BABCOCK & BROWN
POWER

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ASX Release

19 March 2007

INDUSTRY PRESENTATION

Please see attached presentation made today by Babcock & Brown Power (ASX:BBP) Chief Executive Officer, Mr Paul Simshauser at the 2007 Energy Regulation Conference.

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About Babcock & Brown Power Limited

Babcock and Brown Power (ASX: BBP) is a power generation business, with assets diversified by geographic location, fuel source, customers, contract types and operating mode. Its aim is to grow returns to its securityholders through optimisation of its existing power generation business and the addition of further power assets via a combination of new construction and strategic acquisitions.

The initial portfolio has interests in seven operating power stations and one power station under construction and due for completion in late 2008. The portfolio has a total electricity generation capacity of approximately 2,900 MW.[1] Babcock & Brown has been developing, operating and acquiring the generation portfolio over a period of 10 years. Four of the power stations have been co-developed by Babcock & Brown from green field development opportunities and four have been acquired from other operators.

[1] Some assets have minority shareholders. BBP's equity interest in the assets is equivalent to 2,350 MW.

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Portfolio Summary

Power station	Location	Equity interest (%)	Fuel	Operations Start Date	Capacity (MW)	Operating Mode	Offtake
Operating power stations							
Braemar	Queensland	85%[1]	Gas	September 2006	455MW	Intermediate	Energex/Market
Oakey	Queensland	50%	Gas	January 2000	286MW	Peak	Enertrade
Redbank	NSW	100%	Coal	April 2001	135MW	Base load	EnergyAustralia
Ecogen (Jeeralang)	Victoria	73%	Gas	1980	449MW	Peak	TRUenergy
Ecogen (Newport)	Victoria	73%	Gas	1980	510MW	Peak	
Flinders (Playford)	South Australia	100%	Coal	1960-1964	240MW	Intermediate	Various/Market
Flinders (Northern)	South Australia	100%	Coal	1985	527MW	Base load	Various/Market
Under construction							
NewGen Kwinana	Western Australia	70%[1]	Gas	late 2008 (projected)	320MW	Base load	Synergy
Total of operating and under construction					**2,922MW[2]**		
Contracted power offtake							
Osborne contracts	South Australia	100%	Gas/ cogeneration		180MW	Base load	Various/Market

1 Direct and indirect equity interest.
2 BBP's equity interest in the assets is equivalent to 2,350MW.

For further information please visit our website: www.bbpower.com

Dynamic efficiency gains from introducing Capacity Payments in the NEM

Energy Regulation Conference
19-20 March 2007, Sydney

Paul Simshauser

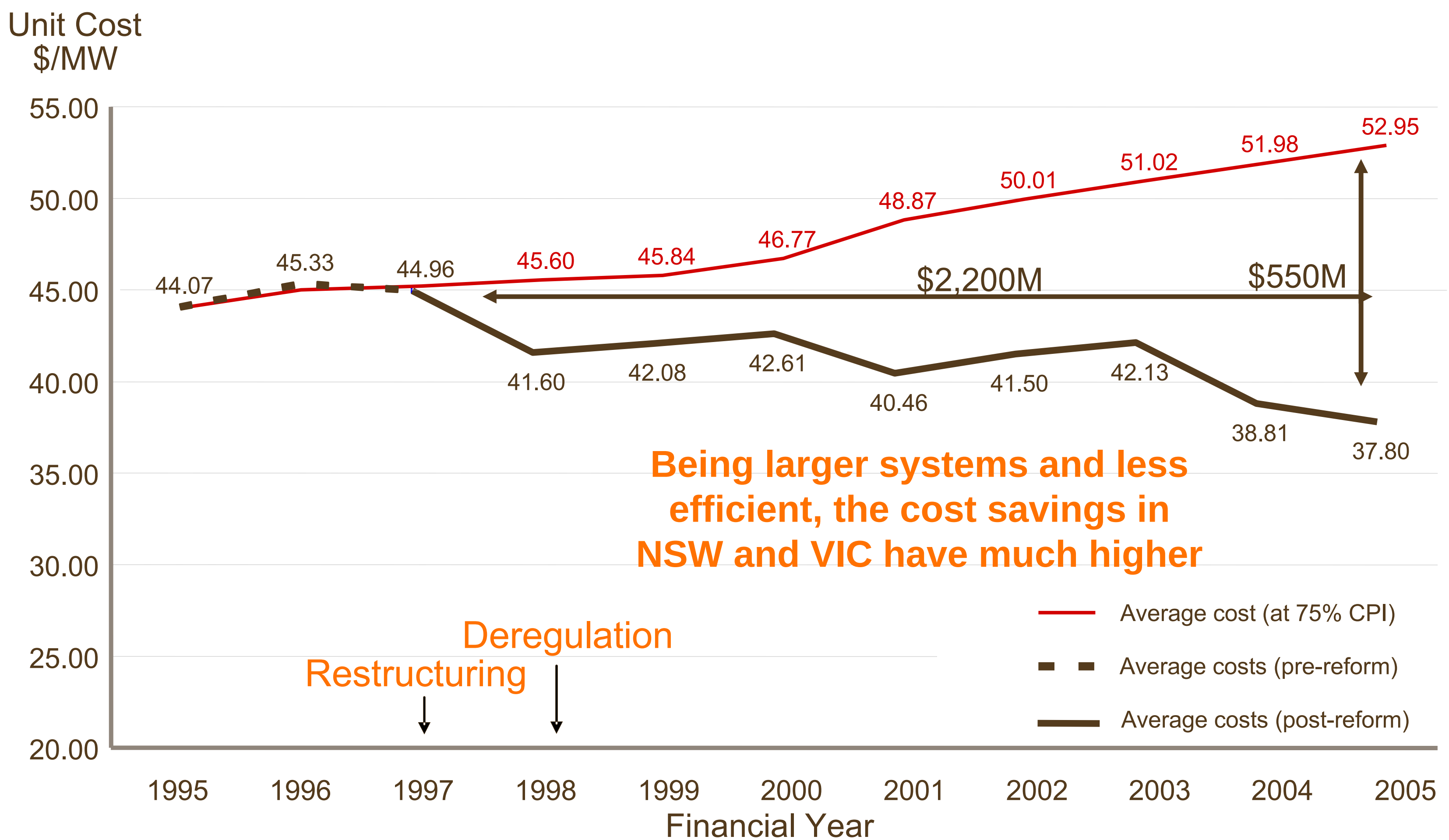
Overview

- NEM Performance (1998 to 2005)
- Emerging structural faults on the supply-side
- Market characteristics of peaking plant
- Inherent instability of energy-only markets
- Institutional changes required

