Takeaways from COP27 in Sharm El Sheikh

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EEMI Bauhaus Week, Trento
15 February 2023

Grantham Research Institute on Climate Change and the Environment

Centre for Climate Change Economics and Policy

THE NEW CLIMATE ECONOMY
The Global Commission on the Economy and Climate

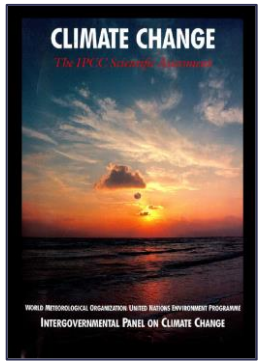
E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

The Grantham Foundation for the Protection of the Environment

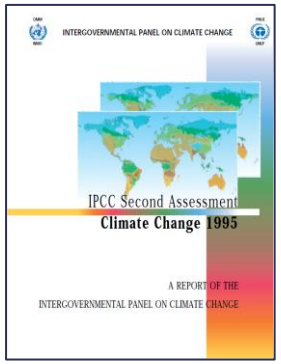
UNIVERSITY OF LEEDS

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

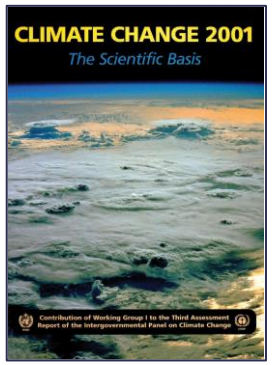
Urgency and opportunity of climate action now even clearer



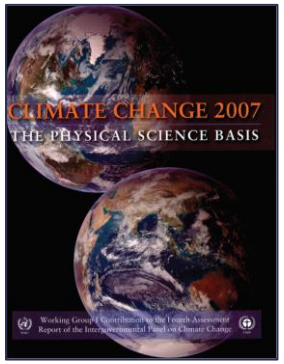
1990



1995



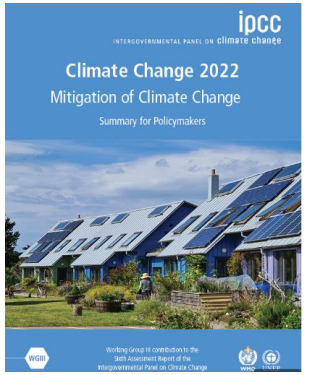
2001



2007

2013

2018



2022

"There is ***new and stronger evidence*** that most of the warming observed over the last 50 years is attributable to human activities."

"An increasing body of observations gives a collective picture of a ***warming world and other changes*** in the climate system."

– Third IPCC Assessment Report, 2001

"It is ***unequivocal*** that human influence has warmed the atmosphere, ocean and land."

"Human-induced climate change is ***already affecting*** many weather and ***climate extremes*** in every region across the globe."

– Sixth IPCC Assessment Report, 2021

"The world faces **unavoidable** multiple climate hazards over the next two decades with global warming of 1.5°C. Even temporarily exceeding this warming level will result in **additional severe impacts**, some of which will be **irreversible**."

"People and ecosystems **least able** to cope are being **hardest hit**."

–IPCC, February 2022

2022 headlines: this is what the future is on course to look like

Factbox: Nearly 560,000 still without power in Florida after Hurricane Ian

Reuters

Heatwave: Fires blaze after UK passes 40C for first time

19 July · Comments

UK heatwaves

:e in the village of Wennington on the outskirts

Wildfire still raging in southwestern France, more evacuations

Reuters

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Droughts, Ukraine war push global grain stocks toward worrying decade low

By Tom Polansek

Historic demographic transition: opportunity and challenge for breakthrough on climate and development

Welcome to the United Nations

World population to reach 8 billion on 15 November 2022

Amid falling growth rates, global population projected to peak around 10.4 billion in the 2080s

