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On Emissions Trading
CEDA
9 May 2007

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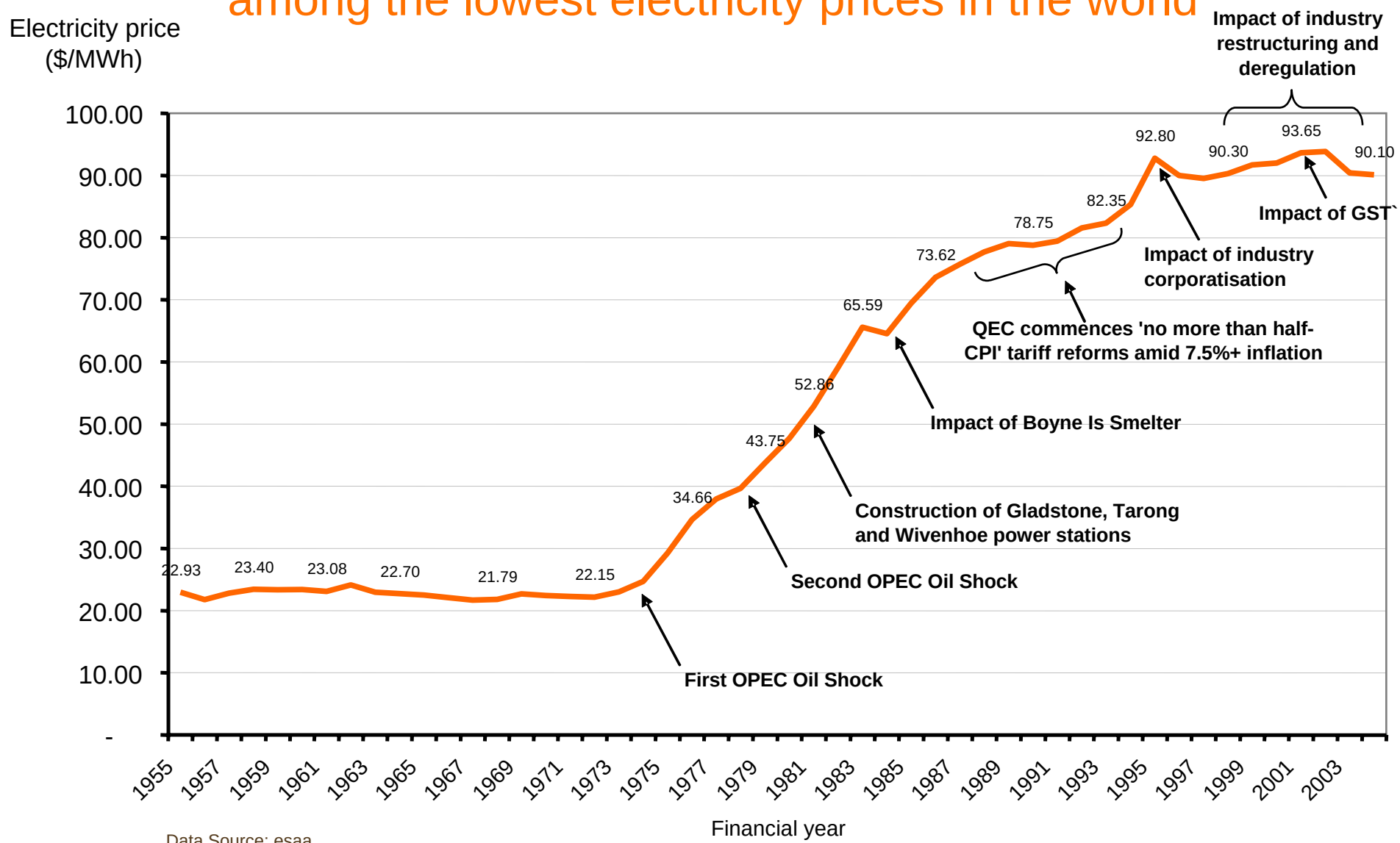
Emissions Trading – the quick overview

- Who will be included? Power Generators, <100 sites, >35% emissions
- Who should be included? As many industries as possible
- Who will be excluded? Trade-exposed industries (with some justification)
- When is it likely to start? No earlier than 2010
- What sort of scheme? Probably Cap and Trade
- What price should Carbon Trade at? $16/t+ to make an impact
- What will the penalty (max) price be first up? Probably $15/t
- Who will be near-term impacted? Electricity generators (sharp impact), domestic electricity consumers (moderate impact)
- Who will be long-run impacted? Electricity generators, industrial electricity consumers
- Any policy issues that have a “ticking device” attached? Yes – the vexed matter of permit allocation (Auction vs. Grandfather)

50-year history of electricity prices in Qld: from 1993, among the lowest electricity prices in the world