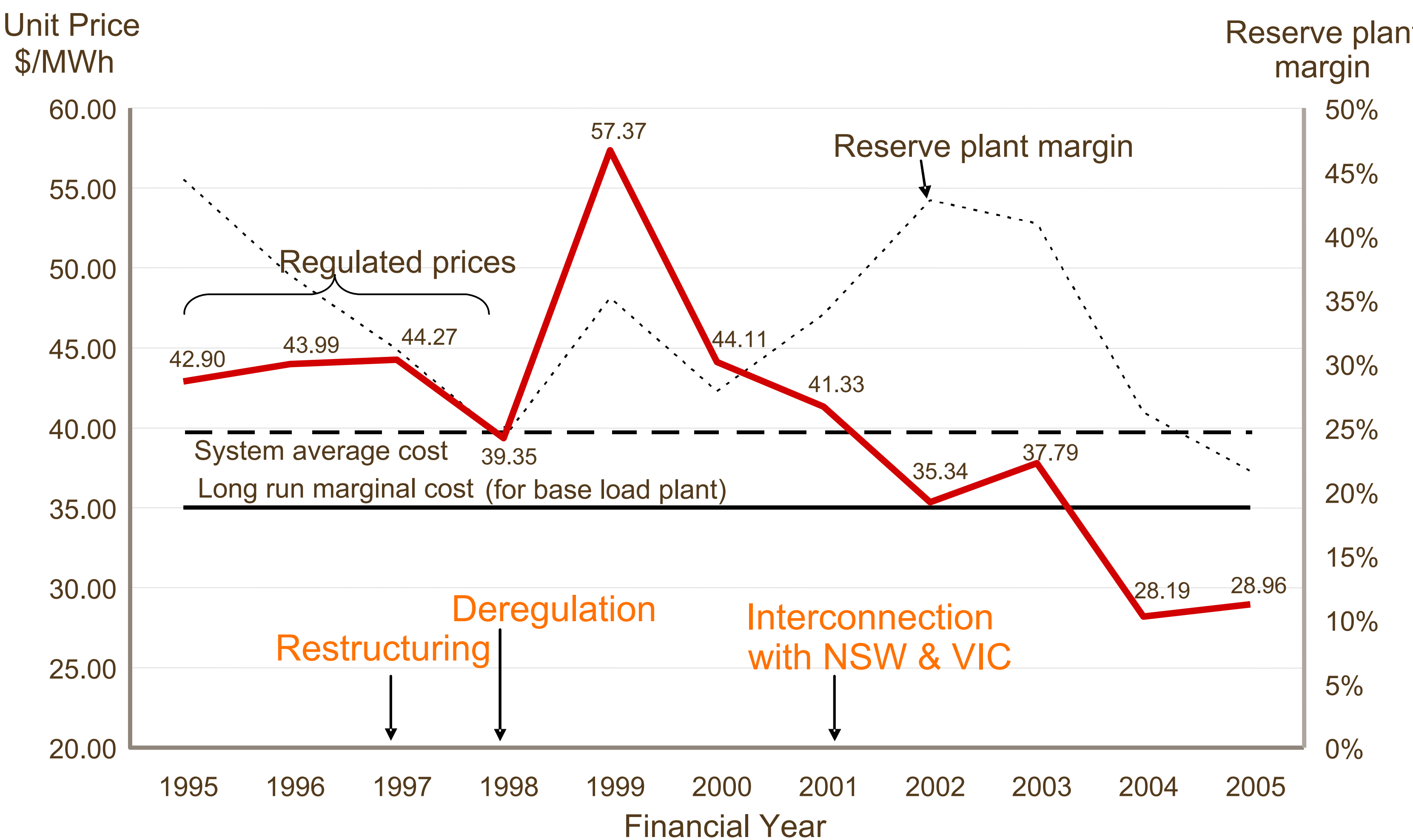
NEM Performance

- The NEM has, on balance, achieved most of its efficiency objectives:
  - Productive efficiency (costs have fallen);
  - Allocative efficiency (prices reflect competitive levels); and
  - Dynamic efficiency (oversupply has largely cleared).

Productive Efficiency (Qld example)



Allocative Efficiency (Qld example)



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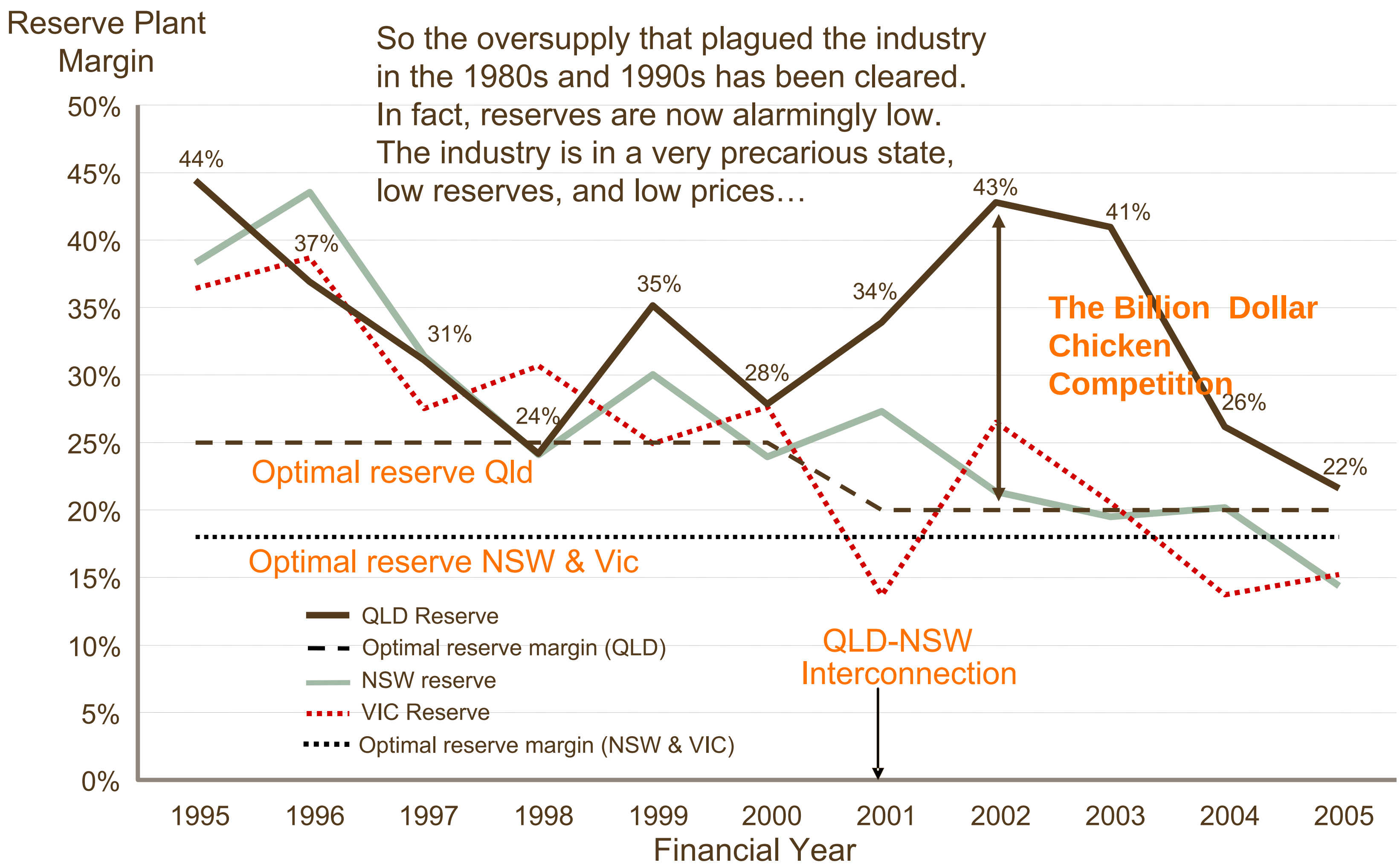
Dynamic Efficiency (Qld, NSW, Vic)



