Carbon Tracker Initiative

Here comes the sun (and wind)

Vietnam's low-cost renewables revolution and its implications for coal power investments

Vietnam, June, 2019

Who are we?

Identity Carbon Tracker is an independent non-profit financial think tank funded by EU and US foundations interested in climate.

Vision To enable a climate secure global energy system by aligning the capital markets with the low carbon transition.

Mission Mapping the transition for the fossil fuel industry to stay within a two-degree budget.

Strategy

Research that unpicks the implications of the energy transition for fossil fuel supply and demand

Communicate to amplify research findings and influence the debate in mainstream media

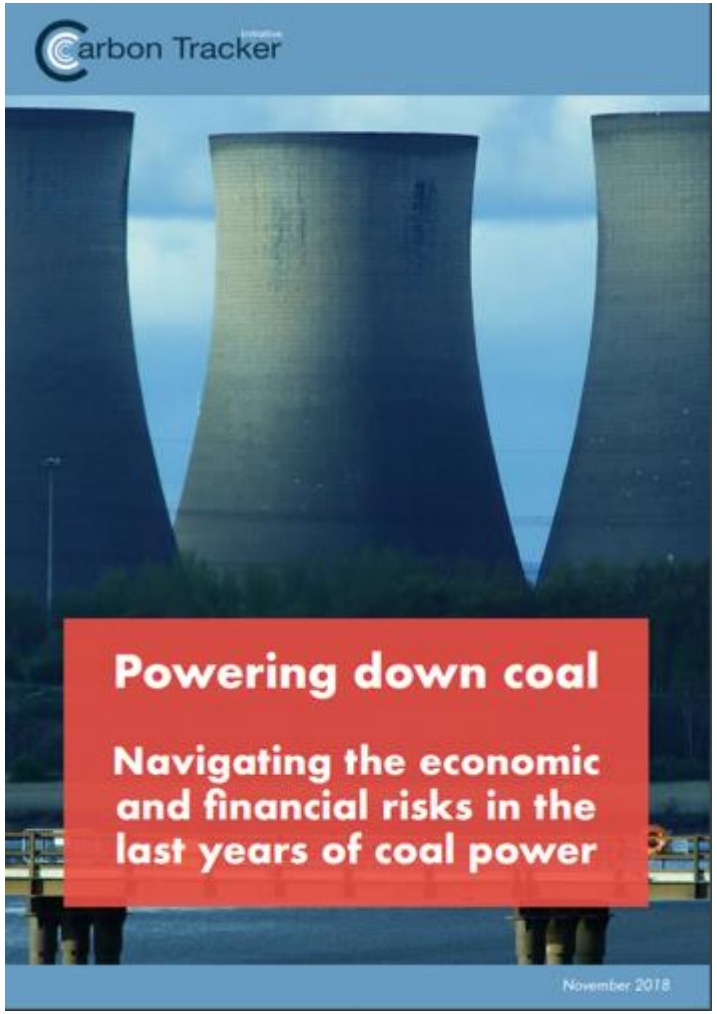
Educate mainstream financiers and policy-makers over the risk of a disorderly transition

Engage to deepen the dialogue with investors to enable transparency on implications of transition

REPORT BACKGROUND

Two-year data & analytics effort

- 7,300 coal units, 900 companies and 34 countries
- 95% of operating capacity and 90% of capacity under-construction
- Operating cost, gross profitabilty, relative competitiveness, below 2°C phase-out year and below 2°C stranded asset risk
- Aggregatable by unit, plant, company, province and country

