



**A2EP – 2xEP Energy Productivity Summit**  
**04-05 April, 2017**  
**Australian National Maritime Museum**  
**Darling Harbour, Sydney**

**Session 07**

**2xEP by 2030: How? Why?**

**2xEP and net zero emissions**

*Paul Graham > presentation follows*

Shauna Coffey

Alan Pears

Gordon Weiss

*Chair: Amandine Denis*



*Doing more. Using less.*

# The potential role of the demand side in electricity system productivity and supporting zero emission electricity

April 2017

CSIRO ENERGY  
[www.csiro.au](http://www.csiro.au)



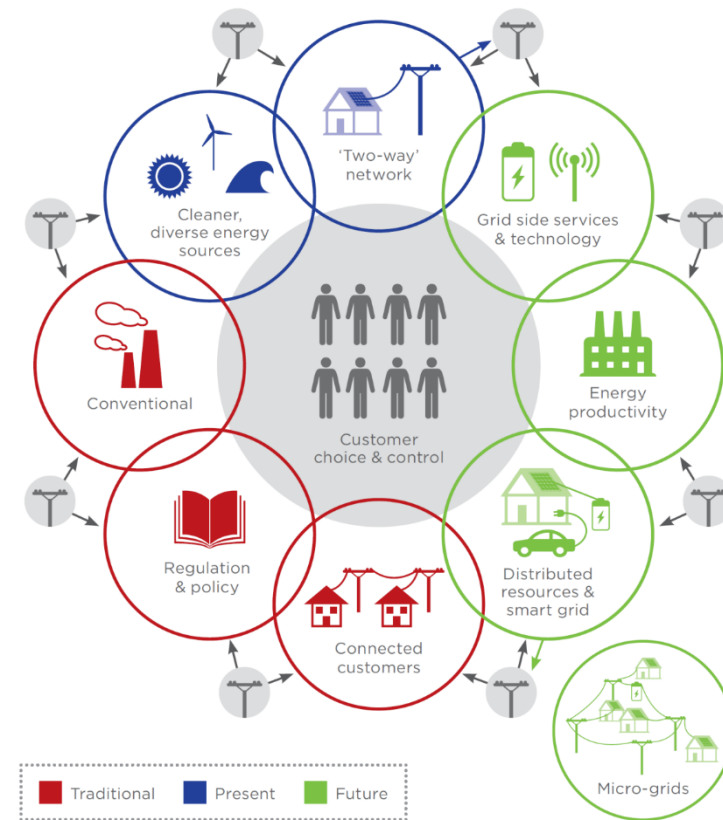
# Two big drivers of change

## Actions to mitigate climate change

Bipartisan  
commitment to Paris  
climate targets



## Distributed energy (solar, batteries, electric vehicles)



# Both increase electricity prices

## Actions to mitigate climate change

When the full costs of integration are included, all low emission technologies lead to higher generation prices

