

# Unravelling Embedded Networks for Strata



**LookUpStrata**



**EMBEDDED  
NETWORK  
ARENA**

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## Topics Covered

- **Residential Embedded Network Sector Size**
- **What is an Embedded Network**
- **How, Why & Where**
- **Who Benefits – Winners & Losers**
- **How Choice Works**
- **Key Regulatory Items**
- **Q&A Session**





# Embedded Network Sector

## Did you know.....

- ❖ Residential Embedded Networks are found across Australia
- ❖ >1,000,000 people live in embedded networks
- ❖ While the fundamentals are similar per state
- ❖ There are some nuances & different Rules
- ❖ Our presentation will touch on key items
- ❖ So.....What is an Embedded Network?



# What is an Embedded Network?

- Embedded networks supply power, or other utilities, to a development with many homes or commercial units such as:
  - Residential Apartments & Retirements Villages
  - Shopping Centres & Airports
- But, they are a private utility network where power first runs through a centralised meter
- “Parent” or “Gate” meter measures the aggregated ‘utility’ used
- “Child” metering measures individual customers’ usage
- Common Embedded Utilities include:
  - Electricity / Centralised Hot Water & Gas / EV / Batteries / Solar
  - Centralised Air Conditioning
  - Potable Water Billing
  - Fibre (*different to other utilities*)
- Regulatory compliance (especially electricity)



**Energy Policy WA**





# Who owns Residential Embedded Networks?

- Embedded Network Operator??
- “Strata” i.e. Owners Corporation / Body Corporate / Strata Council??

YES  
MAYBE  
NO

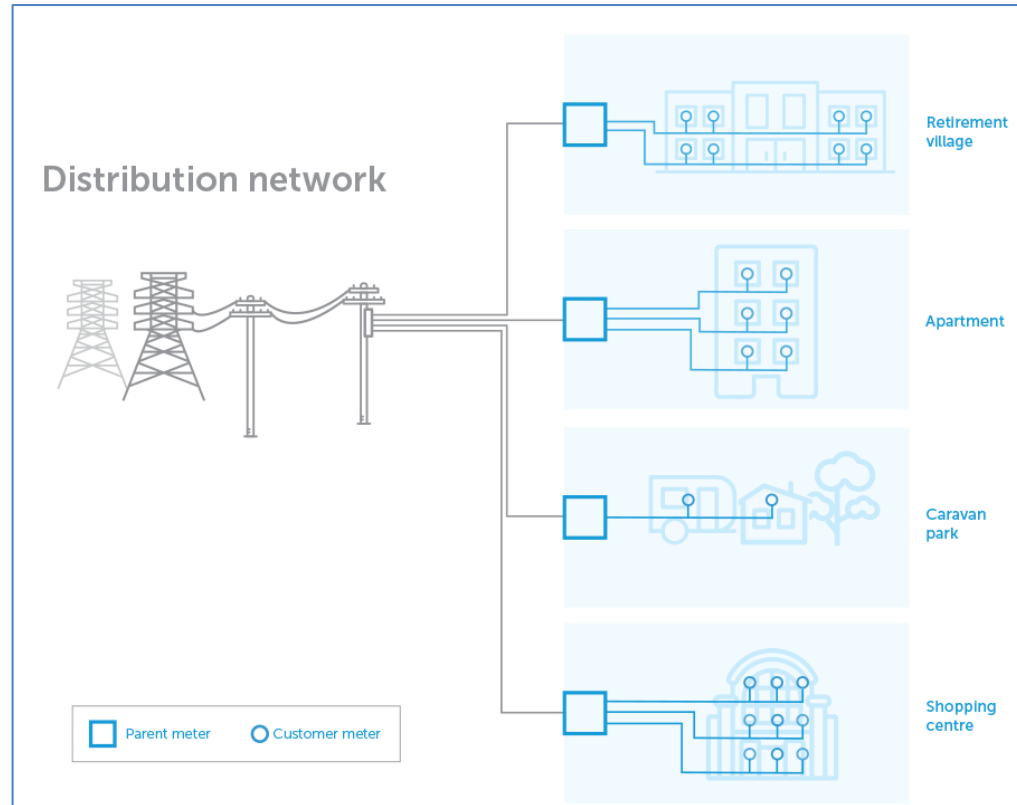


- In most cases it's the “Strata”
- If agreements note to the contrary....best to query it
- Noting, the Embedded Network Operator may own most plant & equipment in the embedded network

