

Avoiding carbon lock-in: Phasing out fossil fuels in the power sector

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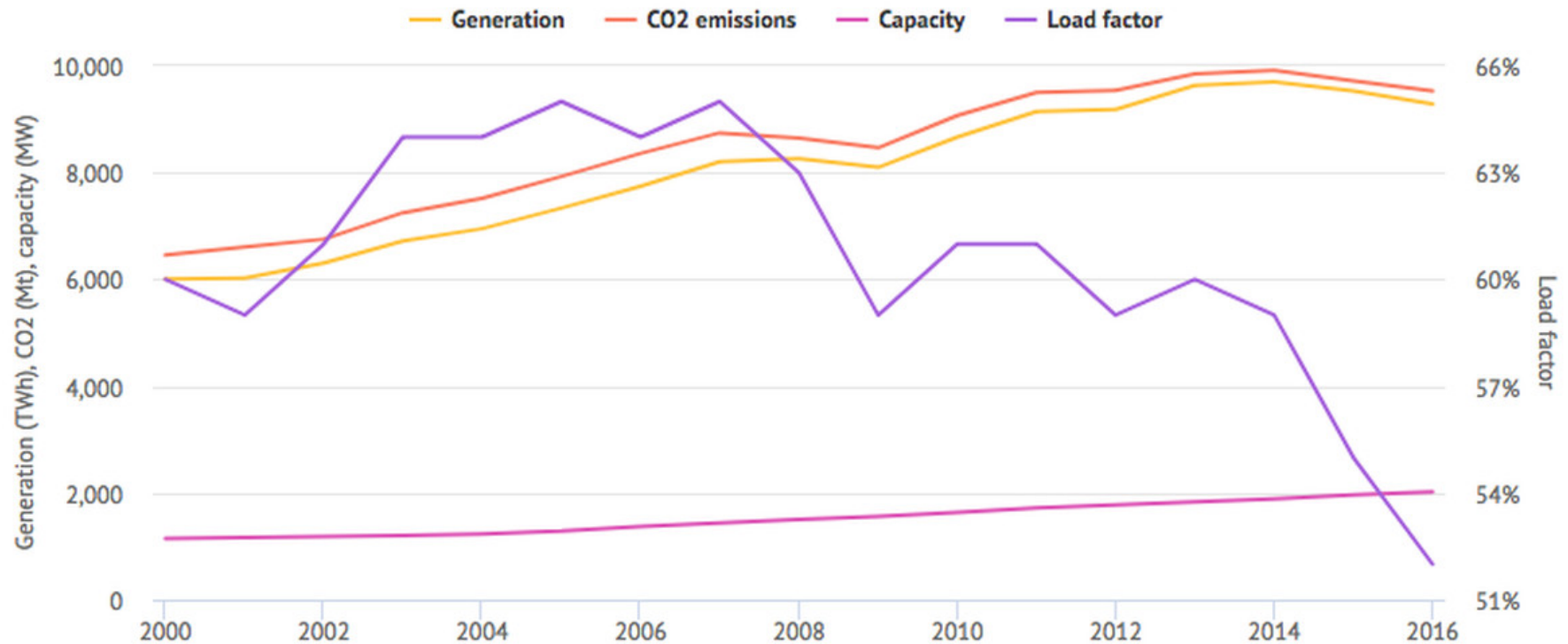
What is a *stranded asset*?

- *Financial stranding* – occurs when an asset no longer meets expected or needed rate of return. Of most interest / concern to investors. Asset may still continue to operate if it covers its ongoing cash costs.
- *Physical stranding*– an asset that is retired early and no longer operates