## Distributed energy (solar, batteries, electric vehicles)

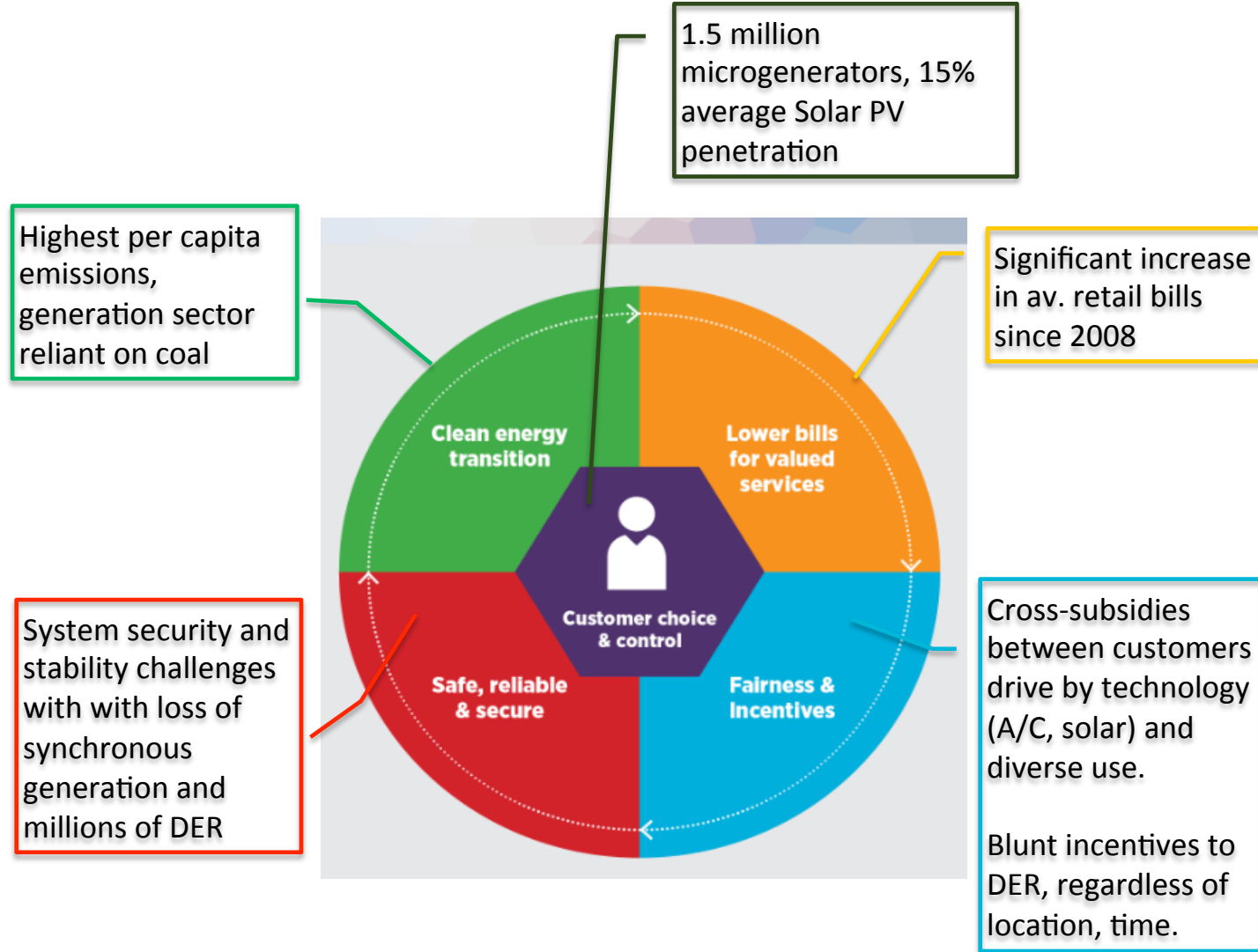
↑ Customer solar + flat consumption outlook =  
↓ kWh supplied by networks

