



Imperatives to Manage Energy and Carbon

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Drivers for Reducing Energy/C



- Cost reduction: Protection from doubling of energy prices.
- Positioning on C compared to competitors, peers and customers.
- Supply chain partner pressures.
- Staff engagement.
- Strategic competitive opportunities – you can see what's ahead better if you are a driver than a passenger!

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We have been used to cheap electricity

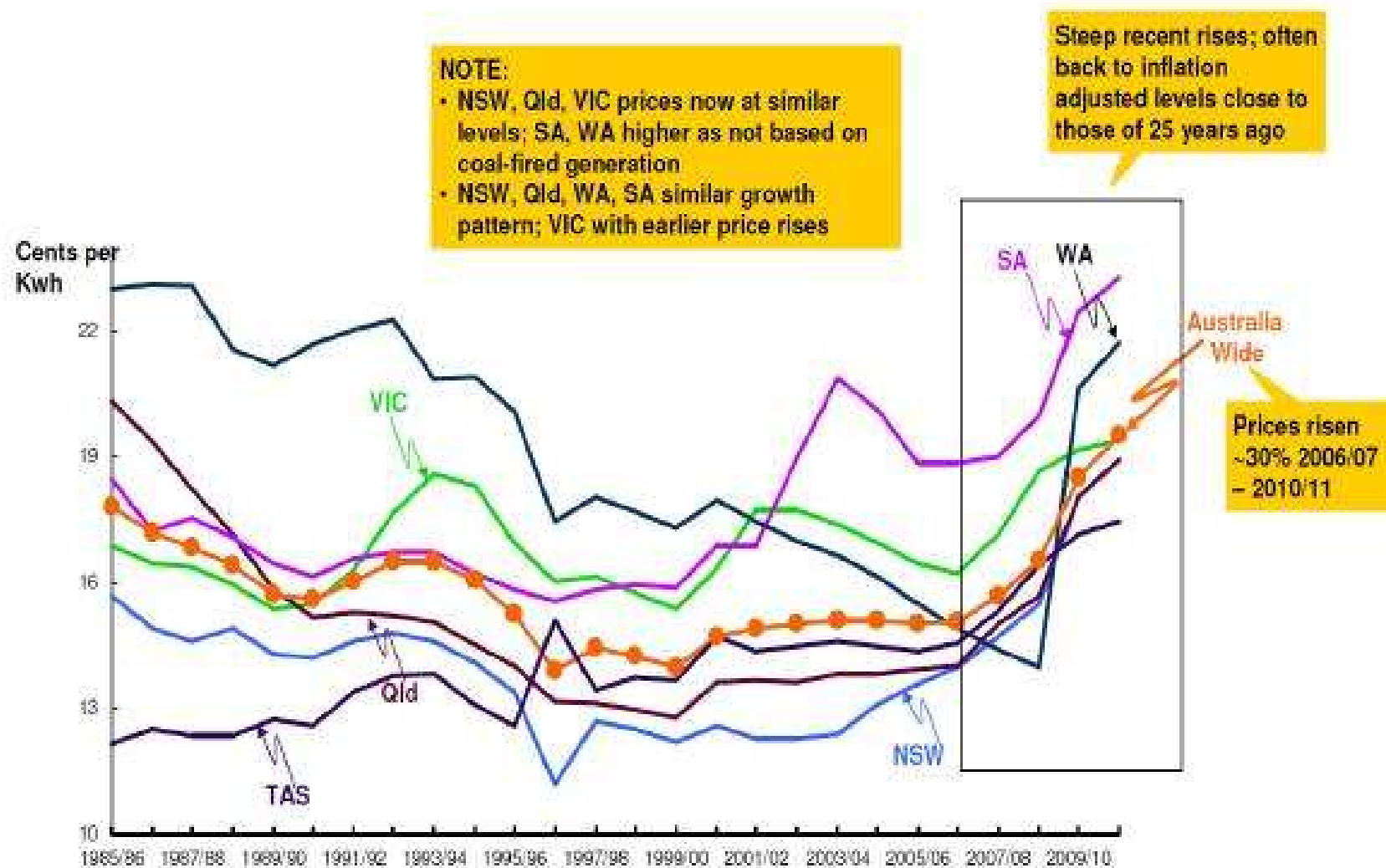
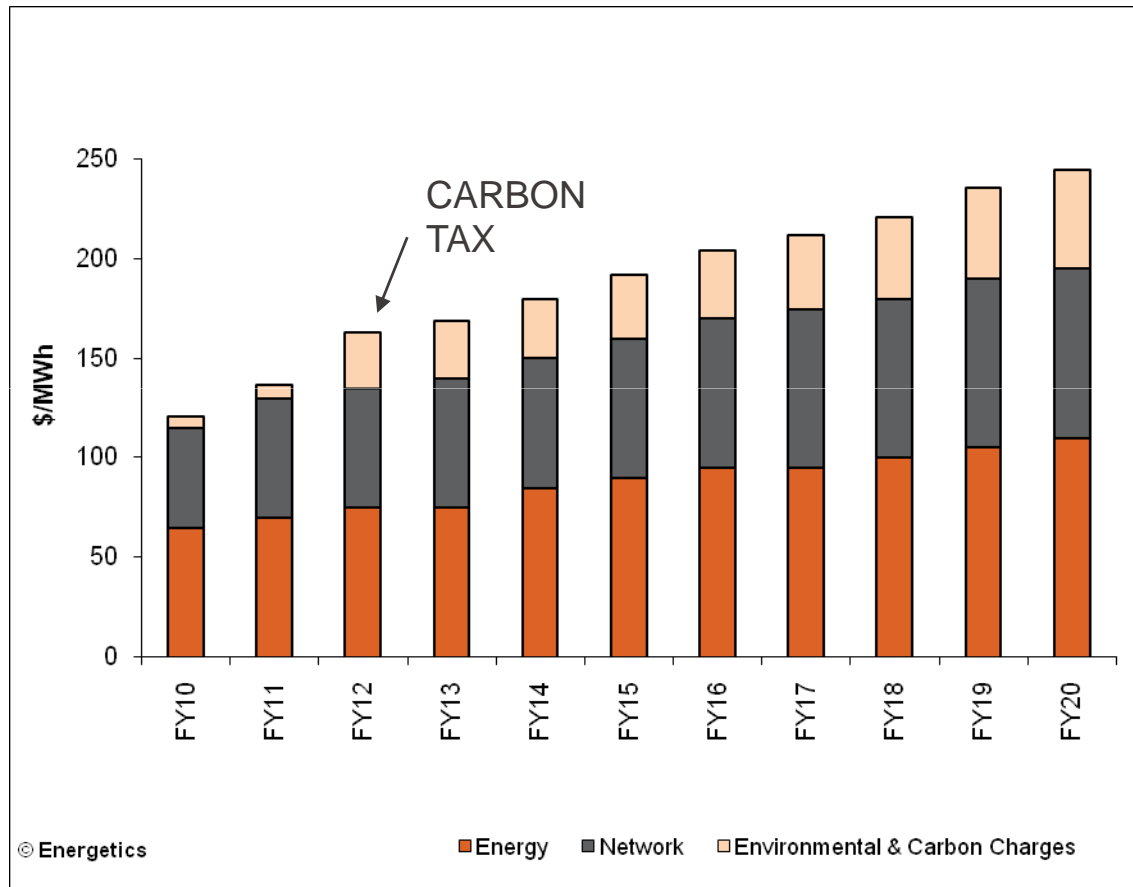