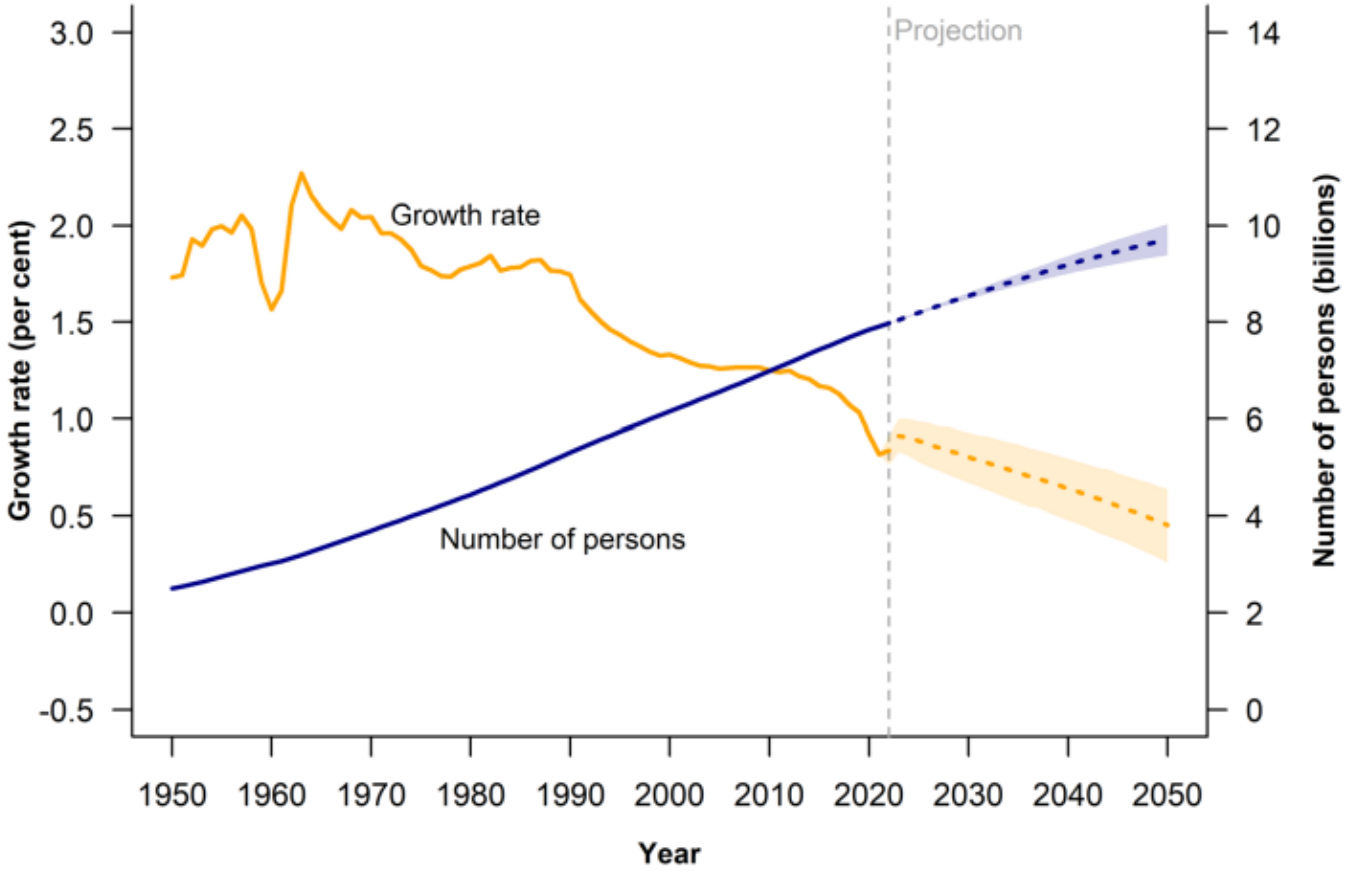
In just days, our planet's population will cross a new threshold.

The 8 billionth member of our human family will be born. This milestone puts into perspective what this climate conference is all about.

-UNSG's remarks to High-Level opening of COP27

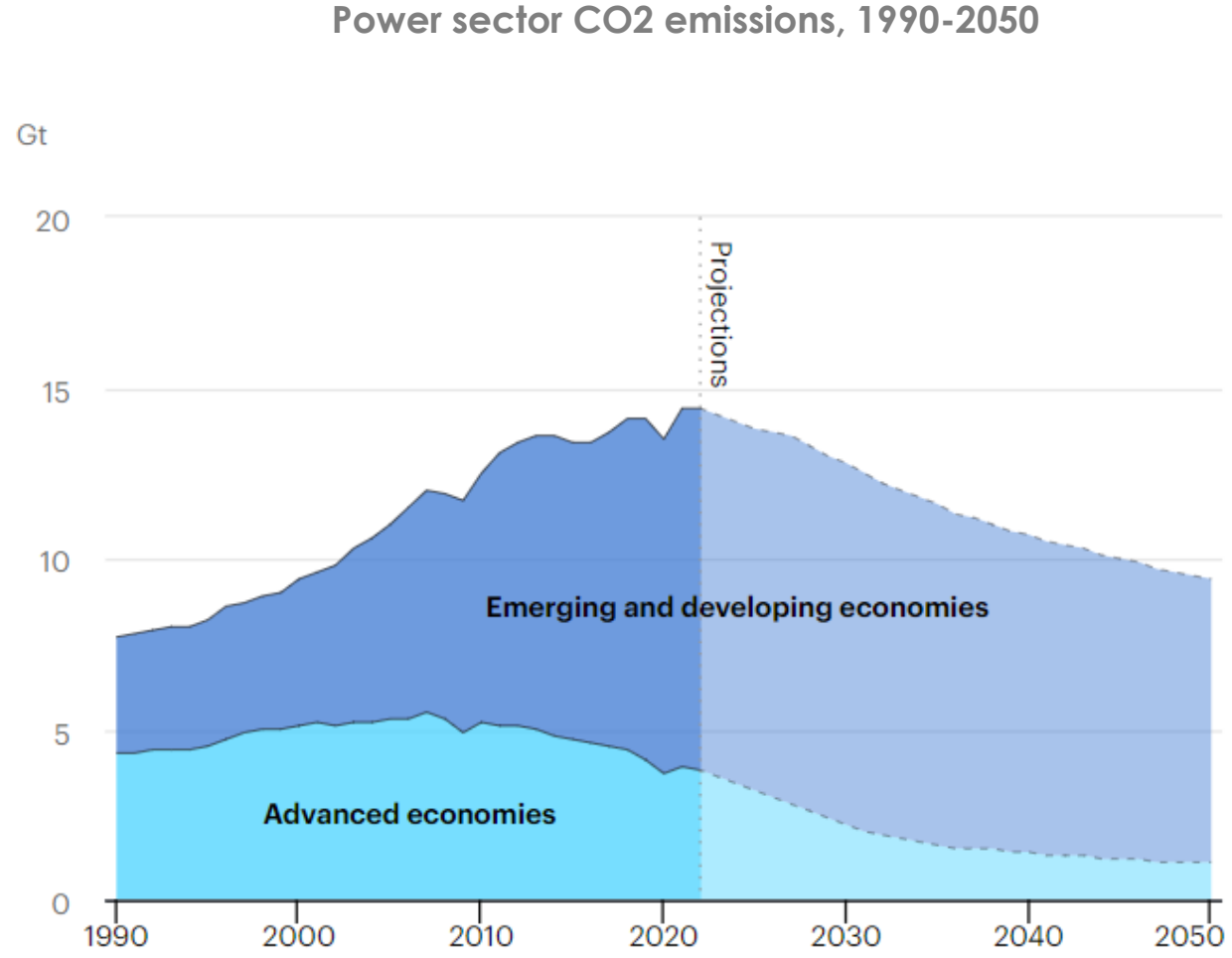
Historic demographic transition: opportunity and challenge for breakthrough on climate and development

