Off-Site Renewable Energy
Stakeholder Workshop #1
24th Nov 2016
# Project Overview

<table>
<thead>
<tr>
<th>Title</th>
<th>Facilitating large energy user deployment of off-site renewable generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>CRC for Low Carbon Living</td>
</tr>
<tr>
<td>Duration</td>
<td>12 months</td>
</tr>
<tr>
<td>Motivation</td>
<td>Recent market explosion in the US</td>
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<td></td>
<td>Initial movements in Australia but perceived lack of transparency/information</td>
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<tr>
<td>Methodology</td>
<td>Case studies</td>
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<tr>
<td></td>
<td>Market survey</td>
</tr>
<tr>
<td></td>
<td>Stakeholder workshops</td>
</tr>
</tbody>
</table>
Project Rationale - Objectives

**Rationale**
To bring information into the public domain which supports end user decision making and reduces transaction costs associated with implementing direct procurement deals.

**Objectives**
1. to explore the options available to end users in directly procuring offsite renewable energy; and
2. to describe the market for such services in the Australian electricity industry context;
3. to describe the current status of offsite contracting in Australia and identify drivers and barriers to market development.

- Green Power
- Range of structures for offsite RE
- Behind the Meter RE
Transaction costs and market maturity – where we want to go

**Rationale**
To bring information into the public domain which supports end user decision making and reduces transaction costs associated with implementing direct procurement deals.
Market Survey

Interviews completed with 31 end users, 6 retailers, 6 project developers and 4 intermediaries.

Drivers and attitudes
- Energy costs
- CSR and RE
- Drivers
- Experience and attitudes:
  - Green Power
  - On-site generation
  - Off-site generation

Off-site RE preferences
- Buy vs own
- Green or black
- Counterparty identity
- Aggregation
- Additionality

Forward looking
- View on the likely development in Aust.
- Barriers
- Recommendations

For electricity retailers
- Business drivers
- Product offerings
- Deal preferences

For project developers
- Business drivers
- Deal preferences
- Financing
- Risk allocation
# Case Studies

<table>
<thead>
<tr>
<th>Project name</th>
<th>Who?</th>
<th>BOO/Buy</th>
<th>Single/Aggreg.</th>
<th>Black/LGC only</th>
<th>Retailer involved?</th>
<th>Status</th>
<th>Case study?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desalination Plant</td>
<td>Sydney Water</td>
<td>Buy</td>
<td>Single</td>
<td>Black+LGC</td>
<td>Retailer - developer</td>
<td>Complete</td>
<td></td>
</tr>
<tr>
<td>Singleton Solar Deal</td>
<td>UTS</td>
<td>Buy</td>
<td>Single</td>
<td>Black only</td>
<td>Supply unserved load</td>
<td>(Pre-existing)</td>
<td>*</td>
</tr>
<tr>
<td>RE Reverse Auctions</td>
<td>ACT state govt</td>
<td>Buy</td>
<td>Single</td>
<td>LGC only</td>
<td>No</td>
<td>Complete</td>
<td></td>
</tr>
<tr>
<td>RE Purchasing</td>
<td>Victorian state govt</td>
<td>Buy</td>
<td>Single</td>
<td>LGC only</td>
<td>No</td>
<td>Construction</td>
<td>*</td>
</tr>
<tr>
<td>Sunshine Coast Solar Farm</td>
<td>Sunshine Coast City Council</td>
<td>BOO</td>
<td>Single</td>
<td>n/a</td>
<td>Pass through spot exposure</td>
<td>Construction</td>
<td>*</td>
</tr>
<tr>
<td>Melbourne RE Project (MREP)</td>
<td>Melbourne City Council</td>
<td>Buy</td>
<td>Agreg</td>
<td>Black+LGC</td>
<td>PPA counterparty</td>
<td>Tender</td>
<td>*</td>
</tr>
<tr>
<td>Sydney Metro North West</td>
<td>Transport for NSW</td>
<td>Buy</td>
<td>Single</td>
<td>Black+LGC (probably)</td>
<td>PPA counterp (probably)</td>
<td>Tender</td>
<td>*</td>
</tr>
<tr>
<td>RE Buyers Forum</td>
<td>WWF/JLL</td>
<td>Buy</td>
<td>Agreg</td>
<td>Black+LGC</td>
<td>PPA counterparty</td>
<td>EOI</td>
<td></td>
</tr>
<tr>
<td>Summerhill Solar Farm</td>
<td>Newcastle City Council</td>
<td>BOO (TBC)</td>
<td>Single</td>
<td>n/a</td>
<td>TBC</td>
<td>EOI</td>
<td>*</td>
</tr>
<tr>
<td>Solar Trams</td>
<td>Yarra Trams</td>
<td>Buy</td>
<td>Single</td>
<td>n/a</td>
<td>n/a</td>
<td>Did not proceed</td>
<td></td>
</tr>
</tbody>
</table>
Stakeholder Workshops

- Get **feedback** from stakeholders
- Generate discussion
- Engage stakeholders in activities to explore details
- Enable networking between stakeholder groups

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td>Presentation 1: <strong>Business structures</strong></td>
</tr>
<tr>
<td>9:45 am</td>
<td>Stakeholder activity 1</td>
</tr>
<tr>
<td>10:30 am</td>
<td>Morning tea</td>
</tr>
<tr>
<td>11:00 am</td>
<td>Presentation 2: <strong>Market structures</strong></td>
</tr>
<tr>
<td>11:45 am</td>
<td>Stakeholder activity 2</td>
</tr>
<tr>
<td>12:15 pm</td>
<td>Final question time</td>
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<tr>
<td>12:30 pm</td>
<td>Lunch</td>
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</table>
Session 1 – Business Structures

The success of source specific end use RE procurement will depend on the efficiency of this process.

