TRIALS RESULTS: VIRTUAL NET METERING & LOCAL NETWORK CREDITS

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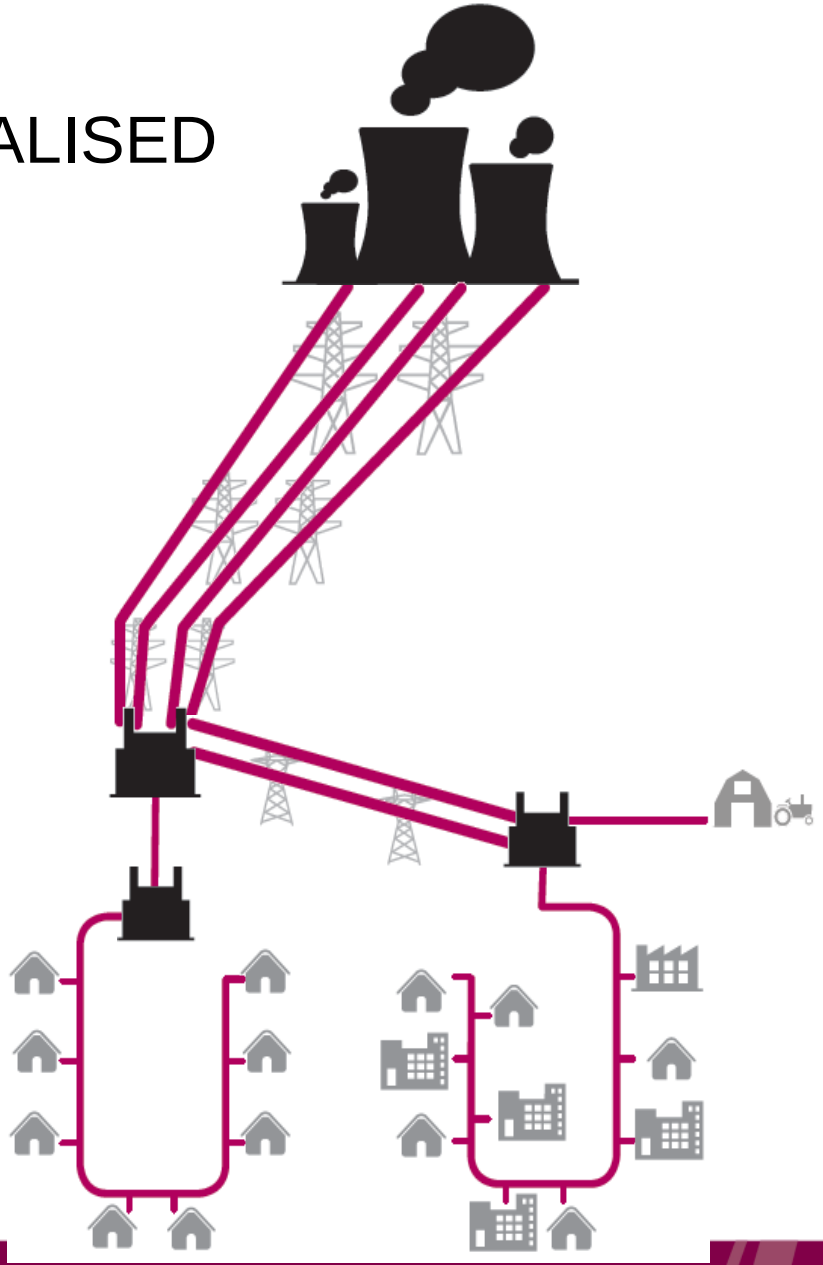
OUTLINE

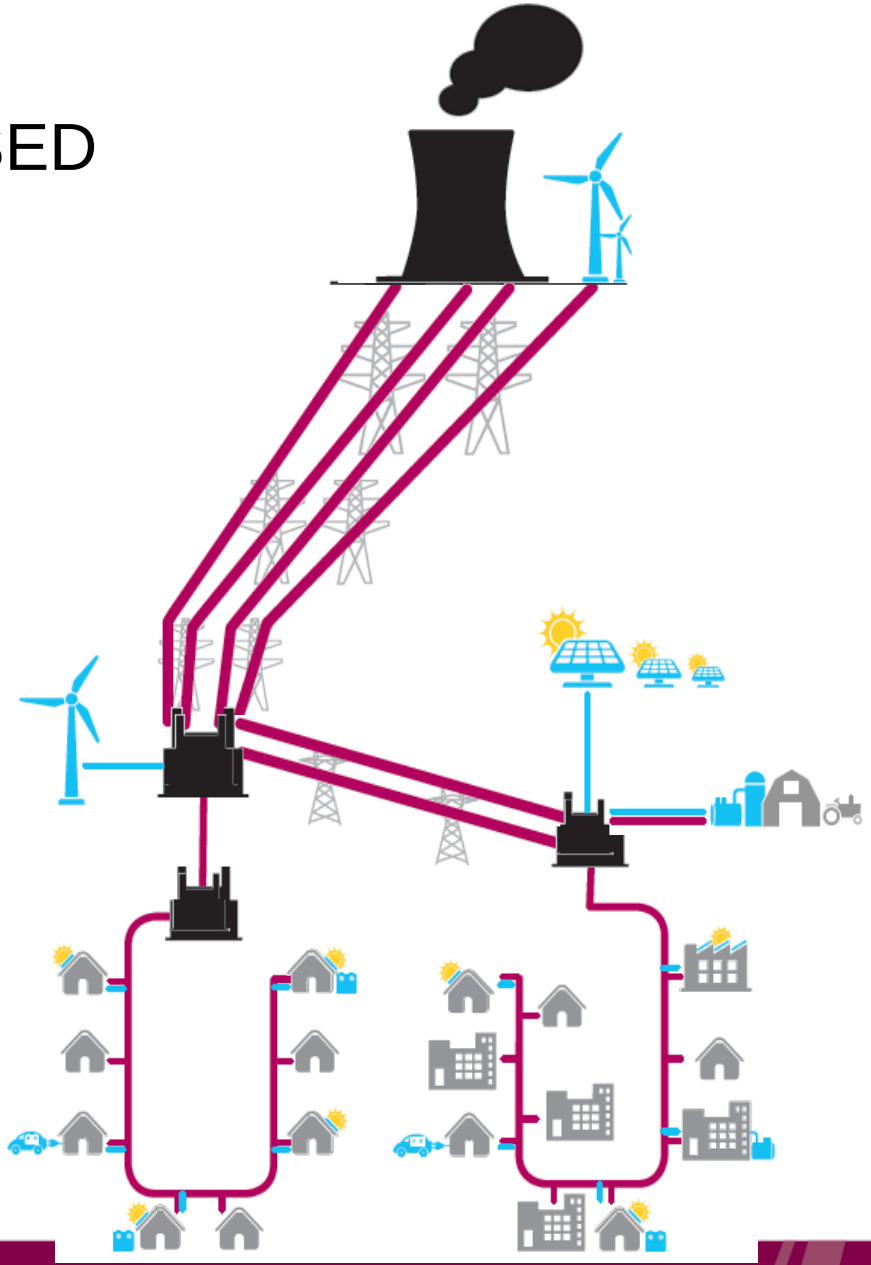
- **The bigger picture**
- **Background - the project & the concepts**
- **Results**
  - Winton
  - Cogeneration (Willoughby)
  - Community solar garden