Global population size and annual growth rate: estimates, 1950-2022, and medium scenario with 95 percent prediction intervals, 2022-2050



Source: United Nations World Population Prospects 2022

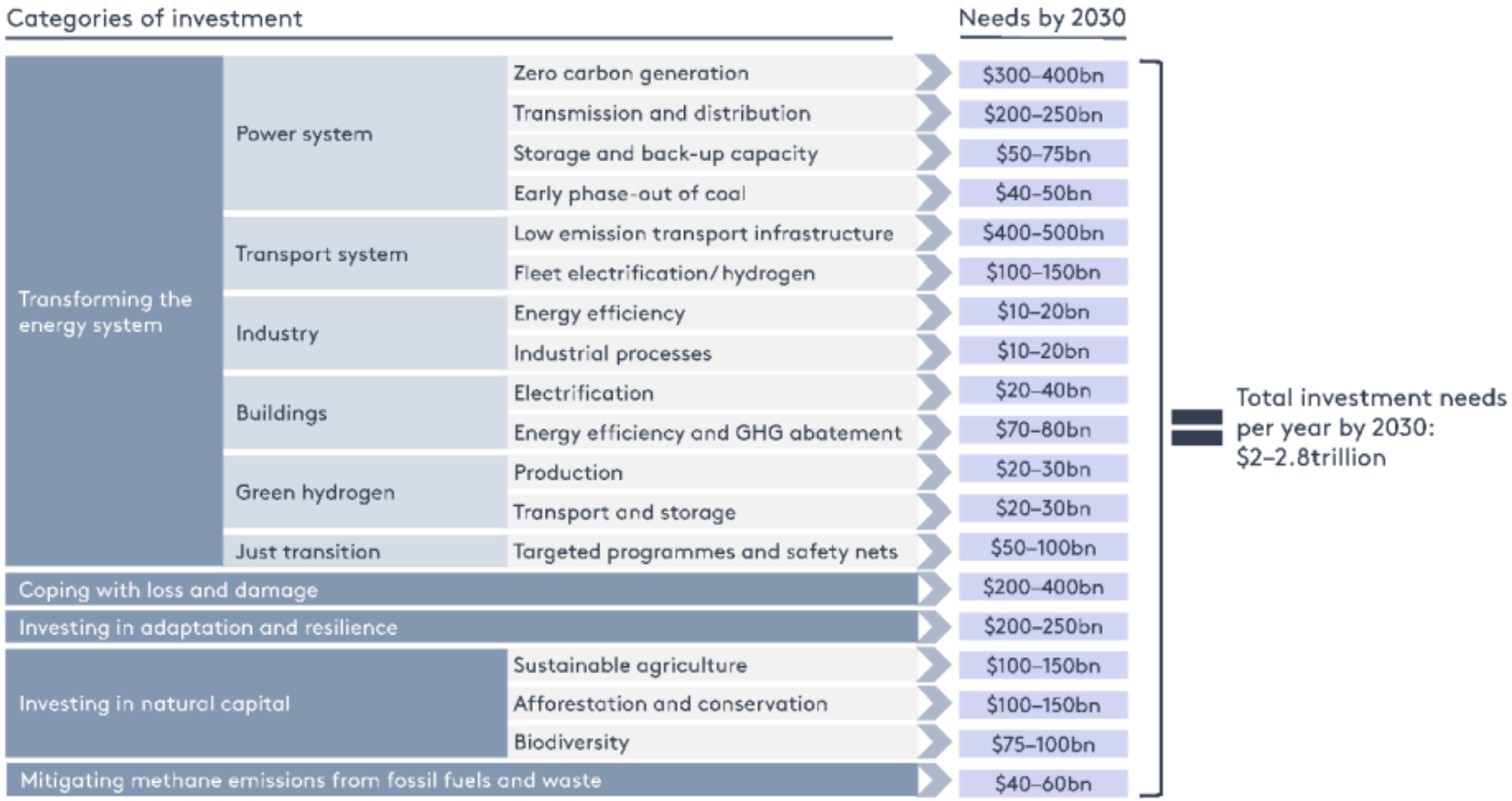
EMDEs at the heart of the transformation



