



Centre for Energy and
Environmental Markets

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Reviewing the Productivity Commission Report on Energy Efficiency

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Outline

- The stationary energy sector
- Ideal decision-making led by end-users
- Barriers to ideal decision-making
- Practical decision-making in the electricity industry
- Practical decision-making about end-use
- Possible improvements to the situation
- Recommendations by the Productivity Commission
- Relevance of the PC recommendations
- Conclusions



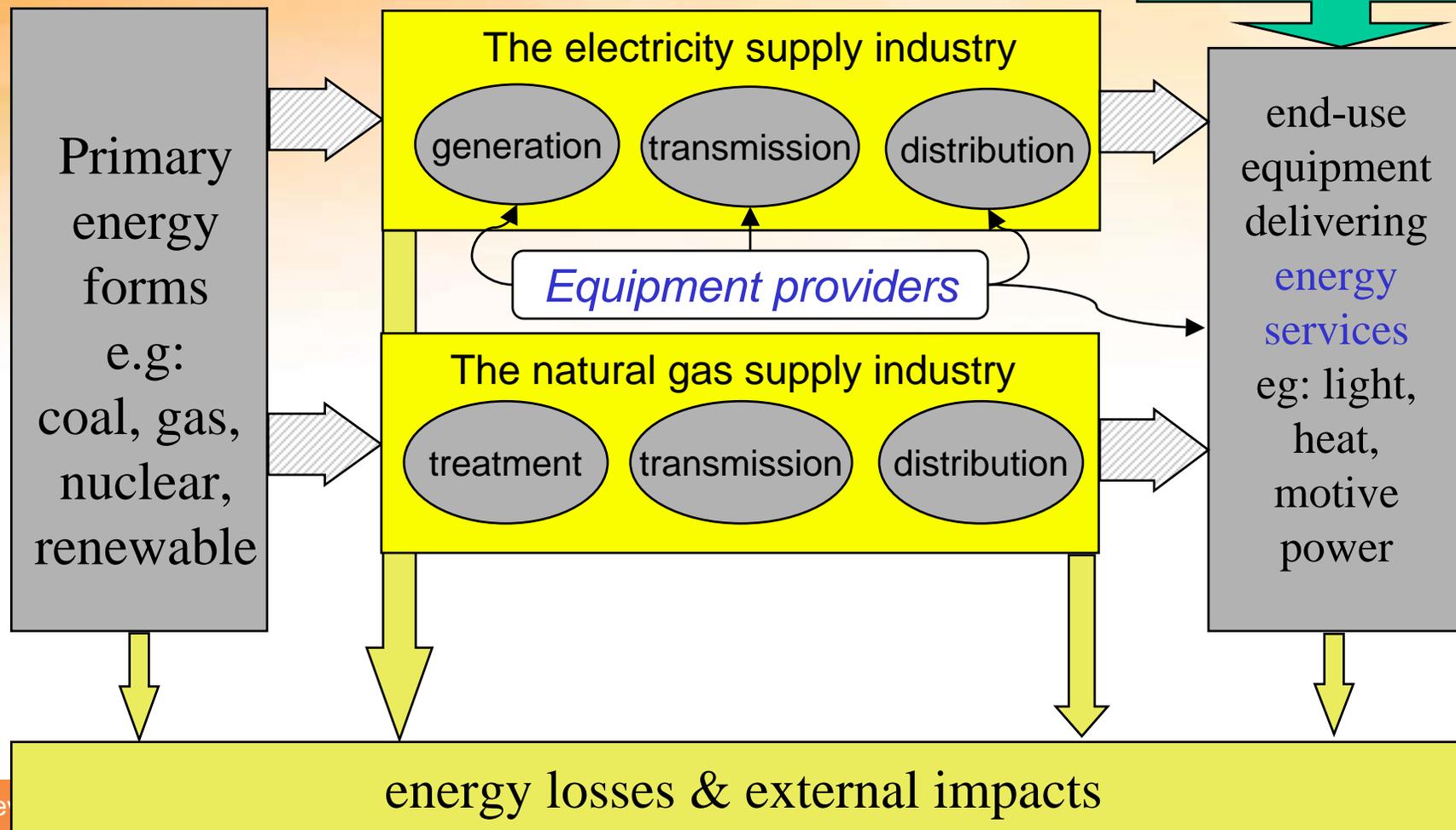
Key issues for the electricity industry

- Part of the stationary energy sector:
 - In competition with other energy vectors to deliver end-use energy services
- Significant externalities:
 - Environmental (eg climate change)
 - Social (eg “essential good”)
- Characteristics of electrical energy:
 - A high quality, secondary energy form:
 - Expensive to make but easy to use
 - Flows at the speed of light from generators through the network to end-use equipment:
 - Difficult to maintain continuous energy flow



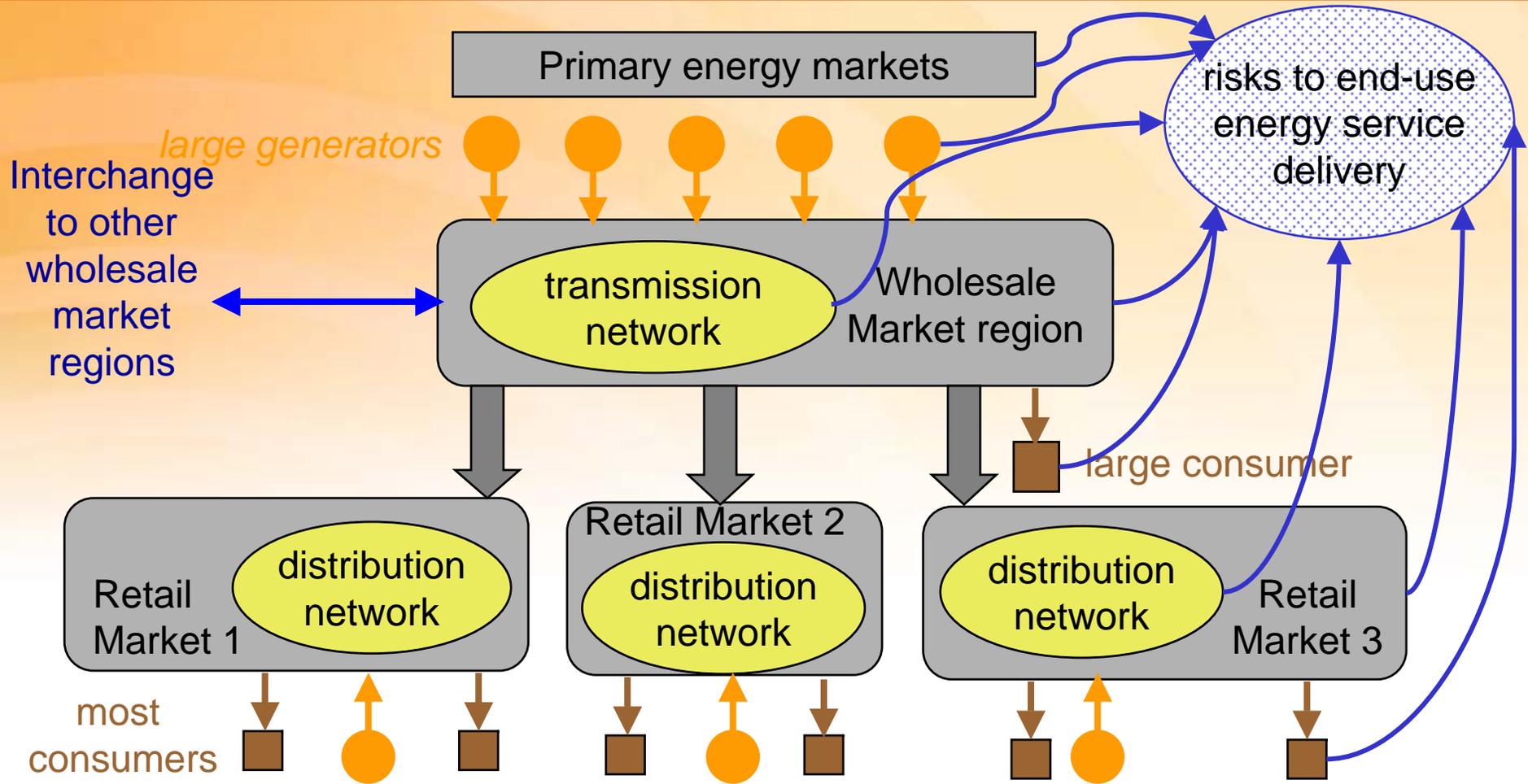
Energy service delivery in the stationary energy sector