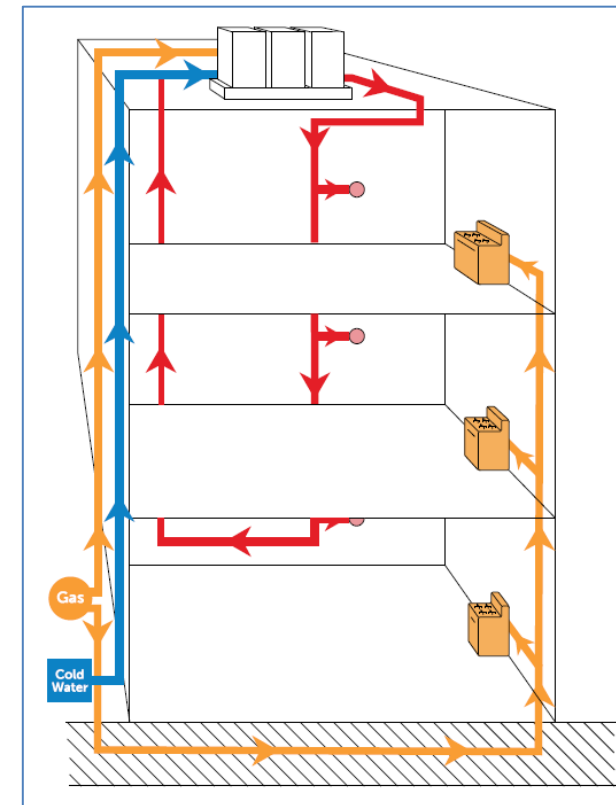


# Common Embedded Utilities

## Electricity



## Centralised Hot Water



Images care of EWOV

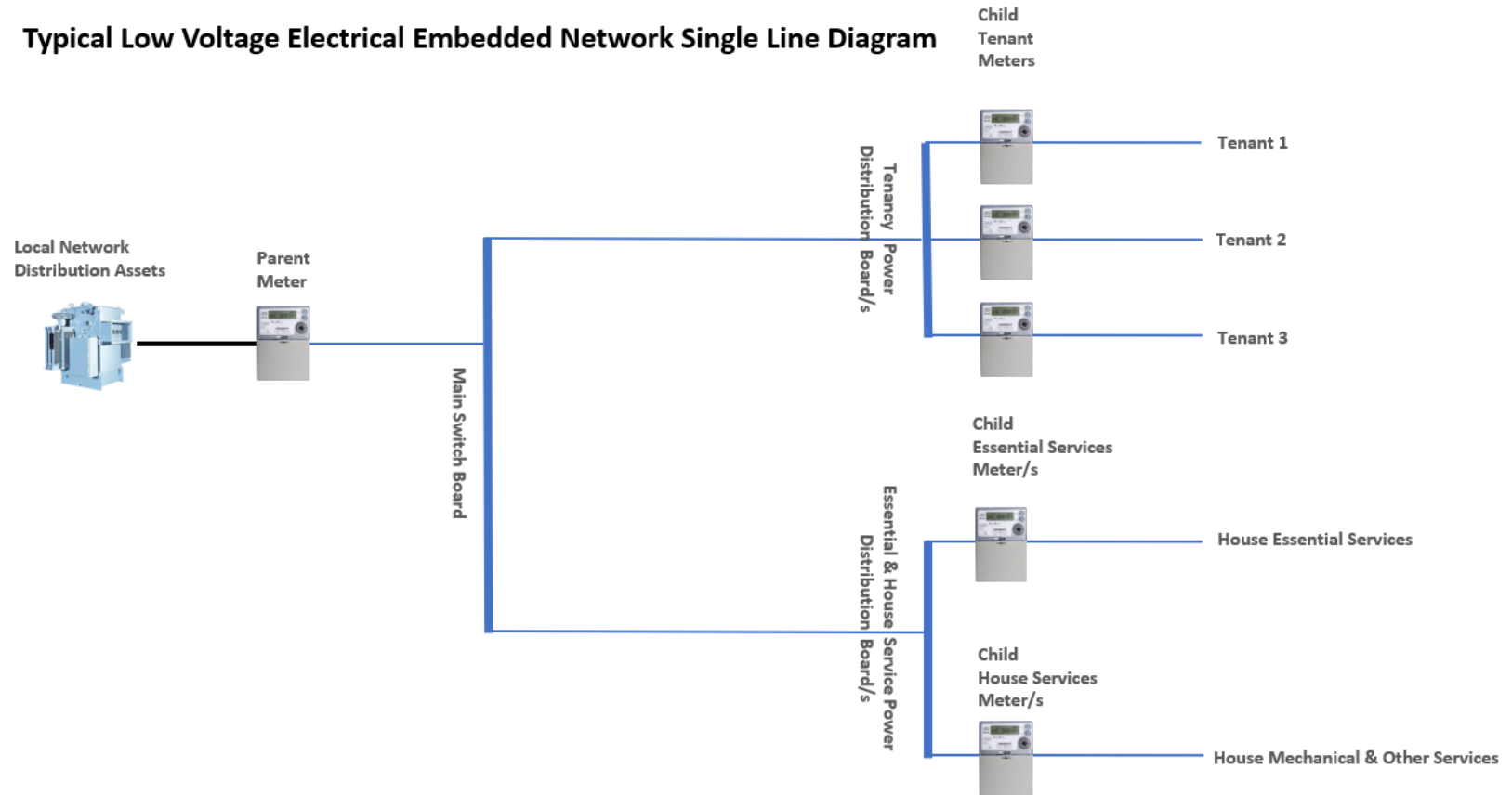
Hot water meter  
(not usually visible  
inside an apartment)

