Centre for Energy and Environmental Markets

UNSW

The Australian National Energy Reform Agenda: Where is it up to, going and in whose interest?

Iain MacGill, Research Coordinator, CEEM

2006 Annual Conference of the Financial and Consumer Rights Council (FCRC)

Ballarat, 4 October 2006

www.ceem.unsw.edu.au

The question… and a possible answer up front

- The Australian National Energy Reform Agenda: Where is it up to, going and in whose interest?
- A possible answer
  - A decade in, too early to say but likely a mixed success
    - Improved economic efficiency but some inequitable outcomes + worsening environmental impacts
  - Now growing cost, efficiency, equity + environmental pressures
  - Current 'reform' agenda
    - Some positive developments: more focus on end-users
    - but some questionable processes

=> Not a matter for speculation but a call for action by 'public good' advocates

Is the Australian energy industry undergoing…

- Deregulation?
- Privatisation?
- Reform?
- Restructuring?

Is the Australian energy industry undergoing…

- Deregulation?
  - Regulation will always be required in energy; although its nature may change
- Privatisation?
  - Industry still majority government owned… for now
- Reform?

re·form _ P Pronunciation Key (r -fôrm)
v. **re·formed, re·form·ing, re·forms**
v. tr.

1. To improve by alteration, correction of error, or removal of defects; put into a better form or condition.
   a. To abolish abuse or malpractice in: *reform the government.*
   b. To put an end to (a wrong). See Synonyms at correct.
2. To cause (a person) to give up harmful or immoral practices; persuade to adopt a better way of life.

EI restructuring – a changing framework for *decision making*

- *Objectives*
  - *Economic*: maximise **benefits-costs** of delivered energy services
  - *Security*: reliable delivery of these services to consumers
  - *Environmental:* manage adverse environmental impacts of provision of these services
  - Social: an essential public good, empowerment, governance
- Who makes decisions
  - In whose interests, with what accountability
- Using what process
  - Information, transparency
  - Stakeholder input

=> Frameworks fall somewhere on spectrum between *Centralised (govt directed) ⇔ market-based (commercial)*

Strictly markets… or a govt role in energy?

- Possible Economist (and Australian National Competition Policy perspective): *when the market does not provide efficient outcomes for society; ie. market failures*
- Energy industry features every possible form of market failure
  - Monopolies
    - *Generally concentrated supply-side, monopoly Tx and Dx networks*
  - Public Goods
    - *Essential services, contribution to economic welfare*
  - Incomplete markets
    - *Electricity networks are shared - require high levels of coordination*
  - Information failures
    - *Including generally poorly informed energy users*
  - The "Business Cycle"
    - *Capital intensive, long-lived investments*
  - **Externalities**
    - *Climate change, energy security, social impacts*

Australia's energy policy objectives

- COAG's agreed energy policy objectives (2001)
  - Encouraging **efficient** provision of reliable, **competitively-priced** energy services to Australians, underpinning **wealth** and **job creation** and improved **quality of life**, taking into account the needs of **regional, rural and remote** areas;
  - Encouraging responsible **development** of Australia's energy resources, technology and expertise, their efficient use by industries and households and their exploitation in export markets; and
  - Mitigating local and global **environmental impacts**, notably greenhouse impacts, of energy production, transformation, supply and use.

Other jurisdictions: eg. Victorian Energy Policy

(DNRE, *Energy for Victoria*, October 2003)

- **Ensure an efficient and secure energy system.** This requires ongoing investment in both supplies and the efficient use of those supplies.
- **Ensure those supplies are delivered reliably and safely.** The reliable distribution of energy is an ongoing challenge.
- **Ensure consumers can access energy at affordable prices.** The Government is committed to ensuring all consumers, *especially low income earners*, can access essential energy services at affordable prices.
- **Ensure our energy supplies and the way we use them are environmentally sustainable – and in particular less greenhouse intensive.** Achieving sustainability is a key challenge for Victoria. We generate most of our low cost electricity from brown coal, which brings major economic benefits but also contributes about half of our greenhouse gas emissions. We have to find ways to ensure our mix of energy sources and our use of them minimises damage to the environment and economy …

Traditional EI model - centralised

- Britain, Australia, numerous other jurisidctions
  - Statutory authorities supervised by a Minister:
    - Usually vertically integrated monopolies
  - Decision making political, "behind closed doors":
    - Politicians negotiate tradeoffs
- Possible limitations
  - Low efficiency and innovation
  - stakeholder capture, supply-side focus
  - Process issues: transparency, stakeholder consultation
  - *separation of powers b/n who makes rules, implements + judges them*

=> *Industries in some countries started to run into problems in 1980s – 1990s*

Electricity industry restructuring objectives

- Improve economic efficiency by facilitating competition & new entry, which assumes:
  - Effective markets & sound legal & policy frameworks
- Enhance accountability to end-users & society through 'customer choice', which assumes:
  - End-users become active participants in the industry
  - End-users are independent agents who make "informed" decisions & efficiently manage the associated risks:
- Implement a market-based approach to social & environmental externalities:
  - Assumes political will to regulate non-monetary impacts
- Release government funds by asset sales:
  - Creates a moral hazard for politicians

