Centre for Energy and Environmental Markets

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SYDNEY • AUSTRALIA



Some Considerations when Designing Retail Electricity Markets that work for Energy Efficiency & Distributed Resources

The Business of Energy Efficiency

BCSE Melbourne, 22-23 November 2005

Presented by
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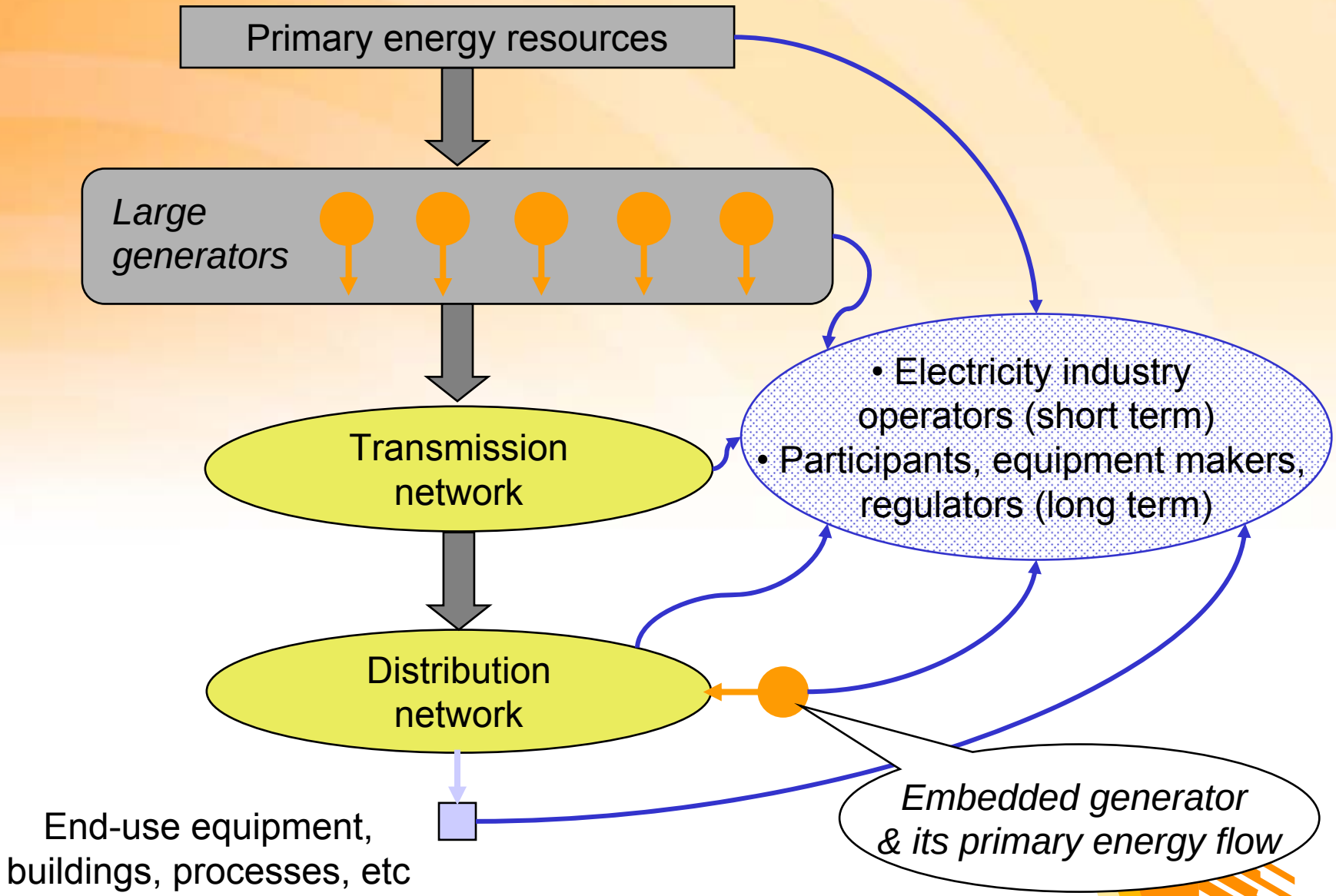
Outline of presentation

- Retail electricity markets
- Retail electricity customers
- Energy supply situation
- Implications of supply-side focus
- Infrastructure influences on energy use
- Possible ways forward