Energy service companies focus on end-use options, eg: efficiency, CHP, solar





An electricity trading framework



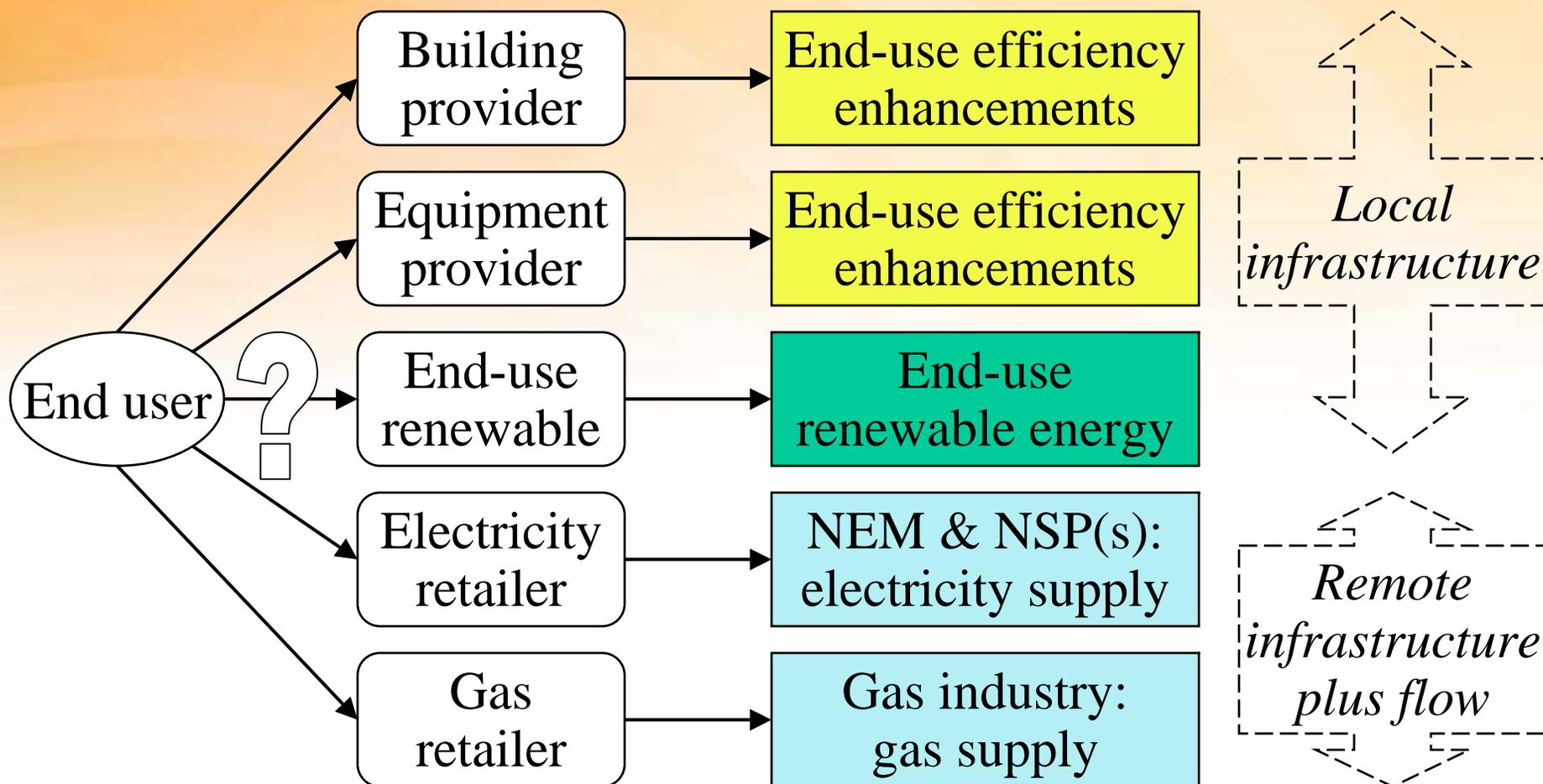
embedded generators

- *Small consumers, embedded generators & storage should be supported by energy service advisers*

- *Wholesale & retail market designs should be compatible*
 - *Both should include network models*



Ideal decision making in the stationary energy sector: *led by the end-user*





Barriers to good end-user decision-making

- Local infrastructure options:
 - Knowledge, cash flow, innovation & risk exposure
 - Limited influence over options (dependence on others)
 - Need for coordinated decision making (scale effects)
- Remote infrastructure & flow options:
 - Limited knowledge & influence (dependence on others)
 - Revenue recovery tariffs (tax rather than price)
 - 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