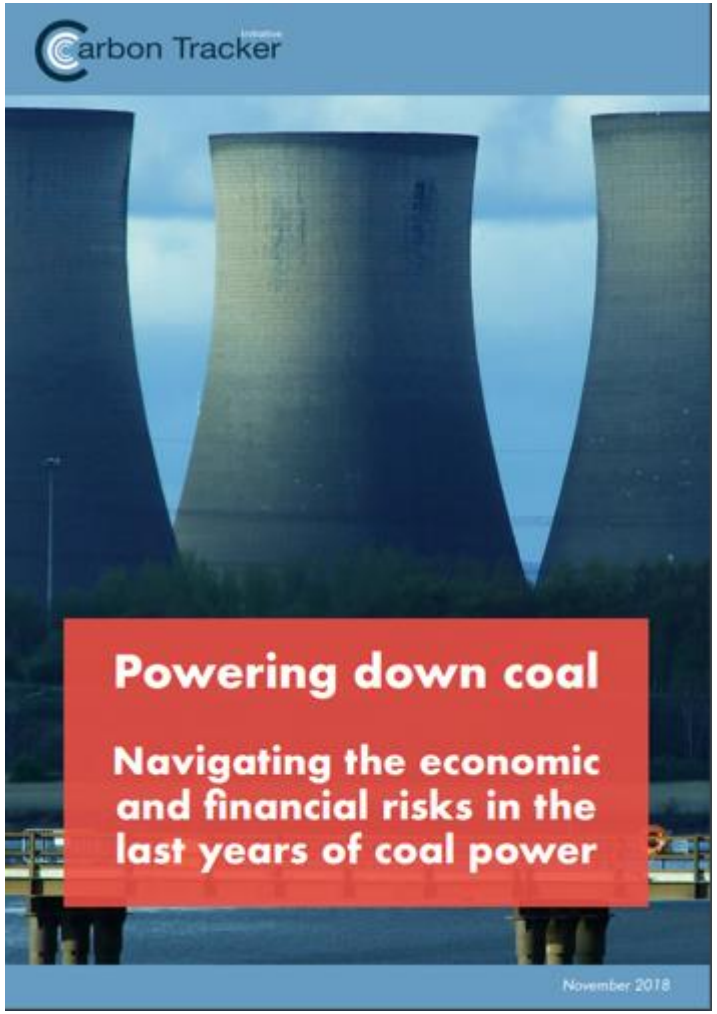


Powering down coal report findings

1. ***~40%*** of coal plants across the globe are unprofitable today

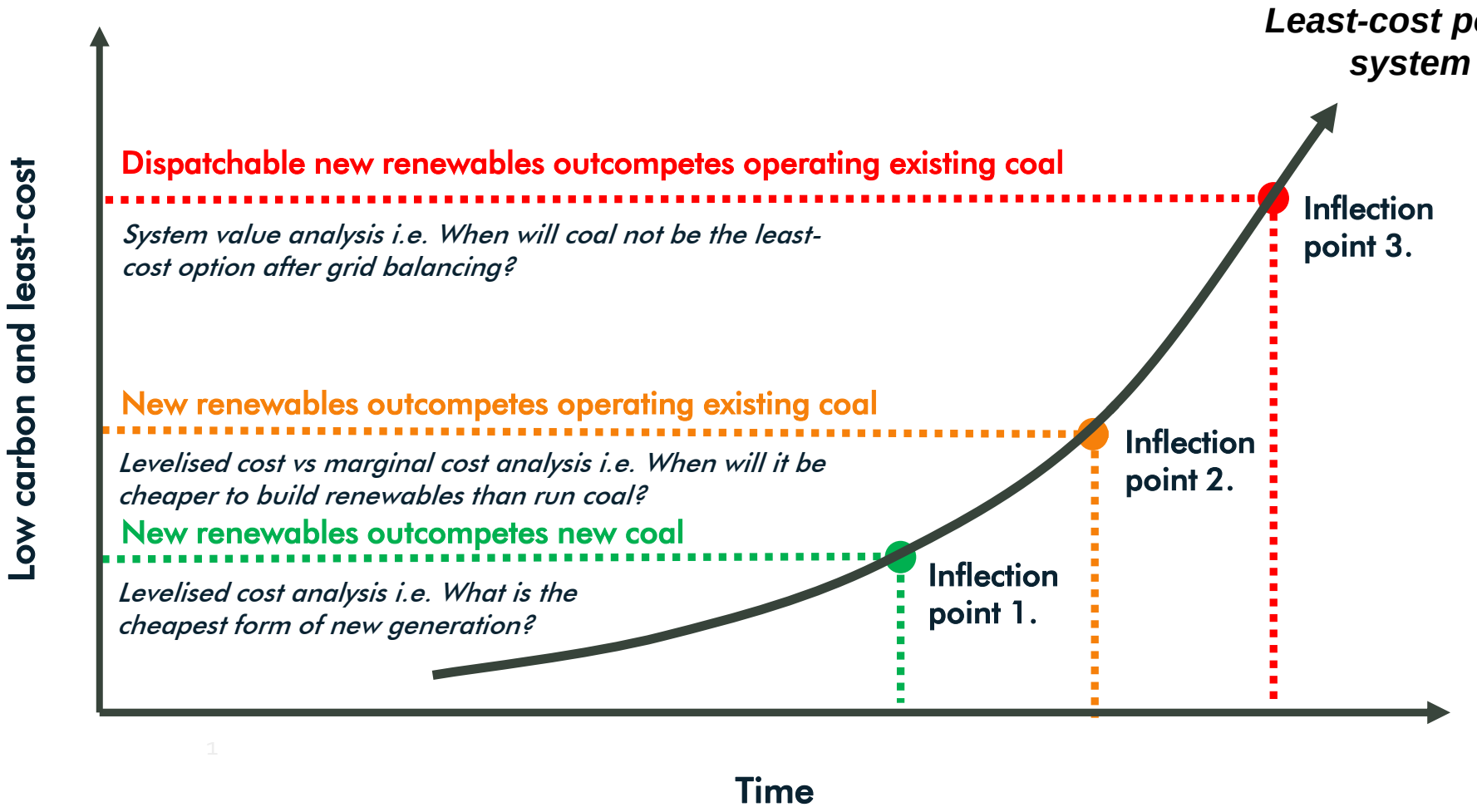
2. ***~500 GW*** of operating coal capacity costs more to run than building new renewables today