THE BIGGER PICTURE

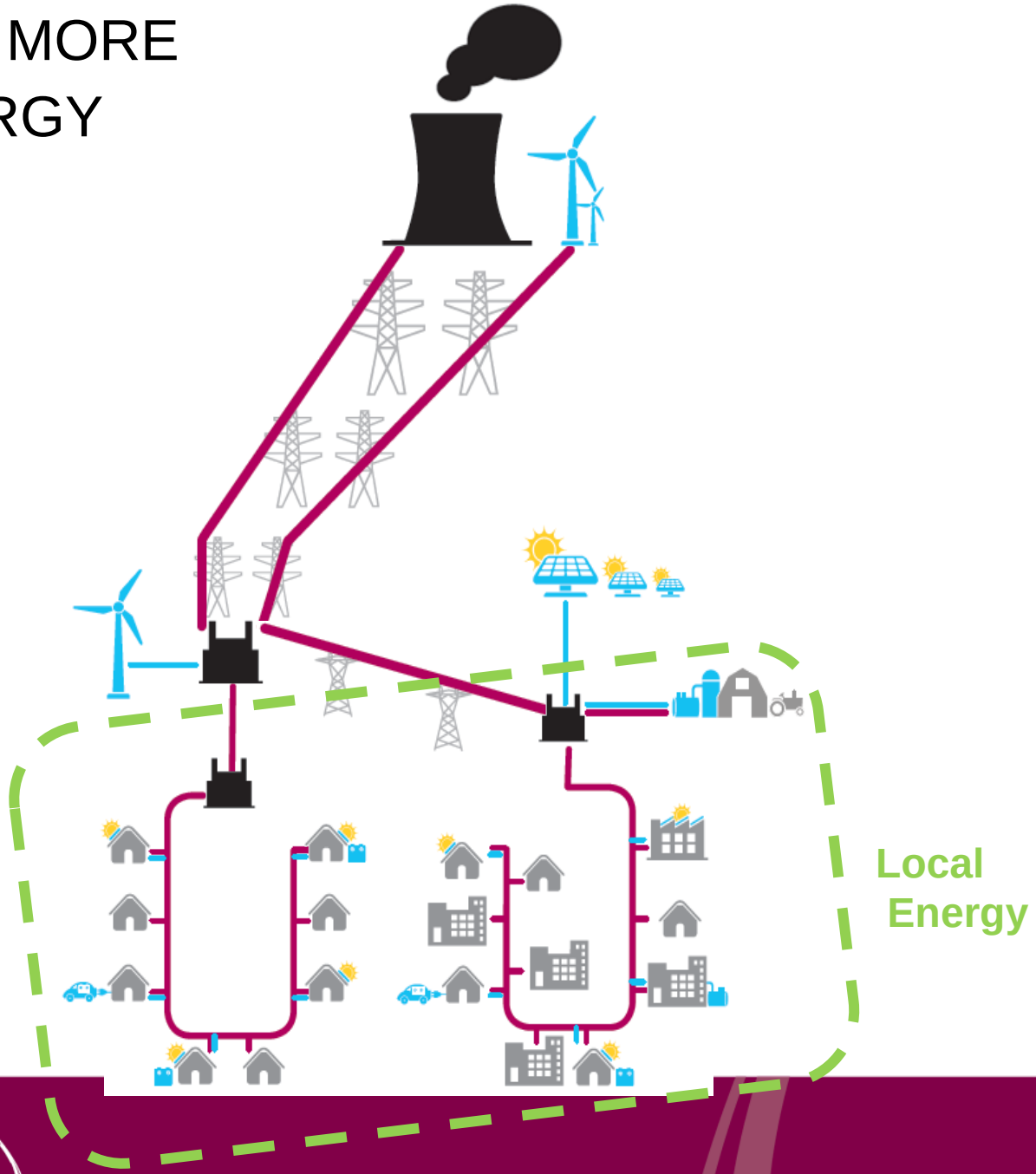
TODAY:
HIGHLY CENTRALISED NETWORK



THE FUTURE: DECENTRALISED NETWORK



…WITH FAR MORE LOCAL ENERGY



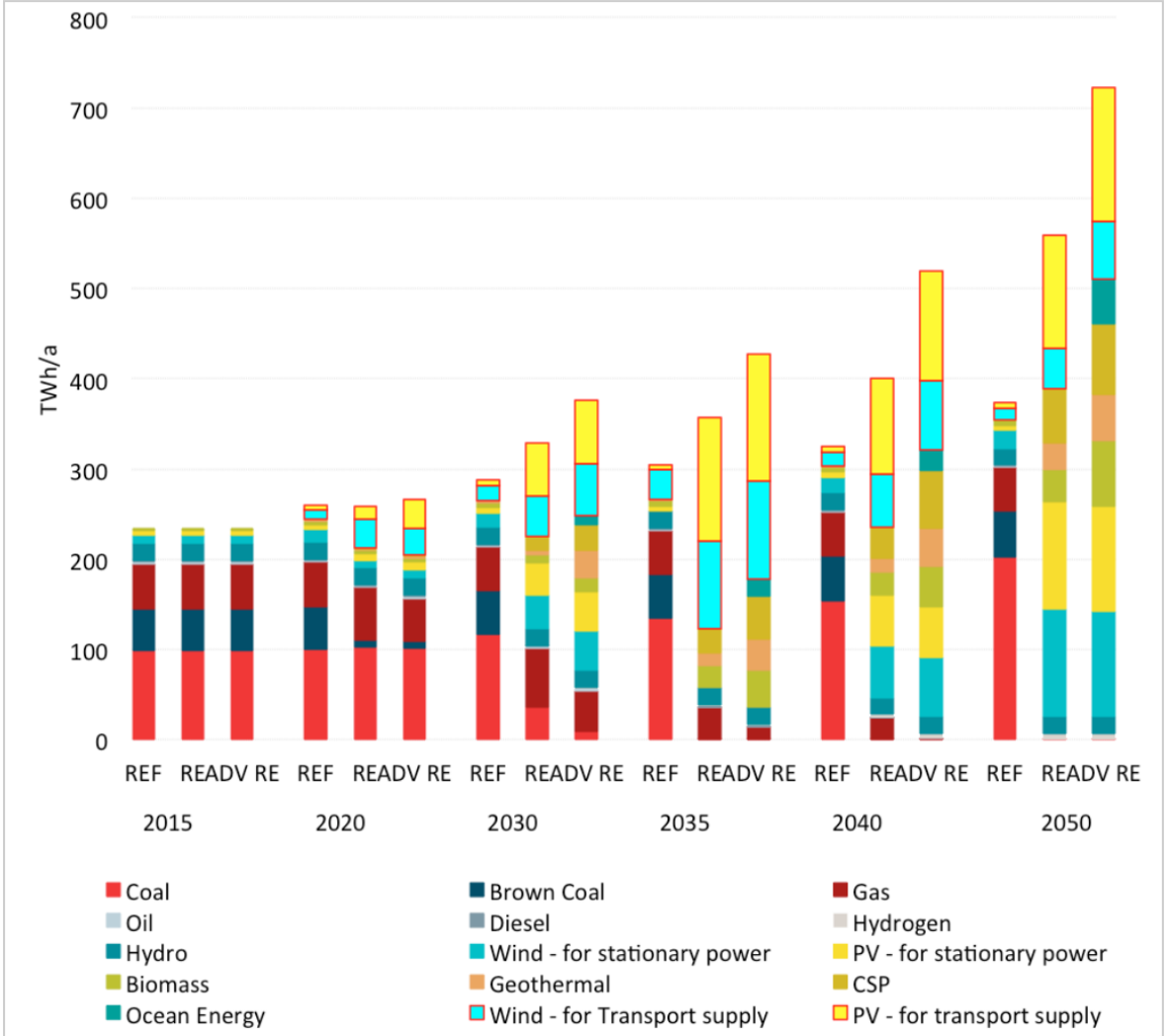
CLIMATE POLICY & NETWORKS

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

- **Paris Agreement**: To keep global temp. rise "well below" 2ºC & "endeavour to limit" rise to 1.5ºC

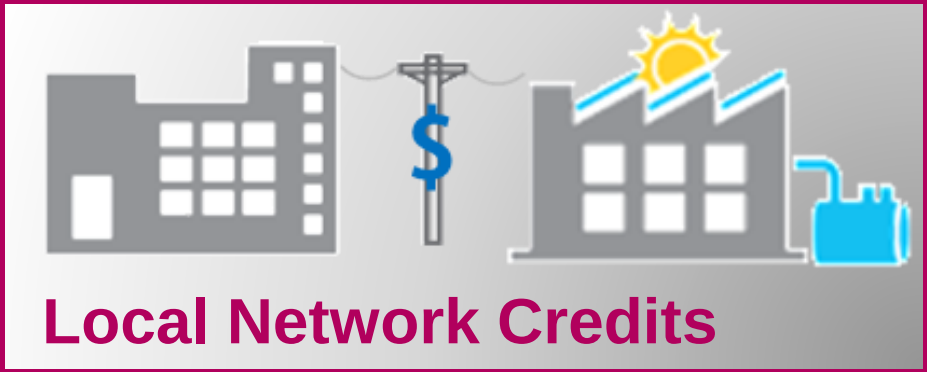
- Net zero carbon energy sector ~2050 >
  - Current RE: 15%
  - Future RE: 100%

- We will need new RE capacity **everywhere** - how do we maximise the value of existing network?



Breakdown of electricity generation by technology

BACKGROUND: THE PROJECT



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THE PROJECT: WHO'S INVOLVED

PROJECT LEAD

UTS:ISF INSTITUTE FOR SUSTAINABLE FUTURES

MAIN SPONSOR

ARENA

Australian Government
Australian Renewable Energy Agency

SWAN HILL Rural City Council

Byron Shire Council

WILLOUGHBY CITY COUNCIL

ERGON. ENERGY

CITIPOWER

Powercor AUSTRALIA

Energy in action. Since 1837 AGL

MOIRA SHIRE ON THE MURRAY

CITY OF SYDNEY

Total Environment Centre for the future

wannonWATER

NSW GOVERNMENT Renewable Energy Advocate

Essential Energy

Ausgrid

Energy Australia

Origin Energy

Winton Council/ LGIS

Australian Energy Council

Electricity Networks Association

Clean Energy Council

Coalition for Community Energy

WHAT DID WE DO?

Objective: To facilitate the introduction of local network charges* & Local Electricity Trading**

- Five case studies, or “virtual trials”
- A recommended methodology for Local Network Credits
- An assessment of requirements & costs for Local Electricity Trading
- Economic modelling of benefits & impacts
- Increase stakeholder understanding and support for Local Network Credit rule change

***** implemented as Local Network Credits paid to the generator***

***** also called Virtual Net Metering or VNM***

THE CONCEPTS

Local Network Credits:

export credits for energy generated & consumed ‘locally’; recognises the value in reducing future network costs

Local Electricity Trading**

netting off generation from one site at another site on a time-of-use basis, so that Site 1 can ‘sell’ or assign generation to nearby Site 2