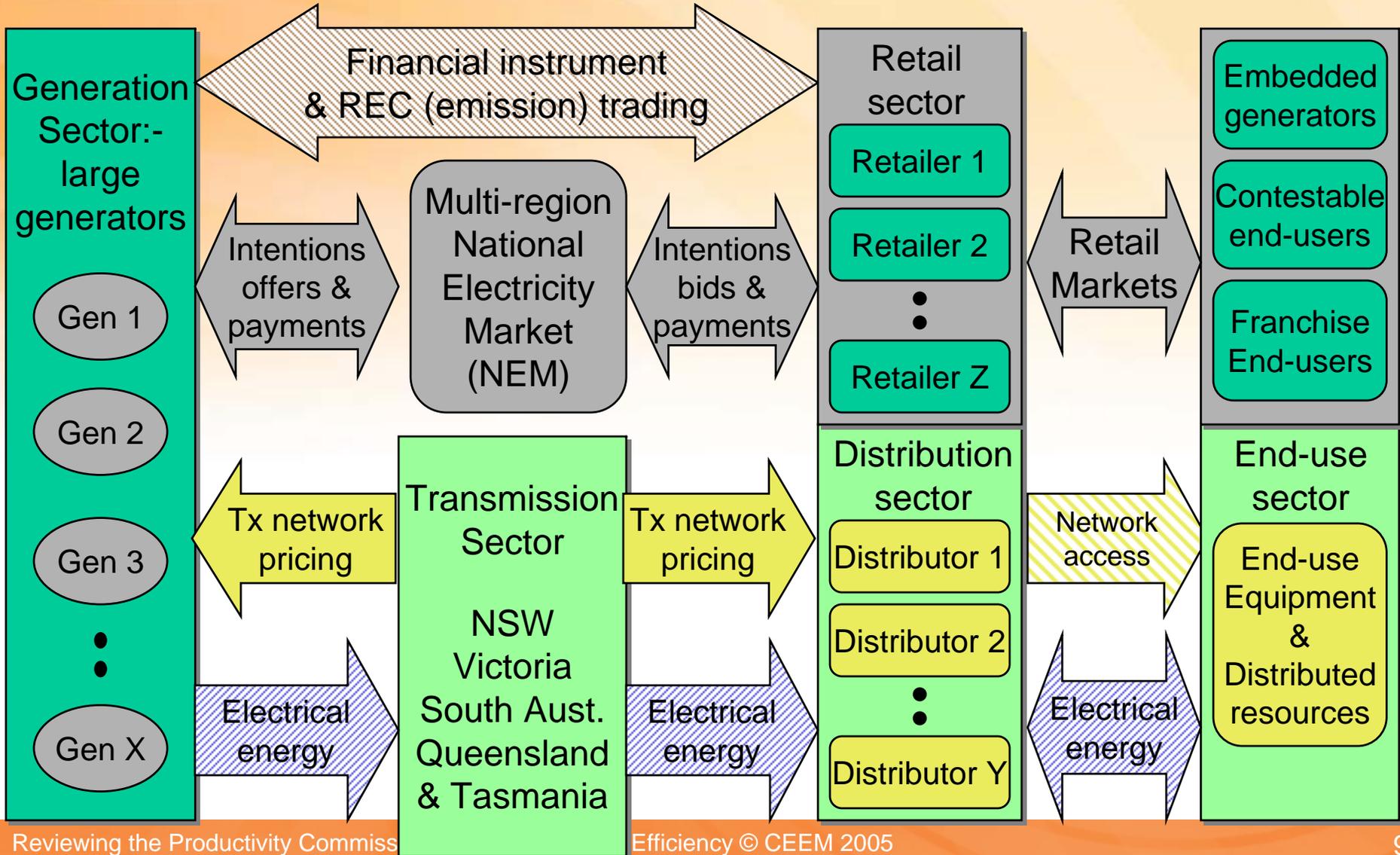


National Electricity Law: *Overall objective for the National Electricity Market (NEM)*

- *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 and the reliability, safety and security of the national electricity system***
- *Implies efficient investment in network services:*
 - *Refers to both technical and economic criteria but doesn't clearly define electricity services*



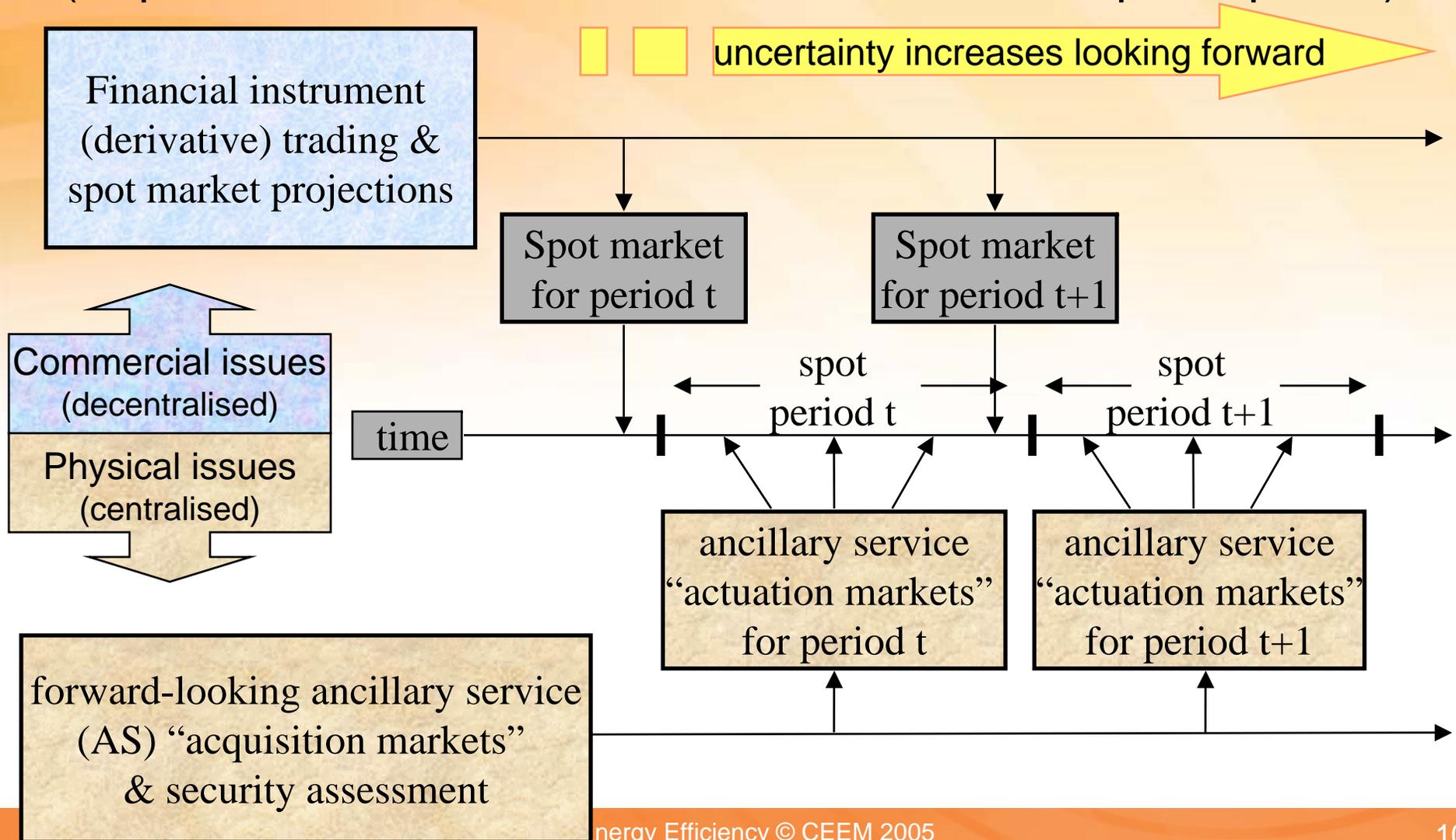
Restructured electricity industry in SE Australia





