

## BABCOCK & BROWN POWER

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### ASX Release

28 May 2007

### APEC ENERGY BUSINESS PRESENTATION

Please find attached presentation to be given by Dr Paul Simshauser, Babcock & Brown Power CEO at the APEC Energy Business Forum today.

### ENDS

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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.<sup>1</sup> 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.

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<sup>1</sup> Some assets have minority shareholders. BBP's equity interest in the assets is equivalent to approximately 2,370 MW.

## Portfolio Summary

Power station	Location	Equity interest (%)	Fuel	Operations Start Date	Capacity (MW)	Operating Mode	Offtake
<b>Operating power stations</b>							
Braemar	Queensland	85% <sup>1</sup>	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
<b>Under construction</b>							
NewGen Kwinana	Western Australia	70% <sup>1</sup>	Gas	late 2008 (projected)	320MW	Base load	Synergy
<b>Total of operating and under construction</b>					<b>2,922MW<sup>2</sup></b>		
<b>Contracted power offtake</b>							
Osborne contracts	South Australia	100%	Gas/cogeneration		180MW	Base load	Various/Market

<sup>1</sup> Direct and indirect equity interest.

<sup>2</sup> BBP's equity interest in the assets is equivalent to 2,350MW.

For further information please visit our website: [www.bbpower.com](http://www.bbpower.com)

# Climate change: near-term impacts and future planning for power generation

APEC Energy Business Forum  
28 May 2007, Darwin

Paul Simshauser  
Chief Executive Officer

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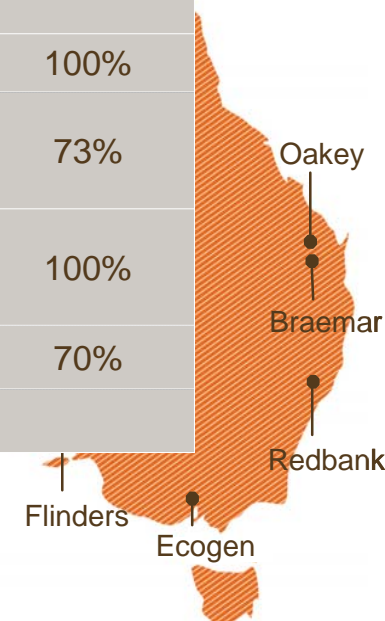
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# Babcock & Brown Power – largest ASX listed generator

Generator	Region	Fuel	Capacity (MW)	Operating mode	Contract Type	Equity Ownership <sup>1</sup>
Oakey	QLD	Gas	286	Peak	PPA	50%
Braemar	QLD	Gas	455	Intermediate	Cap contract	85%
Redbank	NSW	Coal	135	Base load	PPA	100%
Ecogen - Jeeralang	VIC	Gas	449	Peak	PPA	73%
Ecogen - Newport	VIC	Gas	510	Peak		
Flinders - Northern	SA	Coal	527	Base load	Rolling Hedges	100%
Flinders - Playford	SA	Coal	240	Intermediate		
Kwinana <sup>2</sup>	WA	Gas	320	Base load	PPA	70%
Total			2,922			



1. Direct and indirect equity interest  
 2. Kwinana is currently under construction  
 PPA = Power Purchase Agreement  
 Refer to the PDS for more information on the BBP assets

# The pending Alinta acquisition (late August) will substantially increase BBP's portfolio

Asset	Asset Type	Location	Economic Interest	MW
AlintaAGL (WA Retail & WA Cogeneration Plants)	Gas and Electricity Retailing & Power Generation	<b>WA</b>	0% or 100% (currently 67%)	409*
Port Hedland Power Station	Power Generation	<b>WA</b>	100%	175
Newman Power Station	Power Generation	<b>WA</b>	100%	105
Goldfields Gas Pipeline	Gas Transmission	<b>WA</b>	11.8%	NA
Glenbrook NZ Power Station	Power Generation	<b>NZ</b>	100%	112
Bairnsdale Power Station	Power Generation	<b>VIC</b>	100%	94
Cause Cogeneration Plant	Power Generation	<b>WA</b>	100%	16
LPG business	Energy Markets	<b>WA</b>	100%	NA
Tamar Development Project	Power Generation	<b>TAS</b>	100%	380



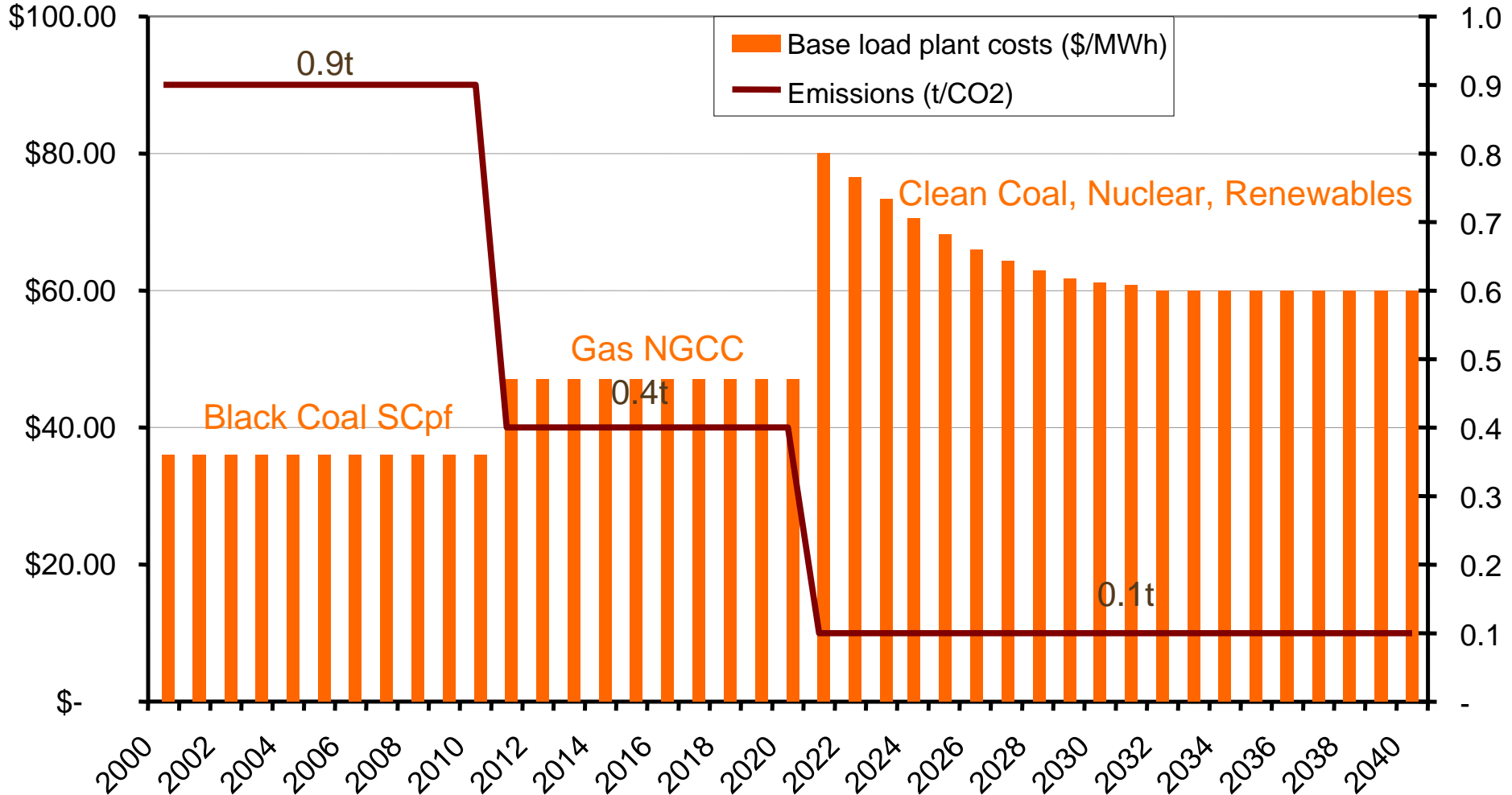
# The challenges facing power generation in Australia

- Australia has one of the lowest cost power systems in the world and is key comparative advantage for the economy
  - Largely driven by Australia's vast low cost thermal coal reserves (A\$1.00/GJ)
  - Coal fired generation accounts for 80-85% of energy generated
  - Australia also has substantial low cost natural and coal seam gas (A\$3.00/GJ)
- The near-term challenge facing the power generation industry in Australia
  - Capacity stocks are largely exhausted
  - New capacity required is largely intermediate/peaking, thus Australia has a 'stay of execution' from an emissions perspective (gas generation being the lowest cost int./peak solution)
  - But by early/mid next decade, new base capacity is required, and Australia's supply-side must make the structural adjustment to the transitional fuel (viz. gas-fired generation) for base load duties – for this to occur, CO2 must carry a price
  - This implies Emissions Trading, permit allocation must ensure that energy security is not violated and that the system's world class economic performance is maintained
- The long-term challenge facing the power generation industry
  - Australia's power system will double between 2005 and 2030
  - By 2050, the incumbent thermal plant stock must be completely turned over
  - And gas is only a transitional fuel. Ultimately new technologies must be introduced to the Australian power system, and make the final transition to clean coal, nuclear and renewables, and reserve gas for intermediate and peaking duties

# Graphically, this challenge looks as follows...

Unit cost of base load power applications (\$/MWh)

Emissions intensity of base load power (t/CO2)

