CLIMATE ENERGY FINANCE

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[i3] Luncheon: Investing During the Energy Transition

3 August 2022

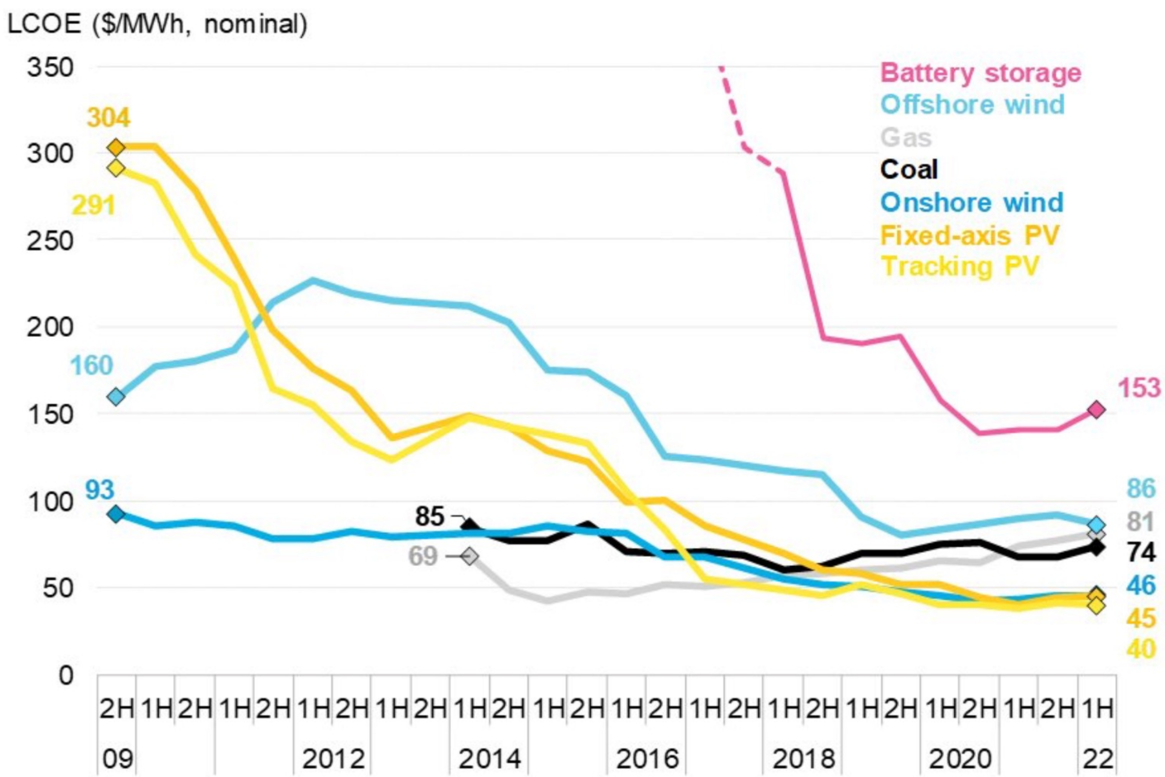
Agenda: Investing During the Energy Transition

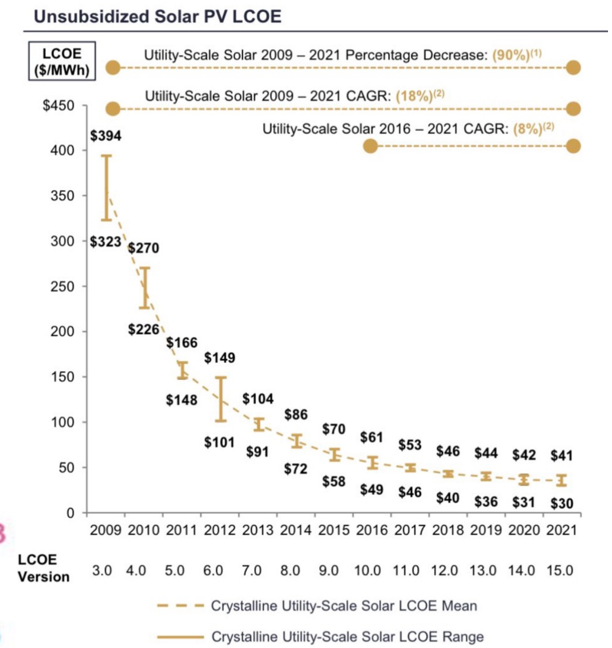
- The global energy transition is accelerating, driven by the convergence of factors:
    1. Technology-Driven Deflation in Renewables
    2. Global Policy Developments in Decarbonisation
    3. CO_2 Pricing (& CBAM)
    4. Global Finance Zero Emissions (GFANZ) Pledges – US$130 trillion
    5. The Climate Science
- Global Energy Sector Investment Trends
- China leads the world in embracing the industry opportunities
- Investment Performance – NextEra vs Duke vs Exxon
- AGL Energy – Divestment vs Engagement vs Impact?

1. Technology-Driven Deflation

Ongoing Renewable Energy and Battery Deflation

Figure 1: Global levelized cost of electricity benchmarks, 2009-2022



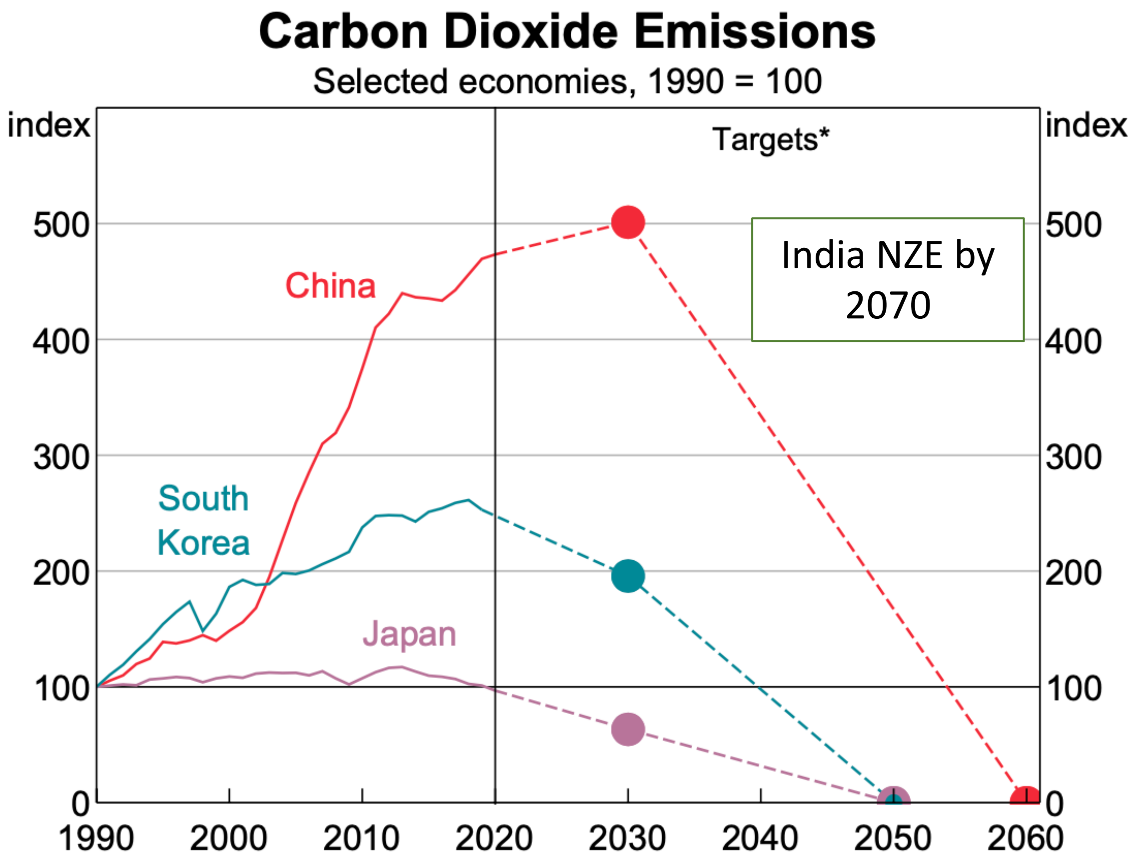


Source: BloombergNEF. Note: The global benchmark for PV, wind and storage is a country-weighted average using the latest annual capacity additions. The storage LCOE is reflective of a utility-scale Li-ion battery storage system with four-hour duration running at a daily cycle and includes charging costs.

