offsite RE facility. Councils and other government entities which had access to low cost capital, backed by state government Treasuries, and appropriate in-house skill sets were more amenable to ownership as an option. These entities also generally owned land which could be used to site RE generation facilities. An attractive factor for these types of entities was their very long term view of infrastructure assets. Such a long-term view saw these organisations value capital retention and the residual value of a RE facility well beyond a conventional PPA term.

New vs Existing

An end user may prefer to procure RE from a new facility which is built specifically to satisfy the requirements of that end user. Alternatively, an end user may wish to procure RE from a facility which is already financed and built. Respondents considered the question of new vs existing to be largely moot at this point given the lack of un-contracted RE generation in the market at present. A number however identified it as a future prospect as existing facilities start to come off the back of existing long term PPAs.

A range of advantages and disadvantages were nominated by end users in this regard. These substantially relate to cost, term flexibility, and additionality. Project developers were of the view that if end users wish to realise the lower cost pricing which reflects the underlying economics of the contracted plant, then they need to accept a longer term off-take agreement required to underwrite new generation. Existing generation which is not facing a financing barrier was considered likely to be more flexible, and able to contract for shorter terms. These shorter term contracts would however reflect market prices and be higher cost than long term off-takes for new generation, particularly over the medium term. Some respondents considered contracting with existing generation to be more like business as usual and aligned with standard electricity procurement terms. Other respondents were firm as their desire for new generation, either for cost or additionality reasons.

Additionality in respect of generation from RE sources can be claimed at a range of levels from regulatory additionality in respect of the RET to financial additionality. In order to achieve financial additionality and all related GHG emission benefits, an end user would need to sign a PPA which underwrites new generation which would not have otherwise been built. This would require a long term offtake agreement with new generation. Discussions with end users about additionality were challenging and it is evident that not

all end users fully appreciate this issue, particularly given its importance in making environmental claims.

There is clearly a trade-off between cost and term which is likely to be a strong driver of end user preferences with respect to the choice between new versus existing generation. Additional market maturity will however be required before any definitive view can be taken with respect to end user preferences in this area.

The form of RE procured – ‘Green’ vs ‘black’ vs ‘bundled’

End user procurement of offsite RE can take a range of forms from arrangements to purchase RECs as offsets (‘green’) to arrangements which see the value of RE generation passed through to end users as part of their electricity procurement (‘black’). Arrangements can be structured to procure green only, black only, or green and black bundled together. Green only may be viewed as an option on the RE procurement spectrum which is closer to the GreenPower end. Indeed, some respondents noted that such an approach can be a type of do-it yourself GreenPower, potentially at lower cost. In contrast, the acquisition of RE generation value, either under contractual arrangements or through facility ownership, lies on the behind-the-meter side of the RE procurement spectrum.

Electricity retailer respondents noted a trend towards corporate end users acquiring RECs separately before transferring them to the retailer for surrender against the LRET component of their electricity consumption. This is easy from the perspective of an end user as there are no licensing or other restrictions which apply to participation in the REC market. End users choosing this option were however noted as generally seeking to reduce the mandatory LRET component of their bills rather than procuring RE in order to offset their electricity consumption.

End user respondents expressed a general preference for acquiring generation value (‘black’) along with RECs (‘green’) under an arrangement for offsite RE procurement. A number of reasons were provided justifying this preference. The bundled price was viewed as offering the opportunity for lowest cost outcomes. The very high cost of RECs and the increasing price of market procured electricity combined to make a long term agreement for both black and green the general preference of many. Marketability, tangibility, and cost/hedge value were also noted as being enhanced by an arrangement which saw generation value procured.

It was however unclear the extent to which end users were aware of the physical reality of the electricity system as being unable to match supply and demand across different sites at a physical level. In addition, Australia's electricity market design does not include bi-lateral contracts in formal electricity market option, unlike some international electricity markets. Therefore, any pass through of generation value under Australia's electricity market arrangements is purely a financial construct. A more complete understanding of such issues on the part of end users may see a shift in the preferences of some in this area.

A key drawback with procuring generation value is the extent to which it involves additional complexity in contractual arrangements. End users valued simplicity with some becoming un-comfortable when the interviewer raised the risks which required management under a RE generation value ('black') procurement option. While a desire for RE generation value clearly exists, this desire may also be tempered by the complexities associated with implementing arrangements which enable such procurement.

Market structure

At the top level of the 'funnel' model shown in Figure 3, is the Market Structure stage which involves the process via which parties on both the supply and demand side match depending on the extent to which their individual preferences and objectives align. The end user preferences discussed above guide their engagement with other market participants, such as intermediaries, electricity retailers, and project developers, in evaluating market offerings and negotiating outcomes meeting their organisational objectives.

A schematic representation of the market for offsite RE procurement is presented in Figure 4 showing five groups which make up the supply and demand sides of the emerging market for offsite RE.

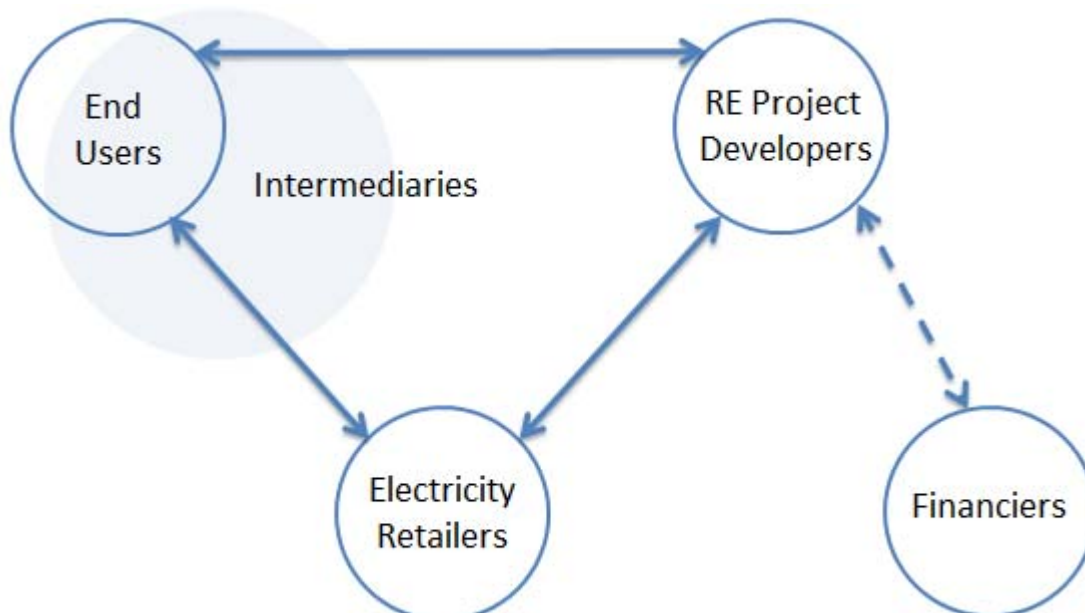


Figure 4 – Tri-partite model of offsite RE procurement market

End users, electricity retailers, and RE project developers can be viewed as the three key market groups. In addition, Financiers and Intermediaries, such as consultants and energy brokers, represent a secondary group given their role influencing decisions made by the principal three. The triangular relationship evident in Figure 4 indicates a tri-partite arrangement between end users, project developers, and electricity retailers. This section focusses on this market level by exploring the perspectives that each of the three key groups bring to the market.

Prior to considering the perspectives of each participant group, it is worth noting that if the end user only seeks to procure RECs as offsets, the relationship with the electricity retailer with respect to RE

procurement is simple or even absent. While an agreement with an electricity retailer is required should the end user wish to surrender procured RECs to cover the LRET component of their electricity consumption, respondents considered this agreement to be relatively simple in nature. In contrast, end users who wish to procure RE generation value may require a more involved relationship with an intermediate electricity retailer depending on their procurement approach.

End User Context

Offsite RE procurement, motivated by a mix of cost, CSR, marketing, and environmental drivers requires organisational co-ordination between the sustainability team, energy procurement team, and senior executive team whose sign off is ultimately required. Arriving at a consistent internal decision across these parts of the

business was noted as the first and most important challenge to getting organisational buy in for an offsite RE deal to go ahead. End users considered risk adverse decision making by senior executives as an issue in this regard. While an aversion to risk may be rational given the level of market maturity at this time, understanding was also seen as a challenge associated with obtaining management buy in.

End user respondents were generally from organisations for which electricity procurement was not part of their core business. While electricity is a major cost center for some, and increases in price are reported as having caught management attention, respondents generally noted insufficient information and in-house skills as a barrier to evaluating the opportunities and risks associated with an offsite RE

procurement deal. An information asymmetry between end users and other electricity industry participants (electricity retailers and project developers) was evident, which puts them at a disadvantage when negotiating offsite RE procurement deals. While internal capacities varied significantly between respondents, a number reported being heavily reliant on advice provided by external parties such as consultants and electricity brokers. The role of these entities, shown in Figure 4 as intermediaries, is therefore noted to be of critical importance in addressing some of the information/skill asymmetry issues faced by end users when participating in the market for offsite RE.

End users come to the market with a historic approach to electricity procurement that involves tendering for retail electricity supply agreements, often through brokers, for terms of up to three years. Long term agreements for a period of over 5 years were mentioned by some as requiring board approval. Board approval further exacerbates the challenge of getting management buy in for an offsite RE deal of a term sufficient to underpin new generation investment and achieve lowest cost outcomes. End user respondents overwhelmingly nominated longer term electricity procurement contracts to be a significantly challenging proposition for their businesses. The tension between term and cost was evident.

Entering into a long-term agreement underpinning new generation requires an end user to take a long-term view of their electricity procurement needs. The ability to take such a view varied significantly across respondents. End users who, due to their business models, value operational flexibility were not in a good position to predict their electricity consumption needs into the longer term. In contrast, businesses which own assets for which long term electricity consumption is more certain were in a better position to take a long-term perspective on electricity procurement. Institutional entities and those owning long lived assets fall into this category. As a result, there will be a mix of different appetites for term, and the market will need a mix of different offerings in order to cater for appetites in this regard.

Electricity Retailer Context

Electricity retailers play a fundamental facilitating role in not only passing RE generation value through to end users but also (depending on their role) managing financial exposures associated with the balancing load required to manage RE intermittency. As businesses, electricity retailers need to be able to make a profit

from providing offsite RE related services in order to enter the market. In this regard, retailer respondents noted that their profit margins on commercial and industrial end users were small and that any increase in costs associated with additional administrative or risk management requirements would need to be passed through to end users. This was particularly a concern given the bespoke nature of offsite RE deals at present. Not only were contractual and other transaction costs high, but the additional costs associated with doing bespoke settlement was noted as needing significant standardization, and end users who were willing to bear higher costs.

A divergence was noted between the large electricity retailers and their smaller competitors with respect to their willingness to facilitate offsite RE procurement. Larger electricity retailers were generally reluctant to participate in this study and those that did were of the view that a significant number of potential customers would be required to justify business attention. There was concern that the potential size of the market was insufficient to warrant their entry. Some of the smaller electricity retailers were of the view that the large retailers, as owners of significant generation portfolios, faced a set of commercial incentives which work against their willingness to facilitate linking end users with specific sources of generation.

The smaller and mid-size electricity retailers who participated in this study were, in contrast, more open to providing services facilitating offsite RE procurement by end users. The value of customer acquisition, retention, and market differentiation were factors which saw these retailers willing to enter the market even though thin profit margins were still noted as an issue. Some of the newer retail market entrants in particular saw an opportunity to avoid having to compete solely on price as additional services, such as facilitating offsite RE, could grow their customer base and improve customer loyalty.

While there is a clear opportunity for smaller electricity retailers to satisfy demand for offsite RE, they face some barriers that their larger competitors don't. One of those barriers involves their lack of track record in the eyes of end users who may be risk adverse when seeking retail partners. Smaller retailers also lack large balance sheets, and their resulting credit rating limits their ability to facilitate the market, particularly when it comes to acting as a counterparty to any PPA with an RE facility. The smaller newer-entry retailers cited this as a fundamental challenge. While large electricity retailers may enter the market once it has grown to a point where they can attract a critical mass of customers, initial market growth is likely to rely on

small and midsize retailers, some of whom face significant barriers.

The primary function of an electricity retailer in Australia's electricity market context is as a manager of financial electricity market risk on behalf of end users. Electricity retailers offer end users a generally variable volume fixed price electricity supply in the context of electricity market prices which can range between \$14,000/MWh to negative \$1000/MWh. Electricity retailers manage this risk on behalf of customers by entering into a portfolio of financial and physical hedges. Therefore, an end user's price of electricity not only covers the cost of generating electricity matching their load but also includes administrative costs, a profit margin, and cost of managing the market risk associated with that supply.