Data Source: esaa

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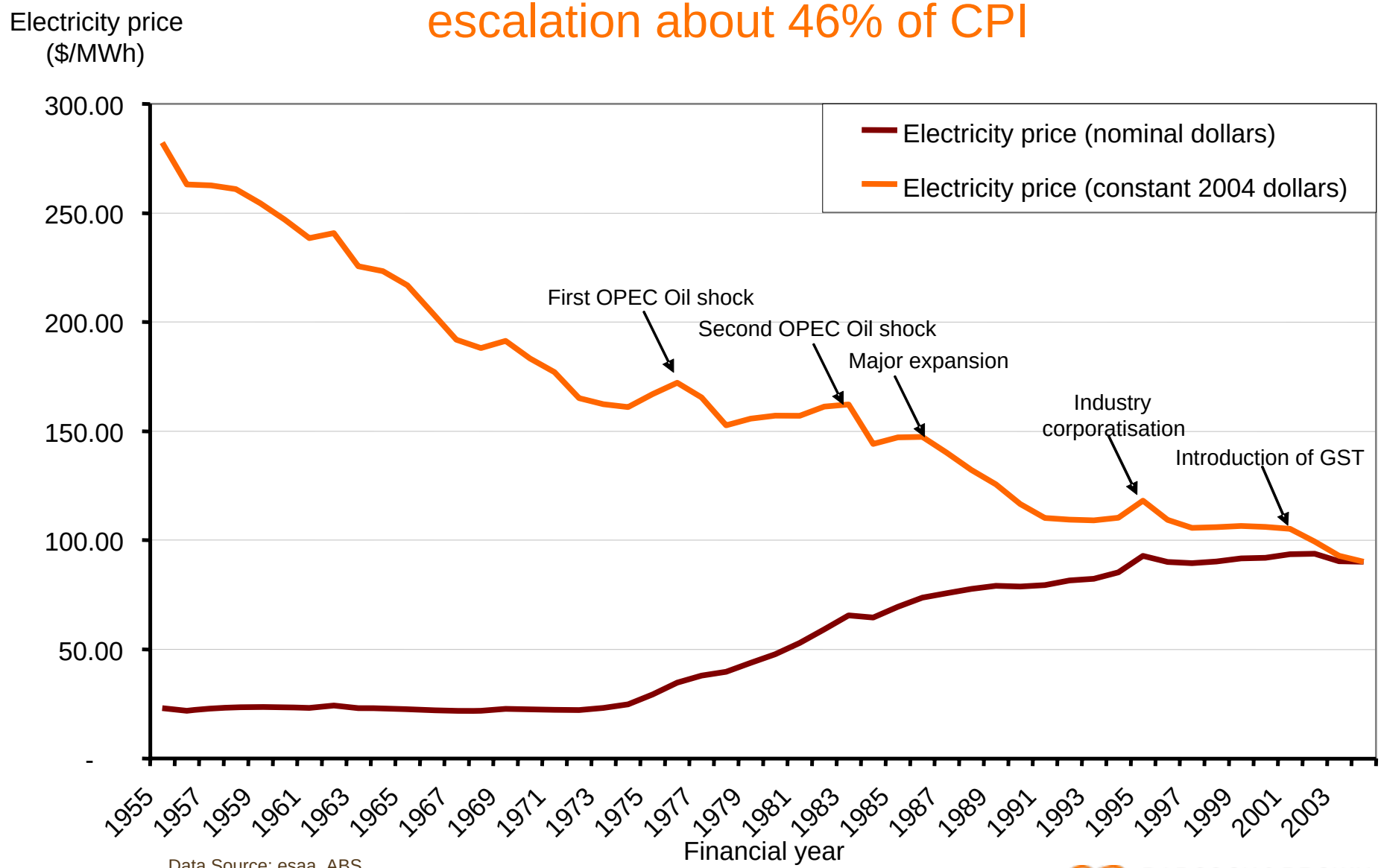
Over 50 years, prices have fallen in real terms escalation about 46% of CPI



Data Source: esaa, ABS

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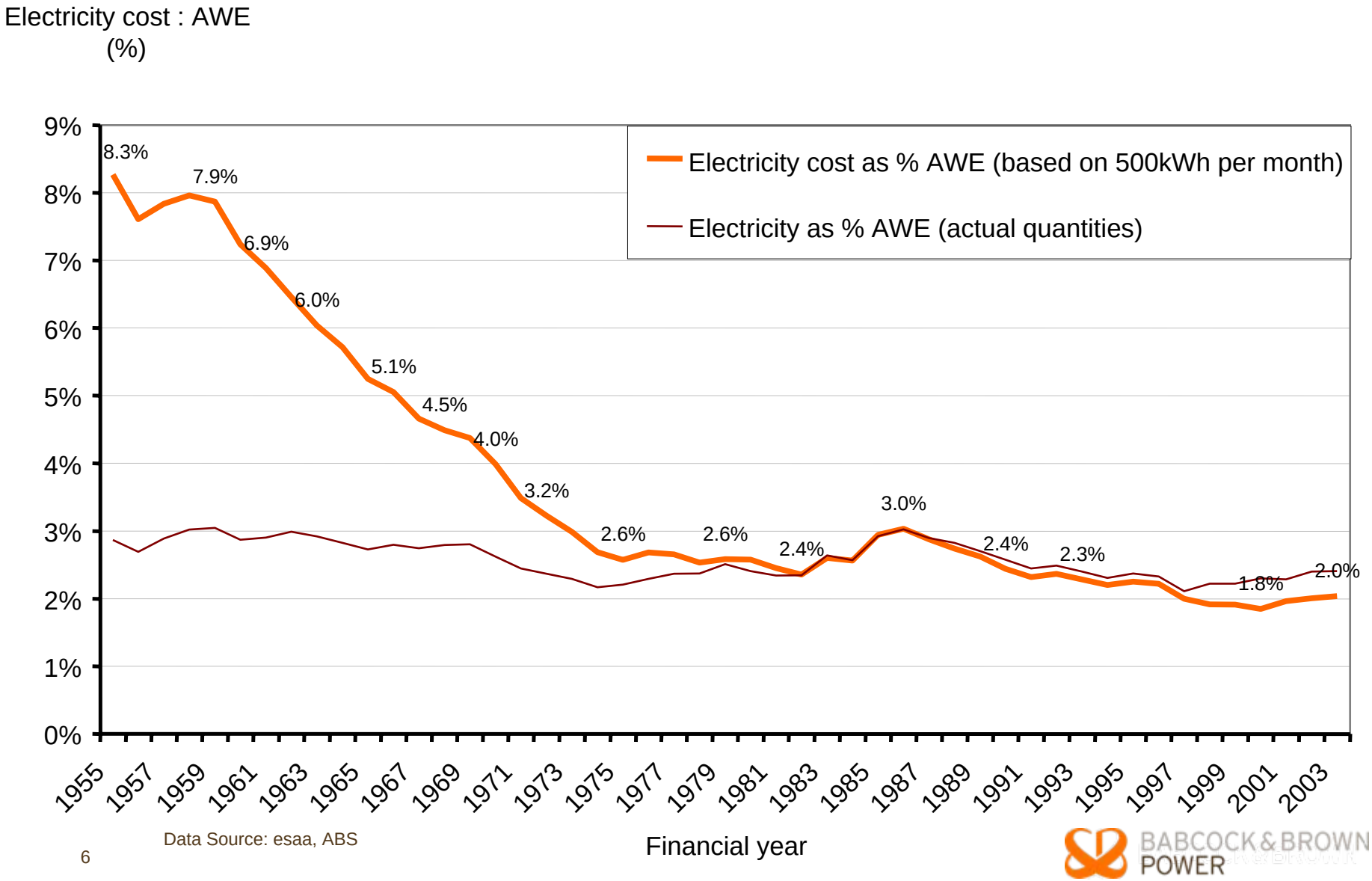
Despite ever rising demand (70% increase in 10 years by SEQld'ers) electricity has never been cheaper…