Relative advantage is accelerating vs hyperinflation in fossil fuel prices in 2022.

Source: Bloomberg New Energy Finance, July 2022

2. Global Policy Developments



* Bubbles show targets; dashed lines show indicative paths to achieve them; Japan and South Korea's greenhouse gas targets are shown in terms of carbon dioxide; China's 2030 target is authors' estimate based on carbon intensity target for 2030 and authorities' desire for GDP growth to 2035

Sources: CEIC Data; International Energy Agency; RBA

Australia's 43% by 2030 is far better than 26%, but still far from aligned with the science.

2005 is Australia's all time emissions high, a false starting point vs other countries.

Tim Buckley, Climate Energy Finance

3. Emissions – CO_2 Prices are Rocketing Up

The Five-Year EU ETS Pricing (€/t)

Since July 2021 China operates the world's largest ETS.
India's PM Modi is expected to propose a national ETS in Aug'2022.

Source: [Trading Economics](), Accessed 23 June 2022

4. Global Finance Zero Emissions Pledges

UN Net Zero Finance Alliance 1.5°C

New Financial Alliance for Net Zero Emissions Launches

PRESS RELEASE ISSUED ON BEHALF OF THE COP25 and COP26 CLIMATE CHAMPIONS

Industry-led and UN-convened Net Zero Banking Alliance also announced today, co-launched by the UNEP Finance Initiative and the Financial Services Taskforce of the Sustainable Markets Initiative

• The Glasgow Financial Alliance for Net Zero (GFANZ), chaired by Mark Carney, UN Special Envoy on Climate Action and Finance, brings together over 160 firms (together responsible for assets in excess of $70 trillion[1]) from the leading net zero initiatives across the financial system to accelerate the transition to net zero emissions by 2050 at the latest.

• All GFANZ member alliances must be accredited by the UN Race to Zero campaign. They must use science-based guidelines to reach net zero emissions, cover all emission scopes, include 2030 interim target setting, and commit to transparent reporting and accounting in line with the UN Race to Zero criteria.

• 43 banks from 23 countries (with assets of $28.5 trillion) form the Net-Zero Banking Alliance (NZBA) today - which joins GFANZ - with its members committing to align operational and attributable emissions from their portfolios with pathways to net-zero by 2050 or sooner.

US$130 trillion by Nov 2021
(+90% in 6 months)

A Tectonic Shift Accelerates

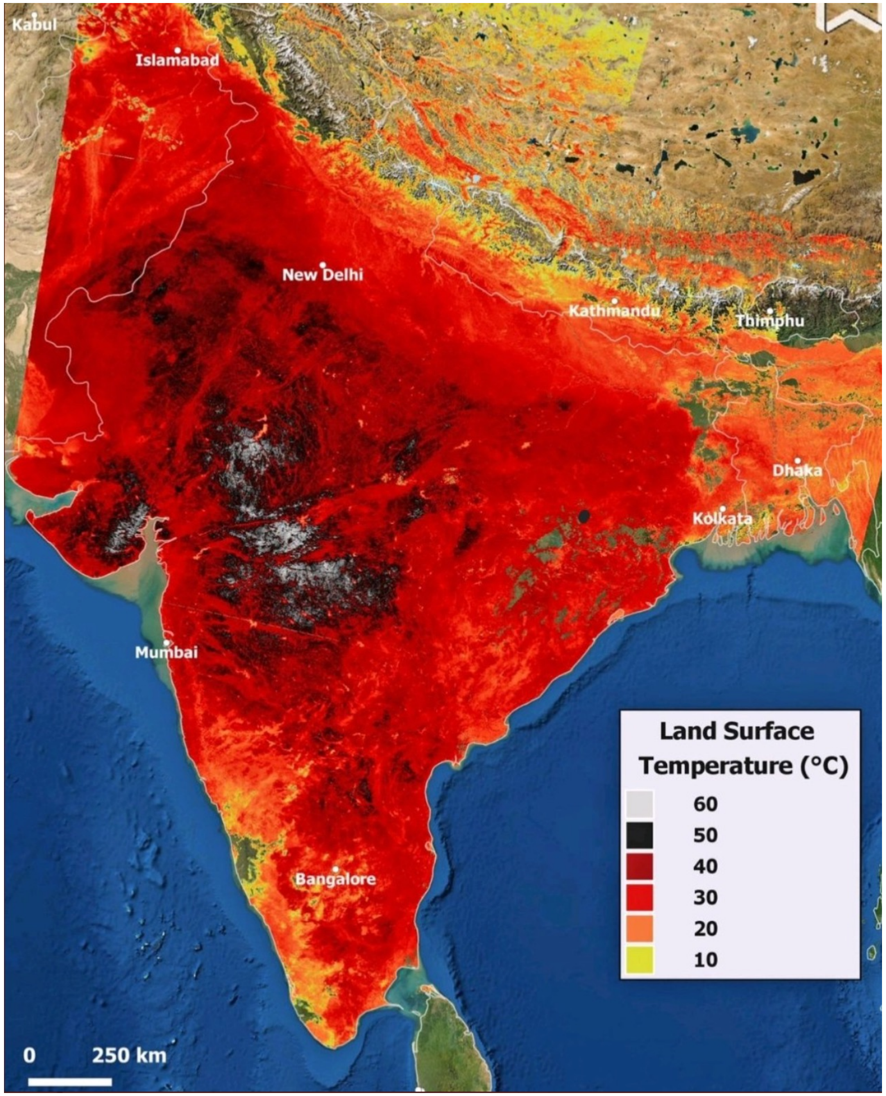
In January of last year, I wrote that climate risk is investment risk. I said then that as markets started to price climate risk into the value of securities, it would spark a fundamental reallocation of capital. Then the pandemic took hold – and in March, the conventional wisdom was the crisis would divert attention from climate. **But just the opposite took place, and the reallocation of capital accelerated even faster than I anticipated.**

From January through November 2020, investors in mutual funds and ETFs invested $288 billion globally in sustainable assets, a 96% increase over the whole of 2019.[1] I believe that this is the beginning of a **long but rapidly accelerating transition** – one that will unfold over many years and reshape asset prices of every type. **We know that climate risk is investment risk. But we also believe the climate transition presents a historic investment opportunity.**

