

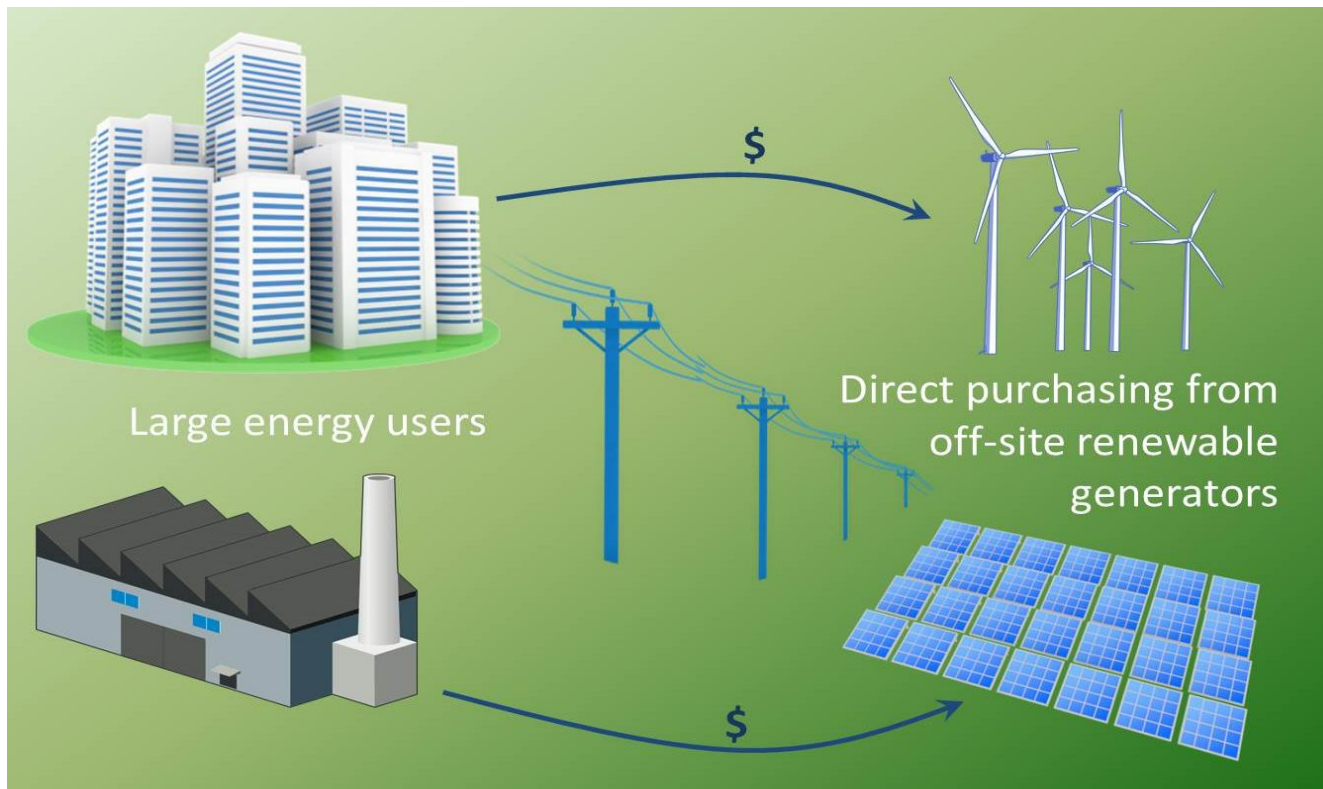
# Off-Site Renewable Energy

Stakeholder Workshop #1

24<sup>th</sup> Nov 2016

Never Stand Still

Engineering



# Terminology

“Off-site RE”

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Corporate PPAs (i.e. power purchase agreements)

