Paying for the energy transition

Why the energy system is in transition and why we should support a fast transition

- Emissions reduction, technological changes and consumer preferences
- Reduce emissions to limit global warming
- Energy sector can transition faster than other sectors
- The slower the transition the more costly both with respect to mitigation and climate adaptation, this becomes an intergenerational issue

Low income and disadvantaged households pay disproportionately more for a poorly managed transition

- Low-income households spend more of their income on electricity
- Low-income/disadvantaged households have less choice and control to reduce costs

Challenges to date

Some policies to date have increased costs to consumers, in particular low-income:

- increase essential services (carbon price),
- costs are smeared across bills (RET)
- cross subsidising those who can afford new technology (FiTs and DERs)
- favour industry over households resulting in equity issues (RET and NEG)

Challenges to date

Policy frameworks continue to favour status quo:

- network investment regulation and practices continue to favour traditional network build over alternatives
- wholesale dispatch, forecasting and control systems which were designed for a generation sector dominated by thermal units

Framework for considering the transition

FROM	TO	IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
Fossil-fuelled	Renewable			
Centralised supply	Decentralised supply			
Passive consumers	Active consumers			
Mechanical control	Electronic control			
Made-to-order transmission connections	Generation-enabling transmission connections			
Inefficient homes/buildings	High efficient homes/buildings			

FROM	TO	IMPLICATIONS FOR THE SYSTEM	
Fossil-fuelled	Renewable	• Need for new gen investment • Need for old gen retirement (payment for closure?) • Changed major flow paths in network	• Dispatch and system stability needs to better integrate variable generation
Centralised supply	Decentralised supply	• Reinforcing/upgrading distribution network to handle two-way flows • Reduced utilisation of transmission assets (partial stranding risks?)	• Greater robustness to network interruptions as more supply options closer to load
Passive consumers	Active consumers	• Greater options for DR, etc • Forecasts and control systems	• More volatile demand is uncoordinated
Mechanical control	Electronic control	• Rethinking system stability protection systems (eg: inertia, frequency, voltage)	
Made-to-order transmission connections	Generation-enabling transmission connections	• Signalling and coordination of new gen • Who pays for the network cost and wears the risk?	
Inefficient homes/buildings	High efficient homes/buildings	• Reduce demand from network	

Fossil-fueled → Renewable

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
• Need for new gen investment • Need for old gen retirement (payment for closure?) • Changed major flow paths in network • Dispatch and system stability needs to better integrate variable generation	• New costs from new entrants • Potential cost from investment (un)certainty • Lower emissions • Impact on wholesale prices from competition and merit order effect	• RET certs come from Gov’t budget rather than energy bills

Centralised → Decentralised

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
• Reinforcing/upgrading distribution network to handle two-way flows • Reduced utilisation of transmission assets (partial stranding risks?) • Greater robustness to network interruptions as more supply options closer to load	• Greater robustness (and potentially quality) of supply • Independence (both real and imagined) • Low income households could be left behind	• FiTs come from Gov't budget rather than energy bills • Peer-to-peer trading

Passive → Active consumers

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
• Greater options for DR, etc • Forecasts and control systems • More volatile demand is uncoordinated	• More options for energy procurement and use • Potential obligation to become engaged	• Basic Service Offer • Tariff reform for DER and DR • Programs for low-income households • Peer-to-peer trading

Mechanical → Electronic control

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS

• Rethinking system stability protection systems
  ◦ Inertia
  ◦ Frequency
  ◦ Voltage
	• Consumers contribute via DER systems
	  ◦ Can contribute to solution
	  ◦ Can be cause of issues
	• Consumers pay for upgrades to system and network
	• Consumers potentially experience lower reliability/quality supply
		• Review standards and functions for inverters
		• Efficient ancillary services procurement (level of procurement, market vs regulated service, scope of potential providers)

Made-to-order → Generation-enabling transmission

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
• Signalling and coordination of new gen • Who pays for the network cost and wears the risk?	• Balancing unlocking new gen vs building a white elephant • Consumers bearing risk of asset underutilisation • Riskier investments flow through to WACC for rest of network business	• Transparent and robust planning (ISP, RIT-T, etc) • Signals for timing and location of generation AND network investment • Cost/risk allocation for network investment between consumers and gen/NSP • Government funding and/or underwriting network costs

Inefficient → High efficiency housing and buildings

IMPLICATIONS FOR THE SYSTEM	IMPLICATIONS FOR CONSUMERS	SOLUTIONS
• Reduce demand from network	• Lower electricity consumption – and hopefully lower bills • To date, has increased fixed network costs • Low income households left behind because they are unable to afford EE upgrade or higher efficiency housing	• Programs for low-income households • Rental EE – information and/or mandatory standards