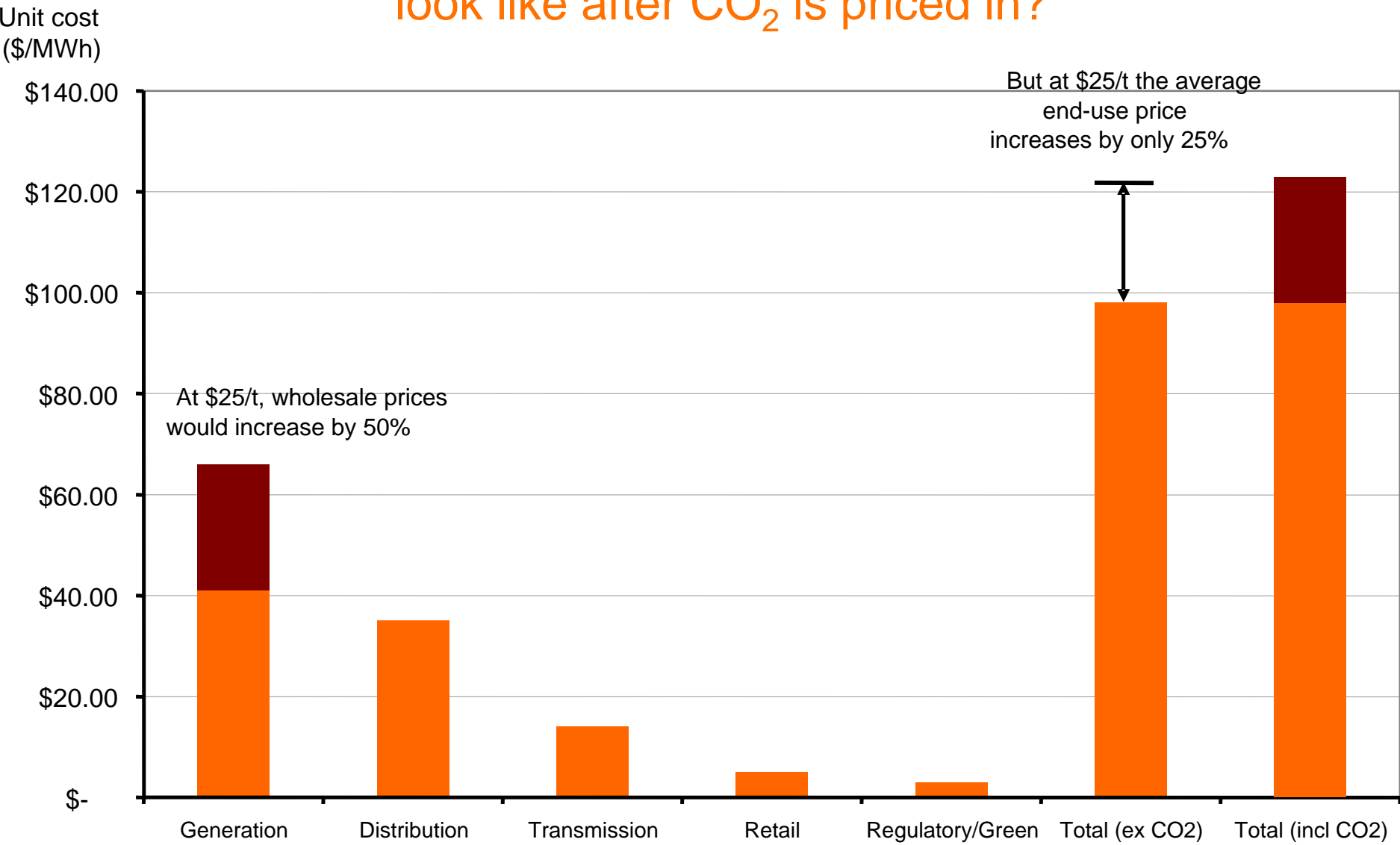




# The near-term challenge

- The near-term challenge for industry is to build new capacity in a timely manner to ensure security of supply at economic rates in light of CO2 uncertainty (both regime and price)
- The near-term challenge for policy makers is to ensure that by the time new base capacity is actually required, the uncertainty associated with “CO2 regime” has been substantially resolved
- Any “ticking devices” attached to either challenge?
  - For industry, investing in technologies that will not be long-term stranded
  - For policy makers, the vexed question of permit allocation policy, and its impact on the stability of wholesale electricity/commodity prices over the next 10 years.

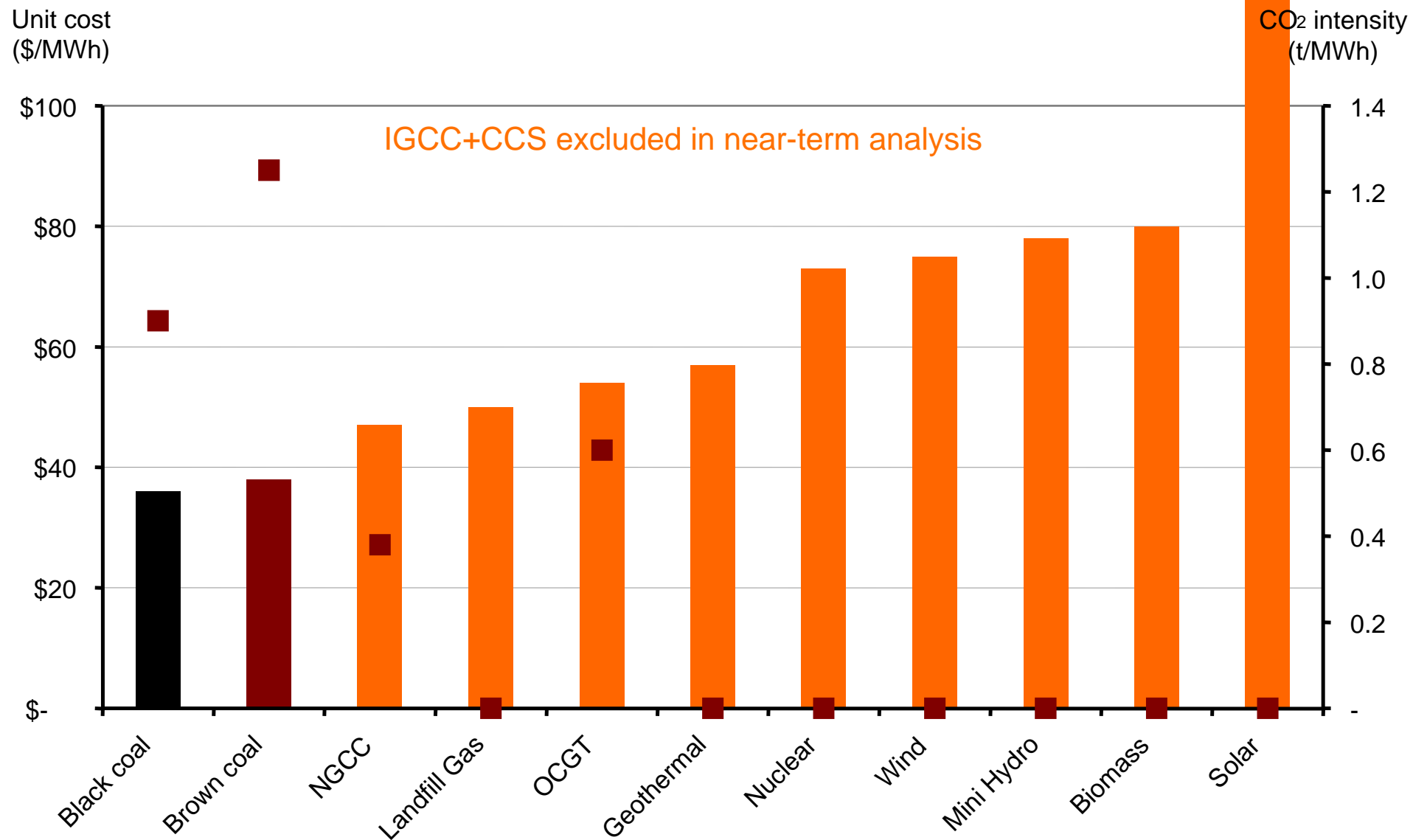
# So what makes up the cost of electricity, and what will it look like after CO<sub>2</sub> is priced in?



