

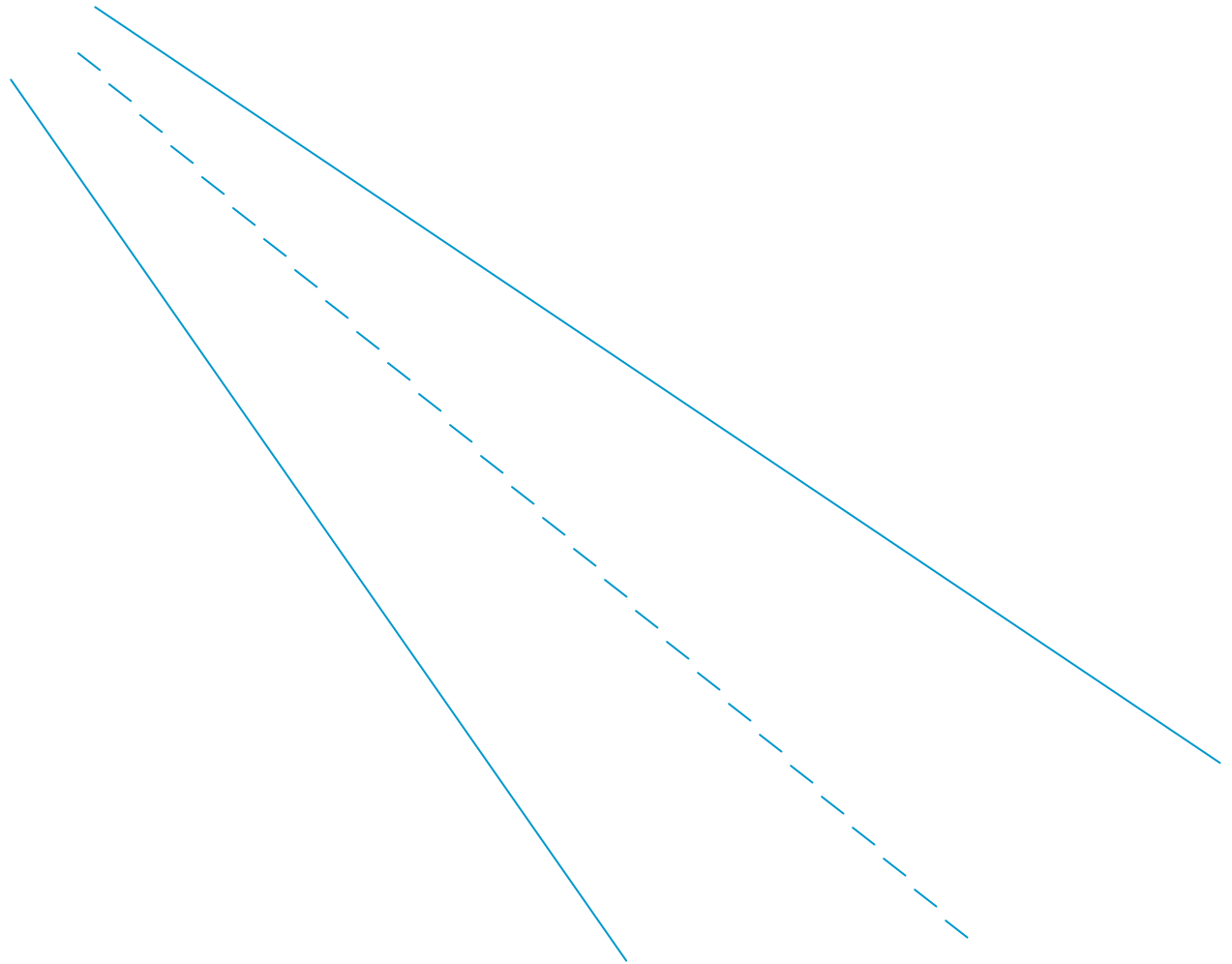
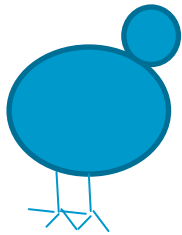
# Distributed electricity generation from gas in NSW: an idea whose time has come

