

## **Derailment Risk**

Matt Pritchard Director, Baringa Partners 05 03 2024 Westminster Energy Forum



Baringa is a certified B Corp™ with high standards of social and environmental performance, transparency and accountability.

Copyright © Baringa Partners LLP 2022. All rights reserved. This document is subject to contract and contains confidential and proprietary information

♦ \$20.4

Baringa Confidential

## **Definition of Derailment Risk**

Causes beyond Carbon? Impacts beyond the Energy Transition?



- A narrow definition: derailment of the energy transition by physical impacts exacerbated by carbon emissions
- A broad definition: 'the risk that humanity's efforts to remain with a safe operating space are derailed by interacting biophysical and socio-economic factors.'

Laurie Laybourn et al., 'Derailment risk: A systems analysis that identifies risks which could derail the sustainability transition.' November 2023. *Earth System Dynamics* 14(6):1171-1182.





China and India's emissions are set to exceed Paris because their targets are not Paris-aligned...





**Baringa** 



...while US and EU will overshoot because they lack both nearterm practical policy support and stable long-term political support for transition





**Baringa** 



## **Baringa's Climate Base Case**

The Stage upon which the Transition must occur

Annual global emissions will exceed Paris by c. 20Gt CO<sub>2</sub> from the 2030s, setting us on a 2.5 degree pathway



2040

2045

2050

#### Forecasted base case vs Paris aligned required annual global GHG emissions



1.5 degrees

10

2020

2025

2030

2035

# Higher rates and commodity prices, in addition to widespread protectionist policies worldwide, have increased the cost of the energy transition

#### Key speed and cost drivers

	SPEED DRIVERS	
	RESILIENT PPA DEMAND	1
Y	POLICY AMBITION	1
	REFORMING BARRIERS TO DEVELOPMENT	1
		Faster

	COST DRIVERS	
<b>  €  </b>	POLICY RATES HIKES	1
~	COMMODITY PRICES INCREASE	1
5	PROTECTIONISM ON THE RISE	1
		Dearer



#### The Energy transition: speed & costs



## **Optimising Adaptation**

**Transformational vs Incremental** 



- *'We should see adaptation as an enabler of mitigation under conditions of escalating destabilisation within the Earth system: the sustainability transition itself needs to be made more resilient.'*
- 'In this way, derailment risk bolsters the case for "transformational adaptation".'

Laybourn et al., 2023

Optimise adaptations for both affordability and effectiveness, but plan for the long-term.

It's a worst-case scenario if you incur costs for successive, expensive adaptations *and* for successive, expensive damages (e.g. Carlisle flooding).



7 Copyright © Baringa Partners LLP 2024. All rights reserved. This document is subject to contract and contains confidential and proprietary information

## **Confronting Vicious Cycles**

When might mitigation, adaptation and disaster recovery *themselves* jeopardise safe operating spaces?

Mitigation: **Mitigation:** Adaptation: **Disaster Recovery: Offshore Wind Turbines Data/AI for Sustainability Flood defences Temporary Housing** Data centres curbed as pressure grows on electricity grids 350m reland. Germany, Singapore and China are imposing One Canada Square Futurism Deansgate Squar Canary Wharf 300m South Towe London - 236 m Sam Altman Says AI Using Too Much Manchester The Gherkin, 250m - 200m Energy, Will Require Breakthrough London - 180m Energy Source 200m Big Ben, et there without a breakthrough. 150m ondon - 93 100m 50m 2MW 2002 6MW 2014 8-9MW 2018 12MW 2022-23 Increasing size of offshore Data and AI can make various Flood defences may be In order to provide relief from climate-related wind turbines requires new, contributions to sustainability constructed from aggregates larger ships and new port mined on land or at sea, monitoring and analysis, but disasters, shelter must be infrastructure, in turn entail huge amounts of ... in place quickly, often entailing more... entailing more... entailing more...

...habitat destruction, materials, emissions and pollution.



## **Building a Derailment Indicators and Warnings Regime** From Theory to Evidence





- Militaries increasingly involved in responding to climate hazards
- How do we assess the evidence regarding if and how other defence activities are being affected?
- 37 x \$1 billion climate-related disasters in US in 2023
- Under what conditions can costs no longer be socialised?



## **Indicators and Warnings**

### The Historical Perspective

#### Jared Diamond







**Peter Turchin** 

END

lites, Counter-Elites and the Path of Political

Disintegration

PETER TURCHIN



#### All complex societies go through cycles of integration and disintegration

- In the latter, elites fail to advance common interests, turning on the 'wealth pump' which transfers money from poor to rich
- Simultaneously, too many 'elite aspirants' compete to be in the upper echelons
- Civic cohesiveness and cooperation declines, with collapsing levels of trust in institutions and unravelling social norms.

#### **Joseph Tainter**



The Collapse of Complex Societies

New Studies in Archaeo



- Sources of collapse may be resource depletion, environmental degradation, or changes in the social, economic or political landscape
- To develop and sustain themselves, societies must solve problems and generate benefits for their members
- The benefits of increased energy expenditure on problem-solving capacity must exceed the costs
- At a certain point, the marginal benefits on increased investment are outweighed by the costs, and the society experiences a rapid decline in socio-political complexity.



- Five factors contributing to collapse: environmental damage, climate change, hostile neighbours, trade failures and society's response to environmental problems
- Crucial choices: 'the courage to practice longterm thinking, and to make bold, courageous, anticipatory decisions at a time when problems have become perceptible but before they have reached crisis proportions' and 'the courage to take painful decisions about values.'
- Offers a four-stage road map of failures in group decision-making: failure to anticipate, perceive, try and execute.

## **Indicators and Warnings**

The Planetary Perspective

#### THE GAIA HYPOTHESIS

#### THE ATHENA HYPOTHESIS



Living organisms on the planet interact with their surrounding inorganic environment to form a synergetic and self-regulating system.  'Co-evolution of a sentient species with its life-support systems depends on its deeper collective intelligence.'
Joe Ravetz