Timeline for *electricity* trading in NEM

(requires locational detail & active demand-side participation)

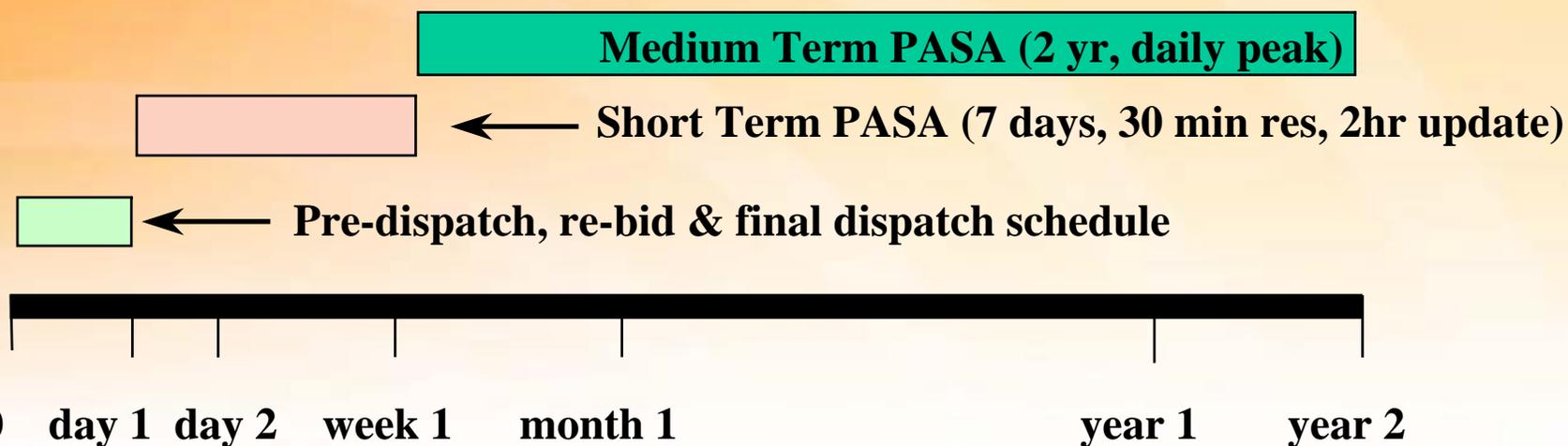




Dispatch, Pre-dispatch, PASA, SOO & ANTS

(source: NEMMCO)

SOO & ANTS (10 yr)

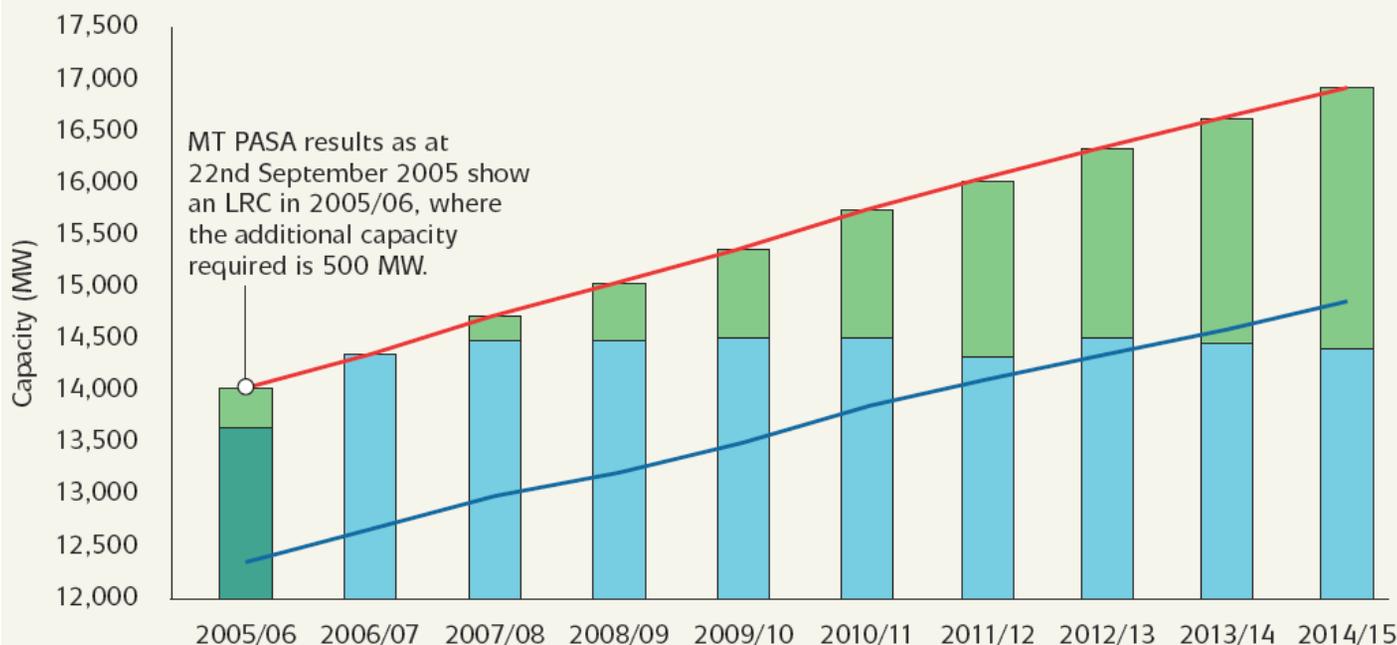


- ST & MT Projected Assessment of System Adequacy support reserve assessment & participant operating decisions. ST PASA projects region demand & reserve for 7 days @ 30 min resolution, updated every 2 hours. MT PASA projects region daily peak demand & reserve for 2 yrs, updated weekly.
- Statement of Opportunities (SOO) & Annual National Transmission Statement (ANTS) are intended to inform generation, demand & network investment decisions (10 year horizon, issued annually)