Data Source: esaa, ABS

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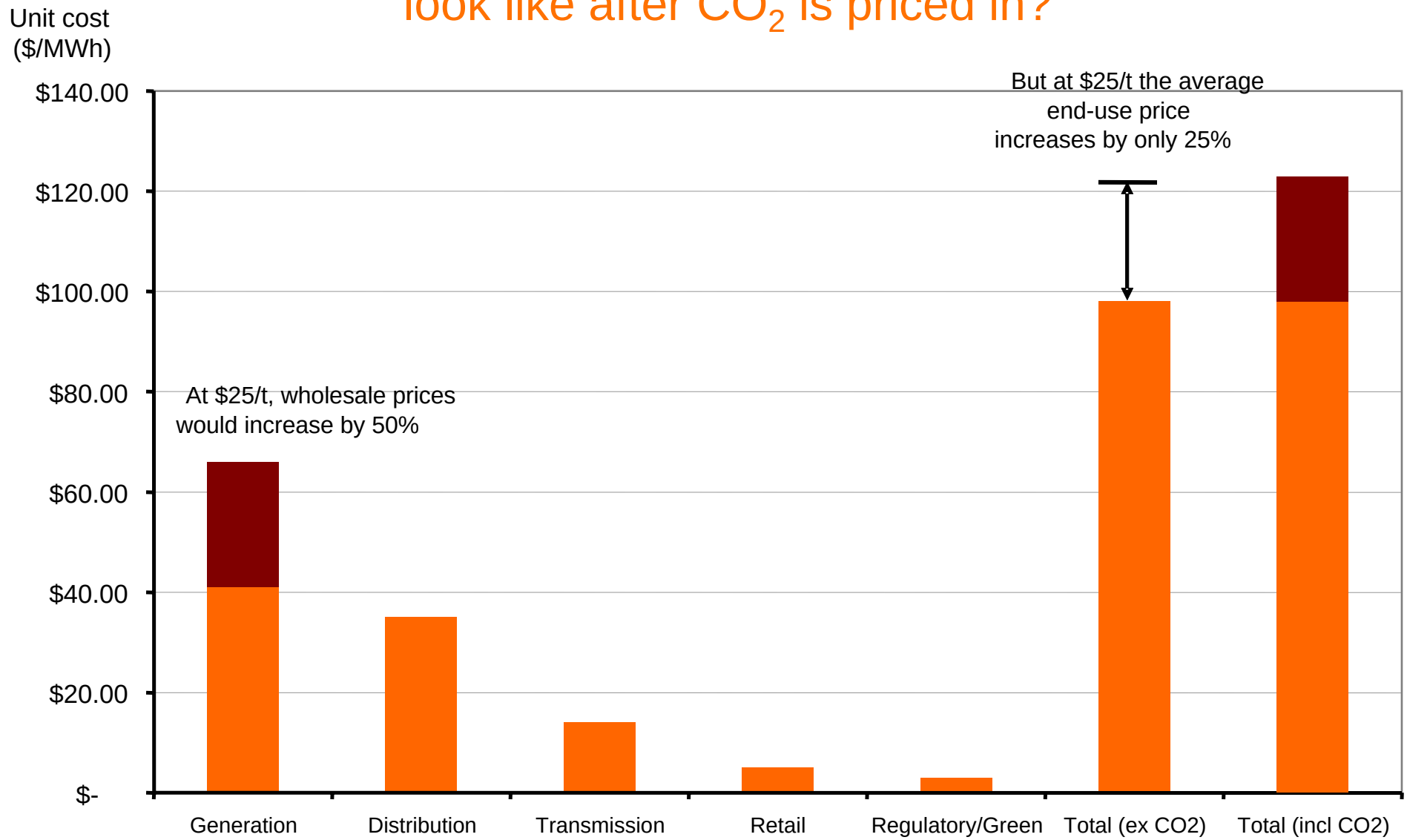
So what makes up the cost of electricity, and what will it look like after CO_2 is priced in?



