



Off-Site Renewable Energy

Never Stand Still

Engineering

Stakeholder Workshop #2

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Project Overview

Title	Facilitating large energy user procurement of off-site renewable generation
Funding	CRC for Low Carbon Living
Duration	12 months
Motivation	Recent market explosion in the US Initial movements in Australia but perceived lack of transparency/information
Methodology	Case studies Market survey Stakeholder workshops



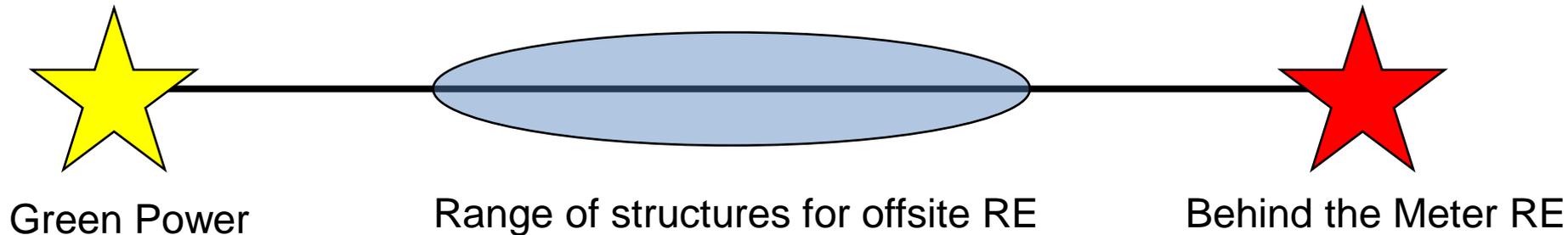
Project rationale - objectives

- **Rationale**

To bring information into the public domain which supports end user decision making and reduces transaction costs associated with procurement of offsite RE by end users

- **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.



Scope and limitations

- This project was constrained by time and resourcing
- An exhaustive investigation of all aspects was not possible
- Therefore, this study focussed on:
 - Larger scale end users (residential small business is excluded)
 - Structures for energy procurement (network issues are excluded)
 - Qualitative investigation of market issues (economic/business case excluded)
- Information here is of a general nature only and any commentary on issues involving risk management, licensing, contracting, accounting, tax should not be construed as providing professional advice.



Methods

- This study adopted a: 1) exploratory; 2) descriptive; and 3) explanatory approach to understanding:
 - 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 providing services for offsite RE procurement.
- **Survey methods** were used to distil market participant values, drivers, and preferences with respect to procurement options and structures.
- **Case studies** were used to illustrate the different options identified in the resulting framework for offsite RE procurement.
- **Stakeholder workshops** were used to test ideas in a group setting and disseminate research outcomes

Qualitative Market Survey

- Survey methods were of a semi structured, qualitative nature with questions which were designed generate broader discussion
- Interview transcriptions were then 'coded' to identify themes across participants
- The identified themes were key in developing and refining the framework
- Interviews completed with 31 end users, 6 retailers, 7 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

- Case studies in the Australian context were identified which illustrate a range of possible offsite RE procurement approaches and structures

Project name	Who?	BOO/ Buy	Single/ Aggreg.	Black/ LGC only	Retailer involved?	Status	Case study?
Desalination Plant	Sydney Water	Buy	Single	Black+LGC	Retailer = developer	Complete	
Singleton Solar Deal	UTS	Buy	Single	Black only	Supply unserved load	(Pre-existing)	*
RE Reverse Auctions	ACT state govt	Buy	Single	LGC only	No	Complete	
RE Purchasing	Victorian state govt	Buy	Single	LGC only	No	Construction	*
Sunshine Coast Solar Farm	Sunshine Coast City Council	BOO	Single	n/a	Pass through spot exposure	Construction	*
Solar Yarra Trams	Victorian state govt	Buy	Single	LGC only	No	Construction	
Zinc refinery solar farm	Sun Metals	BOO	Single	n/a	No, on-site. (behind meter?)	Construction	
Melbourne RE Project (MREP)	Melbourne City Council	Buy	Aggreg	Black+LGC	PPA counterparty	Tender	*
Sydney Metro North West	Transport for NSW	Buy	Single	Black+LGC (probably)	PPA counterp (probably)	Tender	*
RE Buyers Forum	WWF/JLL	Buy	Aggreg	Black+LGC	PPA counterparty	EOI	
Summerhill Solar Farm	Newcastle City Council	BOO ? (TBC)	Single	n/a	TBC	EOI	*