Source: International Energy Agency World Energy Outlook 2022

Population growth & development needs require high investment

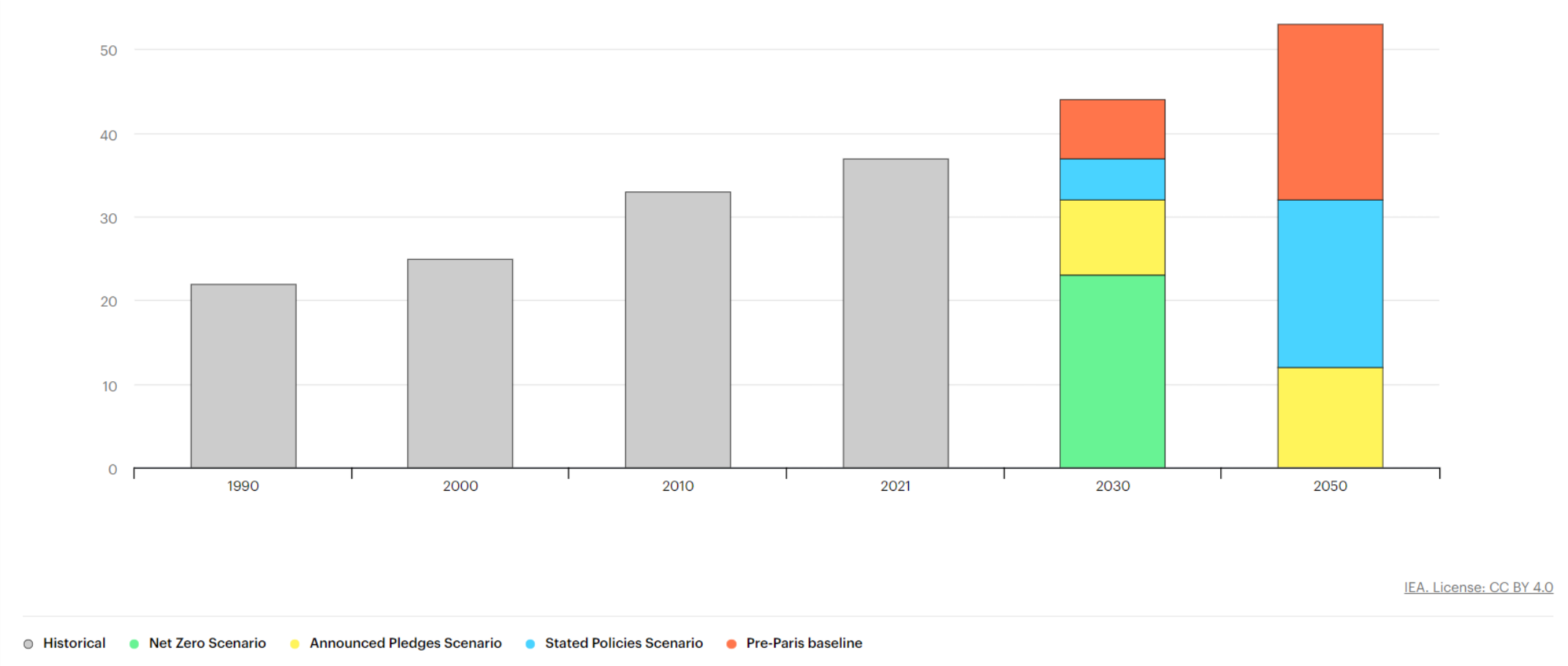
Investment/spending needs for climate action per year by 2030



Source: Songwe, Stern et al 2022

Action must start today, not tommorow

Global CO2 emissions by scenarios, 2000-50



Source: International Energy Agency World Energy Outlook 2022

Delay is expensive

REPORT

China's role in supplying critical minerals for the global energy transition: What could the future hold?

Rodrigo Castillo and **Caitlin Purdy** · Monday, August 1, 2022

Results for Development

Barbados PM launches blistering attack on rich nations at Cop27 climate talks

Mia Mottley warns of a billion refugees by the middle of the century unless governments act now to tackle crisis

'We have the collective capacity to transform,' says Mia Mottley at Cop27 – video

COP27

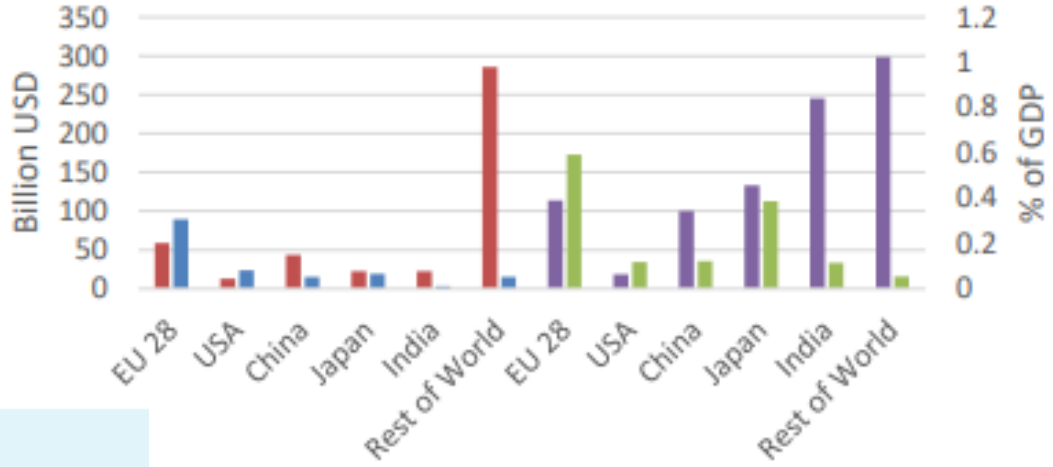
3 minute read · November 22, 2022 7:57 AM GMT · Last Updated 2 days ago

Explainer: Who will pay for climate 'loss and damage'?