Gas cook top  
(if applicable)



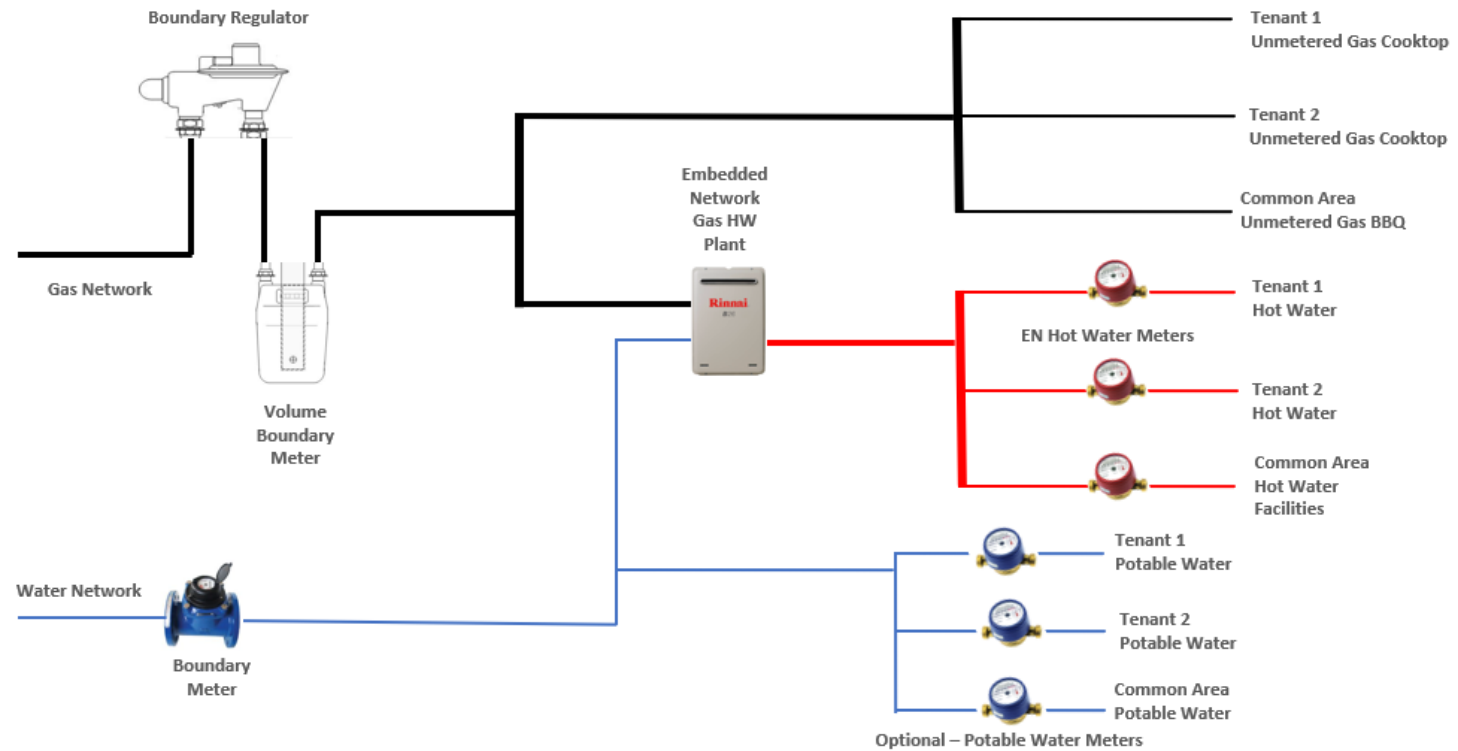
# Basic SLD – Electricity

Typical Low Voltage Electrical Embedded Network Single Line Diagram



# Basic SLD – Gas Hot Water

Typical Gas Hot Water & Gas Cooktop Embedded Network Single Line Diagram







# How do Embedded Networks work?

## **Use traditional building infrastructure, e.g.**

- Main Switchboard
- Electricity distribution boards & wiring
- Hot water reticulation, hot water burners, etc
- Additional infrastructure needed to house 'Parent /Gate Meter'

## **Aggregation of all energy creates a bulk buying opportunity, i.e.**

- Buy as a 'Large Market' customer
- On-sell to 'Small Market' customers

## **Child Metering**

- Facilitates billing to Occupants & Common Area needs

## **'Buy : Sell' Arbitrage Funds....**

- Discounts
- Shared benefits
- Profit