<http://www.csiro.au/resources/IG-report.html>

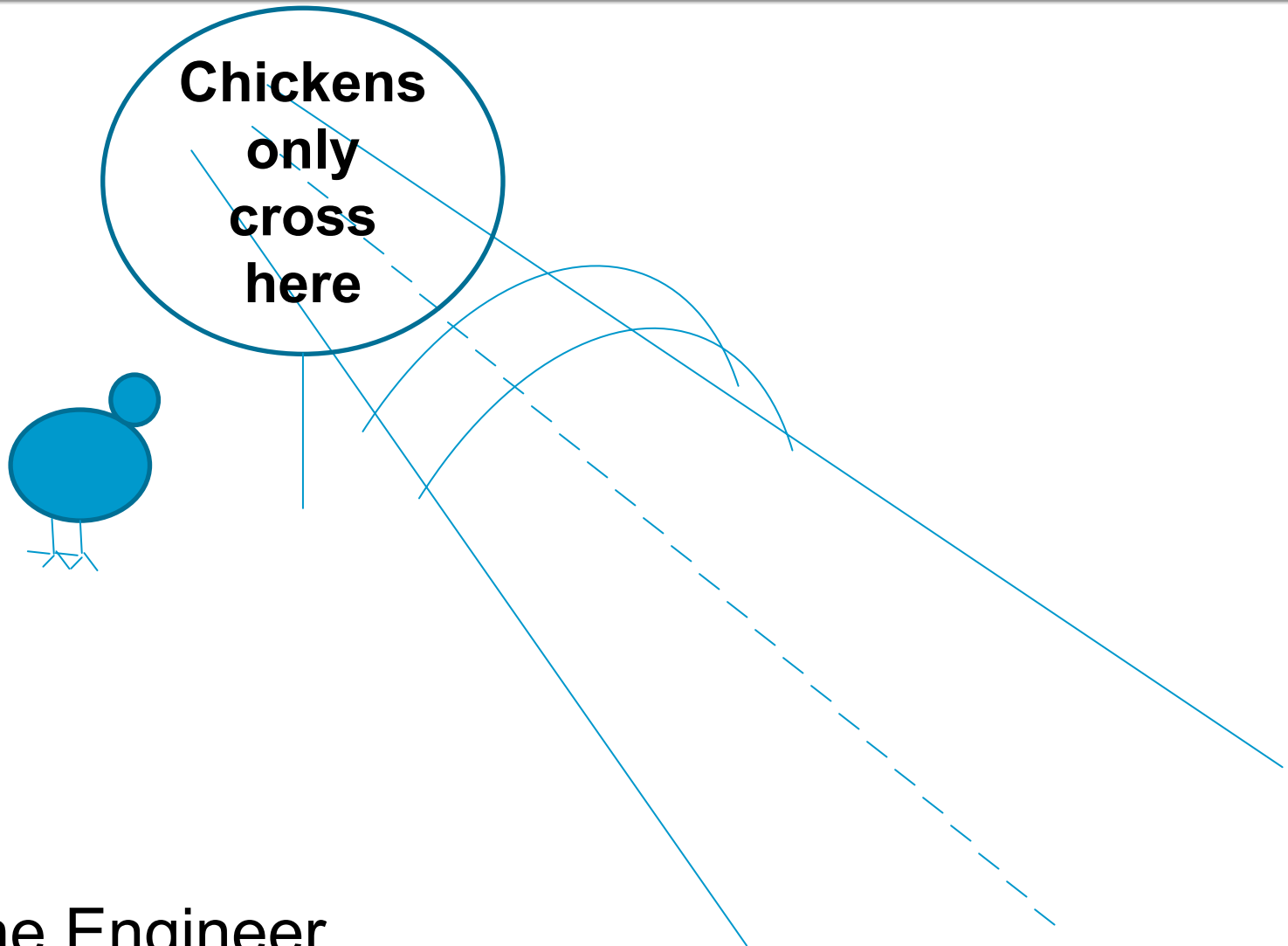
Anthony (Tosh) Szatow, Intelligent Grid  
 Australian Institute of Energy, 2010



# How do you get a chicken to cross the road safely?



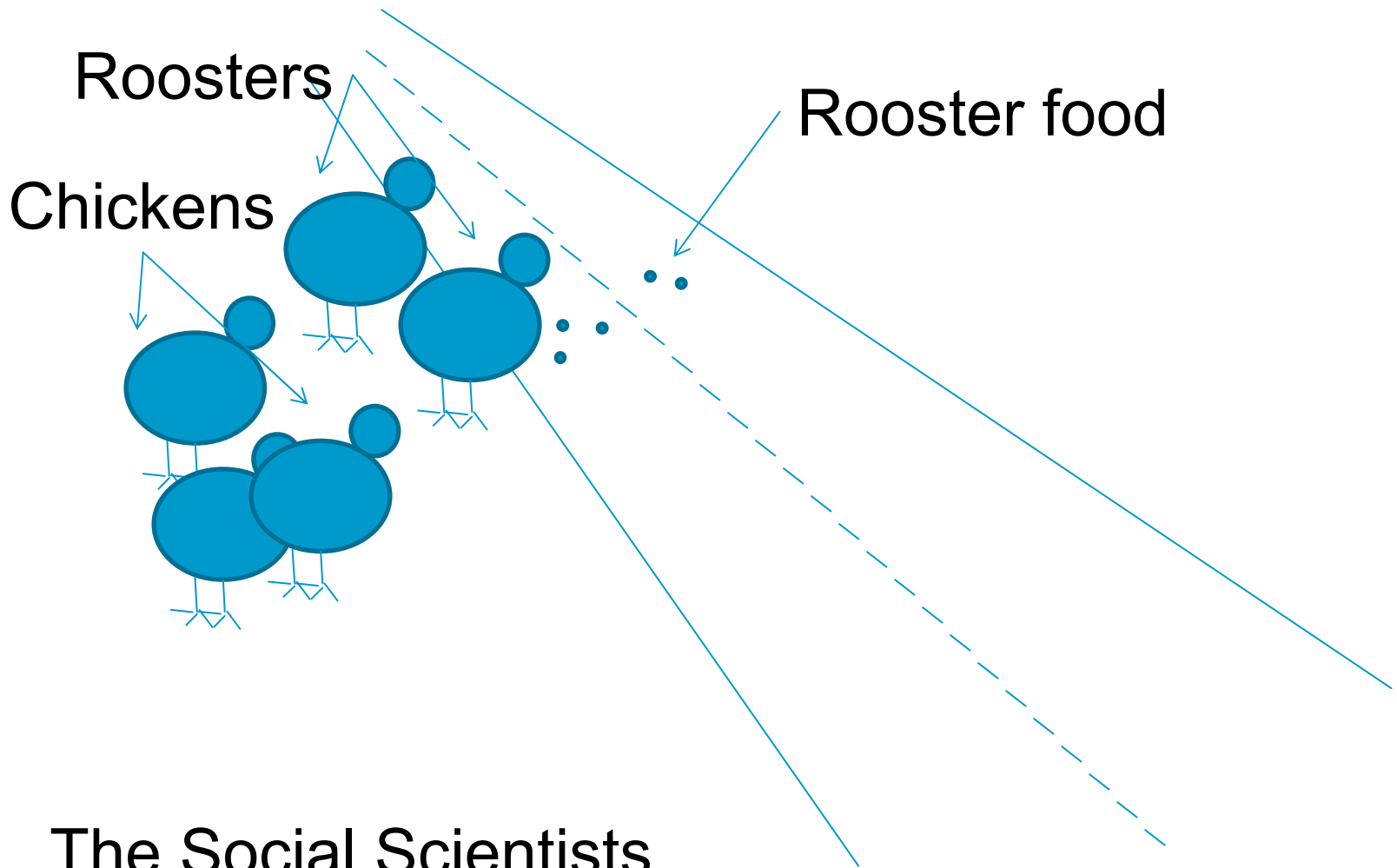
# How do you get a chicken to cross the road safely?