3. ***~$250 billion*** (USD) of losses could be avoided if coal power is shut down in a manner consistent with the temperature goal in the Paris Agreement



HIGH-LEVEL FINDINGS FROM HERE COMES THE SUN (AND WIND)

Three economic inflections points which will make coal economically obsolete over time

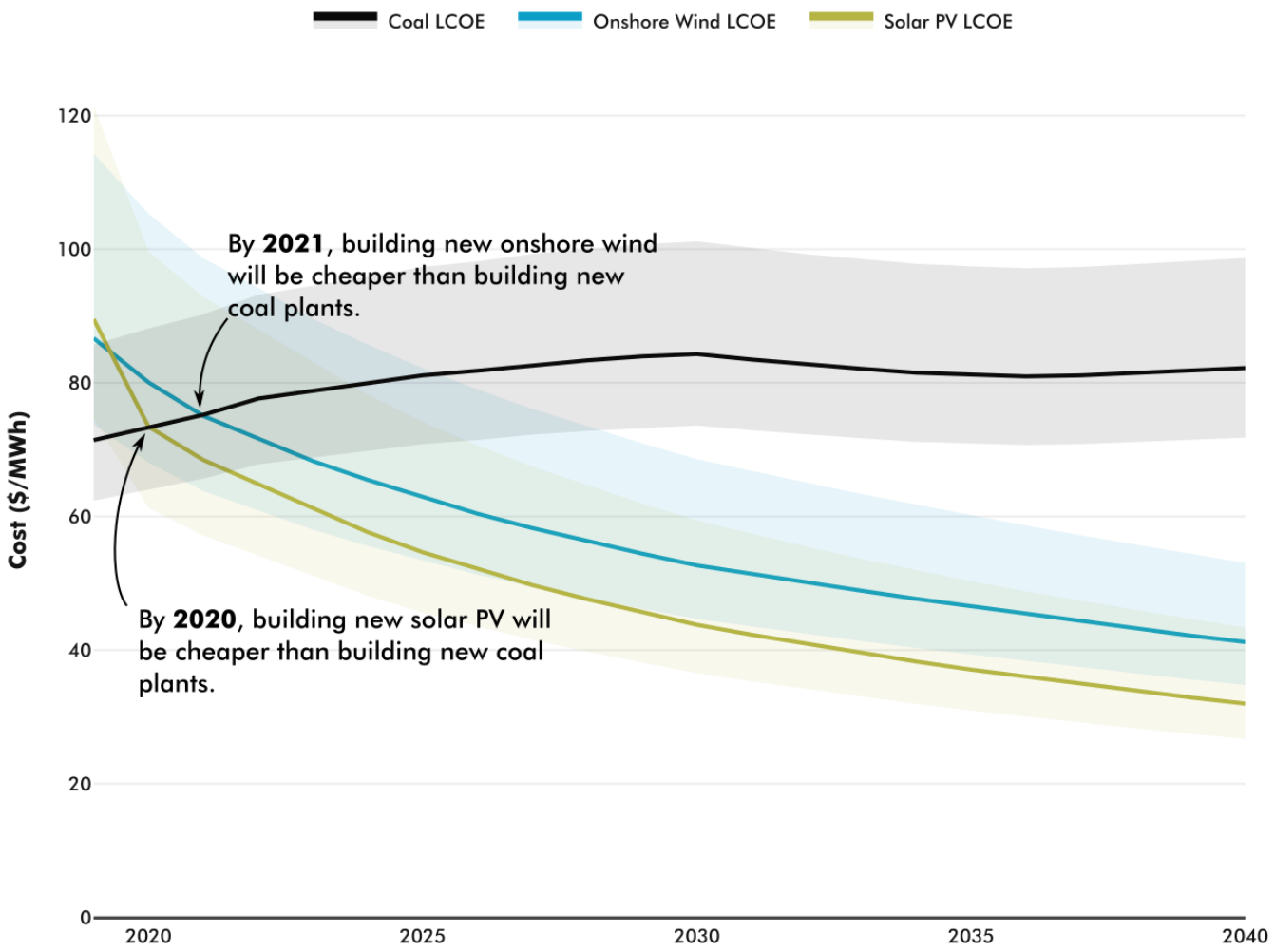


Implication of inflection point 3.
Policymaker: *Implemented a coal phase out*