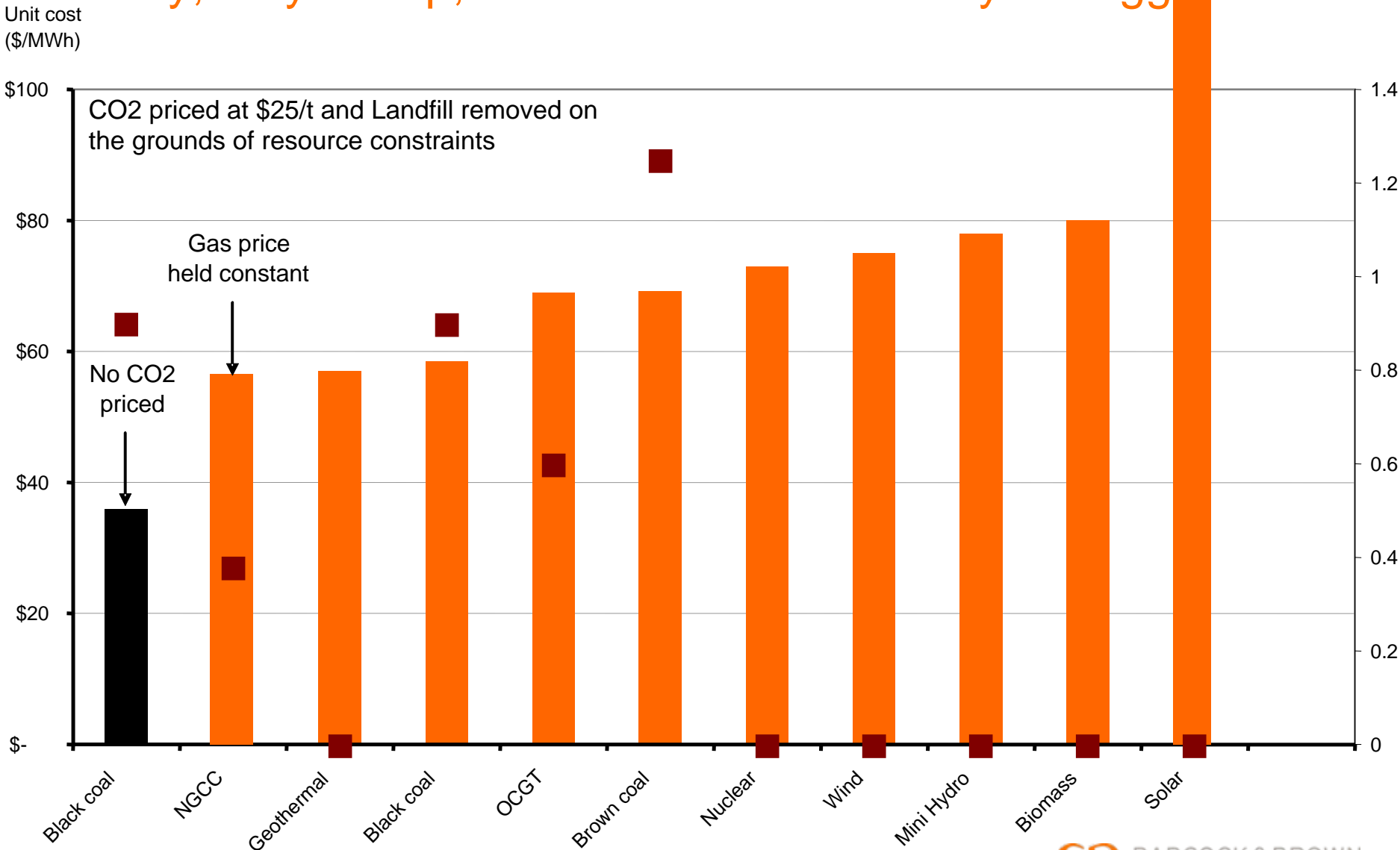
At \$25/t, wholesale prices would increase by 50%

But at \$25/t the average end-use price increases by only 25%

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



# When CO<sub>2</sub> is priced, it helps... But east-coast coal is very, very cheap, so renewables will always struggle...

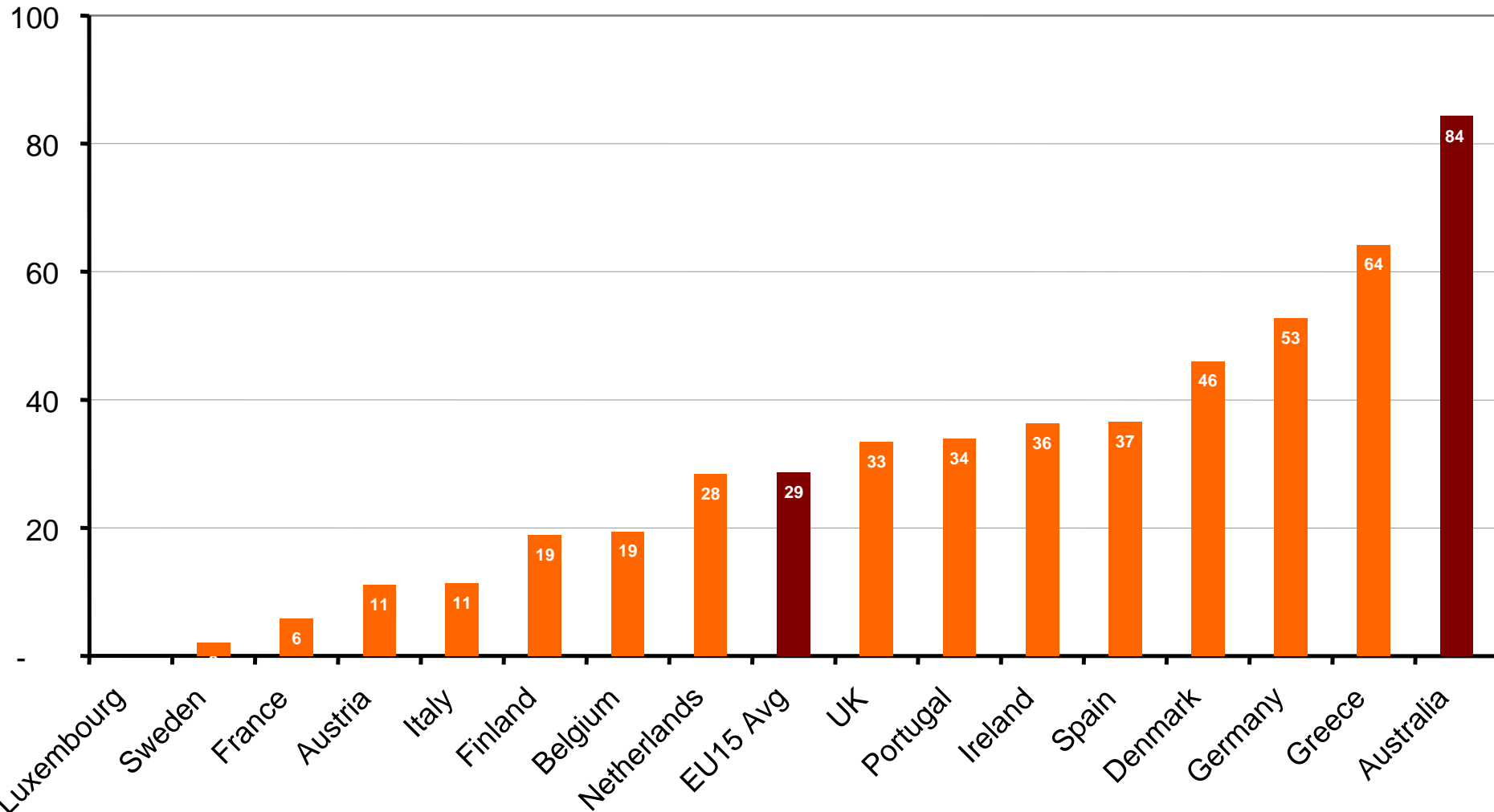


# GETTING EMISSIONS TRADING POLICY SETTINGS RIGHT

- 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 -

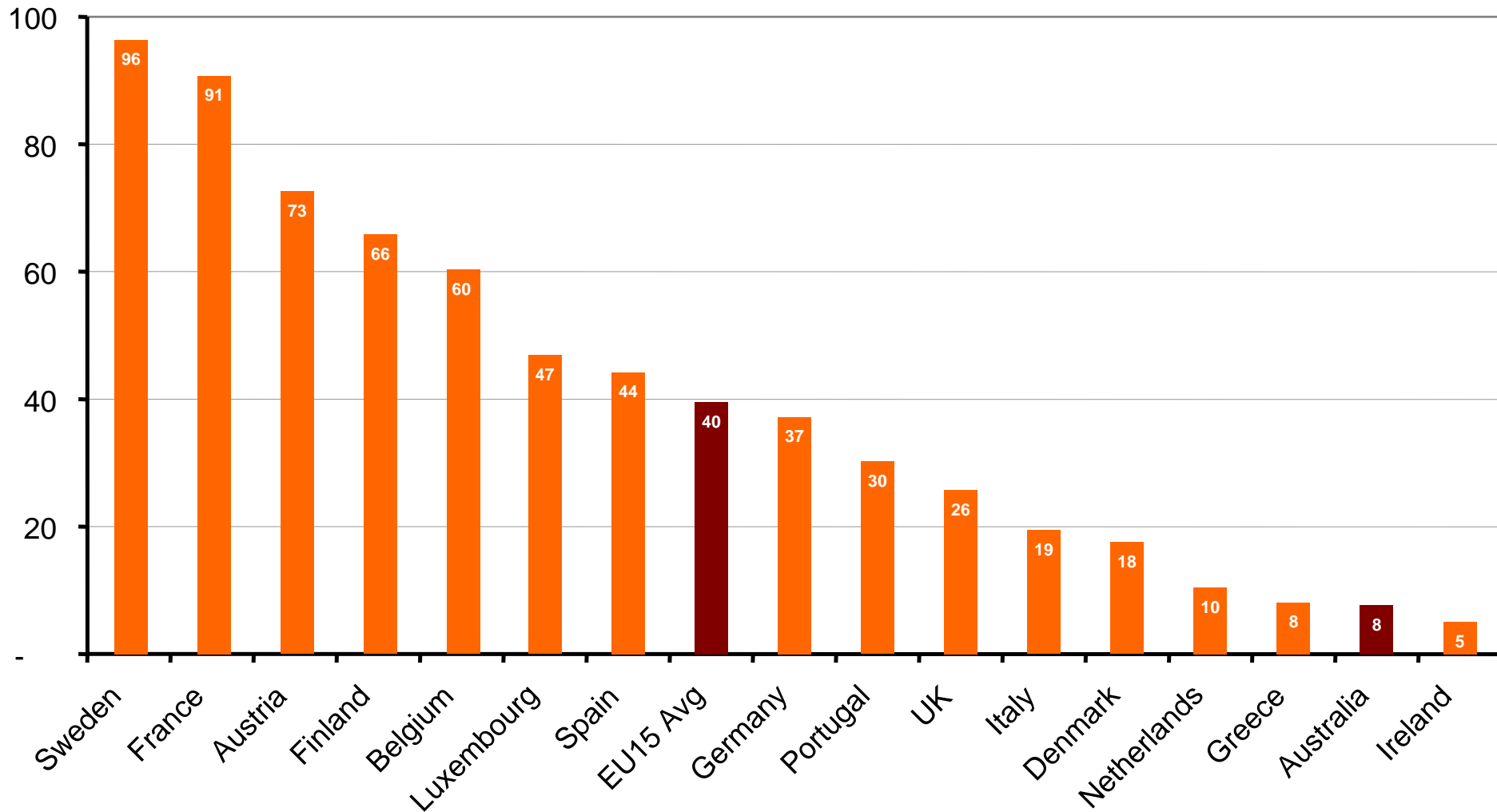
# Coal-fired generation: market share in the EU15

