



AMEU/SAIEE joint virtual webinar

“THE DIGITAL MUNICIPAL Dx ELECTRICTY UTILITY OF THE FUTURE”

25 August 2022

Session 6 (Theory/Case Study) Disruptions – “Black Swan” Issues?

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SAIEE



Disruptions – “Black Swan” Events

One can define a “Black Swan” event as

A significant change in fundamental assumptions that upsets the business environment.

Black Swan events are normally predicted by some analysts, but these are dismissed as “irrational fears”.

After the event has occurred the general comment is that it was virtually inevitable and obvious (in hindsight!).

Specific International Examples

1637 Dutch tulip bulb market bubble

“it was obvious that the prices were irrational”

1990 Collapse of the USSR

“the Soviet central planning was fundamentally flawed”

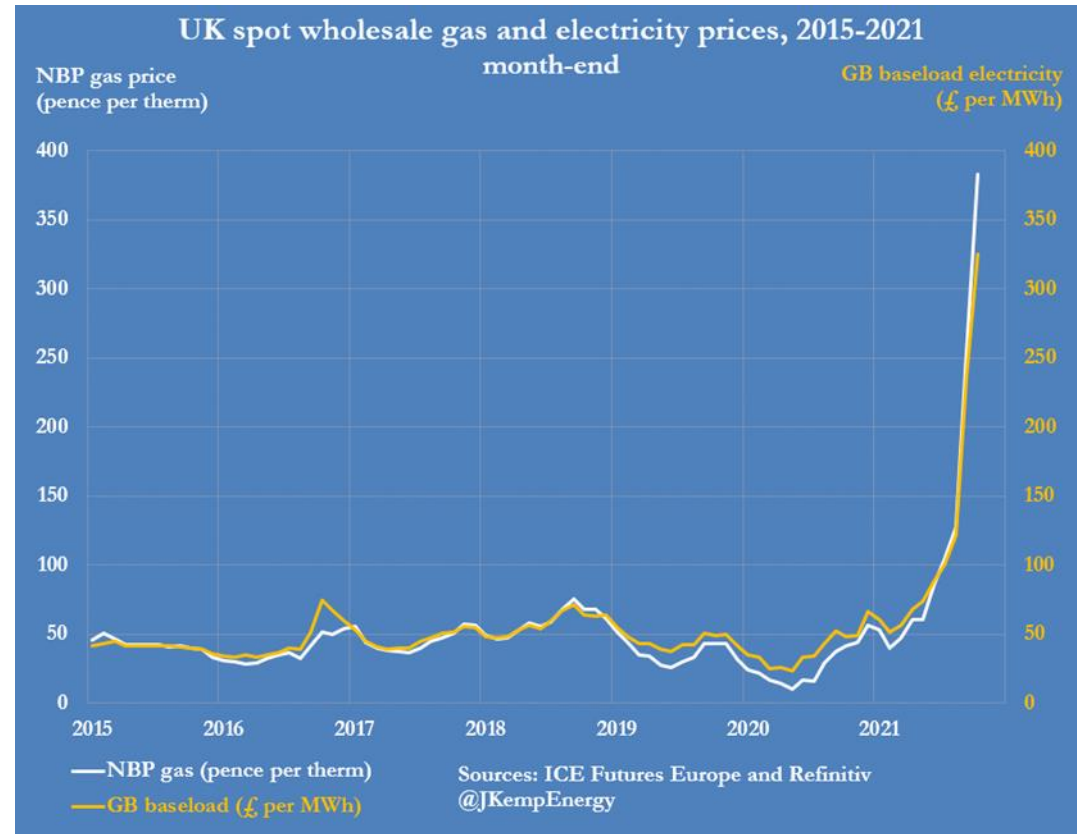
2008 Financial Crisis

“the banks were over leveraged”

2011 Japanese tsunami and Fukushima disaster

“the Japanese safety authorities were too close to the utility”

Surely We Are Too Clever Now?



Issues for South Africa's Electricity?

- Restructuring the tariff structure to more accurately reflect Eskom's cost structure (R0.50c/kWh variable, balance fixed?)
- Complete collapse of Eskom performance to "Nigerian" levels ("Nigeria's national electricity grid has collapsed more than 200 times in the last nine years" – *The Conversation 22 March 2022*)
- Eskom returns to the performance of 2017 (80% EAF) and has no supply problems
- South Africa discovers large natural gas reserves, commercially viable at US rates, which allow 30GW of new generation at R1.00/kWh