Stakeholder workshops

- Two stakeholder workshops have been held to:
 - Get **feedback** from stakeholders
 - Generate discussion
 - Engage stakeholders in activities to explore details
 - Enable networking between stakeholder groups
 - Disseminate results
- Workshop #1 (24 November 2016) / Workshop #2 - Today

9:00 am	Presentation 1: Market and Decision Framework Findings
10:30 am	Morning tea
11:00 am	Presentation 2: Panel – Issues and the way forward
12:15 pm	Final question time
12:30 pm	Lunch

- **Are there any questions about the nature of the study?**



End-user drivers

- **First things first - Why would end-users be interested in procuring offsite RE?**
- Identifying drivers is a fundamental first step in achieving study goals
- Drivers in this regard may be divided into three groups:
 - I. Drivers of a general nature which influence an end user's decision to procure RE from any source;
 - II. Drivers which may see an offsite RE solution satisfy end user preferences to a greater or lesser degree than other options; and
 - III. Barriers to other RE procurement options which then become drivers to consider an offsite RE solution.



End-user drivers – general / specific

- Drivers of a general nature, apply but are not specific to offsite RE
 - End user control
 - Environmental/CSR targets;
 - Political/community values/targets; and
 - Government policy vacuum.
- Drivers which may see an offsite RE solution satisfy end user objectives more, or less, than other options depending on the preferences and situation of the end user:
 - Cost;
 - Cost hedging;
 - Marketing value;
 - Traceability/Tangibility; and
 - Flexibility for multi-site operations.

Drivers – barriers to other RE options

- The third category of driver relate to the barriers to behind the meter RE procurement options, and the general attitude towards GreenPower, both of which act as specific drivers for end users to consider an offsite RE solution.
 - **Barrier to behind the meter RE:**
 - Facility barriers: Space; roofing condition; electrical installation; facility flexibility;
 - Tenant Landlord: Split incentives; negotiation cost; short term lease/long term asset lifetime.
 - **End user attitudes towards GreenPower:**
 - Additional cost: Green power is an expensive option;
 - Tangibility: lacks tangibility; untraceable;
 - Integrity/marketing: lacks integrity;

- **Are you surprised by the attitude towards GreenPower/certificate mechanisms?**
- **Do these drivers correspond to your impression?**

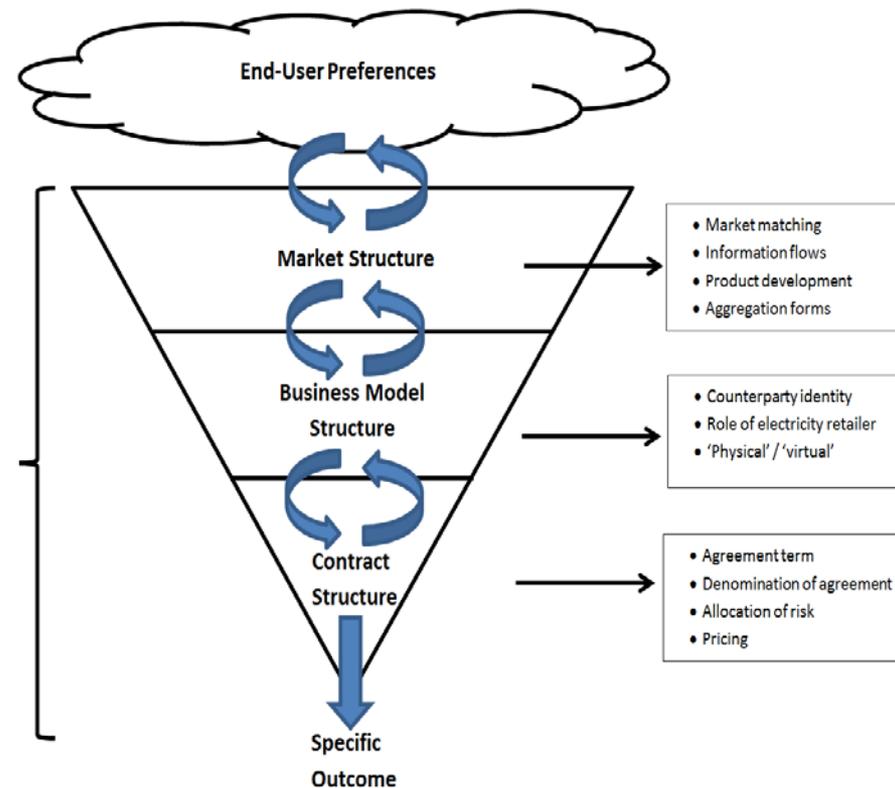


Models for understanding the market/process

- Two models for describing this market:
 - 1) **Process ‘funnel’ model**
 - 2) **Decision framework** model of an offsite RE deal



