energy trading

what the what?

Local energy trading (LET)

Trading *locally* – ie on the LV network on the same feeder or within the same substation area (thus potentially avoiding some upstream network costs)

Peer to peer trading (P2P)

Trading anywhere on the grid between individual prosumers and consumers

Virtual net metering (VNM)

Selling of DER exports via *netting off* exports in one place with imports in another (could be either LET or P2P)

Virtual power plant (VPP)

Aggregation of DER exports by a retailer or other party for arbitraging, FCAS etc

energy trading

Multiple trading relationships at the meter

Rule change FAILED because ‘cost outweighed consumer benefit’

Local network credits

Rule change FAILED because ‘cost outweighed consumer benefit’

Friendly retailer (even better: + distributor)

Renewable Newstead with Diamond Energy and Powercor

Friendly (and sneaky) distributor + smart meters

Ausnet trial

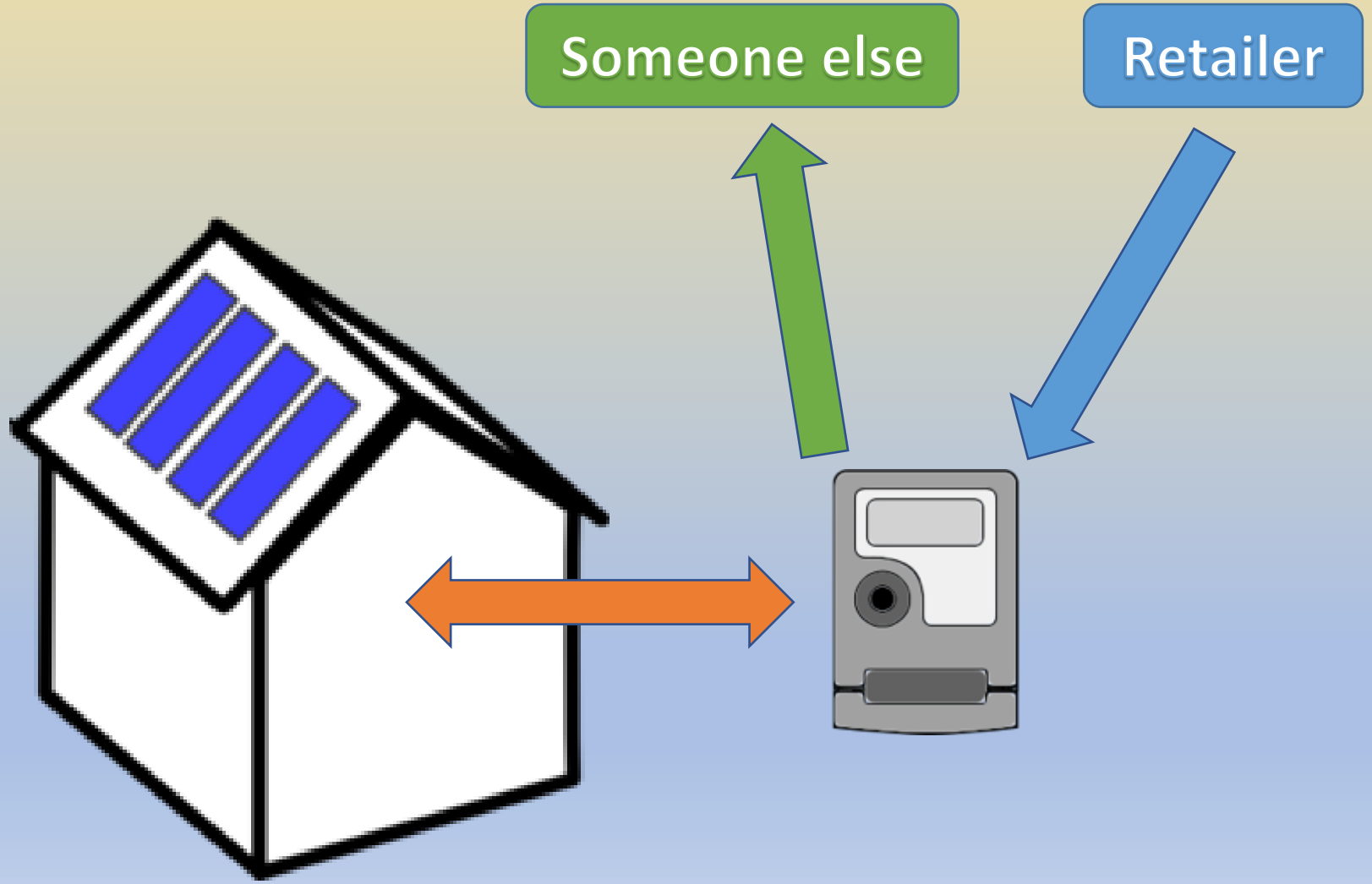
BLOCKCHAIN!!!