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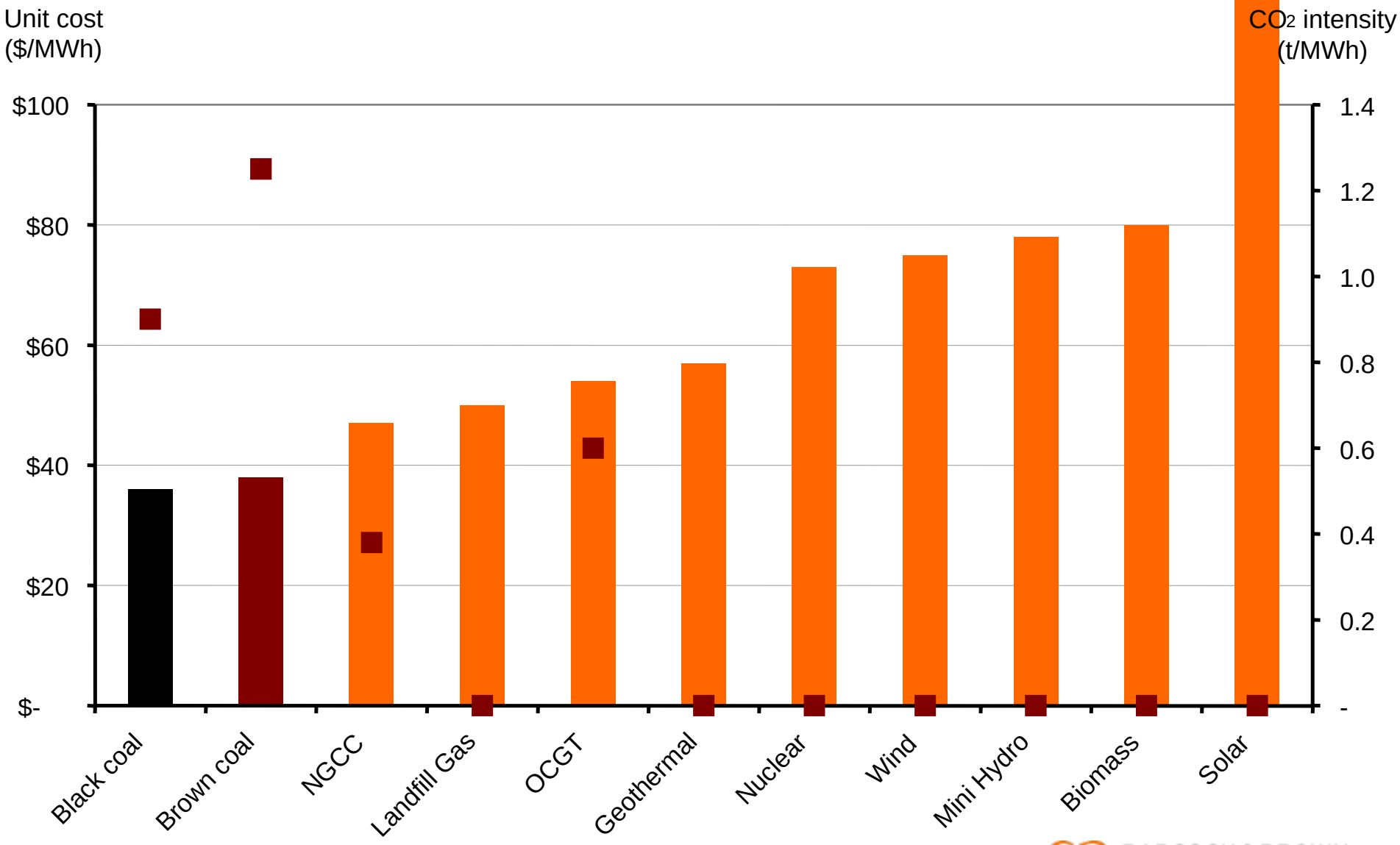
Why don't we just go renewable? Cost & availability…



Data Source: BBP

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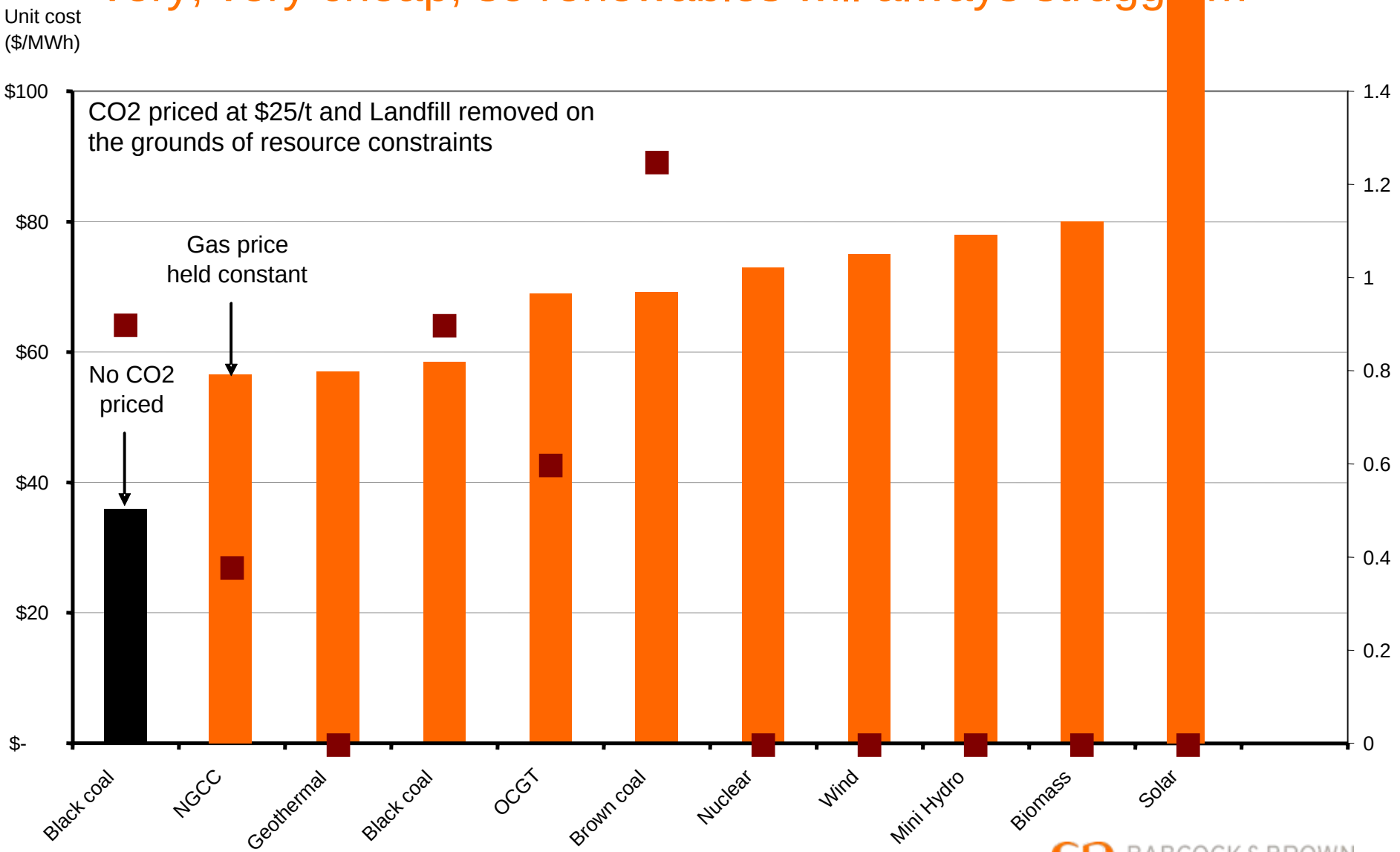
When CO_2 is priced, it helps… But east-coast coal is very, very cheap, so renewables will always strugg…