Evolution of EI restructuring in Australia

- Development of COAG process in late 80's
  - Formal interface between Federal & State governments
- National Competition Policy, *1993 Hilmer Report*:
  - Facilitate competition where effective & pro-competitive regulation where not; Treat public & private firms equally; uniform market rules of conduct where possible; access regimes for essential facilities
  - **Highlighted potential value of energy industry 'reform'**
- Competition Reform Act, *1995*
  - Amended TPA + new Competition & Consumer Commission (ACCC):
- *Now well over a decade of energy industry restructuring*
  - *National Electricity Market (NEM) incorporating NSW, QLD, VIC, ACT, SA (+ now TAS) established in 2000*
  - *More limited changes in Gas industry*
  - *A mix of national + jurisdictional (State + Territory) roles*

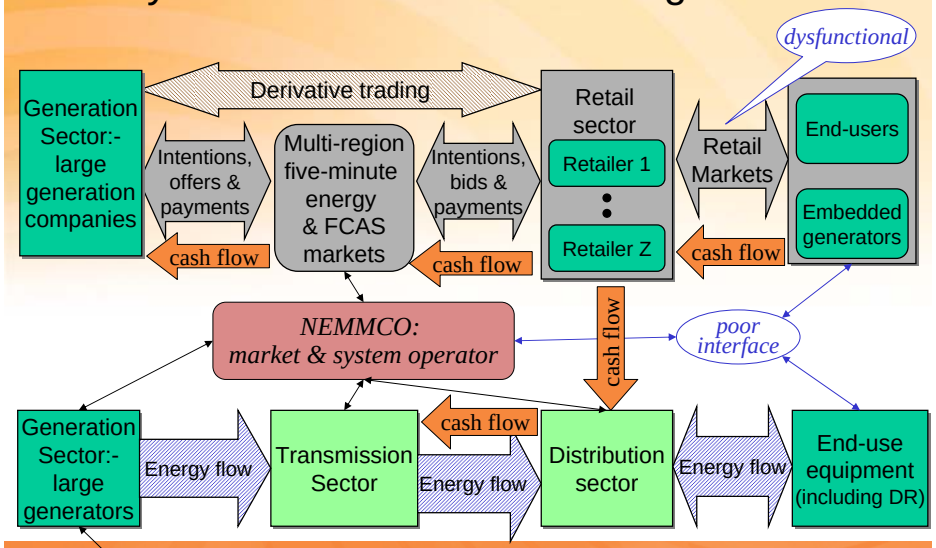
Major objectives of Australian Energy Market Reform

Established during 1990's, See Energy Market Review, Issue paper, March 2002

Reform Objectives

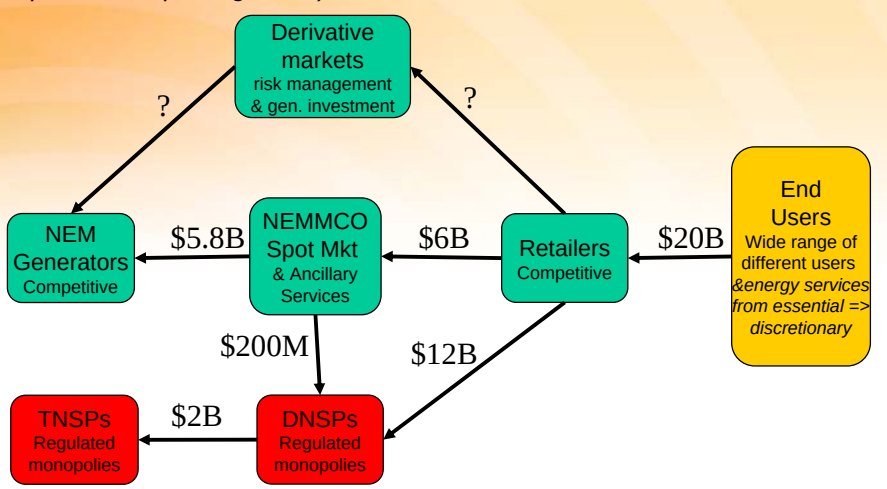
- Restructuring government-owned utilities
- Removing barriers to inter-state and intra-state trade of energy
- Establishing a transparent, wholesale spot market for electricity to enable competition among generators and retailers in the eastern states
- Establishing open access to electricity networks and third-party access to natural gas networks, and economic regulation of transmission and distribution networks to ensure efficient and transparent pricing of network services
- Enabling customer choice down to the smallest retail customer
- Achieving competitive neutrality in relation to fuel sources, between incumbents and new entrants and between government-owned and privately-owned businesses