Longer-term outlook for Victoria & SA: *Performance indicator: Low Reserve Capacity (LRC)* (NEMMCO SOO, 2005)

Figure 5 Victoria and South Australia Summer Outlook

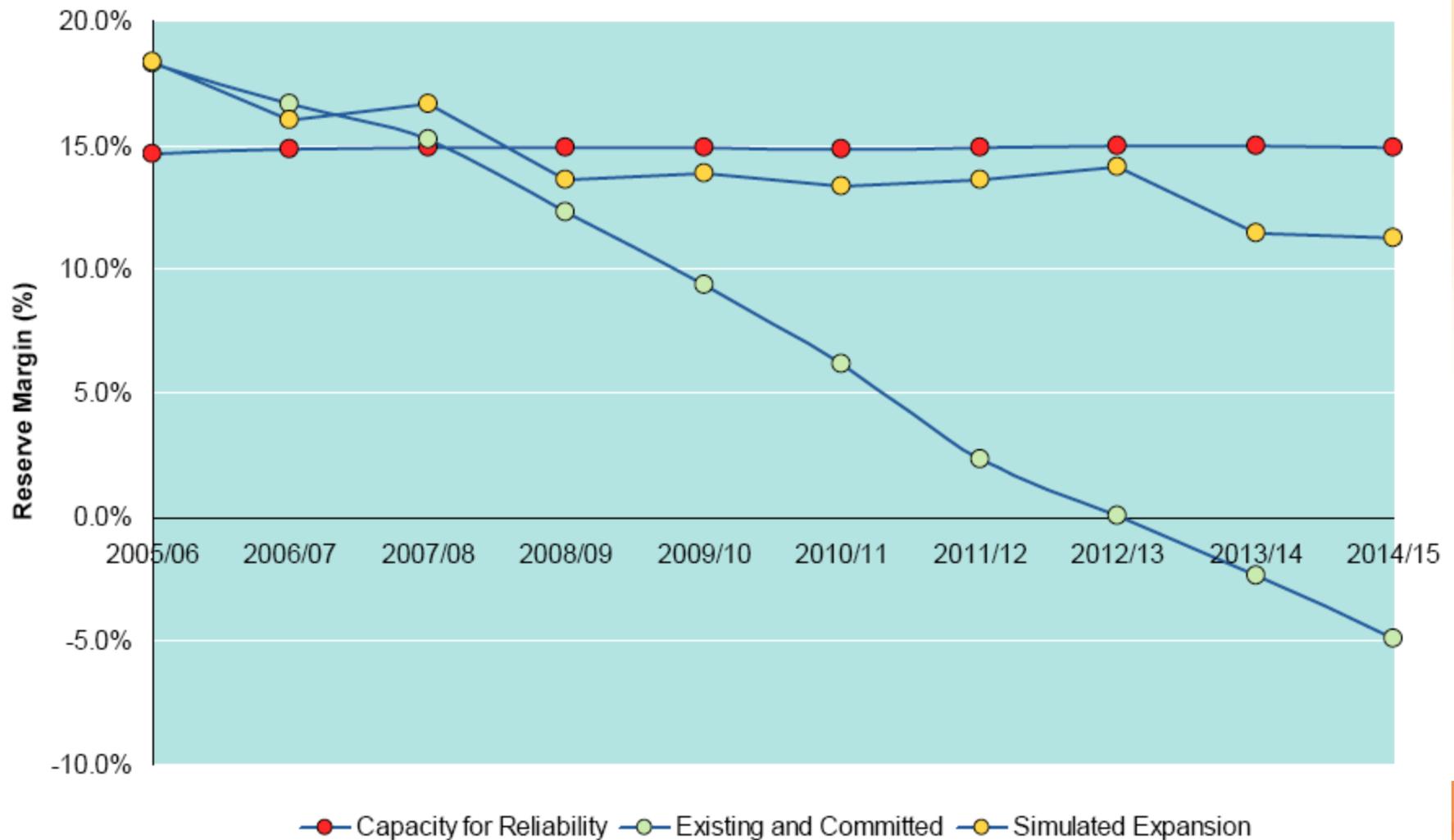


- from 2006/07 onwards, following commissioning of Basslink, there is an additional 590 MW available to Victoria and South Australia;
- from 2005/06 to 2007/08, reserve support from Snowy, New South Wales and Queensland is limited by the Snowy to Victoria interconnector's capability; and
- the next LRC 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.

Note: uncertainty in future supply-demand balance is inevitable in a restructured industry with decentralised decision-making



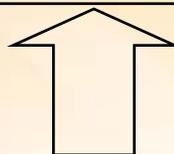
Projected NEM-wide reserve margin: *(installed gen - peak demand)/(installed gen)* (NEMMCO SOO, 2005)



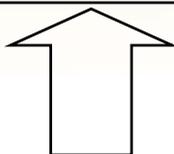


Network planning process in NEM (all processes to 10 year horizon)

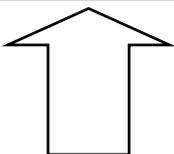
NEMMCO Annual National Transmission Statement (ANTS)