# Electricity – Strata’s Arrangements

## Contractually

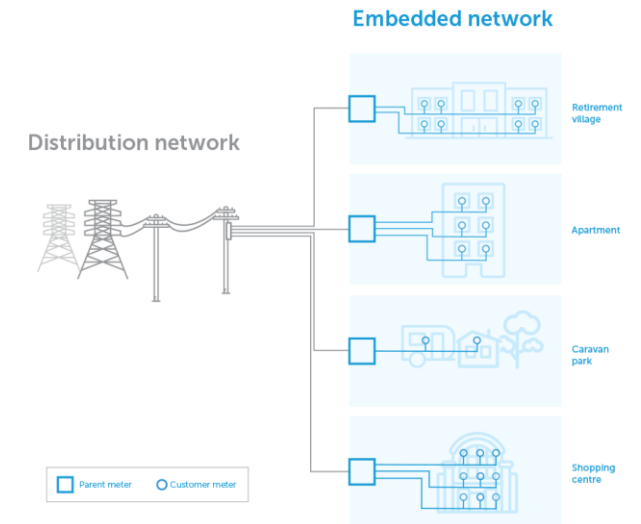
- Agreements between the Strata & EN Operator, e.g.:
  - Embedded Network Operations/Management
  - On-selling of Electricity

## Operationally

- Electricity meters for each tenancy
- Usage billed on a user-pay-basis
- Customers have “Power of Choice” (most regions)
- Choice applies to Common Area energy too

## Asset Ownership

- Strata
  - Main Switchboard
  - Wiring reticulation
  - Meter boards
- Embedded Network Operator
  - Metering (usually)
  - Solar/Batteries/EV Charging Infrastructure (if applicable)



# Hot Water – Strata's Arrangements

## Contractually

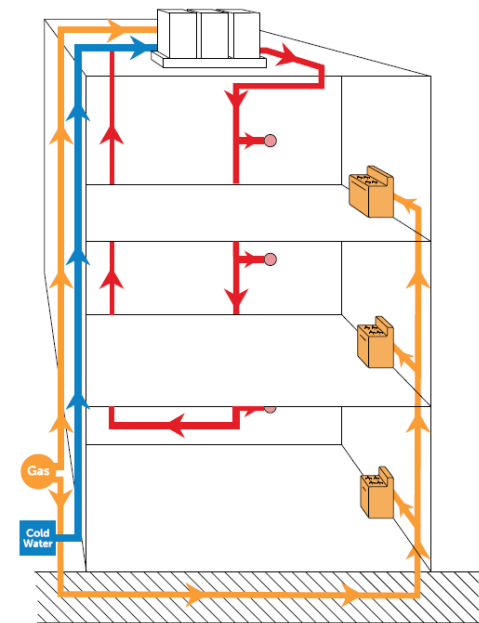
- Agreements between the Strata & EN Operator, e.g.:
  - Bulk Hot Water
  - Serviced Hot Water
  - On-selling of Hot Water & Gas (if applicable)