Data Source: BBP

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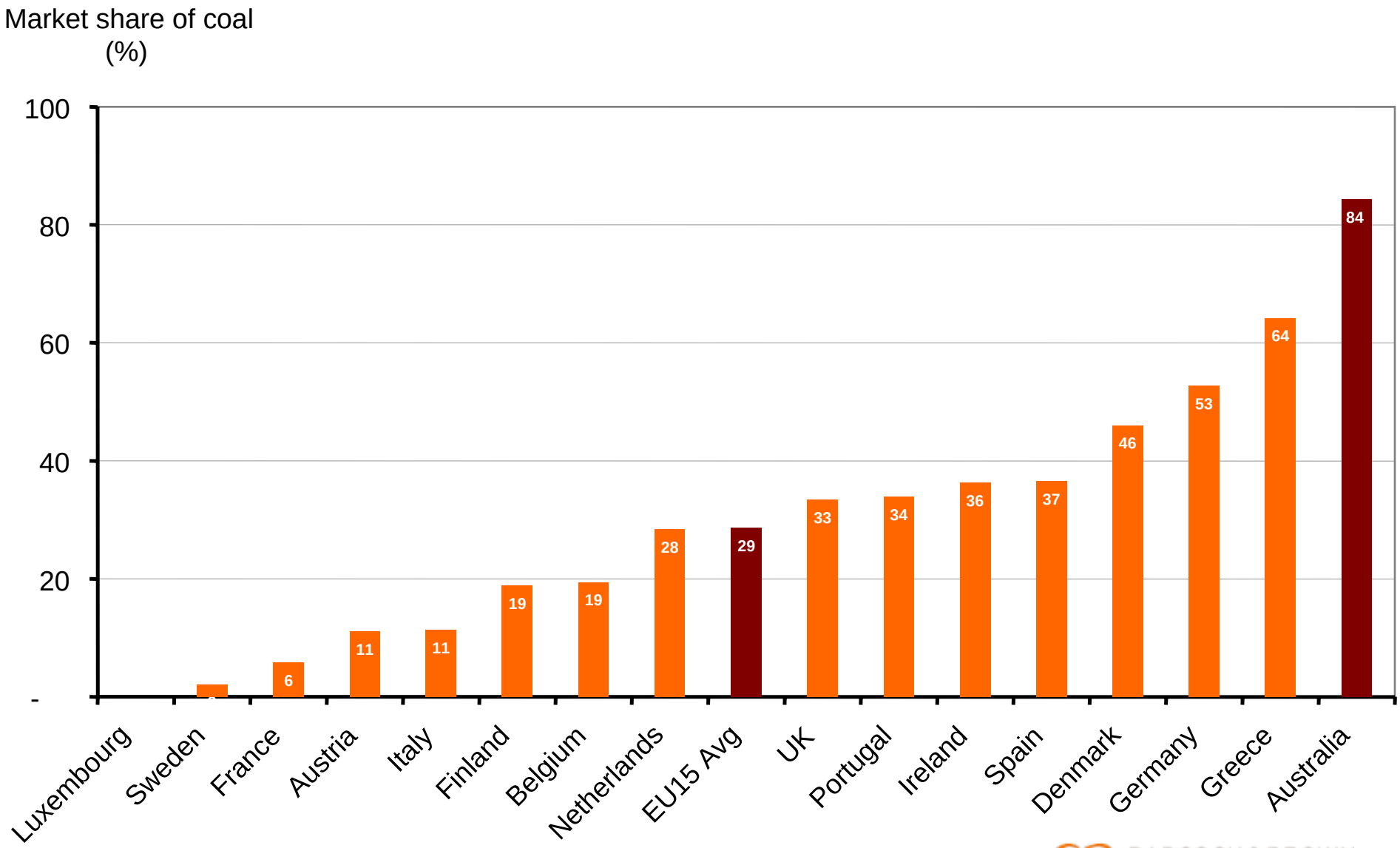
GETTING EMISSIONS TRADING POLICY SETTINGS RIGHT