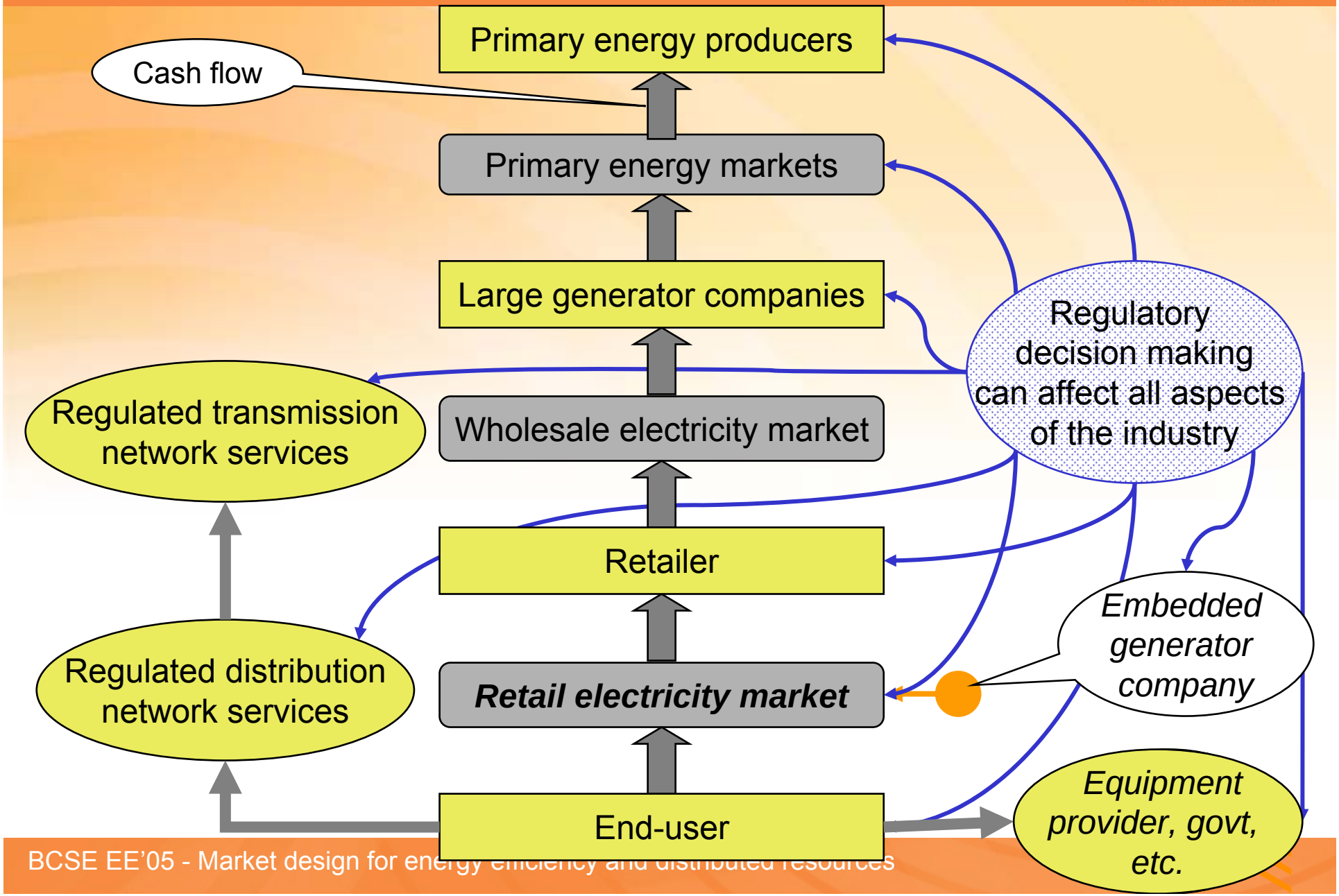
Retail Electricity Markets

- Interface between small customers and NEM
- State based retail regulation within a national market
  - Predominantly supply side approach to date
  - Limited or no time or locational signals
  - Limited or no greenhouse or other environmental and social externalities
- Electricity seen as an essential public good
  - Political sensitivity to price increases
  - Retail price signals do not adequately reflect market costs
- Retailers act as electricity sales not energy service agents