Market share of coal  
(%)



# Non-fossil generation: market share

Market share of non-fossils (%)



## 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.

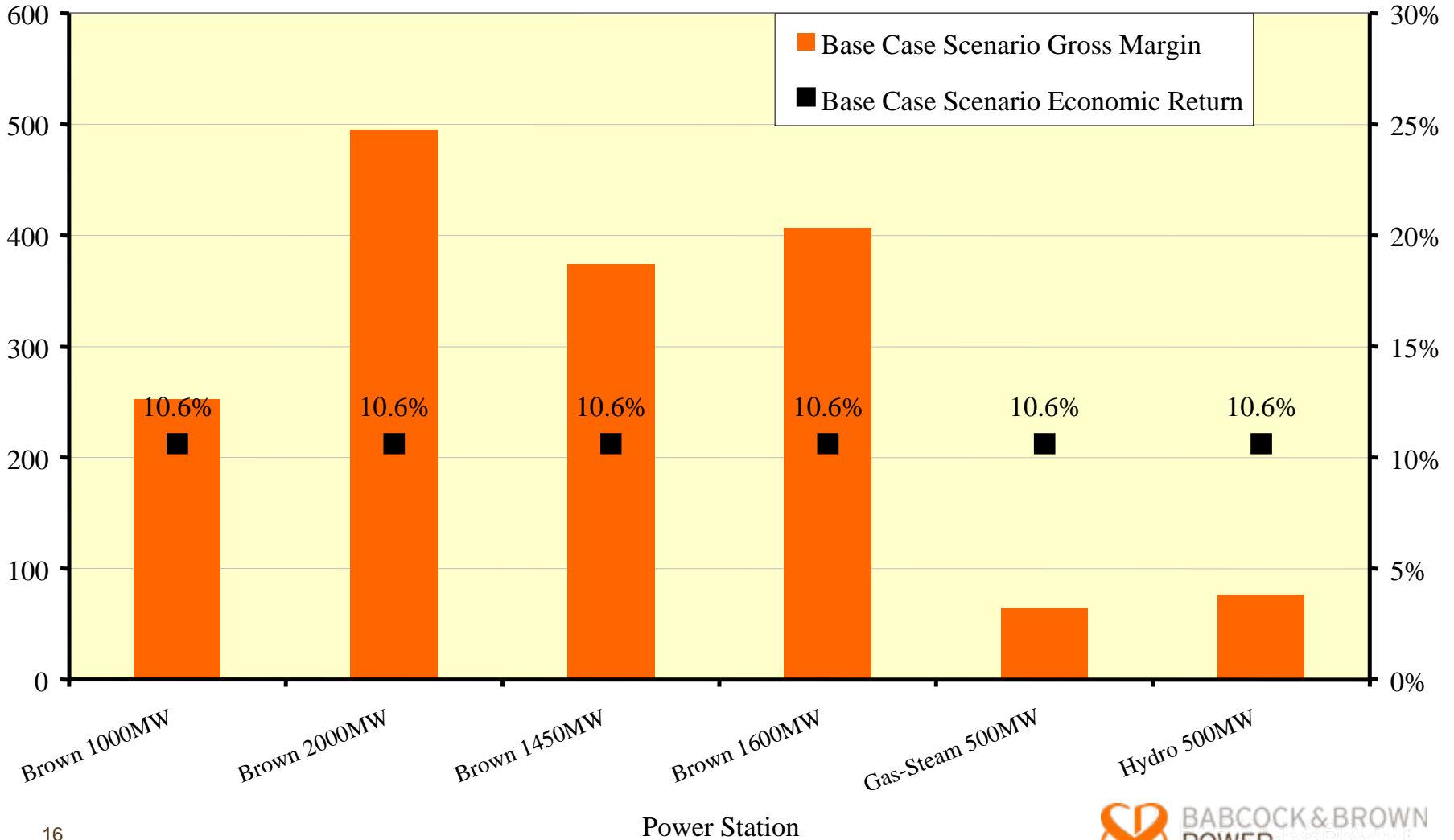


## The *Wounded-Bull Scenario*

- 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)

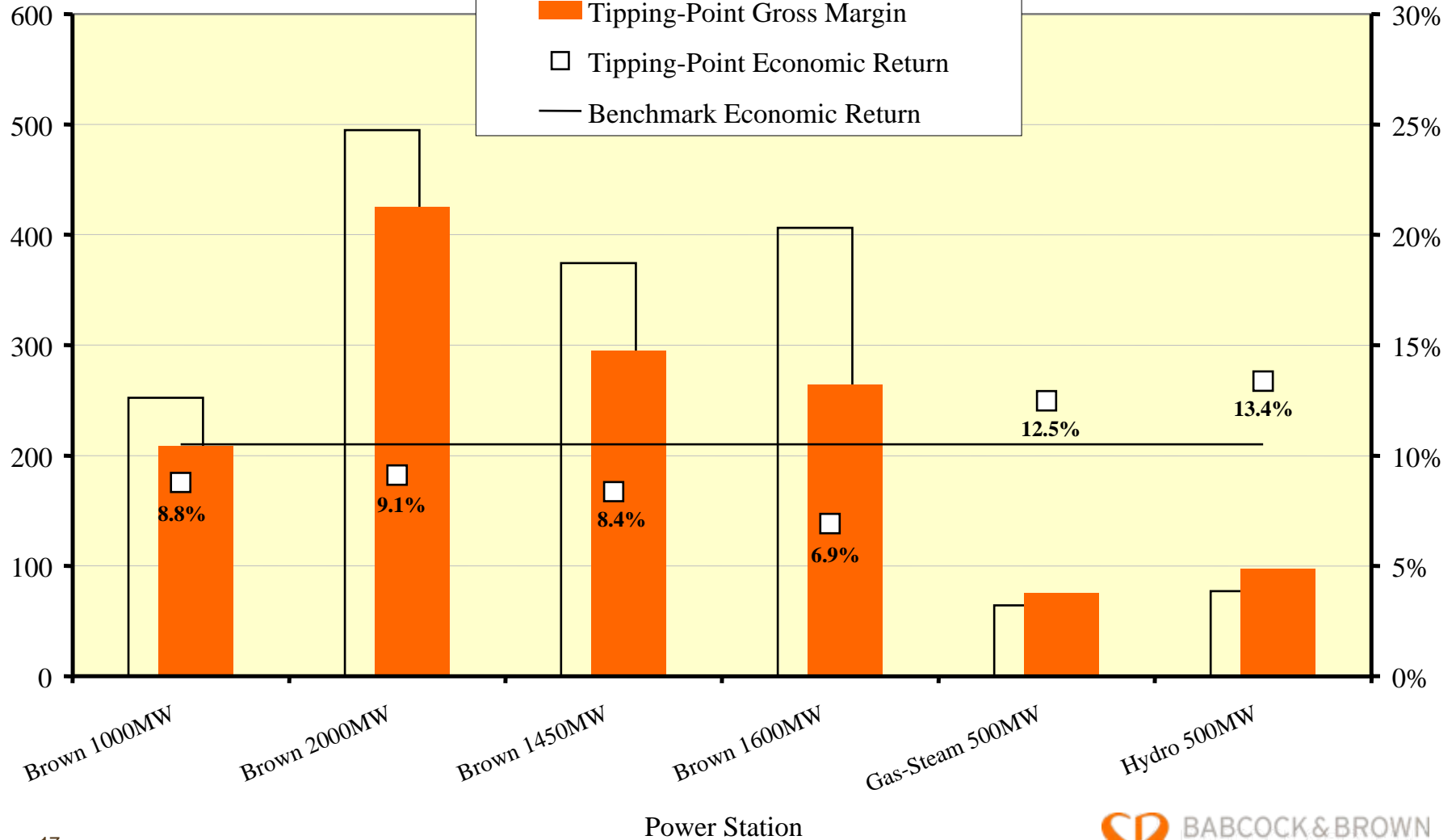
# Base Case Scenario

Gross margin  
(\$ million)