TYPICAL MAKEUP OF ELECTRICITY BILL

affects this part

affects this part

$ network charges

$ retail

$ energy costs

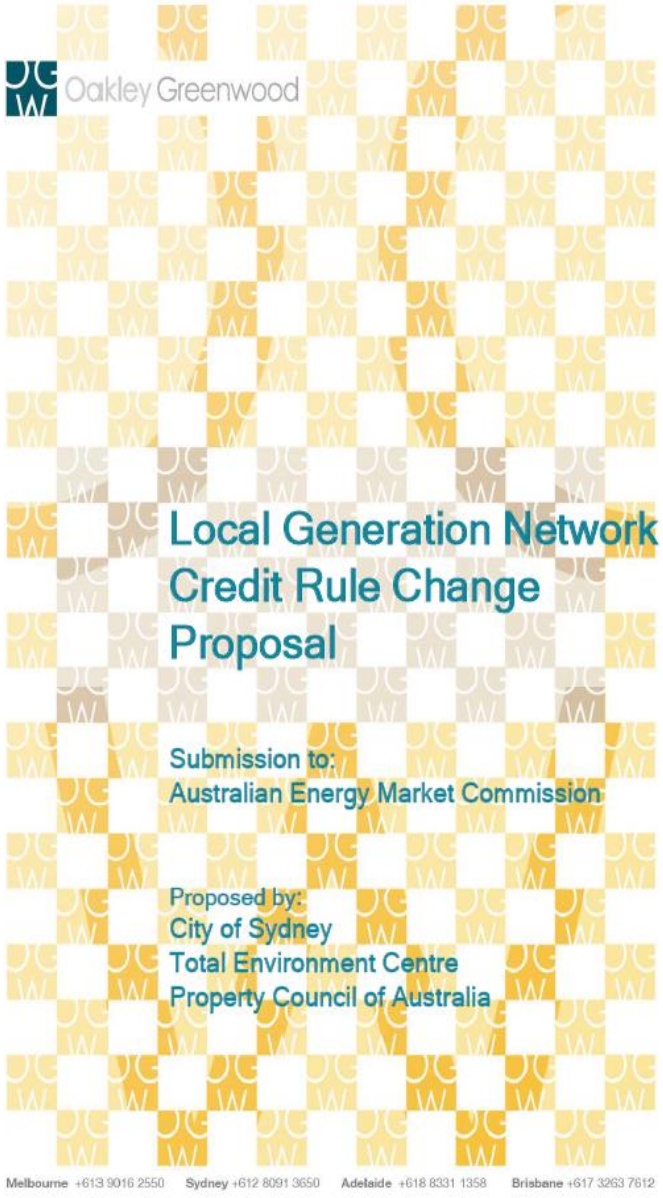
NEEDS A CHANGE IN ELECTRICITY MARKET RULES

CAN HAPPEN NOW – SOME RETAILERS OFFER SIMPLE VERSIONS

***also known as Virtual Net Metering (VNM)*

LGNC RULE CHANGE PROPOSAL

- Submitted July 2015 by City of Sydney, Total Environment Centre, and the Property Council of Australia
- Local network charges achieved via a CREDIT TO GENERATOR
- **AEMC draft determination 22nd September – rejected proposal**
- Need your input to the consultation!



LET: UTS ‘CUSTOMER LED RENEWABLES’

Competitive procurement: specified PPA in with bill “netting off”

200kW Singleton Solar Farm

12% of demand

Dr Chau Chak Wing Building

POTENTIAL BENEFITS OF LET

- **Local Electricity Trading**
  - Increase consumer choice
    - customers can choose where their power comes from, making energy ‘personal’
    - unlocks local energy projects
    - Enables stand alone community energy projects
  - Competitive advantage for retailers offering LET (esp. local govt, large corporates, community energy customer groups)

POTENTIAL BENEFITS OF LNC

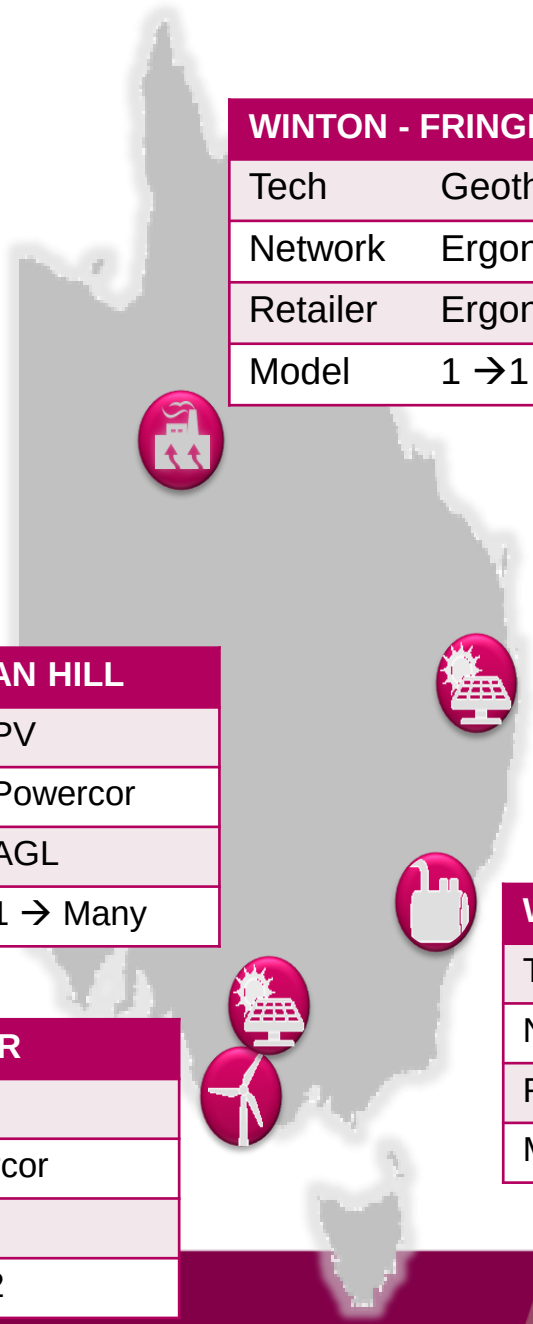
- **Local Network Credits**
  - Reduce future network costs and consumer costs
  - Reduce load defection and maintain network utilisation
  - Unlock new local energy projects
  - Unlock new product offerings e.g. neighbourhood energy storage, LET

THE TRIALS

- WINTON RESULTS
- DISPATCHABLE GENERATION (COGEN)
- ONE TO MANY

virtual

THE TRIALS



WINTON - FRINGE OF GRID	
Tech	Geothermal
Network	Ergon Energy
Retailer	Ergon Energy
Model	1 →1