Physical decision making



Commercial / Regulatory decision making

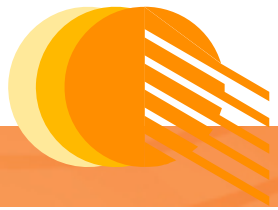


Small Retail Electricity Customers

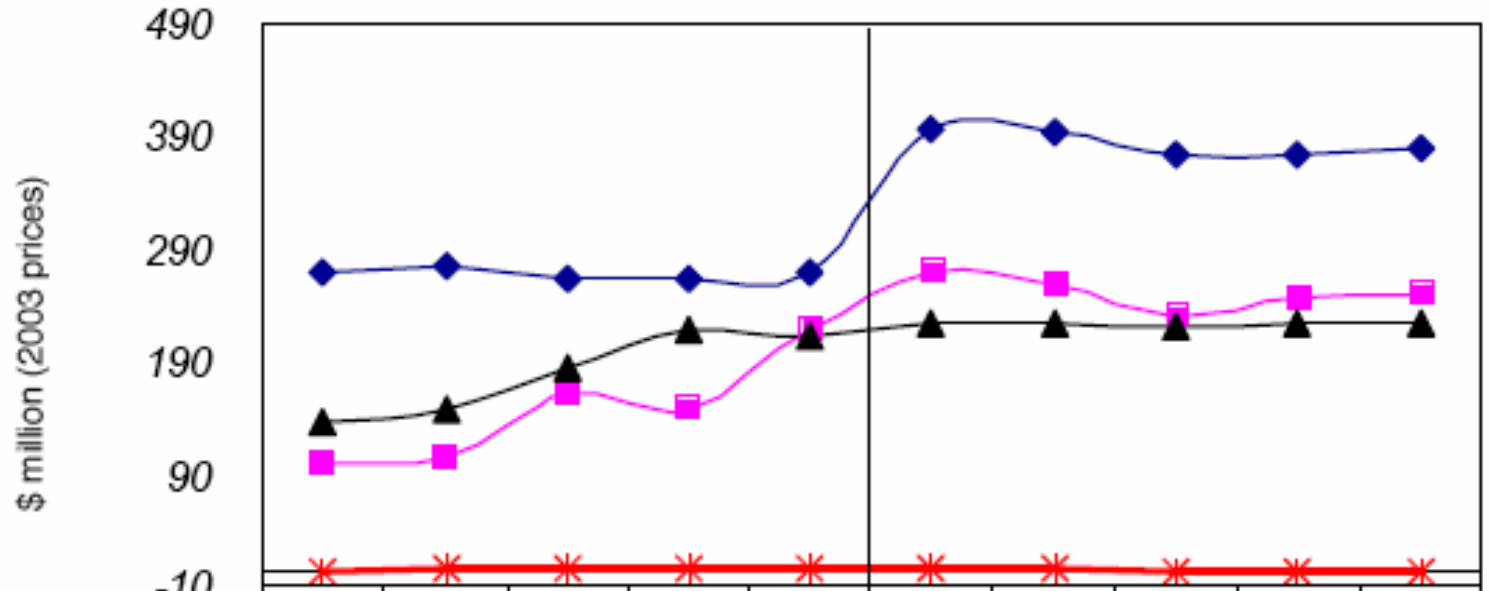
- Energy not a large % of expenditure
- Low price elasticity
- Focus on reliable energy services
  - Generally not interested in market operation
  - Seek simplicity and protection from market volatility
- Energy knowledge often limited
- Energy choices often limited
  - other decisions conflict with energy aspects

The electricity supply situation

- Scrambling to meet rapidly escalating energy consumption and demand peaks
- Looks set to increase Australia's greenhouse gas emissions significantly over the next decade
- Billions of investment dollars will be diverted to energy sector, with significant macroeconomic consequences
- Renewable energy and energy efficiency technologies
  - can have a major impact on energy demand and emissions
  - still at an early stage of development
  - compete against large and well-established incumbent players
  - failing to gain traction in present markets



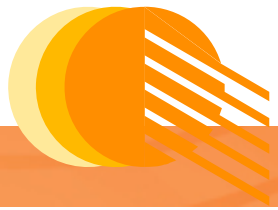
NSW distributor actual & forecast capital expenditure (IPART, Dist Pricing Draft Rpt, 2004)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Energy Australia	271	275	264	263	270	398	394	374	375	379
Integral Energy	101	106	162	148	218	270	257	230	248	249
Country Energy	138	148	185	218	213	225	224	222	224	224
Australian Inland	3	3	4	3	5	3	3	3	2	2