By Kate Abnett and Dominic Evans

Persistent fossil fuel subsidies distort incentives

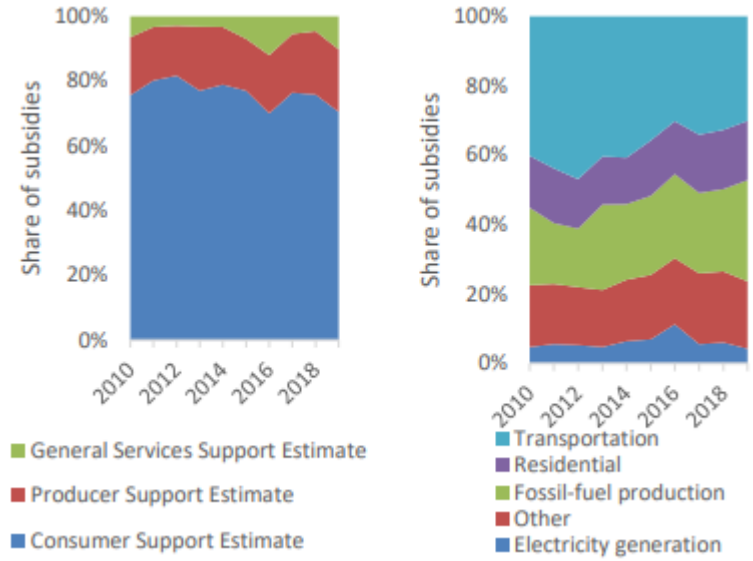
Comparison of global fossil fuel vs. renewable energy subsidies



	OECD	IEA	IMF
Countries included	52	40+	176
Estimate	**USD 345 bn (2020)** **USD 494 bn (2019)**	**USD 440 bn (2021)**	**USD 5.9 tn (2020)**
Approach	Inventory of government producer and consumer support mechanisms	Comparison of government's policies lowering domestic price of fossil fuels to the international market price ("price gap" estimation)	Explicit (pre-tax) subsidies and implicit (post-tax) subsidies or externalities (air pollution, climate change)

Source: Allianz
https://www.allianz.com/content/dam/onemarketing/azcom/Allianz_com/economic-research/publications/specials/en/2021/may/2021_05_19_Fossil_Subsidies.pdf

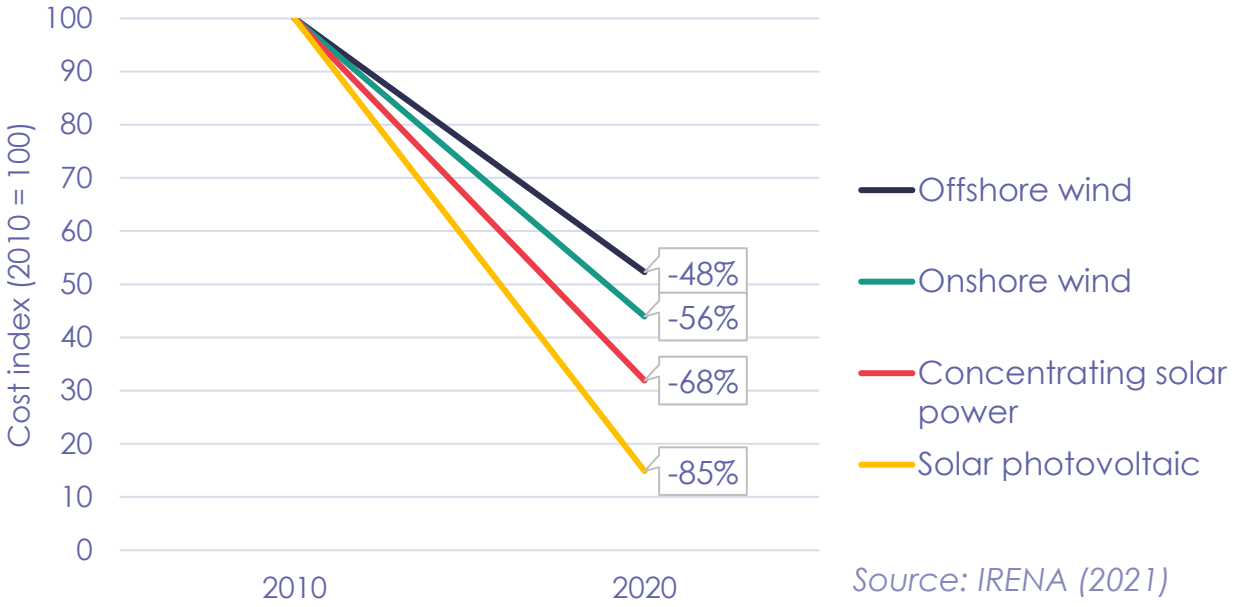
Fossil fuel support by beneficiary (left) and by sector (right) (50 countries)