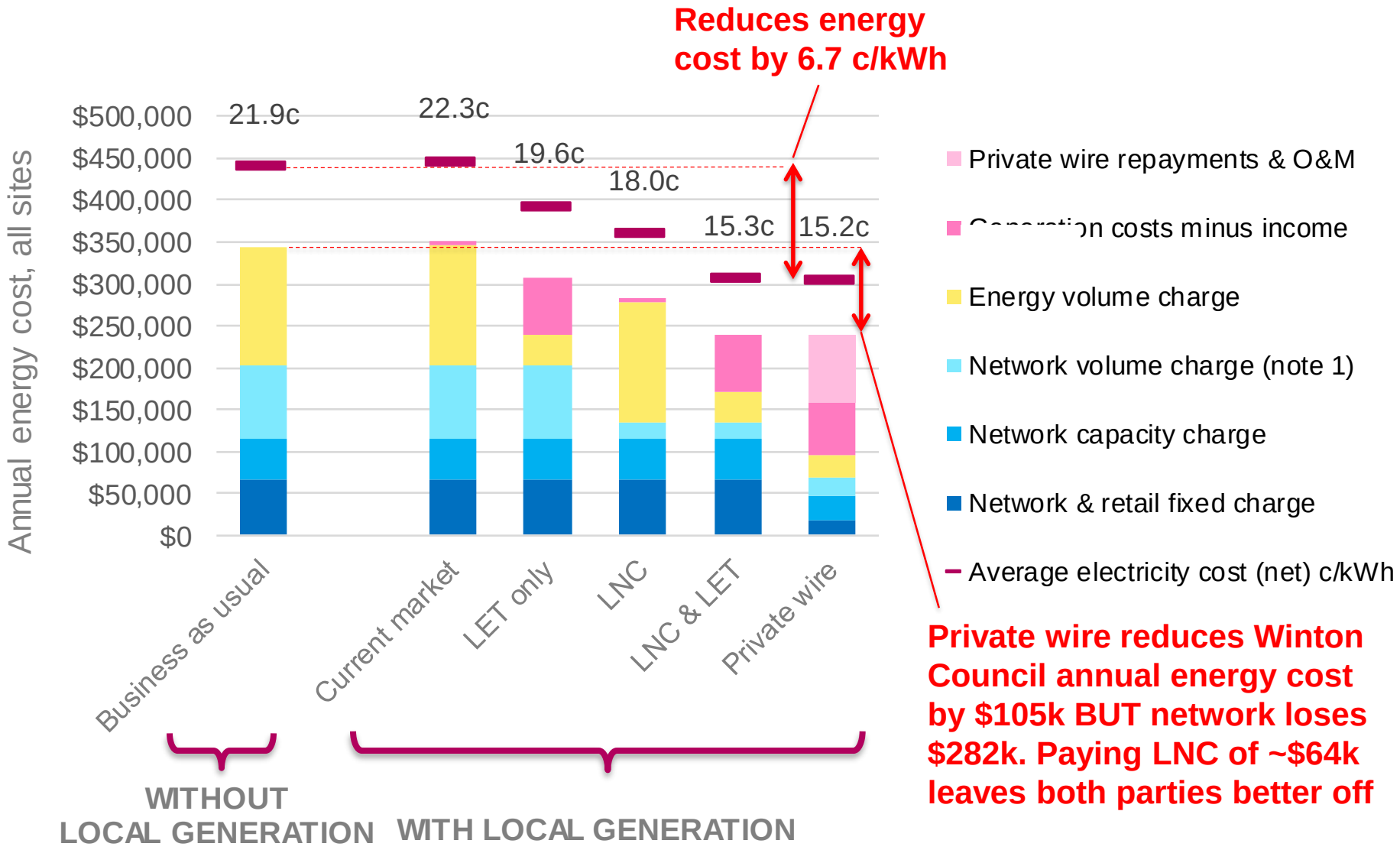
BYRON	
Tech	PV
Network	Essential
Retailer	Origin Energy
Model	Council 1 → 1

MOIRA/SWAN HILL	
Tech	PV
Network	Powercor
Retailer	AGL
Model	1 → Many

WILLOUGHBY	
Tech	Cogen + PV
Network	Ausgrid
Retailer	Energy Australia
Model	Council 1 → 1

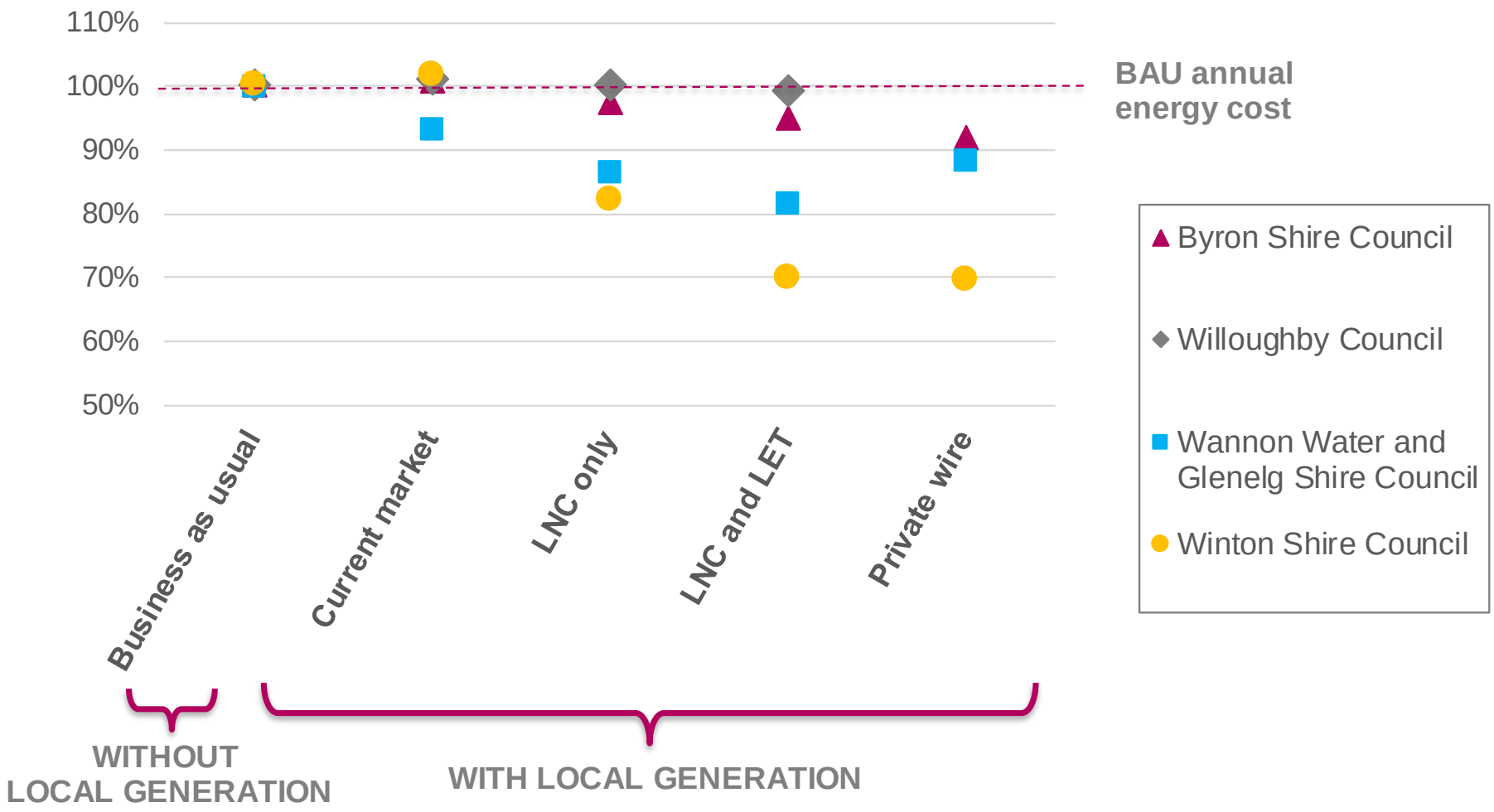
WANNON WATER	
Tech	Wind
Network	Powercor
Retailer	AGL
Model	1 → 2