Current Supply Focus

- Supply expected to respond to consumer demand
  - Minor efforts to modify demand patterns via off-peak hot water & TOU tariffs (no reduction in energy or emissions)
- Resource intensity of demand also influenced by:
  - generation (under-utilised baseload capacity → off-peak hot water)
  - distribution (fast return on investment → increased energy end-use)
  - availability of end-use technologies (air conditioners change comfort standards and squeeze out less resource intensive heating/cooling options)



Problems with Supply Focus

- Supply and demand interact & consumers influenced by:
  - market forces
  - organisation of networks
  - supply, distribution and consumer technologies
  - changing social energy use expectations
- Hence:
  - supply focus of energy policy, which guides infrastructure development, serves to mould and encourage demand
  - single measures such as appliance labeling, which ignore broader supply chain effects, don't make significant changes to patterns of energy use

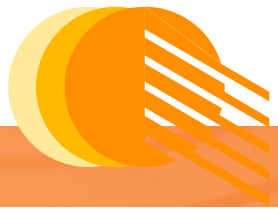
The Customer's situation

Choices constrained by:

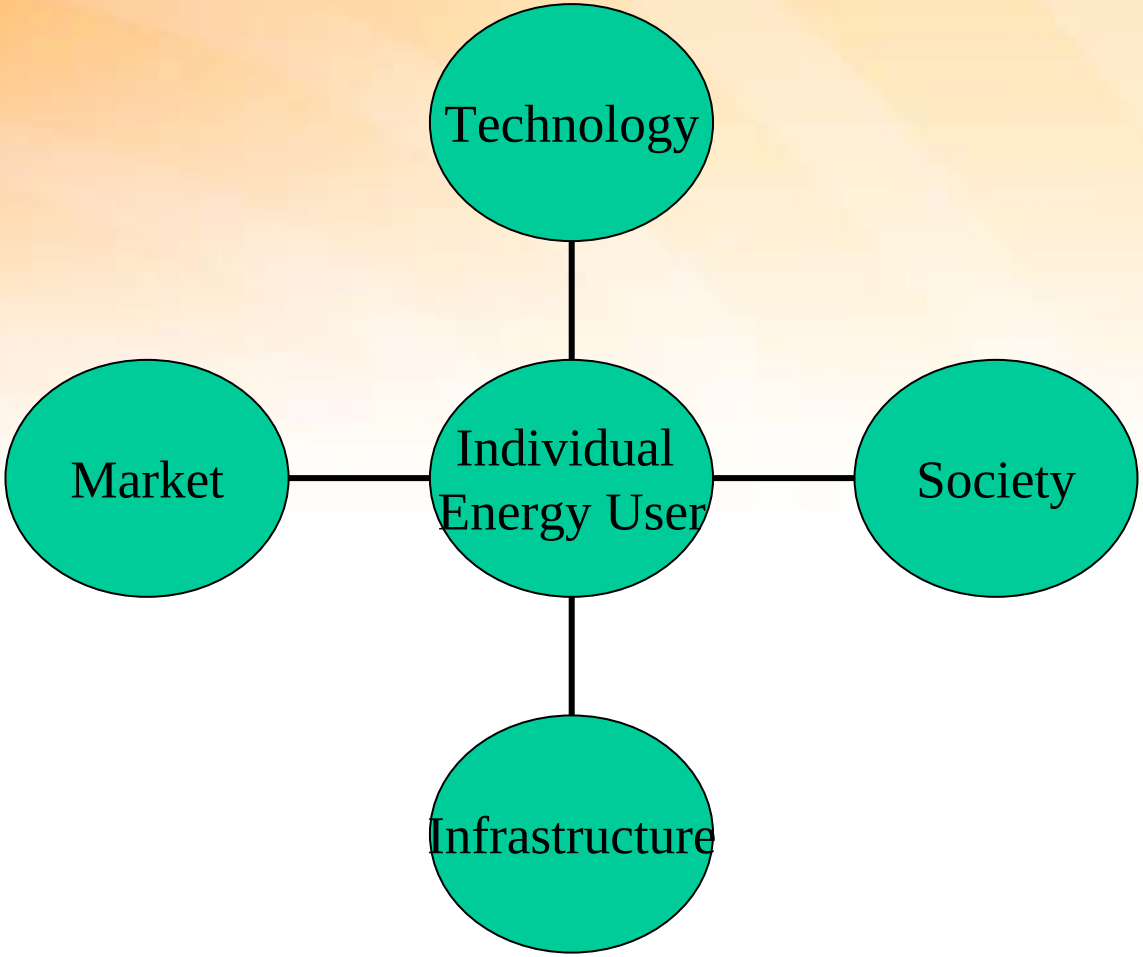
- existing structure and operation of the energy industry
  - supply-based paradigm of current policy frameworks
  - non cost reflective energy pricing
  - institutional and technical infrastructure
- social expectations for the provision of energy services