The good news: tech progress has moved faster than hoped

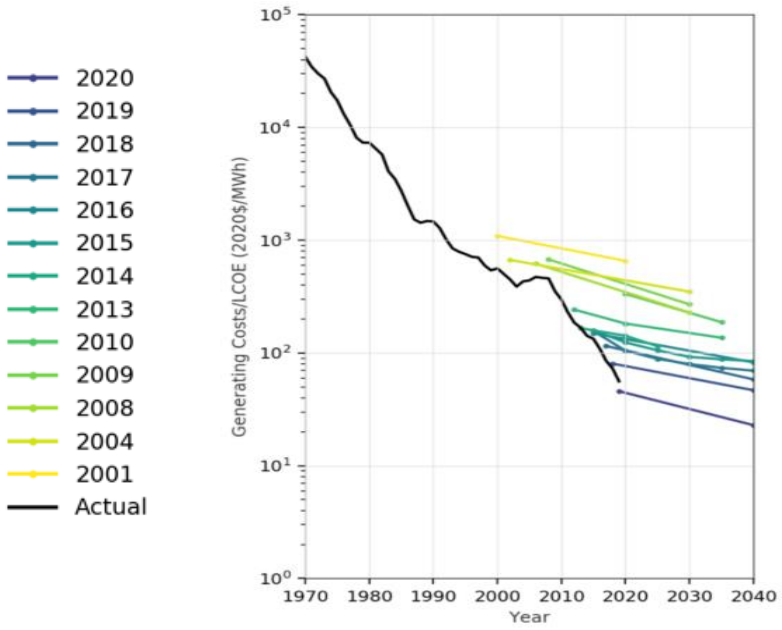
Historic demographic transitions, rising investment needs, intense technological progress

Renewable power technologies: decreases in levelized cost of electricity



Source: IRENA (2021)

Actual versus IEA projected LCOE of solar PV



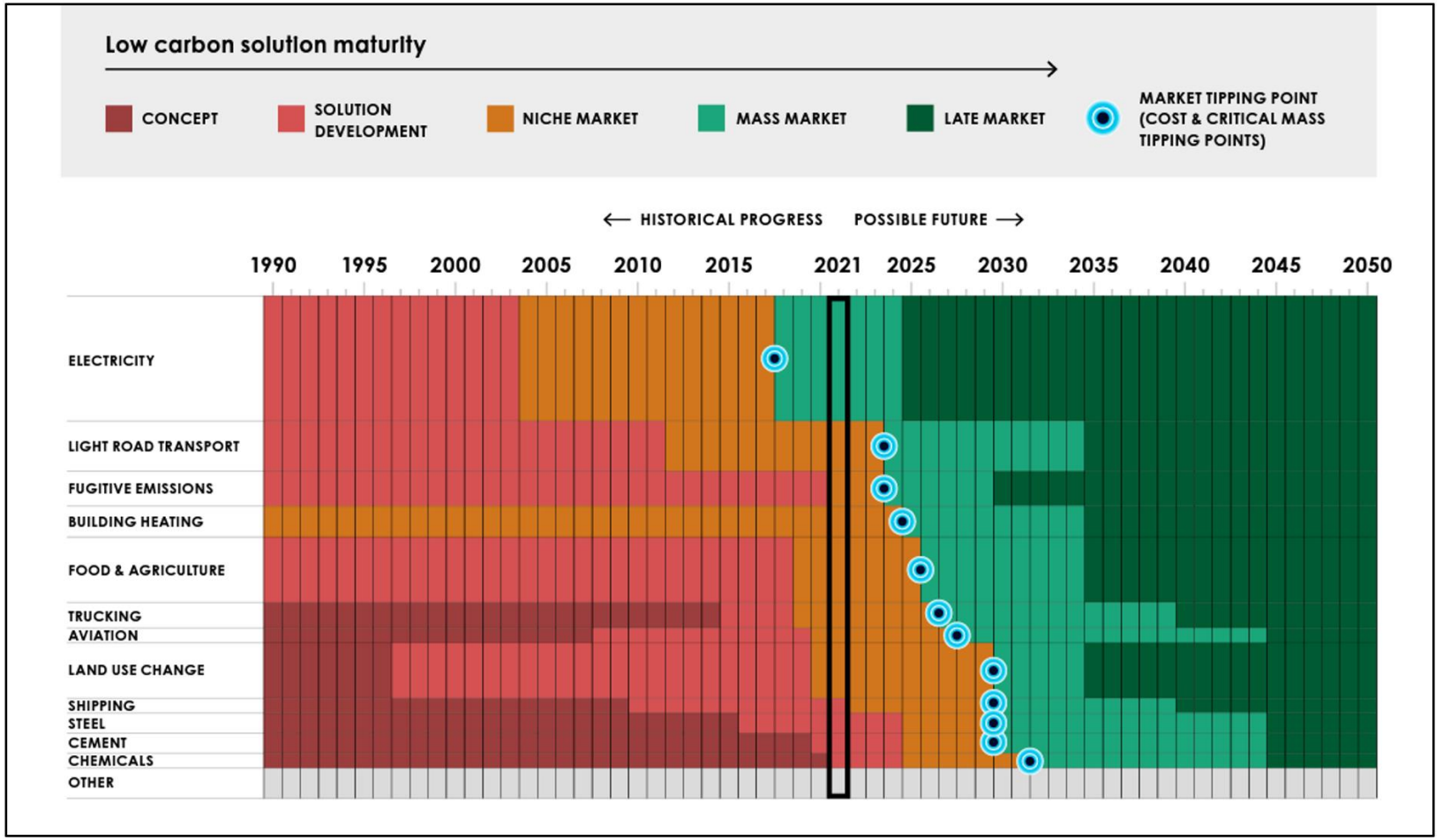
Source: Ives et al (2021)

Renewables with storage now competitive (without subsidy or carbon price in much of the world). In 2020, solar/wind was the cheapest form of new power generation in countries representing over 70% of GDP (SYSTEMIQ, 2020).