Figure 15 - State electricity prices, in fflation adjusted¹

But now electricity prices are doubling

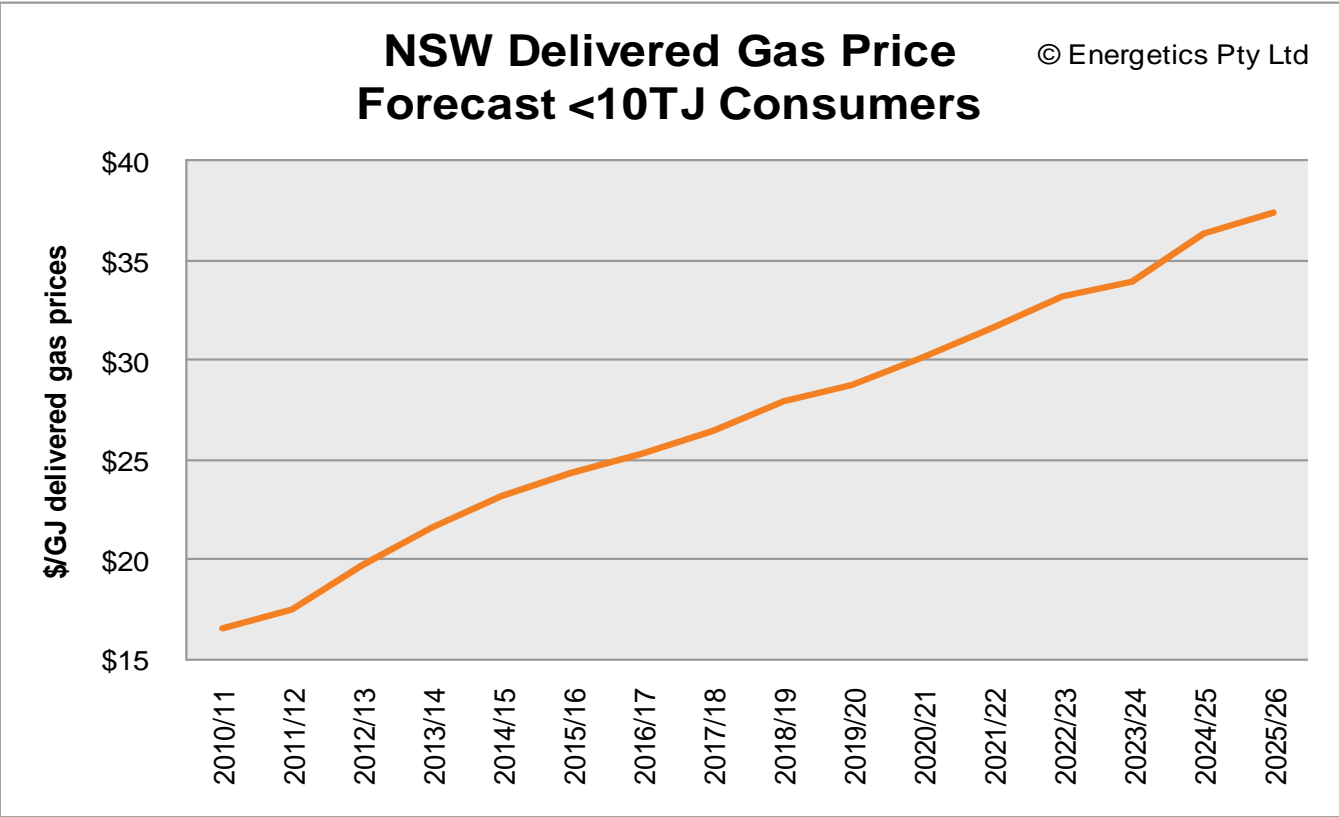


Electricity cost increase drivers

1. Tightening demand and supply
2. Increasing world oil, black coal and natural gas prices
3. Increasing network costs
4. Renewable energy target
5. Energy efficiency schemes
6. Carbon costs

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Gas Prices also will escalate rapidly once LNG plants are on-line



1) Pricing is for a typical <10TJ site located in NSW. Site specific pricing will depend on location, size and load shape.