Industry structure & decision-making in the NEM



Cash flow through the NEM

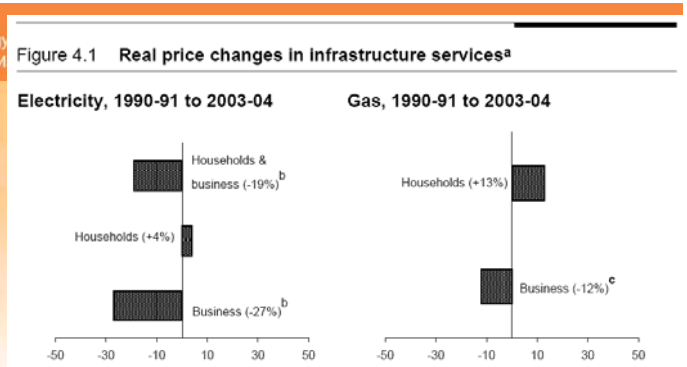
(adapted from Spalding, 2006)



Some outcomes of restructuring to date

- Improved economic efficiency
  - But still questions regarding future outcomes given capital intensive nature of industry, starting point for restructuring
  - *Most modeling exercises estimating industry + wider economic benefits of only limited value*
  - Largely supply-side focussed efficiency improvements
- Security + reliability reasonably well managed
  - But ongoing challenges for commercial arrangements + attempting to manage low-risk/high-consequence events
  - and diversity between + within jurisdictions
- Equity + environmental outcomes?

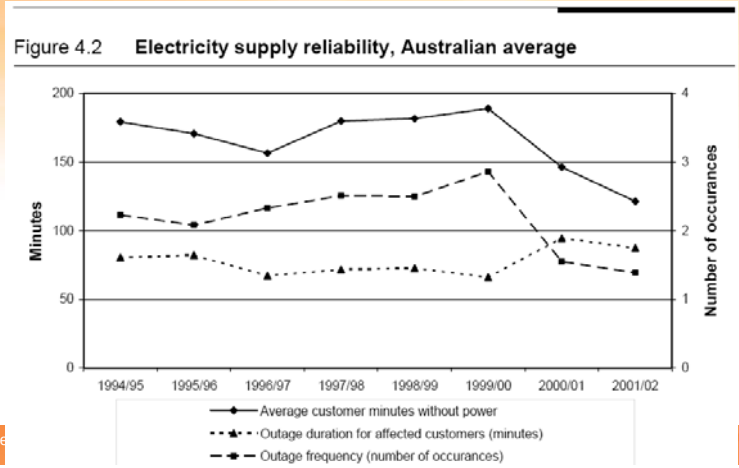
Equity outcomes



- At least part of this divergence intentional – reduction of cross subsidies
- For vulnerable consumers, "Limited amount of evidence suggesting that:
  - price rises for households in regional areas may have been somewhat higher than for their counterparts in metropolitan areas; and
  - increases in household prices .. have generally been greater for households with low demand and often lower incomes" (PC, 2005)
- *Different jurisdictions have had markedly different outcomes*
  - Different policy + regulatory positions; CSO arrangements, other support mechanisms

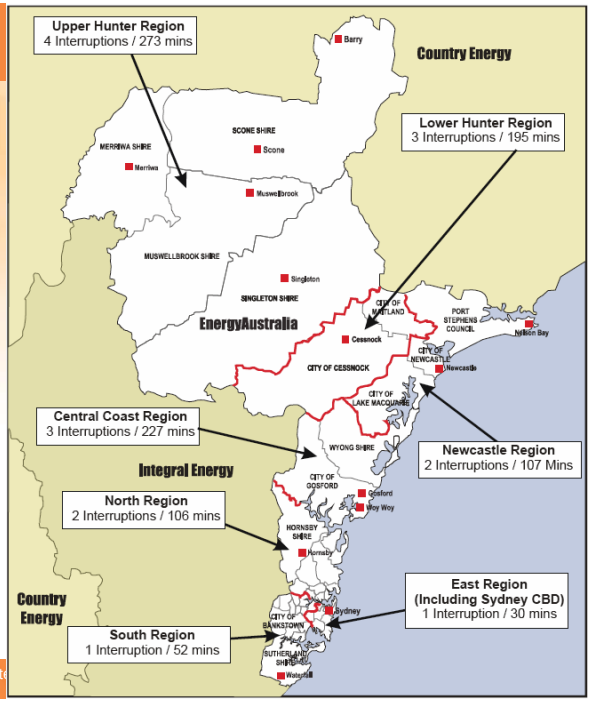
Electricity supply reliability outcomes (PC, 2005)

- Some general improvement



…but note variation between + within jurisdictions

5-year average reliability in EnergyAustralia regions
(EA Network Standards, 2004)



Climate change outcomes

- Stationary energy sector responsible for half of Australian greenhouse emission
- CoAG national energy policy objectives include need for action on climate change but EI restructuring has no specific env. objectives
- However, original expectation by some that would help *"14 MtCO2 reduction from BAU in 2010":*
  (Commonwealth Govt, *Climate Change: 2nd Communication to IPCC,* 1997)
  - Efficient competition in supply by gas + renewables
  - More sensible patterns of energy use
- Instead, likely outcome is increased emissions wrt BAU (CoAG, 2002)
  - Low cost of coal fired generation, immature gas market
  - Reduced emphasis on EE from lower prices
  - Current failure to price greenhouse emissions
  - Market design and regulation that favours incumbents Supply-side orientation of reforms to date