Comprises broad range of groups with different habits, priorities and socio-economic expectations

- No single demand-side measure likely to reach all consumers
- Simple calls on "public good" benefits ignore broader influences on consumer behaviour and increasingly undermined as private sector operators take over public service delivery



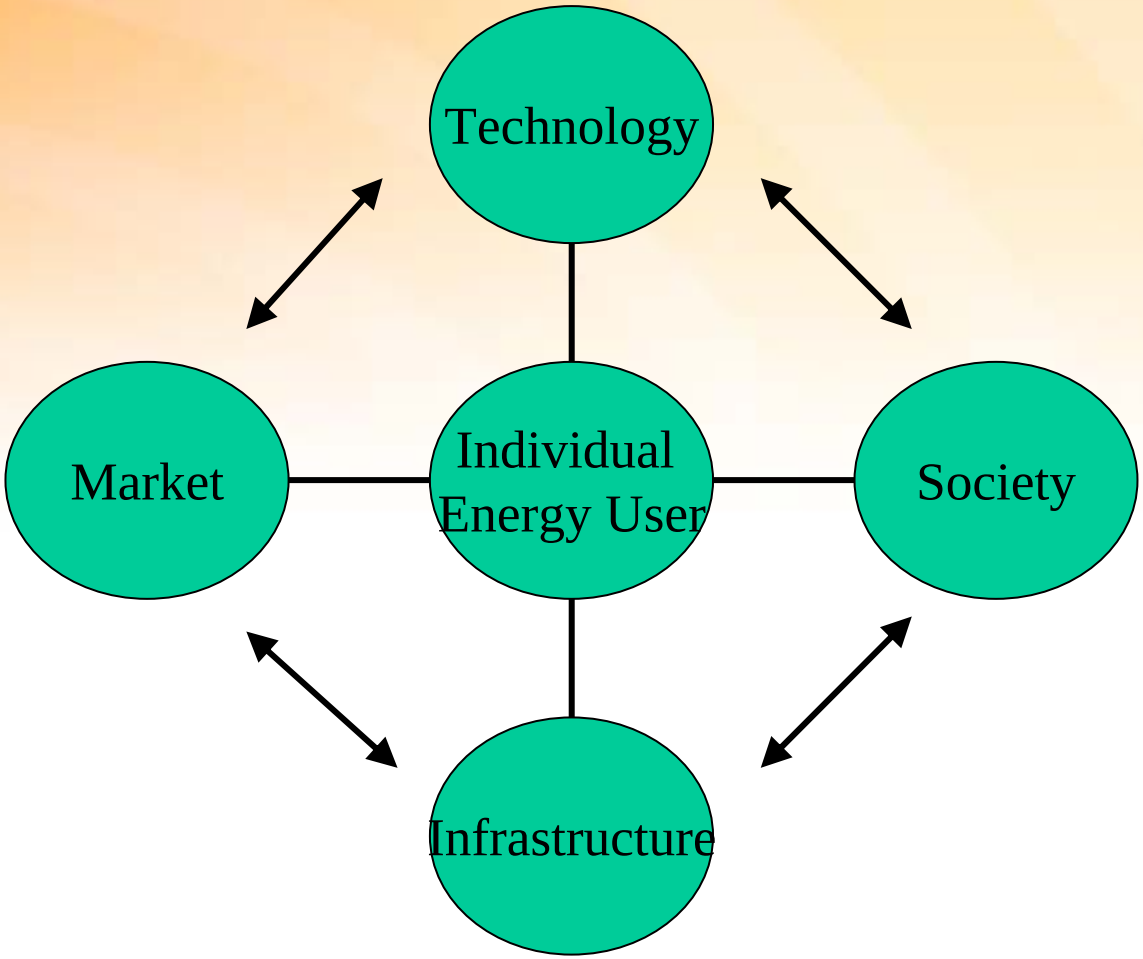
Influences on Energy demand



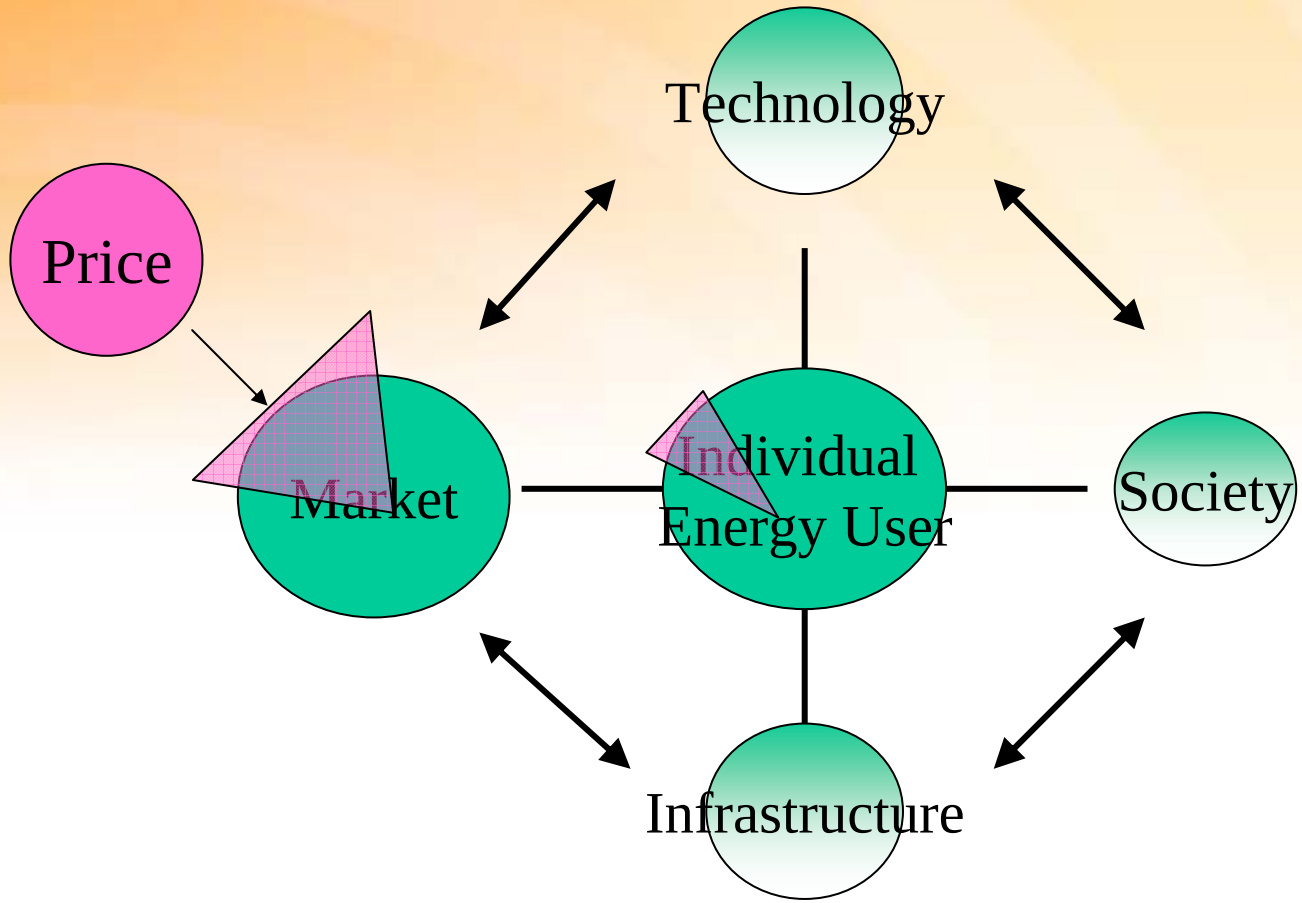