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Oil prices continue to be volatile but continue upward trend – peak oil



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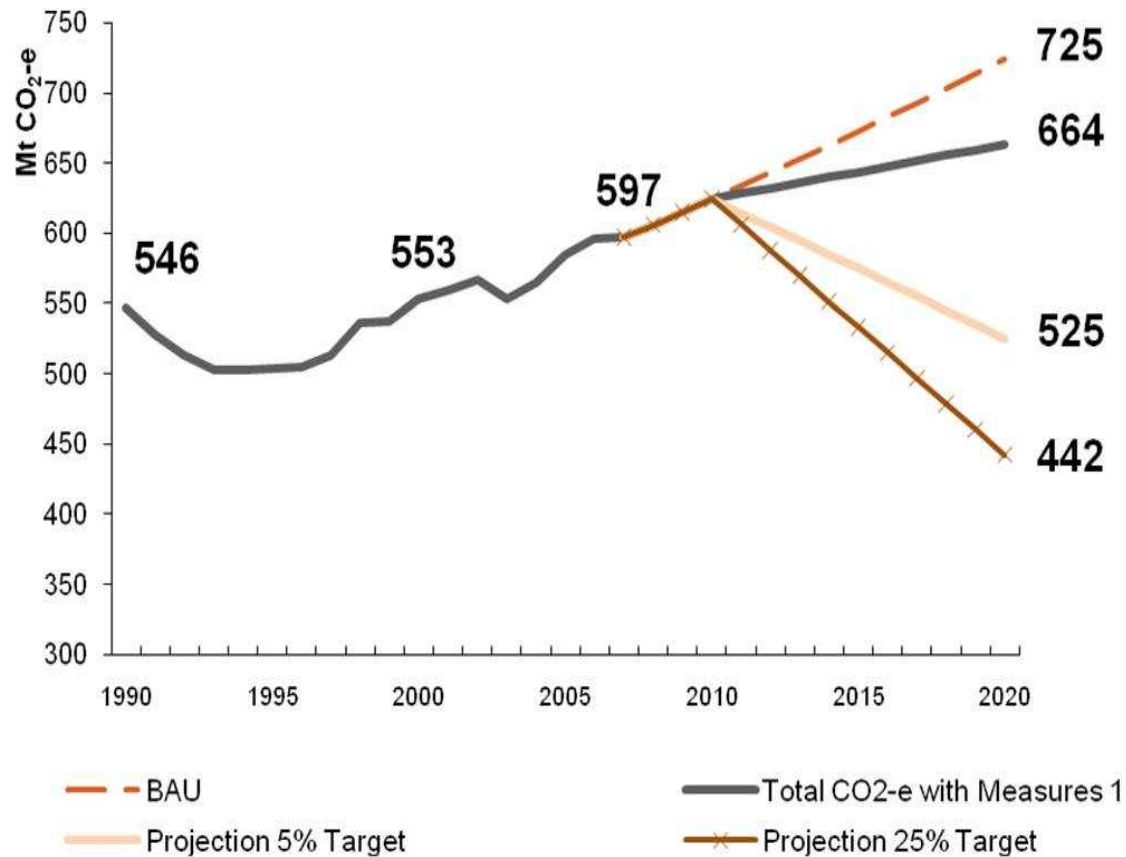
And we need to urgently cut C emissions



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- To contain global warming to 2C, we have a “budget” of 890 billion tonnes of CO2 emissions because C stays in the atmosphere for hundreds of years.
 - So what is important is total we emit – not when we emit it.
 - If we continue to burn fossil fuels at business-as-usual rate, we use up our global budgeted emissions by 2024!