The Engineer



# How do you get a chicken to cross the road safely?

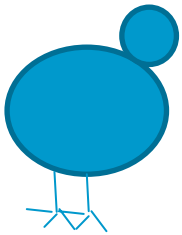
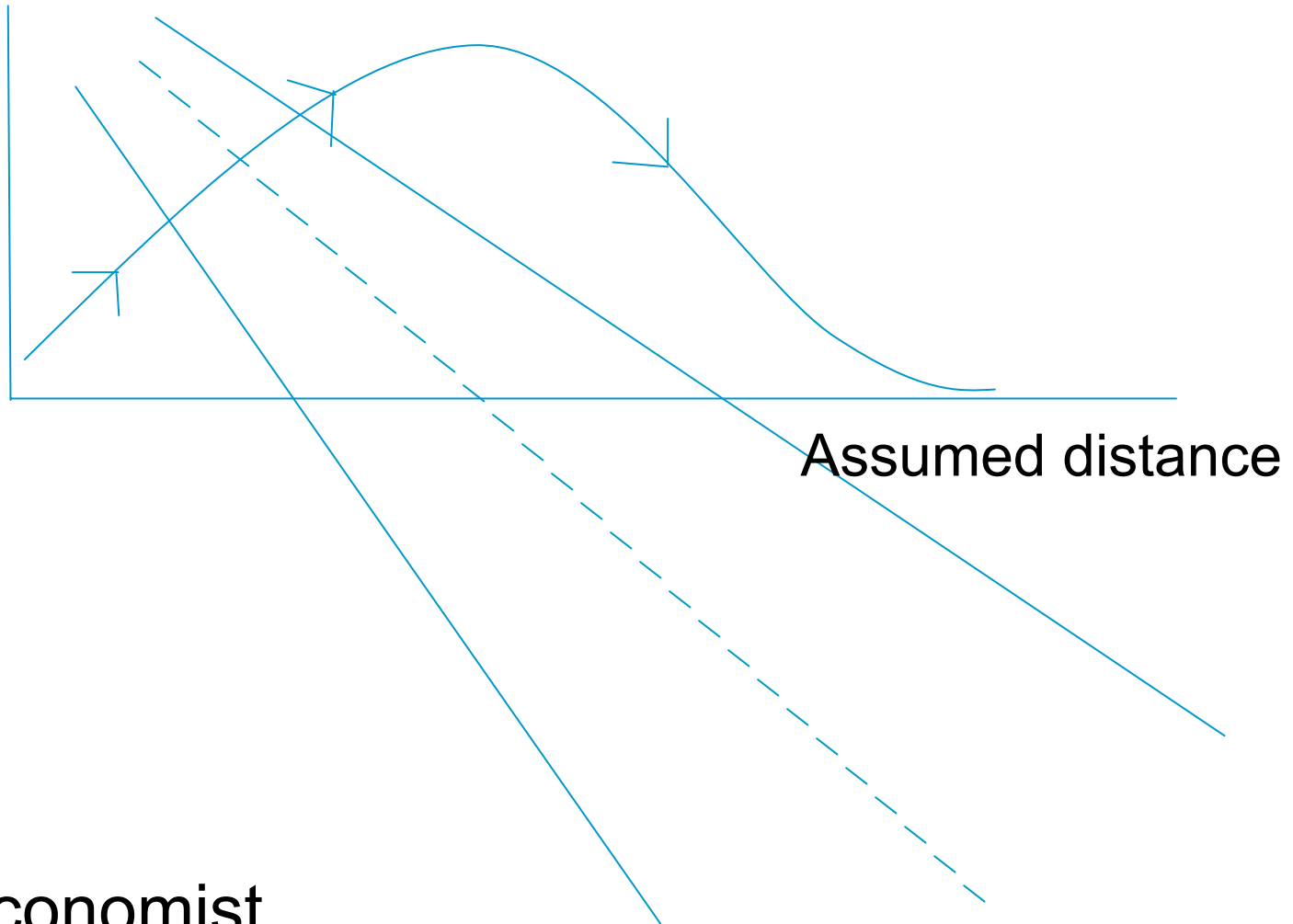