BlackRock (AuM US$10 trillion)
Larry Fink 2021 CEO Letter

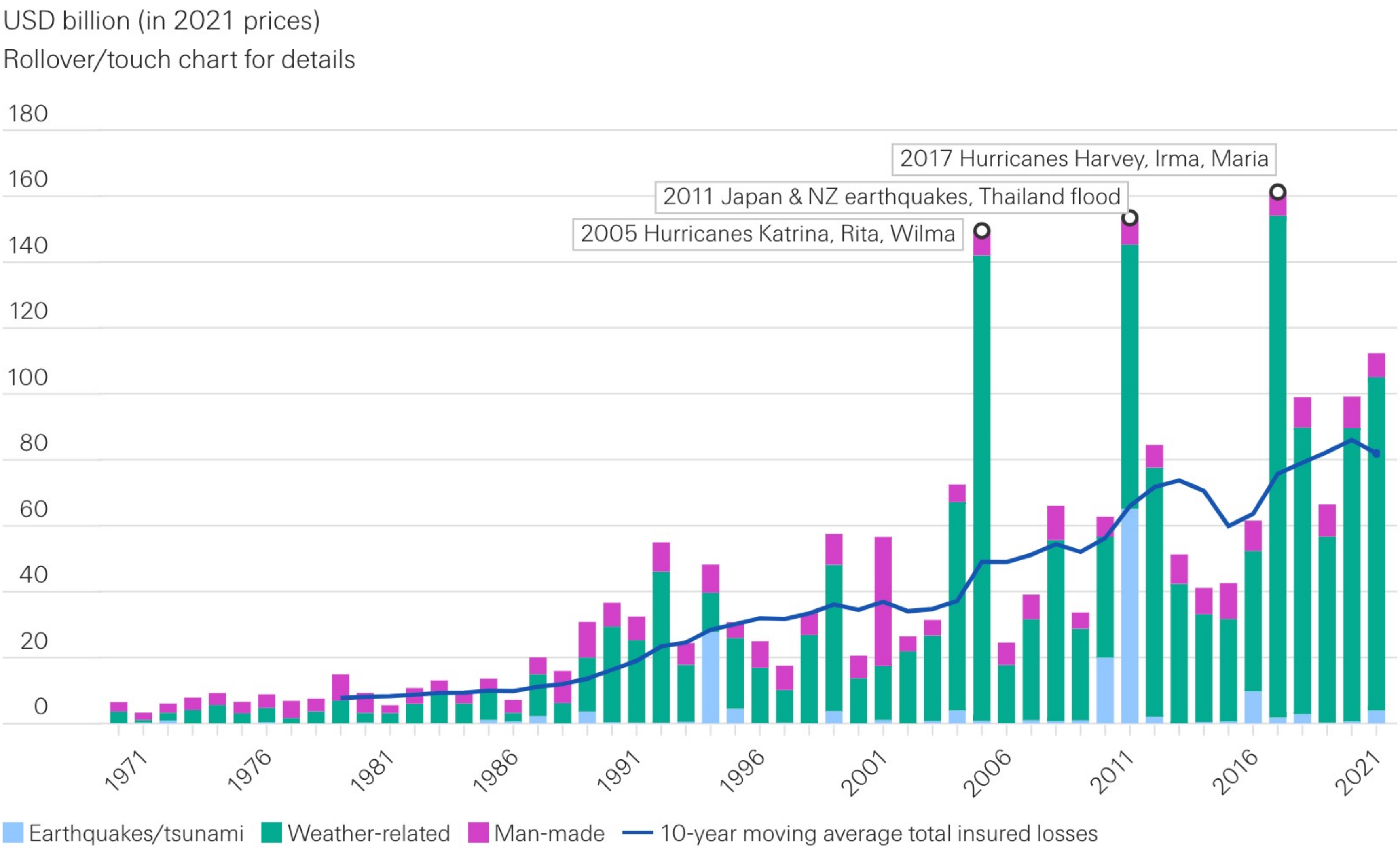
5. The Climate Science

There is no economy on an unliveable planet



https://earthobservatory.nasa.gov/images/149766/early-season-heat-waves-strike-india 29 April 2022

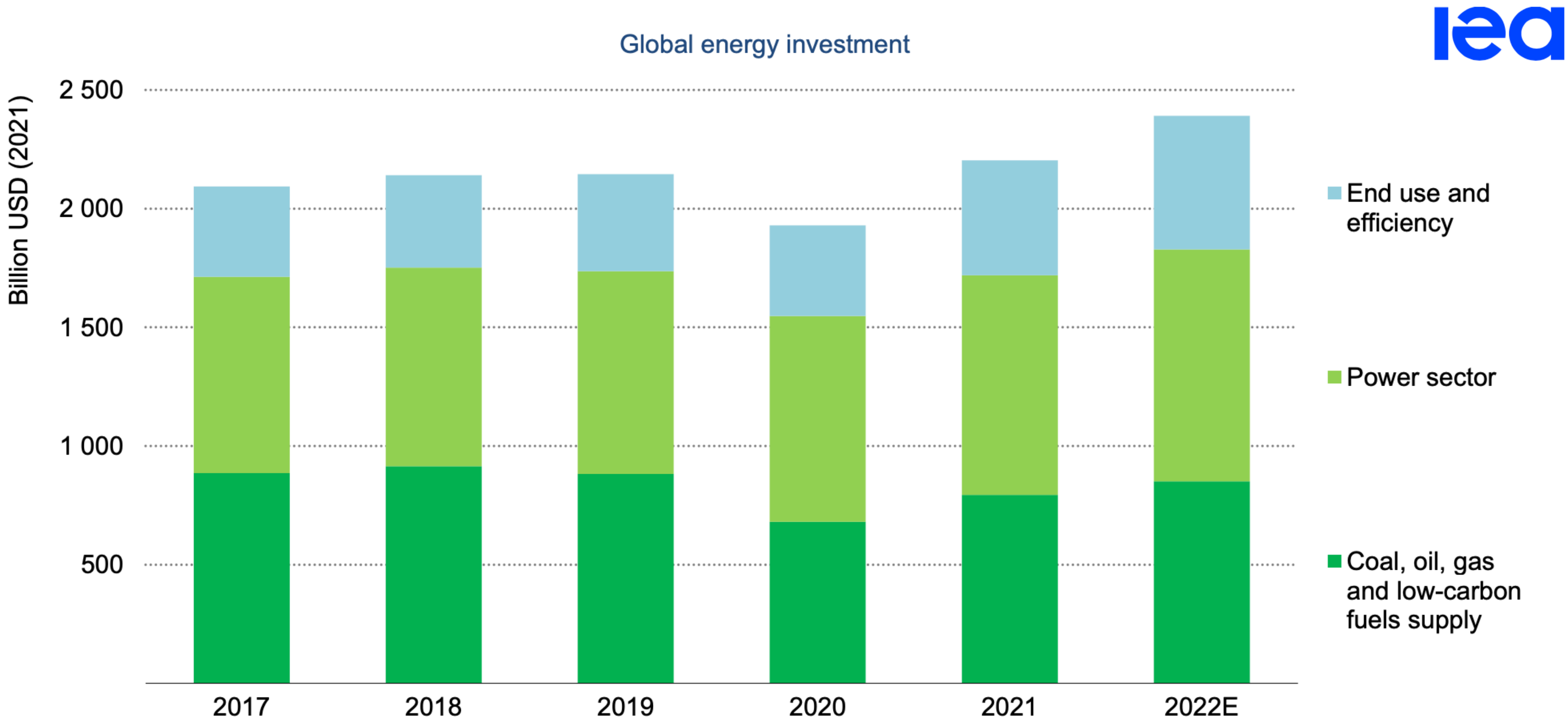
Global Insured Natural Catastrophe Losses



Source: Swiss Re Institute Dec 2021 https://www.swissre.com/media/press-release/nr-20211214-sigma-full-year-2021-preliminary-natcat-loss-estimates.html

Global Energy Investments

US$2.4 trillion (+8% yoy)