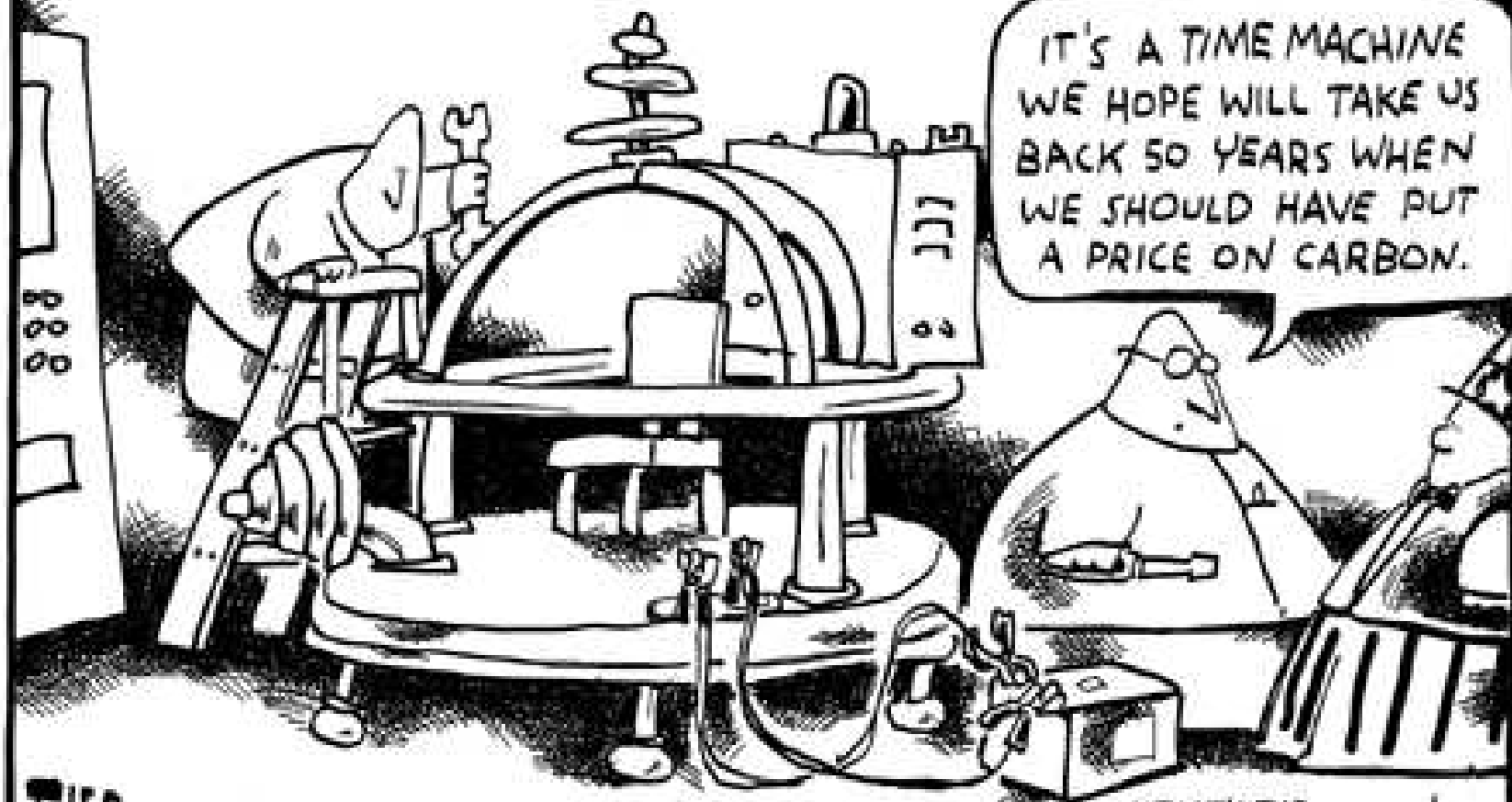
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We are heading away from 5% target – C price \$25/t+ now to \$50/t+ by 2020



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Year 2060: The search for a breakthrough technology to solve climate change continues.



IT'S A TIME MACHINE WE HOPE WILL TAKE US BACK 50 YEARS WHEN WE SHOULD HAVE PUT A PRICE ON CARBON.

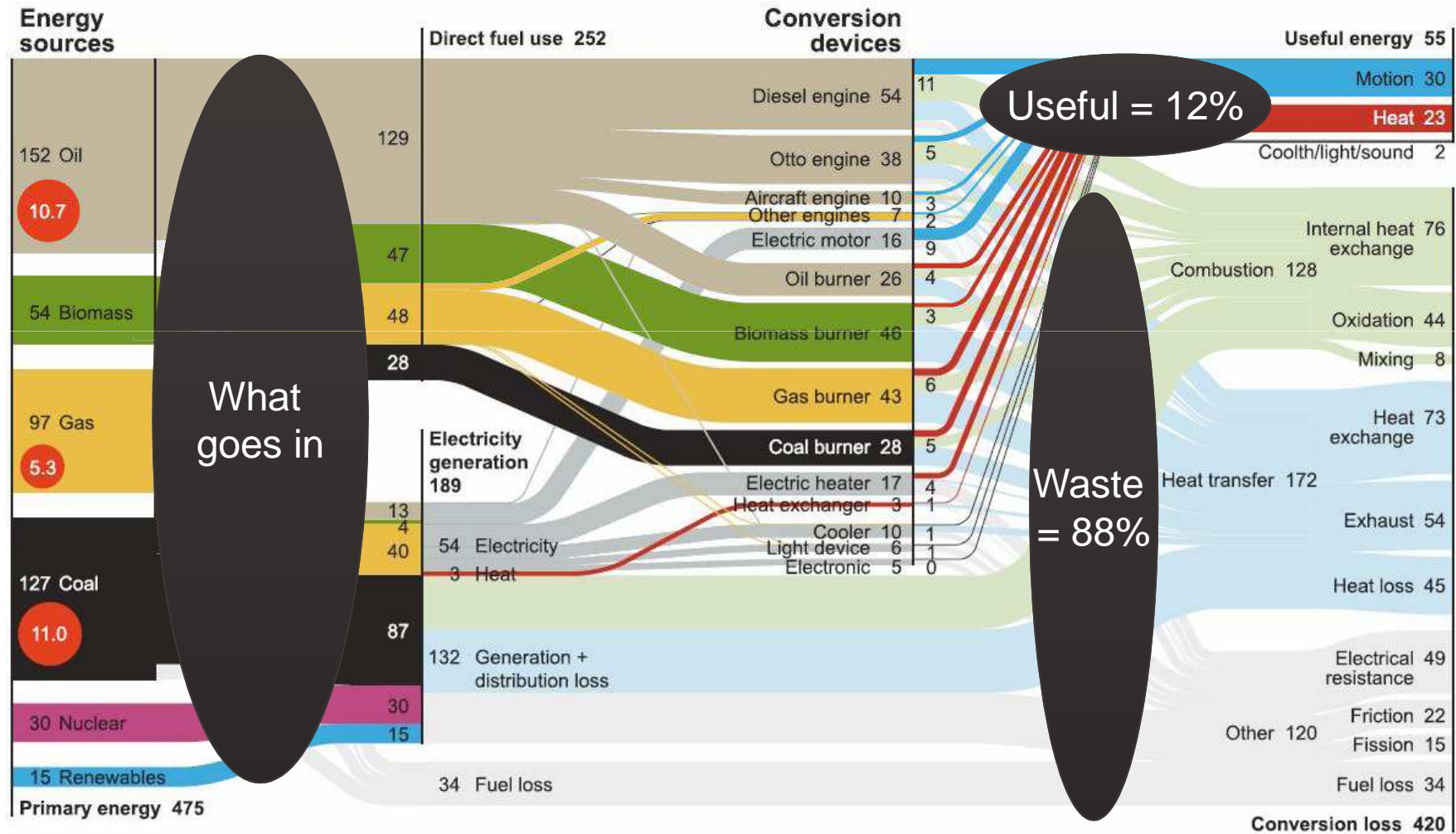
WE BETTER HURRY!