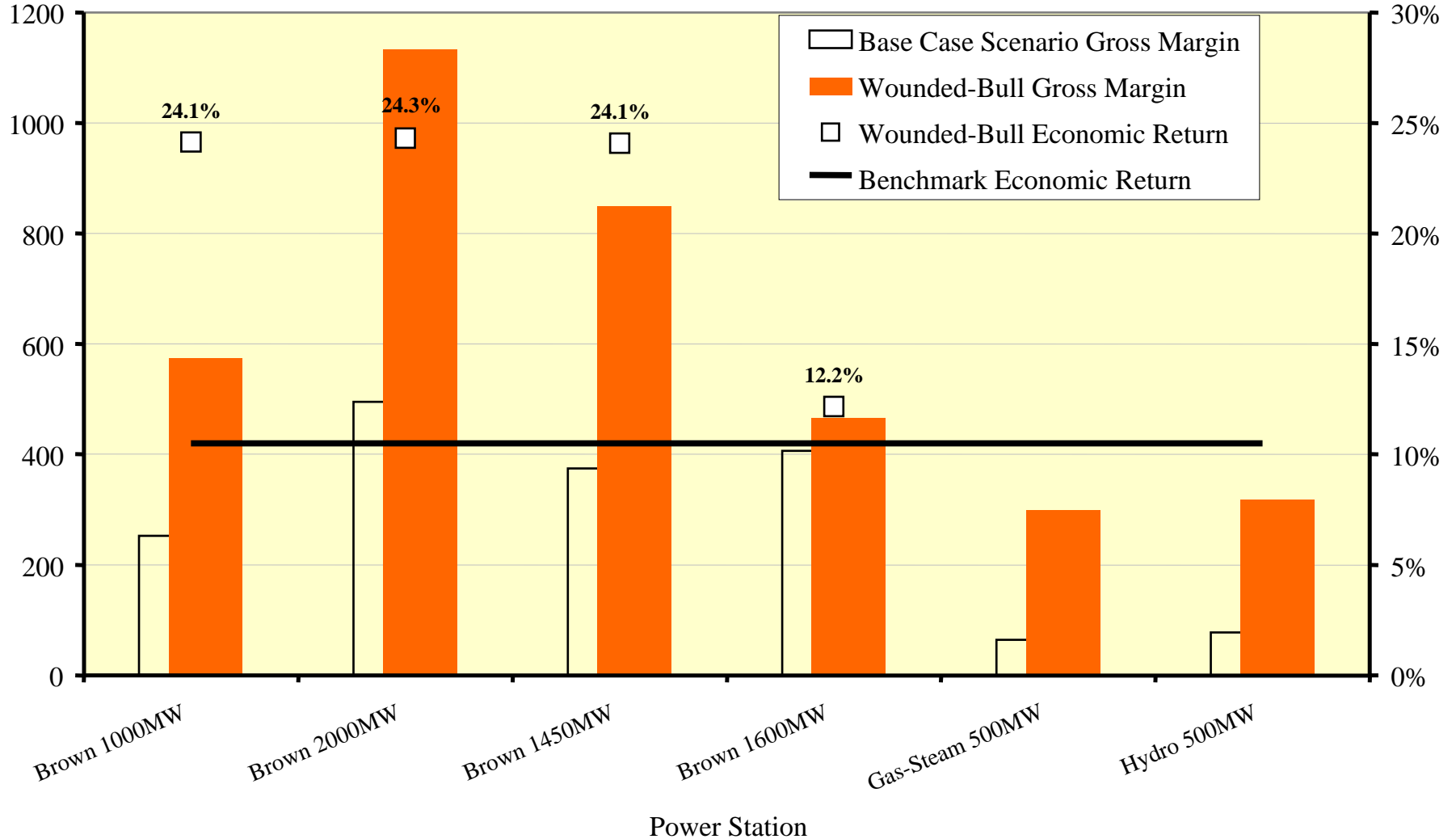
# Tipping-Point Scenario

Gross margin  
(\$ million)



# Wounded-Bull Scenario

Gross profit  
(\$ million)



## Near-term implications

- 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, 80-85% 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 if it means stability and reliability/security of supply is be maintained
- 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, and tragically, justifiable
- The longer term welfare implications of a *Wounded-Bull Scenario* far out-weight an incorrectly generous allocation system to incumbent coal generators

## The long-term challenge

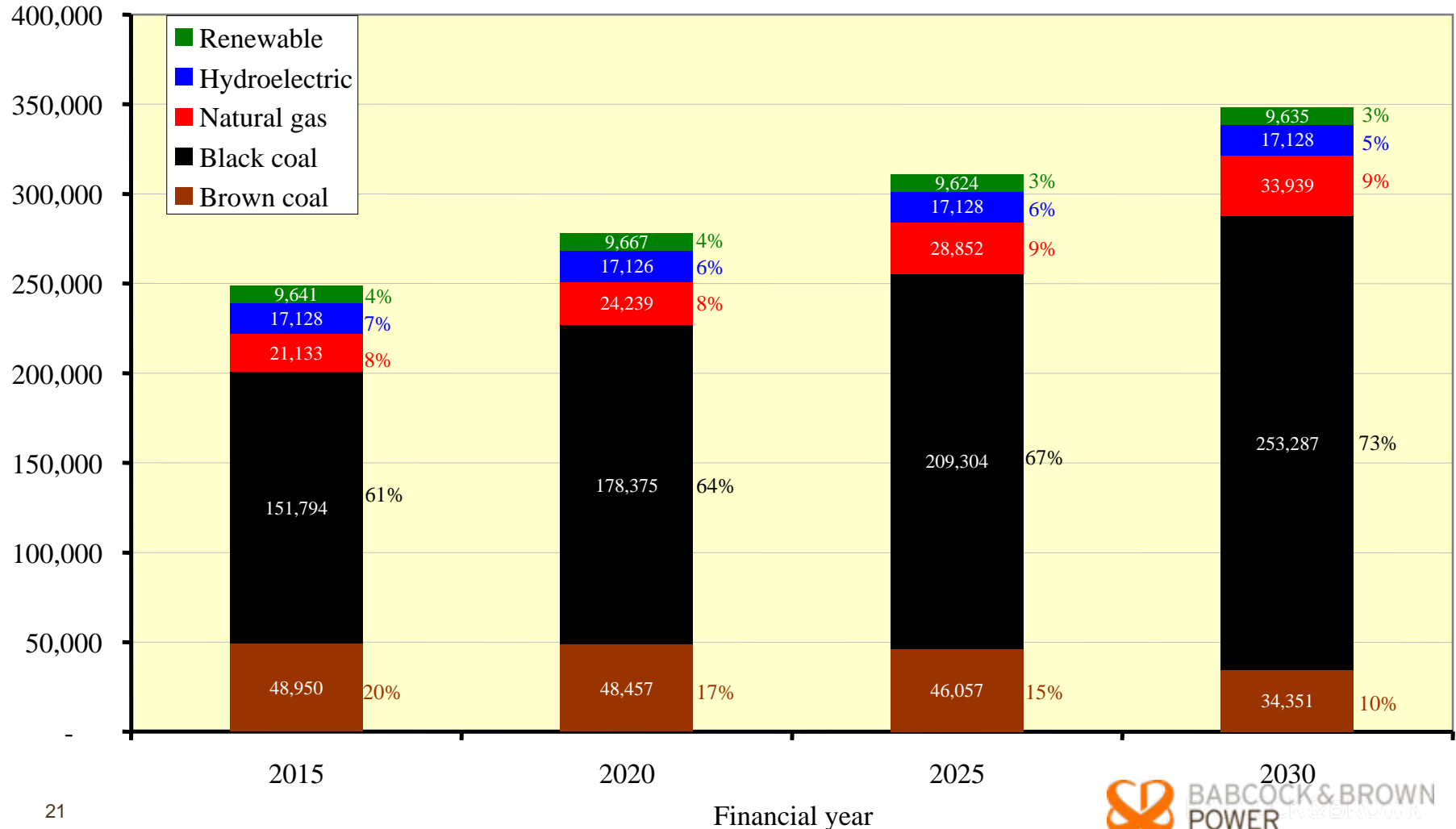
- Between now and 2030, the Australian power system will virtually double: load from 31,000MW to 63,000MW, and generation from 40,000MW to 73,000MW
- While gas fired generation provides an elegant near-term solution, there are simply insufficient gas supplies to power Australia's base load over the very long run
- Investment required in new plant between now and 2030; somewhere between \$45-\$80 billion depending on the technology set:

Plant	Actual 2005 (MW)	Retirements (MW)	Optimal 2030 (MW)	Shortfall (MW)
Baseload	27,700	10,400	44,000	26,700
Intermediate	2,000	600	8,600	7,200
Peak	7,900	800	20,400	13,300
<b>Total</b>	<b>37,600</b>	<b>11,800</b>	<b>73,000</b>	<b>47,200</b>

Data Source: Simshauser, Doan & Lacey (2007), "The outlook for the economic and environmental performance of Australia's National Electricity Market in 2030", Electricity Journal, June 2007.