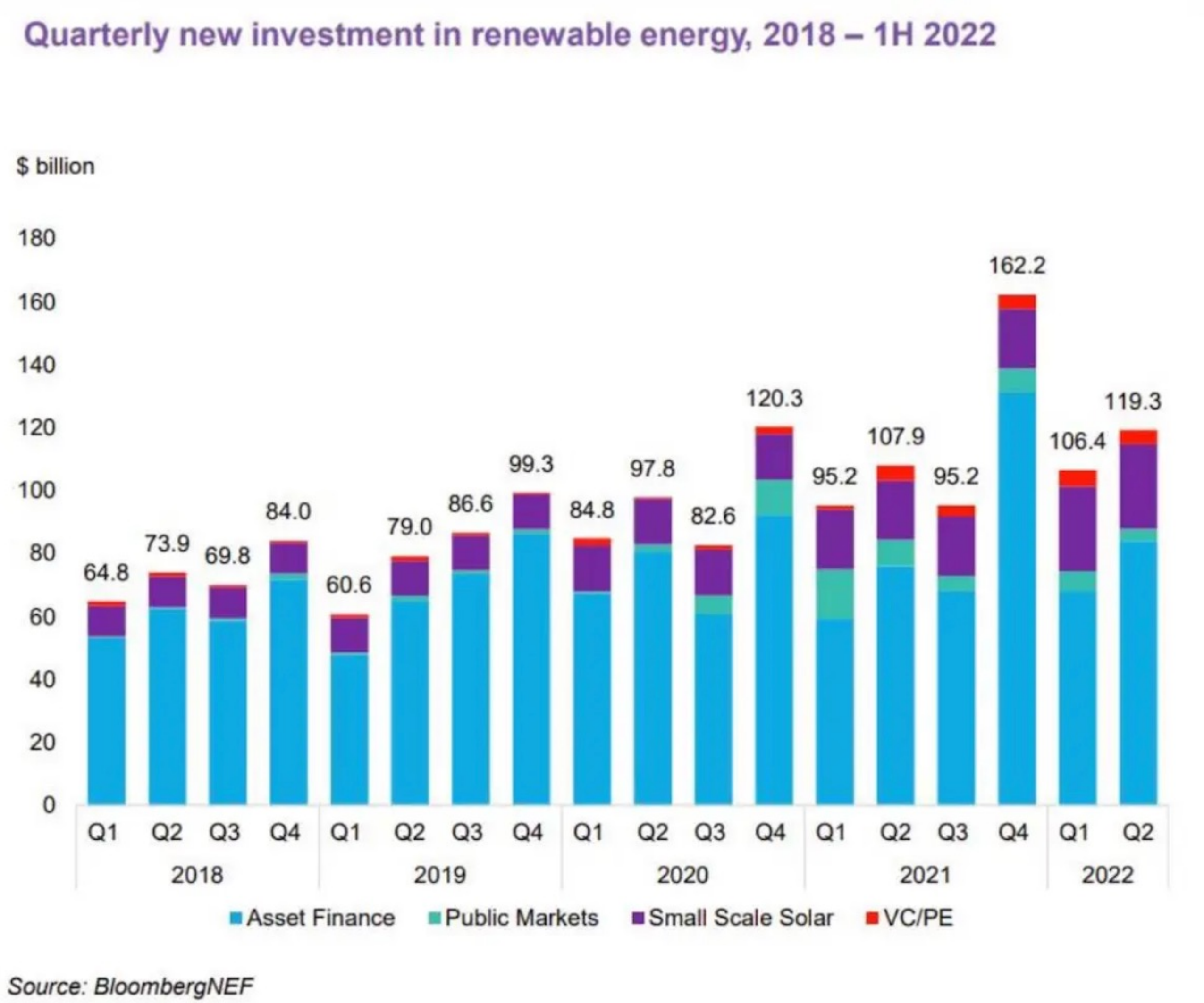


Source: IEA World Energy Investment 2022

As emerging markets grow, and annual fossil fuel spend is capitalised into upfront RE infrastructure capex, energy investments will rise to ~$4 trillion pa - US$100 trillion by 2050