NO! THAT'S THE GREAT THING ABOUT THIS TECHNOLOGY!

TOLSON

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The Good News: Huge Scope for Energy Savings!



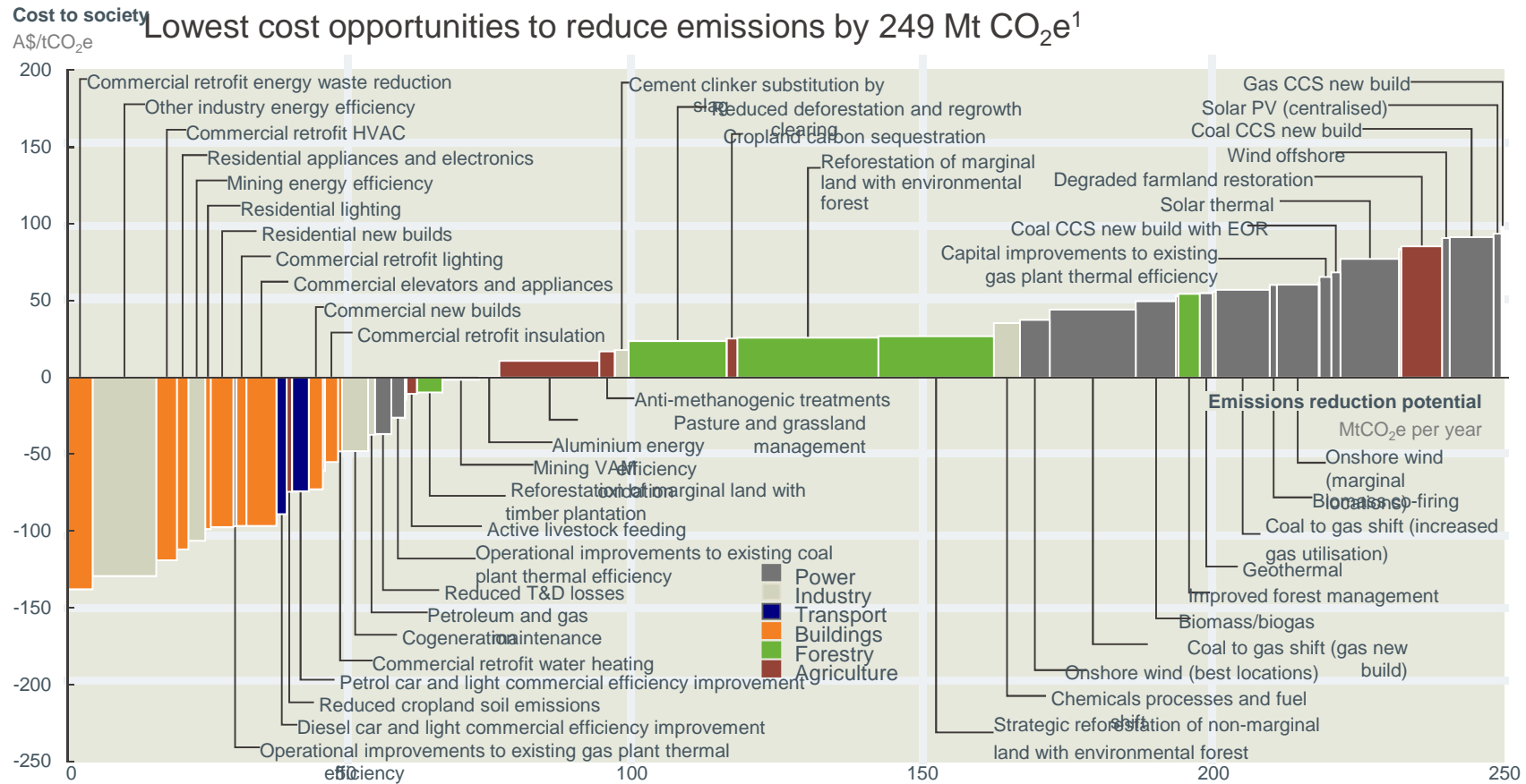
Global energy demand in 2005, total = 475 EJ