Yeah, whatever

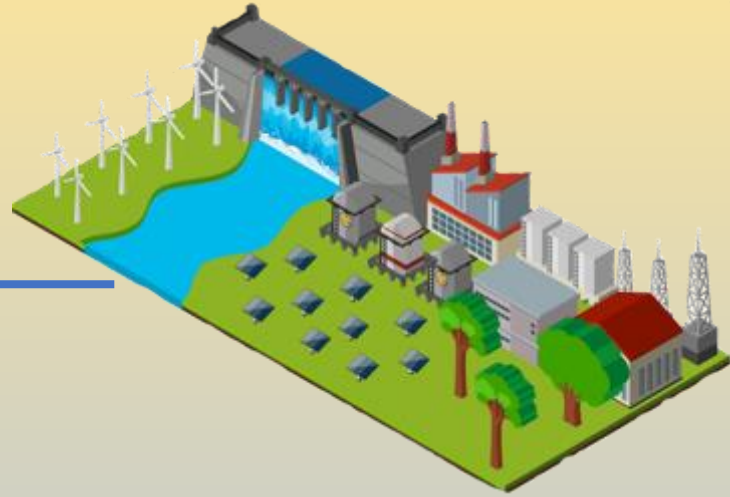
Not-blockchain

deX (ARENA and GreenSync)