A strong theme from electricity retailer respondents was that end users would need to bear an additional risk premium to facilitate the pass through of RE generation value which displaces standard supply. Intermittent RE resources by their nature result in a temporal mismatch between end user load and generation. This temporal mismatch produces a residual exposure to electricity market prices which needs to be allocated and managed. End users are also generally variable load, so backing variable load with intermittent generation sees a compounding of risk because there are non-firm variables on both sides of the relationship. One respondent compared the generation value of intermittent RE to a standby airline ticket with the risk premium being like the price difference between the standby and normal airline ticket. Retailers noted that end users were generally un-aware of this additional risk premium and reported difficulty in communicating and justifying it. Retailers however regarded themselves as the natural agents to manage such risk and were comfortable with the role of providing such services to end users procuring offsite RE.

A number of retailer respondents noted that sophisticated electricity brokers were important repositories of knowledge and skills in assisting end users to procure offsite RE, particularly when pass through of generation value was desired. Concerns were however aired that there was significant variation in electricity broker skills with some lacking the ability to understand the issues and effectively advise their clients in this area. While energy brokers were considered to be critical to the success of end users procuring offsite RE, poor brokers were also noted as a risk and a reason that good projects may not get off the ground.

Project Developer Context

Project developers were interested in end users as a new type of off taker which would increase the diversity of their effective customer base. Diversity was considered valuable as it enabled them to 'cut past' the large incumbent retailers in getting new RE built so as to meet the RET. A number of project developers saw value in the message that would be sent to the large electricity retailers, specifically the message that they don't have the market power to delay the delivery of new capacity. It was noted that large incumbent retailers currently have the power to drive PPA prices down as few other off-takers had credit ratings to underwrite new RE developments. It was also noted that corporates often have credit ratings which are, in some instances, better than those of the large electricity retailers. The future entry of corporates willing to sign off-take agreements was therefore considered to be beneficial in diversifying the market available to project developers.

Project developers reported their fundamental constraint to be financier requirements. In particular, the amount of debt which would be supplied by banks. Debt availability was reported as being determined by the size and length of any off-take agreement which underpins the project. The term of an off-take agreement and credit worthiness of the off-taker determine the level of risk associated with a new project. An off-take agreement which locks in revenues for the project developer effectively de-risks that project in the eyes of the financier which then reduces the requirement for equity and overall cost of financing.

Given that RE facilities are capital intensive with low operational costs, the cost of financing largely determines the cost of energy under an off-take agreement. Therefore, a longer term agreement with a credit worthy off-taker would produce a lower overall cost of energy than a short term agreement with an off-taker with poor, or no credit rating. The key risk nominated by project developers was the counterparty default risk which may arise given the long term nature of agreements underpinning new RE generation. In this regard, it was noted that end users come and go and if there is a decade long agreement, there would need to be a reasonably high level of confidence that the end user will be around to see its end. The longevity of smaller electricity retailers was spoken about in the same terms. This situation was cited by a range of respondents as being a serious challenge for smaller, newer retailers in facilitating offsite RE procurement by end users. Counterparty risk is generally managed using mechanisms such as Credit Default Swaps (CDS),

which were noted as not yet widely available for most Australian C&I customers. An additional fee would be required in order to engage a bank to underwrite a CDS for a new C&I customer which would further increase the risk premium with respect to the deal.

A long term off-take agreement is generally required by banks and other traditional financial institutions that are risk averse in their approach to lending. A number of project developers however noted that private equity investors with a higher tolerance to risk were available to fund RE developments without the security of a long term off-take. Projects without a long term off-take agreement are referred to as 'merchant' projects as their revenue is subject to electricity market price volatility. Merchant projects are therefore likely to be amenable to shorter term, more flexible,

contracting than is the case with traditionally financed plant. It should, however, be emphasised that such short term options are still likely to reflect expected market prices, and therefore be higher cost than a long term contract option.

In line with end users, project developers also had a clear preference for an off-take agreement which bundled generation value pass through ('black') with RECs ('green'). Historically RECs were the harder part to sell and are not underpinned by a real physical market like electricity. The government retains the ability to kill the RET at will. Bundling REC and generation value would also manage the market pricing risk associated with the potential implementation of carbon pricing. The alignment of project developer and end user preference in this area is potentially significant.

Market Development

A market requires mutually beneficial exchange between parties in order to form. As each participant group brings their own perspectives, preferences, and objectives to the market, the offerings which can be expected to emerge as the market matures will be those which see the preferences and objectives of each participant group acceptably satisfied. This is conceptually illustrated in Figure 5 which shows a venn-diagram representation of the set of possible outcomes acceptable to each participant group. The region of intersection between these sets then represents ‘the sweet spot’ set of market offerings which produce an acceptable division of benefits between each group. Market development/maturation can then be understood as an iterative process of interaction between end users, electricity retailers, and project developers to collectively discover the set of market offerings in this ‘sweet spot’. This section discusses some key factors in understanding and enhancing this process of discovery.

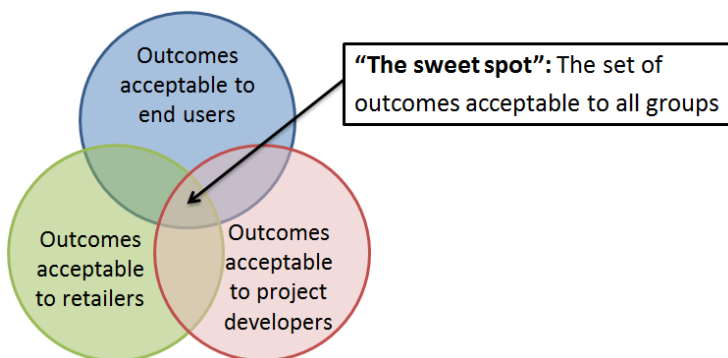


Figure 5 – Venn-diagram model illustrating the set of outcomes acceptable to all groups

Key to the efficiency of market maturation will be the way in which market participants interact and the information available to guide and assist that interaction. End user respondents were particularly interested in who would provide such assistance given their information and education challenges. While electricity retailers generally considered themselves to be the natural interface between end users and the electricity industry, other respondents didn't consider electricity retailers to be a neutral party suited to playing an education and information dissemination role facilitating market development. Electricity brokers on the other hand were noted as having commercial incentives which were aligned with those of the end user. It was also observed that brokers have played a significant role in the development of the

offsite RE procurement market in the US. While capable, sophisticated electricity brokers clearly have a role to play in the process of market matching, they are also businesses for which information has commercial value. Therefore, electricity brokers are not entities who are likely to disseminate information and education as a public good informing wider market development.

Respondents were generally of the view that government was not an ideal entity to directly perform a market development role. Political drivers and incentives in this regard were seen as a risk to commercial outcomes. An alternative is for an independent non-profit entity, such as an NGO, to play a public good education and information provision role. With respect to NGO activity in the Australian context, a number of respondents were part of the Renewable Energy Buyers Forum (REBF), an activity run by World Wildlife Foundation (WWF). The REBF included companies, institutions, and state and local governments who met regularly over 2015 and 2016 to discuss issues related to the implementation of an aggregated offsite RE buyers group, the Renewable

Energy Buyers Aggregation Project [10]. The REBF was however a process which was framed around a defined objective being to enable group procurement with respect to a specific project, rather than providing a wider market development/facilitation role that might include actively helping parties qualify different offsite RE procurement opportunities.

An example of a 'market-making' NGO is the Rocky Mountains Institute (RMI), which has taken a leading role in corporate engagement and offsite RE market facilitation through its Business Renewables Centre (RMI-BRC). The RMI-BRC is a member-based platform that streamlines and accelerates corporate purchasing of off-site, large-scale wind and solar energy, includes 178 different members, and boasts 6.6 GW of new offsite RE development completed by its members who represent a cross section of some of the largest corporations in the US [11]. The RMI-BRC provides a range of information resources for members including guides, primers, and transactional templates. They offer a market platform for matching end users and suppliers, as well as running a series of events and meetings to bring market participants together for group based learning and interaction. The RMI-BRC represents a particular NGO based model of market facilitation that would represent a significant evolution of efforts in Australia, such as the WWF-REBF. Whether building on the work of the WWF-REBF or through a separate

entity, there is scope for an appropriate institution to facilitate market development in the Australian context.

Standardization - products vs services

In addition to the broader challenge of market facilitation and education/information provision, a range of respondents reported a desire for more standardisation in market offerings. Respondents were widely of the view that there is currently a lack of contractual structures, established businesses, and pricing to support market participants effectively and efficiently doing deals. A common request was for an ‘off the shelf model’ which could be drawn upon to avoid the complexity and transaction costs of implementing an offsite RE procurement deal from scratch.

In respect to standardisation, there is a tension between demand side and supply side preferences as the driving force for deal structure and market activity. In order to investigate this tension, workshop

participant views were sought on market development occurring through the following two modes:

A product led approach to the development of an offsite RE market involves the supply side developing a set of standardised offerings (products) from which end users choose.

A service led approach to the development of an offsite RE market involves the end user engaging with the supply side in order to seek the design of specific, bespoke, solutions which meets their needs.

These two modes are simply represented in Figure 6 which shows the product led approach involving electricity retailers and project developers co-ordinating to define the parameters of an offer ‘product’ for selection by end users. The service led approach, is alternatively represented as an end user engaging with suppliers, potentially seeking a bespoke solution. The mode of actual market development will likely not be either product led, or solutions led in its entirety but instead involve a mix of the two. This mix may involve a hybrid ‘menu’ of options ranging in degrees of standardisation.

Respondents were clear in their view that the market to this point has been driven through a solution led approach to offsite RE procurement. This situation is due to end users seeking outcomes in the absence of a market mature enough to have a set of standardised offerings in place. A significant number of respondents, both end user and retailer, considered only a limited number of end users to be sophisticated enough, and willing to bear the transaction costs, of putting an offsite RE deal together via a solution led approach. As a result, market development beyond a very limited niche was considered to require the supply side (electricity retailers and project developers) to effectively bear the upfront contracting and implementation costs on behalf of end users through a product development process.

In addition to enhancing the prospects of market growth, respondents also indicated some additional benefits which may flow from the development of standardised offerings. These include the potential for offsite RE offers to act as another point of differentiation in the retail electricity market. It was noted that competition for retail electricity supply was generally based on price with a few retailers bundling in offers such as behind-the-meter solar. The availability of standardised offsite RE offerings would enhance customer choice and potentially lead to a more competitive retail electricity market in general. In addition, the development of standardised offerings also offers the potential for retailers to avoid the

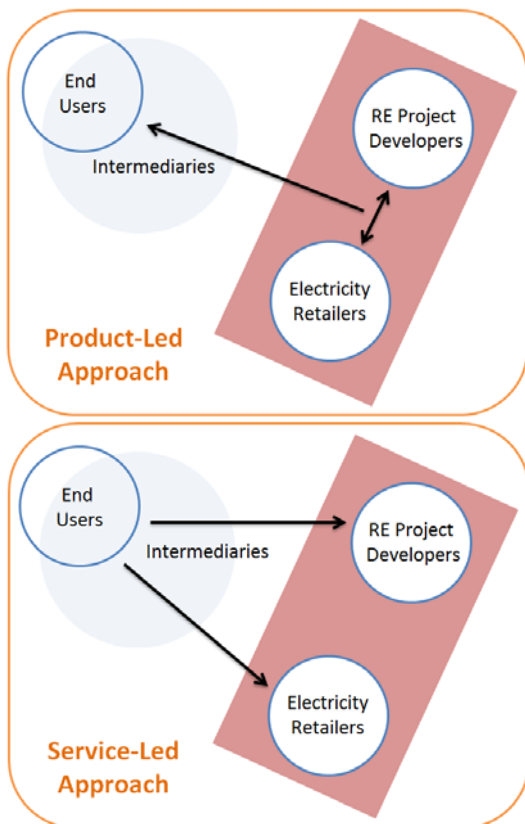


Figure 6 – Product versus solution model for offsite RE procurement

administrative burden associated with doing individual customer settlement based on bespoke end user agreements. One electricity retailer respondent was

particularly clear that these administrative costs were unacceptable from a business perspective.

Business Structures

Once an end user has determined their preferences and engaged with market offerings, they will need to make a set of decisions with respect to the business structure they wish to pursue. The business structure refers to the second level in the RE process 'funnel', shown in Figure 4, and involves the division of roles, rights, and obligations between the parties involved in an offsite RE deal. As a first order investigation of the different business structures available in respect of offsite RE, this section considers the subset of end-user decisions outlined in Table 4.

Deal type	Exclusive	Aggregated
Counterparty	Direct	Intermediated
Procurement approach	Physically allocated	Virtual

Table 4 – End user decision-option framework – Business structure decisions

Deal type – exclusive vs aggregated

The first end user decision at the business structure level involves whether to seek an exclusive agreement, or participate in an aggregated buyers group.

Deal type	Exclusive	Aggregated
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A fundamental tension exists between an end user's desire for a low cost outcome and the RE project scale required to achieve such an outcome. While the optimal scale of an offsite RE facility will depend on the generation technology and resource involved, the efficient size of a large scale RE development, particularly a wind development, is likely to be larger

than the total energy consumption of even very large end users. Therefore, in order to achieve a low cost RE procurement outcome, some form of aggregation will likely be required for most end users.