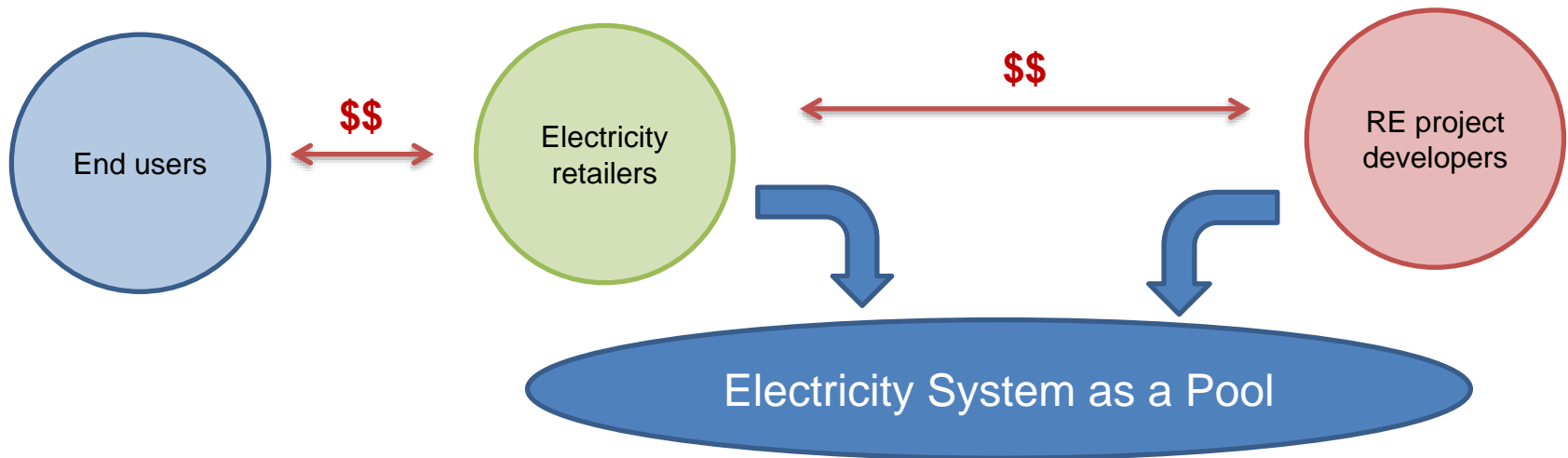
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Direct procurement of RE



# Why is this important?

- What is the difference from 'Business As Usual'?



# Project team

- Graham Mills
- Iain MacGill
- Anna Bruce
- Sharon Young



# Project Overview

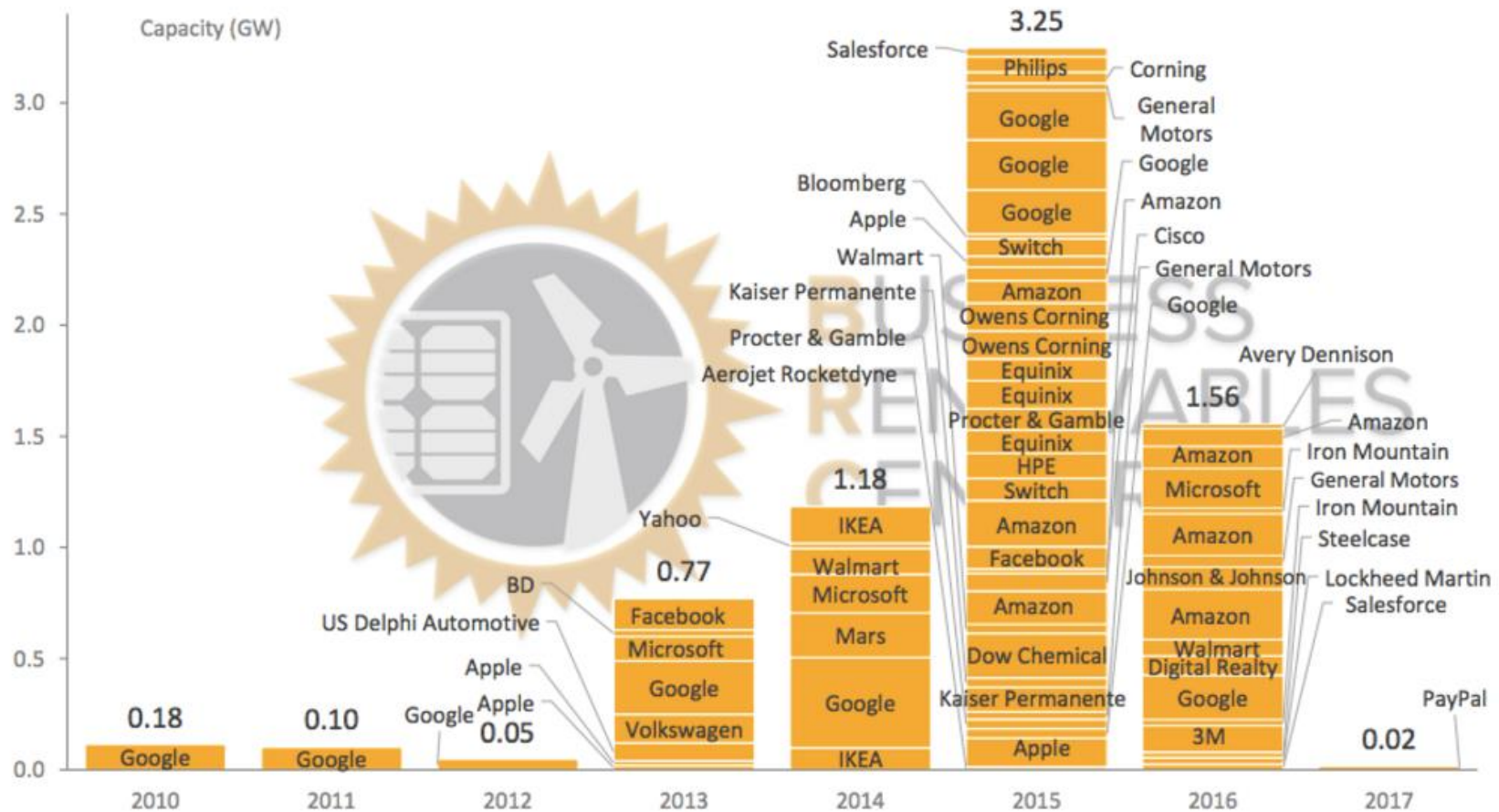
Title	Facilitating large energy user deployment of off-site renewable generation
Funding	CRC for Low Carbon Living
Duration	12 months
Motivation	Recent market explosion in the US Initial movements in Australia but perceived lack of transparency/information
Methodology	Case studies Market survey Stakeholder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