multiple trading relationships

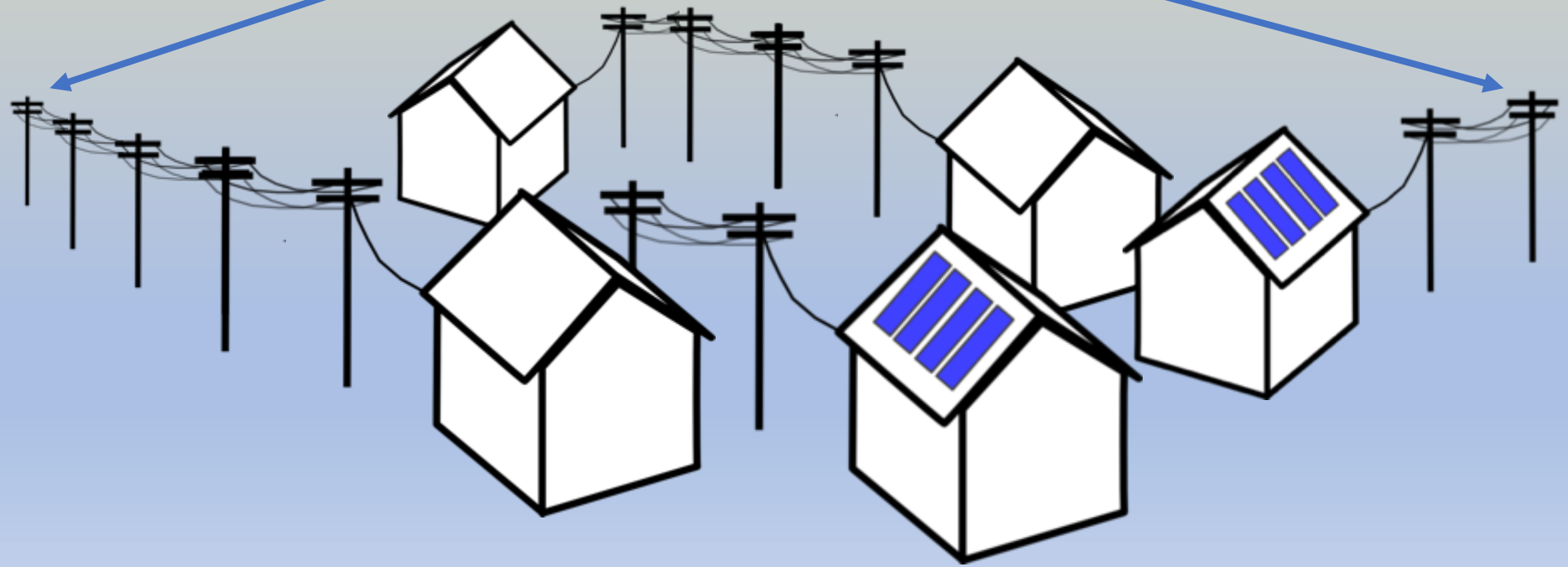


renewable newstead



Powercor
AUSTRALIA

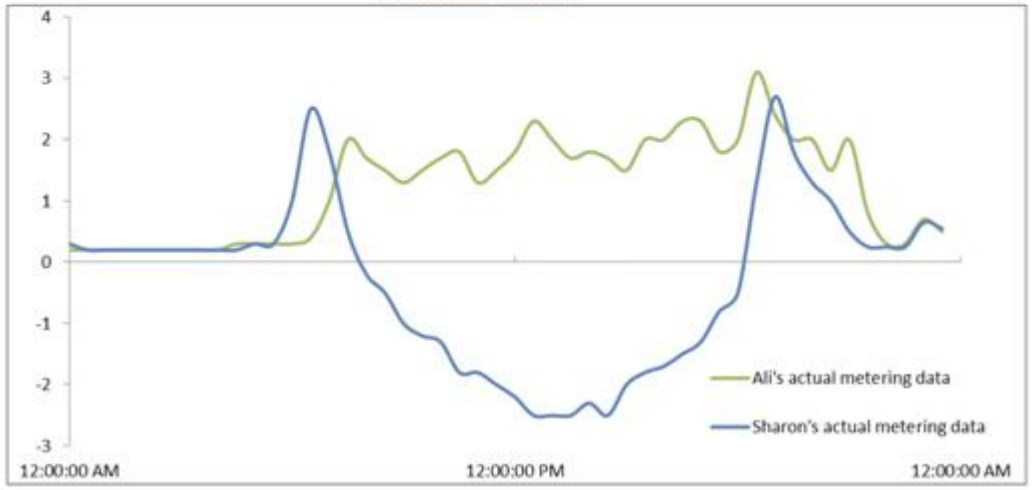
Diamond
Energy



ausnet trading platform

Ali and Sharon

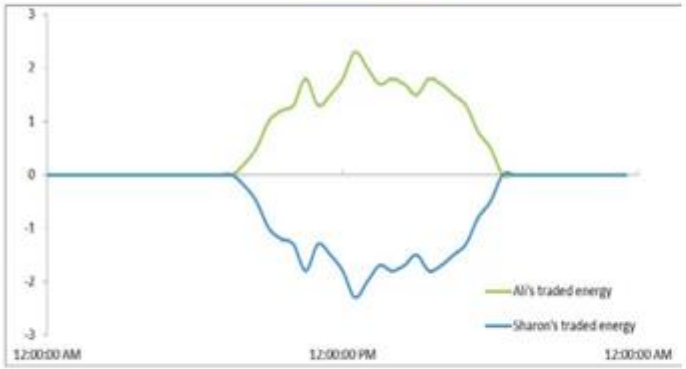
Metered energy



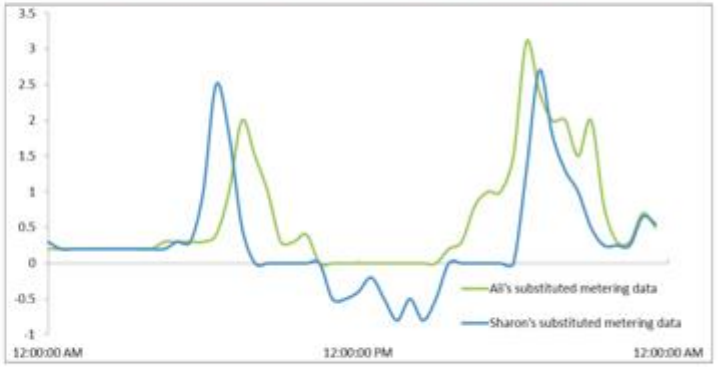
What happens to the meter data?

- **Bids are matched after they have actually exported or consumed the energy they've traded. (i.e. 'ex-post').**
- **New meter data, that does not include traded energy, is then provided to retailers.**