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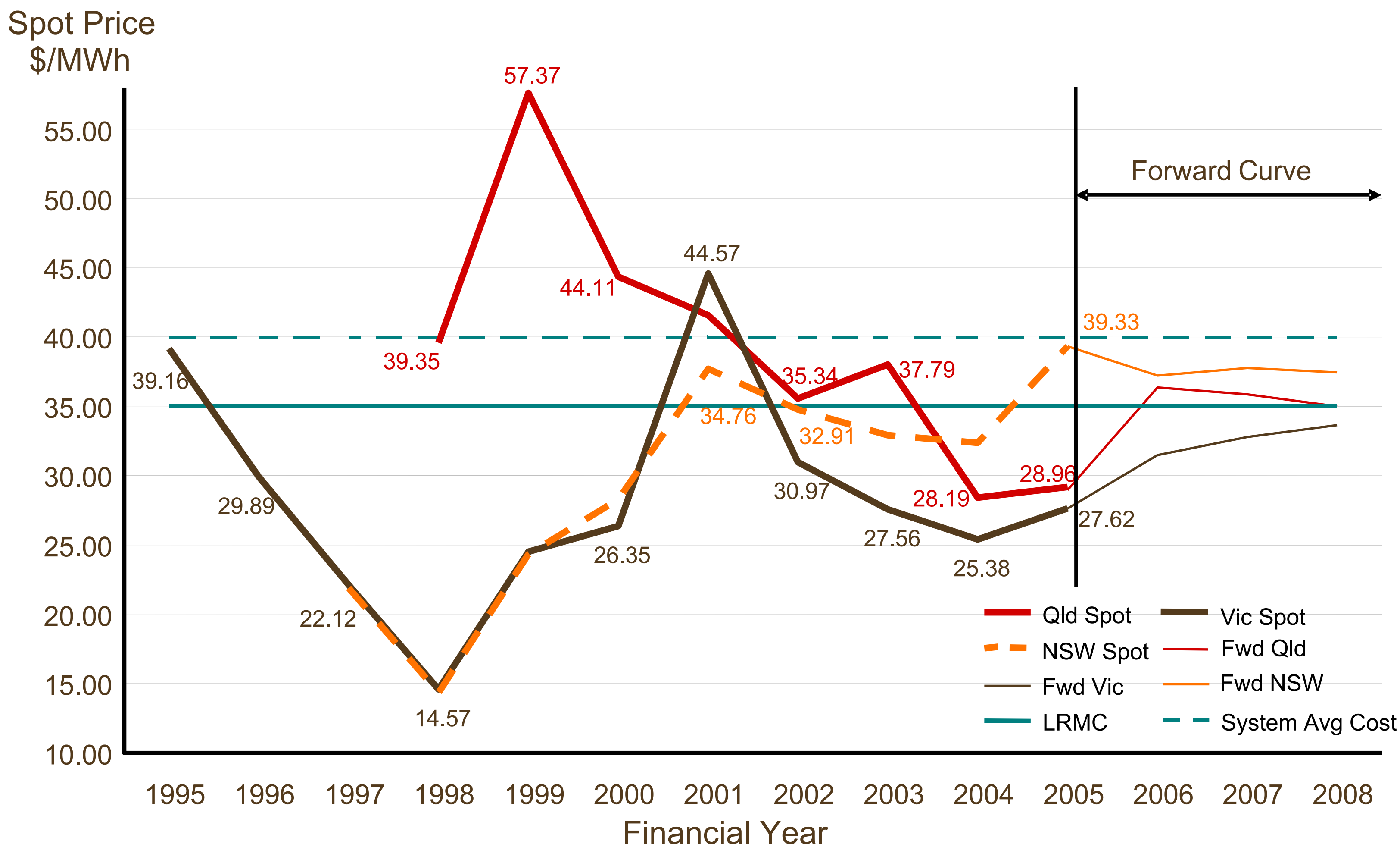
By 2005, Low Reserves, Low Prices…



Why Low Reserves & Low Prices?

- The NEM now comprises deep structural supply-side faults
- If NEM policy settings remain unchanged, the situation will almost certainly deteriorate
- So has reliability been a problem in the NEM?
- Not yet. Sufficient reliability in the NEM has been delivered via the oversupply inherited at inception, and a *billion dollar chicken competition* in Queensland…

But fundamentally, there is a looming problem in the NEM:

"Resource Adequacy"

1998 NEM Supply-side Structure

The plant stock at the start of the NEM was **overweight** base plant and **underweight** peaking plant:

NEM 1997/98	Optimal (MW)	Actual (MW)	Portfolio balance (MW)	
Baseload	20,400	24,500	4,100	*overweight*
Intermediate	2,000	2,100	100	*overweight*
Peaking	8,200	6,600	-1,600	*underweight*
Total	30,600	33,200	2,600	*oversupplied*

Value of the structural fault: $ 5.1 billion (13%)

Value of the asset portfolio: $43.9 billion

2005 NEM Supply-side Structure

At the aggregate level, oversupply has cleared quite significantly. But structurally, the situation is much worse:

NEM 2004/05	Optimal (MW)	Actual (MW)	Portfolio balance (MW)	
Baseload	23,300	26,700	3,400	*overweight*
Intermediate	2,300	3,200	900	*overweight*
Peaking	11,900	8,000	-3,900	*underweight*
Total	37,500	37,900	400	*oversupplied*

Value of the structural fault: $ 3.1 billion (7%)

Value of the asset portfolio: $49.4 billion

Note that the oversupply of base plant is just as bad (perhaps worse) than in 1998 – which helps to explain 'low reserves, low prices'

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As an important part of the NEM supply-side portfolio, peaking plant is drifting further and further away from optimality, while reserve margins are deteriorating

- This should be of critical concern to Government, Regulators, Consumers and Industry Participants alike.
- During 2006, the NEM received a much needed injection of peaking capacity via Laverton, Tasmania & Braemar. But…
- By 2015, the NEM will need an additional 9600MW of peaking plant if transmission system regulations remain in their current state.

So why does peaking plant struggle in the energy only market?

Hazardous Revenues

- In an energy-only market, peaking plant revenue is especially hazardous, and therefore merchant profitability is manifestly random
- Peak plant requires a continuous revenue stream of around $10-$11/MWh, whereas Option Prices fluctuate between $4-$20
- Compare this to base plant ($35/MWh) where swap prices fluctuate between $30-$40
- Little wonder that banks don't view peaking plant as *a dripping roast*
- The banks won't finance peaking plant in an energy-only market without suitable long-dated contracts
- Anecdotal evidence in England & Wales: +*7%* to WACC which means $10-$11 becomes $16-$17

Limited Long-Dated Contracts (FRC)

- Full Retail Contestability (FRC) compounds the situation - trading focuses on 1-3 years ahead

- Some academics are now questioning the economic logic of FRC as a result in E&W

- Peaking plant can still enter with FRC, but it requires courageous retailers

- There are a few around, but they bear a heavy burden: consumers and competitors free-ride from the internalisation of a serious market externality (adequate reserve in an energy-only pool is *actually* an externality):

  …..As is well known from standard economic text books, the presence of a large externality is one of the problems that a market cannot, by itself, deal with; and, if left alone, such an externality will be a predictable cause of market failure…

VI Entities Hinder rather than Help

- VI Entities are indeed capable of banking peak plant (own project or by contract) but this does not guarantee resource adequacy for the system, only their own load
- Portfolio generators generally withhold some of their capacity for self-insurance (see for example Anderson, Hu & Winchester 2006)
- This can help pull capacity into the market a tad earlier than otherwise might be the case
- VI entities have a lesser requirement for insurance because of their ability to offset outages with DSM (understandably)
- Thus the delivery of system reserves is less likely to occur under VI entities than with portfolio generators
- Note: This should not be construed as an economic argument against VI. VI is simply a natural outworking of the current institutional arrangements (energy-only)