Transaction
Costs



The decision/option model

- The top two levels of the RE procurement process funnel are the primary focus for this study.
- The framework describes the decisions which need to be made by end users in structuring an offsite RE procurement deal.
- Decision model describes 192 different structures.

Structure	Buy		Own
Project type	New		Existing
Form of RE procurement	Green	Black	Bundled
Deal type	Exclusive		Aggregated
Counterparty	Retailer		End-user
Financial approach	Physical pass through		Virtual
LGC treatment	Sell		Surrender

End-user preferences

- Prior to going through the procurement process, an end user needs to come to a view as to an initial set of preferences with respect to what they want.
- End user preferences in this regard will determine the offerings in the market.
- The three decision variables assessed at this stage:
 - **Ownership structure:** Buy vs own
 - **Project type:** New vs Existing
 - **Form of RE procured:** 'Green' vs 'Black'
- Buy vs own is determined by cost of capital, in-house expertise
- New vs existing: appetite around term required for financibility and cost; additionality;

RE generation value ('Black') vs RECs ('Green')

- A key preference expressed by a broad range of end users was for RE generation value to be procured with/or without RECs;
- It should be noted that this is not a physical proposition, it instead reflects a financial arrangement;
- Issues in this regard:
 - RECs as offsets are an additional cost options and abstract mechanism which was hard to describe;
 - Acquiring generation value will reduce electricity costs;
 - Marketability and tangibility all enhanced;
- It was not entirely clear the extent to which all end users appreciated the physical vs financial nature of generation value procurement.

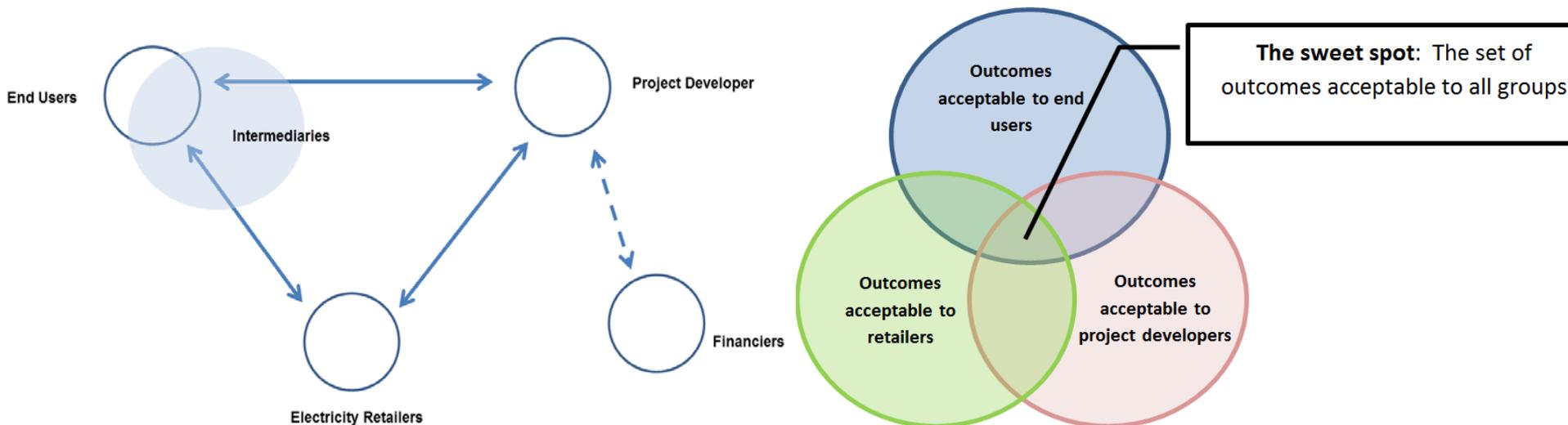


- **What are your views about the end user preference to procure RE generation value under an offsite RE deal?**