Traded energy

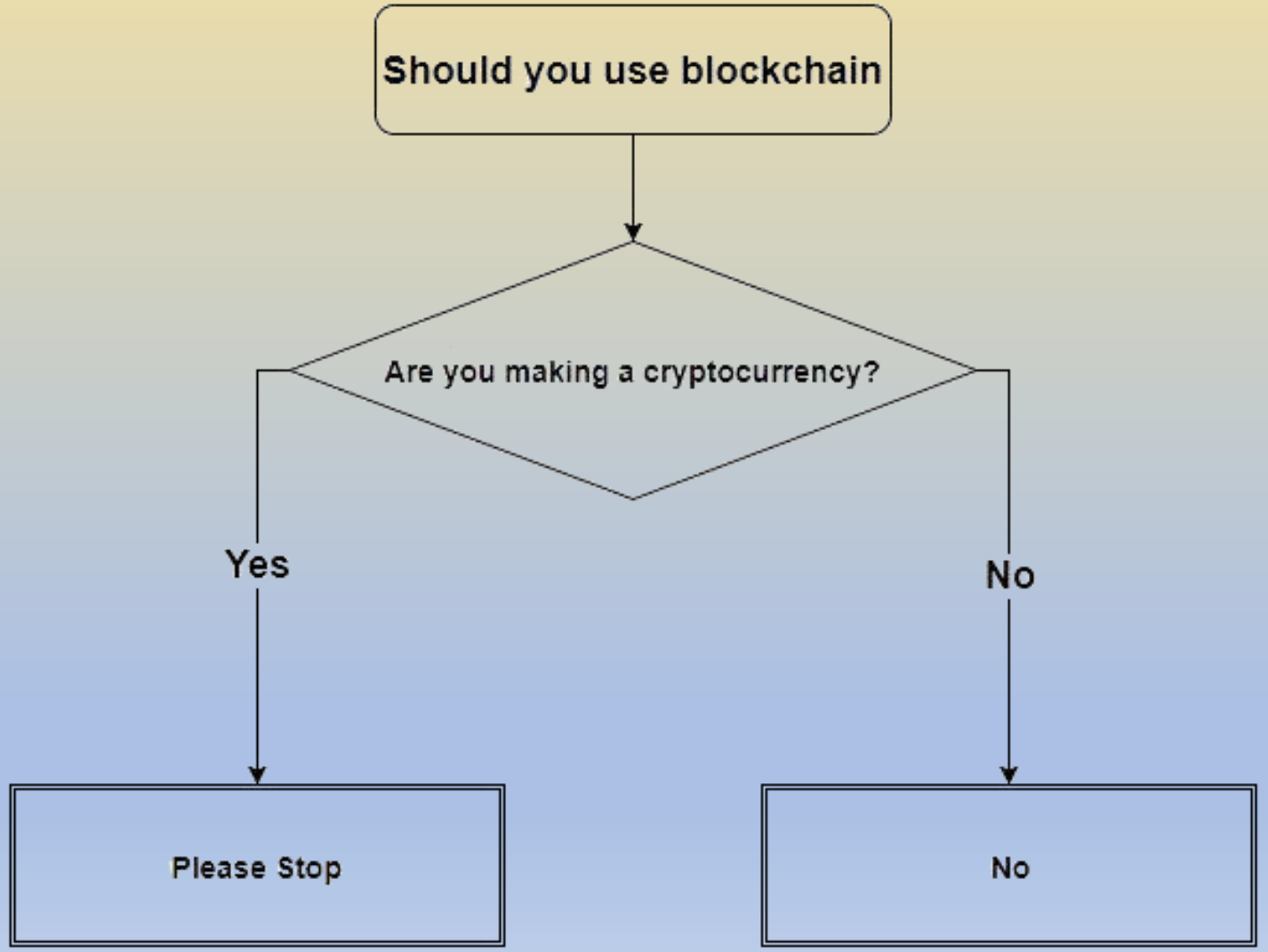


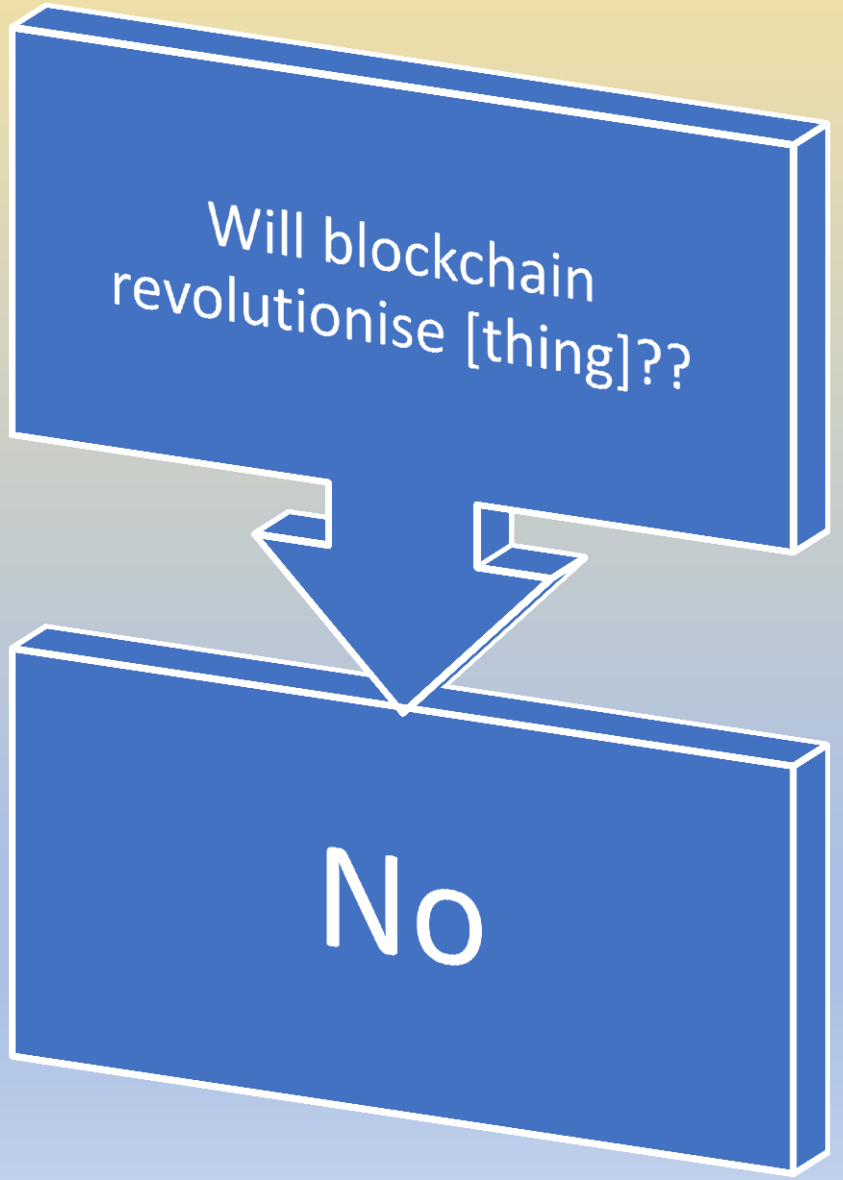
Substituted data – *used for billing*



Peer-to-peer trading does not impact the net outcomes in the market.

blockchain


Should you use blockchain
Are you making a cryptocurrency?
Yes
No
Please Stop
No


Will blockchain revolutionise [thing]??
No

deX

What is deX?

Conceptually, deX is an open exchange where energy capacity can be transacted between businesses, households, communities and utilities.

Practically, deX is a software platform that helps to drive coordinated development implementation of distributed energy resources (DERs) like solar panels and batteries into electricity markets.

Functionally, deX brings DERs online to deX participants, making them visible in the network and dispatchable when required. Agreements can be formed and capacity from DERs can be aggregated.

GreenSync

ARENA
Australian Government
Australian Renewable Energy Agency

deX

GreenSync

ARENA
Australian Government
Australian Renewable Energy Agency

I am a homeowner and would like to participate in deX. How do I become involved?

We understand that you are excited about deX—we are too. Unfortunately, the deX team are not equipped to manage enquiries from homeowners just yet.

The best way for you to get involved is to contact your energy retailer who will be able to walk you through the options available for your home. Or you can subscribe to deX newsletter to stay up to date on deX news.

deX

Electricity Networks

Electricity Retailers

Equipment Manufacturers

Technology vendors

Integrators

Installers

Peak bodies

Consulting

deX Stakeholders

Many of these organisations helped to steer deX in the pilot project. Some had involvement in overseeing academic research while others have input from a policy regulation standpoint.

Founding Partners

Policy and Regulation

Research

virtual power plants

SA government

- Free solar batteries in public housing, subsidised in private housing
- Batteries controlled for grid support services
- All energy (self-generated and from grid) at a reduced price (≃30% less)

AGL in SA

- Subsidised battery
- Surplus stored energy sometimes discharged for grid support (supply shortfall)