## Operationally

- Hot water meters for each tenancy
- Usage billed on a user-pay-basis
- Customers have no choice

## Asset Ownership

- Strata
  - Bulk Hot Water plant
  - Water reticulation
- Embedded Network Operator
  - Serviced Hot Water plant
  - Metering (usually)







# How are Customers Billed?

## Electricity Bills Reflect the Market....mostly

### Residential Electricity

- Tariffs shadow the 'Default Market Offer', 'Victorian Default Offer' or 'Synergy' (WA)
- Energy charge (kWh)
- Daily Service Fee
- Greater consumer protections for 'Small Market' customers

### Residential Hot Water

- Energy charge for heating the water (usually billed as c/litre)
- Daily Service Fee
- Daily Gas Cooktops Fee (if applicable)
- Potentially hot (potable) water recovery fee on behalf of the strata

### Strata's 'Common Area' electricity is a Customer too

- Small Market or Large Market Customer Account
- Less consumer protections if 'Large Customer'
- Not always consistent billing practices
- *Bundled vs Unbundled* bills observed for Large customers
- Electricity example bills following





# Example of Unbundled Bill

Meter No: [REDACTED]  
 Supply Address: MSB 1 House Services [REDACTED] NSW 2112  
 Period: 01/08/2019 to 31/08/2019 (31 Days)

<i>Item</i>	<i>Read Type</i>	<i>Current Consumption</i>	<i>Rate</i>	<i>Sub Total</i>
<b>Energy Charges</b>				
Peak	Consumption	5930.7202 kWh	0.118910/kWh	\$705.22
Shoulder	Consumption	8905.1201 kWh	0.118910/kWh	\$1,058.91
Off Peak	Consumption	17223.5195 kWh	0.089852/kWh	\$1,547.57
<b>Market Charges</b>				
AEMO Participant Charge	Consumption	32059.3594 kWh	0.000394/kWh	\$12.63
AEMO Ancillary Services	Consumption	32059.3594 kWh	0.000456/kWh	\$14.62
<b>Environmental Charges</b>				
SRES Charge	Consumption	32059.3594 kWh	0.008479/kWh	\$271.83
NSW ESS	Consumption	32059.3594 kWh	0.002006/kWh	\$64.31
LRET Charge	Consumption	32059.3594 kWh	0.008370/kWh	\$268.34
<b>Network Charges</b>				
NUOS - Peak	Consumption	5930.7202 kWh	0.046546/kWh	\$276.05
NUOS - Shoulder	Consumption	8905.1201 kWh	0.017939/kWh	\$159.75
Network Access Charge		31.0000 Day	12.255960/Day	\$379.93
<b>Network Charges (EA310)</b>				
NUOS - Off Peak	Consumption	17223.5195 kWh	0.008582/kWh	\$147.81
Demand Charge		51.8400 kVA	0.364566/kVA	\$585.87
<b>Metering and Other Charges</b>				
Meter Charge		31.0000 Day	1.660000/Day	\$51.46
Retail Service Fee		31.0000 Day	0.890000/Day	\$27.59
Total (Ex GST)				<b>\$5,571.89</b>
GST				<b>\$557.19</b>
Total (Inc GST)				<b>\$6,129.08</b>



# Example of Bundled Bill

## ELECTRICITY SUPPLY

Service Address: [REDACTED] NSW 2250  
Customer Number: [REDACTED]  
Supply Period: 15/10/2020 - 05/01/2021 (83 days)  
Unit Of Measurement: kWh

## Meter Reads

Meter Number	Multiplier	Start Date	Start Read	End Date	End Read	Total Usage
[REDACTED]	1	15/10/2020	42,391.200 (A)	05/01/2021	58,750.086 (A)	16,358.886
Next Scheduled Meter Read: 31/03/2021						E: Estimated   A: Actual
[REDACTED]	1	15/10/2020	9,204.800 (A)	05/01/2021	16,843.322 (A)	7,638.522
Next Scheduled Meter Read: 31/03/2021						E: Estimated   A: Actual

## Usage Charges

Description	Charge Period	Quantity	Unit	Rate	Total
All Day Usage	15/10/2020 to 05/01/2021	23,997.408	kWh	x \$0.302700 =	\$7,264.02
Daily Charge	15/10/2020 to 05/01/2021	83	days	x \$1.770000 =	\$146.91
Total Charges (excl. GST)					\$7,410.93