Growing pressures on restructuring

- Continuing growth in peak demand
  - Energy an essential good but also growing discretionary + 'conspicuous consumption' energy services; eg. Air Conditioning, industry development
  - Estimated to require $24b investment in Tx + Dx infrastructure over next 5 years; this is regulated expenditure
  - This growth will also require major investment in new peaking plant
  - Current market arrangements smear these costs, potentially perverse outcomes
- Growing climate change concerns
  - Protecting the climate seems likely to require major (60-80% by 2050), rapid (peaking within decades) global emissions reductions
  - Australian per-capita emissions 2 X > developed world average, 5-10 X > developing world
  - Emission reductions will impose direct costs on EI

=> Underlying cost structure of industry likely to grow

Demand growth + projected reserves (NEMMCO, 2005)

Table 2 Averaged Annual Energy and Demand Growth Rates

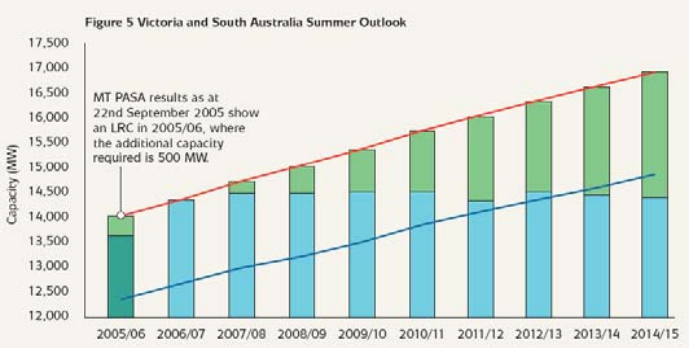
	10-year Energy Growth Rate	10% POE Summer Maximum-Demand Growth Rate	10% POE Winter Maximum-Demand Growth Rate
Queensland	3.2%	3.9%	3.6%
New South Wales	1.9%	2.8%	2.3%
Victoria	1.1%	2.1%	1.8%
South Australia	1.5%	2.4%	2.1%
Tasmania	1.1%	1.5%	1.3%

Table 6 Projected Low Reserve Conditions

	LRC Point	Reserve Deficit
Queensland	2008/09	251 MW
New South Wales	2008/09	372 MW
Victoria/South Australia (combined)	2005/06 2007/08	500 MW[1] 237 MW
Tasmania	Beyond 2014/15	

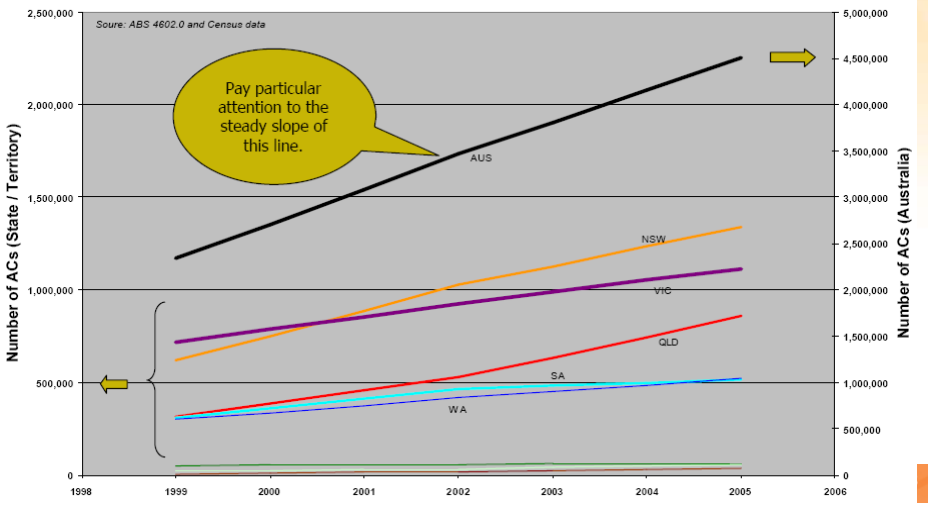
[1] The 2005/06 reserve deficit is determined through the MT PASA process, not the SOO's supply-demand outlook. This figure was effective as at 22nd September 2005 to reflect most recent market information.