Only option to recover the fixed costs of networks is to ↑ prices

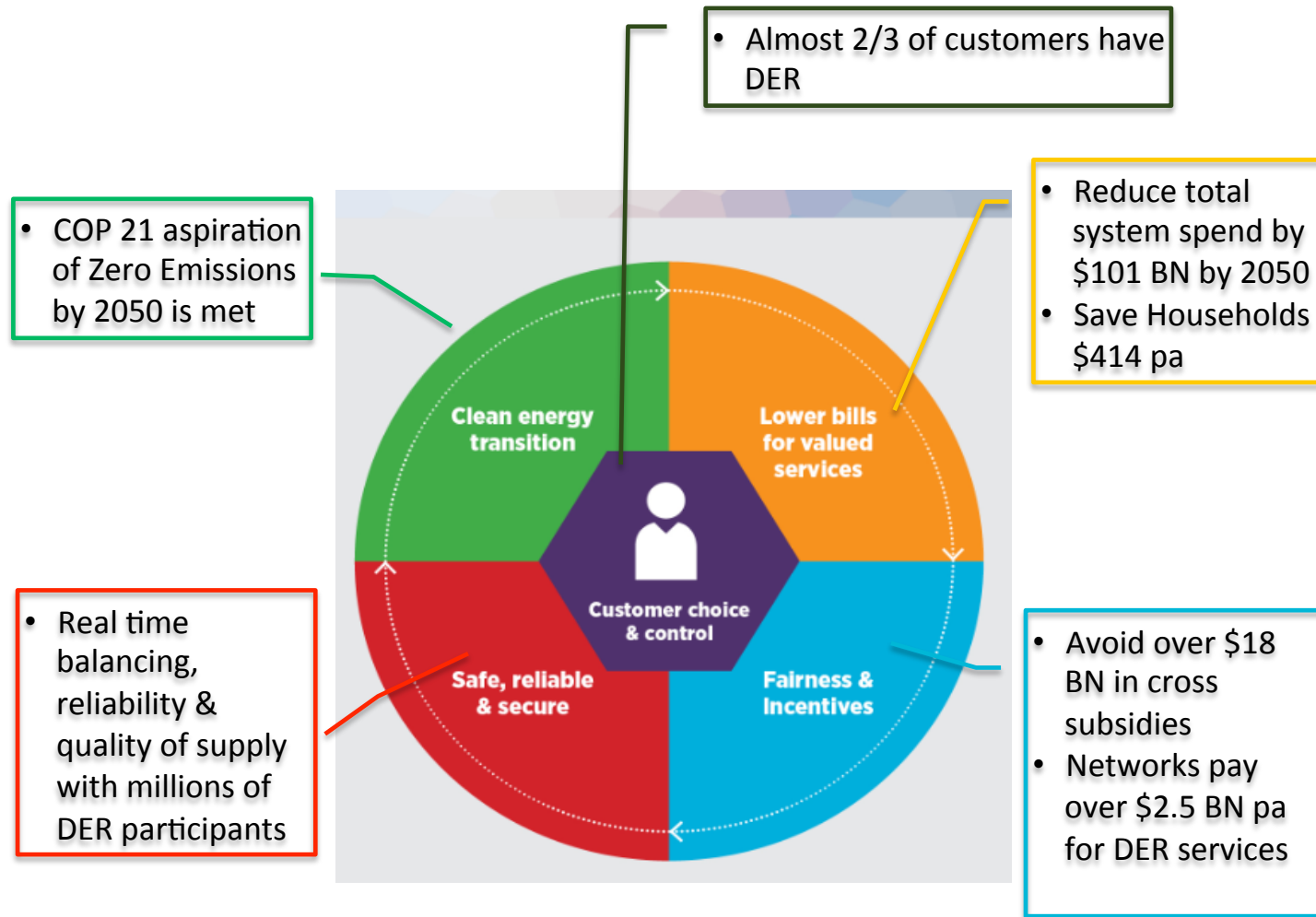
# Electricity Network Transformation Roadmap 2017-2027

- ✓ **CSIRO – ENA collaboration**
  - ✓ **Evidence-based** (Qual + Quant)
    - ✓ Informs **specific, purposeful actions** ('Milestones' + 'Actions')
    - ✓ Enables **whole-of-system optimisation**
    - ✓ Central focus on **balanced outcomes** for **customers and society**
      - ✓ A '**living document**' updated periodically through 2017-27 decade

# Status today ...



# A better future...



## How? – Two key strategies

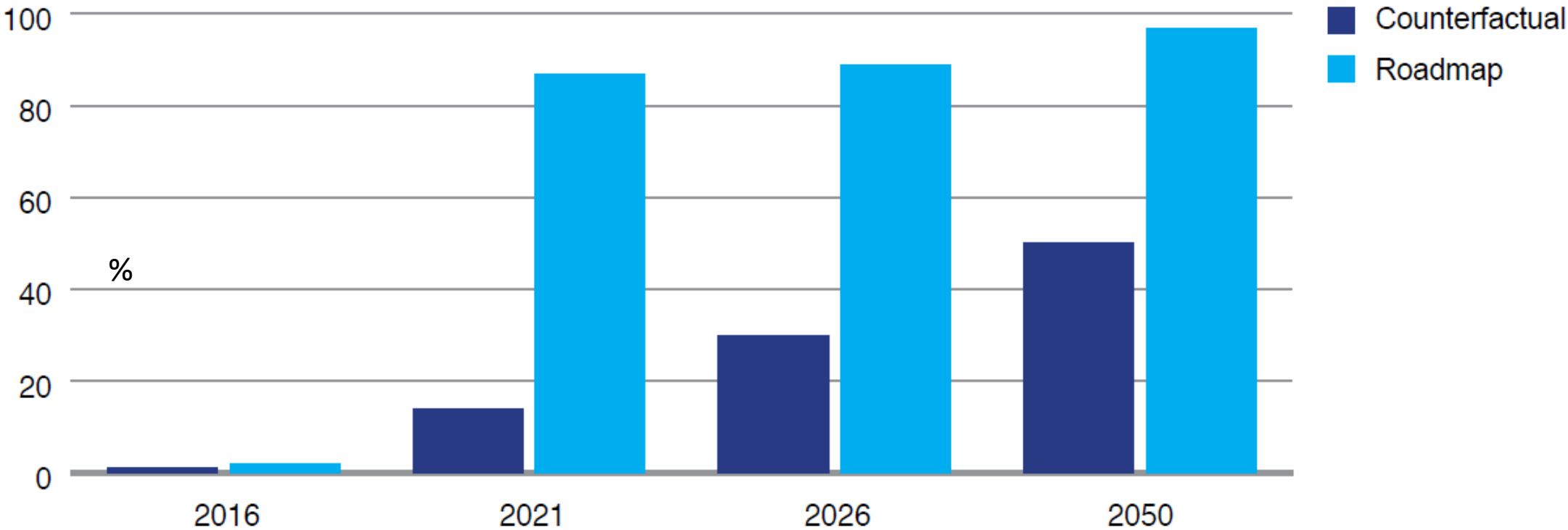
Avoided duplication – better utilise the distributed energy resources that customers are going to install no matter what