Rebound & Other Effects

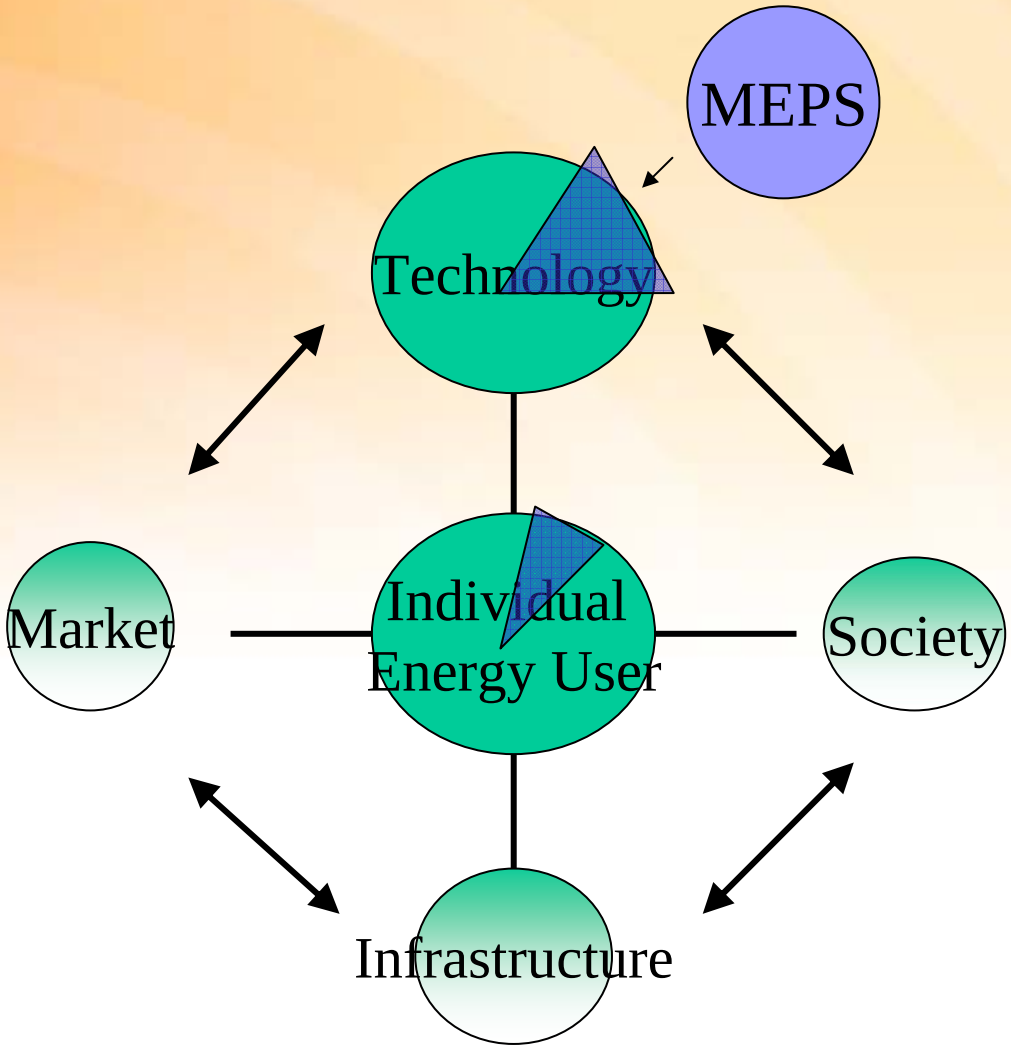
- Energy savings resulting from conservation & efficiency absorbed by reinvestment in increased energy demand
- Implicit in current supply-side policies
- Also involve lifestyle factors, influenced by energy infrastructure
  - New fridges more efficient, but consumers purchase larger models
    - increased availability of processed food requires cool storage
    - reduction in home gardens and local shops
  - Washing machines more efficient but washing done more often
    - health awareness
    - ease of washing (and drying)
    - changing social expectations
  - Where energy service not meeting the consumer's requirements, energy efficiency may not reduce energy use
    - insulation may not reduce energy use if house not warm in the first place
    - changed expectations of warmth – whole house rather than one room