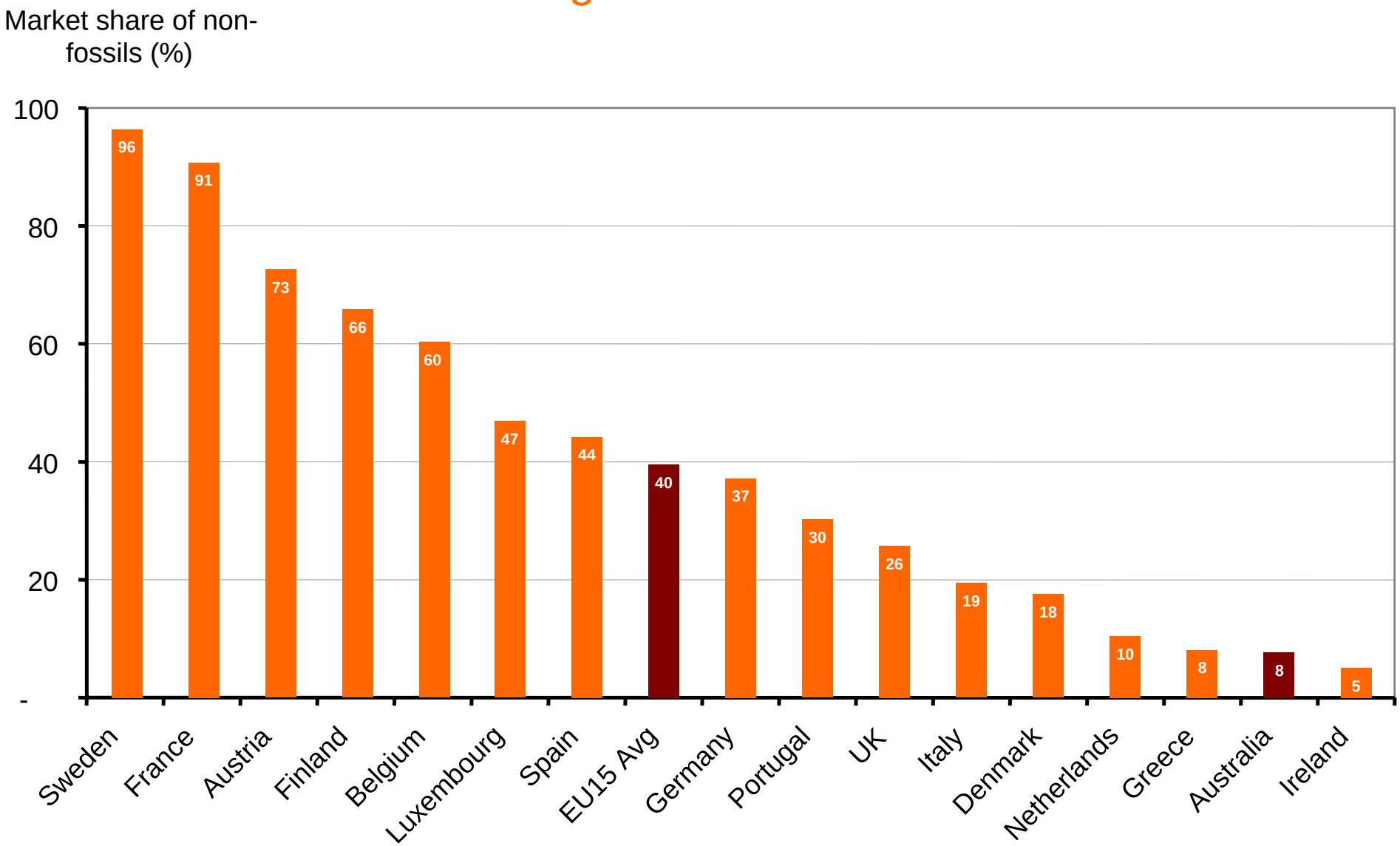
- Emissions trading, by way of auction allocation, necessarily brings about very substantial wealth transfers
- In the Euro-Zone, permits were “Grandfathered” (i.e. allocated for free) to power generators in order to minimise wealth transfers
- This led to so-called ‘windfall profits’ in the generation sector and hence the policy of Grandfathering has since become exceedingly unpopular with policy makers
- But it is important to examine EU15 results carefully, they don’t translate to Aust “neatly”:
  - In Germany, the Bundeskartellamt claimed that if *work-on rates* exceeded 25% then windfall gains existed because permits were allocated for free
  - In Germany, permits allocated (382mt) were greater than production (373mt) because policy makers included plant earmarked for closure in the allocation process
  - In Spain, the two dominant generators (80% market share) control all of the nuclear and hydro power, which constitutes 50% of energy… under such conditions, supra-normal profits would arise whether emissions were Grandfathered or Auctioned
  - In Europe, natural gas prices went from €3.05 to €5.70 (i.e. $5/GJ to $9/GJ) just as emissions trading was implemented
  - Windfall profits must be gauged against a suitable time dimension: If the economic (as opposed to technical) life of a generator reduces from 30 years down to 5-10 years, benchmark WACC returns rise from 11%pa to 23%pa
  - Coal in EU15: 28% market share. Coal in Australia: 85% market share. This is a very important difference -

Coal-fired generation: market share in the EU15



Data Source: IEA, esaa

Non-fossil generation: market share



Data Source: IEA, esaa

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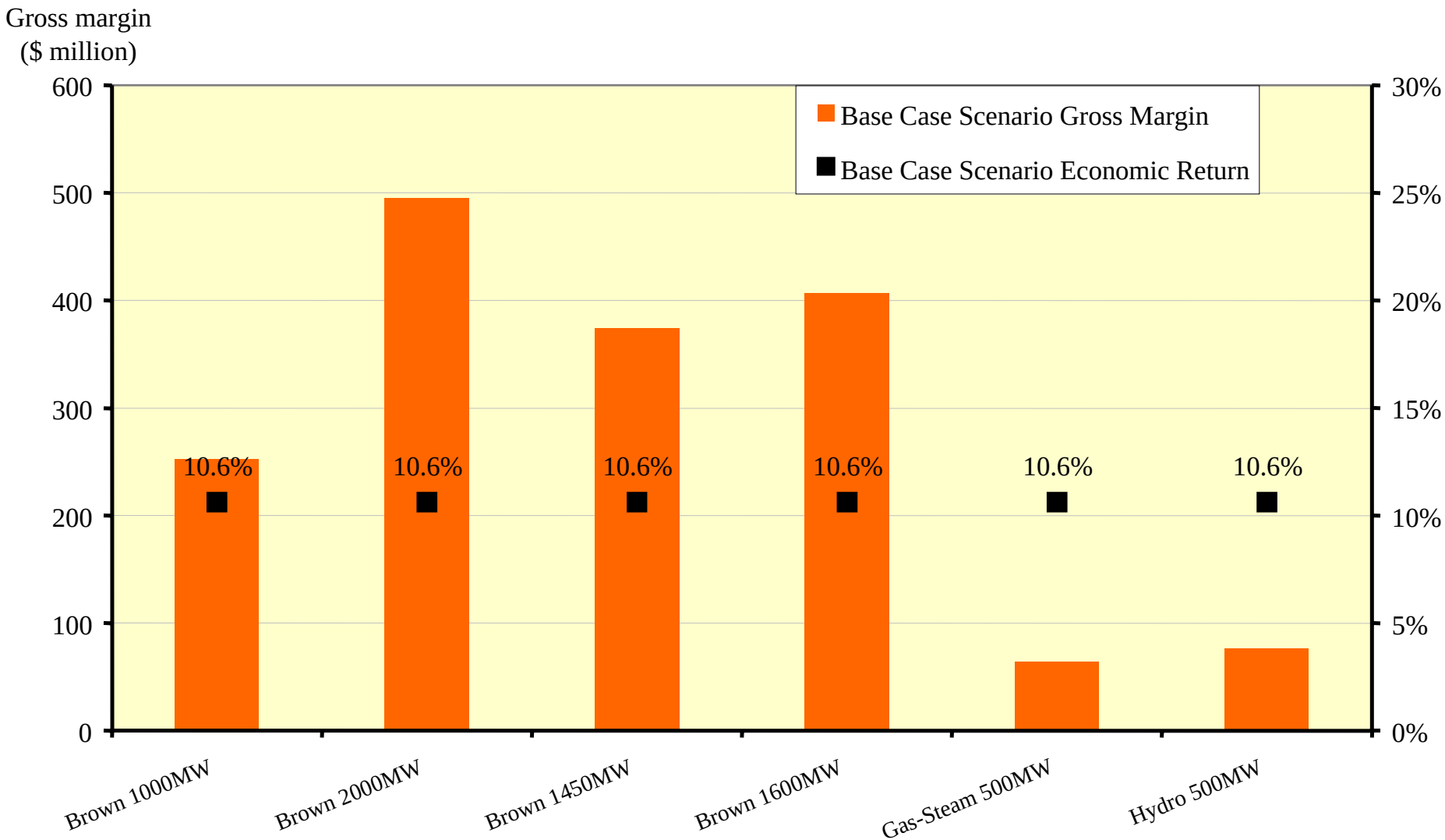
Add-On Rates & Work-On Rates: who wears the cost?