Some end user respondents valued independence more than others when deciding whether to participate in an aggregation group or pursue an exclusive arrangement. End users who considered themselves large enough questioned whether the loss of independence would justify any gains achieved through being part of an aggregation group. The flexibility to choose the approach which suited them and negotiate with electricity retailers and project developers unencumbered was cited as a factor motivating an exclusive arrangement. There was also a perception that participation in an aggregation group may dilute the marketing and communication value of an offsite RE deal.

A factor cited in support of participating in an aggregation group involved the validation associated with not acting alone. Joining a group of other companies was considered to share decision making risk in this regard. The information and risk sharing involved in such a joint decision making process was considered to provide additional comfort to management thereby enhancing the chances of buy in. It was also suggested that, despite potentially being large enough to pursue an exclusive agreement, participating in an aggregation group may provide an organisation with a chance to learn and gain experience prior to pursuing a larger scale, higher risk, exclusive agreement.

With respect to approaches to aggregation, the following two models were identified from discussions with market participants:

- Buy-side aggregation – involves end user load pooled via an intermediary who holds a single off-

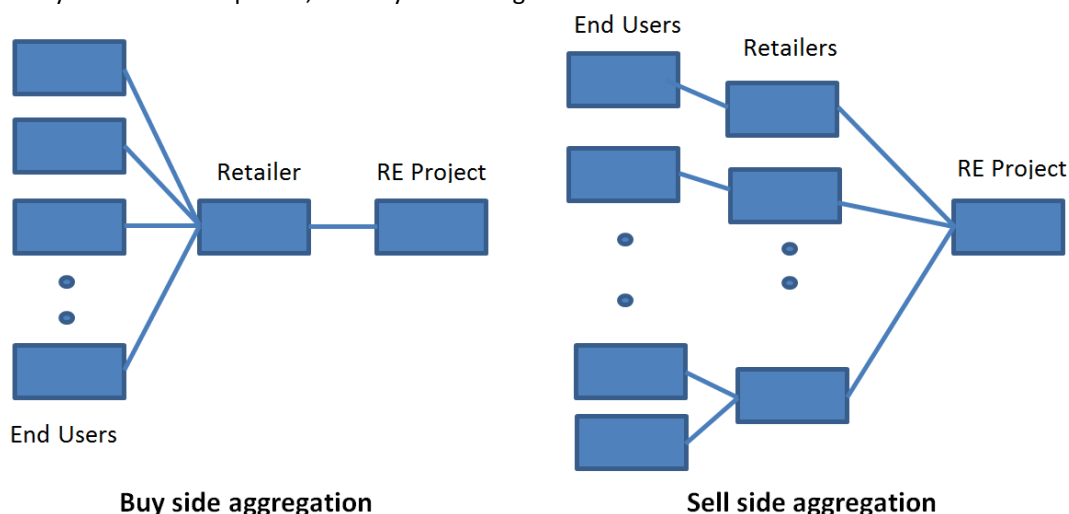


Figure 3: Buy-side and sell-side models for aggregation

take agreement with the RE facility of interest.

- Sell-side aggregation – involves multiple off-take agreements with respect to a single RE facility. This model could involve either allocation of project output or physical allocation of the project itself.

Buy-side aggregation is the approach which conforms most closely to established practice and was generally well understood and accepted by respondents. Project developers were supportive of such an approach as long as the counterparty to the PPA was appropriately credit worthy. It was the complexity associated with negotiating outcomes amongst the end users making up the group that was considered the most significant challenge associated with buy-side aggregation. The more entities involved in a buyers group, the more parties must be negotiated with in coming to an agreement. This increases transaction costs and requires end users to compromise with respect to their individual preferences. It was also noted that some end users have more attractive load profiles than others and would therefore end up cross-subsidising those with peakier load shapes. End user respondents also noted the presence of risks such as liability should other members of the aggregation group default. Managing the challenges that arise with respect to decision making and risk/benefit allocation were clearly challenges in implementing a buy-side aggregation scheme.

The similarity of members was considered important to the success of a buy-side aggregation group. The presence of entities from different industries with different business models was noted as likely to aggravate the negotiation and decision-making challenges of such a group. By contrast, respondents that were part of an existing corporate group, or industry specific electricity buyers group (government, universities, and councils) were more comfortable with

group for offsite RE. Established channels of communication, aligned business interests, and similar decision making processes were seen to alleviate the challenges of group decision making.

In contrast to buy-side aggregation, sell-side aggregation was generally not supported by project developers. Project developers, with one exception, were of the view that multiple off-takers were undesirable given the additional contractual complexity involved. Project developers were also generally uncomfortable with the prospect of interfacing with multiple customers given their lack of customer management infrastructure and experience. For these reasons project developers had a strong preference for buy-side aggregation. Only one project developer was open to sell-side aggregation. Their view was justified on the basis that accepting some additional contractual complexity was necessary to make offsite RE procurement sufficiently attractive to get deals across the line for potential end user off-takers.

While project developers were generally not in favour, sell-side aggregation has some attractive features for end users. The end user retains the ability to structure procurement arrangements independent of other off-takers as their flexibility is not constrained by the need to achieve consensus with other group members. As a result, much of the negotiation challenge associated with establishing aggregation groups is eliminated under this approach. The reduction in end-user negotiating complexity is however counterbalanced by an increase in the contractual complexity seen by project developers. It was noted that international jurisdictions, such as Mexico, had seen significant market development around the sell-side aggregation approach. The utilisation of such an approach in Australia may be a function of the extent to which the additional business opportunity available to project

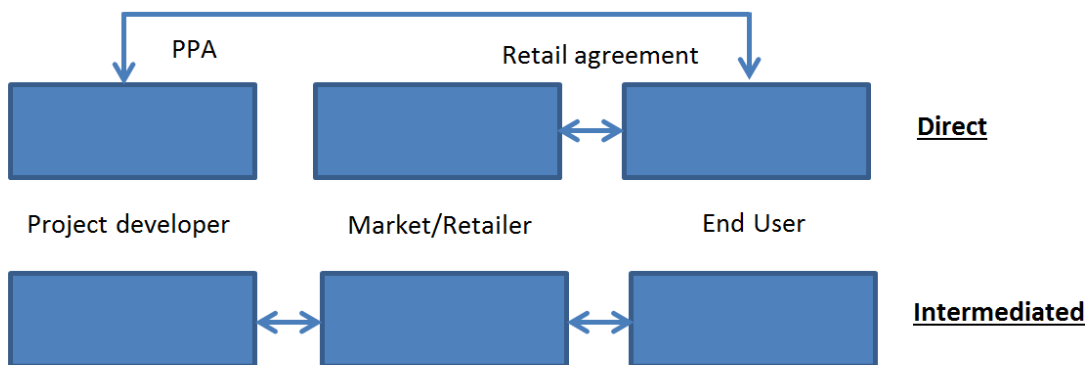


Figure 4: Direct vs intermediated business structure models

the prospect of participating in an aggregated buyers

developers outweighs the additional costs associated with contractual complexity.

It should be noted that these two forms of aggregation are not entirely discrete options. The potential exists to run buy-side aggregation groups with respect to a part of a facility which is aggregating on the sell-side. Such an approach is illustrated in the bottom right of Figure 7 and was suggested as an option for small electricity retailers who may lack the customer base and credit ratings to underwrite a complete project themselves.

Counterparty identity – Direct vs intermediated

Direct and intermediated business structures involve a choice as to the identity of counterparty to the PPA with the project developer. The two options explored in this regard include:

- **Direct:** the end-user is the counterparty to the PPA with the project developer;
- **Intermediated:** an electricity retailer acts as the counterparty to the PPA on the behalf of an end user.

Counterparty	Direct	Intermediated
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The direct approach involves the end user acting as counterparty to the PPA with the RE project developer. All contractual payments, terms and conditions, with respect to the procurement of RE would be specified directly in the agreement between the end user and project developer. A direct arrangement may either be decoupled from the electricity retailer that is managing physical supply and settlement, or it may see a role for the retailer with respect to pass through of generation value, balancing supply, and the management of risk associated with RE intermittency.

The intermediated option describes an electricity retailer entering into a PPA with a specific RE facility on behalf of an end user. The end user would then enter into a separate retail agreement with the intermediate electricity retailer which specifies the specific generation source, the price and terms on which RE generation is procured.

An intermediated approach represents the model most closely reflecting current practice whereby electricity retailers enter into PPAs with RE developments for the purpose of meeting their obligations under the RET. This approach goes a step further by tying generation value from an RE facility to a specific end user retail agreement. Respondents considered an advantage of the intermediated approach being that it avoids many

of the skill, transaction, and legal cost barriers associated with establishing a direct agreement between end user and project developer. The end user would see a single commercial interface for the RE procurement and balancing load via the retail agreement. Respondents considered this approach to be simple and straight forward. The complexity of procuring generation resources would therefore be placed with the electricity retailer as the party best resourced to manage it. Such an approach was also seen as likely to facilitate product development and aggregation, either buy-side or sell-side and thereby aid market development.

A number of challenges were however noted with respect to an intermediated approach. Trust was cited as a factor inhibiting the willingness of end users to choose this option. End users would need to be able to trust the retailer to faithfully execute the RE procurement terms of the retail agreement and/or have verification mechanisms available. Retailer credit-worthiness was also an issue. Some smaller retailers considered this approach infeasible without additional credit support through end user guarantees. As a result, the intermediated approach may be primarily adopted by large electricity retailers who are the parties considered least likely to see business incentives to facilitate offsite RE. Another challenge was the perceived need to have a ‘back to back’ retail arrangement with the end user which matched the term of the PPA. This was considered important by electricity retailer respondents. In the absence of a retail agreement matching the PPA term, the electricity retailer faced residual exposures should the end user decide to change retailer during the PPA term. End user respondents were however challenged by this requirement as it would potentially lock them into a single provider with respect to balancing supply and risk management costs. Flexibility to access the retail market was highly valued by respondents as there was concern that long-term retail agreements may provide electricity retailers with unreasonable pricing power over elements of an end user’s electricity costs.

End user respondents had a general preference for a direct contractual relationship with the project developer by acting as PPA counterparty. While an intermediated approach was seen as an administratively simpler option, the direct approach was considered to be more valuable from a marketing and communication perspective. It was strongly felt to be better for ‘telling the story’. Another factor that was significant in end user views was the potential to retain retail market flexibility. In contrast to the intermediated approach, this approach does not see

the need for a ‘back to back’ retail agreement matching the term of the PPA. An end user’s ability to change retail suppliers during the PPA contract term is however tempered by the availability of other retailers providing acceptable terms should generation value pass through be desired. A mature market for these services is therefore required to enable this flexibility to a useful degree.

Smaller electricity retailers were particularly amenable to this approach as counterparty risk is borne by the end user in the first instance rather than the intermediate electricity retailer. Thus, this option overcomes the credit rating challenge and allows them to facilitate market transactions. While respondents generally considered this approach to be a practical alternative to an intermediated approach, it was however noted as not being amenable to buy-side aggregation. As a result, direct agreements may arise primarily with respect to exclusive arrangements or sell-side aggregation and therefore may be most suited to larger users with significant in-house skill and capability levels.

While these issues exist, it was also noted that there are contractual mechanisms that could be applied to an intermediated relationship to potentially address the small retailer credit rating issue and prevent the need to lock end users into a single facilitating retailer. Such approaches were mentioned as being utilised in international jurisdictions and would address respondent concerns with respect to an intermediated business structure. As such, contractual structures may be adopted as the market develops that could address the challenges of an intermediated relationship.

Licensing barriers - Direct PPAs

Electricity retail licensing requirements were identified as a regulatory barrier to direct agreements for some end users. Several project developers reported that they had legal advice to the effect that they would need to have a retail electricity license to enter into direct PPAs. This requirement then constrained their ability to facilitate offsite RE procurement via this model.

In this regard, National Electricity Retail Law prohibits the sale of energy unless a party is either the holder of an electricity retail authorisation (license) or the holder of an exemption issued by the Australian Energy Regulator (AER) [12]. The Act [13] however empowers the AER to exempt an individual or class of persons from this requirement. Existing exemptions which are relevant to offsite RE procurement by end users include [12]:

- **Class R5 – Persons selling metered energy to large customers** – customers who consume (> 100 MWh in NSW/ACT/Vic/Qld, >150 MWh in Tas, >160MWh in SA) at a single site are classified as large energy consumers. Registerable exemption Class R5 requires a project developer to register a sale agreement with the AER but exempts them from the need to hold an electricity retail authorization with respect to agreements with large energy users.
- **Class R8 - Persons selling electricity through power purchase agreements (PPAs) to customers who are connected to the national electricity grid** – PPAs are however defined as being with respect to the provision of a generation system at a customer’s premises. This definition therefore has the effect of excluding offsite PPAs.

While a standing exemption category applies to large energy users, a gap exists for smaller users seeking direct agreements with project developers for the procurement of offsite RE. As such, an extension of the existing exemption for behind-the-meter PPAs or a new exemption category is likely required to facilitate the uptake of direct agreements beyond large end users.