Global carbon emissions in 2005, total = 27 Gt CO₂

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Submitted to *Energy*

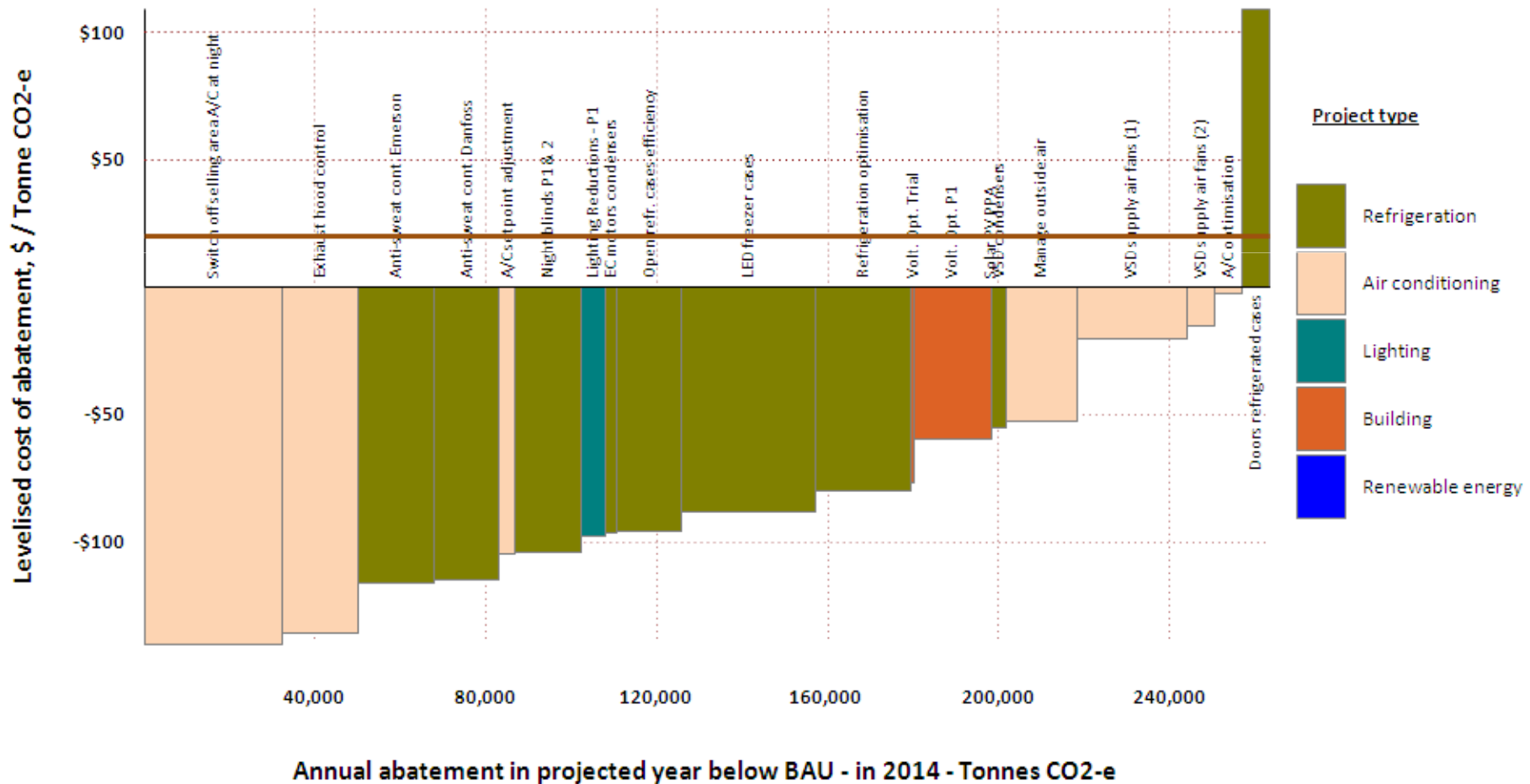


C emissions reduction cost curve