**Panel discussion!**



# Corporate Renewable Deals

2010 – 2017



Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US and Mexico, 2012 – 2016. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. Last updated: February 21, 2017.

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For more information, please visit <http://www.businessrenewables.org/> or contact [BRC@RMI.org](mailto:BRC@RMI.org)

# And the Australian context?

- Project initiated based on a couple of pioneering projects
  - Could this be a game changer??
- The answer was unclear 12 months ago but...
  - Yes
  - (Lucky for us 😊)



# 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.

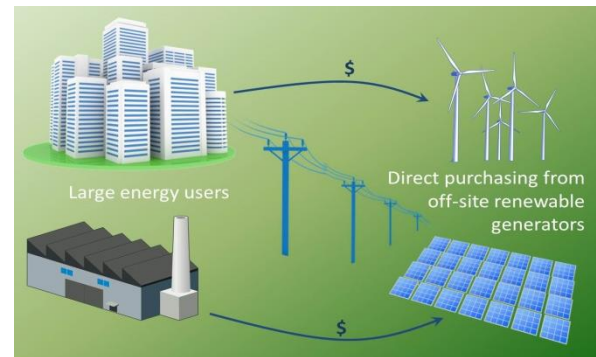




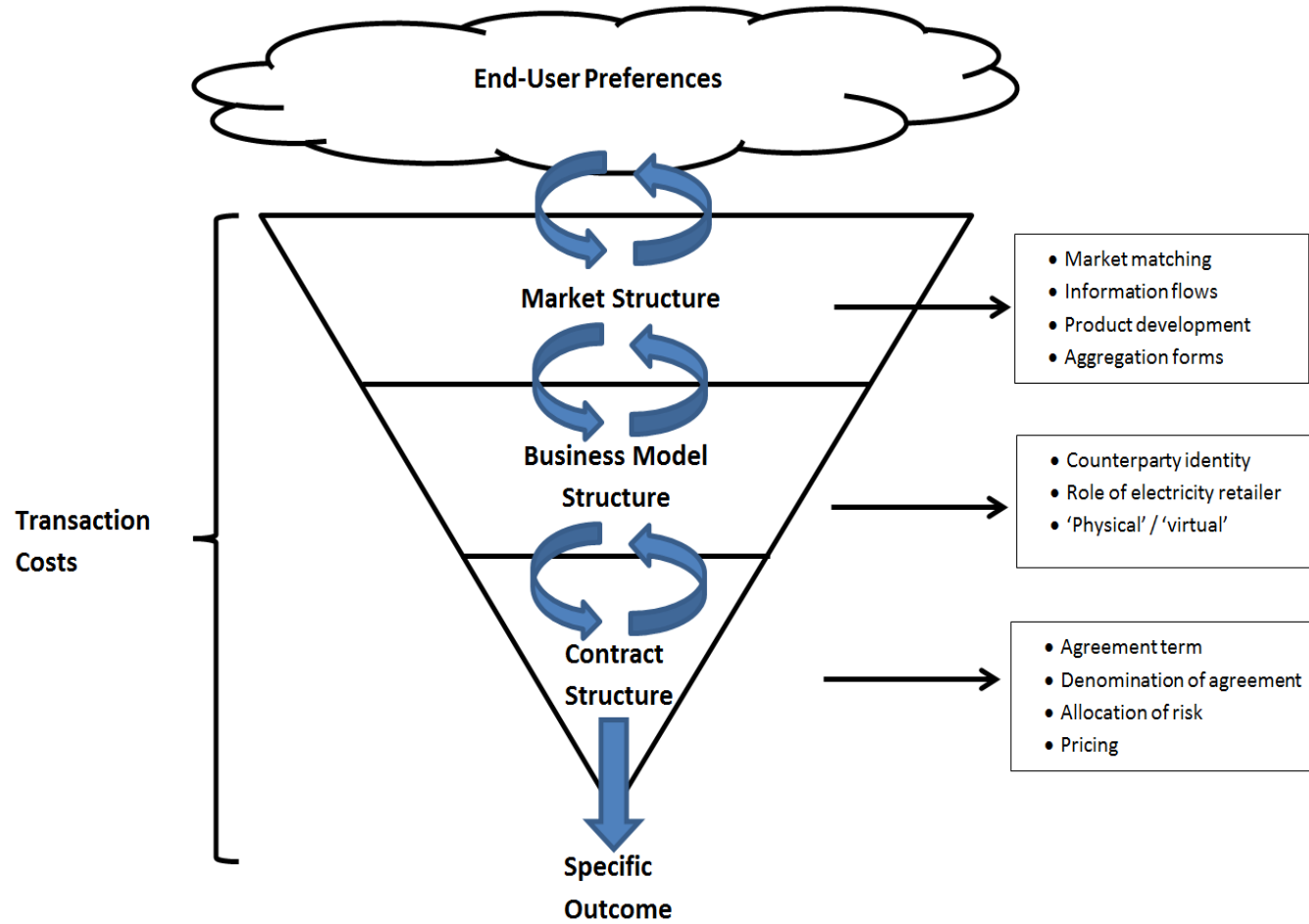
# Transaction costs and market maturity – where we want to go