- In theory, generators aim for a 100% *add-on rate* but in practice only 70% is likely due to technical limitations and fuel constraints
- Experience in the EU15 is that the *work-on rate* is around 60%
  - In Germany, 73% *work-on rate* in peak, 46% *work-on rate* in off-peak, avg: 60%
  - Netherlands, 39% *work-on rate* in peak, 55% *work-on rate* in off-peak, avg: 50%
  - Analysis stripped-out the gas price shock
- Forecast included in the NETT (2007) paper for the NEM: about 70%
- Simshauser & Doan for Victoria: at $17.50/t, about 78% *work-on rate*
  - This has substantial implications for the brown coal generators $10.2 billion investment
- If emissions trading is successful, the *work-on rate* will decline over time as new lower emission generators spend an increasing amount of time setting clearing prices in the combined commodity/emission market
- So what happens if adequate permits are not Grandfathered to the coal generators? Marginal generators will react in the spot market in a predictable manner.

The *Wounded-Bull Scenario*

- Marginal coal generators are likely to become *Wounded-Bulls* under an “all auctioned” scenario
- In Simshauser & Doan’s (2007) scenario, CO2 is priced at $17.50 and all permits are auctioned
  - Brown Coal generator returns fall from about 11% to about 8%
  - Spot prices rises from $34 to $52
  - NGCC plant can enter and undercut the marginal coal producer
  - Marginal coal producer returns drop from about 7% to less than 4%
  - At this point the marginal producer would otherwise default on financial covenants, so…
  - Reverts to unwinding hedges and then withholds generating capacity to spike prices
  - Modelling results indicate that wholesale electricity prices rise from $34, to $52, to $103/MWh (300% increase)
  - Marginal generator thus attempts to recover its otherwise stranded asset
  - All remaining generators extract supra-normal profits – more than would have been the case had all permits been allocated (resembles the current water-constrained environment, but in contrast, has been artificially manufactured)

Base Case Scenario



Data Source: Simshauser & Doan (2007)

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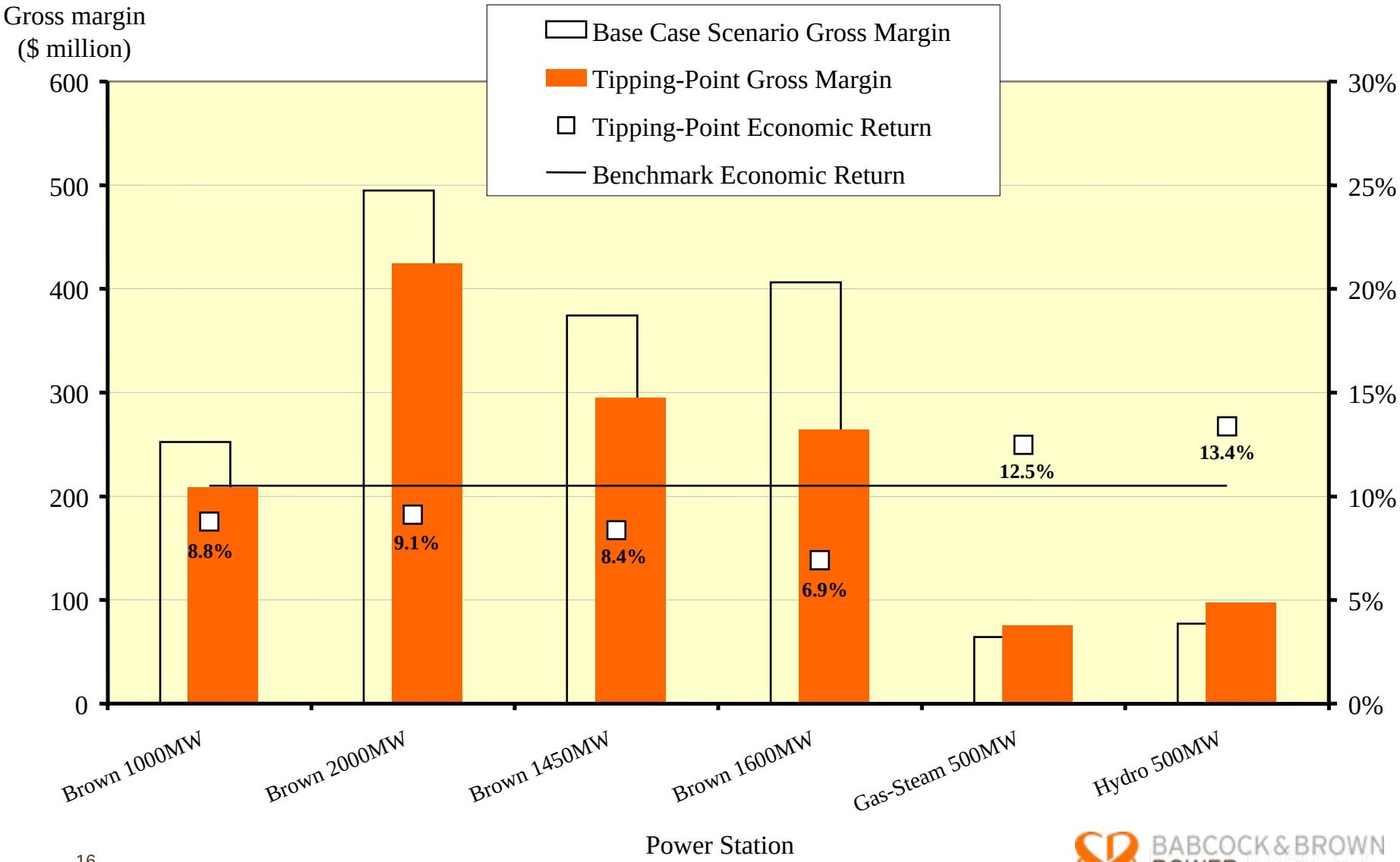
Tipping-Point Scenario