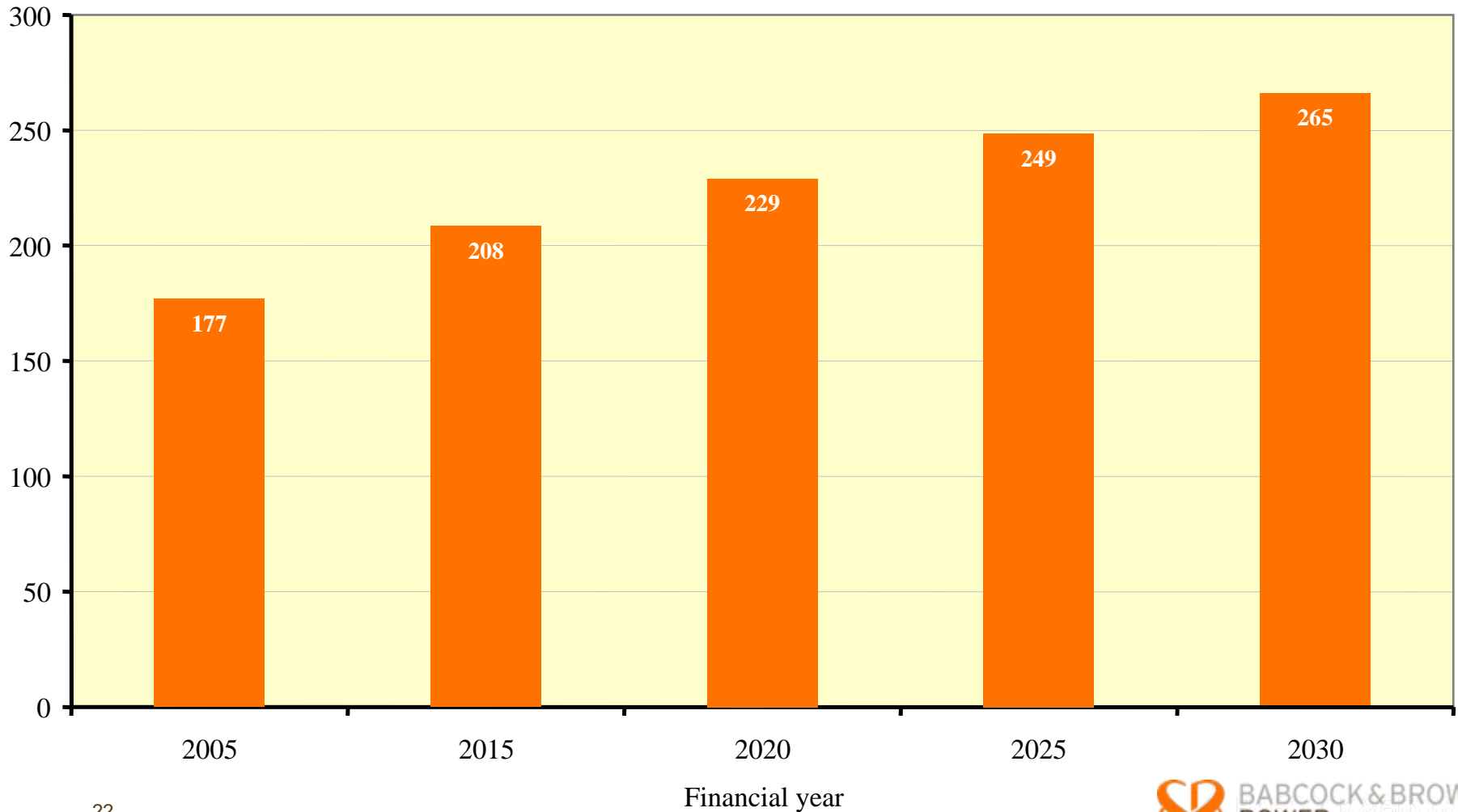
# If we do nothing, this is the outlook... 83% coal & high emissions

Energy generated  
(GWh)



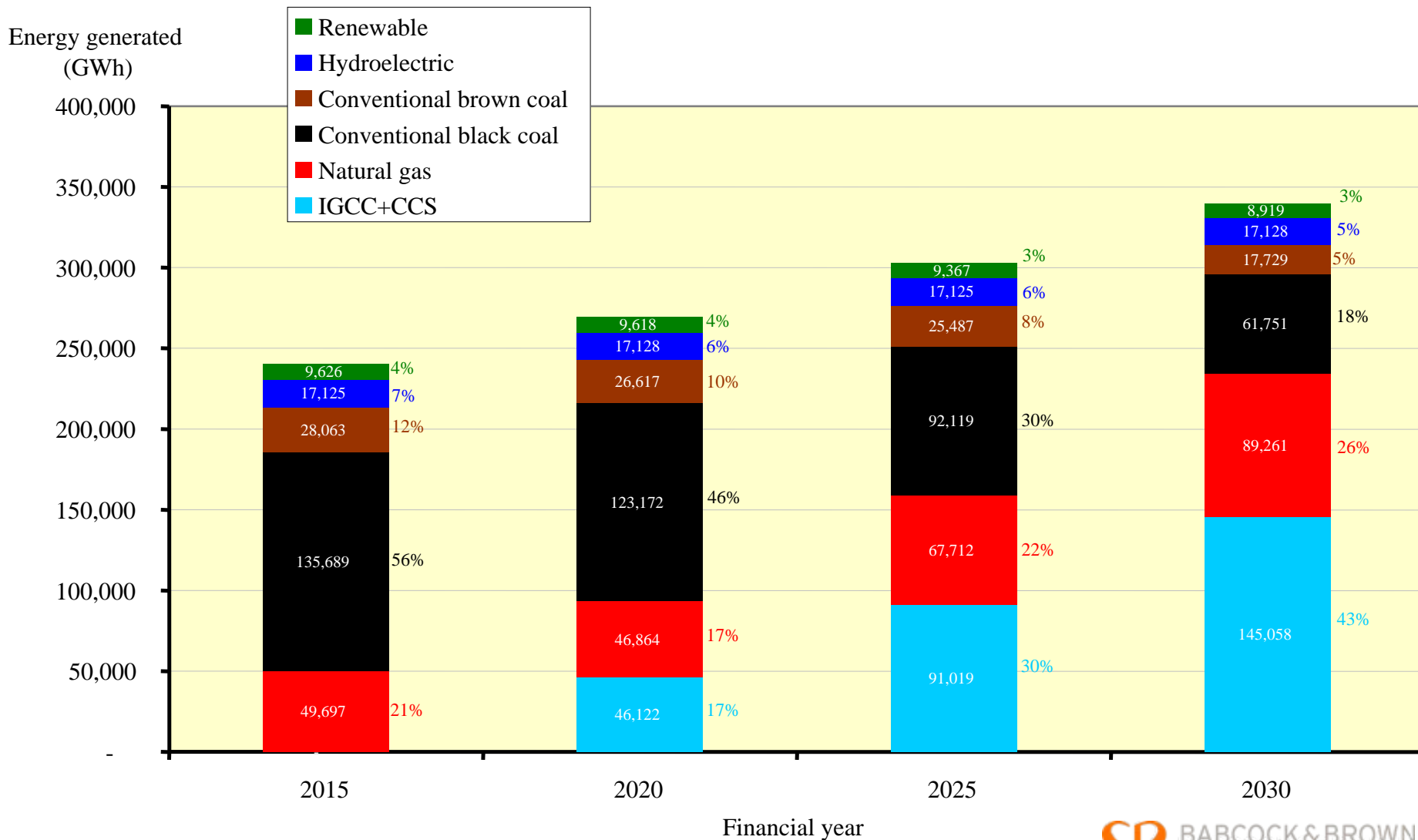
# And CO<sub>2</sub> emissions from the power industry rises sharply

NEM CO<sub>2</sub> emissions  
(Mt)