Electric vehicles – fill in the whole left by rooftop solar with a new consumption source



# Better utilising DER requires pricing and incentive reform

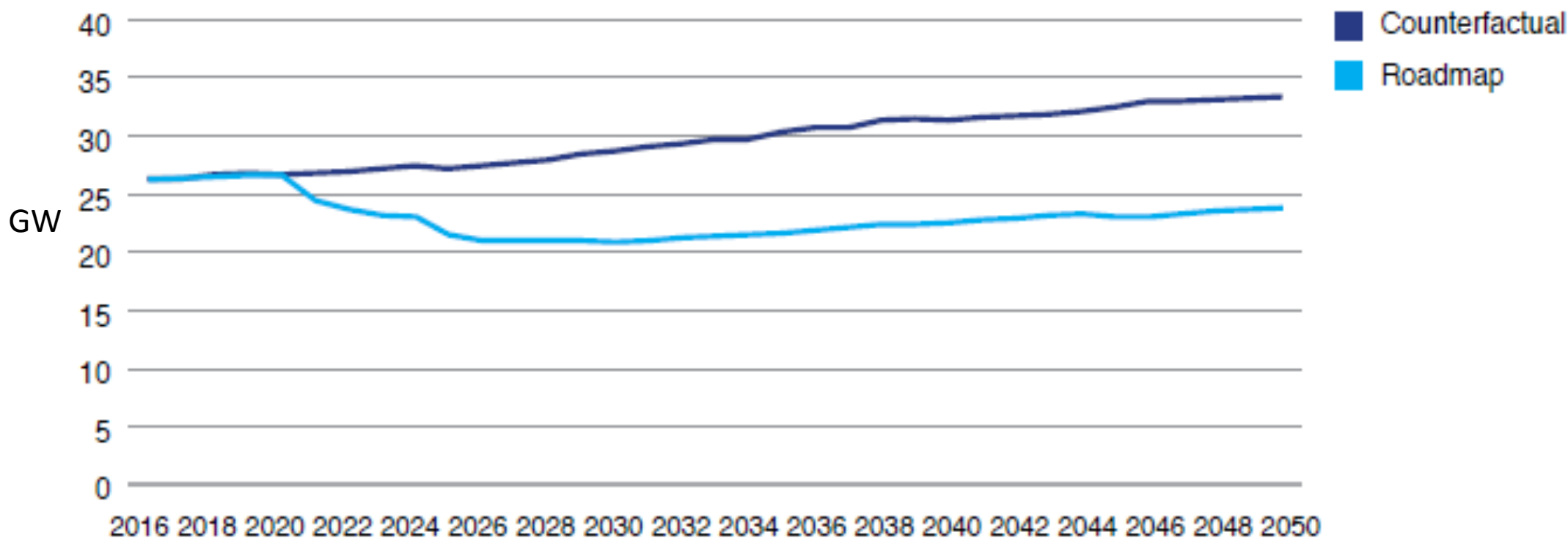
Share of small customers on cost reflective prices