Data Source: Simshauser & Doan (2007)

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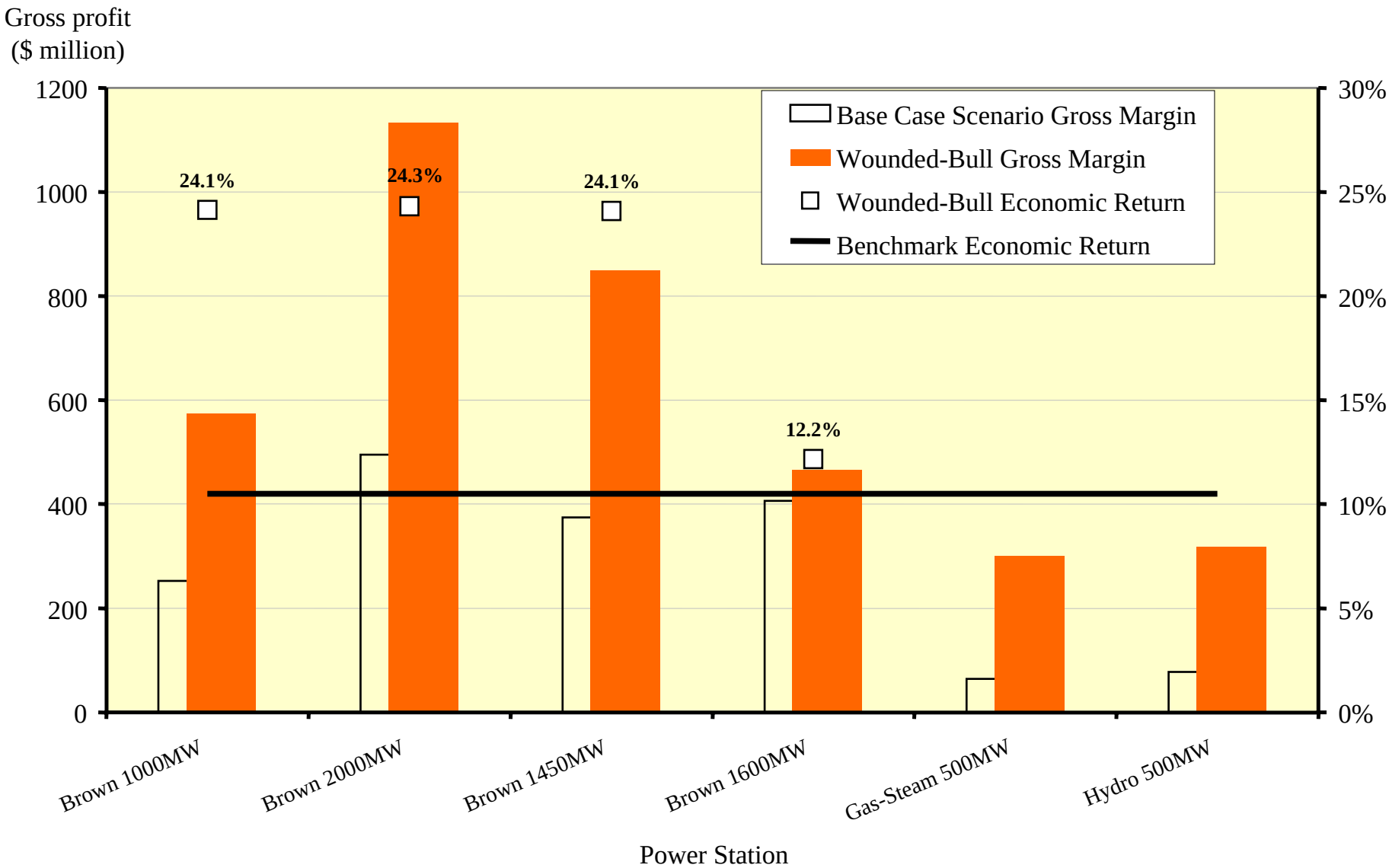
Wounded-Bull Scenario



Data Source: Simshauser & Doan (2007)

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Conclusion

- For an industry that is naturally long GHG, emissions trading is a logical policy option and has the support from most in the power generation industry provided allocation policy deals with asset values
- Over the next 40 years, Australia's thermal plant stock will need a complete turnover, but the current class of coal technologies need a transitional glide path, and right now, 85% of power comes from coal
- This invariably means a careful policy of Grandfathered emission permits to ensure ongoing system security and electricity price stability over this lengthy transitional period
- As one of the bigger developers of new gas-fired generators, BBP sees no problem with incumbent coal generators being 'ushered' into the GHG world
- No generator wants to see the sustained price spikes through continuous economic withholding of capacity, but in the absence of Grandfathering, such an outcome is probably inevitable
- The longer term welfare implications of a *Wounded-Bull Scenario* far out-weight an overly generous allocation system to incumbent coal generators