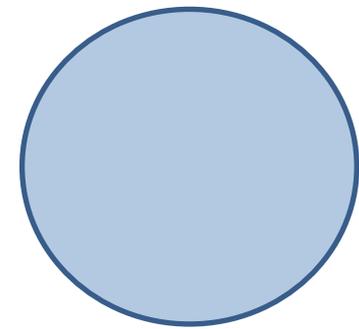


Market Structure level

- **Market Structure** - process through which parties (supply and demand side) match given their individual preferences and objectives
- 3 primary market groups: End Users; Project Developer; Electricity Retailers
- Market is fundamentally tri-partite
- Market evolution will be an iterative process of identifying ‘the sweet spot’ set of options that work for all parties

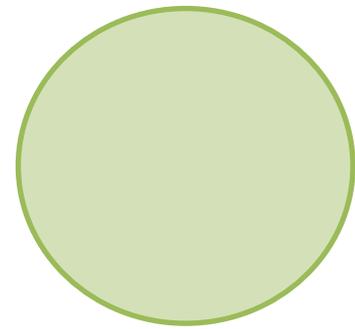


End-user market context



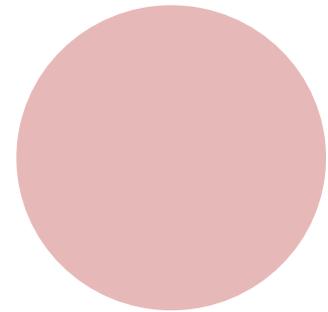
- Issues faced by end-users when participating at the market stage
- End-users want to satisfy their drivers given a set of preferences in the following context:
 - The split between energy procurement and sustainability teams
 - The challenge of internal sign off given risk adverse management
 - Information and education barriers, information asymmetry were significant issues, need help.
 - A traditional approach to electricity procurement involving tenders and max 3 yr agreement terms
 - Significant challenges in entering into agreements long enough to underpin new generation (10 yr)
 - Significant desire to retain as much flexibility as possible

Electricity Retailer market context



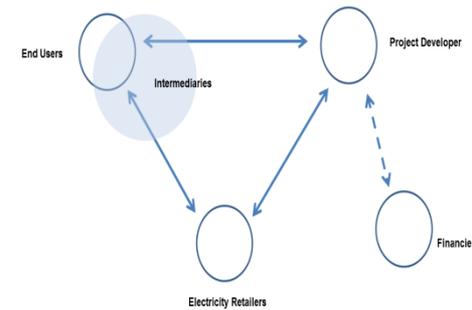
- Electricity retailers play a fundamental facilitating role, particularly if generation value procurement is desired.
 - Electricity retailers need to make a profit to facilitate offsite RE
 - C&I profit margins are thin and bespoke agreements will impose higher costs, to be passed through to end users
 - Value might exist in retain existing, attract new customers / market differentiation
 - Risk management costs associated with RE intermittency/mismatch
 - Large retailers are less interested in entering the market without a significant commercial potential
 - Smaller/mid size retailers face barriers associated with position in the market (customer credibility) and credit rating

Project Developer market context



- Project developers were interested in new type of off taker which would increase the diversity of their effective customer base.
- Project developers fundamental constraint involved the requirements of financiers, debt availability
- Financing cost and availability is a function of the size and term of the offtake and the credit rating of the counterparty
- Counterparty risk was a significant theme
- Small retailer credit ratings were an issue, noted that significant end users have better credit than electricity retailers anyway
- Depending on tech choice, the offtake and facility size required for lowest cost outcomes requires some level of aggregation
- Preference for a bundled REC and generation value offtake.

Market development and facilitation



- Given the market perspective of each participant group market development was considered to be enhanced by:
- Deal standardisation:
 - End users are not well equipped to bear the transaction costs of implementing a deal from scratch
 - Supply side (retailers/project developers) in a better position to define standard offerings that end users can choose from
- A trusted agent facilitating information/education/matching services
 - Brokers have a role to play
 - US market has independent NGOs as significant facilitating entities
 - Rocky Mountains Institute – Business Renewables Centre
 - Market matching, conferences, guides, primers, contract templates
 - 178 members, largest corporations in the US