Supply/demand outlook for Vic/SA
(NEMMCO, 2005 SOO)

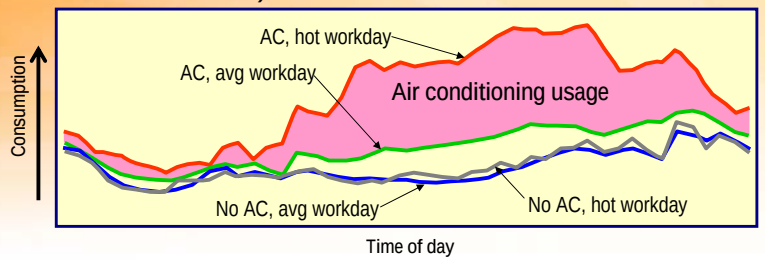


- from 2006/07 onwards, following commissioning of Basslink, there is an additional 590 MW available to Victoria and South Australia;
- from 2005/06 to 2007/08, reserve support from Snowy, New South Wales and Queensland is limited by the Snowy to Victoria inter-connector's capability; and
- the next LRC point occurs in 2007/08, where the additional capacity required is 237 MW. Lower longer-term demand growth in Victoria resulted in the second LRC point occurring one year later than reported in 2004.

Air conditioning trends (Washusen, 2005)



Effect of residential air-conditioning
(H Colebourn, 2005)



- The after-diversity demand of air conditioned houses more than doubles on hot days
- Network capacity is also lower on hot days
- The load factor of domestic air conditioners is < 10%
- Typical residential A/C owner is cross subsidised by $70 pa

Other potentially significant demand drivers

State and regional development policies for energy intensive industry

"Drawing on an extensive range of sources, this paper concludes that smelters in Australia pay, on average, around $21 per megawatt-hour (MWH) of electricity. The notable exceptions are Portland and Point Henry in Victoria, where the smelters pay closer to $14 per MWH. For other smelters, the best estimates are that Bell Bay pays at most $23 per MWh, Tomago $22 and Kurri Kurri closer to $27."

H Turton, "The Aluminium Industry", The Australia Institute, Report No. 44, January 2002

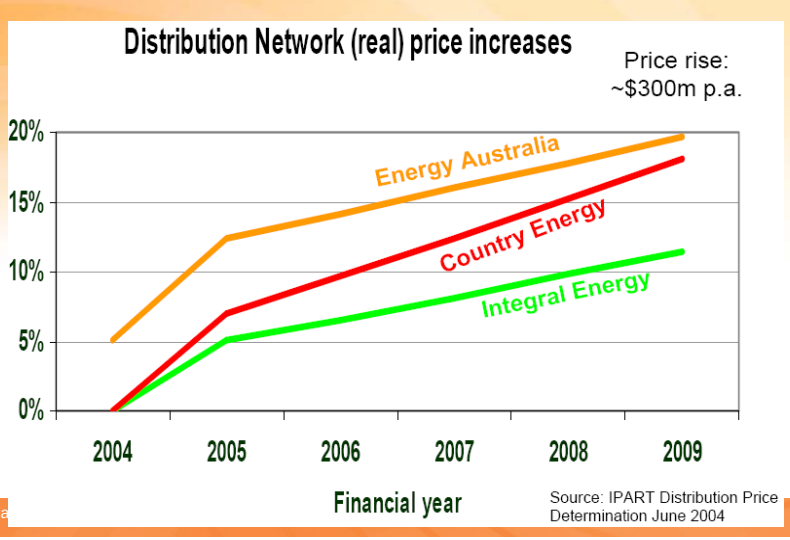
Peak load growth driving network investment in all jurisdictions

- 5 year total Dx Capex allowances up in all jurisdictions (Washusen, EUAA Briefing, Dec. 2005)

State/Territory	Net Capex[1]	Augmentation Reinforcement Capex
ACT	$103	No information
NSW	$4,389	$1,755[2]
QLD	$5,475[3]	$2,097
SA	$735	$200
TAS	$279	No information
VIC	$2,603[4]	$560
	$13,583	**$4,612**

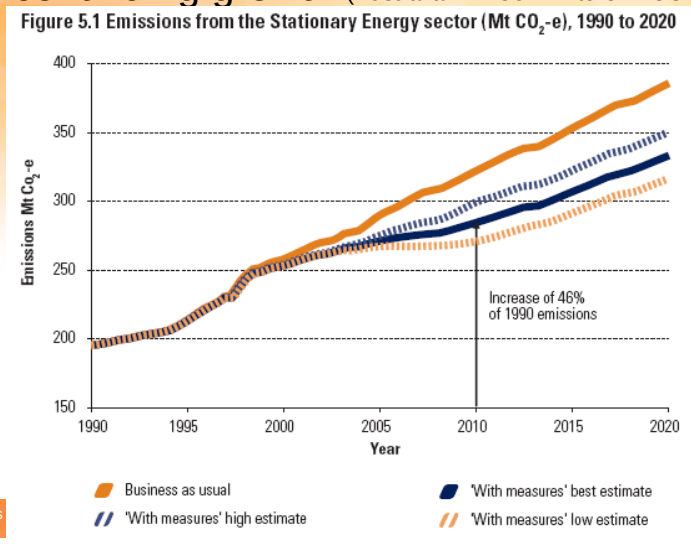
…. now increasing prices in some jurisdictions

(Dunstan, 2005)



Source: IPART Distribution Price Determination June 2004

Stationary energy GHG emission projections see continuing growth (Australian 4th Comm. to UNFCCC, 2006)