TRIALS RESULTS – WINTON GEOTHERMAL PROJECT ANNUAL ENERGY COST BY SCENARIO



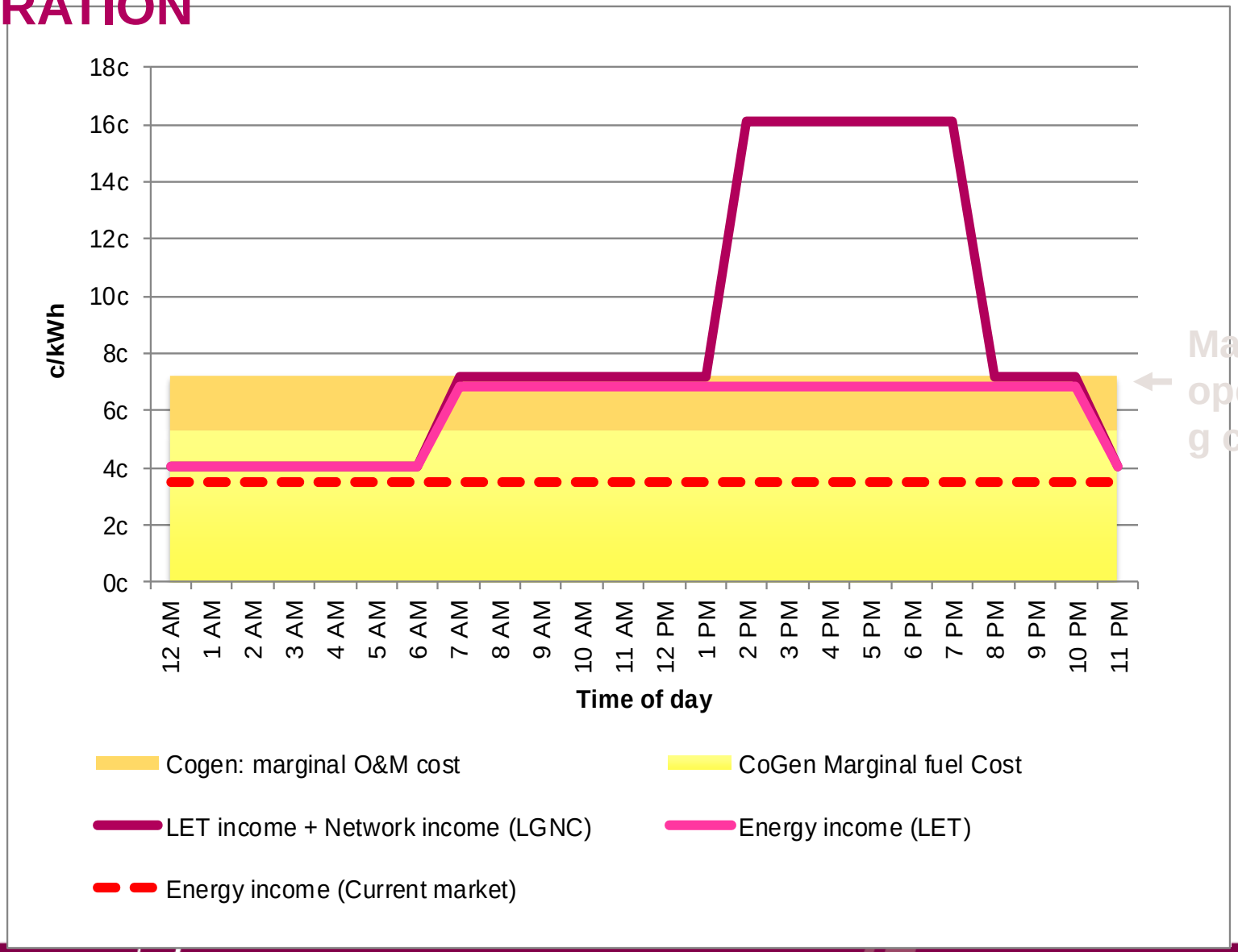
Private wire reduces Winton Council annual energy cost by $105k BUT network loses $282k. Paying LNC of ~$64k leaves both parties better off

ALL TRIALS – IMPACT ON PROPONENTS (TOTAL ENERGY COSTS)



RESULTS: DISPATCHABLE LOCAL GENERATION (COGEN CASE)

COGENERATION – LGNC IMPACT ON MARGINAL OPERATION



COGEN – LGNC IMPACT ON MARGINAL OPERATION

- An LGNC could meaningfully shift the operating profile of existing dispatchable generators to make it available at peak times

- Operating profile changes could in turn shift system design size for new systems, so that proponents size for efficient heat utilisation rather than zero electrical export.