Investor: *No revenues from coal power*

Implication of inflection point 2.
Policymakers: *Design a coal phase out*
Investor: *Prepare for no revenues from coal*

Implication of inflection point 1.
Policymaker: *Stop incentivising new coal*
Investor: *Stop building new coal*

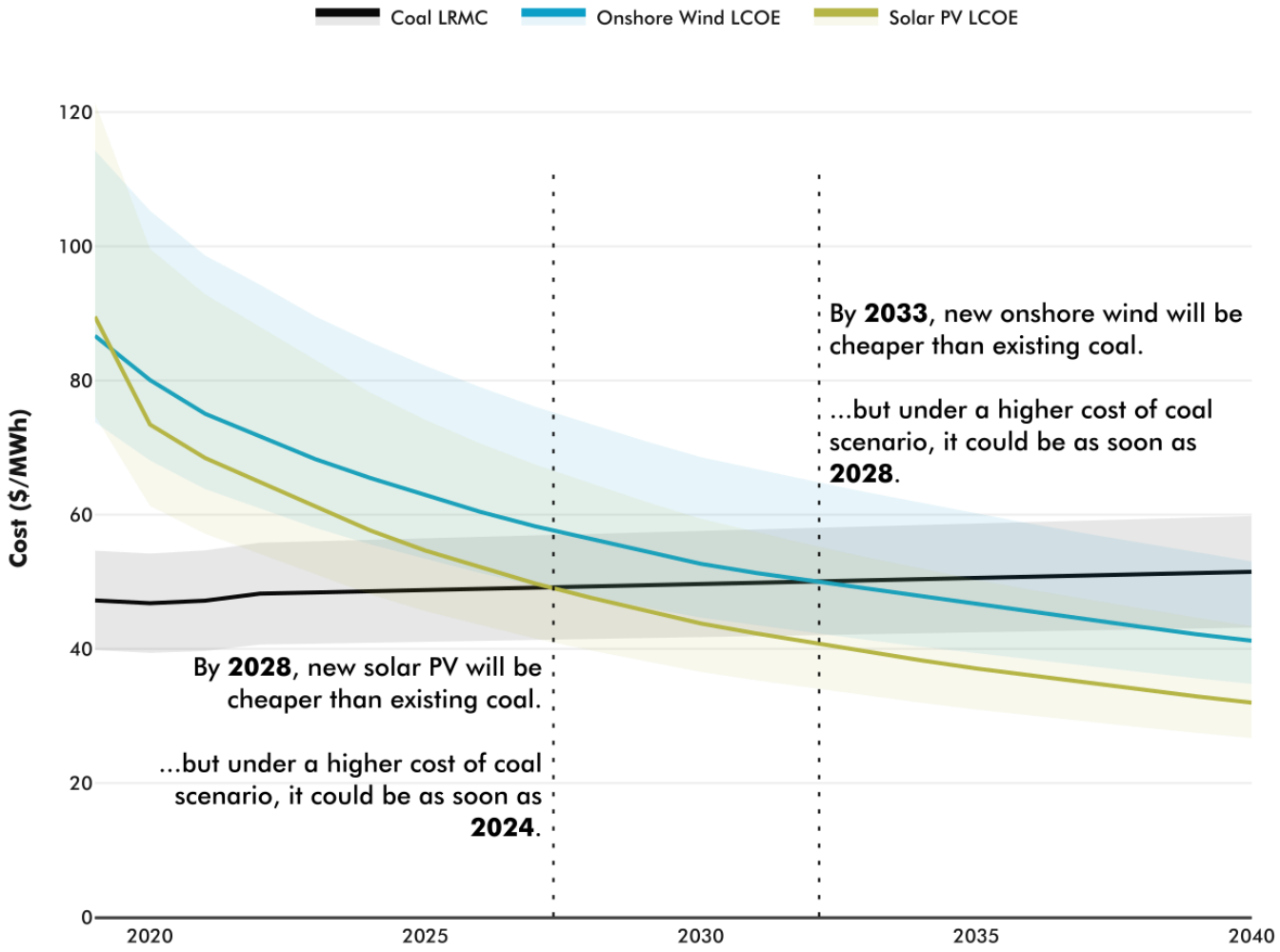
Economic inflection point one: renewable energy is cheaper now