To obtain an exemption, on either an individual or class basis, an application needs to be made to the AER by a party seeking such an agreement. The AER’s Exemption Guideline provides guidance as to the principles to be applied in assessing an application for exemption. In this regard, the rationale justifying an exemption for behind-the-meter PPAs is relevant to an application for exemption for direct PPAs for offsite RE. Specifically, the AERs rationale in granting the behind-the-meter PPA exemption was that the presence of a primary retail supplier (for electricity through the grid) meant that if the secondary source (governed by the behind-the-meter PPA) was disconnected, the customer would still have access to physical electricity supply. The presence of a primary retail electricity supplier that provides the customer with the full suite of energy retail protections means the consumer doesn’t need to same level of consumer protection with respect to the PPA. An exemption was therefore considered appropriate with conditions tailored to the nature of the energy sale [12]. This logic may also be applied to an offsite RE PPA as all aspects of physical electricity sale to the customer are managed by a licensed electricity retailer who provides the end user with the full suite of electricity retail protections and connection services.

Procurement Approach – ‘Physical’ vs ‘virtual’ procurement

The ‘procurement approach’ is taken to involve the mechanism through which financial flows are structured so as to transfer RE generation value to the end user. It should be noted that financial flows with respect to procurement can be engineered to take a range of forms. While the same practical outcomes can be achieved through a variety of different approaches, two standard options are introduced which may be considered as starting points in a discussion:

- **Physical** – transfer of generation value through allocation of market revenue from physical generation;
- **Virtual** – use of financial hedging products to transfer value abstracted from financial flows respect to physical electricity procurement.

These issues were not explicitly explored with respondents due to the difficulty of handling their complexity in the context of an hour-long phone interview. As a result, a general discussion is included to illustrate some of the issues which may be addressed more completely in future work.

Procurement approach	Physical	Virtual
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‘Physical’ and ‘Virtual’ is adopted here to be consistent with terminology used internationally, particularly in the US. There are however some key differences in the Australian electricity market particularly with respect to what constitutes a ‘physical’ agreement. While ‘virtual’ PPAs are utilised extensively to manage electricity market risk in the Australian context, the design of the NEM doesn’t include bi-lateral contracts which enable end users to financially settle against physical sources of generation as part of formal market operation [14] as is the case in major US electricity markets. The Australian NEM is an example of an energy only market in which all generation receives revenue, and load pays costs, corresponding to the market clearing price at a point in time [15].

A ‘physical’ arrangement is here taken to involve the allocation of market revenue with respect to physical generation rather than settlement against a bi-lateral contract. An example may be an end user who owns an offsite RE facility directly receiving revenue from market settlement. Alternatively, an end user who enters into a PPA could arrange for market revenue with respect to physical generation to be allocated to an intermediate electricity retailer for pass through.

Such an approach would also be considered for our purposes as a physical procurement approach.

In contrast, a ‘virtual PPA’ describes an arrangement to pass through generation value via a financial product. Virtual PPAs have been very popular in the US with three quarters of all corporate RE PPAs signed during Q1 of 2015 being of this type [7]. Such arrangements are considered ‘virtual’ in that they are abstracted from direct financial flows with respect to physical generation. Virtual PPAs are generally financial hedges implemented via Contract for Difference (CFDs). A CFD produces financial flows between parties according to the difference between the negotiated PPA ‘strike’ price, and actual market price outcomes over a period of time. If market prices exceed the contract price then the generator pays the end user the difference, if market prices are less than the contract price the end user pays the generator the shortfall. CFDs therefore act as a hedge by fixing the net revenue for a project developer, and cost seen by an end user irrespective of market movements.

While virtual PPAs have been popular in the US, some additional barriers exist to their utilisation in the Australian context, which are described below. The need for commodity trading skills and experience in managing derivative exposures makes virtual PPAs a challenging option for many end users. They may however create scope for additional flexibility in business arrangements given the potential value in decoupling financial flows from retail arrangements.

Licensing and Accounting Barriers - Virtual PPAs

Several barriers to virtual PPAs became clear during this study. There are a set of accounting and licensing issues which need to be considered before entering into a virtual PPA. The first of these involves the requirement for an Australian Financial Service License (AFSL) issued by the Australian Securities and Investment Commission (ASIC). Respondents have suggested that entering into hedge products such as CFDs may constitute ‘dealing’ in a derivative product which requires an AFSL [16]. An investigation of the full scope of this requirement and the potential for exemption is beyond the scope of this study. End users should however be aware that specialist advice is needed as to these requirements.

In addition to the AFSL requirement, Australian accounting standards require special accounting treatment for exposures to derivative products such as CFDs used to implement virtual PPAs. This is an additional area of difference between the US and Australia. Australia uses International Financial Reporting Standards (IFRS Standards) as the basis of its

accounting rules governing the treatment of PPA accounting [17] while the US utilises GAAP standards [18]. As derivatives, virtual PPAs may require derivative accounting treatment with mark-to-market requirements. Such treatment is reported to be very onerous and involve significant complexity [19].

International standards differ from US standards with respect to their treatment of structures such as virtual PPAs. One of the reasons that virtual PPA structures have been so popular in the US is because US accounting standards may not see mark-to-market requirements triggered. In contrast, we understand that mark-to-market requirements are generally triggered under international accounting standards. While a detailed investigation of accounting treatment is also beyond the scope of this study, configuring the business structure to ensure favorable accounting and tax treatment was noted by respondents as being a key objective which should be considered early in the process of offsite RE procurement design. .

Business structure evaluation – workshop results

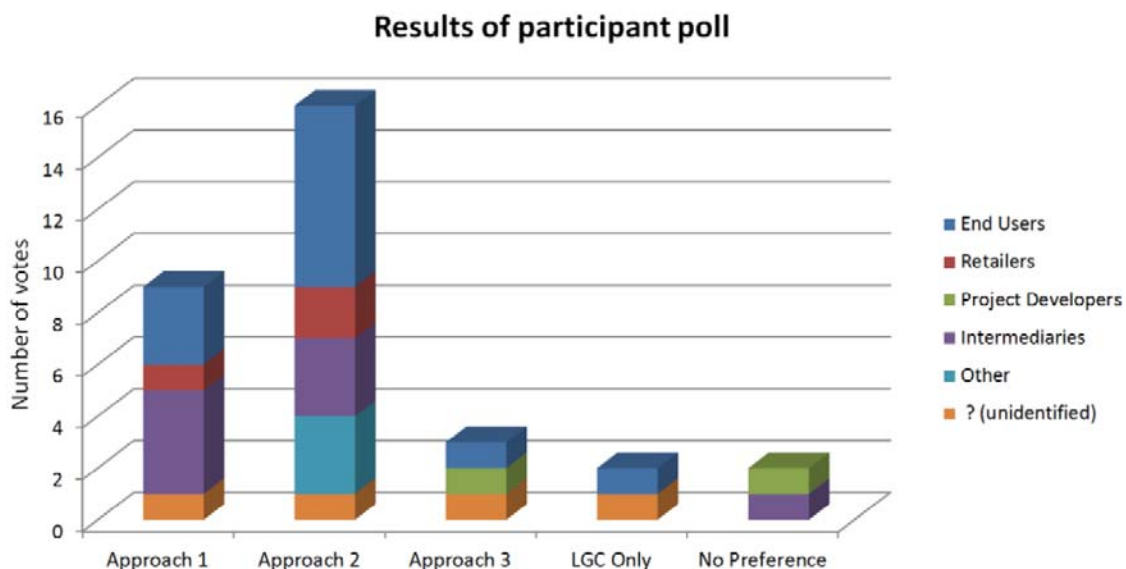
Table 2 shows that there are 288 unique arrangements with respect to the 7 end user decisions identified with respect to implementing an offsite RE deal. While not all of these combinations will be either feasible or desirable, the wide range of options available is clear. A workshop was held in November 2016 In order to distil comparative views and preferences with respect to a subset of these options. This section summarises outcomes from this workshop.

Three generation value procurement models were presented with differing characteristics along with a green only option. These four approaches are not intended to be a comprehensive set, instead they represent a set of archetypes which may be useful as a starting point for market participants to consider when developing their own arrangements.

- **Option 1** – Intermediated, physical pass through
- **Option 2** – Direct agreement, physical pass through
- **Option 3** – Direct agreement, virtual or physical PPA, self-hedged
- **Option 4** - Green only
- **Additional option*** not explored in the workshop but put forward by a respondent

In addition to distilling views, workshop participants were polled on each of the four options. While this poll is with respect to a very small, self-selected sample which cannot be taken as indicating overall preferences in a mature market, it is still a snapshot of present views and preferences. Poll outcomes are presented in Figure 9.

Figure 9 – Workshop poll results



Option 1 – Intermediated, physical pass through

This option describes an approach in which an electricity retailer enters into a PPA with a specific renewable energy facility on behalf of an end user. Contractual arrangements then specify the allocation of physical generation to that electricity retailer so as to enable financial pass through of generation value. The end user enters into a separate retail electricity agreement of the same term as the PPA with the retailer, which specifies the pass through of generation value and the management of balancing supply and risk management services covering RE intermittency. The value of the RE generation is embedded in the overall price of electricity paid by the end user. Balancing supply and risk management costs may be fixed during the term of the agreement or indexed according to market indices. The end user does not have a PPA directly with the project developer.

Form of RE procurement	Green	Black	Bundled
Counterparty	Retailer		End-user
Procurement approach	Physical		Virtual

Option 1 was thought to be the approach which may lead to the best price per kWh and was the option which most closely reflected current practice. Participants were generally comfortable with it as an option for this reason. The natural fit of this approach in enabling buy-side aggregation was considered to be the best way to overcome end user scale issues. The issue with retailer incentives was noted. Large incumbent retailers face commercial incentives to block the facilitation of such agreements given their ownership of conventional generation portfolios. Smaller retailers face the challenge of not having the credit ratings required to act as PPA counterparties.

Participants considered this approach to be simple and straight forward, noting that it avoids many of the practical challenges associated with a direct contractual arrangement between end user and project developer. Specifying the details of the offsite RE to be procured in the retail arrangements would minimise transaction costs. A single commercial interface via the electricity retailer was considered desirable. Such an approach was also seen as likely to facilitate the product development and aggregation. A number of challenges were however noted by participants. The potential for losing the 'story' side of it was considered to be a potential drawback relative to having a direct agreement. The end user not being the counterparty to the PPA was thought by some to increase the risk that the 'tangibility' of the generation would be lost. Retailer trust was a factor. The issue of retailer credit-worthiness was also noted as an issue. Some smaller retailers considered this approach infeasible without additional credit support through end user guarantees. The potential to be locked into a long term agreement with respect to retail electricity supply was a concern.

With regard to these concerns however, it was also suggested that Option 1 as presented was excessively restrictive and did not fully reflect the potential for flexibility in possible arrangements. This view held that contractual arrangements could be structured to prevent the need for a long term retail agreement. Small retailer credit issues could also be managed by looking through to the credit rating of the end user.

Pro	Con
<ul style="list-style-type: none"> • Effective way of unlocking funding for new developments • Risks are understood and placed with entities best placed to manage them • BAU approach, status quo which reduces the barriers associated with something new • Simplicity for end user, only one party acting as commercial interface • Approach aligns with existing procurement processes • Aggregation via this mechanisms is natural, a logical approach 	<ul style="list-style-type: none"> • More complex than LGC purchase • New retailers cannot access credit and therefore face a barrier to acting as PPAs without extra guarantees • Big 3 retailers face reduced margin, supporting projects may undermine value of gen portfolio • Who gets to select the project, the end user or the retailer? • Doesn't suit an end user who wants CAPEX • Inflexible, may lock an end user in to long term retail agreements which are unsuitable to their business circumstances • Market power issues to manage with the retailer requiring a long term retail agreement, could enable them to inflate the price on black. • Complexity with respect to the pricing models to manage long term retail agreements

Table 5 – Pros and cons for Option 1 – Intermediated, physical pass through

Option 2 – Direct agreement, physical pass through

In contrast to the de-coupled approach of Option 1, Option 2 involved the end user acting as counterparty to the PPA with the RE project developer. While the pass through of generation value is via physical allocation to the electricity retailer, the electricity retailer would not be a principal to the PPA and instead would play a role simply with respect to pass through, balancing supply, and the management of risk associated with RE intermittency. An end user would not see a consolidated financial interface via the electricity retailer, as is the case under Option 1, instead, the PPA may specify a fixed payment with respect to contracted RE generation. The retail electricity supply arrangement would specify the terms and conditions of pass through, balancing load, and risk management. The end user would see a final price for electricity that consolidates the value of the RE generation.

Form of RE procurement	Green	Black	Bundled
Counterparty	Retailer		End-user
Procurement approach	Physical		Virtual

This was clearly the most popular option amongst workshop participants. They considered this option to be better for marketing and communication purposes as the direct contractual relationship would tell a stronger story than Option 1. It was however felt that there may still be a challenge in findings a retailer who would be prepared to facilitate. The potential to maintain retail market access and flexibility in retail arrangements were considered valuable as a means to

restrain any inappropriate use of electricity retailer pricing power with respect to balancing supply and risk management services.