# Better utilising DER requires pricing and incentive reform

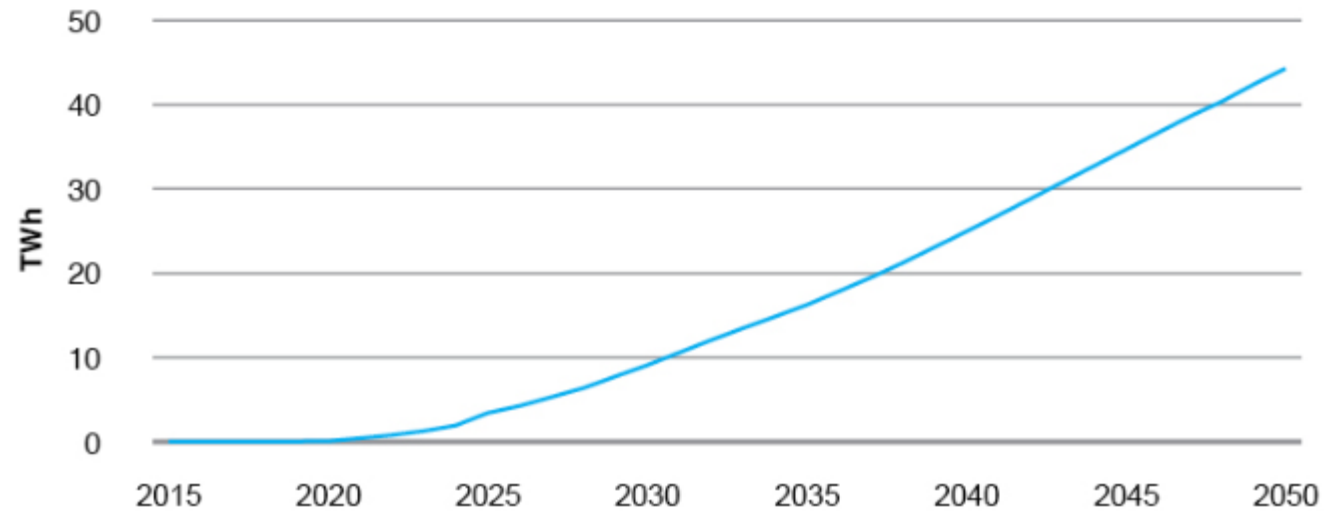
Over \$16bn in network savings can be achieved by 2050 through improving existing tariffs, introducing new tariffs and establishing frameworks for networks to buy grid services from customers with DER