The levelised cost of solar PV and onshore wind will be cheaper than the levelised cost of coal by 2020 and 2021, respectively.

Source: Adapted from Bloomberg NEF (2018) (2019)

Economic inflection point two: new renewables cheaper than running coal plants as soon as 2022



The levelised cost of solar PV could be cheaper than the long-run operating cost of coal as soon as 2022.

Source: Carbon Tracker (2019), Bloomberg NEF (2018) (2019)

Economic inflection point two (cont.): fuel cost sensitivity analysis

Under a high fuel price scenario the levelised cost of solar PV and onshore wind could be cheaper than the long-run operating cost of coal by 2022 and 2024, respectively

		Solar PV LCOE			Onshore wind LCOE		
		Low	Mid	High	Low	Mid	High
Coal LRMC	Low ($64/t)	2028	2032	>2040	2033	2039	>2040
	Mid ($81/t)	2024	2028	2035	2028	2033	>2040
	High ($99/t)	2022	2025	2031	2024	2028	2036

Source: Carbon Tracker (2019), Bloomberg NEF (2018) (2019)

Economic inflection point three: outside the scope but technically possible

- Germany, 1993, 0.1% wind power in total generation

"Renewable energies such as sun, hydro or wind cannot cover more than 4% of our electricity consumption – even in the long run."

Joint statement by German power utilities, published in Die Zeit, 30 July 1993, page 10

2015: 30% RE of annual consumption, instantaneous generation 90%

- Ireland, 2003, 2% wind power in annual generation

"This amount of wind generation does, however, pose an increased risk to the security and stability of the power system which the transmission system operator feels exceeds the level normally likely to be accepted by a prudent system operator."

Kieran O'Brien, Managing Director of ESB National Grid, Ireland, 1 December 2003

2014: 20% wind in annual generation, instantaneous generation 70%

Economic inflection point three: outside the scope but evidence suggests renewables a lot cheaper

- ***International Energy Agency**: integrating 0-15% renewables penetration only requires operational changes (e.g., better supply and demand forecasting)*

- ***UK experience**: systems cost of integrating 30% penetration of renewables could be $6/MWh*

Source: IEA (2015), Carbon Brief (2017)