Financial stranding is happening: Coal plants are increasingly under-utilized

Global coal generation and CO2 emissions peaked in 2014

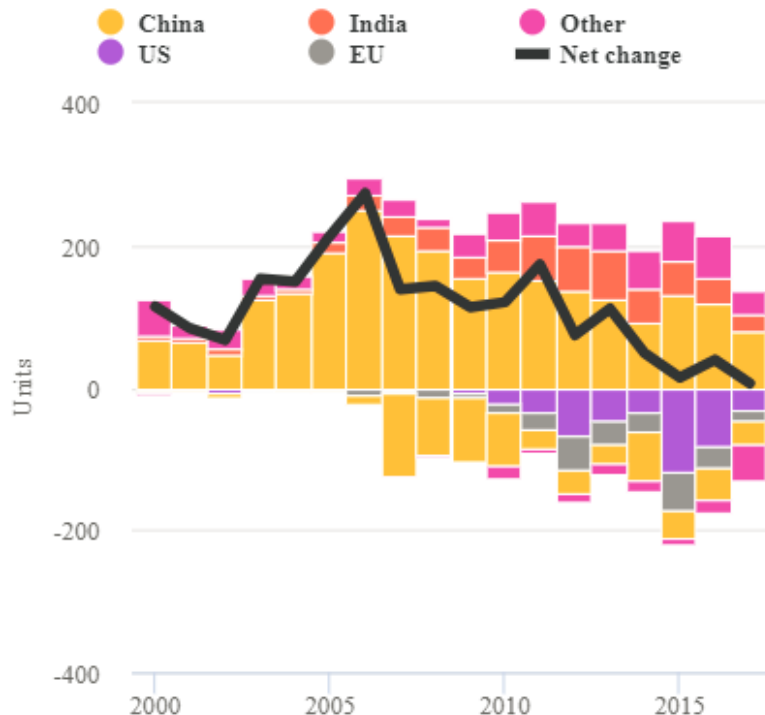
Rising capacity means load factors are falling



Source: [Carbon Brief](#) analysis based on IEA data

Physical stranding is happening: Coal retirements may soon outweigh additions

Unit additions and retirements



Source: [Carbon Brief](#) ^{CB} analysis based on Global Coal Plant Tracker

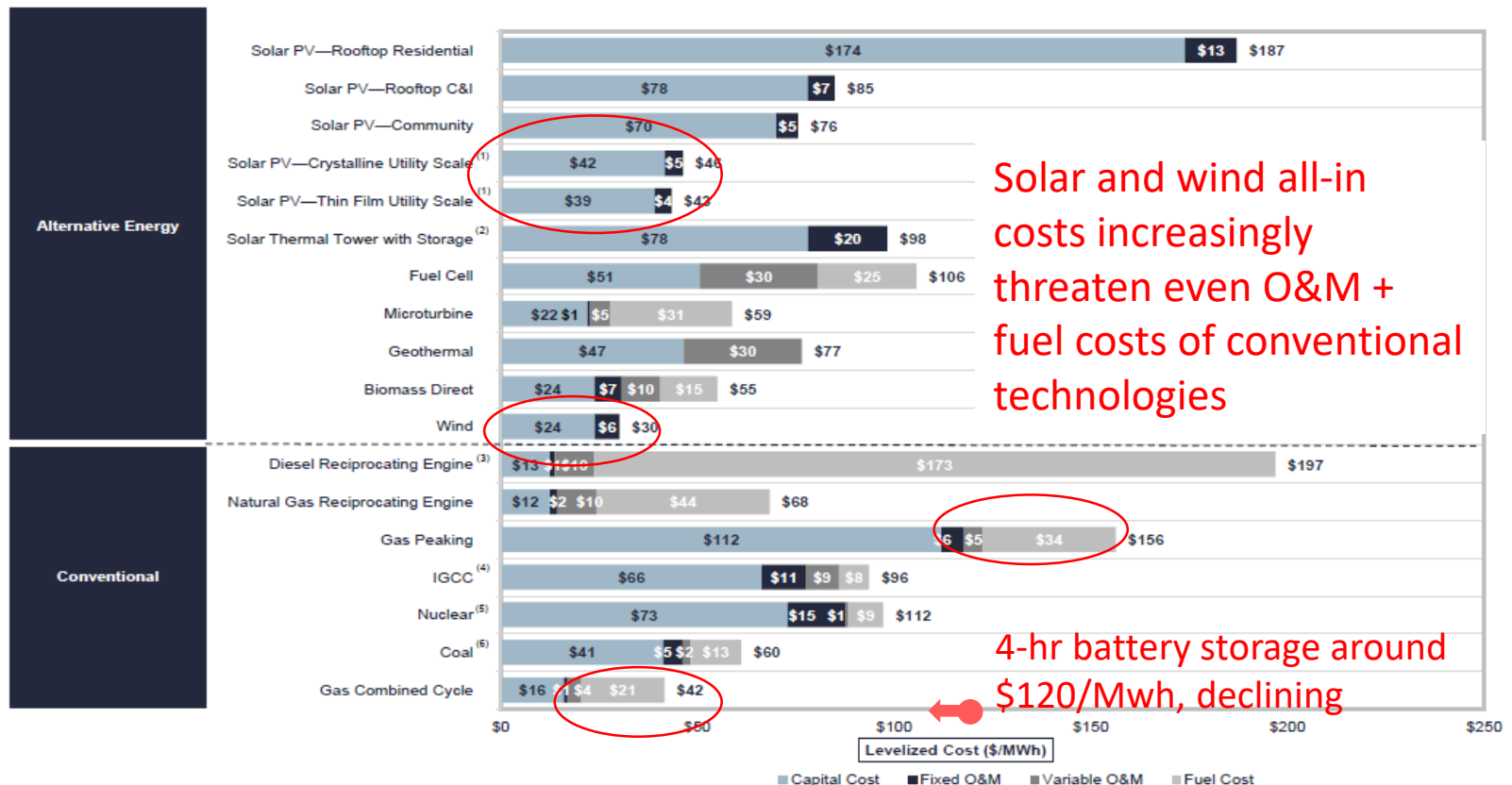
Given decreasing profitability, what and when to retire fossil power plants?