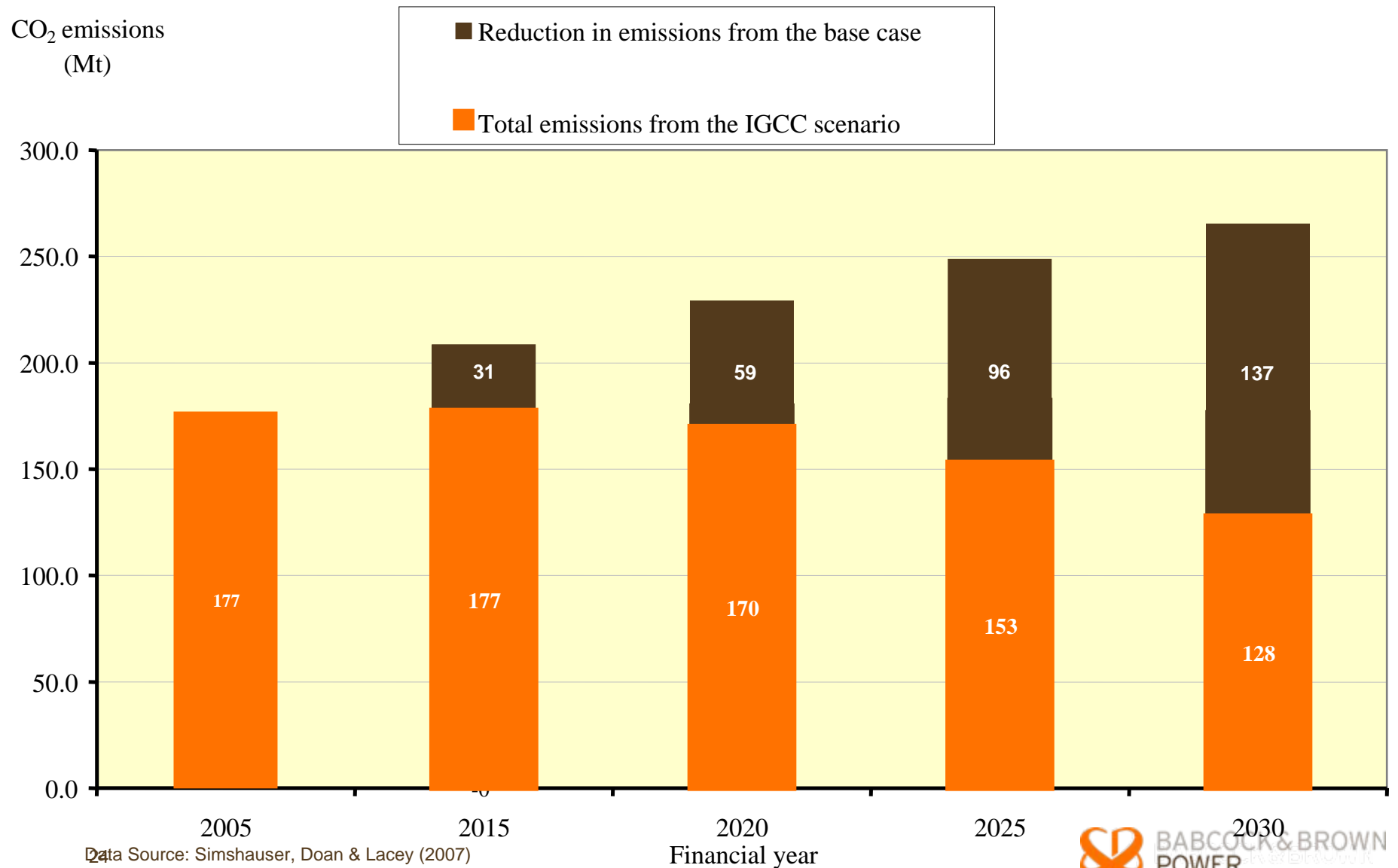




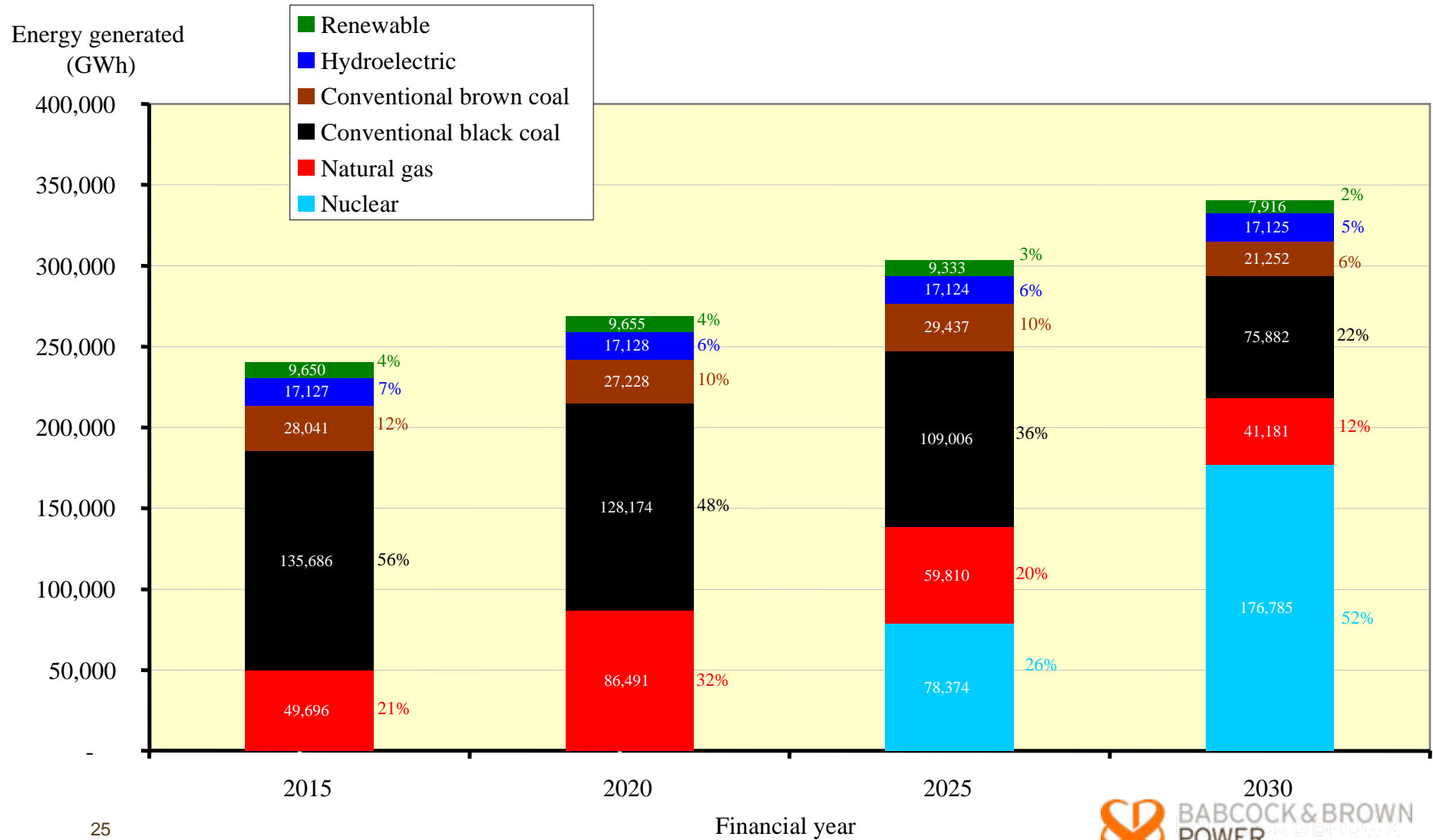
# Gas from 2010, IGCC+CCS from 2020 – a good mix...



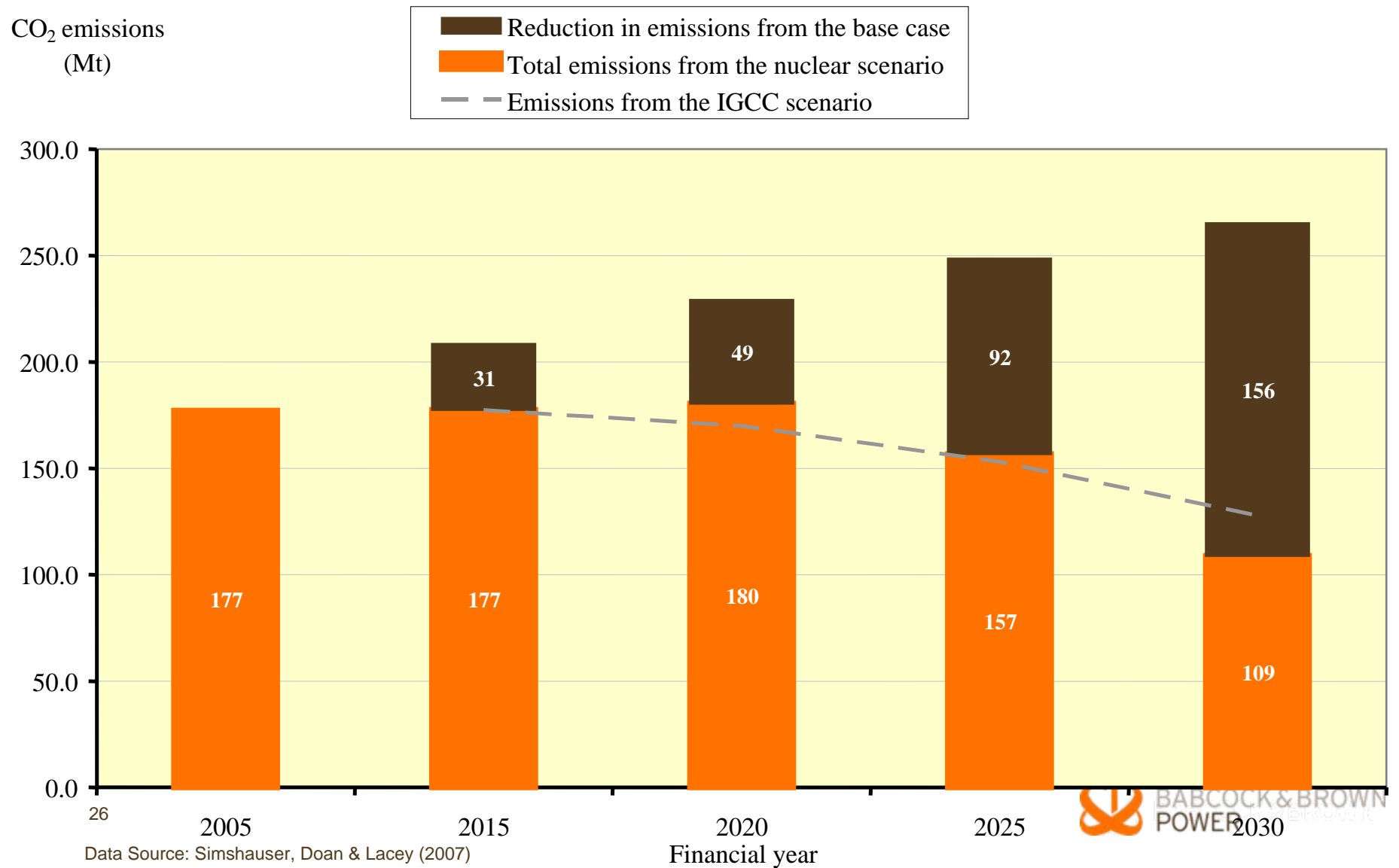
# Emissions reduce substantially...