This approach was more attractive to the smaller electricity retailers as counterparty risk issues are borne by the end user in the first instance rather than the intermediate electricity retailer as is the case under Option 1. The manner in which PPA counterparty risk is held between end user and project developer was felt to be helpful in enabling smaller electricity retailers to facilitate such deals without the need for additional credit support/guarantee structures. As a result, this option overcomes their credit rating challenge. While respondents generally considered this approach to be a practical alternative to Option 1, Option 2 was noted as not being amenable to buy-side aggregation.

Option 2 was considered to be more complex and challenging than Option 1. Option 2 was considered to be best for large end users who have in-house legal and electricity procurement capacity, as PPA establishment would not be able to piggy back on electricity retailer skills and capabilities in this area. Smaller end users were also noted as having less negotiating power when it came to establishing direct relationships with project developers as there was a skill and information asymmetry given the lack of end user skills and experience in negotiating PPAs. Significant assistance was therefore noted as being required to implement this option.

Electricity retail licensing issues were noted as potentially being a significant barrier for direct PPAs. Some jurisdictions were noted as also having requirements additional to those of the AER. Victoria was particularly problematic in this regard. Further clarification and legal input on this issue was considered important.

Pro	Con
<ul style="list-style-type: none"> • Transparent arrangement • Direct link with end user better for marketing and communication • Enables smaller retailers to provide services given counterparty risk is held by the end user • Flexible with respect to retailer, not locked into a long term retail agreement backing the term of the PPA • An approach which would suit end users who are large enough • Market settlement risk is held by the retailer and managed for the end user, at a price • 	<ul style="list-style-type: none"> • More complex than LGCs and end user would need to manage two contracts rather than one • Might not allow matching of load, potentially limited to a smaller fraction of end user load • Doesn't naturally lend itself to buy-side aggregation • May lead to a higher overall cost than option 1 • Unattractive for retailer to facilitate if it was covering a large % of end use load. • Transaction costs likely higher than option 1 • Information and skill asymmetry in negotiating direct PPAs

Table 6 – Pros and cons for Option 2 – Direct agreement, physical pass through

Option 3 – Direct agreement, virtual/physical PPA

While Options 1 and 2 both involved the pass through of contracted generation value via an intermediate retailer (regardless of who is the PPA counterparty). Under Option 3, the electricity retailer provides exposure to spot market prices against which the end user self-hedges via financial flows from RE generation. The mechanism for self-hedging could be directly through generation revenues, in the case that the end user owns the generation facility, or it could be through financial flows from a virtual PPA structured as a CFD. The key characteristic of this arrangement is that the end user is faced with the task of managing electricity market risk, rather than the electricity retailer as under Options 1 and 2. Rather than paying a risk management premium to an intermediate electricity retailer, the end user either accepts balancing load market exposure or arranges the purchase of additional financial hedges. This would be a direct arrangement for which the procurement of renewable electricity is de-coupled from retail electricity procurement.

Option 3 was not well received by workshop participants. Respondents generally considered this model to be highly risky given that the end user faces direct exposure to volatile electricity market prices and is not well equipped to understand and manage that risk. The need for a very good temporal match between load and generation was considered critical in this regard.

Form of RE procurement	Green	Black	Bundled
Counterparty	Retailer		End-user
Procurement approach	Physical		Virtual

Only a very sophisticated end user with a big balance sheet and risk appetite was thought to be suitable for such an approach. Access to additional risk management products was also considered important to limit exposure to very high electricity market prices. The availability of additional products to deal with market risk with respect to balancing load was questioned as not being practical for most end users. Could suitable counterparties be found for such products? The over-the-counter markets for these products in the Australian context were noted as being thin and unlikely to efficiently price financial hedges for end user scale market participants.

Pro	Con
<ul style="list-style-type: none"> • Could be suitable for large end users with commodity trading skills • Can take advantage of average lower wholesale prices if appropriately hedged • Does not rely on retailer pass through, simple for a retailer to pass through spot • May potentially be simpler as settlement occurs between end user and project developer • 	<ul style="list-style-type: none"> • Managing spot market risk not core business of most end users • Would most likely require additional risk management products to manage exposure to high price events • A radical departure from BAU electricity procurement practices • Need a big balance sheet to make this one work

Table 7 – Pros and cons for Option 3 – Direct agreement, virtual/physical PPA

Option 4 - Green Only

Option 4 was included to account for the structures closer to the GreenPower end of the offsite RE procurement spectrum. This option involves an end user entering into a PPA with an offsite RE facility solely for the procurement of RECs from that facility. No generation value pass through is involved.

Form of RE procurement	Green	Black	Bundled
Counterparty	Retailer		End-user
Procurement approach	N/A		

While this option was not subject to focussed discussion during the workshop, general feedback was that it wasn't an ideal option primarily due to its additional cost. It was viewed as easy and currently available but not necessarily meeting the organisational needs and preferences of workshop participants or survey respondents. End users can purchase RECs under long term agreements or on the open market and voluntarily surrender as 'DIY' green-power. The other options allow the end user to potentially reduce their electricity costs through the procurement of generation value that can displace the requirement for conventionally sourced electricity supply. The procurement of RECs as offsets was also considered to be limited in its effectiveness for marketing and communication purposes. The issues noted as applying to GreenPower also applied to a green-certificate-only RE procurement strategy.

While a Green-only strategy was not preferred by workshop participants, it was considered to be easier and generally more flexible than any of the other options.

Pro	Con
<ul style="list-style-type: none"> • Simple • Flexible • Can aggregate simply 	<ul style="list-style-type: none"> • Is it real? • Story isn't as strong • Very expensive • There is an additional cost associated with offsets • Cannot capture generation value from the facility

Table 8 – Pros and cons for Option 4 – Green only

Additional option

In addition to the options put forward in the workshop, a retailer respondent proposed this additional option as being a practical and potentially simpler approach to enabling generation value pass through in a manner that avoids large risk management premiums or residual electricity market exposures under options 1-3.

This option involves the end user seeking a standard electricity retail agreement and utilising the PPA as a variable (non-firm) hedge completely de-coupled from a standard (firm) retail electricity price. Under this

option, the end user accepts generation revenue risk rather than requiring the retailer to manage market risk associated with generation intermittency. By accepting this risk, the electricity retailer no longer needs to hedge the intermittency of contracted generation and incur large risk management expenses, which would be passed through to the end user. The rationale behind this option is that the retail margins on commercial and industrial load are very efficient given the presence of a large portfolio with which to manage risk. Once risk management becomes a bespoke exercise against specific generation and load, the retailer's book efficiency is lost. If the end user can accept the uncertainty associated with a variable revenue stream, over all savings may be realised.

Under this approach, the end user can have the assurance of a firm electricity retail price with the PPA then acting as a variable income stream. In addition to decoupled implementation via PPA, such an outcome could be facilitated by an electricity retailer who may provide a 'net billing' service. This approach may place risks with entities in the most cost efficient manner, align with a business-as-usual retail electricity procurement mindset, and avoid the need for long term back-to-back retail agreements that lock end users in.

Pro	Con
<ul style="list-style-type: none"> • Risks are placed with entities in the most cost efficient manner • BAU approach for Retail contract is simple with low transaction costs • Enables smaller retailers to provide services given counterparty risk is held by the end user • Flexible with respect to retailer, not locked into a long term retail agreement backing the term of the PPA • An approach that would suit end users who are large enough. • Could be suitable for large end users with commodity trading skills • May potentially be simpler as settlement occurs between end user and project developer • Provides end user with price transparency • Provides a firm LGC price hedge, and non-firm energy price hedge for end user • 	<ul style="list-style-type: none"> • More complex than LGC only purchase and end user would need to manage two contracts rather than one • Doesn't naturally lend itself to buy-side aggregation • End user will need to be comfortable with receiving variable revenue (i.e. spot market revenue) • Project developer may require credit support from end user.

As mentioned, this approach was not explored with workshop participants. Further exploration of preferences and practicalities of this, and other, options would be valuable as areas for future work.

Table 9 – Pros and cons for the additional option

Case Studies

As explained in section 1.1, our project methodology included case studies as a way of illustrating the diversity and complexity with a number of concrete examples. What follows in this section are six separate case study reports. In contrast to the survey results, which have been presented as aggregated, distilled and anonymised responses, each case study is presented in the original interview format, with an accompanying summary page. The projects that are included as case studies, ordered according to degree of project completion, are:

- University Technology Sydney / Singleton Solar Farm
- Sunshine Coast Solar Farm
- Victorian Government RE Purchase
- Melbourne Renewable Energy Project (MREP)
- Transport for NSW Sydney Metro Northwest
- Newcastle Summerhill Solar Farm

It should be noted that the six case studies presented do not constitute an exhaustive report on the national offsite RE market activity, but do represent at least half of the projects undertaken to date. To our knowledge, there are only eleven examples in Australia thus far of offsite RE projects, and it could be argued that two of those eleven are not technically offsite RE projects. Here is an overview of the five known projects that are not included as case studies:

[Sydney RE Buyers Forum](#) – An aggregated project, initiated by the World Wildlife Fund (WWF) and being facilitated in partnership with JLL. The structure and aims of the project are very similar to the MREP, which was chosen for the case study in this report due to its advanced progress with the tendering process.

[Yarra Trams Solar](#) – Another recently announced project led by the Victorian Government, this tender will be for an REC contract to help underpin 75 MW of large scale solar, 35 MW of which will be linked to Melbourne’s tram network.

[Sydney Desalination Plant](#) – Probably the first offsite RE project completed in Australia, this 20 year contract was signed in 2008 between the Sydney Water Corporation and Infigen for electricity, RECs and the construction of the 140 MW Capital Hill Wind Farm.

[ACT Government Reverse Auctions](#) – A highly successful scheme whereby the ACT government has underpinned a number of new large scale renewable projects via long term contracts for electricity and RECs. However, these are not technically offsite RE projects as defined by this report, because the auctions have been used to offset the entire ACT’s electricity consumption rather than a specific load or the demand of a specific organization.

[Sun Metals Solar Farm](#) – This zinc refinery in north Queensland is building a 116 MW solar farm to reduce and hedge their rising energy costs. However, this is not technically an offsite RE project as the solar farm will feed directly into the refinery’s existing substation, so it could be classed as behind-the-meter.

CS1: UTS / Singleton

Customer:	University of Technology Sydney		
Generator location:	Singleton Solar Farm, NSW		
Load location:	The UTS Dr Chau Chak Wing Building, Sydney CBD		
System size:	250 kW		
Project status:	Complete		
Structure:	Buy (PPA)	Own	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer	End user	
Purchase of:	LGC only	Electricity	Bundle
LGC treatment:	Sell	Surrender	

Summary

Drivers

- UTS has a significant emissions reduction target
- Looking for more a more cost effective option compared to GreenPower
- Wanting to make a longer term commitment than purchasing GreenPower
- Challenges with on-site rooftop solar related to lack of suitable roof space
- Desire to help solve problem of so many shovel-ready RE projects unable to obtain PPAs

Process

- The aim was to do a small low-risk pilot project
- Looked for an existing solar or wind farm
- Integrated into normal electricity procurement tender as an option
- Worked with successful electricity retail tenderer to get the model right
- Drafted and executed the PPA

Deal Details

- 2 year PPA contract term (as Pilot Project)
- Fixed price per kWh of electricity
- Does not include purchase of LGCs
- UTS contacts directly via a PPA with the solar farm
- A separate contract with the retailer provides the balance of energy

Case study interview with Jonathan Prendergast, UTS

Drivers

What are the drivers associated with electricity procurement in general, and how do these drivers influence the decision with respect to procuring offsite RE?

UTS has quite a significant emissions reduction target and a large fraction of the plan was based on implementation of tri-gen, which has been paused, so we have been considering other options.

Historically, we tender every 2-3 years, and it does make sense on a lot of levels, so our typical energy procurement processes are set on those short to medium term contracts. The selection criteria are primarily procurement probity related, ensuring fairness and value for money for the university. There is some allowance for sustainability, but it typically relates more to corporate sustainability rather than necessarily where the electricity has come from.

Why did your organisation elect to procure offsite RE instead of purchasing Green Power?

UTS did previously purchase GreenPower as part of its electricity but has not done so in recent years, seeking more cost effective carbon emissions reductions. A challenge with GreenPower purchasing decisions is that they are short term commitments so it depends on the decision makers of the day and the financial and environmental objectives of the university. It is sometimes seen a cost with limited financial return on investment. Greenpower has also become very expensive compared to other emissions reduction options.

Does your organisation utilise onsite RE generation? How did the choice of offsite RE deal align with your behind the meter generation assets?

We have a little bit of on-site solar that is part of a research project. UTS is based in dense urban environment, so has limited suitable space for rooftop solar compared to its electricity demand. It also takes time to assess rooftops for solar suitability, structural suitability and implement safety works prior.

Market processes

How the project was initiated, suitable project partners identified and assessed?

When it started, it was really just me investigating this at UTS. I started by trying to identify an existing renewable energy plant of a suitable size who were uncontracted or were able to contract with us and I could only find one. I heard the owner of the Singleton Solar Farm on a radio show and called him and he was very knowledgeable also on the subject and interested in how it may work.