Transmission network service provider (DNSP) Annual Planning Review



Distribution network service provider (DNSP) Annual Planning Review



Local demand forecasts that reflect aggregated end-user decisions

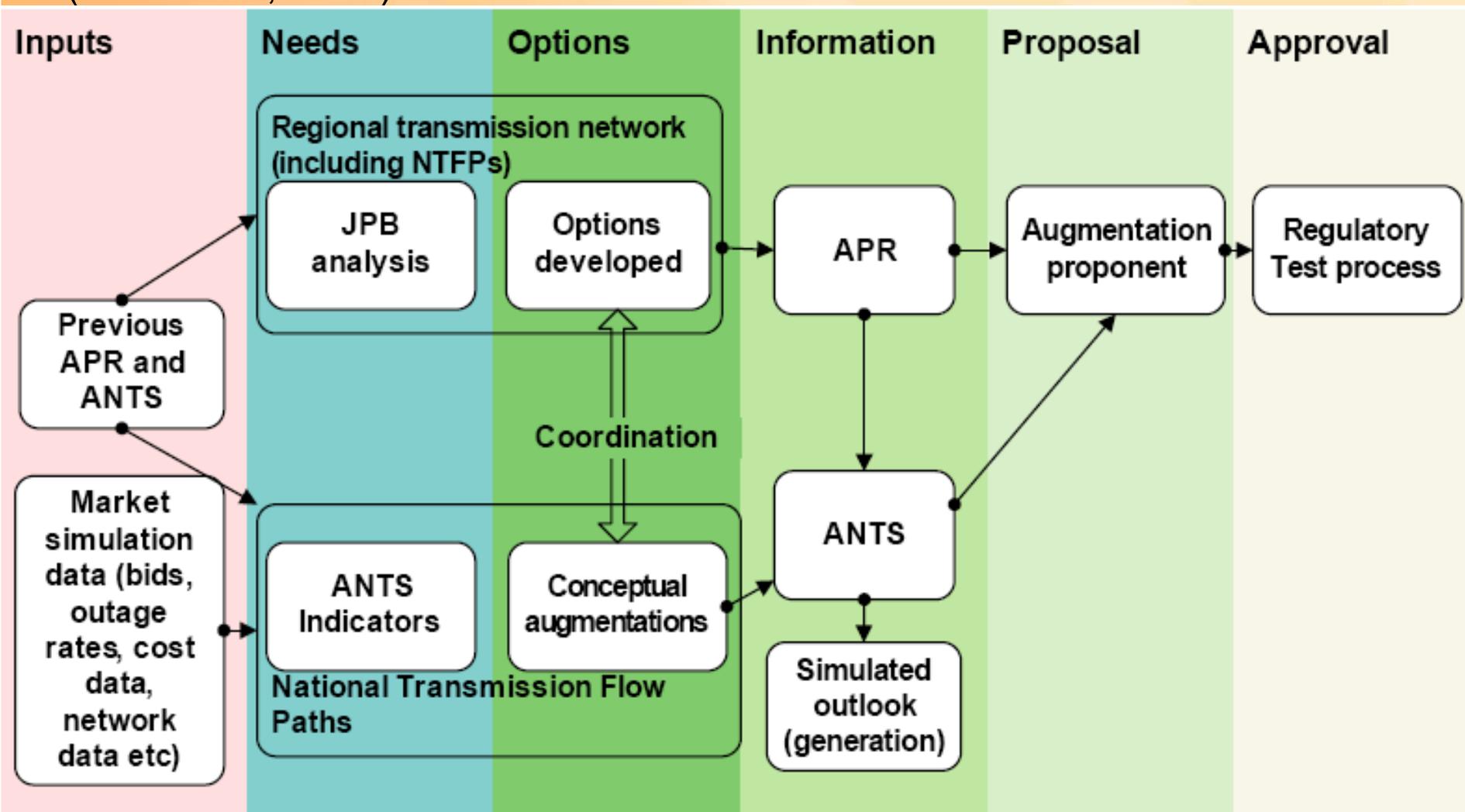


Network investment decision-making

- Each network service provider (NSP) takes own network augmentation (investment) decisions:
 - Subject to review by Independent Regulator:
 - AER (transmission) or State-based (distribution)
 - Accepted by Regulator if pass the Regulatory Test:
 - Reliability criterion OR positive net benefit
- Required to consider distributed resource options:
 - However supply-side bias remains - “obligation to serve”
- Regulator-approved augmentation enters rate-base:
 - Cost recovered from end-users (not avoidable)
 - Also supply reliability incentives for network operation



ANTS process based on demand forecast (NEMMCO, 2005)





Augmentation Opportunities

ANTS process (continued)

Queensland – New South Wales (both directions)
Cost (05/06 \$): \$220M
Timing: 2007/08 & 2009/10

Snowy to Victoria
Cost (05/06 \$): \$75M
Timing: 2009/10

Victoria to South Australia
Cost (05/06 \$): \$80M
Timing: 2009/10

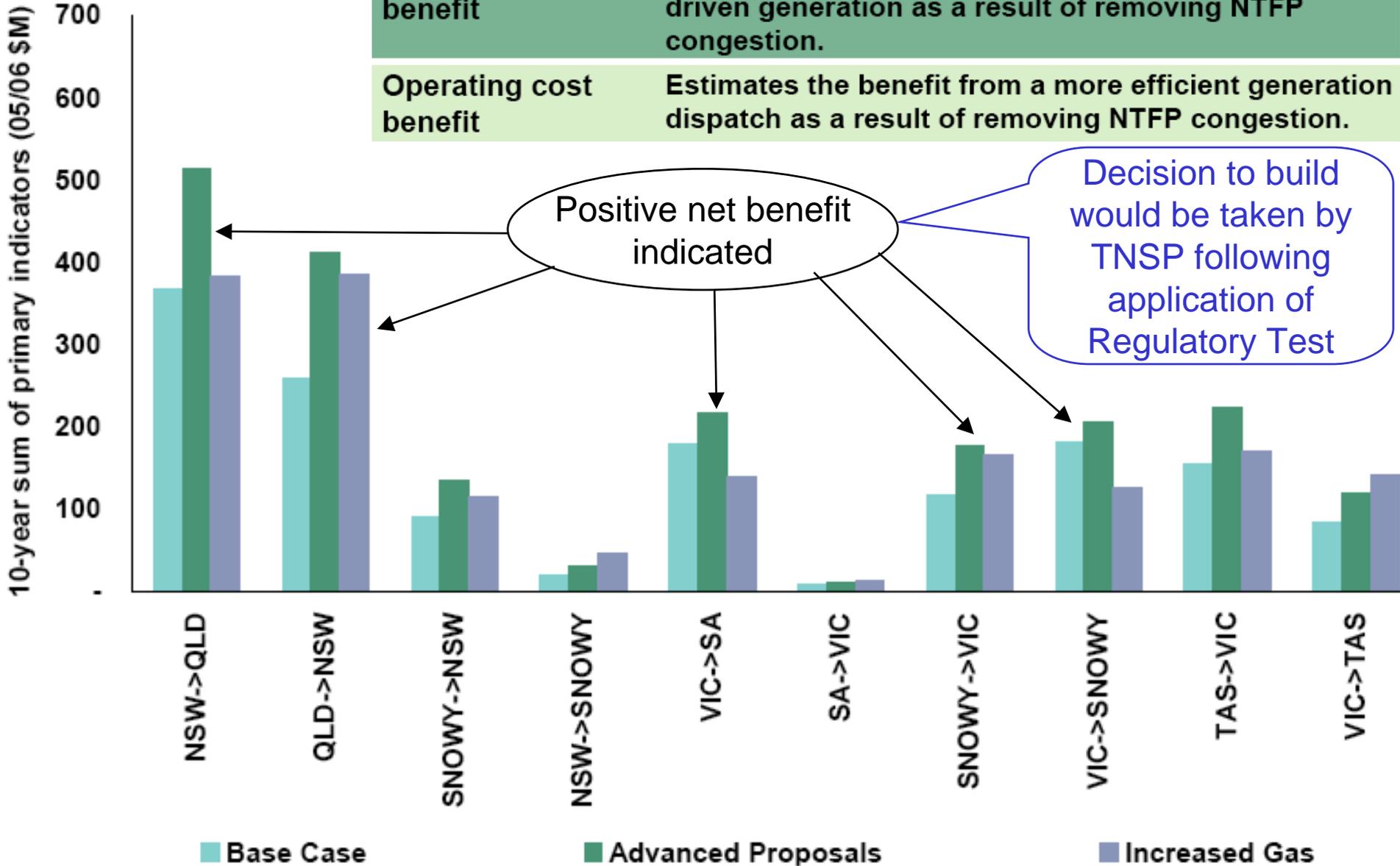
Victoria to Snowy
Cost (05/06 \$): \$50M
Timing: 2009/10

ANTS focuses on network augmentation options



ANTS process (continued)

Primary Indicators	Net Benefit
Reliability benefit	Estimate the benefits from a reduction in unserved energy as a result of removing NTFP congestion.
Capital deferral benefit	Estimate the benefits from deferring some market driven generation as a result of removing NTFP congestion.
Operating cost benefit	Estimates the benefit from a more efficient generation dispatch as a result of removing NTFP congestion.