- Market Structure
  - Process of matching end users and project developers
  - Platform providers/intermediaries
  - Information provision/flows

- Business Model Structure
  - End user buy vs own decision
  - Identity of contractual counterparties
  - Role of Retailer and pass through of contracted generation into retail purchase

- Contract Structure
  - Contractual terms (10+ years?)
  - Settlement terms and pricing (LGCs, Electricity)
  - Division/management of market risk

- Specific Deal Outcomes
  - $/LGC, $/MWh
  - Financing terms (debt/equity)
  - System size
  - Technology Choice
Session 1 - Business Structures

- **Key question** – What do you want to procure?
  - ‘Green’ – LGCs as offsets to purchased ‘grid’ electricity
  - ‘Green’ and/or ‘Black’ – LCGs and/or financial pass through of generation value

- **How to structure the relationship between the End User, Retailer, and Project Developer? Focussing on generation pass through**
Black Pass Through – Context

- The electricity system doesn’t match specific sources of supply and demand at a physical level.
- ‘Pass through’ of contracted generation is therefore a financial construct rather than a physical one.
- Key concept:
  - Generator revenue depends on generation timing and wholesale electricity market prices (generation revenue).
  - End user load pays depending on timing and wholesale electricity market prices (load payment).
Black Pass Through – Context

- If timing of generation and load match perfectly, revenue and payment cancel, eliminating market exposure.
- If there is a mismatch between generation and load, a residual financial market exposure exists (balancing risk).

Example:
- PV will only cover load during daylight hours leaving evening/night load exposed to market prices.
- Area under the generation curve can be netted off total load payment → just pay for the cost of generation.
Role of an Electricity Retailer

- Electricity Retailers manage electricity market risk on behalf of end users.
  - An electricity retailer is required at some level to pass through generation value (we will go into that further)
  - Risk associated with residual (load-generation mismatch) needs to be allocated and managed
- If an end user wishes to purchase RECs as green offsets then no electricity retailer is required in this capacity
- If the pass through of ‘black’ generation value is desired there is a question as to;
  - How best to structure relationship between parties
  - How best to allocate responsibility for residual ‘balancing’ market risk
Session 1 Exercise - Business Structures

• The focus of the following exercise is on the pass through of ‘black’

• There are three structures which are presented with respect to different approaches to allocating risk and enabling financial pass through of generation value.

• We are interested in your views:
  • What positives and negatives do you perceive?
  • What factors do you thing are important in considering the different approaches?
  • What are your preferences with respect to the different structures?

• Your facilitator will start by brainstorming pros and cons

• At the end of the exercise fill out the voting slip and say why you chose the option you did.
Approach 1 - Retailer as PPA Counterparty

- This is the approach which corresponds most closely to the status quo
- The retailer holds the PPA as the counterparty either on behalf of the end user
- The end user would have a retail contract of the same length as the PPA duration
- The retailer would provide balancing services and pass through generation value + the cost of servicing the balancing load
- The end user just has to deal with the electricity retailer, single contract to manage
Approach 1 – Issues and Example

ISSUES TO CONSIDER

- Reduction in retail market flexibility, end user is locked into (long term retail agreement) for both contracted RE and balancing grid electricity
- Who gets to choose the project to be contracted with, the retailer or the end user? There is a negotiation challenge.
- The pricing of balancing grid electricity over the longer term such that the retailer doesn’t exercise undue pricing power.
- Retailer needs to have a high enough credit rating to bank a PPA. Not all retailers have such a credit rating.

EXAMPLE(S)

- Both the JLL-WWF Renewable Energy Buyers Forum and Melbourne City Council are utilising this approach. Approach lends itself to aggregation.