The Social Scientists



# How do you get a chicken to cross the road safely?

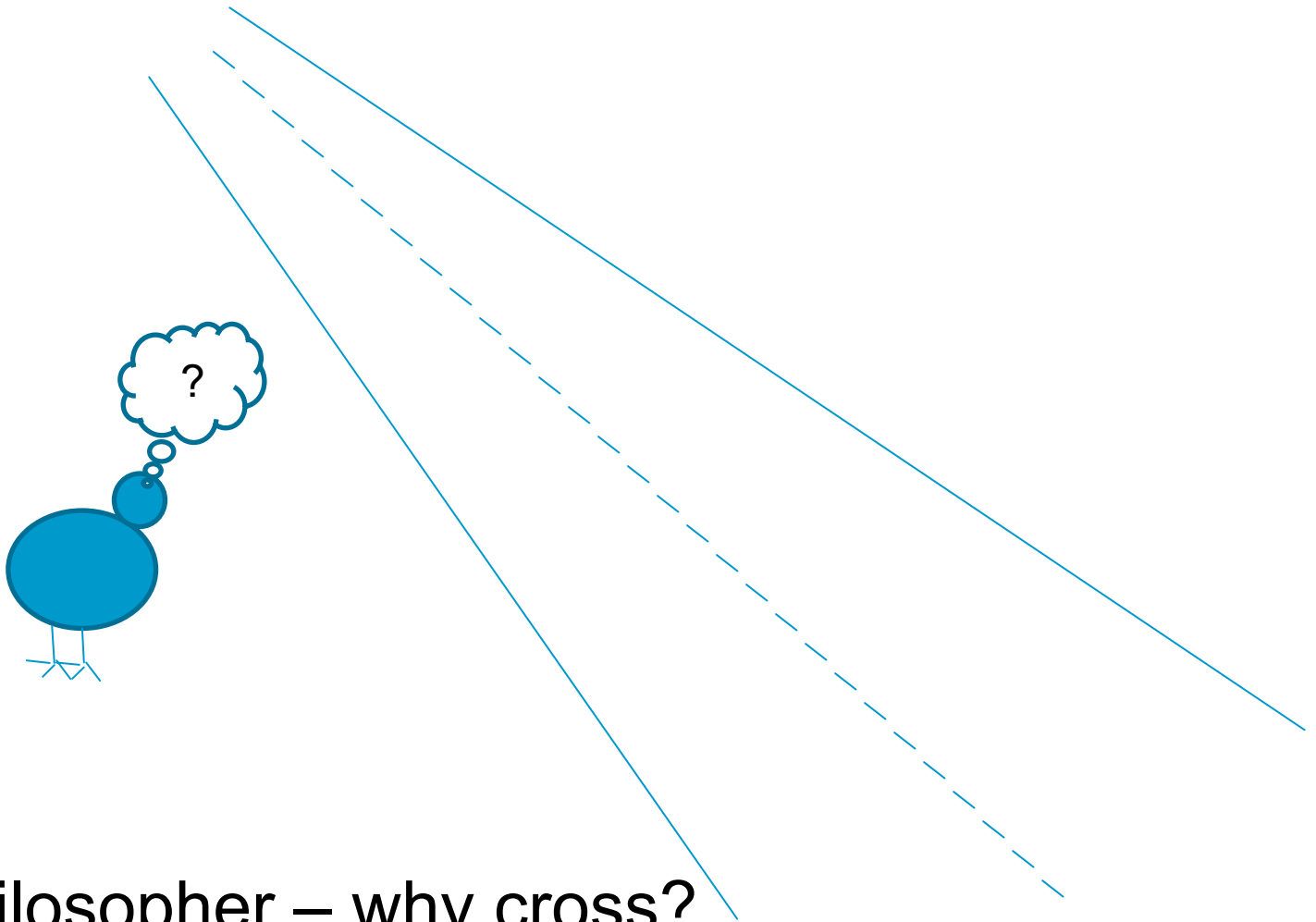
Assumed flight trajectory



The Economist



# How do you get a chicken to cross the road safely?



The Philosopher – why cross?



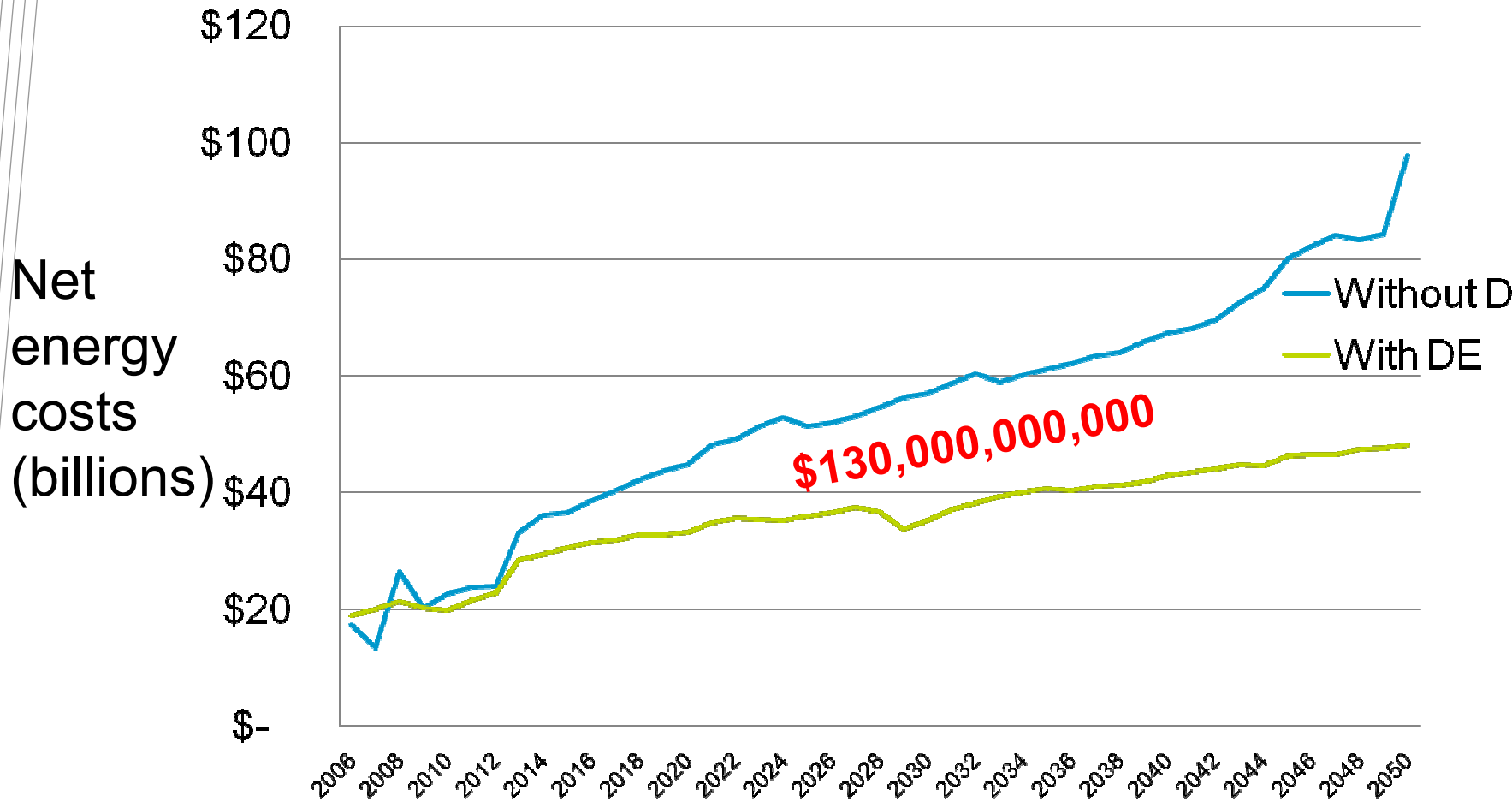
# Why Intelligent Grid?