Decision to build would be taken by TNSP following application of Regulatory Test

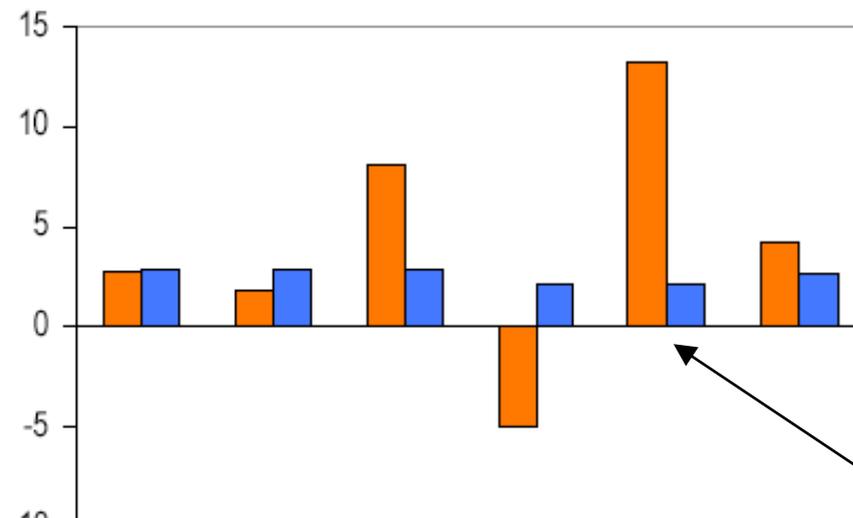


EnergyAustralia summer peak demand (EA submission, IPART DNSP review, 2003)

Summer peak actual vs forecast

1999 - 2003

Annual Growth (%)



Actual summer demand growth

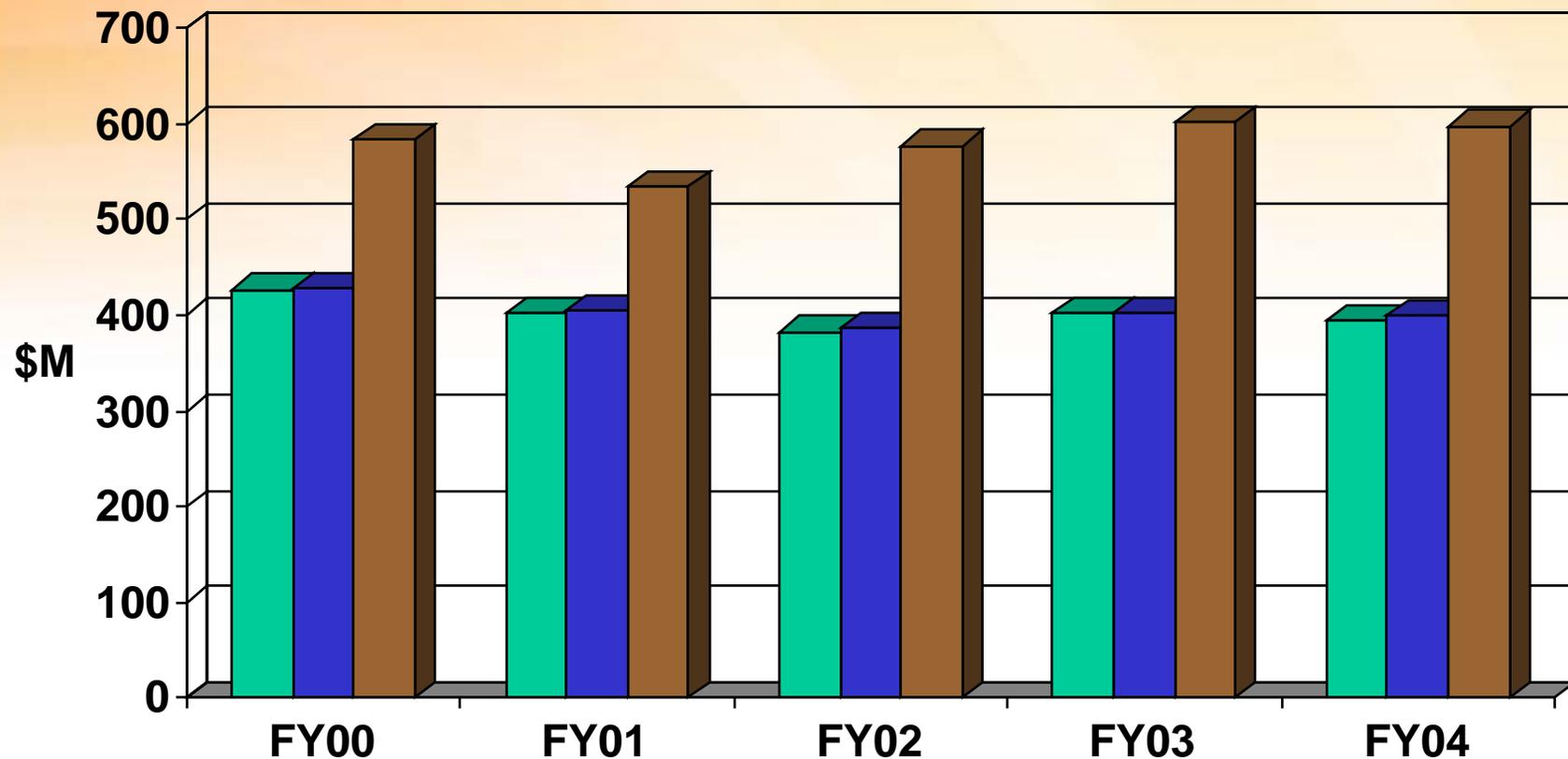
- EnergyAustralia moving to summer peaking
- Shape of summer demand de-rates existing capacity.