We integrated it into our standard electricity procurement tender process, which was a challenge as tender periods are short for electricity retail contract. In retrospect, it could be done better speaking with the existing retailer. There is a risk that future electricity retailers may not facilitate such an arrangement, so it was not feasible to sign a long term PPA beyond the term of the next retail contract. Particularly as there was no or little precedent in the Australian market for such arrangements.

We put it into the tender as an option, rather than a mandatory requirement, and we left it quite open as to the model by which the contracting would occur. I had in mind that the successful retailer might just buy the electricity on our behalf from the solar farm and effectively be supplying it to us via the retail contract during the retail contract term. But what came out of it was a model where UTS could contract directly with the solar farm and the retailer provided our balance of energy. Working together with the successful tenderer, we developed the model and prepared and executed the PPA contract.

What were the key barriers encountered and to what extent were transaction costs (such as legal/consulting costs) significant?

Considering the scale of the project it was reasonably significant in terms of my time and cost to the university relatively to the scale of the contract value and savings. The model is quite simple which means the PPA is quite simple too, so legal fees were quite low. But as the model is proven and greater scale can be achieved, transaction costs can become lower as a portion of the deals.

The acceptability by retailers and costs associated for retailers when deploying this model is uncertain, so we are looking to validate the model further.

A key barrier was a lack of any other projects that had done this before and knowledge and familiarity on these types of contracts. This contract didn't reduce emissions directly for the university's carbon accounting, which is a key sustainability driver. But luckily UTS were open to innovation to do undertake the project and in the end they were very happy with

the outcome. It also opens up opportunities for subsequent projects to reduce emissions for the university.

Reflecting on this process, can you nominate any factors which could make it more efficient?

I think that will happen over time as the market develops and solar developers, investors and corporate PPA customers become more familiar with the contracts and risks. If there were multiple solar farms out there that are shovel ready then you could quite quickly and easily run reverse auctions, agree prices and contract with one/some of them.

Business Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

For the pilot project, contracting with an existing plant meant no new capital investment was put at risk to whether the project was a success or not. It also overcame issues of timing, and deciding when to invest and build a new plant versus when to try and develop and validate the purchasing model.

It was certainly advantageous because it could not have occurred without the existing plant out there, operating, and owned by somebody else.

For future projects I think there are advantages of investing/owning vs buying through PPAs. It is feasible for organisations like Universities to develop solar assets. But also, contracting via PPAs requires less development work by the organisation so reduces risk and time.

Is your organisation procuring electricity from the RE facility to be reflected in your retail purchases or renewable energy certificates as an offset to electricity consumption?

Electricity only, which is deducted off our bill. We are not buying the RECs in this pilot project.

Why did your organisation elect to procure electricity as part of your deal structure?

It was a pilot project, not an emission saving project and it was also short term. It was important to reduce risk of the innovative project, by reducing the contract value, and this was another benefit of just purchasing the electricity.

There was not so much additional impact in buying the RECs seeing as the plant was already built. Secondly, when I initially conceived the project at UTS I was interested in the role that corporates could play in renewables, and the problem I identified was that so many shovel ready renewable energy projects could not get PPAs signed for the electricity. There is mandated purchasing of RECs already and also voluntary purchasing of RECs and no shortage of demand in the current market for RECs, but there is a problem that new RE plants can't get built until they find a PPA for the electricity so that was the problem that could be solved through a corporate PPA. In retrospect, long terms contracts that include RECs also are advantageous to bringing down the cost of capital for new renewable energy projects, as a current high spot price does not help project investment feasibility when there is a risk of future much lower RECs prices.

With regard to the relationship between the 3 parties (end user, RE facility owner and retailer), can you describe the role of the electricity retailer in facilitating the pass through?

There is a retail contract between the retailer and UTS and a power purchase agreement between the solar farm and UTS, so they are both separate. There is no contract between the retailer and the RE facility owner. The retailer deducts the solar generation from the UTS electricity bill.

Who is the counterparty (holds) to the contract with the RE facility?

UTS is the counterparty to the RE facility.

What were the barriers encountered in implementing such a structure? Was complexity and risk management a significant issue?

The concept when we set out was complex but the end result was not. The PPA means that if something goes wrong with the solar farm, the customer (UTS) does not pay anything because it only has to pay for successfully generated solar electricity. The retailer made it easy for us, the contract was easy. So as an overall project it was complicated but the actual implementation was quite simple. So the barriers were just the lack of knowledge and understanding within the organisation and market. Also, there was a lack of certainty of whether this is replicable and whether we can enter into long term commitments and still switch between different retailers over time when electricity is tendered periodically.

Contract Term and Risk Management

What is the term of the agreement and structure of the agreement pricing? (Is it a fixed or variable price and are there any provisions which share electricity price volatility between end user and facility owner?) Why was this term and structure chosen?

It was a 2 year term aligned with our electricity contract so that UTS is unencumbered for its next tender. A fixed-price contract in terms of c/kWh. Obviously the generation is variable due to the nature of a solar farm. So to that extent the retailer manages the risk in terms of balancing their energy trading and portfolio of supply and demand customers, and also the variable pricing in the market.

Can you tell us what was the retailer's attitude to accepting that risk? Were they happy to do it? And did they decide to charge UTS more for it?

Because it was a small scale solar farm compared to UTS's electricity consumption, this risk was small to the retailer. 250 kW is under 1% of UTS annual demand. Certainly it does increase the risk to the retailer but they didn't really comment back to us about their obligation of managing that risk. I'm sure day to day they manage much larger risks than that because a customer can turn a chiller on or off whenever they feel like it, and that is 1 MWe so 250 kW during the day wouldn't rate on that scale. In the future when a customer getting up to 5%, 10%, 30% off site solar, then I imagine the balance of our energy costs would rise to manage that risk. But it is no different from installing rooftop solar when you would have to manage that risk anyway if you were going to those levels of rooftop solar.

Is the end user obliged to acquire a minimum level of RE generation under the contract irrespective of end user demand?

According to the contract, yes. However, this point is irrelevant in this case because the university will certainly be always requiring more electricity than the solar farm output.

RECs/Additionality

Concerning the treatment of Renewable Energy Certificates, how did your organisation treat the RECs

created with respect to generation from the RE facility? Were they surrendered voluntarily or sold to a party liable under the RET?

This is a challenging issue. I think it would be preferable if renewable energy purchasing models could cost effectively include emissions reduction, in terms of the sustainability strategy and reporting and meeting organisational emissions targets. However, there is a case to say that taking action directly through investment or contracts is just as or more additional as buying offsets. Over time as these projects and contracts become more common, and there is more data, prices will come down to the point where electricity purchasing and emissions reduction can be achieved. But we may not get there if we don't proceed with projects as surrendering the RECs makes the projects unfeasible.

There is also interest for the project to have benefits to research or teaching in terms of innovation.

Personally, I think that considering market conditions in the past few months the cost effectiveness and additionality of RECs is challenged as:

- Firstly, increased LRECs spot prices are great for existing projects but do not provide long term certainty to develop future projects.
- Secondly, The LRECs make up such a small fraction of a customer's electricity bill (4-5%), so there is little incentive to retailers to minimise the RECs costs charged to customers. So retailers can pass through high LREC prices to customers rather than to source more renewable energy, increase supply of RECs and decrease the cost of RECs through greater supply.
- Thirdly, with regard to retailers who own RE plans, there is little incentive to invest in more renewables because they are earning higher revenues from short term LGC prices.
- To this extent, LGCs are at a high price and not driving renewable energy investment as quickly as needed, nor doing so cost effectively.

In some cases, surrendering the LGCs may make the project unfeasible. I think it is still better to proceed with such a project without surrendering the LGCs, rather than not supporting the project at all.

- The plant will generate enough power to offset council's entire annual electricity demand

CS2 Sunshine Coast Solar Farm

Customer:	Sunshine Coast Regional Council		
Generator location:	Valdora, Queensland (Sunshine Coast)		
Load location:	Sunshine Coast		
System size:	15 MW		
Project status:	Under construction		
Structure:	Buy (PPA)	Own	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer	End user	
Purchase of:	LGC only	Electricity	Bundle
LGC treatment:	Sell	Surrender	

Summary

Drivers

- Council has a vision to be Australia's most sustainable region – green, vibrant and diverse
- We're a large energy user with aquatic centres, administration buildings, sporting and other facilities
- Electricity prices have been rising and increasing in volatility for many years
- Preference to do it ourselves rather than offset through a third party
- Building inventory not capable of producing enough power with on-site solar
- A retailer is involved to buy and sell into the national electricity market on behalf of Council
- Owning a generation asset enables Council to accept full exposure to market spot prices
- The retailer will also ensure the consistent and uninterrupted electricity supply to council sites, irrespective of the output of the farm.

Process

- Years of financial analysis undertaken to justify decision to build, own and operate a solar farm
- EOI phase that yielded 49 submissions from solar project developers and retailers
- Tendered for the design and construction plus 2 years of operation and maintenance
- Successful tenderer Downer is currently constructing the plant

Deal Details

- A 15 MW solar farm in the local government area

Case study interview with Simon Crock & Phil Woods, Sunshine Coast Regional Council

Drivers

What are the drivers associated with electricity procurement in general?

Our council has a very strong environmental focus, so our vision is to be the most sustainable region, green, vibrant and diverse. So an RE facility sits very well with that strategic vision. We've done some analysis around energy transition planning and have done policy work in that space. That coincided with the introduction of the carbon tax and the RET, both of which impact on our electricity prices. So cost management was a key feature but it aligned with those environmental concerns as well.

How do these drivers influence decisions both with respect to renewable energy in general and the specific decision to procure offsite RE?

What that study showed us was that the cost of non-renewable resources was going to mean increased volatility for energy prices into the future and as more people shifted toward renewables the cost was expected to come down. When we factored in the carbon price and LRET price, that provided a good cost incentive to shift toward renewables sooner for us.

Why did your organisation elect to procure offsite RE instead of purchasing Green Power?

From a policy perspective we thought it made more sense to do it ourselves rather than to offset our emissions through a 3rd party. In pricing terms, every time we go out to the market for a retail agreement we would get pricing on GreenPower but it was very variable and suggested to us that the market wasn't very well developed.

Does your organisation utilise onsite RE generation? How did the choice of offsite RE deal align with your behind the meter generation assets?

We do have some on-site generation, probably less than 50 kW all up. We'd also looked at alternative sources of renewables, i.e. wind, but our part of Queensland doesn't have a good wind resource. We looked at solar on rooftops but our building inventory wasn't capable of producing enough power and we did a study on that which wasn't so cost effective. We also looked at waste to energy and a couple of other options that were not viable. That left us with utility

scale off-site solar. Our landfill gas management contractor has recently installed a 1.4 MW generator.

Market processes

How the project was initiated, suitable project partners identified and assessed?

The project was initiated by a third party who approached council to develop a solar farm and they wanted us to buy the power from them via a PPA. That was not a viable option for us. Eventually we figured out the only way it could work for us was if we buy the project, so we started taking that role as project owner. We figured out that, because we have a large committed electricity spend anyway, the large scale renewables was a good match for us. It means we can effectively buy the power from the plant ourselves.

With regards to procurement, when we were thinking about taking the project on, we went out to the market with an EOI to solar companies to see what they could build, which was an important information gathering exercise. We got about 49 submissions, which gave us really good information on what they cost to build and to operate. In the end, Downer have been contracted as an EPC (engineering, procurement, construction) provider. The contract is for 'Design/Construct + 2 years Operate/Maintain'.

What were the key barriers encountered and to what extent were transaction costs (such as legal/consulting costs) significant?

Yes certainly. In terms of key barriers, that original project proponent got a development approval to build a 10 MW farm on that site. And then that approval was appealed in the planning and environment court, so that process took a long time and a fair bit of expense to work through and saw us having to do a second planning approval for the 15 MW project. I suppose the other transaction costs included the legal costs of developing the contract with Downer, which were significant.

Reflecting on this process, can you nominate any factors which could make it more efficient?

Looking back, it was a very long process. We went through the EOI phase, then short-listing and then a tender phase, which all took 2.5 years and possibly could have been done in 12 months. But there was a lot of uncertainty at the time around the government review of the RET and that sort of thing, and that legal issue was happening around the same time as well.

Business Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

We will own the plant. We're a large energy user anyway with aquatic centres, administration buildings, sporting facilities, etc. We are always going to be a large user of electricity, so for us it was not a big leap to owning a facility rather than just continuing to buy it. Again, it came down to price. In the last 10 years in Queensland the electricity prices kept going up and up, so for us this is an alternative model that was very attractive.

How was the project financed? Was it funded off the balance sheet or through a special purpose vehicle?

Primarily from the balance sheet, funded through a mix of 80% debt and 20% equity. We can borrow through the state government using their AAA credit rating so we get pretty competitive borrowing terms, both with regards to the low interest rate but also a longer debt term than most commercial entities are able to secure.

Can you describe the role of the electricity retailer in facilitating the pass through?