Non-coincident aggregate distribution network peak demand

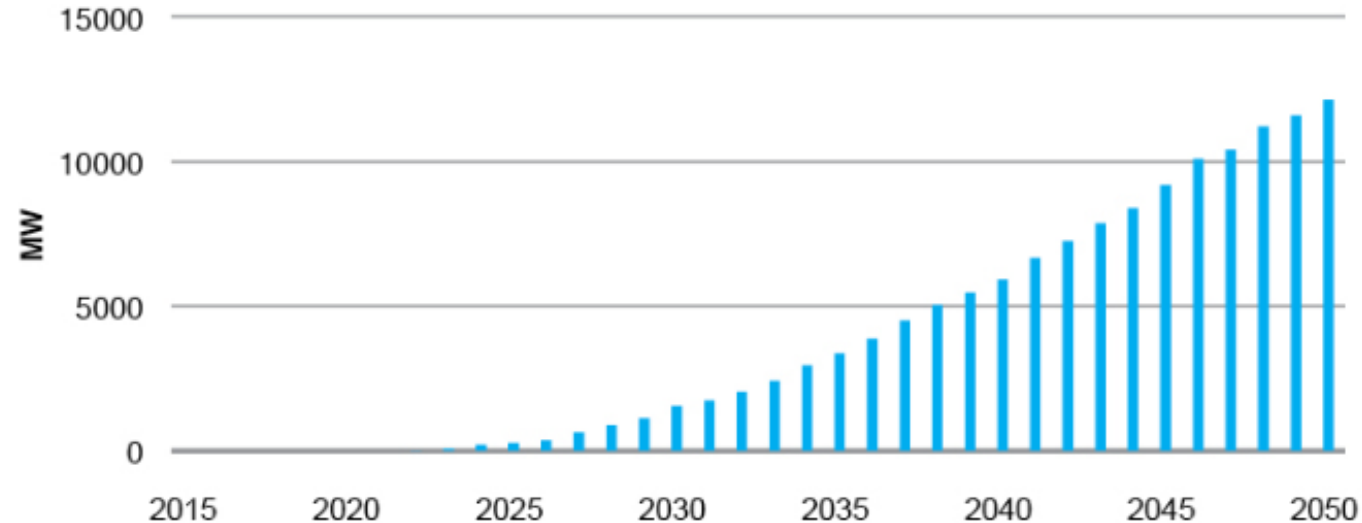


# Efficient capacity utilization – electric vehicles

Projected additional national electricity consumption from electric vehicles

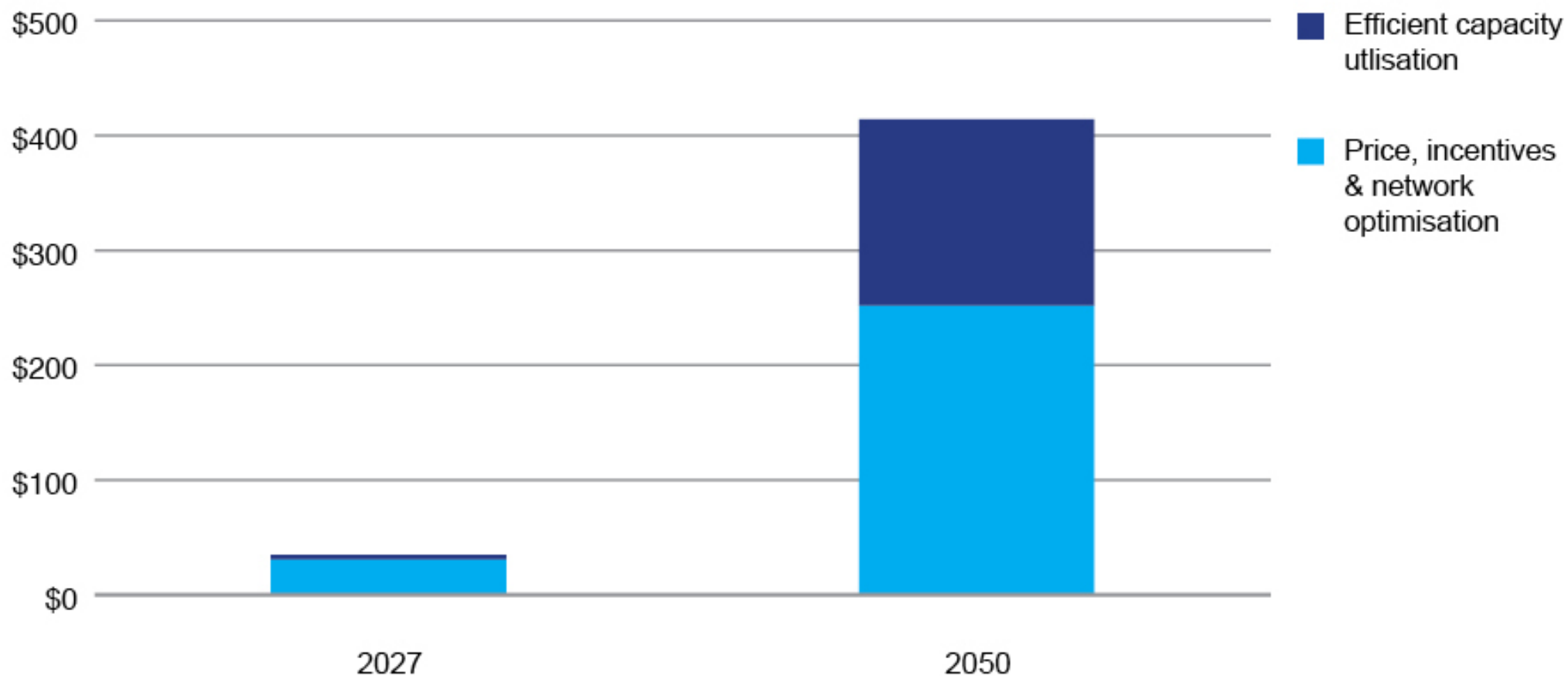


Projected additional national aggregate non-coincidental zone substation load – convenience charging



# Comparing the roadmap Outcomes

Projected avoided increase in average residential bills under the roadmap scenario



# Comparing the roadmap Outcomes

Cumulative electricity system total expenditure to 2050 – Roadmap & counterfactual