Uncertain weather-driven
needle peak demand



Actual & projected DNSP capital expenditures (IPART, DNSP Review, 2003)

■ DNSP plans ■ Worley plans ■ Actual/proj

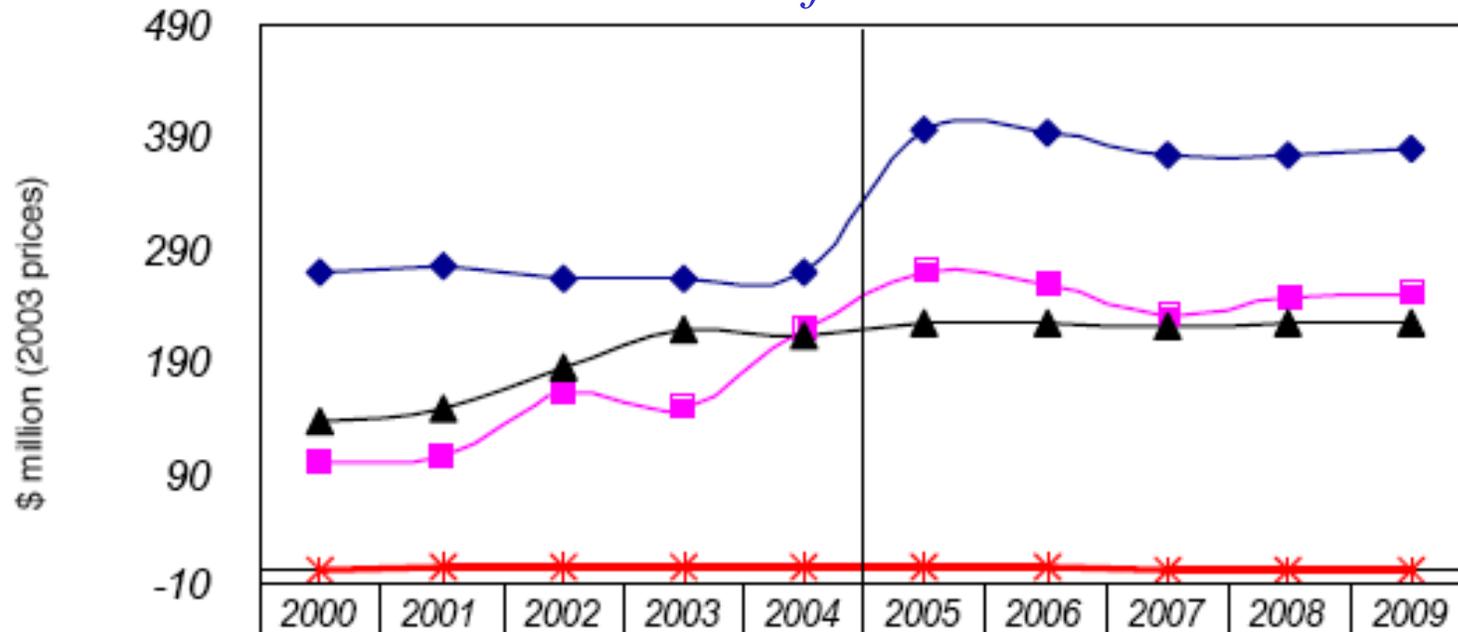


Capital expenditure greater than expected due to unanticipated growth in demand



NSW distributor actual & forecast network augmentation (IPART, Dist Pricing Draft Rpt, 2004)

Recovered from end-users



◆ 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



Summary of distribution augmentation *(subject to State-level regulation at this time)*

- Demand growth is uncertain in time & location:
 - Five-year revenue paths are likely to be wrong
- Distributed resource options should be considered:
 - Allocation of risks & rewards is difficult
 - Obligation to Serve & reliability target detract from this
- Further progress requires:
 - Half-hour metering that also records quality & availability
 - Active end-user participation with contracted quality & reliability specification
 - Retail energy tariffs with spot & derivative format
(forward contracting for energy & peak demand)



PC report on privately cost-effective energy efficiency (EE): *key points*

- EE improvement is a low priority for end-users
- Australia must achieve the level of EE right for it
- Scope for privately cost-effective EE is modest
- Key barriers to privately cost-effective EE:
 - A failure in the provision of information
 - Split incentives
- Some government intervention is appropriate:
 - Mandatory labelling ok but probably not MEPS
 - Case not made for National Energy Efficiency Target & Tradeable Obligations



PC report on EE: *key points (continued)*

- National Framework for EE (NFEE) Stage One:
 - Greater clarity on government objectives for intervention
 - More emphasis on priority setting
 - Rigorous evaluation of past policies & programs, particularly EE regulations in Building Code of Australia
- Promotion of EE conflicts with low energy prices
- EE for environmental outcomes should be assessed against other options



PC report on EE: *recommendations*

- Regulatory impact of MEPS:
 - Do MEPS reduce competition & if so at what cost?
 - Why do individuals need more than energy labels?
 - Disendorsement or voluntary standards as alternatives?
 - Regressive distribution impacts? Forgone alternatives?
- Building codes:
 - How effective in reducing actual energy consumption?
 - Do (private) benefits outweigh the costs?
- Commercial & industrial:
 - No obligation to implement cost-effective options



PC report on EE: *recommendations (ctd)*

- Investigate congestion pricing for road use
- Subject mandated interval metering roll-out to cost-benefit test
- Prevent local governments creating variations in minimum EE standards for buildings
- Establish net benefit of Stage 1 NFEE proposals
- Don't implement a national energy efficiency target



Comments on PC report on EE *(in the context of the electricity industry)*

- Answering the PC report's key question:
 - *Why isn't the market working - or is it?*
- Requires assessment of the full conversion chain:
 - The report shows little understanding of this issue
- In the electricity industry conversion chain:
 - Regulators & operators intervene to maintain *electricity supply* availability, quality & security in short & long term
 - This create a bias to supply-side investment, and
 - Reduces private cost-effectiveness of demand-side options including EE enhancements



A more balanced approach to EE

- A more balanced PC recommendation would be to:
 - Eliminate regulator & operator interventions to maintain:
*Availability, quality & security of **electricity supply***, or
 - Change the objective of interventions to maintaining:
*Availability, quality and security of **energy services***
- Either approach would:
 - Increase the **private benefit** of EE enhancement & other demand-side options (as avoidable costs would increase)
- If not willing to recommend the above, PC should support balancing interventions such as NFEE:
 - Which would then enhance economic efficiency



Conclusions (electricity industry context)

- The PC report fails to provide a full account of the issues or provide balanced recommendations
- The electricity industry is not a “free market”:
 - Impractical given its continuous flow nature
 - Inevitable interventions with non-avoidable cost recovery from end users, creating supply-side bias
- Interventions by operators and regulators presently favour the supply side of the electricity industry:
 - Policy to support EE attempts to redress that imbalance
 - PC should either recommend removal of supply-side interventions or support balancing EE policies



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