Some key reasons for these failures

- Dysfunctional retail markets
  - Little meaningful competition in terms of delivering end-user energy services
  - Limited competition between supply + demand-side options
  - Retailers largely chasing energy sales
  - Low end-user participation in some key decision making
  - Present tariff structures not economically efficient
- Lack of political will to implement effective climate change policies that drive
  - Energy efficiency
  - Renewable energy
  - A greater role for gas: fuel switching + elec. generation

Restructuring continues: the new overall objective for the NEM (NEL Section 7)

- *The national electricity market objective is to promote efficient investment in, and efficient use of, **electricity services** for the **long term** interests of **consumers of electricity** with respect to **price, quality, reliability and security** of supply **of electricity** & the reliability, safety and security of the **national electricity system***

- Possible short-comings of this objective:
  - Emphasises electricity rather than end-use energy services
  - Fails to mention sustainability - in 1991, COAG said the NEM should be *efficient AND sustainable*
  - What of equity?

Some key elements of current MCE agenda

- *Economic Regulation*
  - Establish national Dx and retail framework. Transfer functions to the AER and AEMC
- *Retail Pricing*
  - Phase out energy retail price regulation where effective competition can be demonstrated
- *User Participation*
  - Implement new consumer advocacy arrangements
  - Consider demand side response options
- *Energy Efficiency*
  - Implementation of the NFEE (Stage 1) Response to PC Inquiry, Consideration of the NFEE (Stage 2)

Some key elements of current MCE agenda

- *Economic Regulation*
  - Establish national Dx and retail framework. Transfer functions to the AER and AEMC
- *Retail Pricing*
  - Phase out energy retail price regulation where effective competition can be demonstrated
  - progressive roll out of electricity smart meters to allow TOU pricing + for users to respond to prices and reduce peak demand
  - implementing MCE work program to establish effective DSR mechanisms in market
- *User Participation*
  - Implement new consumer advocacy arrangements
  - Consider demand side response options
- *Energy Efficiency*
  - Implementation of the NFEE (Stage 1) Response to PC Inquiry, Consideration of the NFEE (Stage 2)

National vs jurisdictional regulation

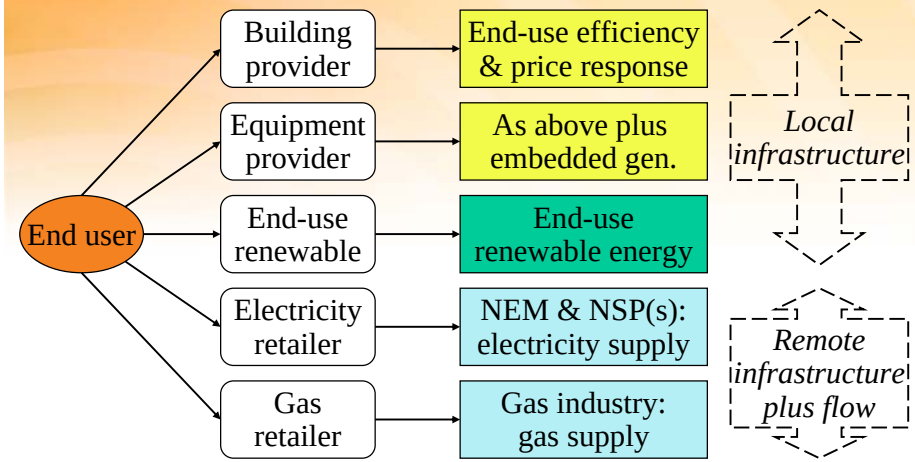
- Universal best practice or lowest common denominator?
- Different jurisdictional circumstances are relevant
  - Many key decisions are political
- Value in agreed national framework wrt regulatory burden, consistent outcomes
- Policy diversity + competition between the jurisdictions has driven innovation
  - Lots to learn from Victorian experience – a leading jurisdiction in equity and other considerations
- What of stakeholder consultation processes

Advocacy challenges

- Technical and commercial complexity
- Ongoing + broad restructuring agenda
- Large, well funded industry participants

=> Well resourced, long-term strategic + expert advocacy likely to be required

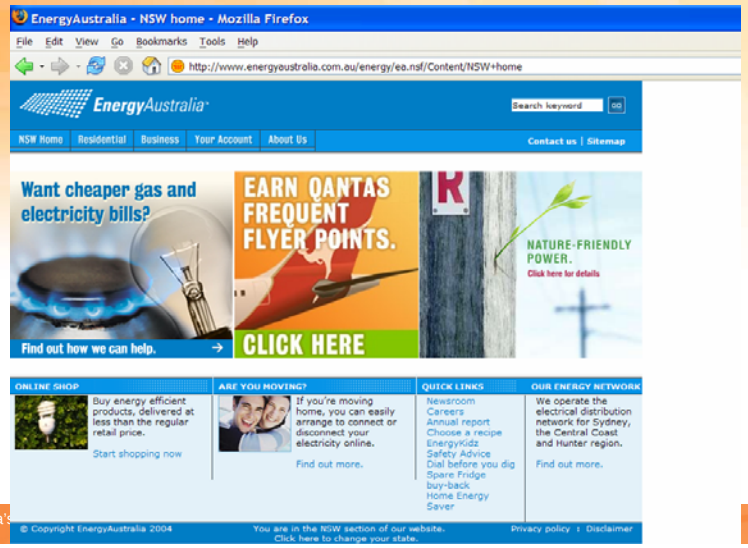
Decision-making in the stationary energy sector: *Ideal: led by end-users within a societal context*