Capital costs for renewables continue to fall much faster than those for conventional technologies. Strong increasing returns to scale in technologies and in discoveries. Much of it unanticipated.

We are close to meeting >50% tipping points for crucial green tech

Tipping Points by Sector – Historical Progress and Indicative Future Timeline



Source: Systemiq: The Breakthrough Effect - Triggering the Global Tipping Cascade.

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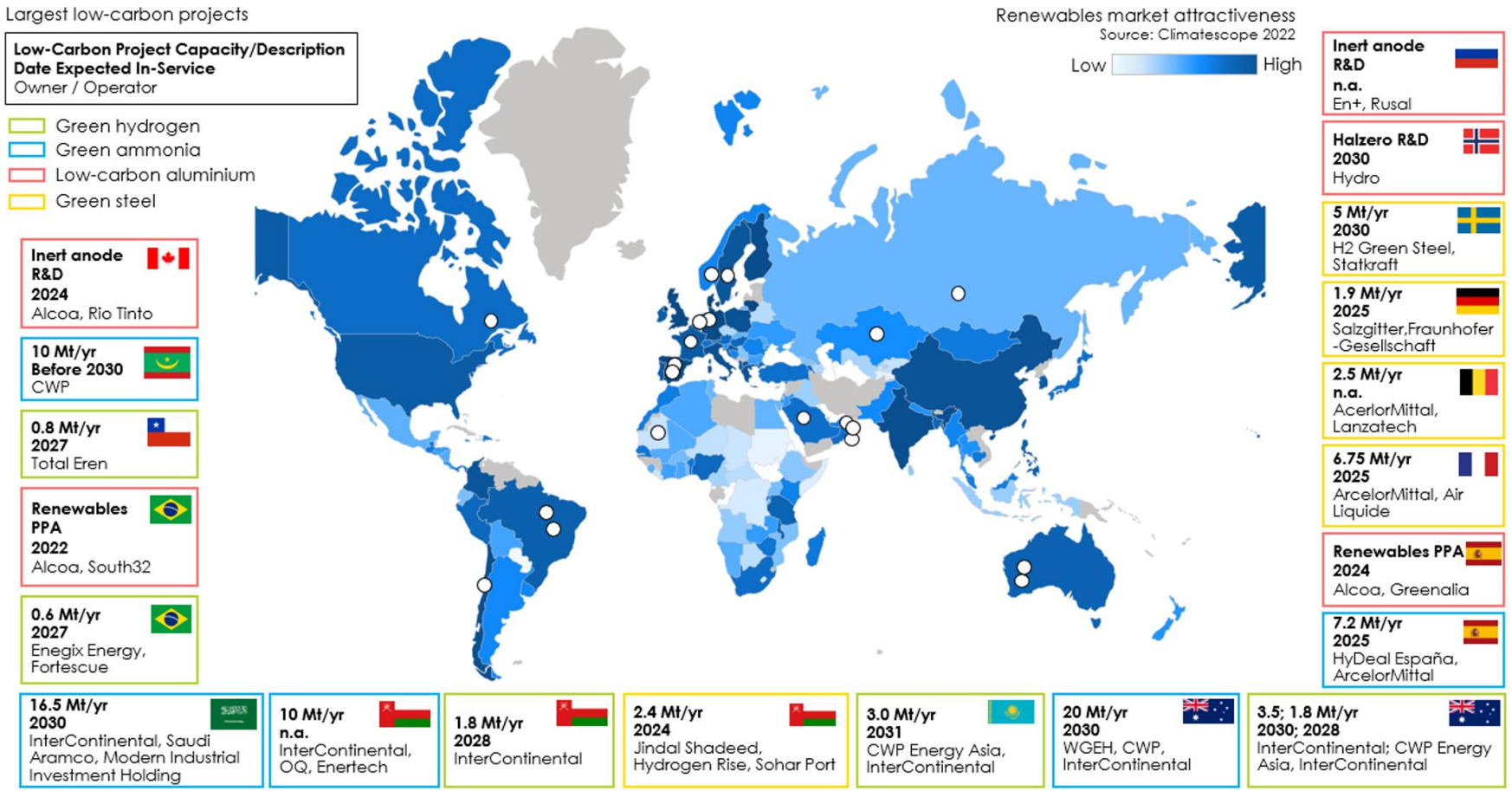
Global South well-positioned but requires strong policy framework

Large low-carbon industrial projects are being announced across the globe, bolstered by attractive renewables markets and growing capacity



Source: Climatescope 2022

The opportunity: AI applications to fighting climate change (1)