- Discounted cash flow analysis (NPV) of existing fossil plant versus alternative (e.g. new renewables), including usual factors (opex, capex, etc.), *plus*:
 - Real or shadow carbon price
 - Regulatory risk, i.e. other pollutants (mercury, SO_x, etc)
 - Other factors, e.g. subsidies
- Consistency and commitment to Paris climate goals

Cost alone may be reason enough to retire, given rapid cost declines in renewables

Levelized Cost of Energy Components—Low End

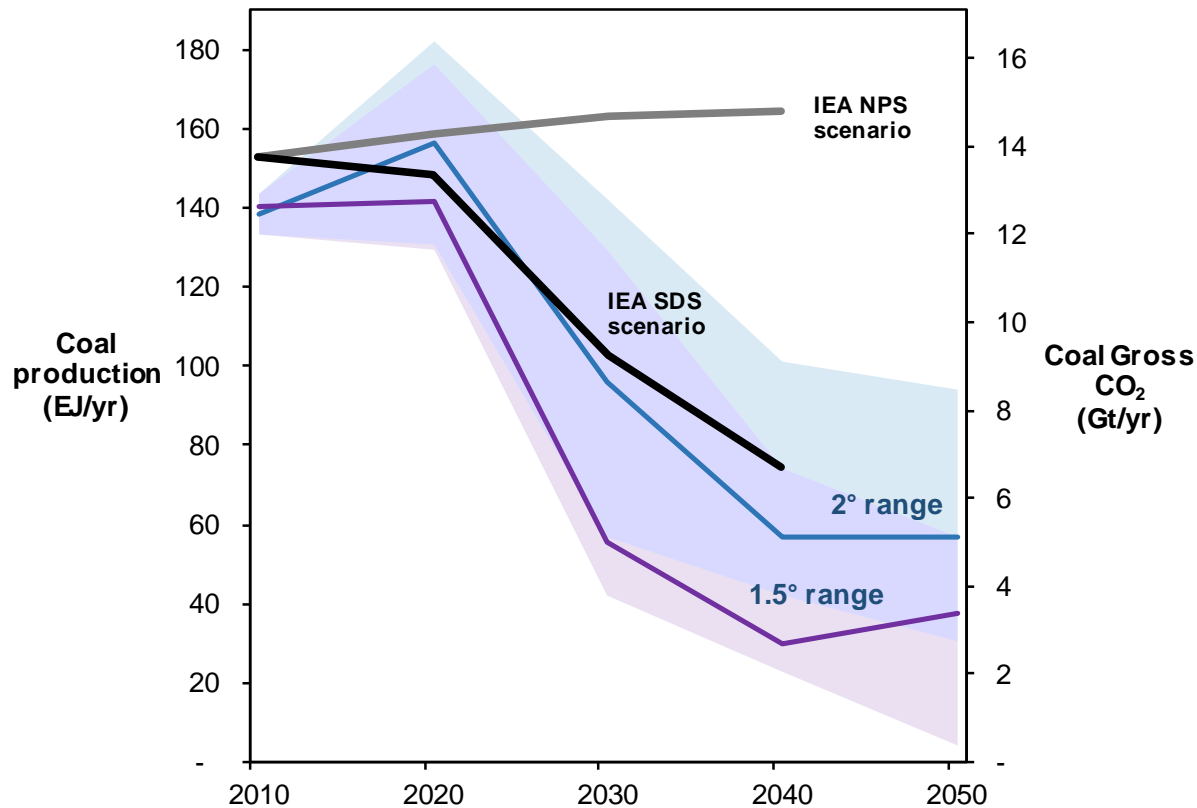
Certain Alternative Energy generation technologies are already cost-competitive with conventional generation technologies; a key factor regarding the long-term competitiveness of currently more expensive Alternative Energy technologies is the ability of technological development and increased production volumes to materially lower the capital costs of certain Alternative Energy technologies, and their levelized cost of energy, over time (e.g., as has been the case with solar PV and wind technologies)