Barriers to good end-user decision-making

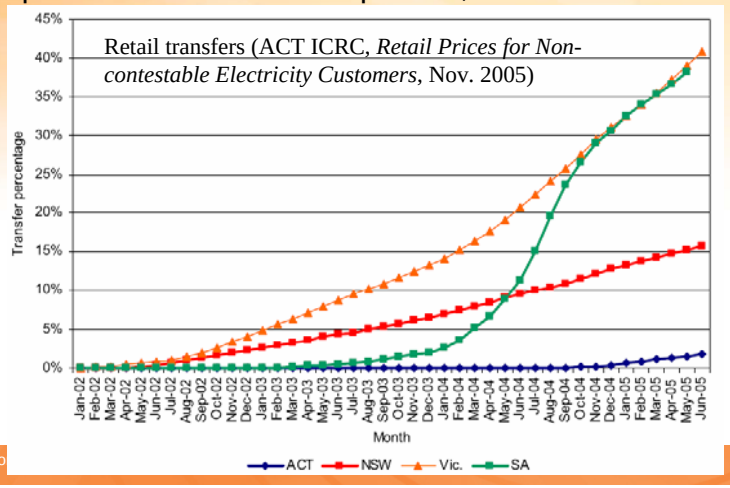
- Barriers for local infrastructure options:
  - Knowledge, cash flow, innovation & risk exposure
  - Limited influence over options (dependence on others eg. landlords)
  - Need for coordinated decision making to value diversity
- Barriers for remote infrastructure & flow options:
  - Limited knowledge & influence (dependence on others)
  - Revenue recovery retail tariffs (ex-post taxation)
  - Business as usual (status quo rather than innovation)
  - Regulators & system operators take key decisions:
    - To maintain availability & quality of energy flow
    - For which end-users bear most of the costs

Current Full Retail Competition limited



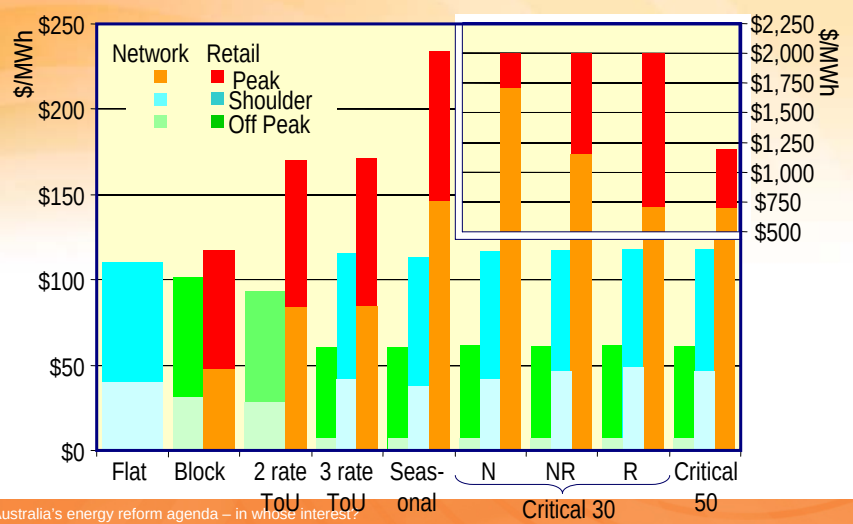
Typical measures of competition not very useful

- Retail transfers? Data limitations, relevance
- Price spreads? Can mean competition, or market failure



Moving towards more cost reflective pricing

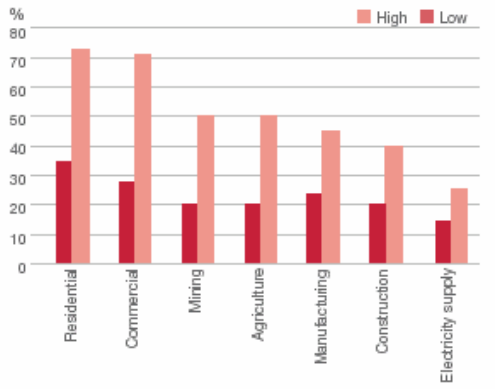
(Colebourn, 2006)