# Gas from 2010, Nuclear from 2025... this works too...

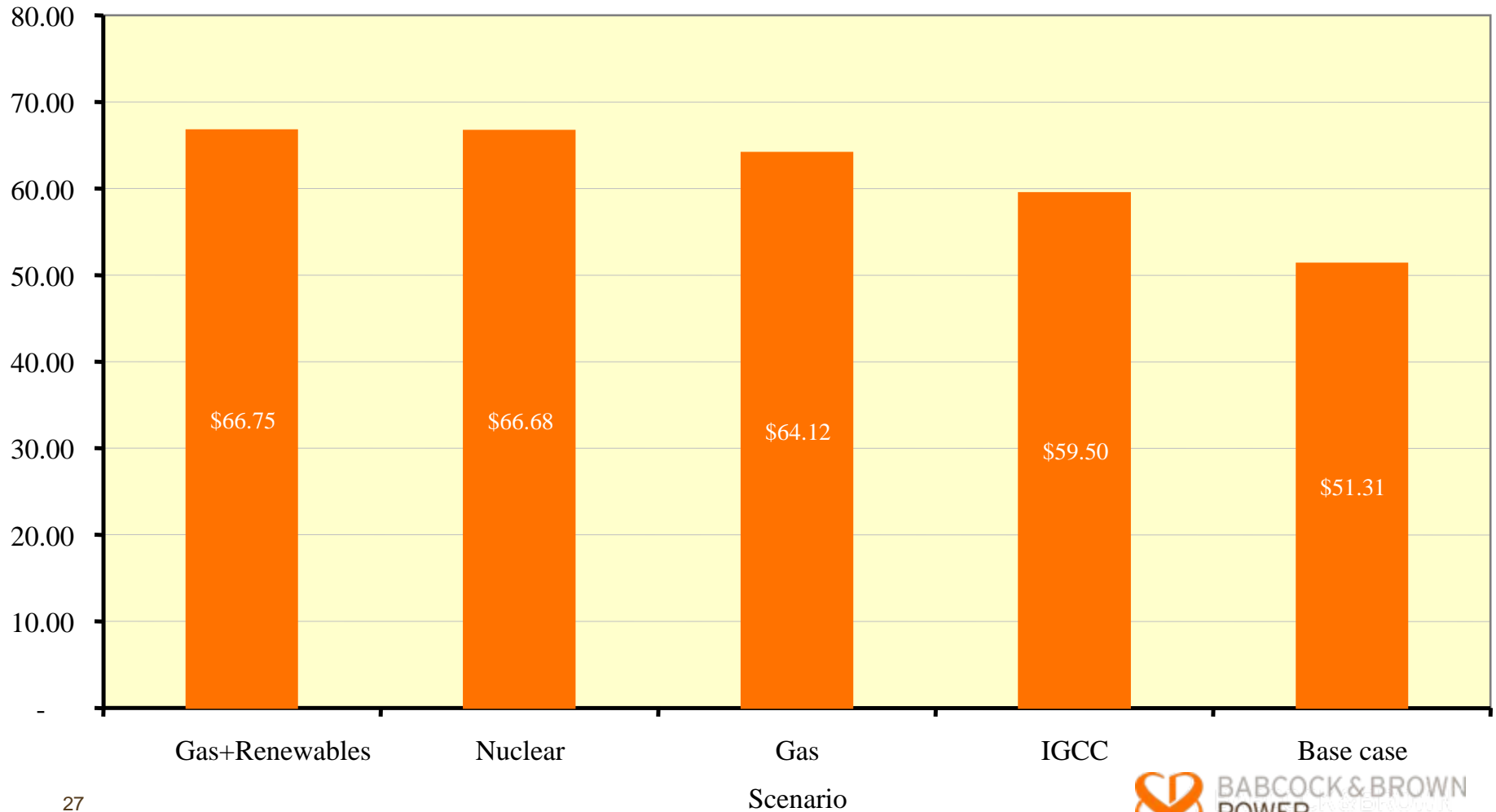


# Emissions reduce even further...



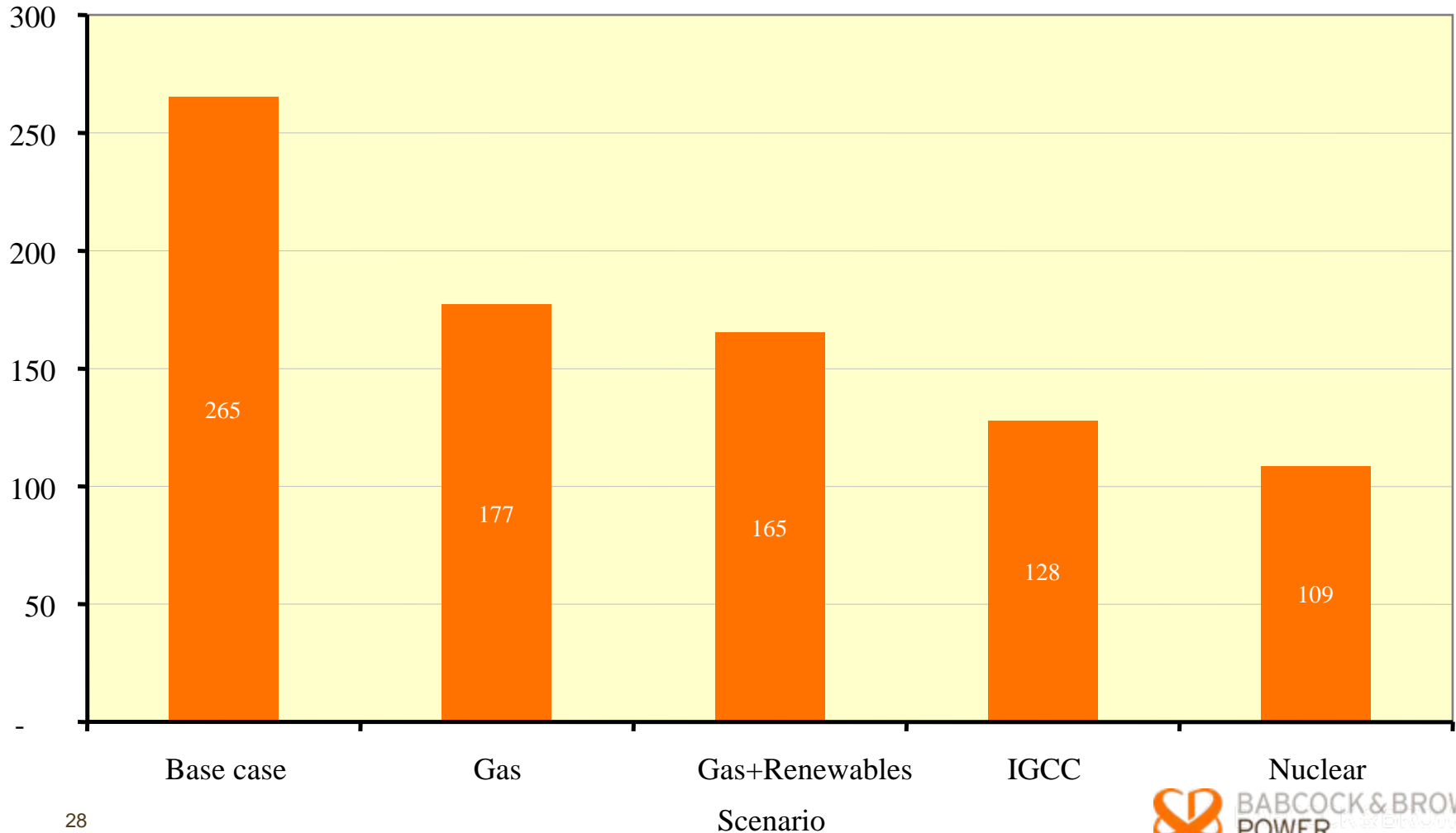
# Under various scenarios, these are the all-up costs in 2030

Underlying power  
system cost (\$/MWh)



# And these are the CO2 emissions in 2030...

Power system emissions  
(Mt CO<sub>2</sub> pa)



## Long-term implications

- From 2020 onwards, technologies that are 'new to Australia' must be introduced to the power system to deal with CO2 constraints
- There are no incumbent technologies in Australia that can optimise the very long-term economic and environmental trade-off in power generation
  - Continued deployment of NGCC would exhaust economic gas stocks and ultimately lead the industry back to conventional coal
  - Requires addition of Nuclear and/or Clean Coal in the long run
  - And renewables should be maximised to the extent practical (especially wind, biomass and geothermal)
- The usual message applies to Australia, i.e. there is no silver bullet and quantitative modelling results currently confirm this to be the case
- For industry, the challenge is to marshal resources away from immediate business pressures to the long-term focus
- For policy makers, this means 'stay the course' and continue to drive RD&D, and innovative entry policies, because left to its own devices, the market will fail. Economic theory has long been relaxed with the notion that the presence of very large –externalities are a predictable cause of market failure

# Conclusions

- For Industry
  - Near term challenge – deal with CO2 regime uncertainty and deliver capacity in a timely manner, learn to live with emissions trading, and commence the deployment of the transitional fuel technology, i.e. NGCC
  - Long term challenge – look beyond the transitional period and focus on the long term glide path, and the requisite RD&D.
- For policy makers
  - Near term challenge – devise an emissions trading regime that does not lead to catastrophic supply-side dislocation and a market implosion. Find the right permit allocation policy to ensure ongoing stability of electricity supply – which means Grandfathering of coal plant and export-sensitive consumers
  - Long term challenge – continue to drive RD&D, continue to introduce renewable feed-in tariffs and schemes, and devise innovative financing policies for clean coal or nuclear because an emissions trading scheme will not, of itself, drive the technological change required in the Australian case.