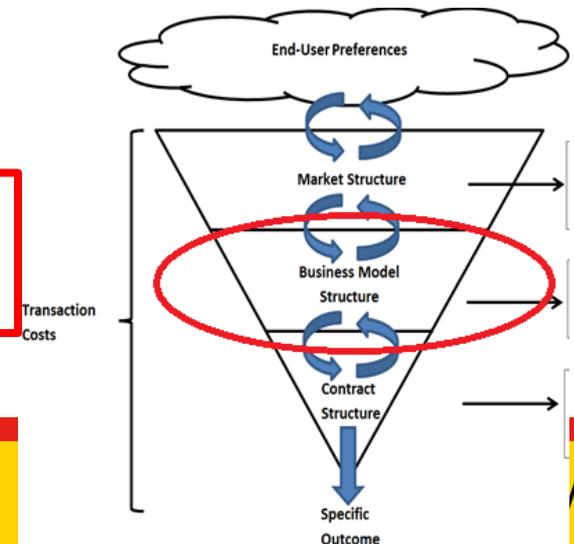
- **How best to facilitate market interaction?**
- **Who is best placed to provide information/education to end users?**



Business Structures

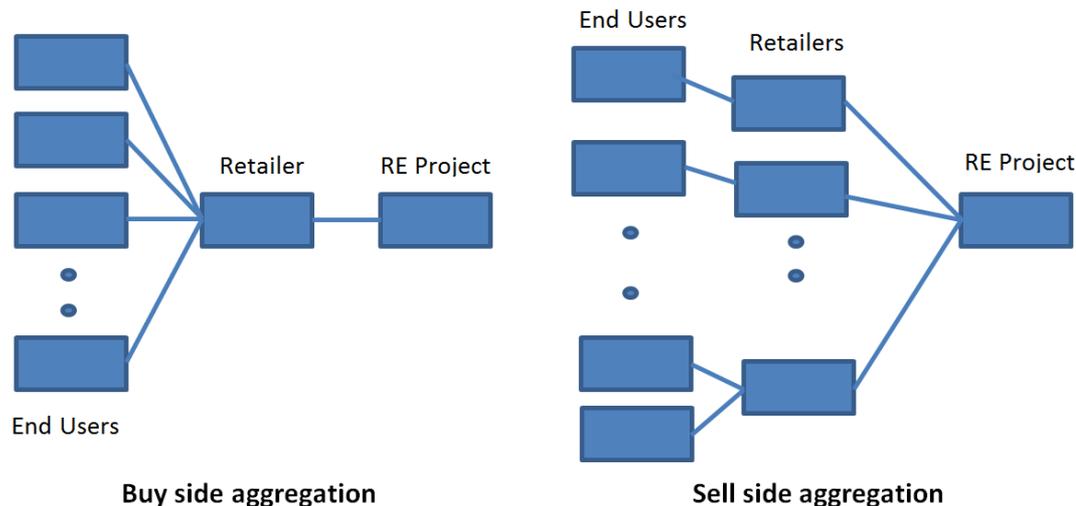
- The 'business structure' stage is the second in the RE process funnel
- involves the division of roles, rights, and obligations between the parties involved in an offsite RE deal.
- Decisions which define the business structure:
 - **Deal type:** Exclusive, Aggregated
 - **Counterparty:** Direct, Intermediated
 - **Financial approach:** 'Physical' pass through, 'Virtual' PPA

Structure	Buy	Own	
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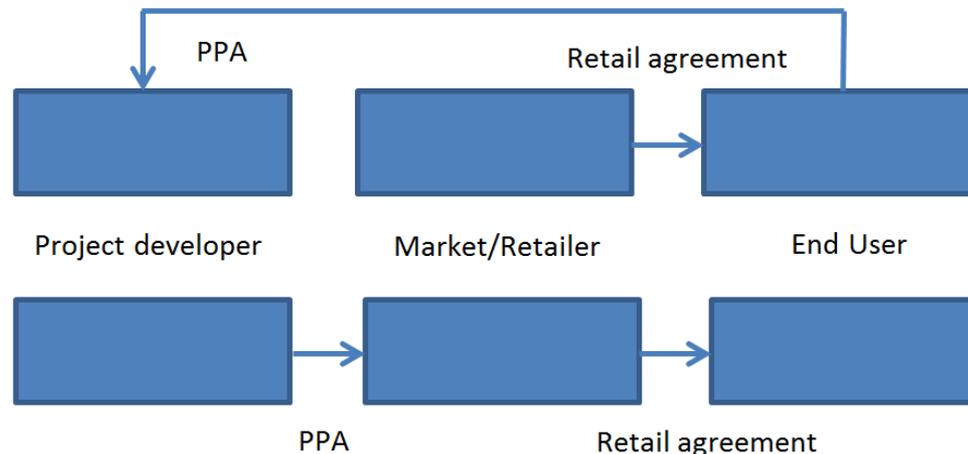
Deal Type - Exclusive or Aggregated

- All about scale for lowest cost outcomes, being attractive for a project developer;
- Larger end users preferred an exclusive agreement for flexibility/marketing
- Smaller end users will need to aggregate via:
 - **Buy side** (formation of a buying group, single PPA)
 - **Sell side** (facility output divided amongst off-takers, multiple PPA)
- Trade off between contractual complexity and decision making/negotiation complexity.