# Spectrum of options for RE



# Conceptualising the off-site RE market



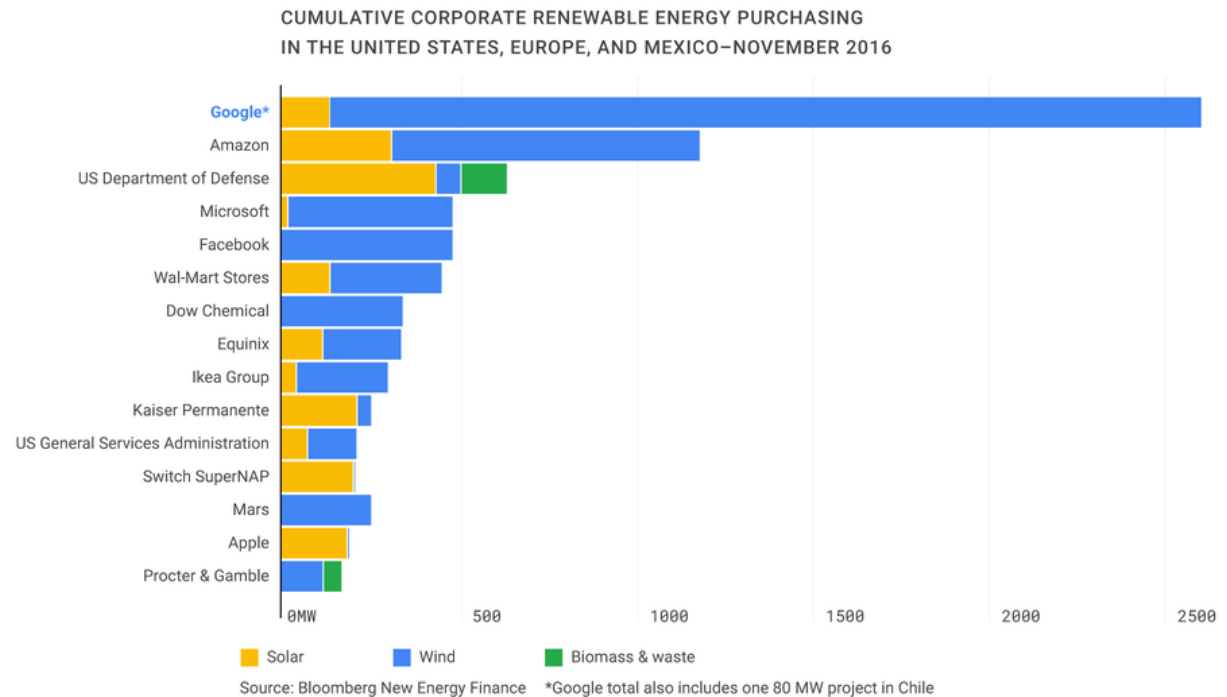
# Example: Google

Google:

- 2.6 GW contracted commitments by end 2016
- Set to be 100% RE this year

Australia:

- Total installed capacity 5.4 GW (APVI Australian PV Market Analysis <http://pv-map.apvi.org.au/analyses>)