Some Areas for thought

Technology Shocks

e.g. Development of cheap batteries or viable fusion design

Domestic Economic Shocks

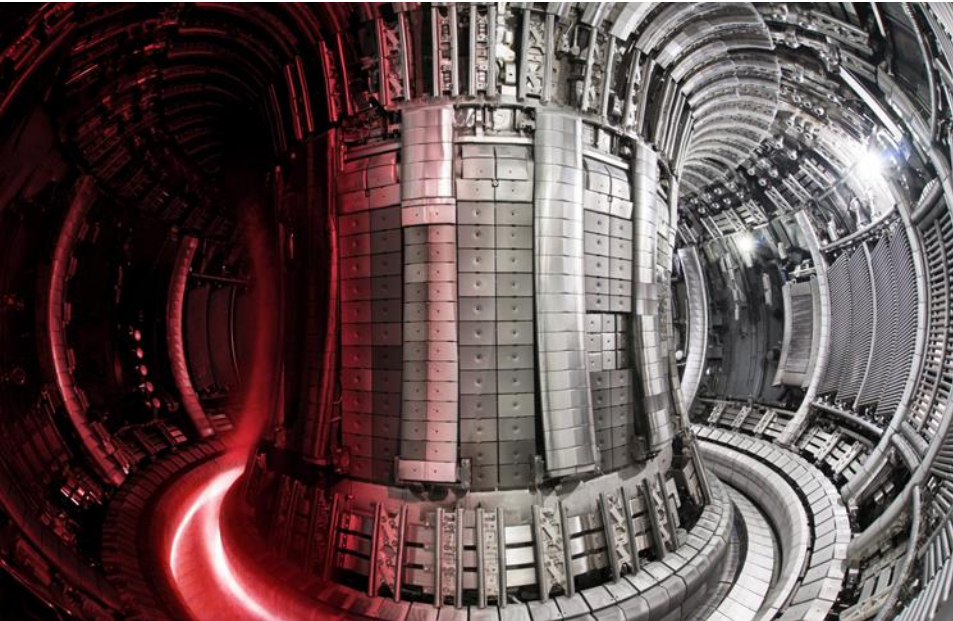
e.g. complete collapse of national transmission company/system (back to pure municipal grids)

International Economic Shocks

e.g. cost of solar and batteries suffers extreme inflation (many times) due to raw material shortages and trade barriers

Political Shocks

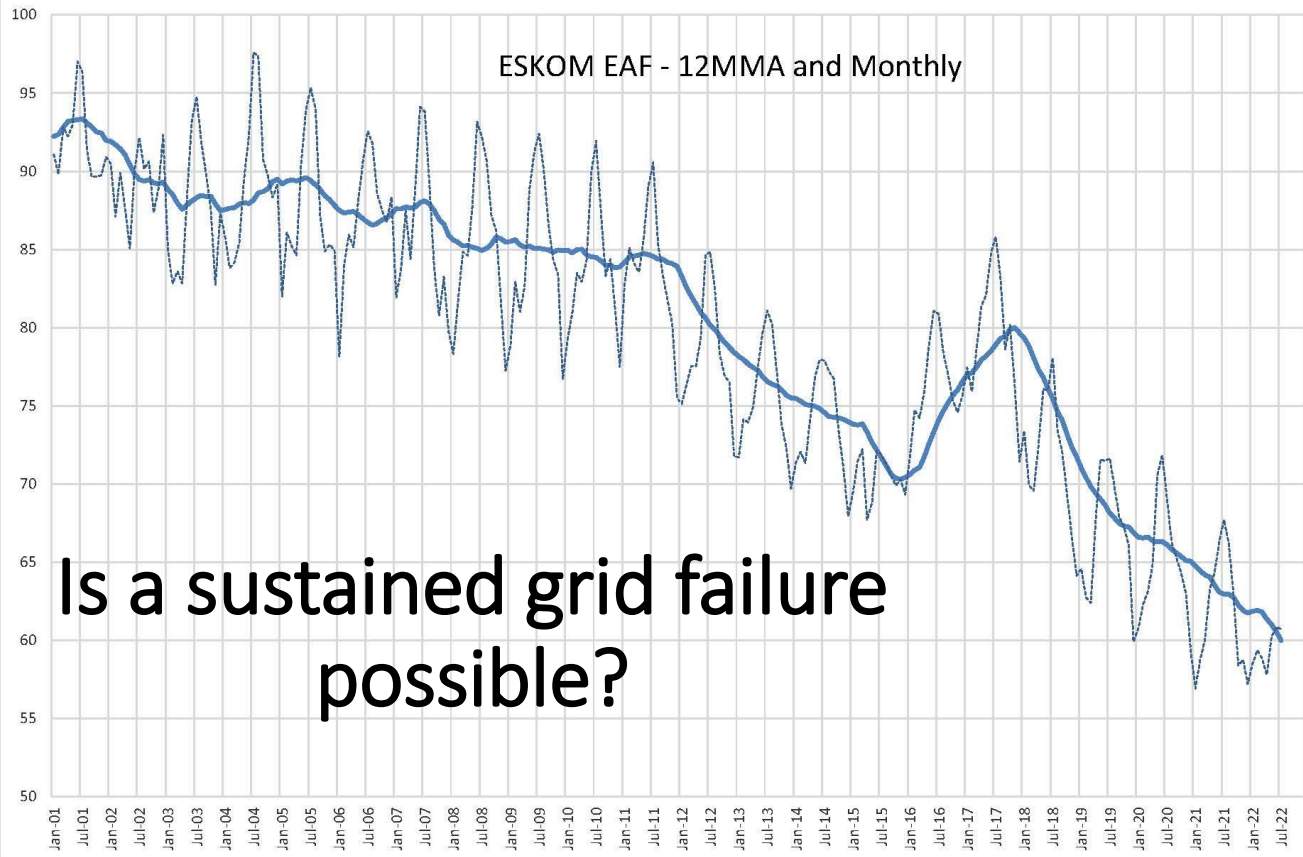
e.g. change of government policy and nationalization of all ESI