# Embedded Network Parties Who Wins & Who Loses







# How Developers Can Benefit

- ✓ Saves time, effort and costs, e.g. dealing with energy distributors & retailers
- ✓ Embedded Network Operator pays for plant & equipment installed on site
- ✓ Managed under a separate '*Establishment Agreement*' between the parties
- ✓ Technical support from experienced Embedded Network Operator
- ✓ Improve sustainability through establishment of a 'green microgrid' e.g.:
  - ✓ Solar & Battery storage
  - ✓ Centralised hot water plants are designed for energy efficiency & space saving
  - ✓ Future proofing platform as new technologies develop such as electric vehicle charging needs
- ✓ Environmentally sustainable properties are more saleable
- ✓ Potential direct financial incentives
- ✓ Option to become an embedded network operator



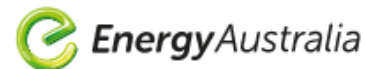


# Embedded Network Brands Significant & Growing Sector

Successful business model.....some familiar brands



oceanenergy



and many  
more



EMBEDDED  
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ARENA

# Market Consolidation Examples

## Sector Consolidation Examples





# Embedded Networks – Strata Wins

- ✓ Engaged Embedded Network Operator
  - ✓ Account Management
  - ✓ Whole of site approach
- ✓ Good discounts for Occupants
- ✓ Below Market tariffs for Strata's energy account
- ✓ Potential additional benefits for the Strata:
  - ✓ Annual financial contribution e.g., energy bill rebate
  - ✓ Embedded Network Operator operates and maintains hot water plant (SHW)
  - ✓ Recover the regulated costs of potable water for the Strata
  - ✓ Free Solar & Battery Storage
  - ✓ Free Electric Vehicle infrastructure funding
  - ✓ Electric Vehicle charging management (Strata not out-of-pocket)
  - ✓ Funding support for items such as LED & HVAC upgrades







# Embedded Networks – Strata Wins

## Establishment of a “Self-Managed Model”

### Strata

- ✓ Manages their building
- ✓ Controls tariffs
- ✓ Use ‘profits’ to reinvestment in the building e.g. solar, energy efficiency upgrades
- ✓ Consideration of tax implications (seek financial advice)

### Outsource services such as:

- ✓ Meter provider
- ✓ Embedded Network Manager
- ✓ Billing & Customer Service Agent
- ✓ Regulatory & Compliance Advice
- ✓ Management Advice

### Risk Management, e.g.:

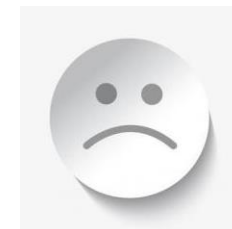
- Parent meter financial liability
- Bad debt risk through non-payment from tenants
- Regulatory compliance





# Embedded Networks – Strata Loses

- ❑ High energy costs needed to recoup Embedded Network Operator's investment
- ❑ Nominal or No discounting for Common Area & No shared benefits
- ❑ Price gouging Occupants
- ❑ Owners' excessive financial liability for embedded network assets buyout
- ❑ Profiteering on customers with limited / no choice
- ❑ Set-and-forget attitude by Embedded Network Operator
- ❑ No account management support for the Committee
- ❑ Poor customer service for Occupants
- ❑ Feelings of being locked in / trapped





# Brownfield Conversions - Yes/No?

## Can existing multi-tenanted buildings be converted to Embedded Networks?

- Yes, it can be done
- Electricity and / or Centralised Hot Water
- Under certain conditions, e.g.:
  - **'EIC'** – Explicit Informed Consent from **'Occupants'** (e.g. 85% AER & ESC requirements)
  - AGM/GM resolution for Strata, i.e. **'Owners'** (e.g. 75% approval in NSW)
  - Over 50 lots generally commercially viable



## Potential benefits

- Improved sustainability through establishment of a microgrid including solar & batteries
- Future proofing platform as new technologies develop e.g. EV charging
- Electrification of gas hot water networks
- Reduced energy costs for Occupants & Common Area bill through bulk buying power
- Self-managed option:
  - Invest profits in the building
- Embedded Network Operator funded:
  - Account management of the whole site
  - Potential funding support for capital items, e.g. LED upgrades & solar
  - Shared benefits / profits with Owners



# Committees' Advice Needs New Sites Example – NSW FAGM

## Have you attended a First Annual General Meeting?

### FAGM – Multiple Utility Agreements to address in a limited time e.g.:

- Electricity, Hot Water & Gas
- Solar Power Purchase Agreement
- Centralised Air Conditioning & Fibre