PPA Counterparty – Direct or intermediated

- Describes whether the agreement is via an intermediate electricity retailer or direct with the project developer;
 - **Direct agreement** (end-user as counterparty to PPA)
 - **Intermediated agreement** (retailer as counterparty to PPA)
- There was a preference for a direct agreement;
- Direct agreement better for flexibility, tractability, marketing
- A direct agreement has electricity retail licensing issues.

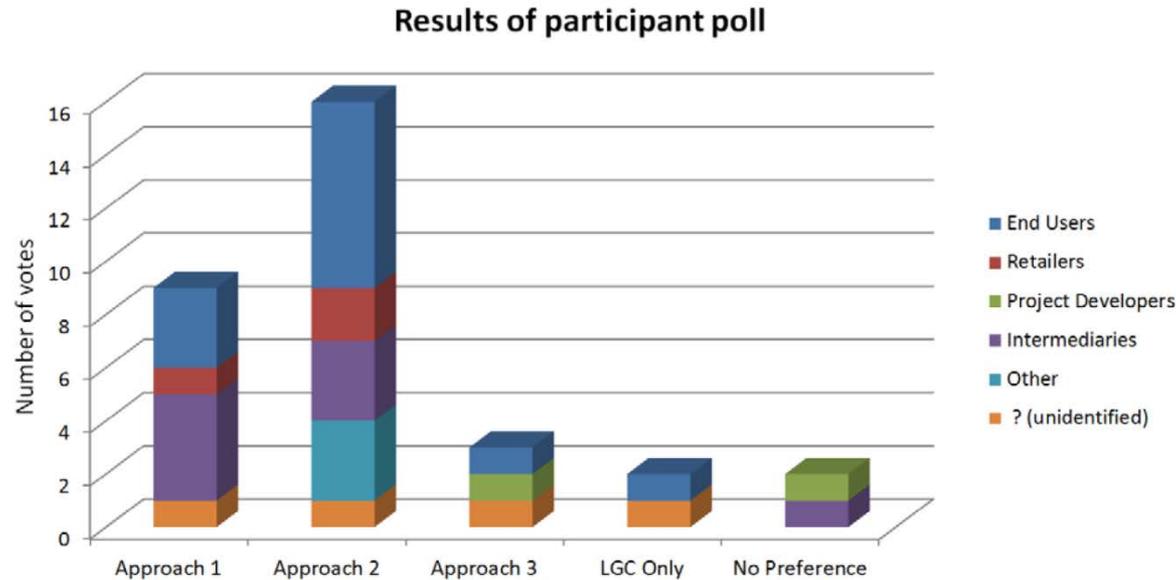


Financial approach – ‘Pass through’, ‘Virtual’

- ‘**Physical**’ and ‘**virtual**’ PPAs are terminology used in the US context
- Australian NEM is an energy only market, no physical bi-lateral contracts;
- Can pass market revenue from physical generation through retailer to end user (‘pass through’). Retailer managed balancing and risk management.
 - Risk management premium is non-trivial
 - Additional administrative costs to do bespoke settlement
- ‘Virtual’ PPAs are extensively used in the Australian electricity industry context.
 - Virtual PPAs can be understood as financial hedges (CFDs)
 - End user may seek spot exposure and self hedge, or treat as decoupled from retail supply
- End users face significant risk associating with market exposure
- AFSL issues need consideration.
- Preference for ‘pass through’ amongst end users



Workshop #1 – Preferred business structure (Poll)



Option 1: Indirect (retailer as PPA counterparty); Physical pass through

Option 2: Direct (end user as PPA counterparty); Physical pass through

Option 3: Direct (end user as PPA counterparty); 'Virtual' PPA

Has this information made you more or less amenable to the idea of an offsite RE procurement deal?

- Complexity**
- Diversity of options**
- Transaction costs**
- Risk**