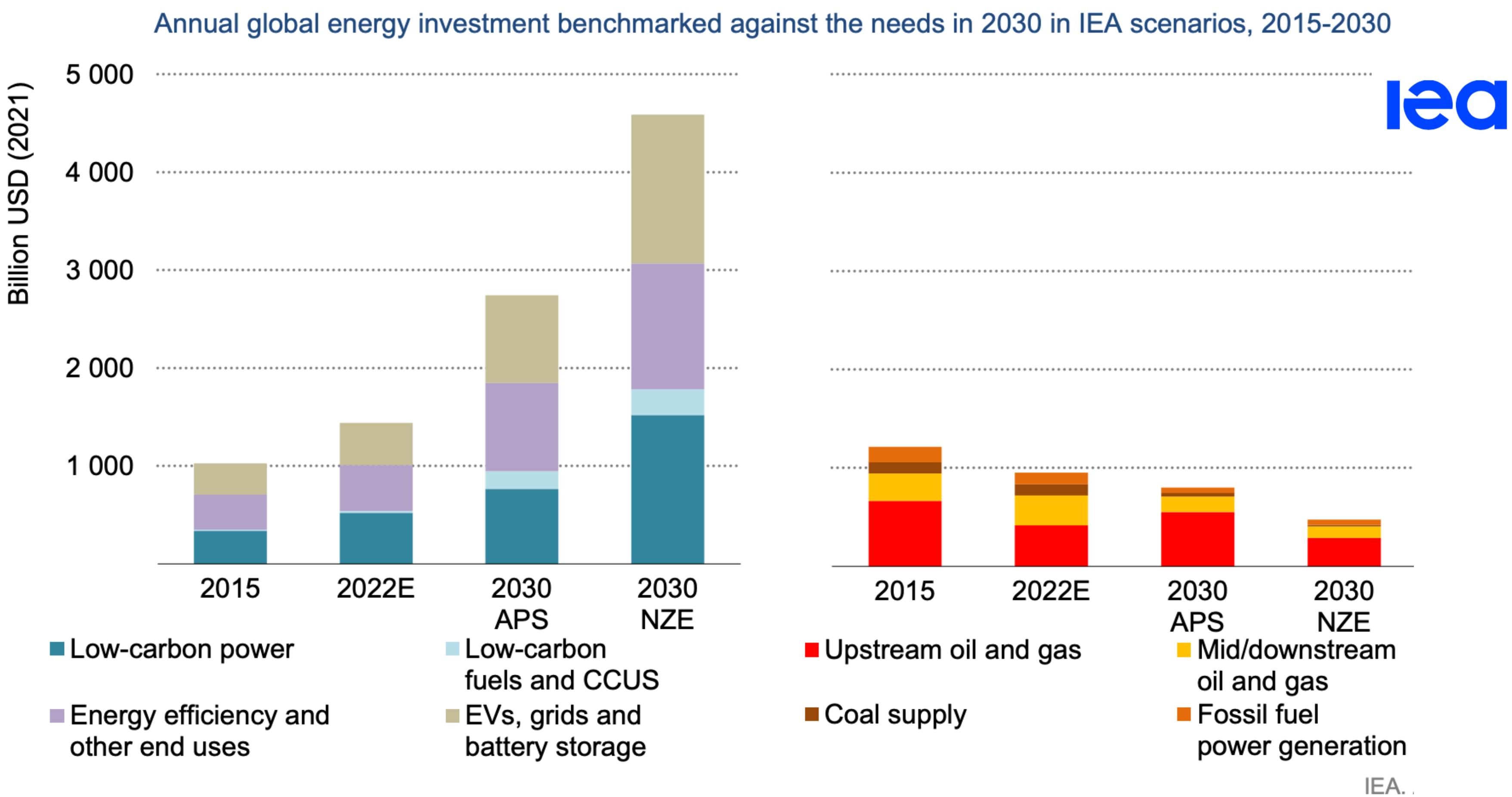
Global Energy Investments

Global RE investment reached a record $US226bn in 1H2022, +11% yoy



Source: BNEF, Renewable Energy Investment Tracker 2H 2022, 2 August 2022

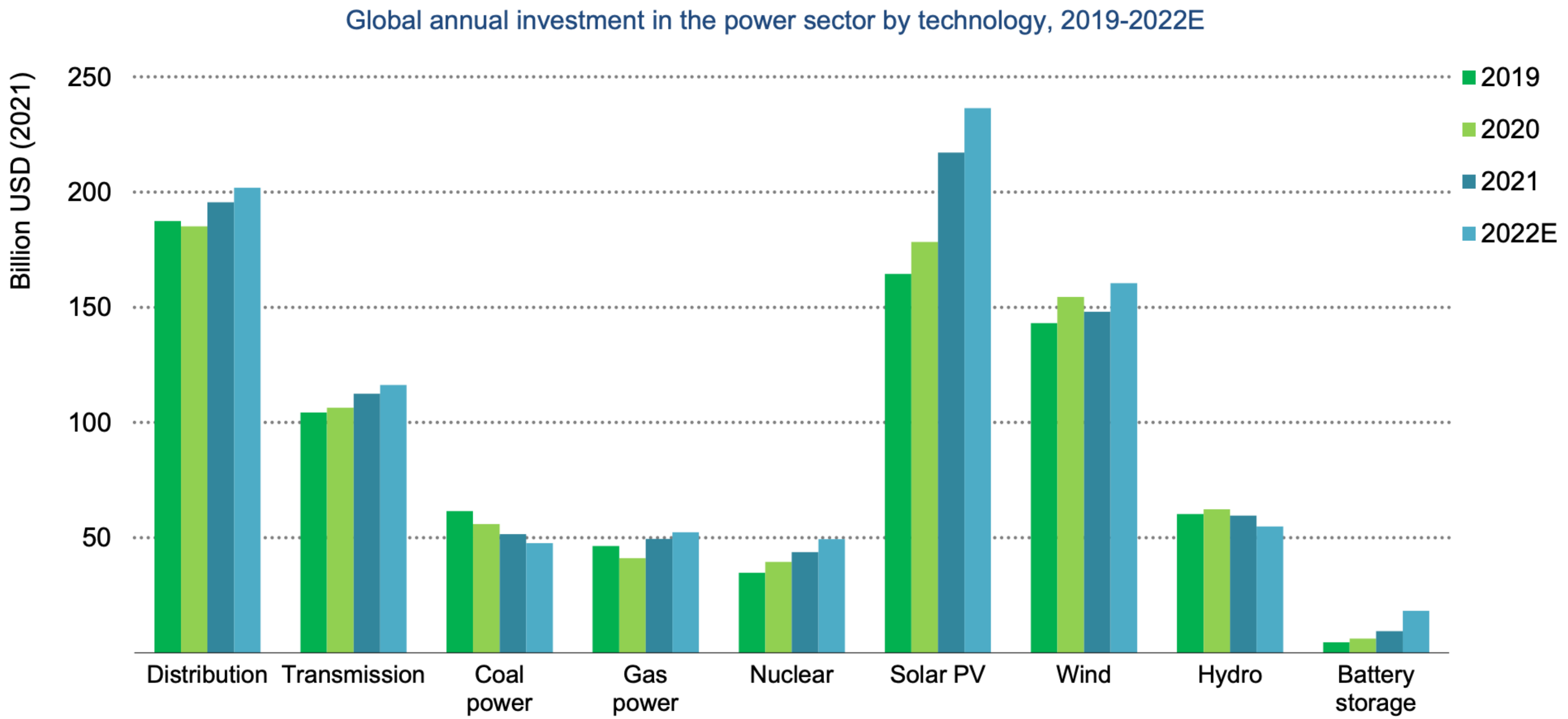
Global Energy Investments



Source: IEA World Energy Investment 2022

Electrification of transport and industry drives a massive global energy system disruption, will huge geopolitical & investment implications.

Global Energy Investments



IEA. All rights reserved.

Notes: Gas-fired generation investment includes both large-scale plants and small-scale generating sets and engines; hydropower includes pumped-hydro storage.

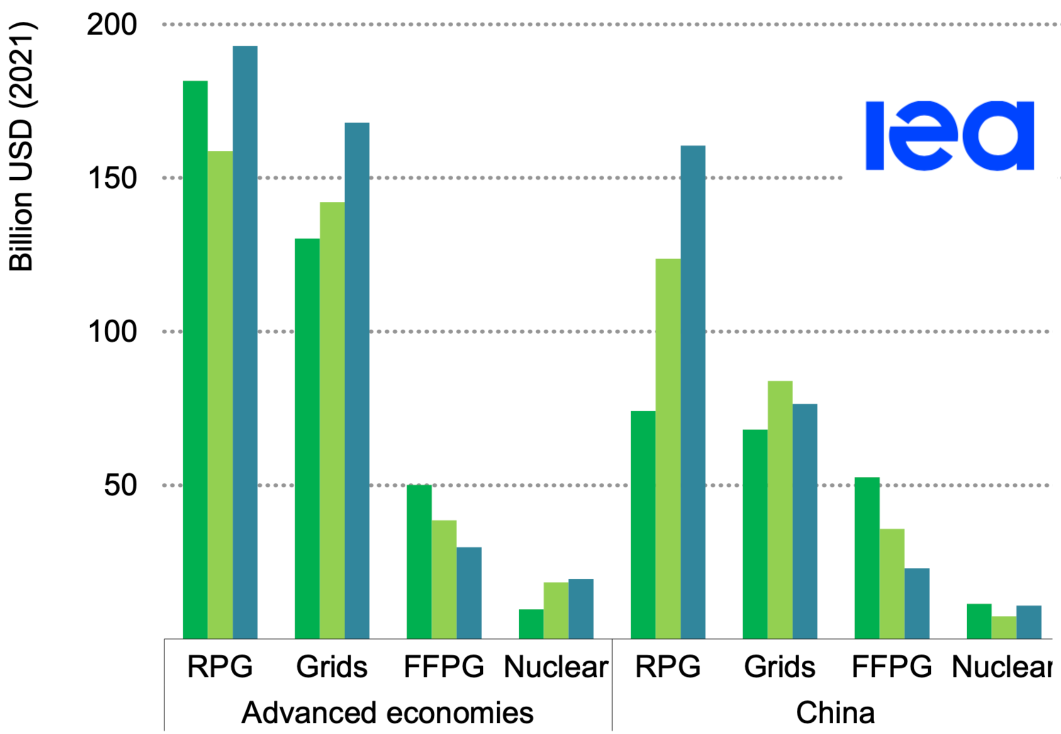
Source: IEA World Energy Investment 2022

Electrification of transport and industry drives a massive global energy system disruption, will huge geopolitical & investment implications.

China Leads the World on RE Investing

We need insights on what China is doing in Renewable Hydrogen

Average annual investment in the power sector by geography and category, 2011-2022E



Source: IEA World Energy Investment 2022

Notes: RPG = renewable power generation; FFPG = fossil fuel power generation.