Energy-only Markets are Inherently Unstable…

- It has long been accepted that SRMC bidding does not lead to the recovery of reasonable costs where a reliability constraint exists
- To see why this is the case, consider the scenario of the perfectly optimal mix of plant, a competitive market, VoLL of $10,000 and a reliability constraint in Qld, NSW and Vic/SA
- We start by determining the optimal plant mix: the framework first devised by CEGB Chief Economist Tom Berrie in 1967

Generation technology	Capital cost ($/kW)	Unit size (MW)	Variable O&M ($/MWh)	Fixed O&M ($M pa)	Useful life (Yrs)	Heat rate (kJ/MWh)	Fuel cost ($/GJ)	Unit clusters (#)
SCpf	1,500	660	-	22.5	40	9,500	1.00	2
NGCC	1,050	375	2.50	4.5	30	7,100	3.25	1
OCGT	750	160	3.00	2.0	30	11,500	3.50	3

Cost of capital 11.0%

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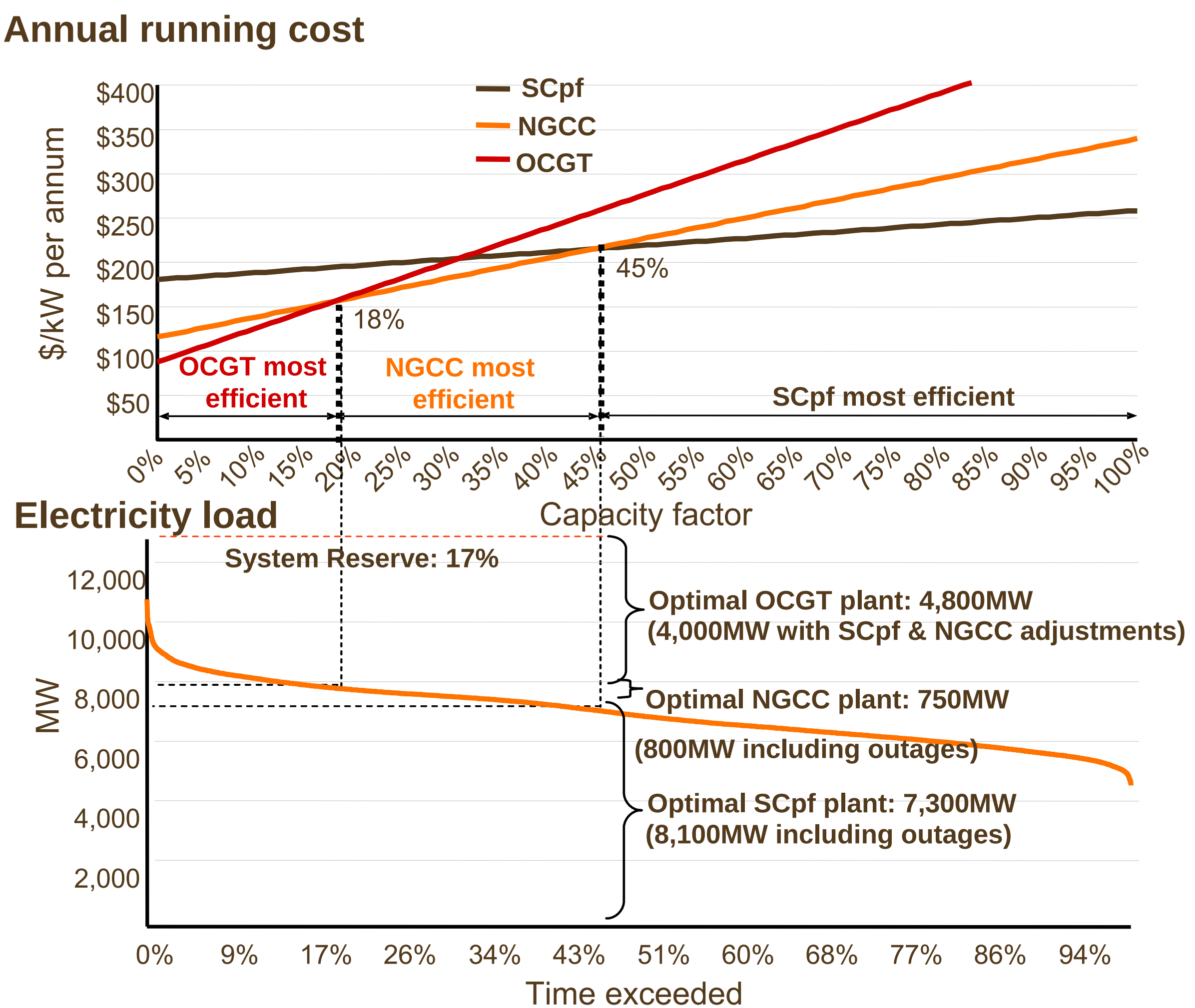
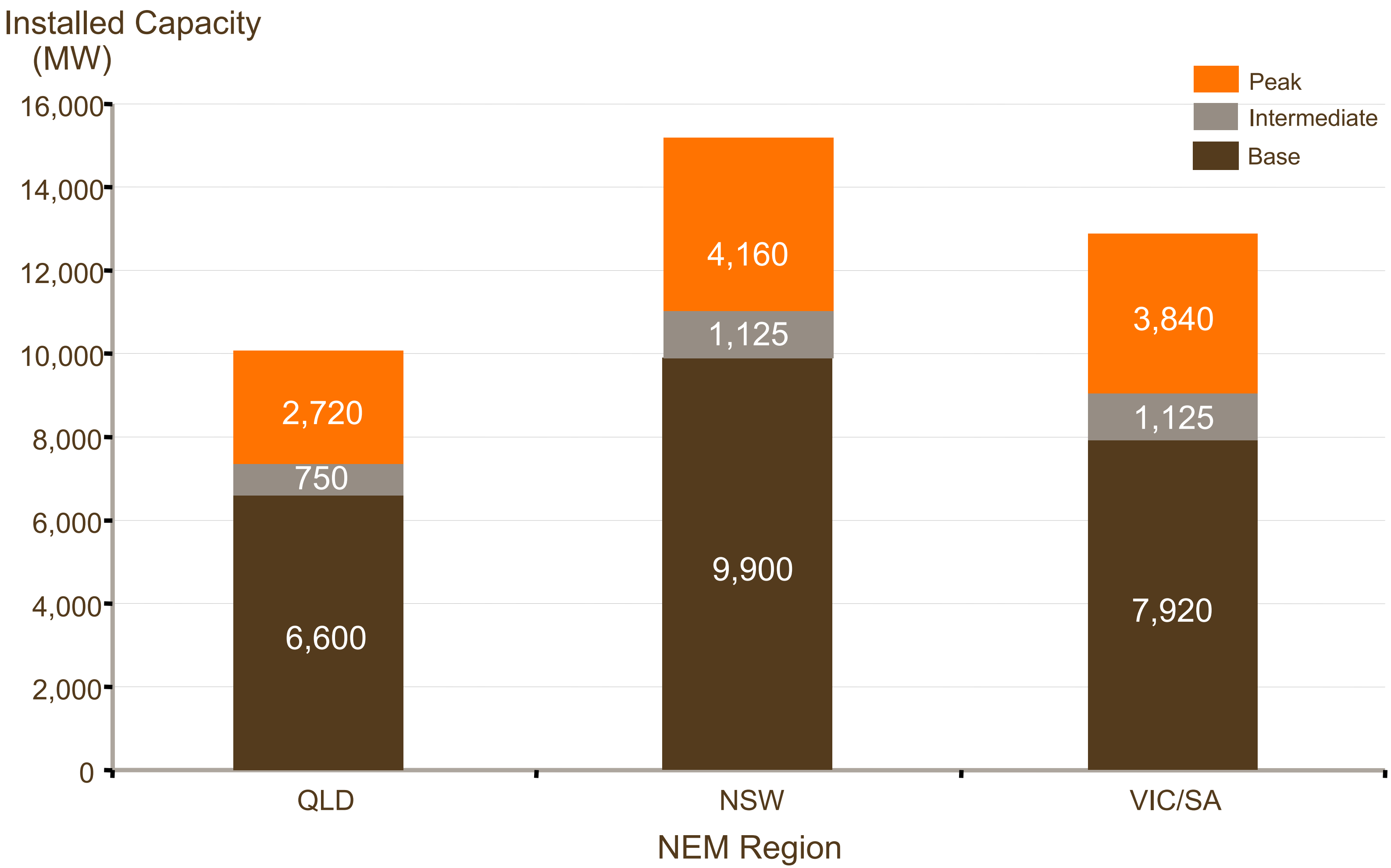
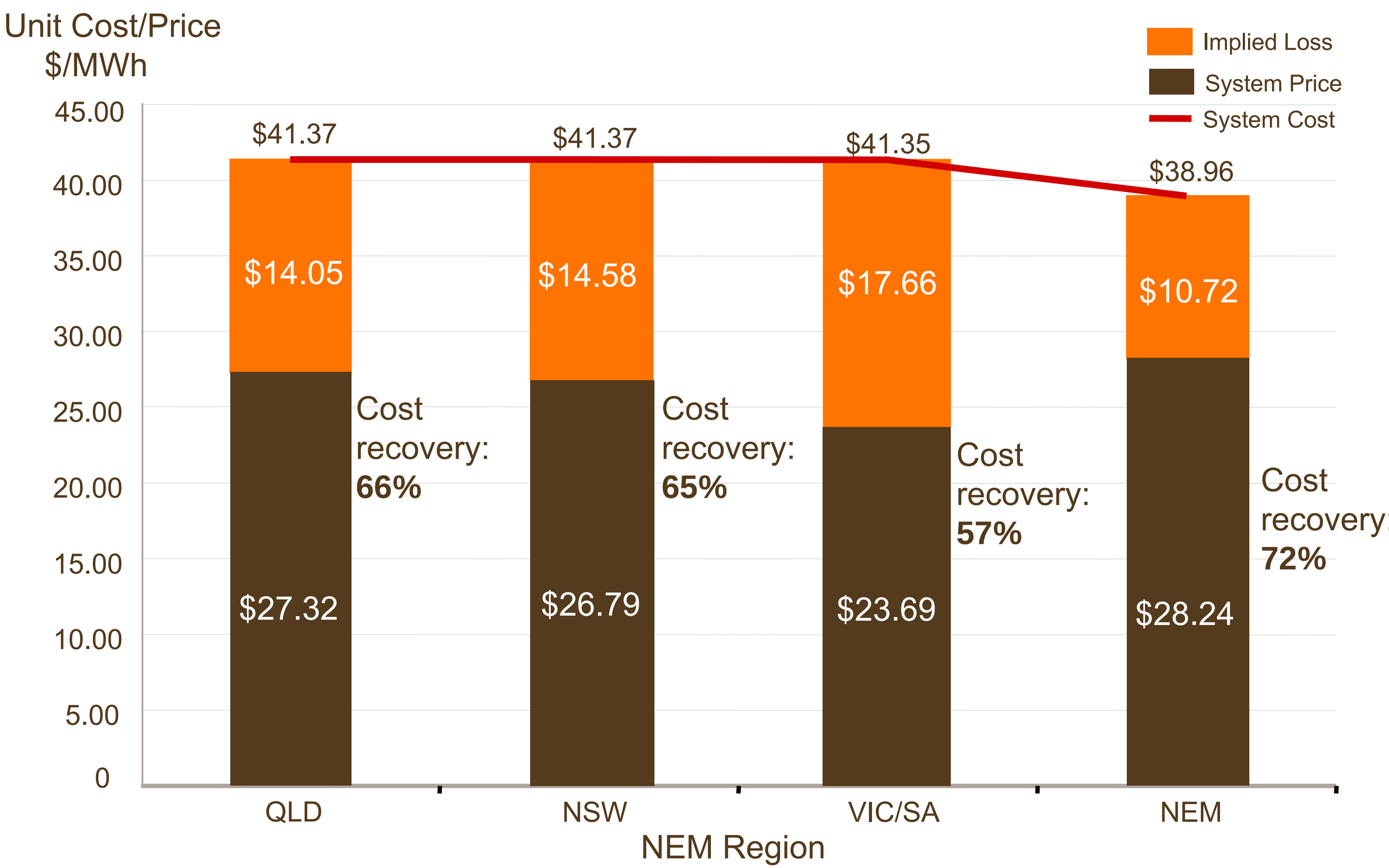
Static Partial Equilibrium Analysis for Vic/SA 2005