Estimates of Australian cost-effective EE

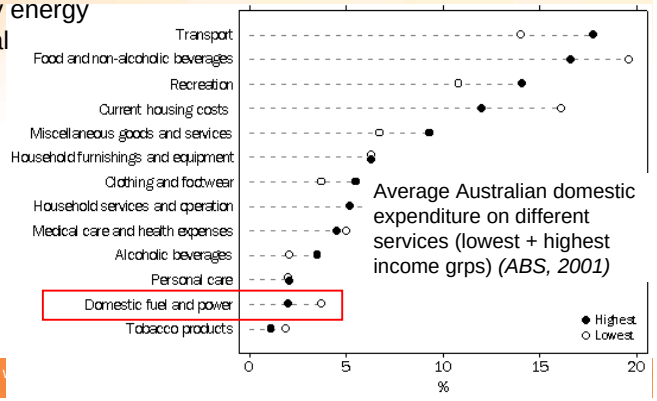
- Estimates have high uncertainty however potential clearly very large (NFEE, 2003)

Figure 4: Percentage cost–effective energy consumption reduction potential across different sectors.



Motivating consumers – a limited role for pricing

- For many **but not all** Australian businesses + in residential sector, stationary energy typically < 5% of total expenditure
- Even for most energy intensive Australian industries, energy costs approx. 20% of production costs
- Share of stationary energy costs for residential budgets in IEA countries fell 20-50% from early 80's to late 90's. Similar experience for most industries (IEA, 2005)



Average Australian domestic expenditure on different services (lowest + highest income grps) *(ABS, 2001)*

Energy efficiency policy

- Many energy users
  - In dysfunctional retail markets
  - Unlikely to be motivated by small price increases
  - Even when motivated, may be poorly equipped to take action through poor understanding, and limited options

  ⇒*"Price based mechanisms, in general, will not address the information and consumer related barriers to 'EE investment – here regulatory solutions tend to be more effective" (UK Energy Saving Trust, 2002)*

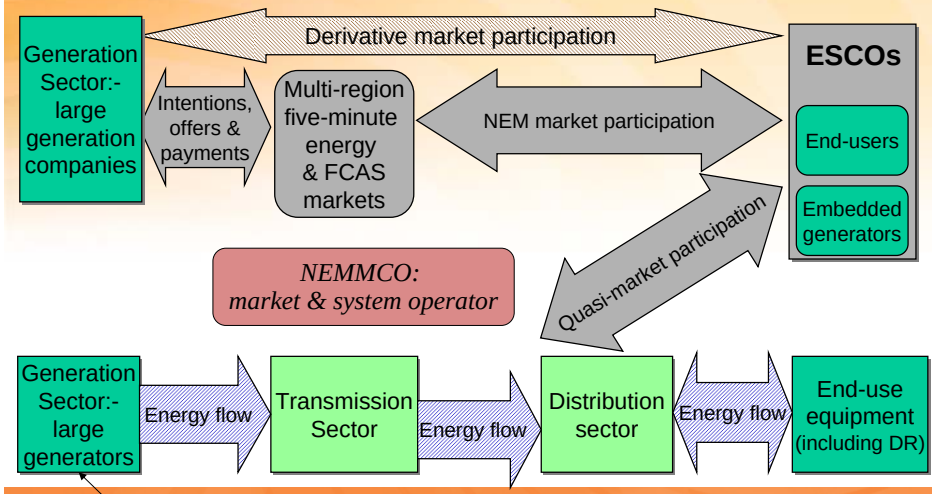
  ⇒Key additional policies include building + equipment standards

Possible futures with real retail competition

Climate change policy

- Voluntary Greenpower approaches can only have limited impact + potentially inequitable
  - Private payment for a public good
- Important roles for direct (eg. appliance + building standards) + market-based (eg. Emissions Trading) regulation
- Key issues
  - Effectiveness, Efficiency and Equity
    - Everyone a beneficiary of effective action on climate change so all should contribute
    - Policy makers must avoid implementing ineffective, inefficient + inequitable measures (in error or by design)

Alternative ESCO-based structure for NEM



Possible transition roles

- DNSPs
  - play an essential role in providing access to the meshed transmission network & the NEM
  - Don't generally, but should have, direct contract with end-users
    - Access agreements with technical obligations on both parties
    - Tariff arrangements with spot + forward elements
- Retailers
  - tariffs transitioning towards having TOU, spot + forward elements
  - currently play ambiguous role: don't physically participate
  - may evolve to become ESCOs
- ESCOs (Energy Service Companies)
  - Focus on end-user's energy service needs – may offer physical, financial options for best meeting these needs
  - Currently only play limited role in Australian electricity industry
  - Very important role in more effective, efficient + equitable competition

Conclusions

- Effective reform requires more than just FRC + ongoing supply-side focussed changes
  - Transition to end-user focus with ESCO support
- Necessary conditions:
  - Interval metering
  - Greater engagement between end-users + industry
    - Information a key requirement
  - More economically efficient tariff structures
  - ESCOs to support decision-making by small end-users
    - Package physical + financial options for delivering energy services with more focus on energy efficiency, fuel switching…
  - **Policy framework for end-use efficiency, climate change + equity concerns where restructured industry has failed to deliver**

Centre for Energy and Environmental Markets
UNSW

Many of our publications are available at:
www.ceem.unsw.edu.au