The World's Largest Green Hydrogen Project With a 150MW Electrolyser Comes Online in China

FuelCellsWorks February 3, 2022

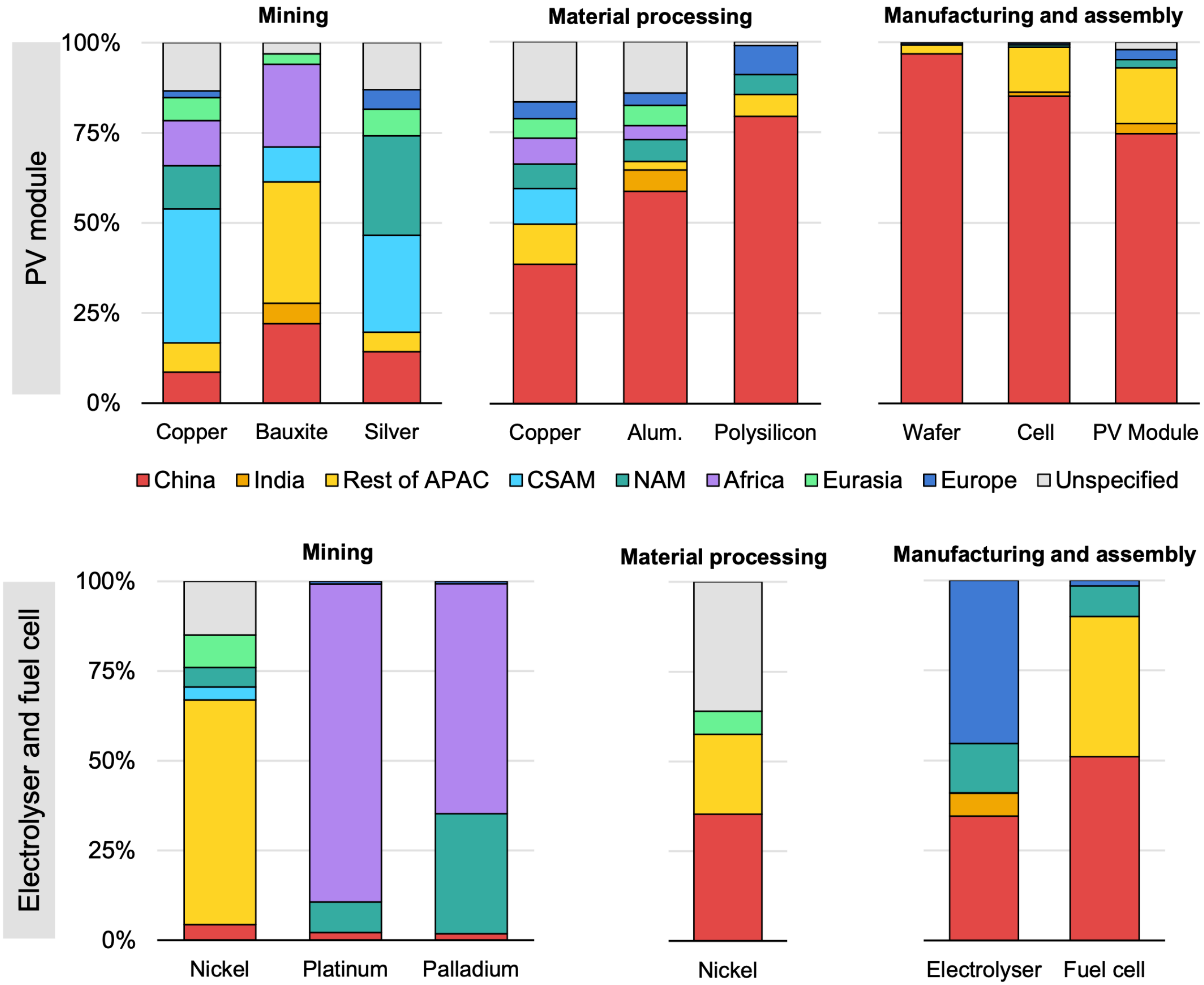
Chinese chemical manufacturer **Ningxia Baofeng Energy Group has commissioned the world's largest green hydrogen project in central China's Ningxia Autonomous Region with a 150MW alkaline electrolyser** powered by a 200MW solar array.

Baofeng Energy's unprecedented facility achieves full commissioning as Chinese oil giant Sinopec breaks ground on 260MW plant

China leads the world on wind & solar installs & manufacturing, EV & batteries, hydro, nuclear, ground heat pumps, grid T&D and GH2.

China Leads the World on Mineral Processing

Supply chain security, cheap RE and resource ownership means Australia should be leveraging our new competitive advantages to lead the global energy transition



Australia exports 36% of iron ore and 46% of lithium globally, why are we not refining using cheap RE pre-export?

Source: IEA Securing Clean Energy Technology Supply Chains July 2022

India’s Aspirations: 450GW RE by 2030

Energy Security means reducing reliance on expensive, high emissions imported fossil fuels for India

India's Electricity Capacity and Generation (FY2021/22)

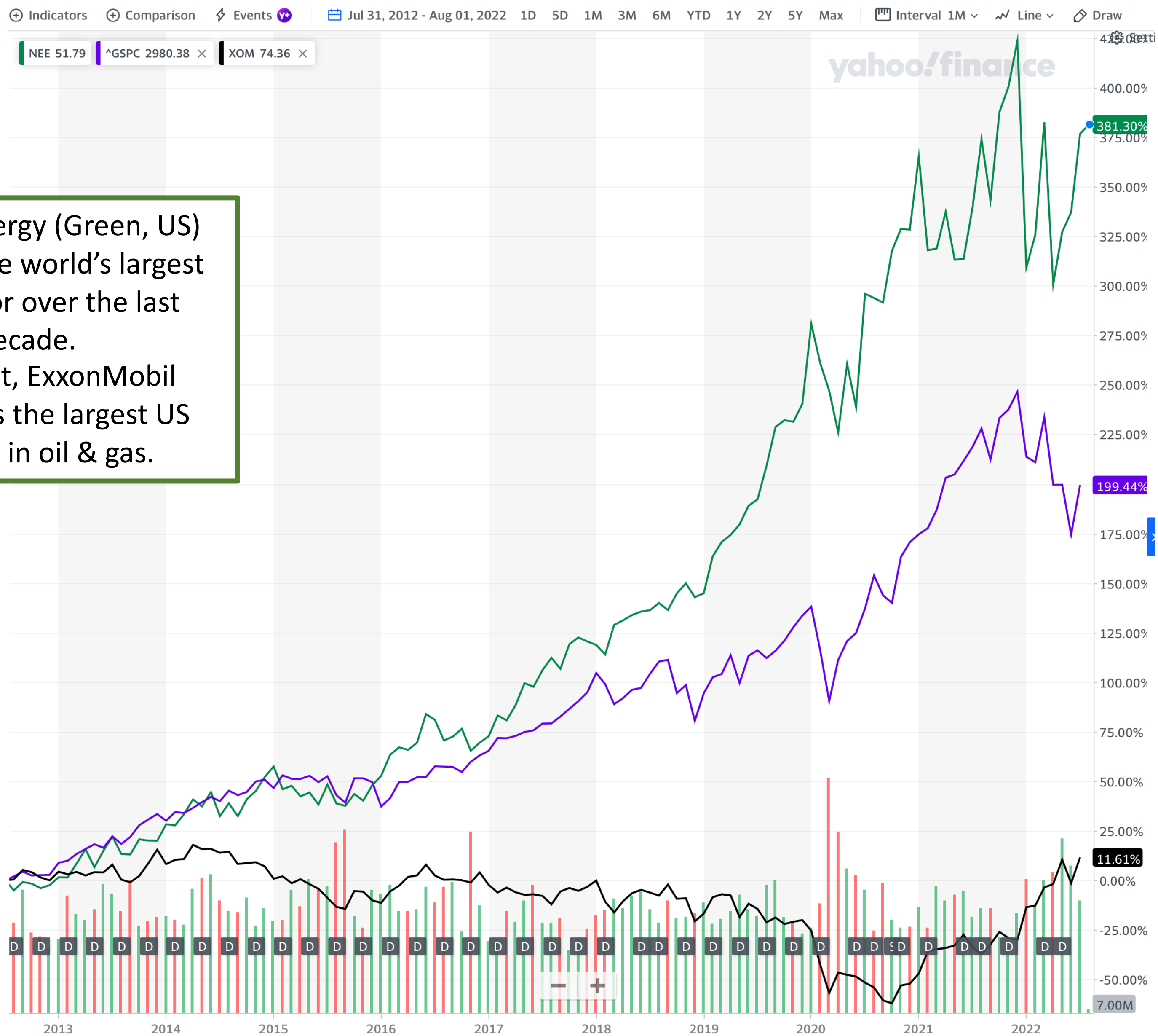
	---- Capacity ----		-- Generation --		Capacity	Increase
	GW	%	TWh	%	Utilisation	GW yoy
Coal-fired	210.7	52.7%	1,082.9	72.6%	58.9%	1.4
Gas-fired	24.9	6.2%	31.3	2.1%	14.3%	0.0
Diesel-fired	0.5	0.1%	0.5	0.0%	12.0%	0.0
Large Hydro	46.7	11.7%	151.6	10.2%	37.3%	0.5
Nuclear	6.8	1.7%	47.1	3.2%	79.2%	0.0
Renewables	109.9	27.5%	170.9	11.5%	19.1%	15.4
Bhutan (Import)	n.a	n.a	7.5	0.5%	n.a.	
Total	**399.5**	**100.0%**	**1,491.8**	**100.0%**		**17.3**