Reposit

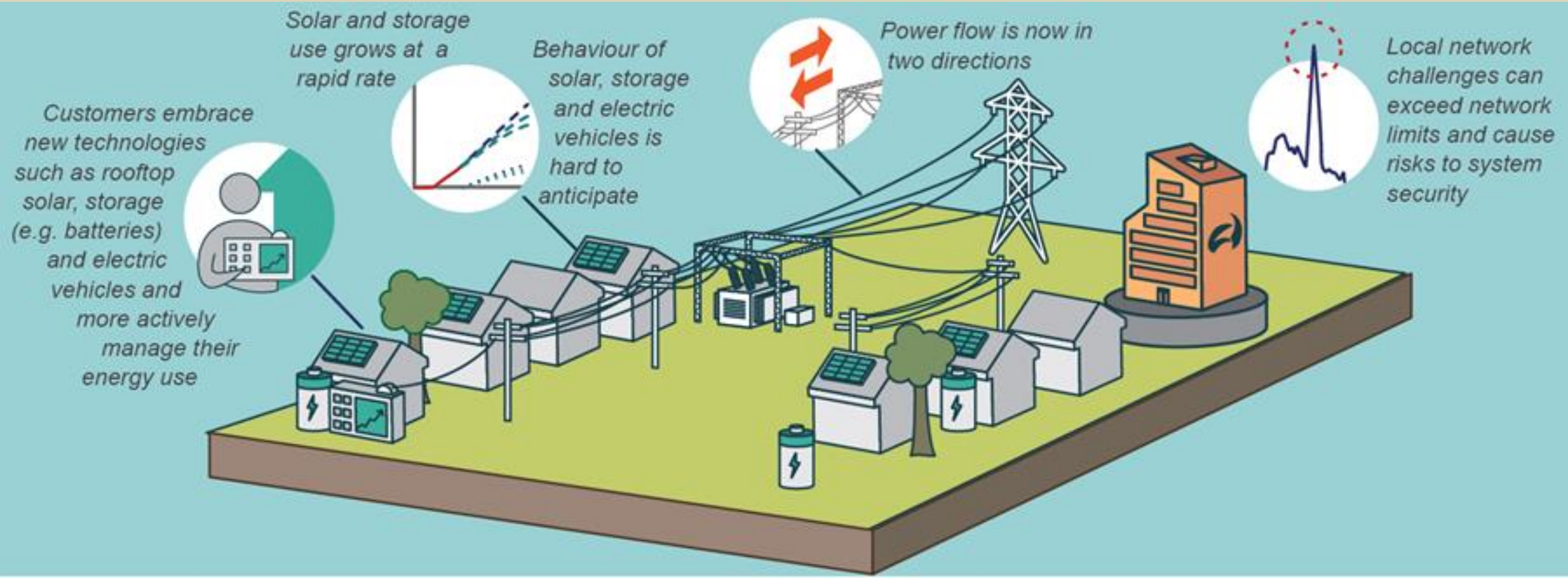
- Add-on controller ($600) for solar+battery homes
- Sell surplus energy to grid at higher prices (up to $1/kWh) during high price grid events
- ~~Not clear~~ ~~UNLIKELY~~ ***IMPLAUSIBLE*** that it is really worth it

virtual power plants

Still…

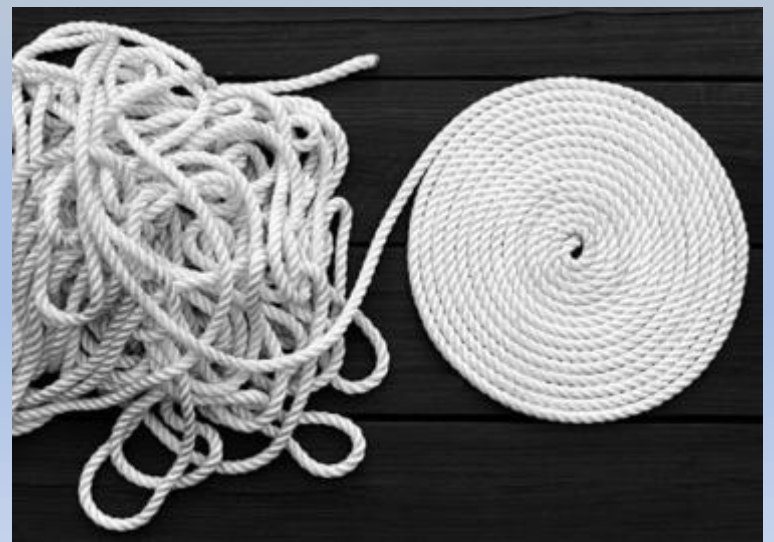
- VPPs likely to solve heaps of energy grid and market problems, especially once there is a proper demand response mechanism in the wholesale market
- Batteries subsidised because they are also used by third parties for demand response, supply augmentation, grid services or ancillary services likely to also offer benefits to households that host them
- Tariff arbitrage could be beneficial in addressing shortfalls between supply and demand if well regulated and appropriate network tariffs in place
- Battery prices coming down fast enough that *they will be cost-effective* for households that can afford them in a few years
- Network capacity constraints on DER will need to be addressed anyway

optimising DER



optimising DER

“When DER penetrations reach very high levels, improved frameworks for system dispatch are required that allow DER dispatch to be optimised within distribution network technical limits... [T]his is a new functionality which no organisation is performing at present.”