Optimal Plant Mix by Region 2005 (Indivisible Plant)



System Cost v Competitive Price



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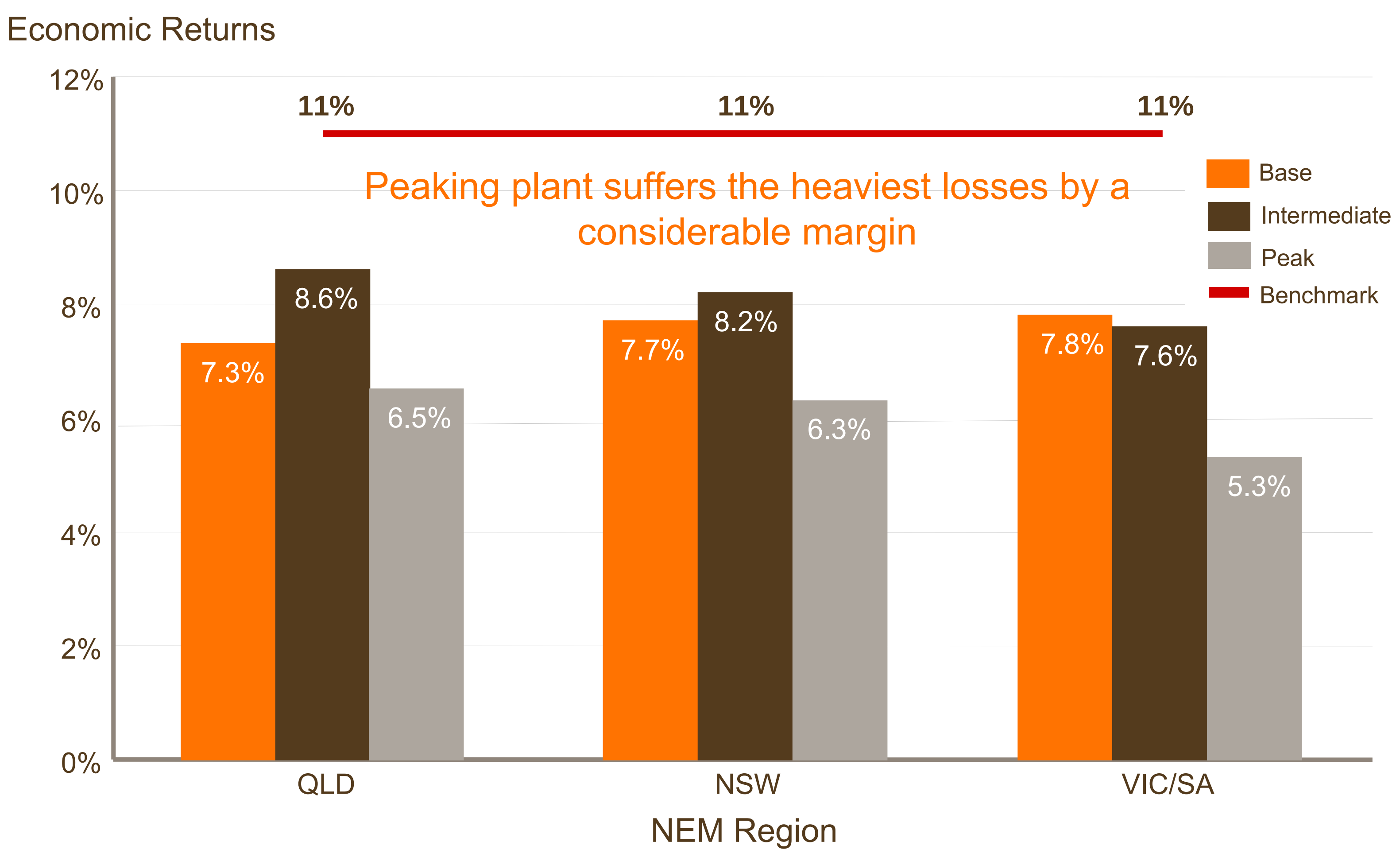
Actual v Benchmark Returns (with an optimal plant stock)