Source: CEA, CEF Calculations

Electricity demand	2021/22	1,491.8	8.0% yoy
	2020/21	1,381.9	

India’s June 2022 fossil fuel import bill was >US$800bn annualised.

Nextera Energy vs ExxonMobil



NextEra Energy (Green, US) has been the world's largest RE investor over the last decade.
In contrast, ExxonMobil (Black) was the largest US investor in oil & gas.

Source: Yahoo Financ

Global Transition / RE Infrastructure Funds

BlackRock to launch infrastructure fund focused on the energy transition

The strategy will be perpetual, meaning investors will capital over its life.

by SELIN BUCAK
Posted 16 JUNE, 2022

POWER & RENEWABLE ENERGY

Brookfield raise $15 bn for Brookfield Global Transition Fund

01 Jul 2022 CW Team

Brookfield Asset Management, a global alternative asset investor, announced that the first net zero-focused impact fund, the Brookfield Global Transition Fund, has reached its final closure with $15 billion in funding.

The fund raised more than its $12.5 billion hard caps, which were greatly surpassed by high demand, making it the largest private equity fund launched to date with a focus on accelerating the transition to a net-zero carbon economy.

https://www.powerfinancerisk.com › news › fund-news

Stonepeak raises $14bn for fourth infra fund

7 Feb 2022 — **Stonepeak** has reached final close on its **Stonepeak Infrastructure Fund IV** with $14 billion of capital commitments.

19 April 2022 16:30 CEST EQT AB Group

EQT sets hard cap for EQT X at EUR 21.5 billion

EQT has today set the hard cap for investor commitments of EUR 21.5 billion for the EQT X fund. A hard cap refers to an upper limit on the amount of investor commitments accepted as part of the fund. The actual fund size is dependent on the outcome of the fundraising process.

As previously communicated, the target fund size for EQT X has been set to EUR 20 billion. The fund's investment strategy and commercial terms are expected to be materially in line with the predecessor fund EQT IX.

Infrastructure Investor

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News & Analysis

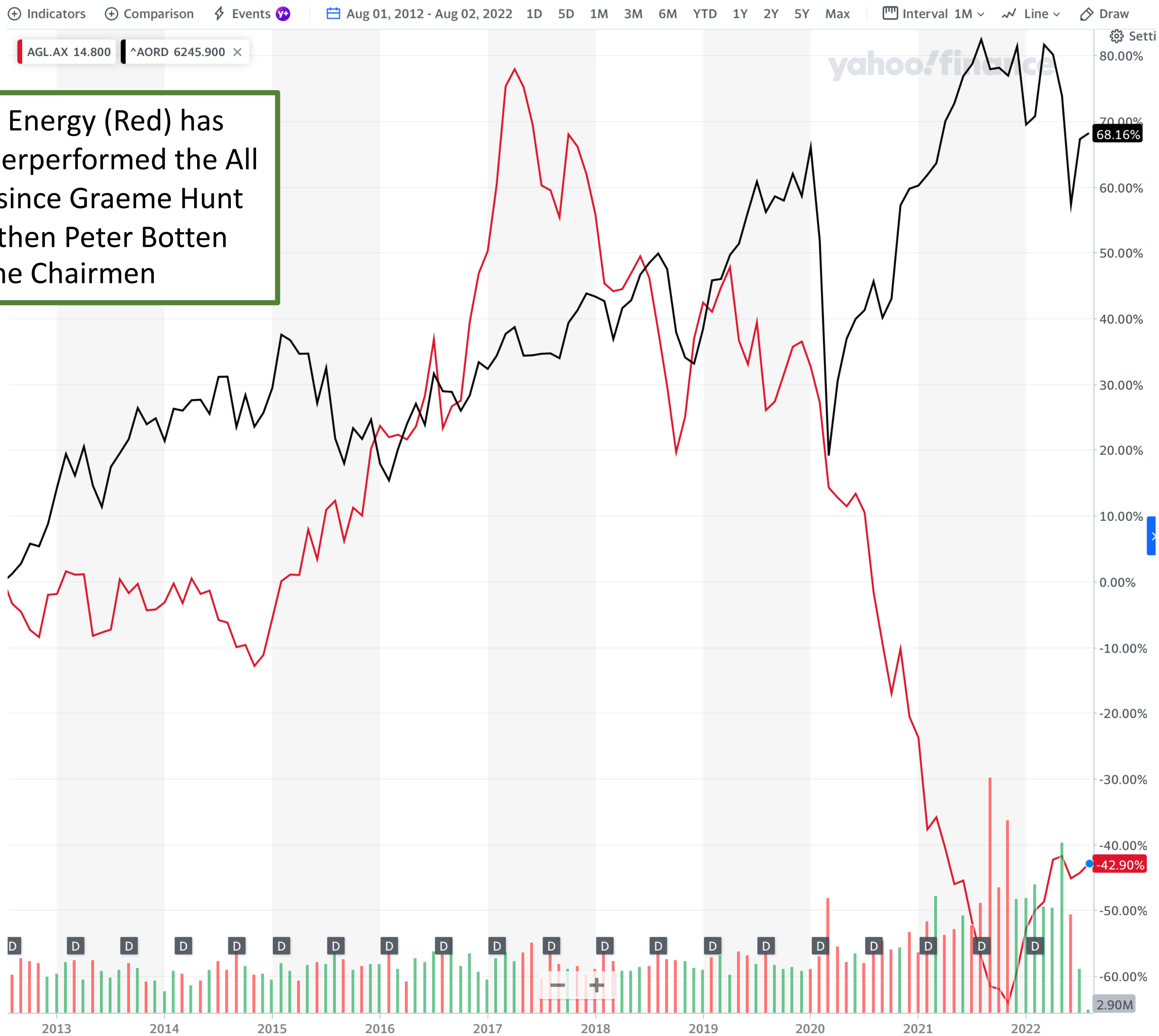
KKR's $17bn Fund IV is 2022's largest close to date

The closing beat Global Infrastructure Investors IV's $12bn target and significantly exceeds the $7.4bn raised by its predecessor in 2018.

Zak Bentley - 15 March 2022

AGL Energy vs All Ords

AGL Energy Energy (Red) has massively underperformed the All Ords (Black) since Graeme Hunt (July 2017) then Peter Botten became Chairmen



Source: Yahoo Finance

AGL Energy: From Laggard to Leader?