Source: Lazard estimates

Chart source: [Lazard's LCOE analysis 2017](#)

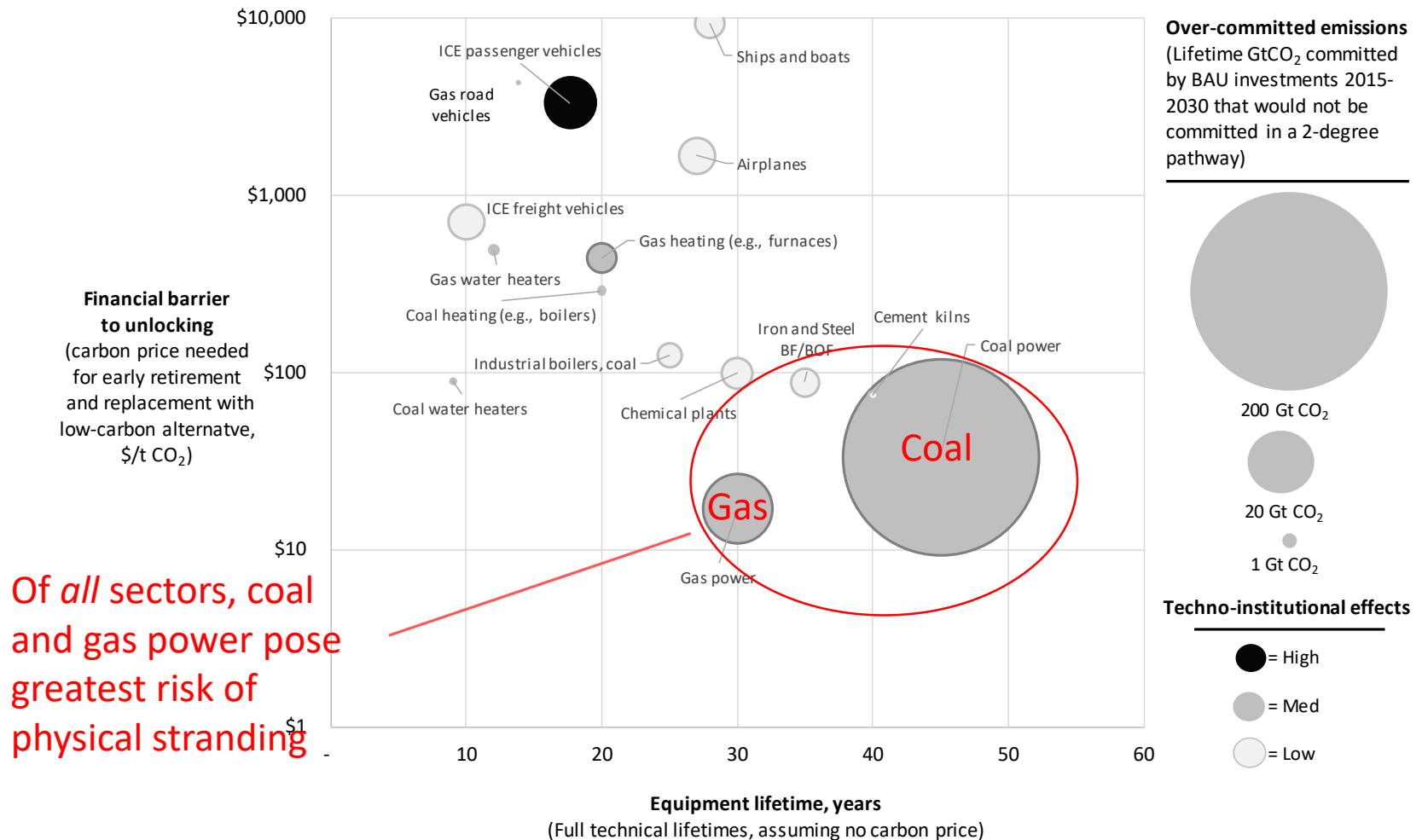
Plus, phasing off coal is a climate imperative