### Issues

- Do new Owners understand the “proposed” agreements?
- Should Owners engage an Embedded Network Operator untried.....
- Some agreements 5, 10+ years
- New owners can seek independent advice

### Do Owners have to pass the utility Motions at FAGM?

- Power won't be cut off over night
- But not set-&-forget, must comply with regulations
- Negotiate the best outcome for the Owners & Occupants
- Seek support, e.g. Ombudsman, Regulators or Independent Consultants







# Existing Embedded Networks Do Owners have Choice?

## Can Owners change Embedded Network Operators?

- Negotiate with incumbent Embedded Network Operator
- Go to market & change Embedded Network Operator
- Change energy suppliers for Common Area power

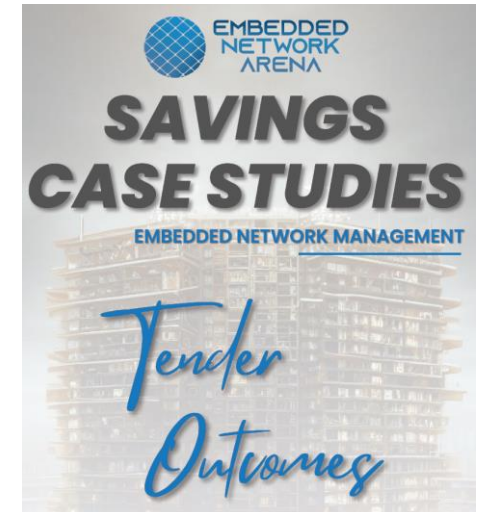


## Why is it a good idea?

- Test the market for a better overall deal for Owners & Occupants
- Improved carbon footprint, e.g. solar, EV charging infrastructure
- The Committee can work with an engaged Embedded Network Operator
- Consider Self-Managed Model

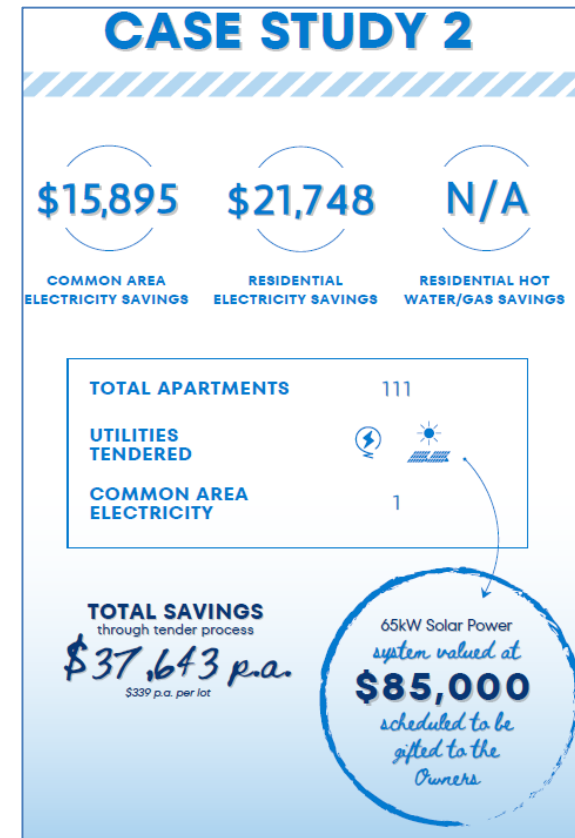
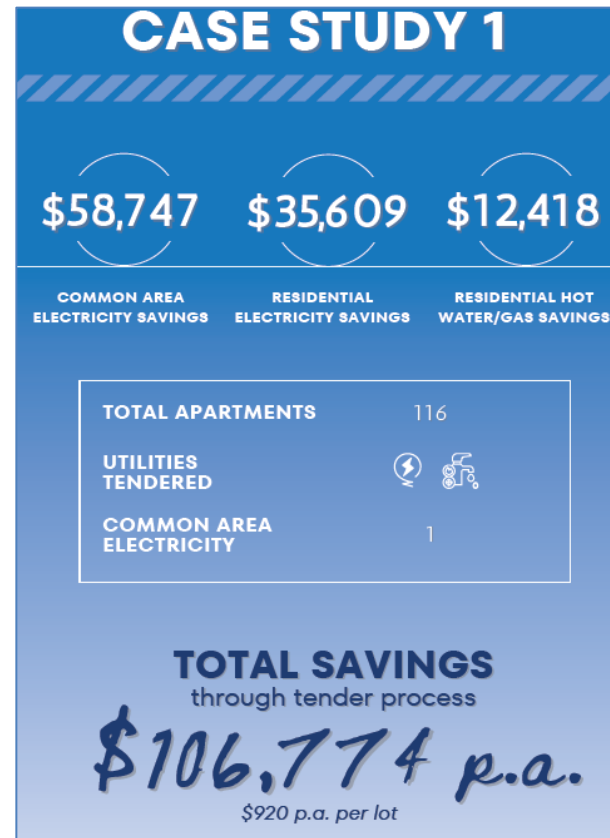
## How?