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This explains why peaking plant has slipped from last place

(underweight 1600MW in 1998)

To very last place

(underweight 3900MW in 2005)

Energy-only Markets

- Dynamic system modeling clearly demonstrates that a competitive energy-only market with a reliability constraint:
  - Does not remunerate any technology adequately
  - Does not have a definable equilibrium under growth conditions (with perfect plant mix let alone deviations)
  - Is therefore an inherently unstable market

- The manner in which plant have thus far achieved remunerative pricing is through the transient exercise of market power (which is considered ‘Bad VoLL’ by stakeholders)

- There are two alternatives:
  - Raise VoLL to levels dramatically higher than $10,000 (‘Bad VoLL’ - intolerable risk to all Participants)
  - Allow system reliability to deteriorate by a factor of 2½+ times the current reliability criteria (‘Good VoLL’ but intolerable situation to Consumers & Government)

Inherently Unstable?

- So, why has the NEM not experienced a melt-down?
- There are four reasons:
  - The NEM inherited an exceptional (and grossly oversupplied) monopoly plant stock at inception – but this has now largely cleared
  - Queensland delayed the impact via the *Billion Dollar Chicken Competition* between 1998 - 2001, and again in 2003 – 2004
  - The regions have been lucky with weather – recent extreme weather events have tended hit non-work days (e.g. NSW on New Years Day, Qld last Sunday)
  - Market power has been exercised (but invariably attracts substantial regulatory and political attention and is therefore not sustainable either – for example, the re-bidding witch-hunt)

THE SOLUTION?

Shift to an energy and capacity market

and reduce VoLL from $10,000 to $2,000

Origins of Capacity Payments

- EdF Chief Economist Marcel Boiteux wrote a seminal paper in 1949 on how to set efficient prices in large thermal power systems
- Set marginal energy prices, and pay all plant the carrying cost (i.e. fixed costs) of the load following unit in peak periods – this results in all plant ‘just’ turning a profit
- For the NEM, this translates into paying the carrying cost of an Open Cycle Gas Turbine
- Combining Boiteux’s (1949) Pricing theory with Tom Berrie’s (1967) Optimal System Cost theory, a tractable equilibrium solution can be obtained…

Capacity Market

1. Introduce a Capacity Payment Pool, with payments equivalent to the carrying cost of an OCGT ≈ $10.70 per MW per hour (i.e. Fixed capital and operating cost of a highly efficient OCGT Plant).

2. Administratively determine the Reserve Plant Margin required for a region (e.g. Vic/SA: 17%).

3. Create a Capacity Payment Pool, multiply optimal plant capacity by OCGT carrying cost, and pay to generators based on availability.

4. Reduce VoLL from $10,000 to $2,000.

5. Maintain all other aspects of the NEM Gross Pool Model…

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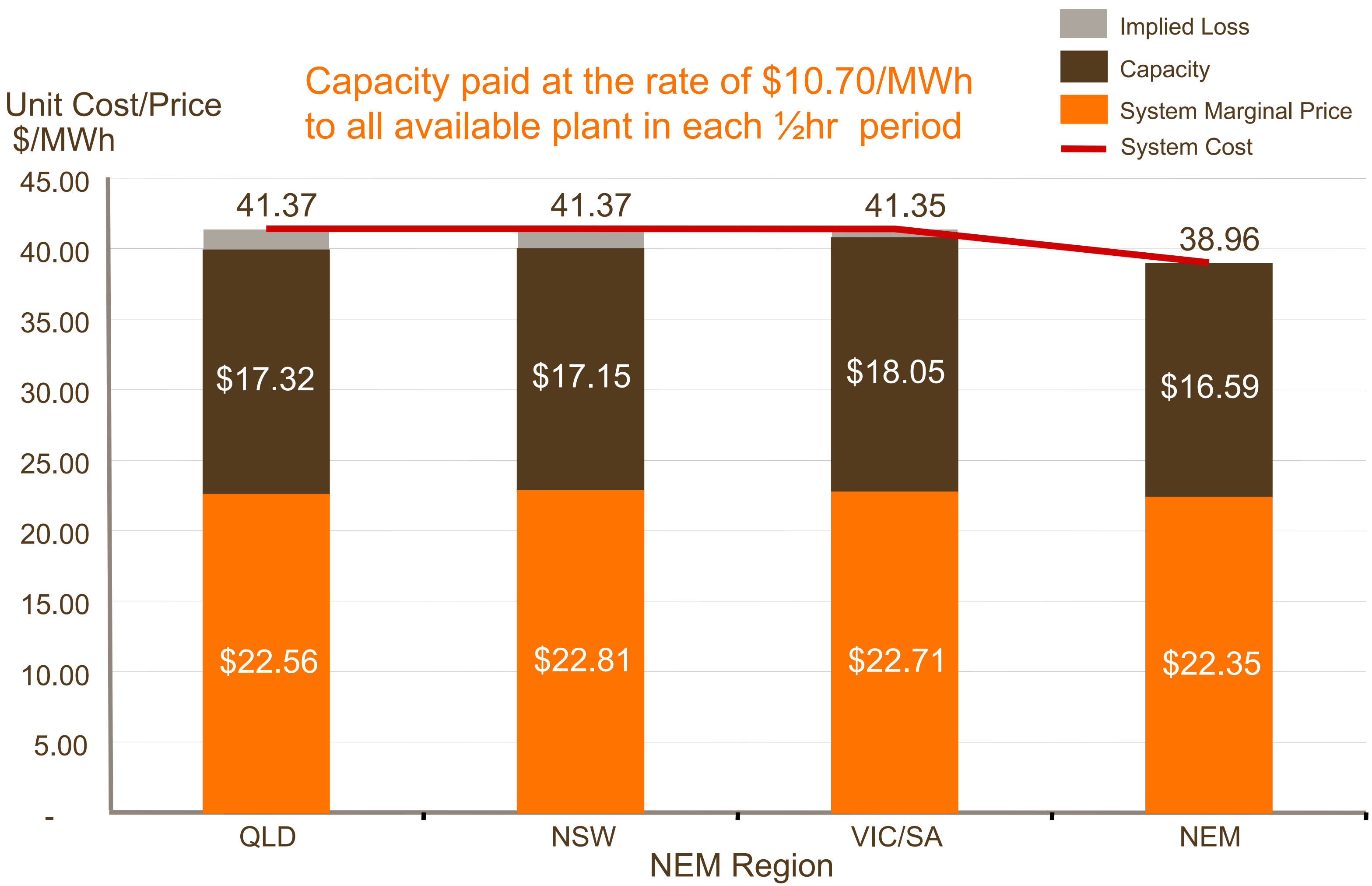
System Cost v Competitive Price