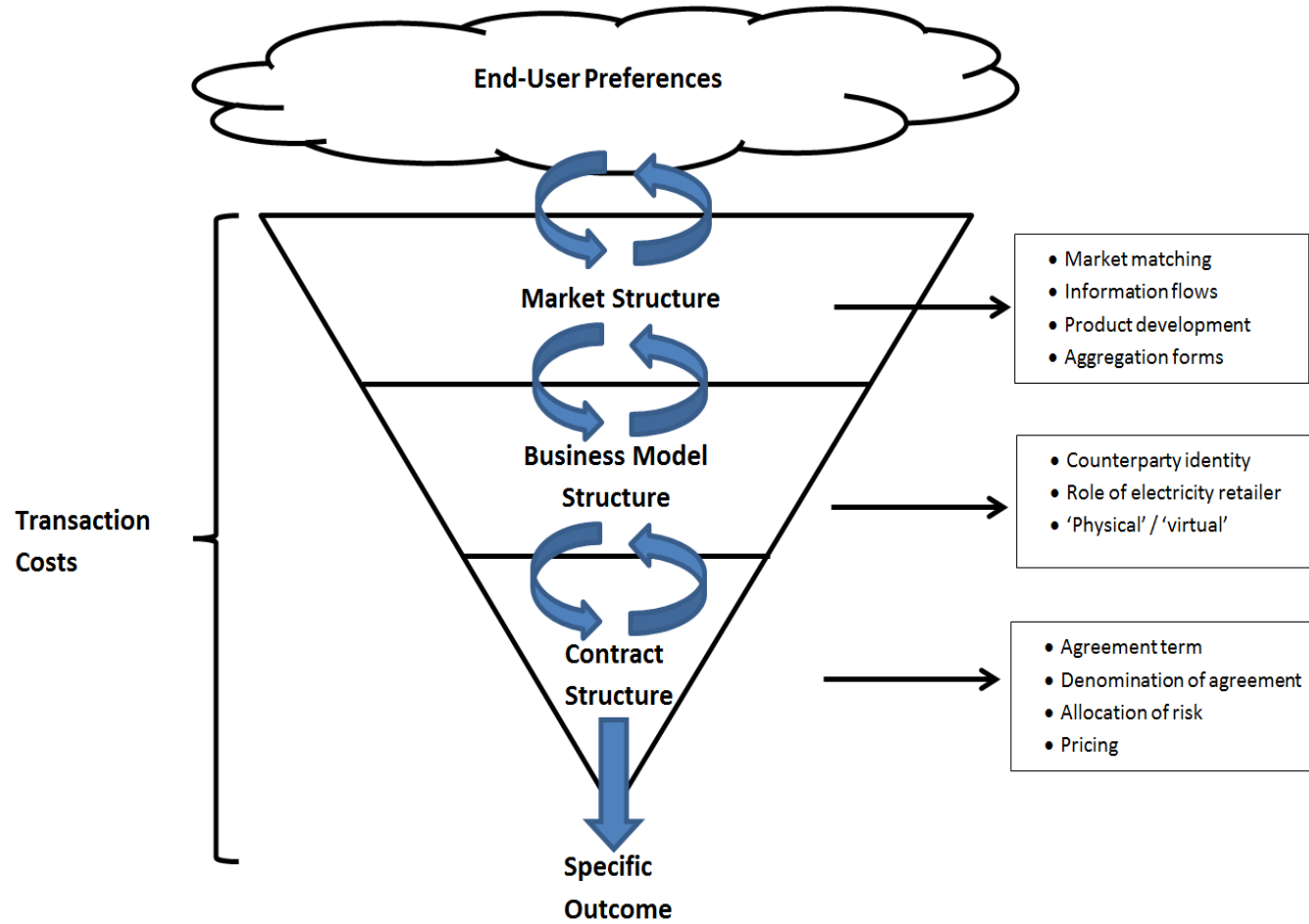


<https://blog.google/topics/environment/100-percent-renewable-energy/>

# Marketing opportunities

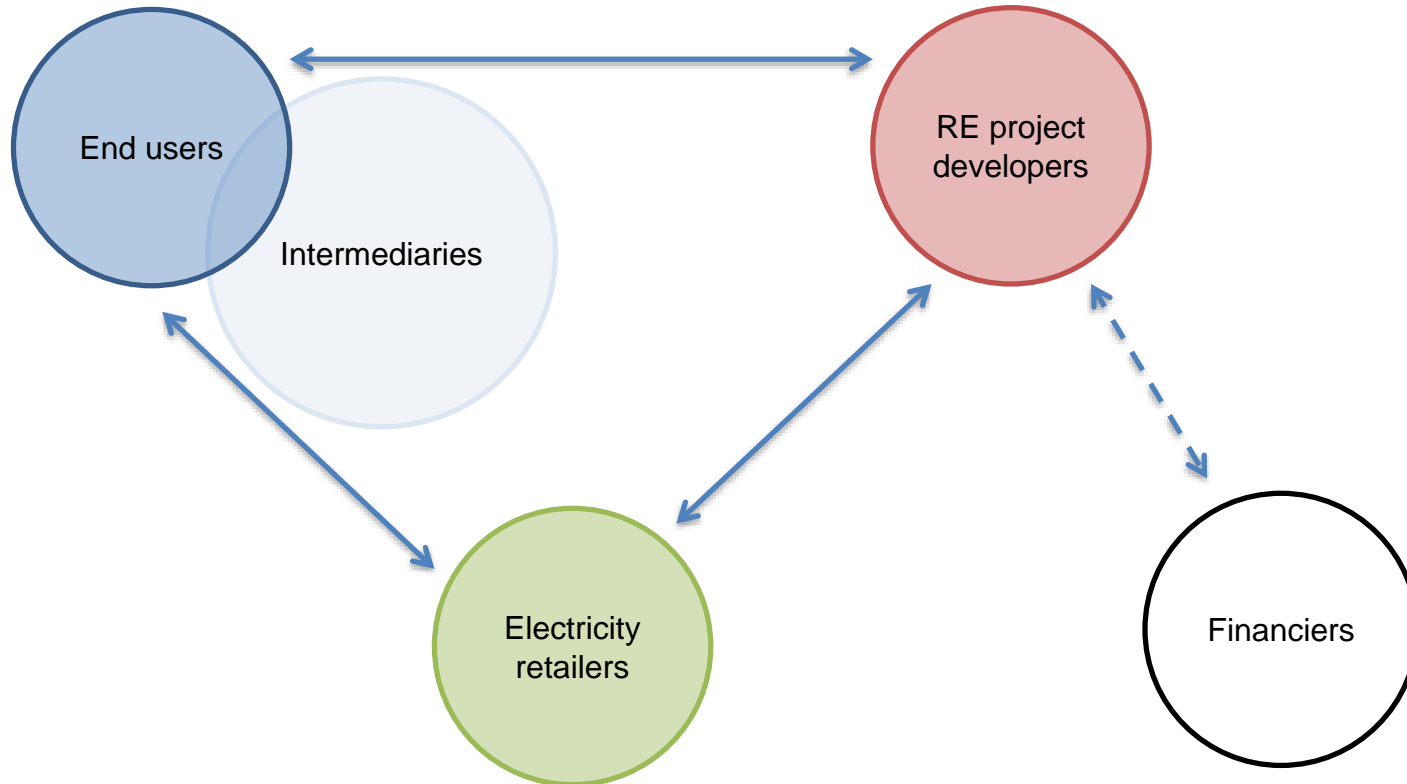


# Conceptualising the off-site RE market



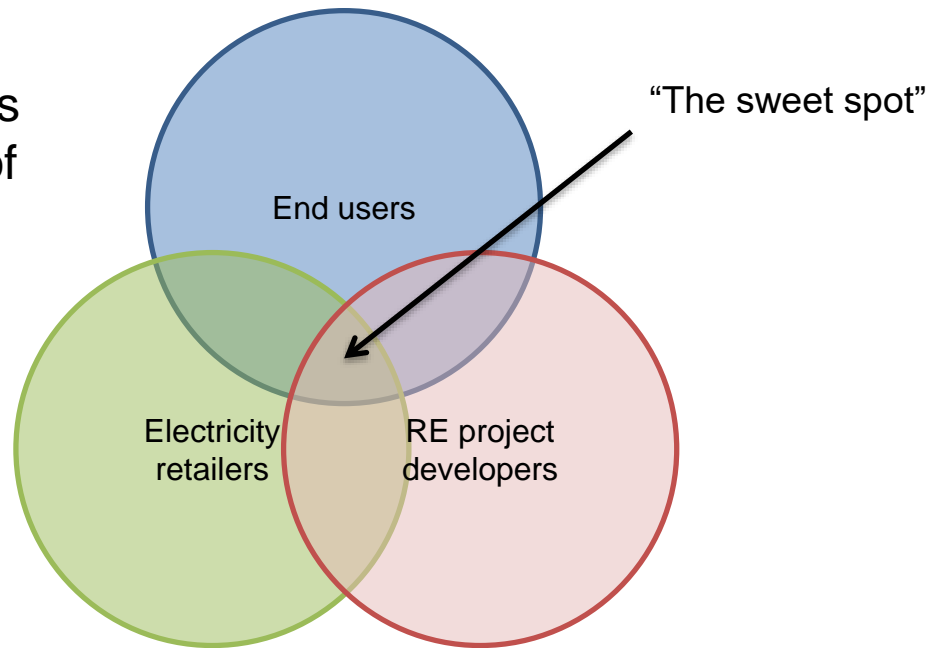
# Tri-partite market

**Market Structure** - process through which parties (supply and demand side) match given their individual preferences and objectives



# How to make everyone happy

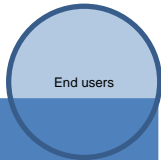
Market evolution will be an iterative process of identifying the set of options that work for all parties



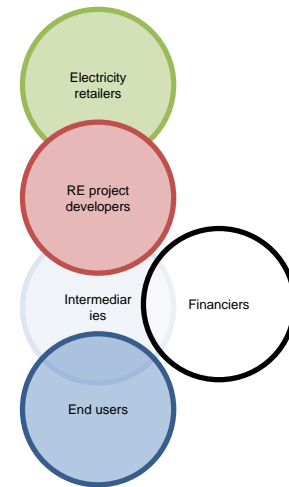


# Overview of participants in our study

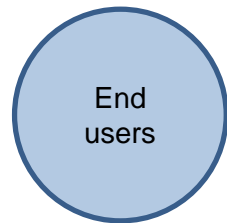
End Users	
Commercial	8
Local govt	5
Manufacturing	4
Property	6
Universities	4
Utilities	3
<b>TOTAL</b>	<b>30</b>