- Straight forward process to change
- No Embedded Network Operator costs for the Owners to bear
- Sector is well established with Embedded Network Operator supplier churn
- Transparent Market tendering process
- Low cost compared to benefits
  - ROI many times over in the first year
  - <https://embeddednetworkarena.com.au/resources/>





# Existing Embedded Networks NSW & VIC Tender Case Studies





# Existing Embedded Networks Occupants Choice

## Do residential customer have real Choice?

### Electricity....YES....how?

- Contact energy retailer (excl. WA)
- Ask for an 'energy only offer'
- 'On-Market' vs 'Off-Market'

## But ...

- In reality, it is very difficult for residential customers
- No easy way to exercise 'Power of Choice' to leave the Embedded Network
- Difficult to find an energy retailer prepared to provide an offer
- Commercial embedded networks churn is more common
- Dual bill scenario likely

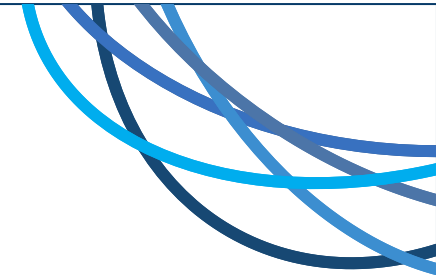
### Centralised Hot Water, Gas & Air Conditioning

- No Choice
- Must buy from the incumbent Embedded Network Operator
- Seek independent advice if not happy (e.g. Consultant, Ombudsman)



YES  
MAYBE  
NO





# Key Energy Regulatory Items

## Fundamentals

Some differences between states but fundamentals similar:

- Exempt Framework for Selling (most cases) & Distribution of Energy
- Embedded Network Manager appointment under certain conditions
- Billing & payment must reflect the energy Market
- Must (in most cases) register with the AER / ESC (N/A WA)
- Join the Ombudsman Schemes (in most cases)
- 'Power of Choice' must be offered to customers (N/A in WA)
- Correct metering infrastructure essential

## National & Jurisdictional Reviews WiP

Promoting customer protections & improved choice options:

- National – AER assessing Rules & Guidelines
- NSW – IPART review WiP (Elect, Hot Water & A/C)
- VIC – ESC (choice, protections & ban on new EN with exceptions)
- WA – Energy Policy WA voluntary code of conduct







# Summary Points

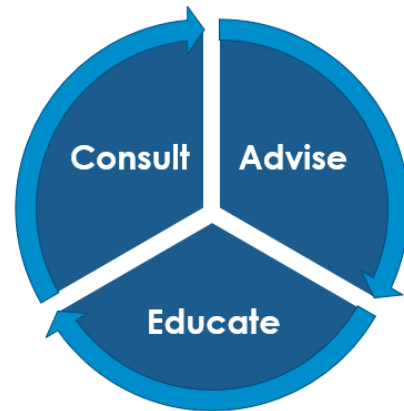
- Good opportunity for Developers to differentiate themselves and ensure.....
  - ✓ Transparency for potential new owners
  - ✓ A sustainable embedded network is established
  - ✓ Environmental & financial benefits available for Owners & Occupants
  - ✓ Potentially more attractive property to sell
- Embedded Network arrangement can be positive or negative for Owners & Occupants
- Embedded Network should not be set-&-forget
- Brownfield conversions are possible & an opportunity to introduce energy sustainability
- The Owners have the right to:
  - ✓ Seek independent advice
  - ✓ Say no & seek to negotiate with an engaged Embedded Network Operator
  - ✓ Review alternative supplier options if incumbent unsatisfactory
- Regulatory review & Rule changes on the horizon to support customers' rights







# Thank You & Any More Questions?



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