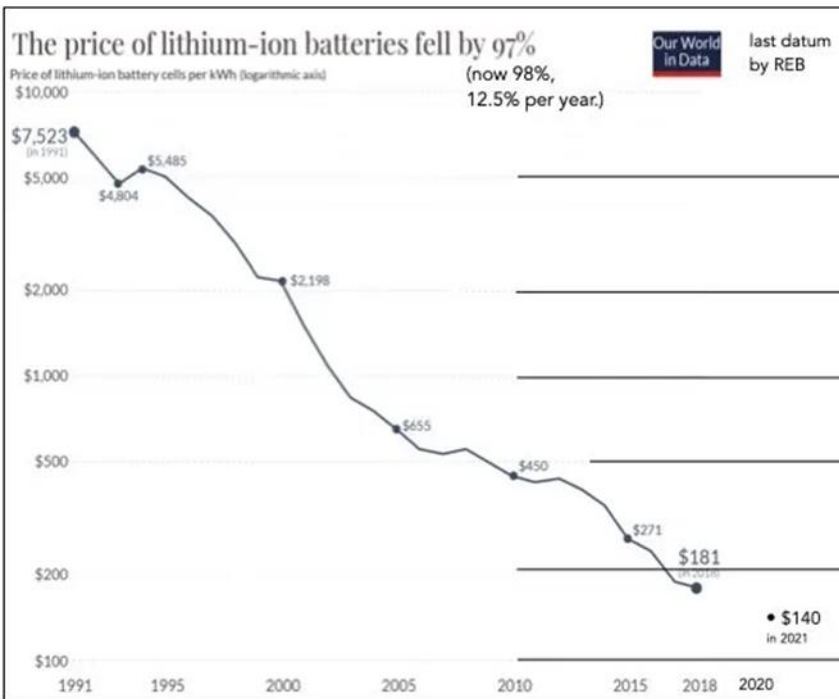
“Major Breakthrough Puts Dream of Unlimited, Clean Nuclear Fusion Energy Within Reach”

*SciTechDaily, By Gareth Willmer,
Horizon June 29, 2022*

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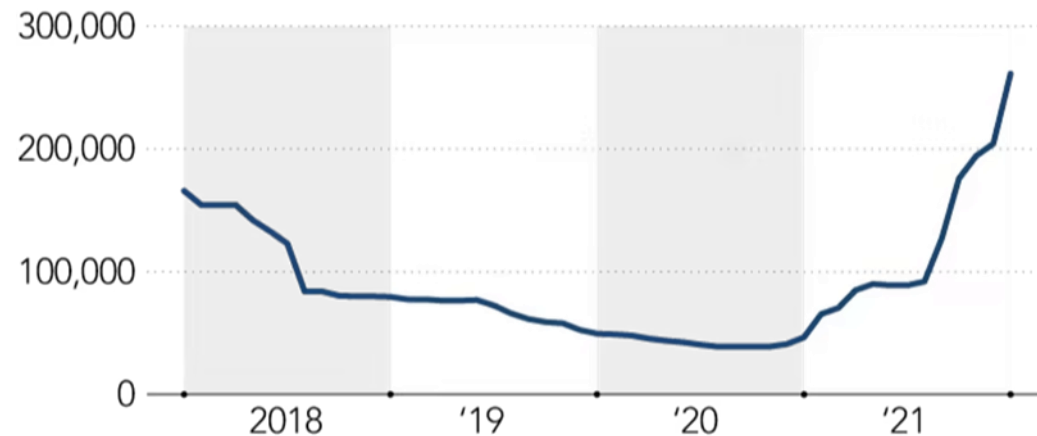


Batteries will just get cheaper?



Prices are adjusted for inflation and given in 2018 US-\$ per kilowatt-hour (kWh).
Source: Michał Zięgler and Jevonka Trancik (2021) Re-examining rates of lithium-ion battery technology improvement and cost decline.
OurWorldInData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

Lithium prices soared in 2021
(Lithium carbonate price, in yuan per ton)



Source: Trading Economics

France to pay nearly €10bn to fully nationalise EDF

“Government seeks to shore up domestic energy supplies amid European crisis”

The Guardian International Edition 19 July 2022

National Grid faces being stripped of energy system management role

“Consultation launched on creating new ‘impartial’ organisation separate from utility to help meet net zero targets”

Financial Times 20 July 2021

Thank you