The retailer acts as our intermediary in the electricity market, effectively passing through spot market price exposure to us. So when our plant is generating they will sell the power into the national market and when the facility is producing less than we need they will buy power for us from that market as well, at the spot market rates.

What were the barriers encountered in implementing such a structure? Was complexity and risk management a significant issue?

Yes, first of all finding a retailer counter party willing to do this took a while. Most of the large retailers do have boutique companies that play in the renewables space but not too many of them were willing to take on a spot exposure pass through arrangement. Yes certainly risk management is an important factor. But that is

where being the user of the electricity itself helps, because we have the generation asset but we also have the demand as well, so that is to a certain extent a natural hedge. But we are certainly putting a lot of emphasis on risk management in terms of what we can do with our load and try to shift or curtail that where we can. Initially we will try the spot pass through arrangement without any financial hedging in place. We will be monitoring that closely and if required we can use those financial tools.

One other point on risk management, with the build side of things, we have put a performance guarantee onto Downer that we're spending \$38 million but we have a guarantee to make sure that the product will do what they say it will do, so that is another important risk mitigation strategy. It also adds complexity and transaction costs, and when you're allocating those risks the counterparty tends to get a bit anxious.

Contract Term and Risk Management

How is load which is not aligned to RE generation managed? Who bears the market risk associated with such load?

We do. We analysed this one in great depth and looked at our exposure in terms of our electricity spend in a year, and have assessed it as not being a material exposure compared to that budget.

RECs/Additionality

Concerning the treatment of Renewable Energy Certificates, how did your organisation treat the RECs created with respect to generation from the RE facility? Were they surrendered voluntarily or sold to a party liable under the RET?

We will offset our own needs for LGCs first. So, for that power that we do need to buy in, we will use our own LGCs first for the 24% liability. And then we'll sell the excess into the market, through our retailer again.

How important is additionality (renewable generation in addition to that which would have been generated anyway) to your organisation?

We took the approach that it was better to make it financially viable to have a RE facility.

CS3 Victorian Government RE Purchase

Customer:	Victorian State Government		
Generator location:	Horsham and Winchelsea, Victoria		
Load location:	Victoria (predominantly Melbourne)		
System size:	30 MW + 66 MW wind farms		
Project status:	Under construction		
Structure:	Buy (PPA)	Own	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer	End user	
Purchase of:	LGC only	Electricity	Bundle
LGC treatment:	Sell	Surrender	

Summary

Drivers

- Demonstrate leadership in leveraging purchasing power
- Address the limited market uptake due to the recent uncertainty around the RET
- Support projects in Victoria (which GreenPower cannot typically guarantee)
- Having a tangible project/s to point to sends a powerful message

Process

- The aim was to do something quick and efficient ahead of the VRET
- Competitive open tender process, technology neutral
- Comprehensive technical and commercial evaluation
- Benefitted from lessons learnt in other jurisdictions, e.g. ACT

Deal Details

- Purchase of LGCs only
- 10 year contract term
- 5 + 5 year collar pricing structure enabling 25% price adjustment up or down
- 100 MW wind farm successfully tendered
- The LGCs will be used to meet the government's own requirements

Case study interview with Victorian State Government:

Drivers

What are the drivers associated with electricity procurement in your organisation, and how did these drivers influence the decision to procure offsite RE?

Within the state government there are a number of different departments and agencies. The broader state government has an electricity purchase contract managed by the finance department. They aggregate all of the departments' demand in order to achieve best value for money. There are some other statutory authorities such as health and public transport that manage their own electricity procurement. The current government wants to demonstrate leadership in leveraging the large aggregated purchasing power including participating agencies to bring forward renewable energy projects. We are trying to address the 'market failure' as a result of the recent uncertainty around the RET. The government saw a need to intervene in order to support project development. Plus, the state government have set the Victorian RET so the projects supported through the RE certificate purchase are also expected to contribute to that RET.

Why did your organisation elect to procure offsite RE instead of purchasing Green Power?

Purchasing GreenPower from a retailer does not typically guarantee that the project will be built in Victoria, as it could be supporting projects in another state. The government wanted to support the supply chains and create jobs in our state. This demonstrates direct action and provides a tangible project/s in Victoria. It sends a more powerful message to have a project to point to.

Does your organisation utilise onsite RE generation? How did the choice of offsite RE deal align with your behind the meter generation assets?

Various sites do have on-site generation but the level of RE penetration varies across portfolios and assets due to various budget and technical constraints. We are still providing grants to some innovative projects which could be both on/off-site. Both the on-site generation, which is mostly smaller scale, and the large scale LGC bid align with the broader government appetite to support renewable energy.

Market processes

How the project was initiated, suitable project partners identified and assessed?

This project was initiated because the government wanted to do something quick and efficient to demonstrate leadership ahead of the introduction of the VRET, which will focus on supporting much larger generation capacities. We went through a competitive open tender process and a comprehensive technical and commercial evaluation. We used a combination of in-house and external commercial and technical expertise to conduct the due diligence on the tenders.

What were the key barriers encountered and to what extent were transaction costs (such as legal/consulting costs) significant?

In terms of transaction costs, we will be buying LGCs for up to 10 years from 100 MW plant/s and the cost over that time will amount to hundreds of millions. So in comparison the transaction costs were pretty small.

We did have to come up with a bespoke contract. There were some challenges getting the right features in terms of risk sharing, finding a project of the right size, and delivering value for money.

Reflecting on this process, can you nominate any factors which could make it more efficient?

We were in a good position. We benefited from lessons learnt in other jurisdictions, e.g. the ACT, which we looked at very closely, and we spoke to many industry proponents. The lessons learnt contributed nicely and we are very pleased with the outcome. It was a fairly efficient process, with a relatively contracted timeline compared to the ACT or ARENA processes.

Business Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

Victoria has a highly privatised market with private generators so the government made a decision many years ago to not own generators. Hence I cannot see us going in that direction again any time soon. (Of course some smaller sites do have small scale government-owned generation assets)

Why did your organisation elect to purchase RECs as offsets and not procure the electricity generated by the facility?

With regards to a PPA structure, there are talks about doing something that could lead down that road. We looked at many options (including reverse auction CFD, bundled black and green PPA, ARENA style seed funding, PPP option, something for the brown electricity component) before landing on the LGC Purchase as our preferred structure. This options seemed the best suited for our time frame. We recognised the complexity of looking at the CFD or PPA structures as part of the VRET plans.

Contract Term and Risk Management

What is the term of the agreement and structure of the agreement pricing? (Is it a fixed or variable price and are there any provisions which share electricity price volatility between end user and facility owner?) Why was this term and structure chosen?

Our contract has a 5 + 5 year term with a collar structure enabling a price adjustment by 25% up or down, as negotiated by the parties after the first 5 years.

RECs/Additionality

Concerning the treatment of Renewable Energy Certificates, how did your organisation treat the RECs created with respect to generation from the RE facility? Were they surrendered voluntarily or sold to a party liable under the RET?

The LGCs are intended to be used to meet the government's effective certificate requirements under the RET.

How important is additionality (renewable generation in addition to that which would have been generated anyway) to your organisation?

We may decide to purchase more LGCs or use any surplus LGCs for greening government entities. This has also been looked at through the VRET process.

CS4 Melbourne RE Project

Customer:	A purchasing group led by the City of Melbourne		
Generator location:	TBA		
Load location:	Melbourne		
System size:	110 GWh pa		
Project status:	Tender responses under review		
Structure:	Buy (PPA)	Own	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer	End user	
Purchase of:	LGC only	Electricity	Bundle
LGC treatment:	Sell	Surrender	

Summary:

Drivers

- To meet City of Melbourne's zero net emissions target
- To enable financing of large scale RE projects by signing PPAs
- To find a cheaper alternative to GreenPower
- Corporate responsibility, public image, etc.
- Long-term electricity price stability (only a primary driver for one participant)
- Direct procurement of renewable electricity "tells a stronger story" than purchasing LGCs
- Overcoming the 'buyers strike'

Process

- City of Melbourne alone did not have a big enough load → decision to aggregate
- 'Request for Information' stage to establish needs of aggregator participants
- Tender facilitated by Procurement Australia
- Project developers and retailers must tender together as a consortia
- Tender criteria cover risk and financability but parties are invited to suggest mechanisms to

- improve their credit worthiness via additional direct payment arrangements with the customer

Deal Details

- Procurement of LGCs and electricity (LGCs surrendered by most participants)
- 10 year PPA term (plus optional 3 year extension)
- Nominated fixed annual customer load plus/minus a buffer
- Fixed 10-year price for the expected 'matched electricity component' and variable (updated every 2 years) price for unmatched spot-price-exposed load.

Case study interview with Adam Zaborzczyk, Melbourne City Council:

Drivers

What are the drivers associated with electricity procurement in general?

The City of Melbourne has a zero net emissions strategy (both for the municipality for own operations and city more broadly), and electricity is an important component. We don't control any of the regulatory aspects of the electricity market so we recognise we need to work in a voluntary way with the community to enable the community to move toward voluntary purchase of RE, and hence this purchasing group has come about.

We sought to overcome the issue that, at the inception of this project, new RE projects were not being signed. This was largely a result of policy uncertainty around the RET at the time. There was little appetite on the part of the large retailers to sign new off take agreements for various reasons. So one of the drivers for the project was to overcome that 'buyers strike' and to enable a model or process whereby customers, through retailers, would be able to drive new uptake of renewables.

Why did your organisation elect to procure offsite RE instead of purchasing Green Power?

We see GreenPower as a relatively expensive project. We also undertook market research and identified that some customers did not have a lot of confidence in the GreenPower product. The brand was seen as delivering little value in terms of reputational benefits or non-carbon accounting or market brand benefits. Some described it as being old and tired and needing a refresh. Another aspect was that GreenPower didn't have a strong connection with a single RE project that was tangible and that you could associate with an organisation. So those were the drivers behind developing our own project.

Does your organisation utilise onsite RE generation? How did the choice of offsite RE deal align with your behind the meter generation assets?

We do use on-site renewable energy. We have insufficient roof space to generate sufficient electricity to meet our corporate needs so there is a need to source off site RE. Similarly if we look at the municipality there is insufficient roof space within the City of Melbourne to support the energy needs of the city, so the need arises for off-site renewables.

Market processes

How the project was initiated, suitable project partners identified and assessed?

The City of Melbourne electricity demand was deemed insufficient to underpin the development of a new wind farm or perhaps solar farm. – At the time this project started the economics of solar were less favourable so it was assumed the project would probably be a wind farm and our load was deemed too small. We saw the need to partner with others to increase the collective load and to develop a model to enable customers to voluntarily purchase large amounts of renewable energy.

Seeking purchasing group partners: To some extent it was a mix of self-selection and organisations being approached by the City of Melbourne. We looked to partner with organisations that had existing sustainability targets but that also had a strong association with Melbourne in some way. These included organisations that have headquarters in Melbourne, are leading iconic Melbourne brands, or neighbouring councils tending to have reputation for sustainability leadership. There wasn't a process of assessing or taking applications or criteria. It was really just based on their willingness to participate. The group grew over time and there came a point where we had to stop taking on new partners and focus on progressing the tender.

Seeking RE project partners: The purchasing partners workshopped and developed the criteria. We had discussions around the criteria or attributes that were important to the partners and how that related to technologies, geography and the branding or 'story telling' benefit. The criteria that we chose were: (1) renewable energy, (2) a new project, (3) non-combustion methods, which excludes landfill and plantation timber, forest timber and agricultural waste, (4) a preference for economic benefit to Victoria but not excluding projects located outside Victoria as long as some economic link exists, (and (5) connected to NEM. These were the criteria that went into the tender documents.

What were the key barriers encountered and to what extent were transaction costs (such as legal/consulting costs) significant?

The key challenge was facilitating a group as diverse and as large as ours was. We had 14 partners with associated diversity and complexity. Transaction costs were significant and ongoing. These involved legal costs, engaging energy consultants and facilitating the procurement processes. Council also invested

considerable resources to facilitate the purchasing group, develop tender specifications and manage the process. The importance of the facilitation role cannot be underestimated in an aggregated purchasing model and we need to find replicable solutions for enabling that for future groups.

Reflecting on this process, can you nominate any factors which could make it more efficient?

There are a number of lessons that we have taken from the process and that we will be willing to share after the completion of our tender process. In short they relate to the diversity across the group and achieving a simpler, less complex tender. There are improvements that we could make to the group size, the diversity across the group etc. These include ways in which you manage a large group and the extent to which you co-create a product specification.

Deal Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

There was a corporate decision made in council quite early on in this process, that the council did not have an interest in owning the RE facility. It was seen as something that not core business to Council. Investing in the generating asset would have involved a greater complexity and risk. So there wasn't appetite for investing in and owning a utility scale RE facility.

First of all, is your organisation procuring electricity from the RE facility to be reflected in your retail purchases or RECs as an offset to electricity consumption?

Yes, we will be procuring both the electricity and the LGCs from the facility. There are a number of nuances in the way that different members have approached this but essentially we will be purchasing electricity and LGCs.