optimising DER

AEMO/ENA Open Energy Networks report

“What new capabilities, functions and roles will be required to coordinate and optimise the value of customers’ DER investments whilst maintaining security and reliability across the NEM and WEM?”

optimising DER

Issues

- *Visibility* - Need for AEMO and networks to see what happening behind meter
- *System security* - Need for networks to respond to tech challenges of high bidirectional energy flows
- *Optimisation* - Need for AEMO/networks to control DER flows to prevent energy spikes/overloads
- *Cost recovery* – Need for networks to recover costs of responding to high DER flows
- *Trading platform*
  - Need for DER owners to be able to sell to others (P2P) preferably with discounted network charges
  - Need for DER aggregators to be able to sell into wholesale market or direct to other customers (VPPs)

Figure 11: Additional value release enabled by optimisation of active DER

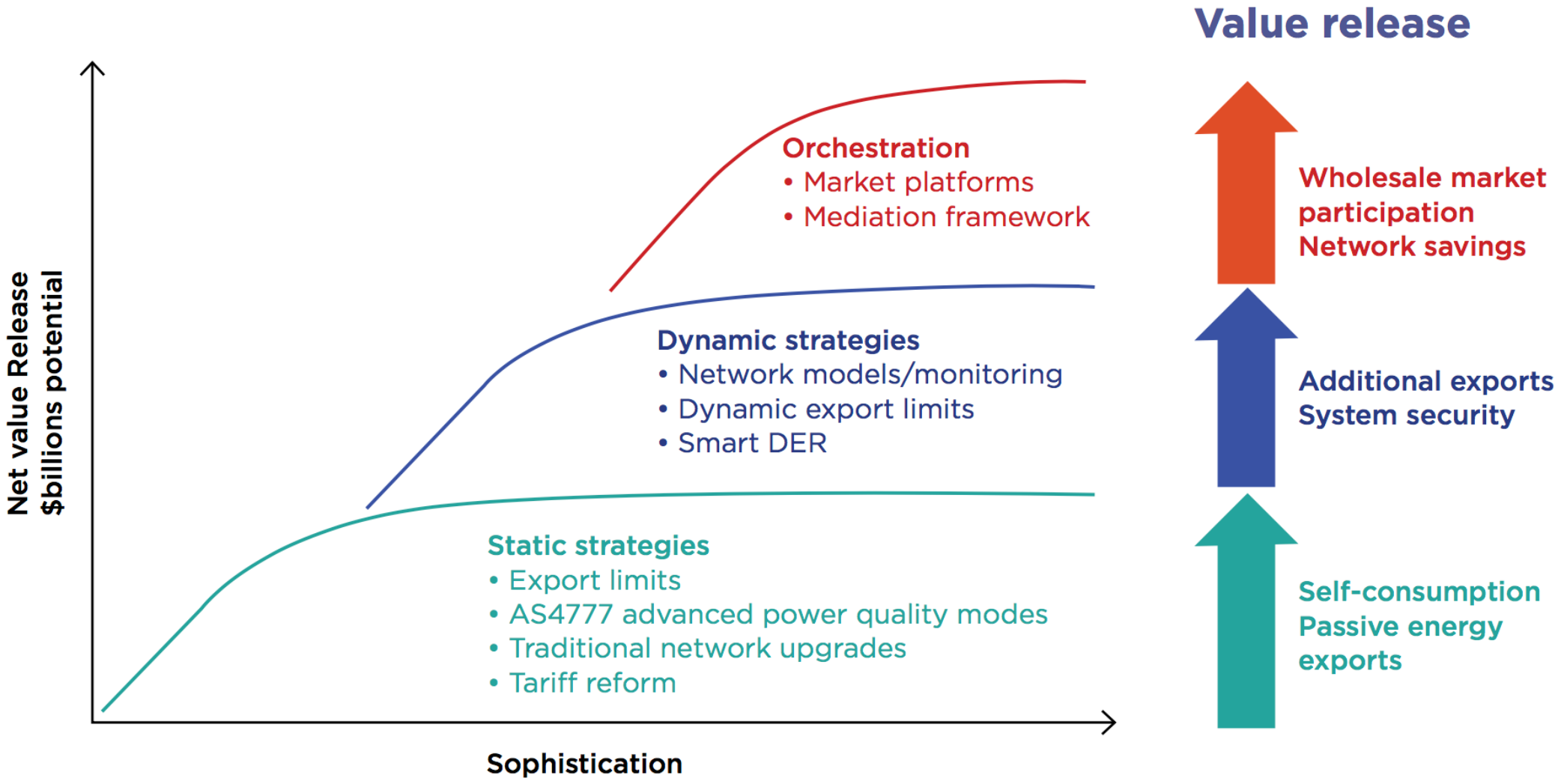
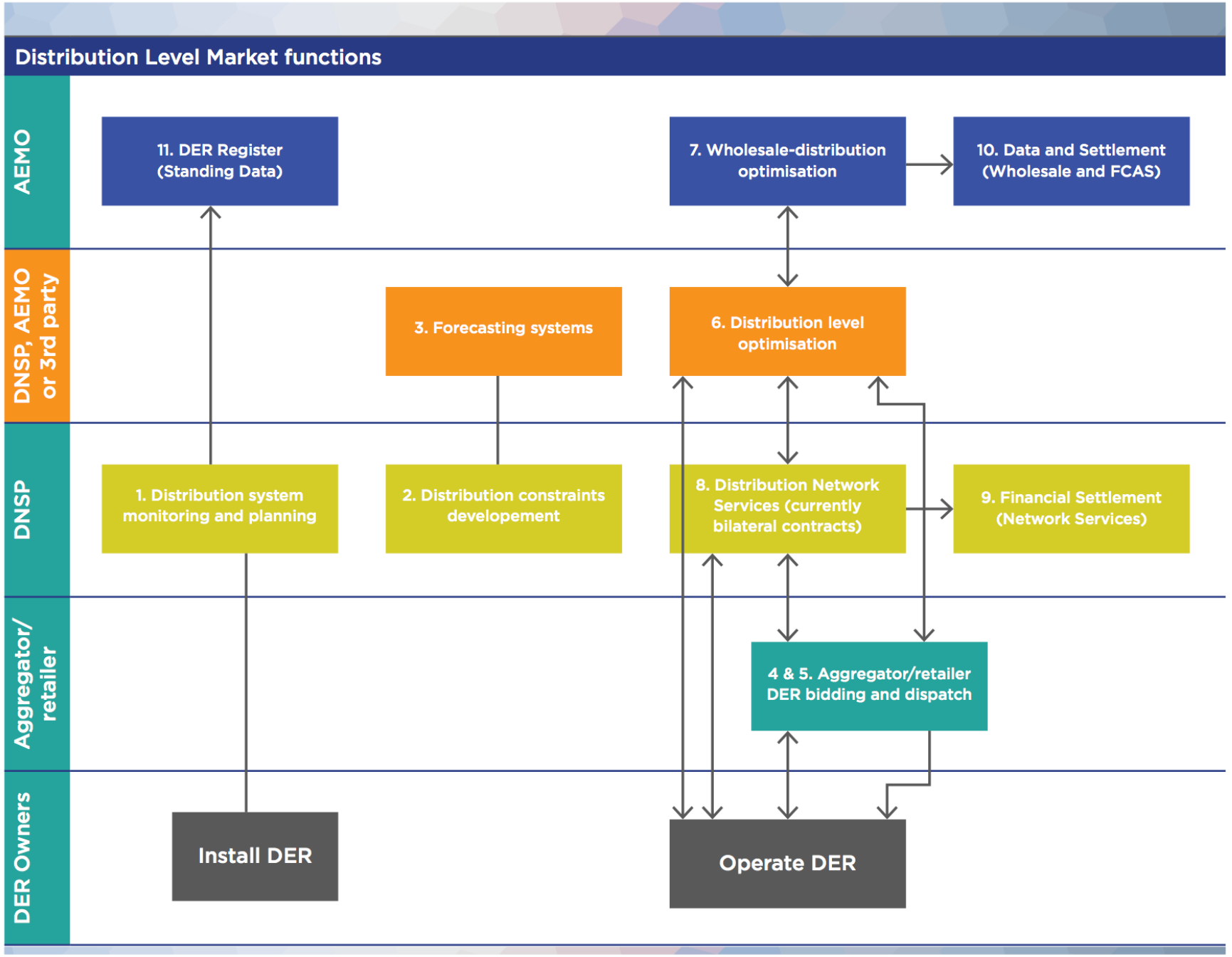


Figure 13: High level overview of key functions for distribution level optimisation



optimising DER

Proposed models

1. *Single Integrated Platform (SIP)*

   Run by AEMO as extension of wholesale market.

2. *Two Step Tiered Regulated Platforms*

   "...a layered distribution level platform interface operated by the local distribution network and an interface between the distribution network's platform and AEMO."

3. *Independent DSO*

   "... a DSO that is separate from AEMO and the distribution utility. Under this model the independent DSO would work with the distribution utility to optimise the dispatch of the DER based upon local system constraints that are provided by the network business [and] provide the aggregated bids to AEMO for incorporation into the larger dispatch."