Interactions between Influences

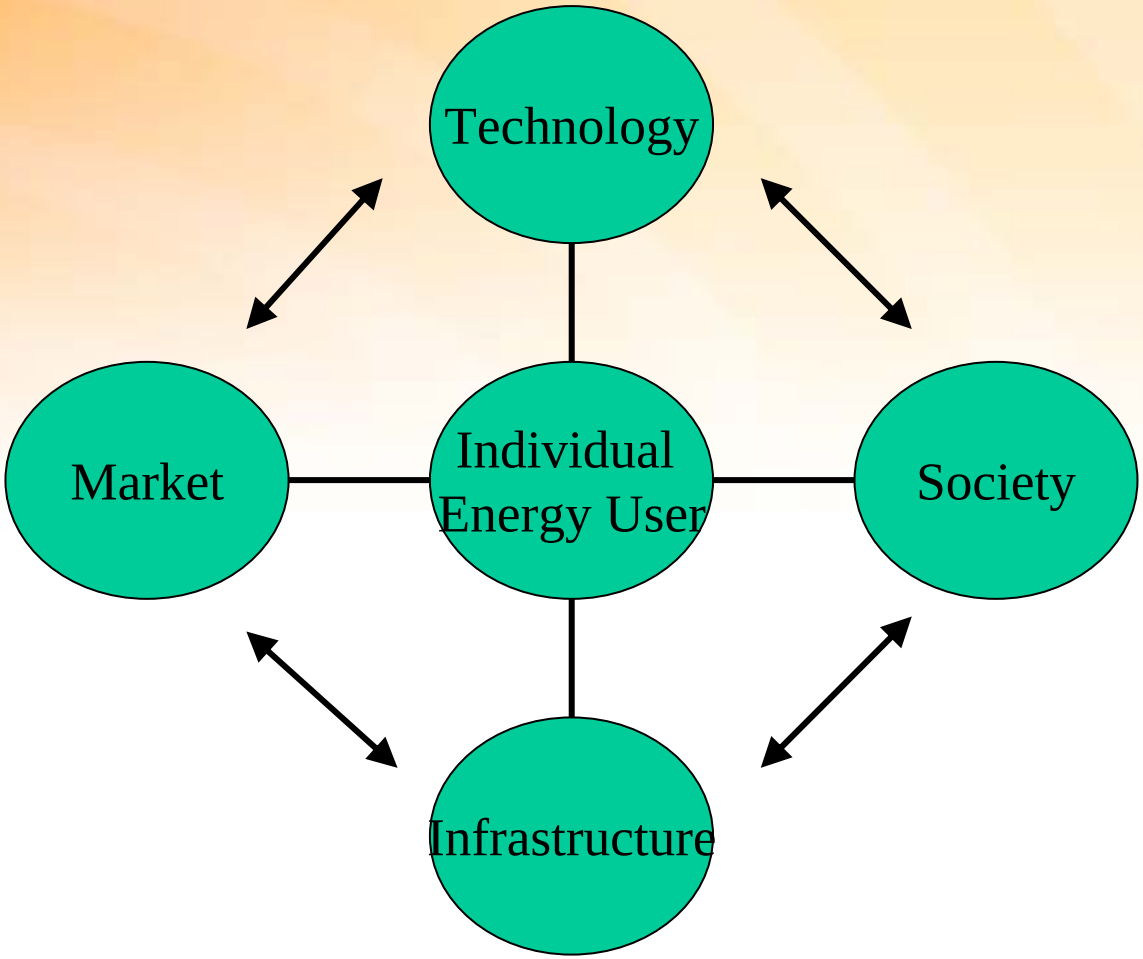


Limited impact with single measures




MEPS
Technology
Market
Individual Energy User
Society
Infrastructure

How do we develop coordinated strategies?



Proposed Research between UNSW & BCSE

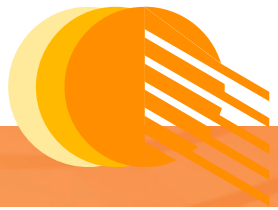
- Analyse existing experience of retail market delivery of sustainable energy services to small customers
- Work with BCSE members to analyse information on customers' energy service requirements and decision-making processes
- Analyse retail market *design* influences on consumer demand and how demand is met, whether by traditional means, renewable energy or energy efficiency
- Analyse retail market *operation* influences on consumer demand and how demand is met
  - realities of day-to-day operation
  - advertising, information
  - intermediaries (designers, planners, tradesman, sales staff)
  - availability, accessibility and affordability of conventional and sustainable appliances and options

Research Outcomes

- Model for decision-making in retail markets that includes:
  - individual choices by various categories of small customers
  - coordinated decision-making represented by government policy and regulation, and by large industry participants
  - the way energy service preferences are shaped by end-use energy-using equipment as well as technologies that generate electricity
- Suggestions for retail electricity market design reflecting:
  - societal expectations of energy services for small customers
  - access to renewable energy and energy efficiency options
  - wider societal objectives of improving energy sector sustainability
- Consideration of wider policy impacts on retail markets
  - end-user characteristics, behaviours and requirements
  - characteristics of both traditional and sustainable energy industries from generation through to end-use appliances

BCSE Energy Efficiency Context

- Examining retail market design fits well into several current areas of BCSE activity:
  - NFEE
  - Productivity Commission enquiry into EE
  - COAG Energy Market processes
  - Housing sector regulation
  - Distributed generation guidelines
  - Commonwealth government R&D and grants programs
  - State government Greenhouse Strategies



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