Can you tell me how the relationship between the end user, RE facility owner, and retailer is structured so as to enable the pass through of generated electricity?

Each customer has a separate but common retail supply agreement with the retailer. The retailer is the counter-party to the renewable energy PPA with the

generator. The retailer purchases the electricity and the LGCs and sells that to each customer.

Contract Term and Risk Management

What is the term of the agreement and structure of the agreement pricing? (Is it a fixed or variable price and are there any provisions which share electricity price volatility between end user and facility owner?) Why was this term and structure chosen?

The contract term was for 10 years with the option to extend for up to 3 years, which was to cover the period to the end of the RET, out to 2030. The pricing structure sought to provide (a) a fixed price for LGCs, (b) a fixed price for a proportion of the electricity commodity representing the 'matched' electricity component, and (c) allow for a variable price reset every 2 years for the unmatched price and retail electricity price.

Is the end user obliged to acquire a minimum level of RE generation under the contract irrespective of end user demand?

Yes. We nominated a volume of demand and nominated that it could scale up or down by 20% over the course of the contract, which is currently a standard provision in most customers' black electricity retail contracts. Given the nature of the portfolios, they are likely to flex over the term of the contract so we included that flexibility.

Why were these choices made and which barriers were associated with your decision?

They reflected the customer needs and current practice in terms of electricity contracting. The key driver behind the adopted structure was that the parts of the business that deal with electricity contracting prefer a 'business as usual' approach. They want a contract that, as closely as possible, resembles the type of electricity contracts they are used to managing.

RECs/Additionality

Were they surrendered voluntarily or sold to a party liable under the RET?

In each case they would be surrendered.

How important is additionality (renewable generation in addition to that which would have been generated anyway) to your organisation?

Additionally is a key driver for the project. The purpose of the project was to drive additional development of renewable energy projects, and also to enable customers to meet their corporate carbon neutrality and renewable energy commitments.



CS5 Sydney Metro Northwest

Customer:	Transport for NSW		
Generator location:	TBA		
Load location:	Sydney		
System size:	134 GWh pa (e.g. approx 61 MW of pv)		
Project status:	Tender open		
Structure:	Buy (PPA)	Own	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer	End user	
Purchase of:	LGC only	Electricity	Bundle
LGC treatment:	Sell	Surrender or sell surplus	

Summary:

Drivers

- Uphold a reputation as a world class metro system
- Offset the carbon emissions from this new rail project
- follow the most cost-effective route for offsetting emissions
- Support the local renewable energy economy within NSW
- The planning approval
- Seek to realise the benefits of bundling LGC and electricity procurement

Process

- An EOI process was run in early 2016
- Workshops with short-listed proponents led to the development of the RFT documentation
- Currently the tender process is open

Deal Details (yet to be confirmed)

- Likely a 15-year Power and Green Products Purchase Agreement (P&GPPA)
- Likely for the purchase of both electricity and LGCs (to be surrendered)
- A potential structure of the deal is that TfNSW will contract (via the PGPPA) with a Retailer who will supply the electricity and LGCs. The Retailer would, in turn, enter into a PPA (to which TfNSW is not a party) with a Generator to construct a new renewable energy project in NSW from which it would source its LGCs that would be supplied to TfNSW.

Case study interview with Stuart Hodgson, Transport for NSW:

Drivers

What are the drivers associated with electricity procurement in your organisation, and how did these drivers influence the decision to procure offsite RE?

Heavy rail systems make important contributions to reducing emissions for the transport system in a city. Nonetheless, modern train systems are very energy intensive, so we made the case that this is still an impact that should be mitigated. This was a project-led initiative that manifested in the conditions of planning approval. The commitment was made to offset the emissions for this project.

Why did your organisation elect to procure offsite RE instead of purchasing Green Power?

A cost benefit analysis study was undertaken 2 years ago to assess the various options for offsetting emissions, including GreenPower, carbon credits, tree planting, etc. In Aug 2015 the recommendation was made to pursue a renewable energy project. The study showed that this approach stimulates the local renewable energy economy more than GreenPower or carbon credits, and from the state development perspective, local is important.

Market processes

How the project was initiated, suitable project partners identified and assessed?

In January 2016 we called for expressions of interest and the industry briefing was well attended. Part of that process was to ask for capability and what projects would be offered. We received about a dozen responses to the EOI nominating solar and wind projects in NSW, and nominated the preferred models.

Six proponents were short-listed and taken through drafting workshops to discuss terms. Through these workshops the RFT was developed and proponents are currently tendering against that. It has been an interactive process involving meetings with proponents both post-EOI and again post-RFT.

The outcome is due in May this year and we are hoping to award mid 2017.

What were the key barriers encountered and to what extent were transaction costs (such as legal/consulting costs) significant?

The key barrier for us was the lack of knowledge and experience within our own team. Hence, it worked well to engage consultants early in the process so they have been following the journey for several years.

Reflecting on this process, can you nominate any factors which could make it more efficient?

In our case, a whole of government approach could be more effective. As for non-government corporate end users, perhaps a centrally run broker system would work well? In general, it would be helpful to broadly communicate that there is an RE master plan at the state level.

Deal Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

At this stage our preference is for a relationship with a retailer, and the retailer would hold the relationship with the generator.

Is your organisation procuring electricity from the RE facility to be reflected in your retail purchases or RECs as an offset to electricity consumption? And why?

We may be procure both electricity and LGCs as a bundle. One risk to consider is our contractual obligations with the construction contractor, one of those being the provision of power. Hence that is the focus and the green comes second.

The EOI documents put forward a couple of models including the option of a straight black power deal with a separate purchase or LGCs, or the purchase of power and LGCs, or just LGCs.

Can you tell me how the relationship between the end user, RE facility owner, and retailer is structured so as to enable the pass through of generated electricity?

This relationship has been explored in the workshops and will be determined through the tender process. One option is that we could have one black power contract with a retailer and a separate renewable energy contract directly with the generator. Alternative we could go through a retailer who has a sub-contract with a generator.

Additionally we have discussed 'step in' rights to provide TfNSW with the right to continue to secure LGCs (under the same terms) for up to 6 months in the

event of a Retailer default. This aligns with the Retailer of last resort facility and provides time for the parties to endeavour to find a new Retailer..

What were the barriers encountered in implementing such a structure? Was complexity and risk management a significant issue?

Part of the complexity has resulted from Sydney Metro NW being a greenfield project (with uncertain load, load shape and start date).

It is all about risk sharing. The way we often try to manage that is to emphasise the motivation for offsetting our emissions with this RE component, which is to protect our reputation as a world class metro system.

Contract Term and Risk Management

What is the term of the agreement and structure of the agreement pricing? (Is it a fixed or variable price and are there any provisions which share electricity price volatility between end user and facility owner?) Why was this term and structure chosen?

The term aligns with the Sydney Metro operator period.

We are asking Proponents to nominate a fixed electricity volume that will have a fixed price, with the remainder to be priced under a variable pricing model, which allows periodic price reset to reflect the electricity futures market.

We are looking at a 15 year term but there will be a reset provision on the black power component.

Because SMNW is a greenfield project, we do need flexibility here. We need to be able to manage demand shortfall/exceedance outside of the contracted range

As part of the EOI responses we received some pricing indications. We did not use this information for the short listing but it gave us an idea of what to expect. We are pleased to see that the “black+green” costs that came in stayed below what we’d estimated over previous years.

How is load which is not aligned to RE generation managed? Who bears the market risk associated with such load?

These details will come out of the tender process. But our demand tends to be ‘lumpy’ in the peaks and the generated power needs to be somehow matched to what we need. This is where the contracting gets complex because we need to define what it is that we

are actually pricing. Perhaps we need to lock in a certain base amount and have a premium for peaks and sharing for troughs, but that is just one option.

RECs/Additionality

Will the RECs be surrendered voluntarily or sold to a party liable under the RET?

The intention is to purchase LGCs needed to cover the load (134GWh). A proportion of these will be available to the Retailer for surrender to meet their obligations under the RET scheme. The remainder will be sold.

CS6 Newcastle Solar Farm

Customer:	Newcastle City Council		
Generator location:	Summerhill Waste Management Centre, Newcastle		
Load location:	Newcastle		
System size:	5 MW		
Project status:	EOI responses under review		
Structure:	Buy (PPA) ??	Own ??	
Project type:	New	Existing	
Approach:	Single end user	Aggregated	
PPA counterparty:	Retailer ??	End user ??	
Purchase of:	LGC only ?	Electricity ?	Bundle ?
LGC treatment:	Sell ??	Surrender ??	

Summary

Drivers

- Cost reduction and emissions reduction
- Looking for a more cost effective, tangible and permanent option compared to GreenPower
- Insufficient roof space for the system size required

Process

- Feasibility study and preliminary system concept design completed
- Network engaged to complete a load flow study
- An EOI round (closed in Nov 2016) sought market feedback on 2 aspects:
 - design/construct plus short-term operate/maintain
 - retail management of the generated electricity

Deal Details

- 5 MW solar farm to be built on council land
- It is yet to be determined whether council will own the solar farm or purchase the output from a third party
- Until the ownership structure is determined, it is unclear whether a PPA will be involved and hence, what the structure of that contract might look like

Case study interview with Adam Clarke, Newcastle City Council:

Drivers

What are the drivers associated with electricity procurement in general, and how do these drivers influence the decision with respect to procuring offsite RE?

The primary driver at this point in time would be cost reduction at our sites. Emissions reduction is an important secondary driver. The council has an emissions reduction target of 30% by 2020 (for council's own operations).

Why did your organisation elect to procure offsite RE instead of purchasing GreenPower?

I believe we did purchase GreenPower in the past but basically the decision was made that we are better off investing in our own projects to produce similar results. One reason is tangibility. Another is about ensuring that additional generation is added to the system, whereas with GreenPower there is a perception that you're just paying for generation that's already in the system. There's also creating additional jobs, putting money into the local economy and providing more of a visible leadership role by having a system in our LGA. Finally, in terms of GreenPower, given that we previously purchased that and now no longer do, this raises doubt around the long term impact of a decision – it's obviously something that can be subject to policy change or simple reversal of the decision. Whereas if

we were to build our own systems within our local government that is long lasting additionality.

Does your organisation utilise onsite RE generation? How did the choice of offsite RE deal align with your behind the meter generation assets?

At the moment we've got 8 behind the meter rooftop systems, which add up to about 442 kW of PV. We are currently looking at another couple of sites. However, the barriers to pushing further with on-site generation are the available roof space and heritage issues. So in terms of having a big move towards the 30% target, we would need quite a large additional generation capacity and it wouldn't be feasible to continue trying to cover every bit of roof space to achieve that.

Market processes

How the project was initiated, suitable project partners identified and assessed?

We've completed a feasibility study, undertaken preliminary concept and connection design for a system, done some geotechnical investigations, and have engaged the network to complete a load flow study. We ran an EOI round which closed late Nov 2016 and we are currently reviewing the submissions.

Reflecting on this process, can you nominate any factors which could make it more efficient?

With regards to the potential opportunity to aggregate with other large energy users in the future, we would consider that. If we get this system up and running it would effectively make our electricity supply 50% renewable, which leaves another 50% for the future. There is a lot of interest from other organisations in the region including Uni Newcastle, other councils, and other private enterprises, so there is definitely the option in the future to look at an aggregated purchase.

Business Structures

Can you describe your organisation's relationship with the offsite RE generation facility, specifically with respect to plant ownership? Why did you choose this option and what were the factors which influenced the decision?

This has not yet been decided and is subject to the results of the EOI. It is possible that own/operate could have the greatest financial return for council in the long

term, particularly as the plant will be on council land, but there are multiple factors in the decision.

Can you describe the role of the electricity retailer in facilitating the pass through?

Yes, it is likely that we would direct our current retailer to purchase electricity from the generator at the same rates we currently have so it can effectively net off consumption at other sites. As for the RE certificates, our current retailer simply charges us a certificate management fee anyway, so we could direct them to procure the certificates from our own generator as well to offset our other sites. Depending on the outcome in terms of the ownership model, we would either be effectively buying and selling from ourselves, or we could just sell the output at a rate that is roughly the same as what we're paying for importing at other sites, essentially as an accounting offset.

There is a secondary part to the EOI, which is the EOI for retail of the electricity from the PV generation asset. So that will look at whether we need to have the same retailer for both our other large sites and the generator or if they can be separately managed as an accounting offset. We have had informal discussions with different retailers about various options but the EOI will allow us to assess any other proposals that may come forward.

RECs/Additionality

Concerning the treatment of Renewable Energy Certificates, how did your organisation treat the RECs created in respect of generation from the RE facility? Were they surrendered voluntarily or sold to a party liable under the RET?

This is also yet to be determined in our case. Twelve months ago I would have said that it was very difficult for projects to stack up commercially without selling the LGCs. That is, at least, if purely on a financial basis without other strongly supportive policies or motivations. However, with the doubling of the wholesale energy prices that we have seen in the past year, it is now possible that projects could be financially viable with or without the additional revenue that can be generated via the sale of the LGCs. These details will be decided by council.

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