Investors demand Paris alignment as AGL dumps split

Angela Macdonald-Smith
Senior resources writer

Updated May 30, 2022 – 6.30pm,
first published at 9.06am

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AGL Energy's decimated board is coming under immediate pressure from large shareholders, led by tech billionaire Mike Cannon-Brookes, to bring forward its exit from coal power generation by 10 years or more after it was forced into a humiliating backdown on a plan to split the business.

The ditching of the demerger proposal confirmed by the country's biggest electricity supplier on Monday claimed the scalps of chairman Peter Botten and chief executive Graeme Hunt, as well as two non-executive directors.

AGL Energy chief executive Graeme Hunt and Atlassian founder Mike Cannon-Brookes. **Louie Douvis, Justin McManus, Wolter Peeters**

RELATED QUOTES

AGL **$8.450** ▲0.84%

1 year 1 day

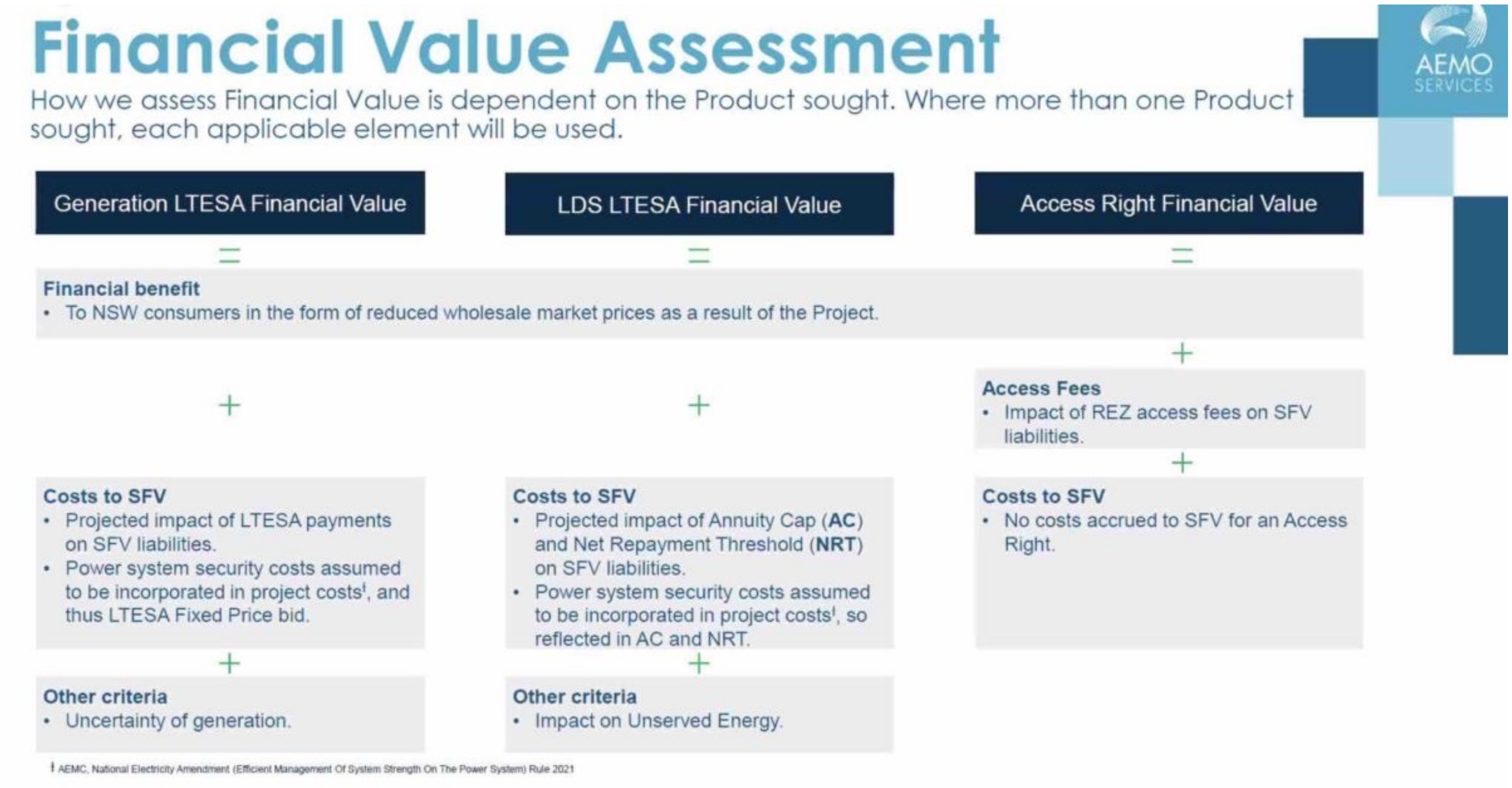
Updated: Aug 1, 2022 – 8.27pm. Data is 20 mins delayed.

View AGL related articles →

Source: AFR, https://www.afr.com/companies/energy/investors-demand-paris-alignment-as-agl-dumps-split-20220530-p5aphb 30 May 2022

AGL Energy: From Laggard to Leader?

Scope to work with the NSW and Vic Governments



NSW Energy Minister Matt Kean's Hunter Valley REZ received A$100bn / 40GW of firmed VRE proposals in March 2022

https://www.nsw.gov.au/media-releases/100-billion-of-investment-potential-for-hunter-central-coast-renewable-energy-zone

Source: Renew Economy https://reneweconomy.com.au/exciting-and-pivotal-moment-nsw-prepares-for-big-switch-from-coal-to-renewables/ 2 August 2022

AGL Energy: From Laggard to Leader?

Blueprint of 5 strategic moves to help AGL transition

AGL Investors outline how the company can go from Laggard to Leader

A group of impact investors, with a relevant interest in more than $50m worth of AGL shares (representing less than 5 percent of AGL), has released a new blueprint today detailing how AGL can reset its strategy to once again become a leading energy company.

The blueprint – "One AGL: From Laggard to Leader" – was written by Climate Energy Finance for the Sentient Impact Group (Sentient) and outlines five strategic moves that the impact investors consider AGL should make to address its declining core business and governance issues and, seize the opportunity to lead the energy transition for Australia.

The blueprint has been shared with the AGL board to help inform its efforts to map out a future direction following the abandoned demerger process.

Sentient, an impact investment funds manager, and the relevant impact investors are encouraging the AGL board to develop appropriate strategic plans aligned with the Paris Agreement and a 1.5˚C limit, consistent with the critical need to decarbonise our economy. Sentient works with impact and ESG capital providers to support companies in transition and enable them to meet emission commitments.

The CEO of Sentient and former CEO of the Clean Energy Finance Corporation, Oliver Yates said, "This group of AGL impact investors strongly support the development of an alternative strategy that leverages the benefits of AGL's vertical integration, market strength, balance sheet resources and all the experienced management and staff."

Author of the blueprint and Director of Climate Energy Finance, Tim Buckley said, "This blueprint has been developed following conversations with dozens of key AGL stakeholders including investor groups and experienced financial and industry experts. There is a large investment opportunity for AGL to seize with the right focus and mindset."

"We welcome the abandonment of the demerger strategy. There are tremendous opportunities for AGL in the energy transformation with the right governance and executive leadership who are credentialed to execute this blueprint."

The five strategic pillars of the report include:
1. Exit coal-fired power generation within a decade;
2. Support the community in the move from coal to renewables;
3. Build out renewable energy generation and storage ahead of coal closures;
4. Digitise in order to drive operational excellence and leverage AGL's leading 4.5 million customer base; and
5. Source disruptive technologies and extend future energy system offerings.

Source: Sentiment Impact Group, https://sentientimpact.com/blog/blueprint-of-5-strategic-moves-to-help-agl-transition/ June 2022