Others	
Retailers	6
Project developers	7
Intermediaries	4
Case studies	6
<b>TOTAL</b>	<b>23</b>



# Market survey interviews



## 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

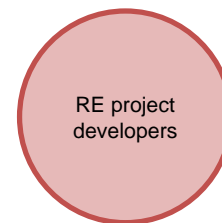
## Forward looking

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



## For electricity retailers

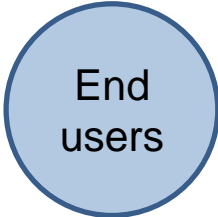
- Business drivers
- Product offerings
- Deal preferences



## For project developers

- Business drivers
- Deal preferences
- Financing
- Risk allocation

# Drivers



- End users drive the market, but why would they want to do this?

## **For RE generally:**

- End user control
- Environmental or CSR targets;
- Political or community values
- Government policy vacuum

## **Specific to Off-site RE:**

- Cost
- Cost hedging
- Marketing value
- Traceability/Tangibility
- Flexibility for multi-site operations

# Drivers (barriers)

- The other drivers are actually **barriers** to alternative options

## Barriers 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;

# 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.

<b>Structure:</b>	Buy (PPA)		Own
<b>Project type:</b>	New		Existing
<b>Approach:</b>	Single end user		Aggregated
<b>PPA counterparty:</b>	Retailer		End user
<b>Purchase of:</b>	LGC only	Electricity	Bundle
<b>LGC treatment:</b>	Sell		Surrender

<b>Structure:</b>	Buy (PPA)	Own
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Melbourne RE Project  
Sydney Metro NW

Sunshine Coast CC  
Ikea

- Decision depends on:
  - Cost of capital
  - In-house expertise



Project type:	New	Existing
	Yarra trams	UTS / Singleton

- Decision depends on:
  - Appetite for long term
  - additionality

<b>Approach:</b>	Single end user	Aggregated
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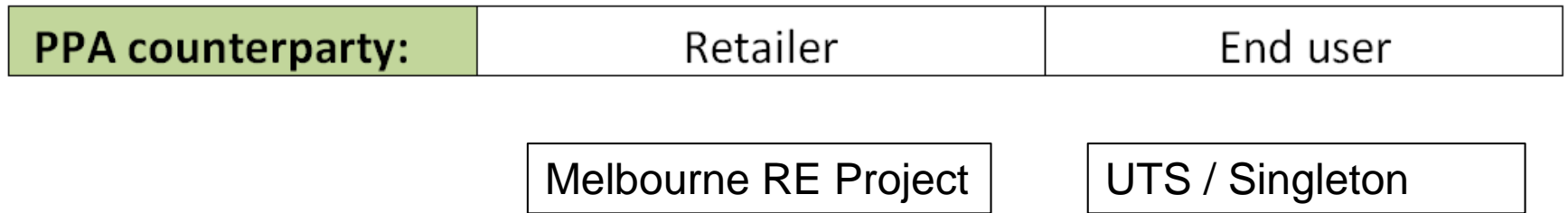
Newcastle City Council  
Victorian State Govt

Melbourne RE Project  
WWF buyers group

- Decision depends on:
  - Size of end user
  - Ability to compromise



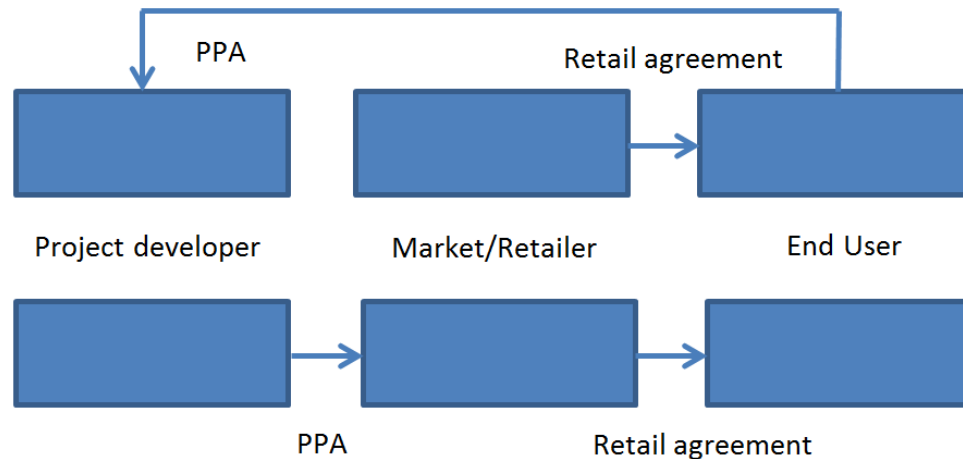




- Decision depends on:
  - Desire for flexibility vs desire for simplicity

# PPA Counterparty – Direct or intermediated

- Electricity retailer's role is to manage risk
  - **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.