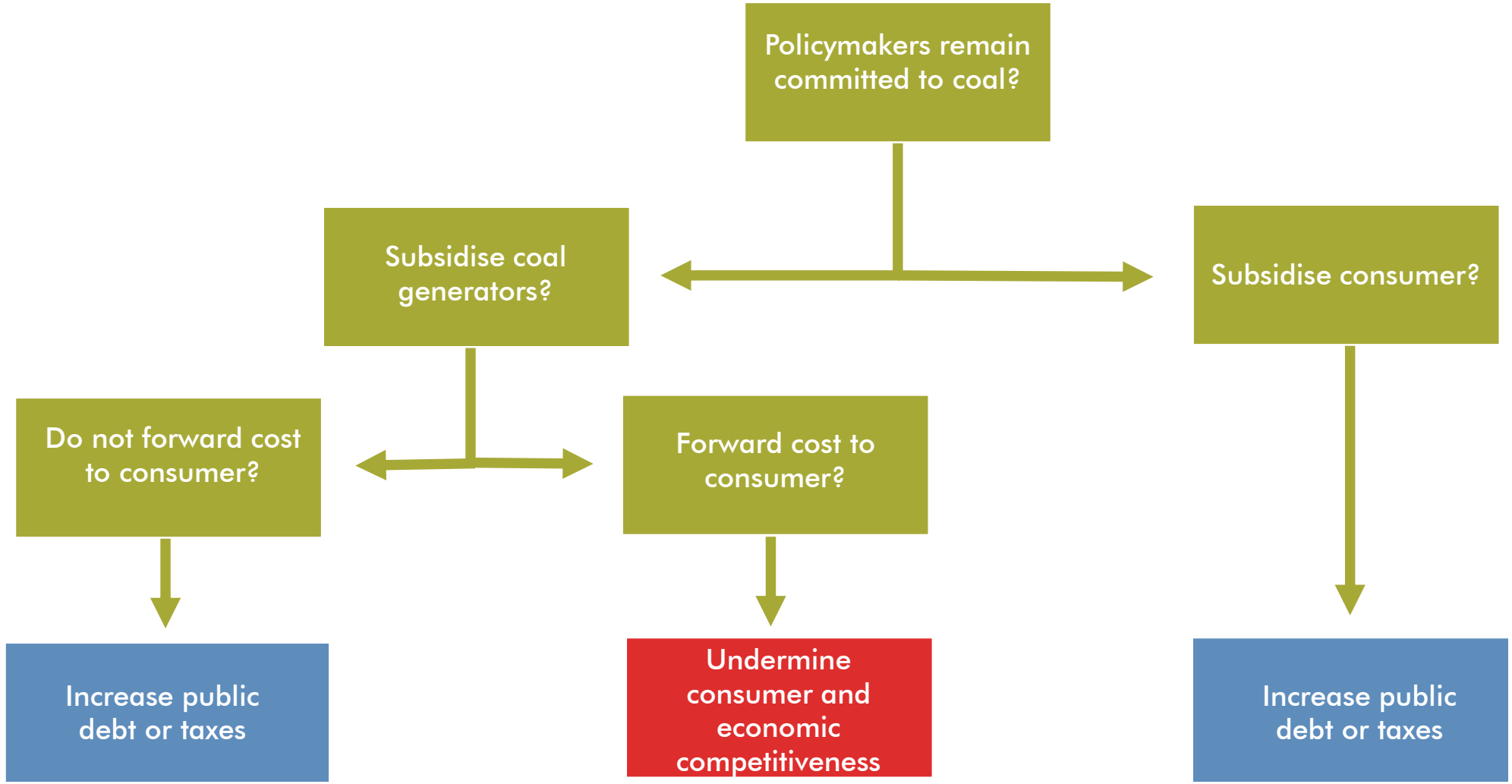
POLICY RECOMMENDATIONS

Policy recommendations for coal power investment in Vietnam

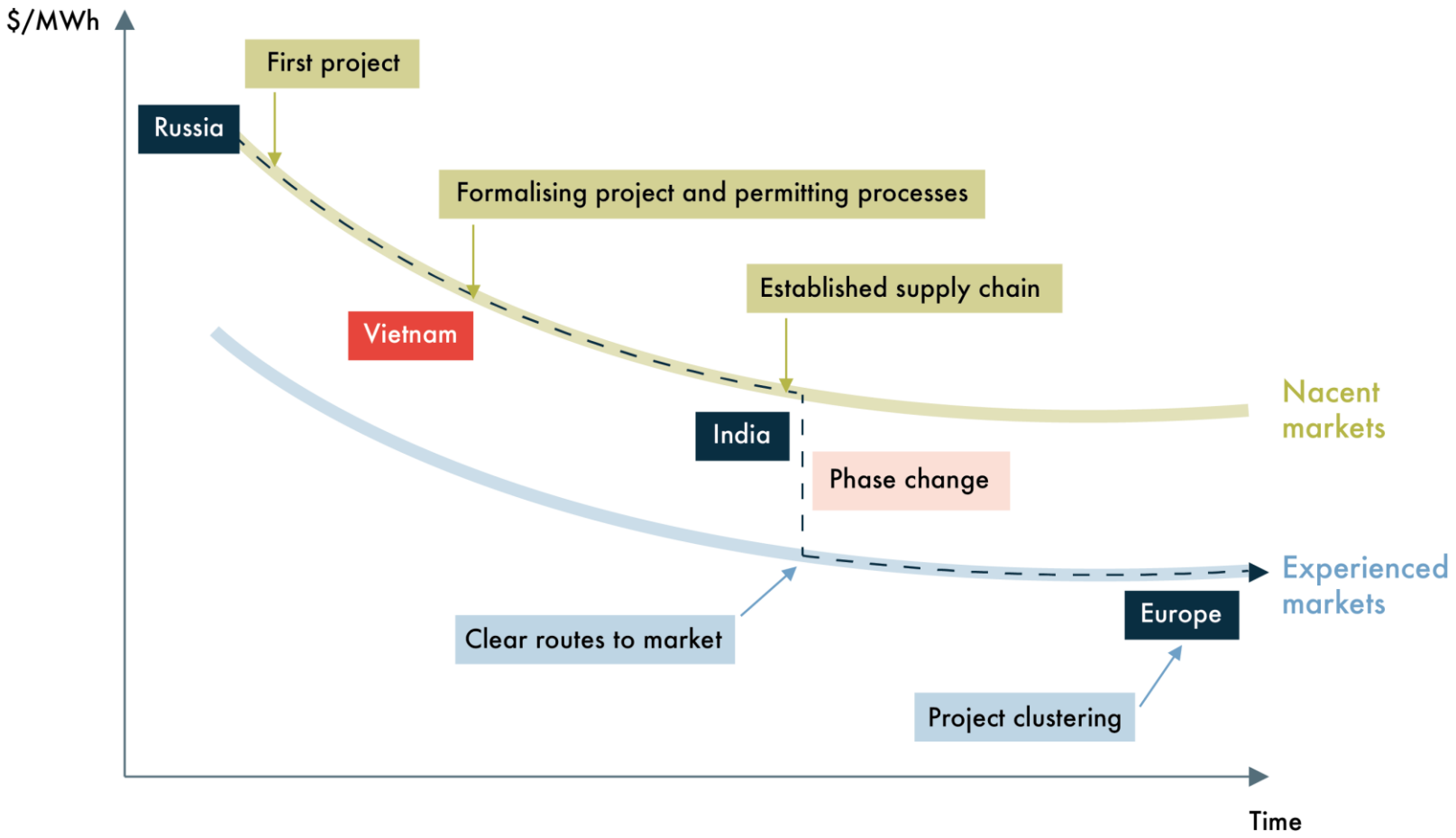
We offer three recommendations to minimise asset stranding:

1. Stop investing in new coal (inflection point 1)
2. Develop a cost-optimised retirement schedule for the operating fleet (inflection points 2 and 3)
3. Reform renewable energy policies

Building coal power today equals high cost power and fiscal liabilities tomorrow



How policymakers can reduce the costs of renewables overtime



Policymakers can do the following:

1. *Replace the FiT system with reverse auctions;*
2. *Increase the bankability of PPA contracts; and*
3. *Introduce stronger air pollutant emission limits for coal plants (which will require the installation of expensive control technologies).*

Source: Adapted from Bloomberg NEF (2018)

Carbon Tracker Initiative

Thanks for listening

For more information please visit:
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If you are interested in knowing more,
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