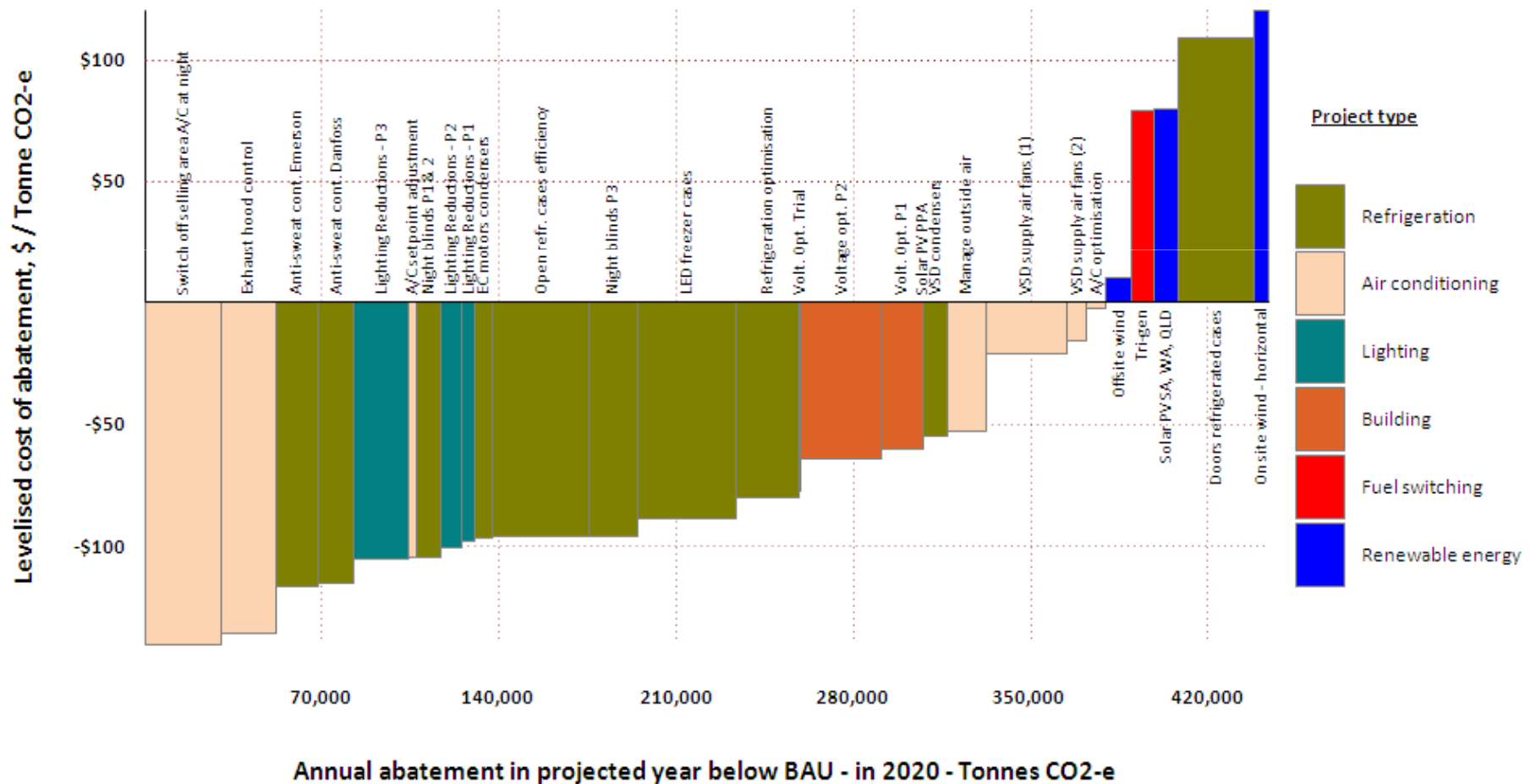


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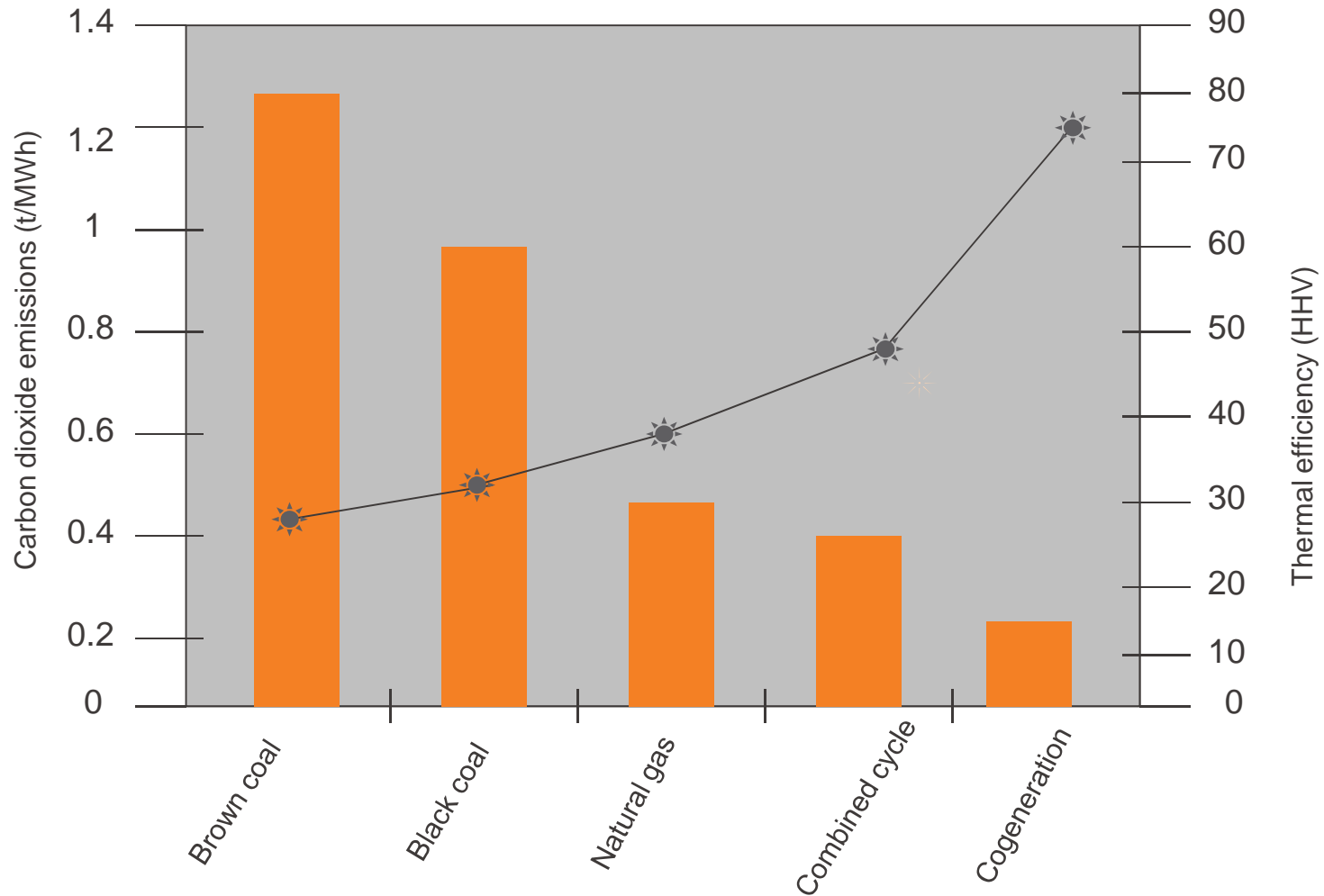
GHG abatement cost curve beyond business-as-usual 2014