<b>Purchase of:</b>	LGC only	Electricity	Bundle
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Vic Govt

Melb RE Proj

- Decision depends on:
  - Simplicity
  - Cost
  - Marketing



# 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.



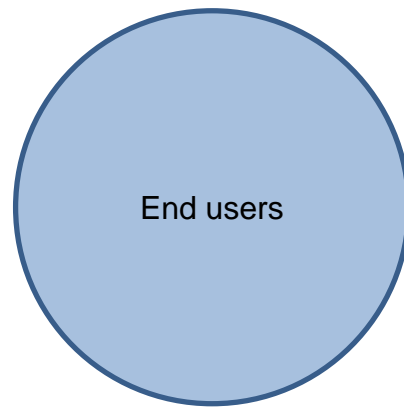
<b>LGC treatment:</b>	Sell	Surrender
	Sunshine Coast CC	Vic Govt

- Decision depends on:
  - Cost
  - Additionality

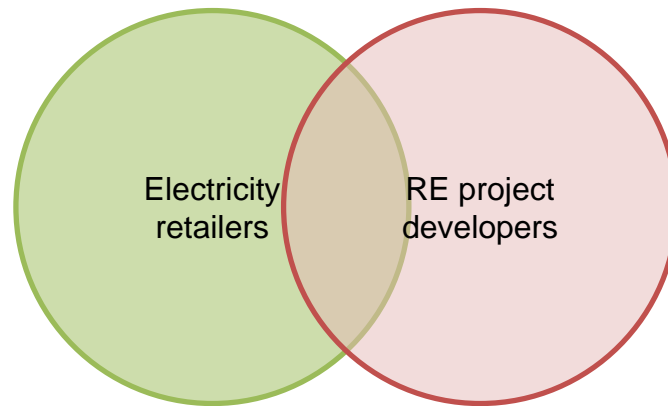
# Case Studies

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	*

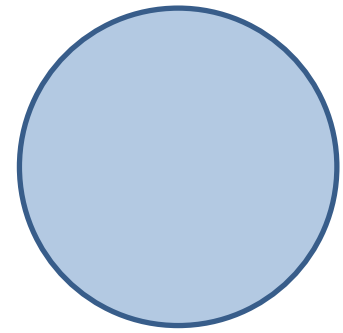
# Market formation



The conditions have been created over the past couple of years...



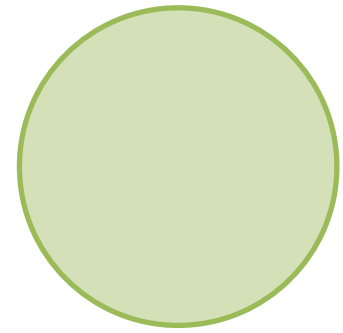
# End-user market context



- Internal decisions:
  - Energy procurement teams vs sustainability teams
  - Risk adverse management
- Doing deals:
  - Information asymmetry (compared to retailers/developers)
  - Typical energy procurement process in 3-year cycles
  - Desire to retain flexibility



# Electricity Retailer market context

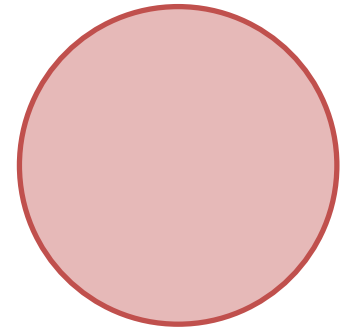


- Drivers:
  - Retain existing or attract new customers, i.e. market differentiation
  - Large retailers less interested
  - Smaller retailers lack the necessary credit rating
- Profit margins are thin in commercial/industrial contracts
  - Bespoke agreements impose higher costs
  - Risk management costs for intermittent generation



Lack of understanding/acceptance  
from end users about these costs

# Project Developer market context



- Drivers
  - Increase diversity of effective customer base
- Constraints
  - Requirements of financiers
  - Finance cost is a function of project size, term, credit rating
  - Counterparty risk (some end users have better rating than retailers!)
- Preferences
  - Off-take contracts for bundled RECs and generation value
  - Contract with a single representative counterparty if end users are aggregated in a buyers group

# Looking forward



- Market facilitation
  - A trusted, independent body is needed for information, education and matching services
  - E.g. RMI Business Renewables Centre in the US, 193 members
- Deal standardisation
  - The most obvious way to reduce transaction costs and speed up market ‘throughput’
  - Is it feasible??
    - Discussion at our workshop last week suggested not.
    - However, opportunities exist to simplify offerings via government programs or aggregated deals