RESULTS:
ONE-TO-MANY
SOLAR GARDEN

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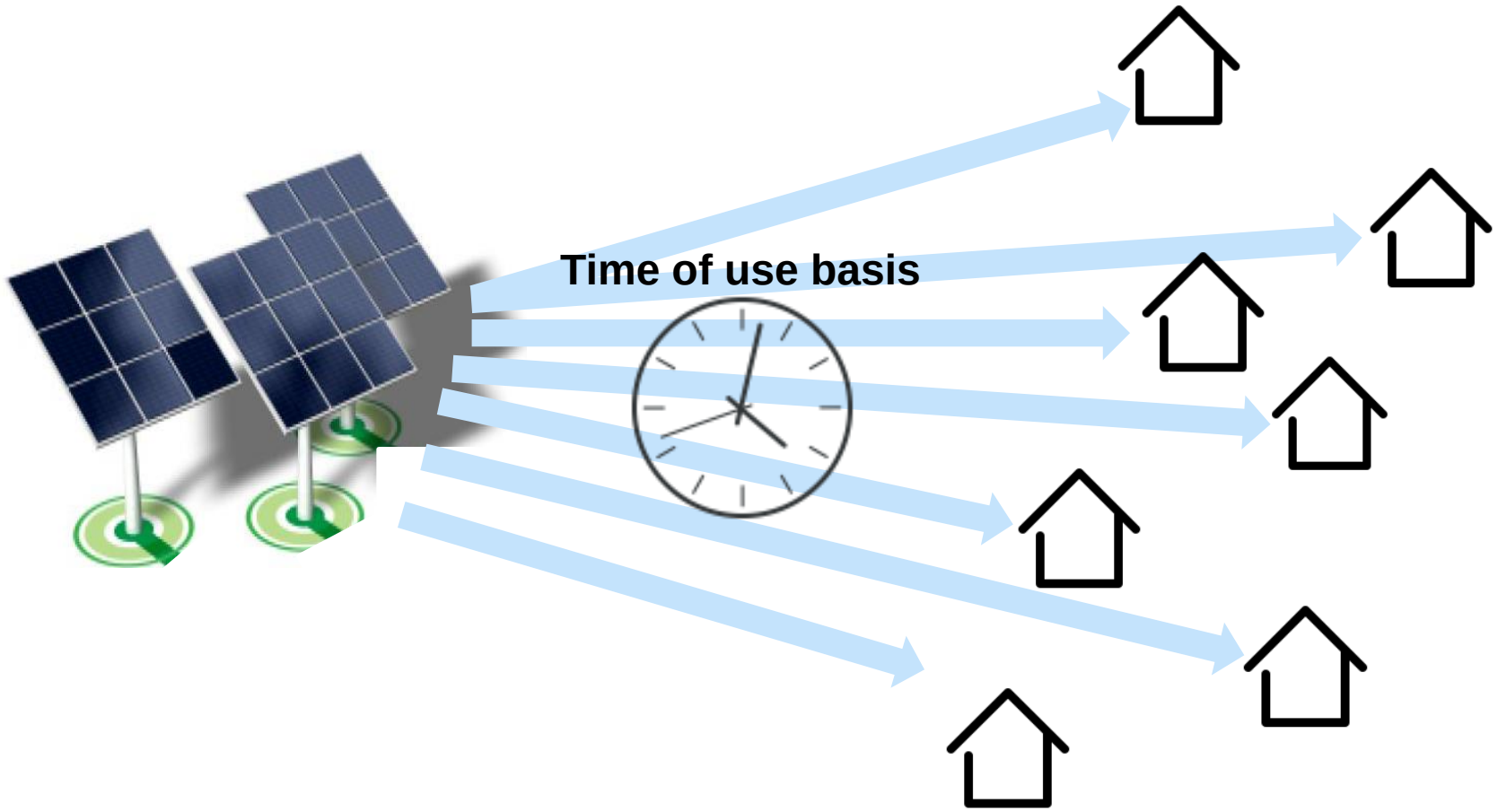
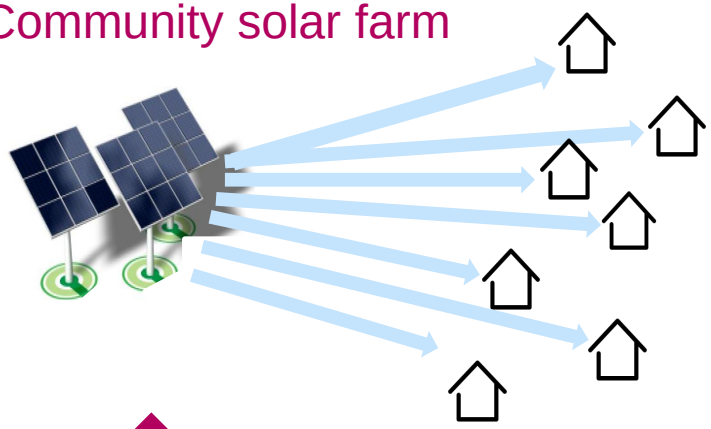
ONE–TO-MANY (COMMUNITY SOLAR FARM)



HOW DOES THE MONEY WORK?

Community solar farm



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Local Generation Certificates go to management company (and some electricity output if there is a shortfall)

1. Households/ businesses invest in farm

2. Electricity “netted off” according to share of farm

Time of use basis

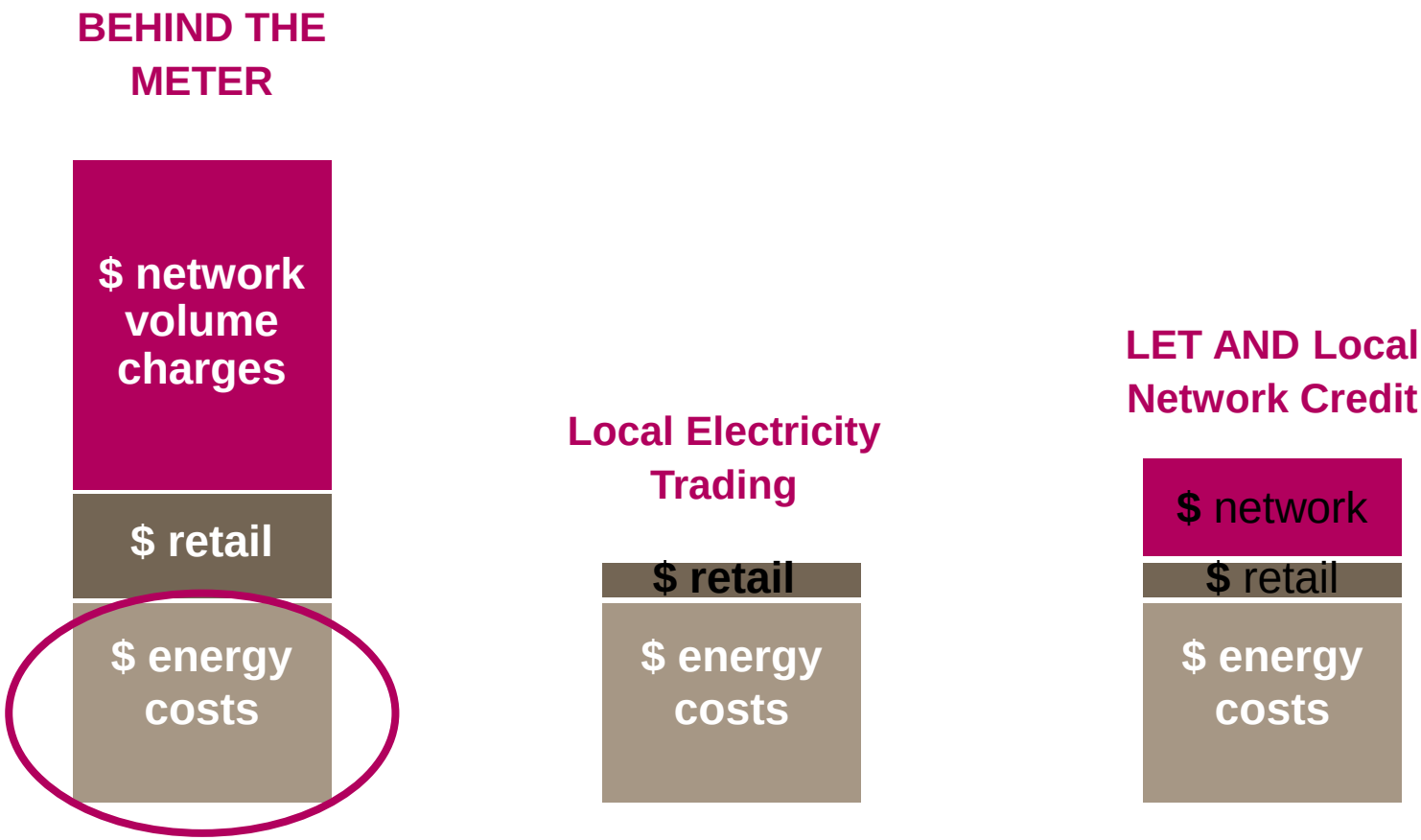
3. If share of solar farm generation greater than house/ business consumption, electricity “exported” and gets FIT