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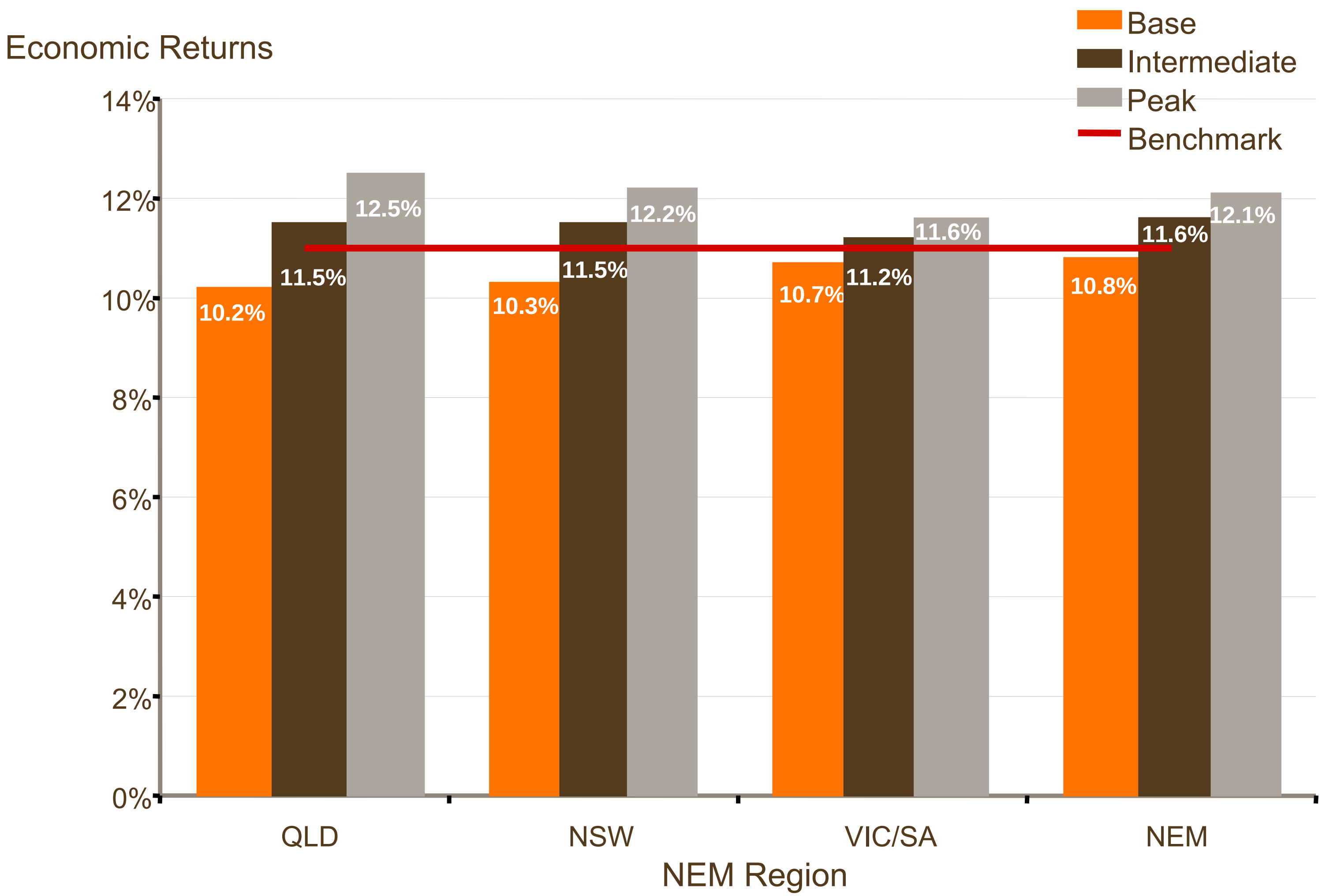
Actual v Benchmark Returns



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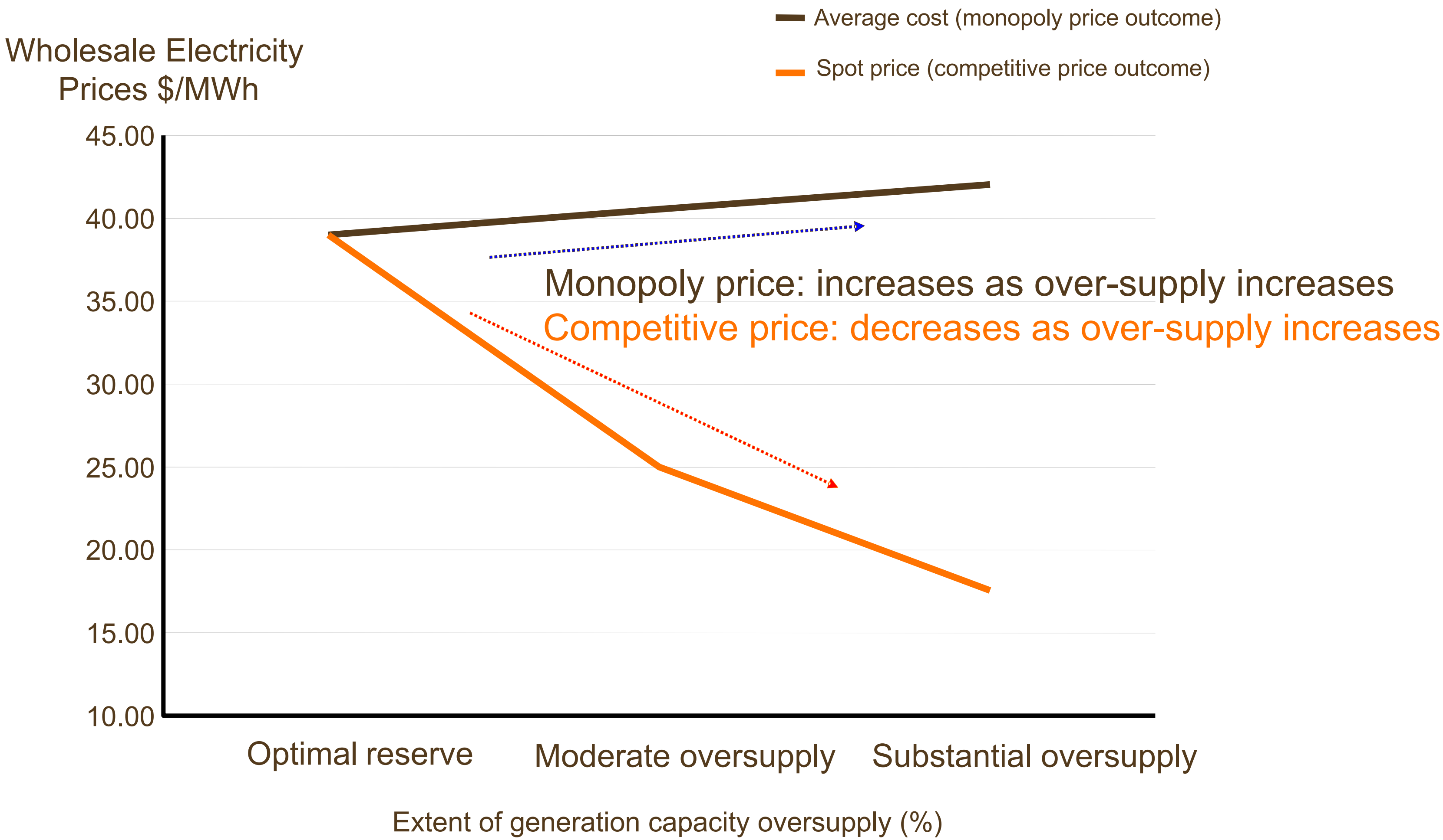
Dynamic Behaviour of Cap Pmts