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Approach 2 – End User as Counterparty – Pass Through

- End user acts as the PPA counterparty, end user enters into a PPA with a project developer of their choice
- Pays the project developer directly in respect of contracted renewable generation
- End user then contracts with an electricity retailer who is happy to facilitate pass through and balance mismatched load.
- Retailer receives generation settlement revenue, which offsets financial exposure to market, and the end user pays the retailer in respect of net load.
Approach 2 – Issues and Example

ISSUES
- The end user is able to retain retail market flexibility
- Need to find an electricity retailer who is happy to take the generation
- End user not restricted in choice of project they wish to contract with, end user is bearing all the counterparty risk
- Balancing services/risk is placed naturally with the electricity retailer
- Does not lend itself to aggregation therefore scale may be a larger barrier
- Smaller retailers, with poorer credit ratings, can provide these services

EXAMPLE(S)
- UTS-Singleton solar farm

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Approach 3 – End User as Counterparty – Self Hedge

• End user acts as the PPA counterparty, end user enters into a PPA with a project developer of their choice
• Pays the project developer directly in respect of contracted renewable generation
• Retailer passes through market spot price exposure, possibly according to time of the day
• End user utilises generation revenue or difference contract to self hedge wholesale market exposure.
• End user either bears settlement mismatch risk or purchases additional hedging products.
Approach 3 – Issues and Example

ISSUES

• Retain retail market flexibility
• End user not restricted in choice of project they wish to contract with, but they bear project developer counterparty risk
• End user accepts market mismatch risk in the first instance, Additional risk management products may be required
• End user bears a greater contract admin/settlement load/more complex
• Smaller retailers, with poorer credit ratings, can provide these services

EXAMPLE(S)

• Sunshine Coast City Council

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<tr>
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Exercise Instructions

• On each table are copies of the slides showing each option
• We are interested in your views:
  • What positives and negatives do you perceive?
  • What factors do you think are important in considering the different approaches?
  • What are your preferences with respect to the different structures?
• Your facilitator will start by brainstorming pros and cons

• At the end of the exercise fill out the voting slip and say why you chose the option you did.
Questions / Discussion

(followed by morning tea)
Session 2 – The Market for Offsite RE

- Context: The market for offsite RE is part of a larger market for renewable energy procurement which includes Green Power and behind the meter RE.

- This session will focus on the development of a market for offsite RE services/products by considering
  - What gets sold/bought in this market?
  - Process of matching end users and project developers
  - How are interactions facilitated/information flows?
The success of source specific end use RE procurement will depend on the efficiency of this process.

- **Process of matching end users and project developers**
- **Platform providers/intermediaries**
- **Information provision/flows**

- **End user buy vs own decision**
- **Identity of contractual counterparties**
- **Role of retailer and pass through of contracted generation into retail purchase**

- **Contractual terms (10+ years?)**
- **Settlement terms and pricing (LGCs, Electricity)**
- **Division/management of market risk**

- **$/LGC, $/MWh**
- **Financing terms (debt/equity)**
- **System size**
- **Technology Choice**
Some Objectives

• Some objectives for a offsite RE contracting market;
  – End user needs and preferences are met;
  – Mutually beneficial exchange is realised;
  – Contracting and deal making is efficient (transaction costs are minimised);
  – Sufficient information is available to enable rational decision making;
Product vs Service

- Given our **objectives** (end user preferences, mutual benefit, efficient contracting, information for rational decision making)
- Imaging the future market for offsite RE as consisting of two modes of supply side/demand side interaction:
  - **Product led or Service led**
- In this case the ‘good’ is the same; it is the procurement of offsite RE, but the manner in which the parameters of that ‘good’ are determined and end user needs satisfied is different.
  - A **product led** approach to the development of an offsite RE market involves the supply side of the offsite RE market 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 out specific solution (likely non-standardised) which meets their specific needs.
Product vs Service

- The market will likely consist of a mix between these two modes

Questions for brainstorming
- What will be the mix between product led and service led outcomes?
- What factors will be important in determining this mix?
- What might these ‘products’ end up looking like?

Product Led Approach

Solution Led Approach
Product vs Solution - Term & New vs Existing

- Introducing two additional parameters to the product vs solution question
- **New/Existing** - Contracting with existing generation offers the prospect of shorter term agreements.
  - New generation requires longer term offtake agreements (10+ years)
  - Existing generation open to shorter term agreements (2 – 5 years)

Questions for brainstorming
- What role will end user choice between New and Existing generation influence solution vs product led outcomes?
- Do you agree with the following, if so why? if not why?

**Diagram:**
- New Generation
  - Long Term
  - SOLUTION LED?
- Existing Generation
  - Short Term
  - PRODUCT LED?
Product vs Solution – Facilitation and Sale

• End users core business activities are generally not related to energy and lack skills in house to manage generation procurement.
• End users require information, skills, and additional facilitation to procure offsite RE
• There are a range of entities who are positioned to facilitate
  – Energy brokers
  – Electricity retailers
  – NGO/Government/Quasi Government (Councils)
  – Aggregation Groups

**Question for brain storming:**
  – Who do you think the main groups will be in facilitating end user procurement?
Exercise Instructions

• On each table are copies of the slides showing the brainstorming questions

Questions for brainstorming:
  – What will be the mix between product led and service led outcomes
  – What factors will be important in determining this mix?
  – What might these ‘products’ end up looking like?

Questions for brainstorming:
  – What role will end user choice between New and Existing generation influence solution vs product led outcomes?
  – Do you agree with the diagram, if so why? if not why?

Questions for brainstorming:
  – Who do you think the main groups will be in facilitating end user procurement?

• Your facilitator will record your views
Questions / Discussion