- *“leaving aside the political feasibility of the 450ppm policy scenario, it is uncertain whether the scale of the transformation envisaged is even technically achievable as the scenario assumes broad deployment of technologies that have not yet been proven. The technology shift, if achievable, would certainly be unprecedented in scale and speed of deployment.” (IEA, 2008)*



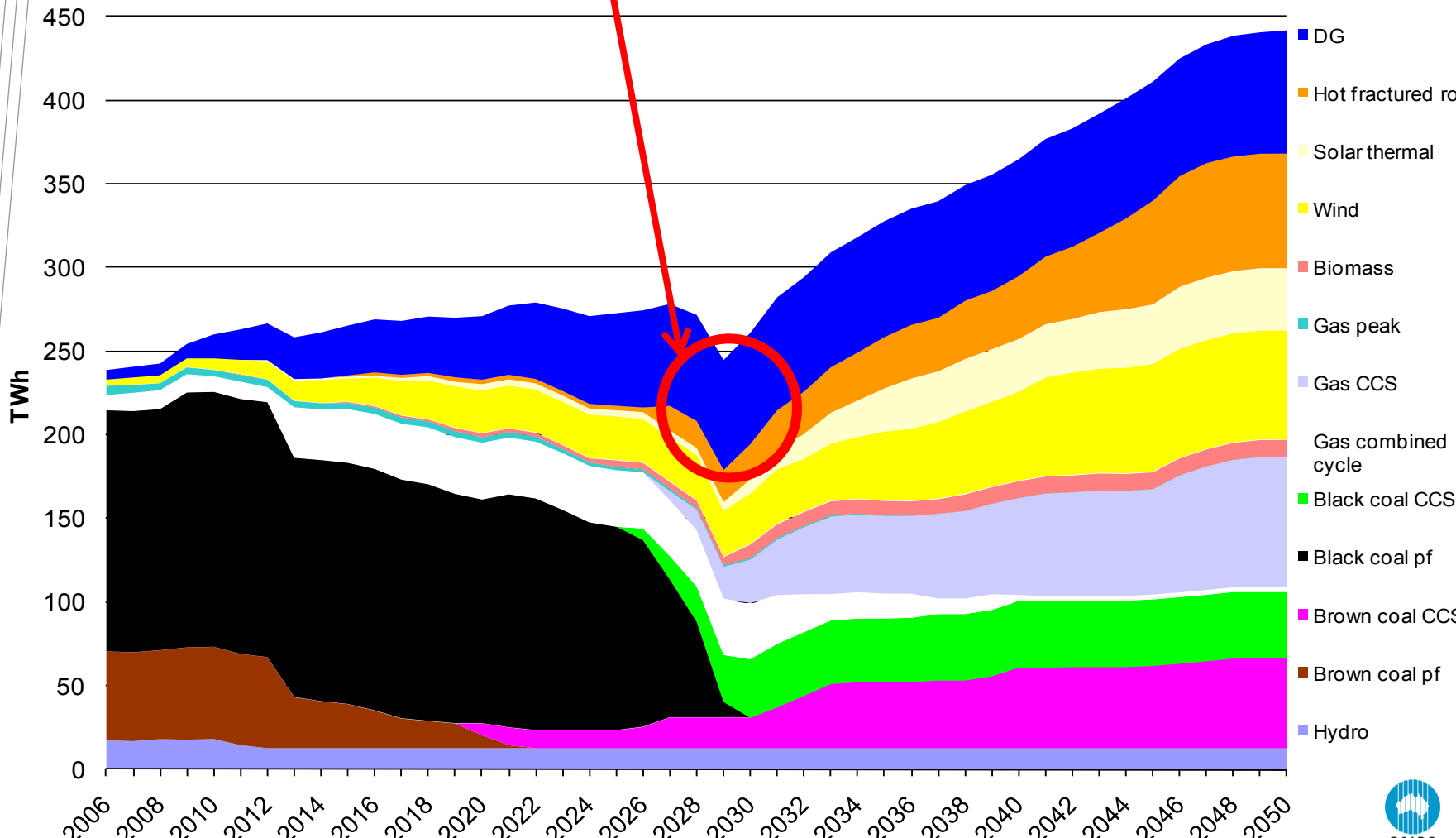