- IPCC and IEA scenarios show coal use dropping precipitously from 2020 – leaves little/no room for new investment

Source: SEI analysis based on IPCC SSP scenario database (Riahi et al 2016) and IEA World Energy Outlook 2017

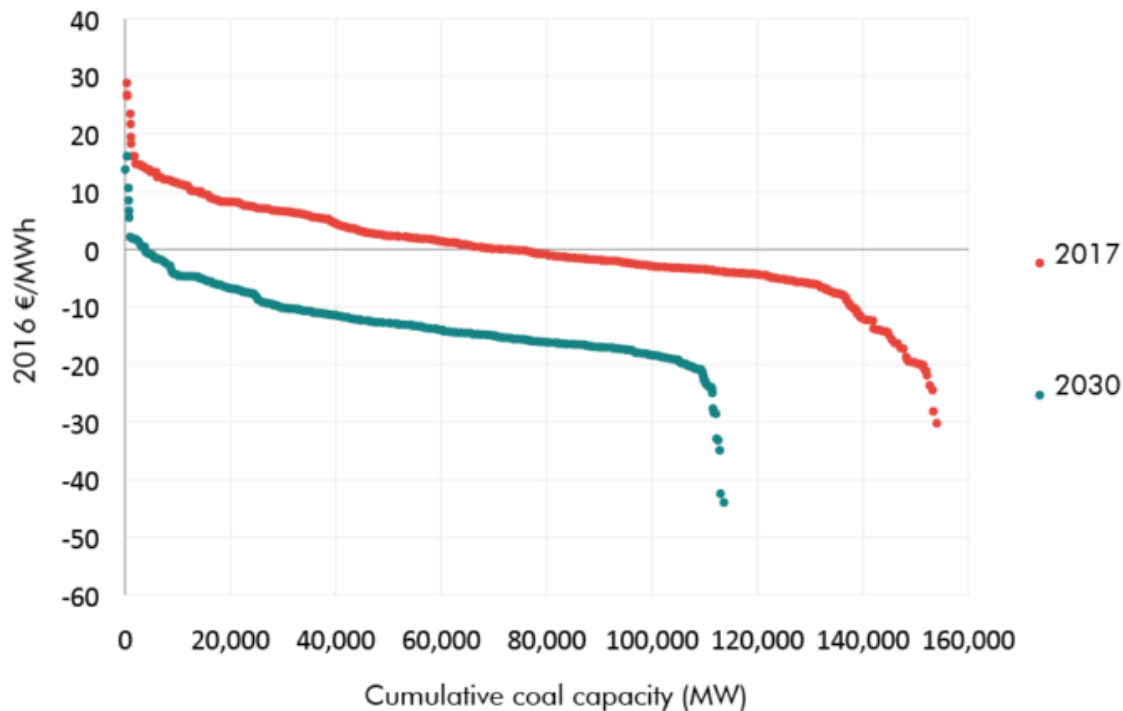
And, not just coal power that will need to be stranded – gas too



Don't wait too long!

Half of EU coal capacity cash-flow negative

Gross profitability of operating coal fleet in 2017 and 2030



Source: Carbon Tracker analysis



Thanks for your attention!

SEI Initiative on Fossil Fuels and Climate Change

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