4. If Local Network Credit is paid to generator, goes to each premise according to their share

5. Appears as credit on electricity bill

Network charges etc are paid just as normal – it is just the ENERGY portion netted off

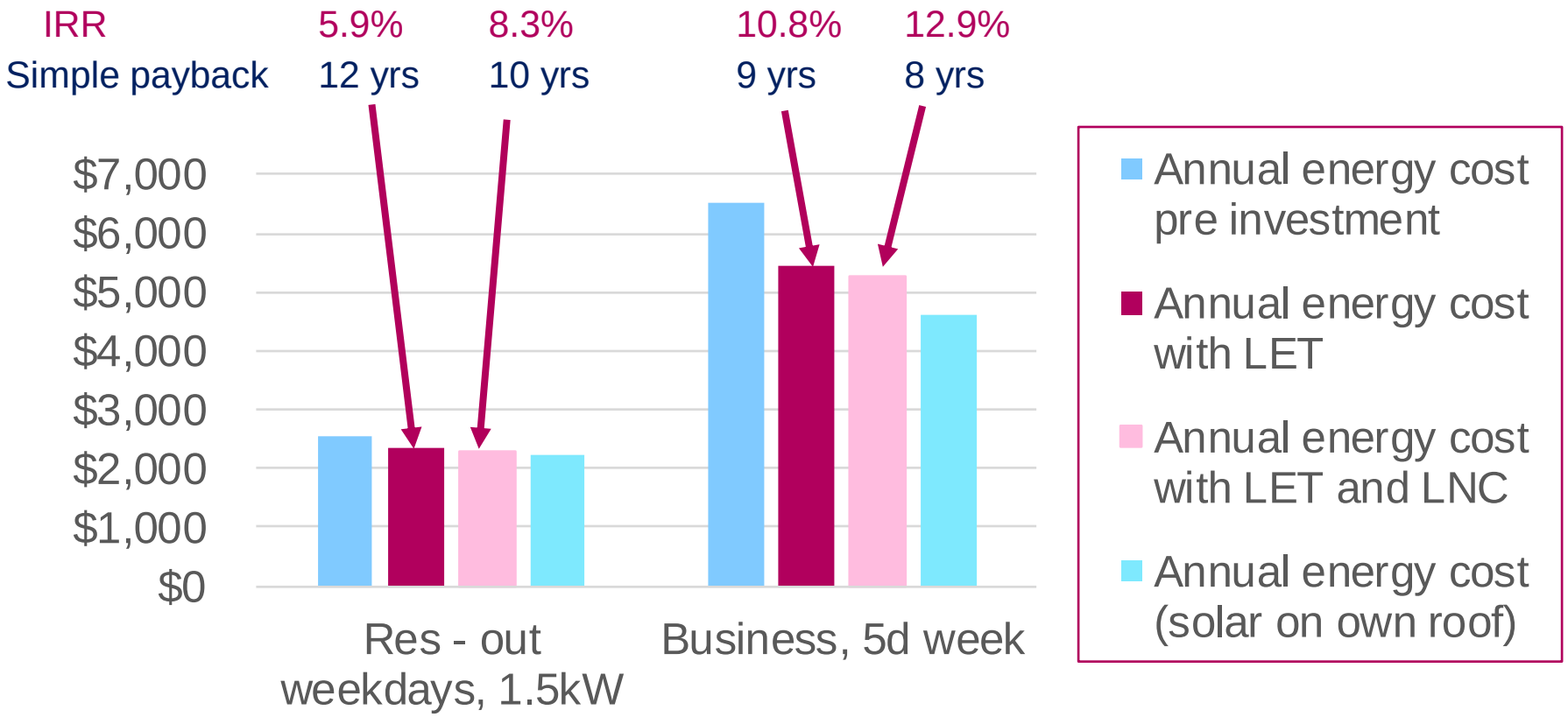
WHAT YOU GET FOR EACH KWH SOLAR



WHAT WE LOOKED AT IN THE TRIAL

- Investor types
  - Residential at home weekdays
  - Residential out weekdays
  - Residential out weekdays with summer AC
  - Business, 5 day week
  - Business, 7 day week
- With and without a Local Network Credit
- A larger/ smaller share
- How it works for the management company

BUSINESS CASE OUTCOMES



ANNUAL ENERGY COST - OUTCOMES BY INVESTOR TYPE

OVERALL BUSINESS CASE OUTCOMES

	Before investing	Local Electricity Trading (LET)	LET & Local Network Credit
Annual energy cost ($)	$314 k	$278 k	$272 k
Simple payback (years)		11 yrs	10 yrs
Investment rate of return (IRR)		5% to 12.3%	7.5% to 14.2%
Lifetime benefit ($)		$757 k	$887 k

Project size = 200 kW

Project cost = $382,000

94 residential and 12 business investors

KEY INFLUENCE ON INVESTOR OUTCOMES

- Generator cost
- What you pay for your energy *without* solar
- What proportion of netted of electricity you consume at your home/ business

Behind the meter has better return

Not suitable for large business because energy volume charge is low

The more LET electricity you consume on site, the better the payback

CONCLUSION

KEY FINDINGS FROM TRIALS

- Potential for distributed generation projects to meet local consumption needs, unlikely to be realised in today's market
- Cogen likely to be undersized without something to incentivise exports
- An Local Network Credit could maintain utilisation of the grid, and help reduce perverse incentives to go behind the meter
- LET (and LNC) could unlock community energy sites and increase access to renewable energy

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THANK YOU

PROJECT WEBSITE

http://bit.do/Local-Energy

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