GHG abatement cost curve beyond business-as-usual 2020

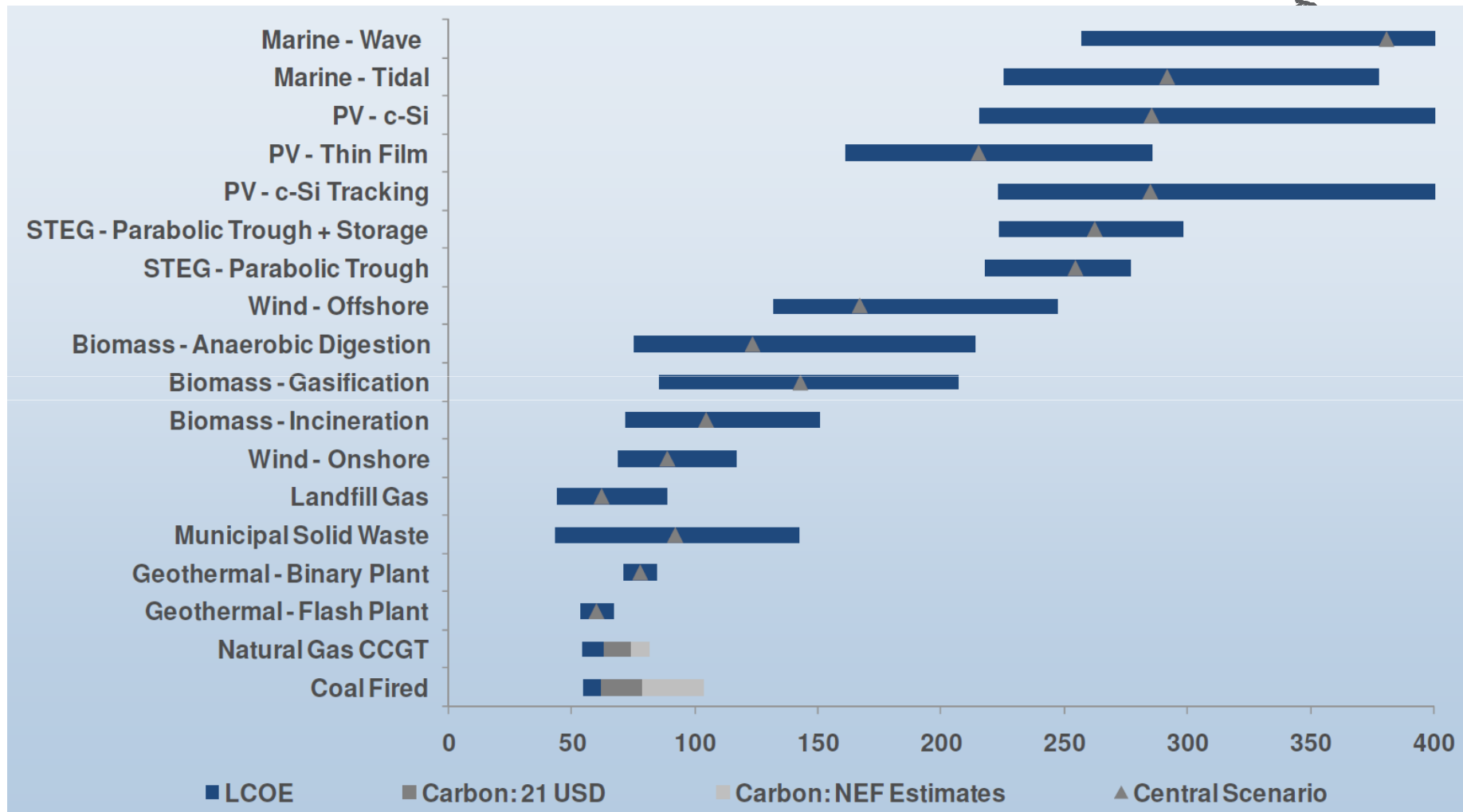


Gas fired cogeneration emissions < 25% of central coal fired station



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Alternative energy forms for central generation are more expensive



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Michael Liebreich, New Energy Finance, Presentation at Guardian Cleantech Summit London – Hilton Tower Bridge, 23 November 2009

Wind power



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- Wind power delivers the lowest cost renewable electricity and is the most deployed.
- However, it's intermittent and transmission issues can be a challenge.
- Good applications exist for on-site wind.

Leading companies are making big cuts

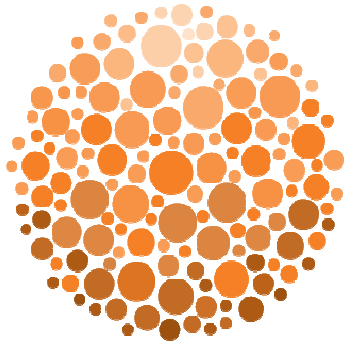
- Sydney Water Corp: 40% reduction in C footprint. C neutral by 2020
- Simplot: 25% EE improvement by 2020. Cogen. will reduce emissions 50% one plant.
- WW: 45% reduction by 2014 on per m2 basis.
- Coles: Zeroing energy price increases through efficiency improvements.
- NAB: 25% reduction in C footprint in 3 years – ‘carbon neutral’. One trigen. plant saved 10%.

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Conclusions



- You need to act now to protect the business from energy/C price escalation.
- Energy efficiency is the best opportunity for cost effective energy cost and carbon reduction.
- There are on-site alternative energy options worth considering.
- Develop a MACC curve to define your opportunities.



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