- Financial results seem to have a slight bias towards peak plant and intermediate plant
  - This reflects the underlying availability assumptions (base plant being lower by 2%)
  - But as one reviewer put it to me, this is perhaps an appropriate outcome, peak and intermediate plant remain riskier propositions because their profitability will still face residual exposures to weather, base plant availability, and the consequences of take-or-pay fuel contracts

- It is nonetheless important to test the dynamic behavior of the model under conditions of oversupply and supply shortages, both in aggregate and structurally

- What we would expect to see:

Allocative Efficiency is Easy to Pick



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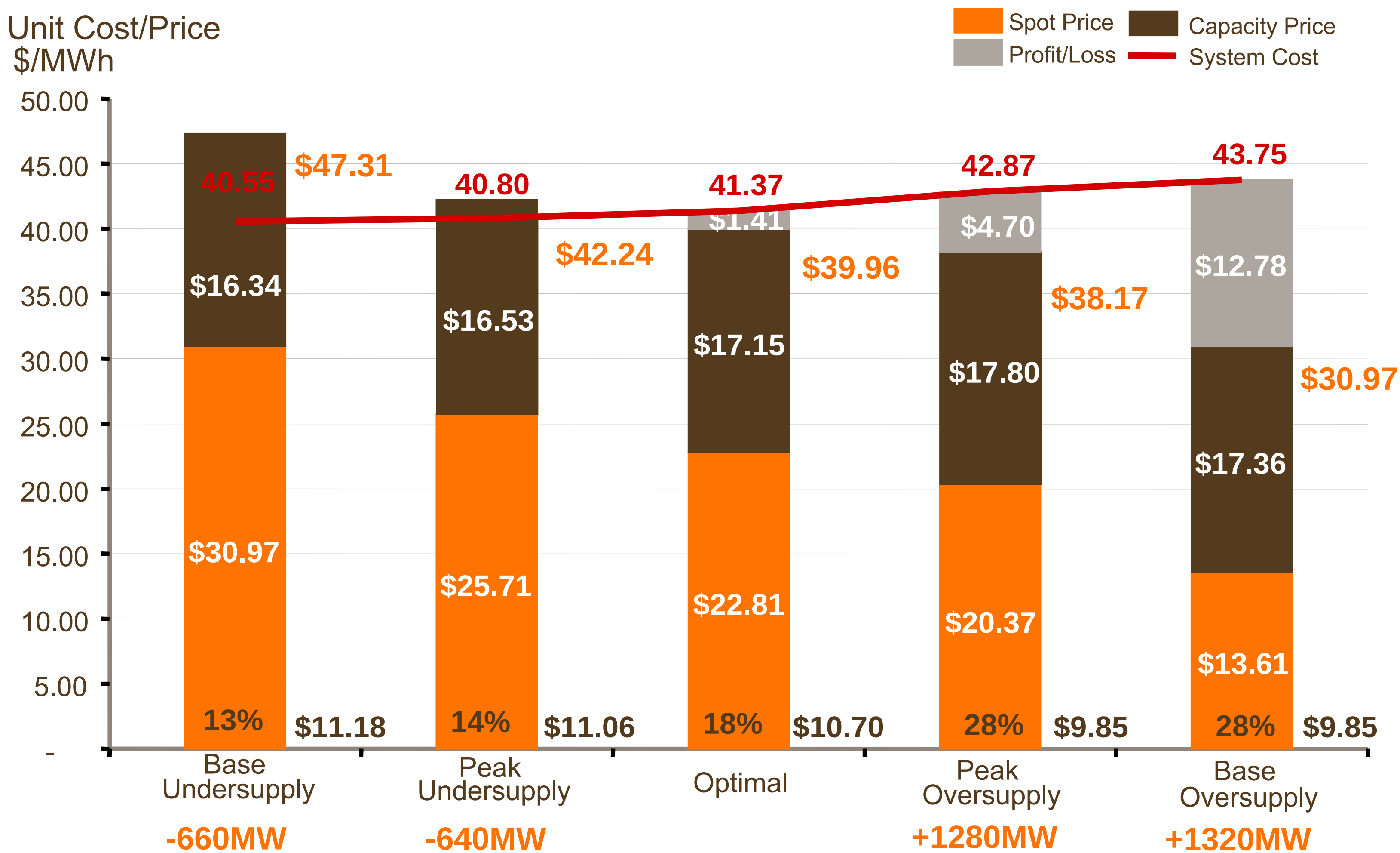
Model Results: Over/Under Supply



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Volatility reduces accordingly

New South Wales region	Energy-only VoLL at $10,000	Capacity + VoLL at $2,000
Undersupplied (-660MW)	$55.60/MWh	$47.31/MWh
Oversupplied (+1320MW)	$15.10/MWh	$30.97/MWh
Volatility:	0.55	0.21

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But all this requires a major ideological shift by the Industry

- Fundamentally, this involves administratively (as opposed to market) determining the reserve plant margin: after all, it's virtually a public good

  …it is necessary to have an external authority to act on the behalf of electricity consumers to determine an appropriate (joint) level of system-wide reliability and to ensure that there is an adequate level of system capacity. In this sense, power system reliability is somewhat like national defense. Each citizen cannot individually provide their own national defense. Nor can people have different levels of national defense. They must collectively decide what they want, and then appoint some authority to achieve it…

- Markets fail and it's Government's role to fix them

Sectoral Interest

- State Govt: provides that 'lever' they are all missing, and eliminates the reasons for Government Ownership of Generation & Retail
- Consumers: delivers price stability, and a market with a tractable equilibrium
- Retailers: reduces risk, eliminates the need for *courageous retailers*, and the ability to free ride on the actions of another retailer
- Generators: delivers an equilibrium market with reduced risk of political and regulatory interference (e.g. re-bidding)
- Stock & Bond Holders: the higher (risk-adjusted) return associated with the merchant power industry will no longer be illusory i.e. reduced interference risk

Conclusions

- Energy-only markets do not have a definable equilibrium. They are therefore inherently unstable

- Adequate system reserve is a large externality

- Economic theory has long been relaxed with the notion that large externalities are a predictable cause of market failure

- But the market has not failed thus far due to the fact that the NEM inherited an excellent and oversupplied Utility-Built plant stock (SECV, ELCOM, SNOWY, QEC etc)

- Queensland added its' Billion Dollar Chicken Competition

- However, the 'oversupply party' is just about over. From here on in, the hang-over starts…

Conclusions

- Peaking plant has not been forthcoming, and adequate peak plant (in a timely manner) is most unlikely
- Peak plant is least profitable in a competitive energy-only market with a reliability constraint
- Boiteux's (1949) theory of electricity pricing provides a robust solution: marginal system price with a capacity payment (reduce VoLL)
- But this cannot be implemented quickly
  - Quick change of itself could be seen as regulatory risk in another form
  - This requires a 5-year implementation plan
  - Importantly, the Cap Payments need to be structured much more elegantly than my flat payment solution – the $10.70 payment would be too vulnerable to gaming by large portfolio generators