# Distributed Energy Value

## Scenario comparison – Garnaut 450ppm

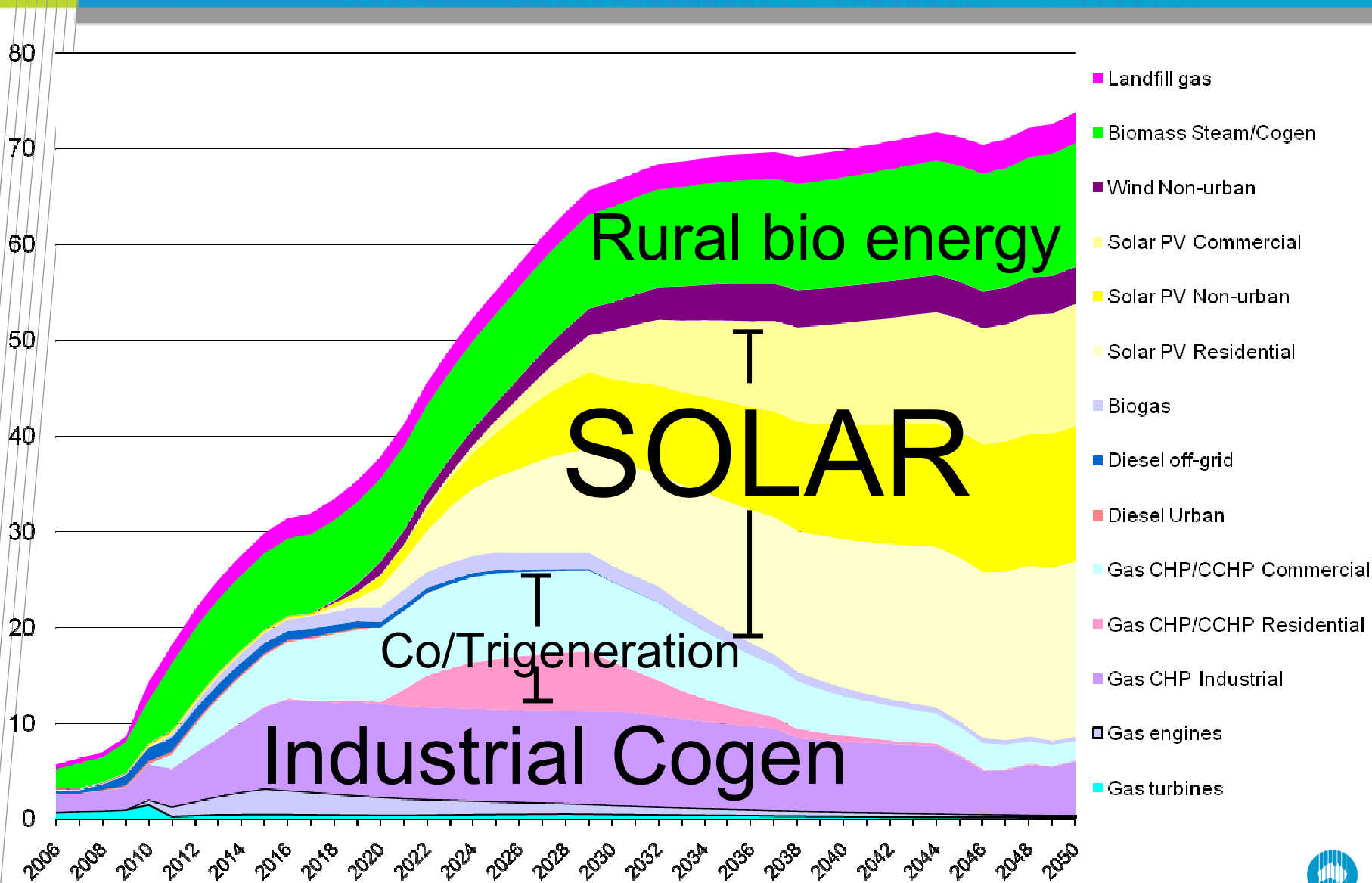


# Energy Sector Model - Scenario

DG ~ 25% energy demand by 2030

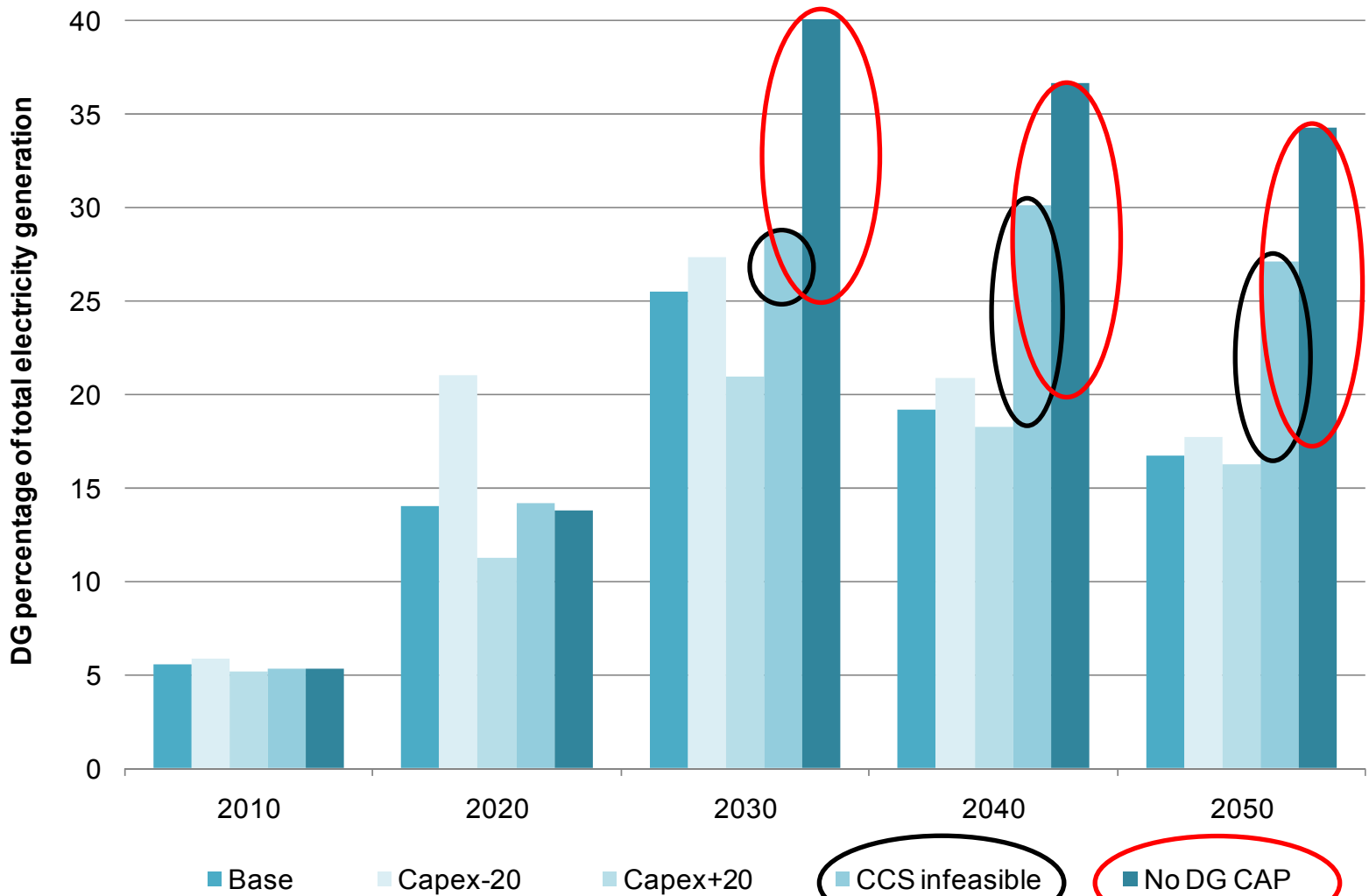


# Converging Energy and Built Environment Systems



# DG Uptake: Sensitivity Analysis

- DG can do heavier lifting



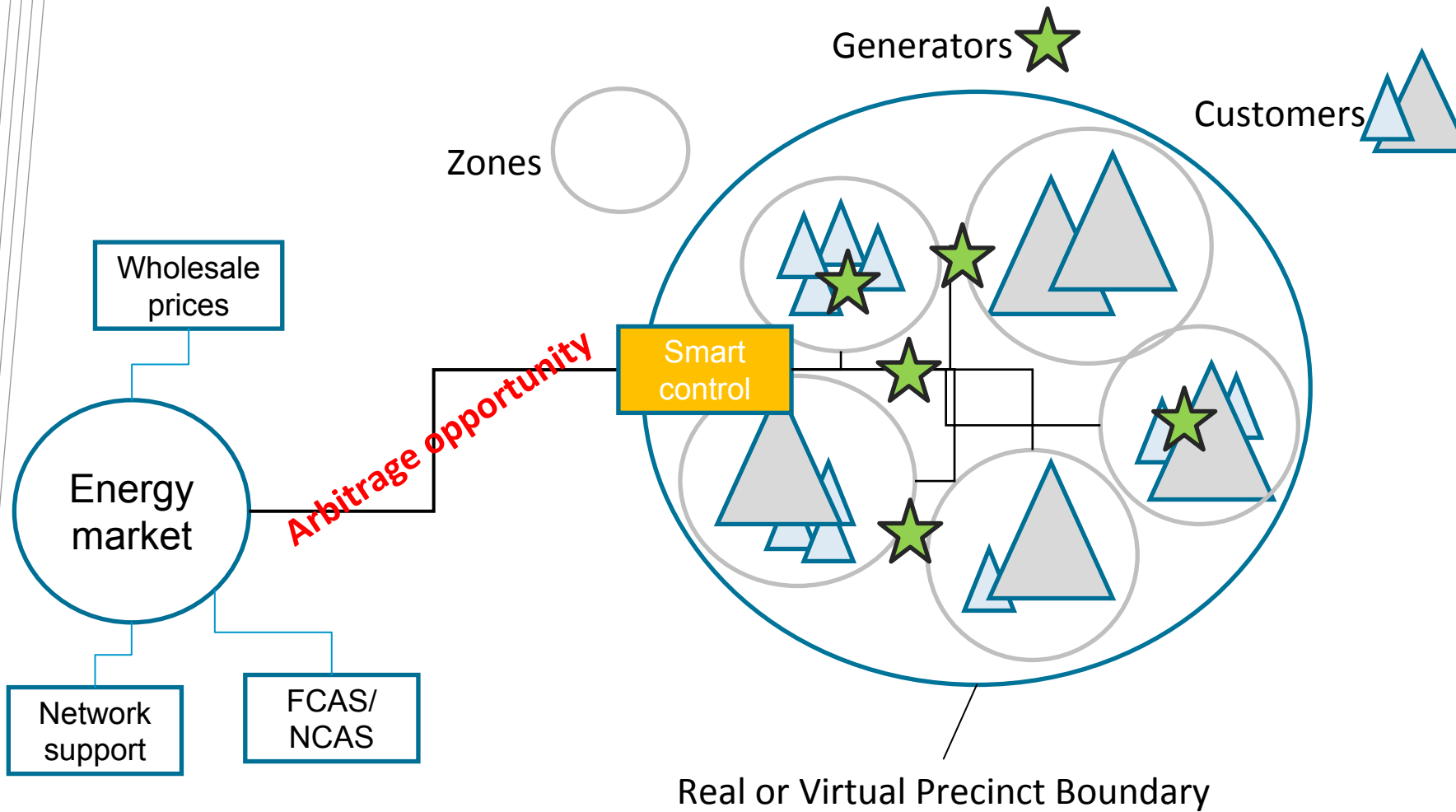
# What Will Influence Uptake?

- Gas price
- Carbon Price
- Funding schemes (project funds, FiT, tax incentive etc)
- Technology evolution
- Water availability for centralised generators
- Grid (electricity and gas) connection process
- Wholesale market access and transaction costs
- Customer appetite
- Industry skills
- Education
- Industry risk appetite
- Impact of the climate change imperative on decision makers
- Building regulations

I could think of more....but will focus on two



# Future Operating Models Influence Uptake



# System Governance Influences uptake

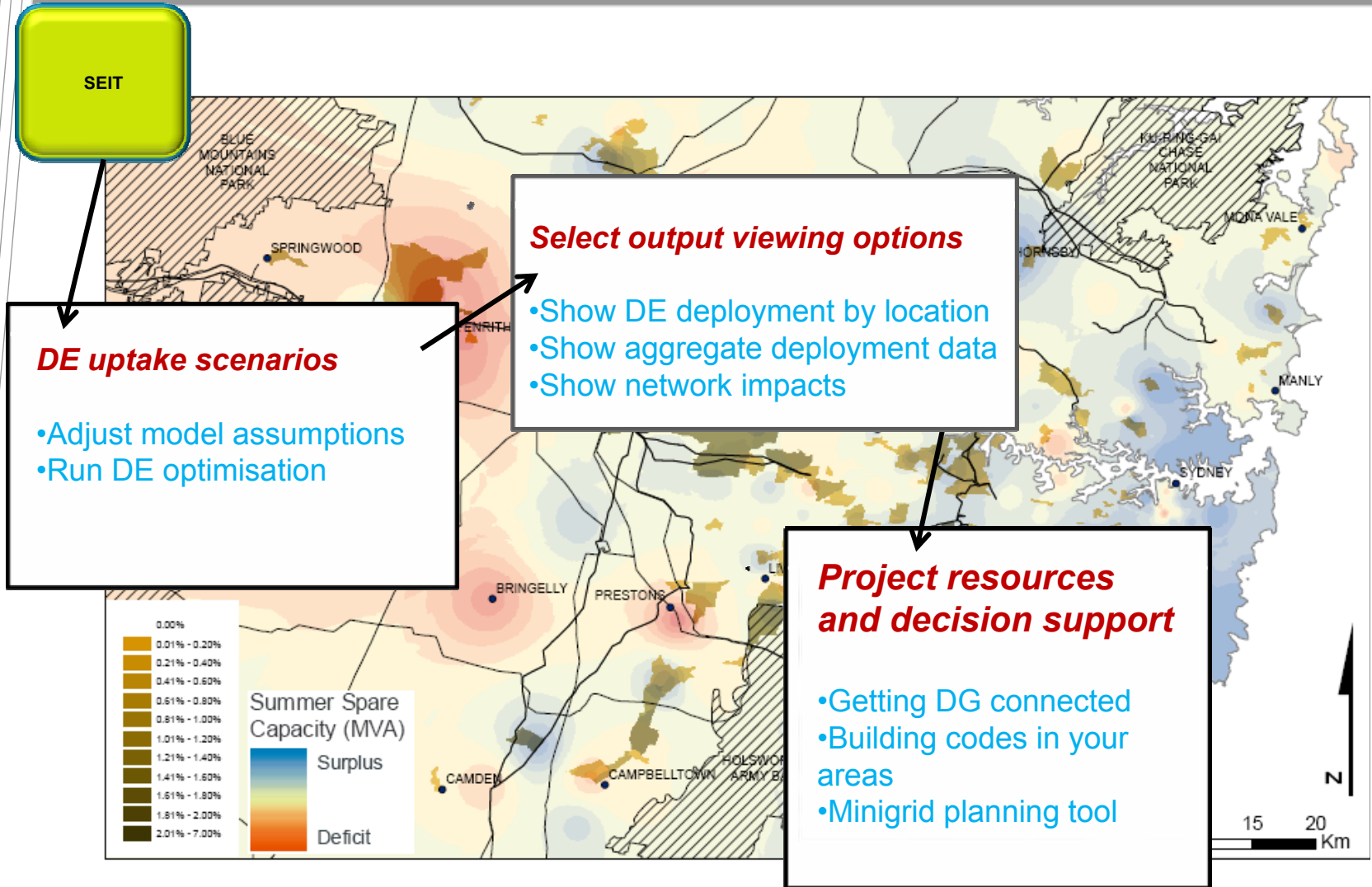
- How do we integrate energy infrastructure and built environment development and optimise their co-evolution?
  - Building regulations provide a useful anchoring point
  - Minimum benchmarks for  $\text{CO}_{2e}/\text{m}^2$  and/or  $\text{kW}_{\text{Max}}/\text{m}^2$
  - Optimise between cost of local solution, cost of centralised solution, desired speed of transition

But...

- Energy market and built environment governance currently separate systems and separate markets



# A Way to Integrate Governance Regimes



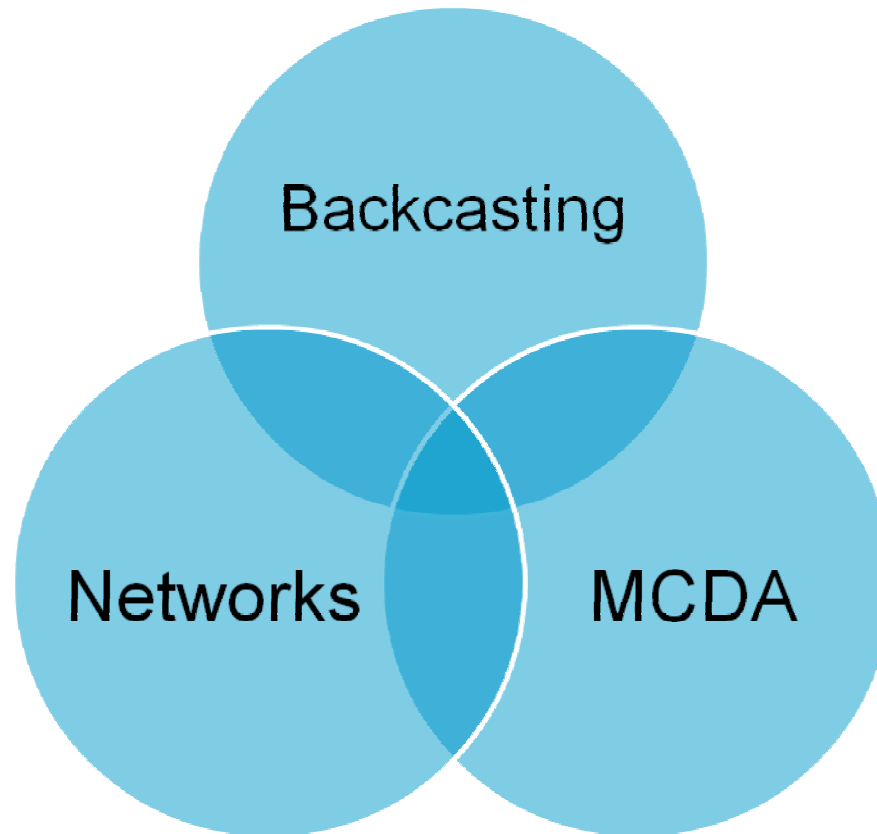


# The Message

- DE has huge value
- DE is a huge opportunity for emerging business models
- DE may be a challenge to existing business models and governance regimes
- We are capable if we go together



# How do we Enable Emergence of Policy, Regulation and Energy Delivery Models?



# How do we Enable Emergence of Policy, Regulation and Energy Delivery Models?

- **Backcasting**

- *Whereas forecasting attempts to determine future scenarios based on information and data analysis today, backcasting attempts to determine what change is necessary to achieve a desired future scenario (Jansen, 2001)*

- **Policy networks**

- *Policy networks coordinate public and private actors who are increasingly bound by shared values, common discourse and dense exchanges of information...” (Ostrom 1990)*

- **Multi-criteria decision making**

- *Through iteration and reflection, MCDA allows sources of decision making anomalies such as incomplete information, misallocation of risk, or the framing of problems to be worked through and resolved (Kiker et al., 2005).*



## Intelligent Grid

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<http://www.csiro.au/science/Intelligent-Grid.html>

Thank you

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