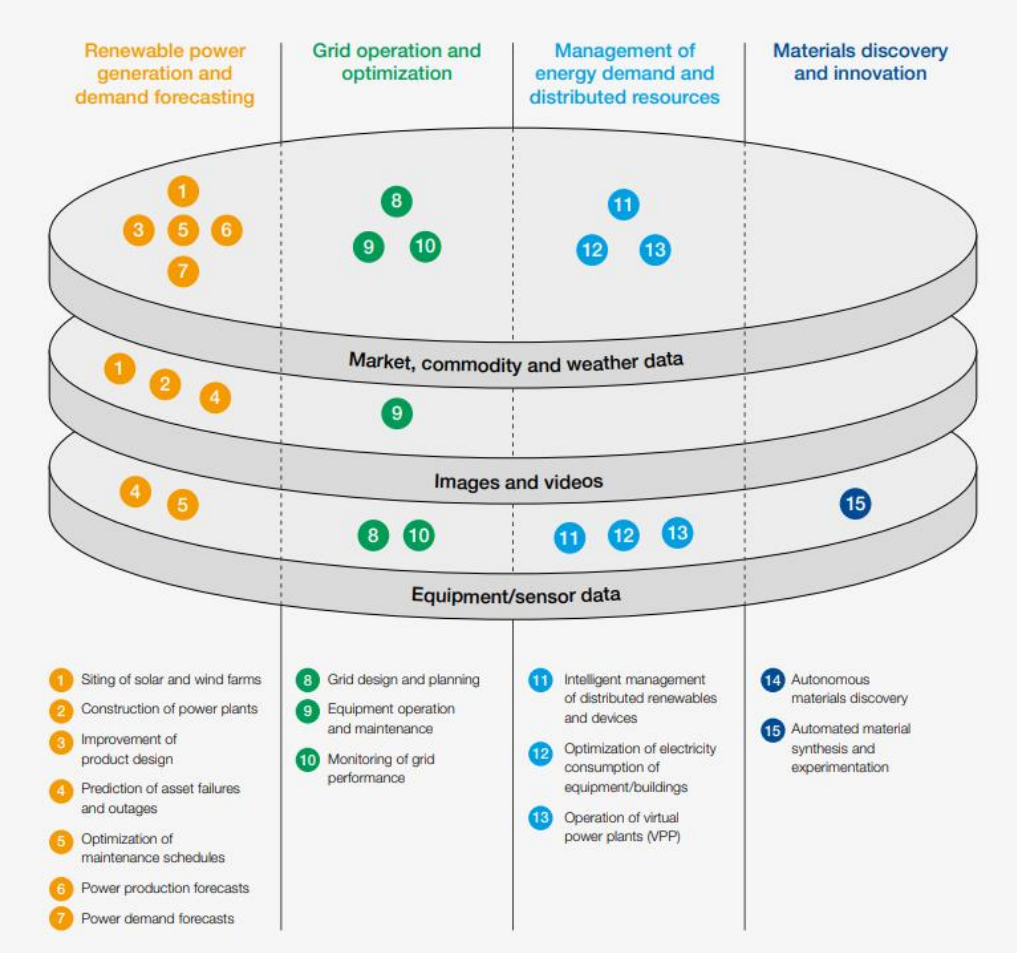
Crop analysis to increase agricultural productivity and resilience

Source: Mineral *https://x.company/projects/mineral/*

- Rising population and climate risks to crop productivity require new solutions beyond today's agriculture system that is focused on small selection of high-yield crops.
- Of the 30,000 edible plant species known, less than 1% are cultivated for human food (UN FAO). AI can help unlock diversity by identifying resilience and productivity of crops in different environments, taking climate change into account.
- The Mineral rover is a low-emission electric power rover fitted with solar panels. It uses GPS software to identify the location of plants in the field and then applies machine perception tools to analyse the data.

The opportunity: AI applications to fighting climate change (2)

Energy demand management – improving the prediction of demand



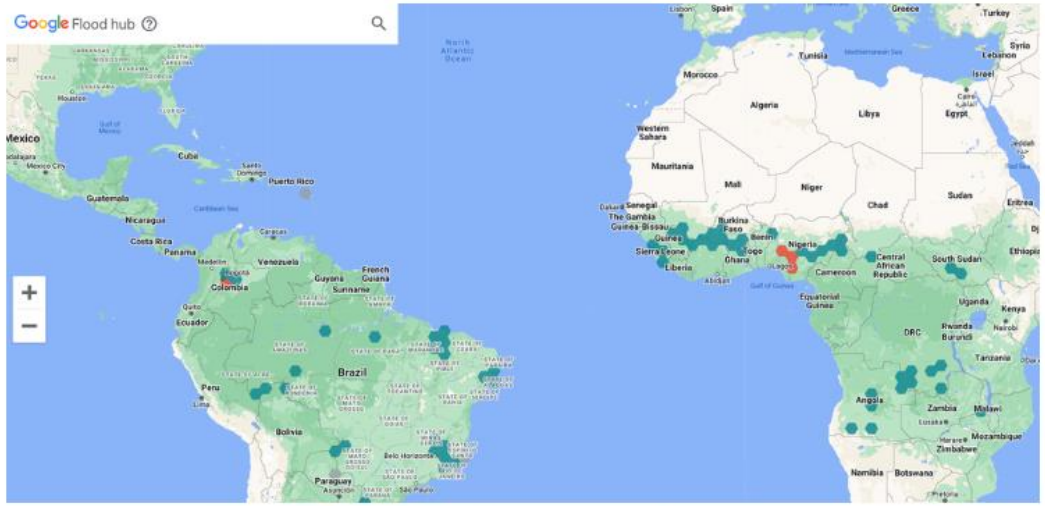
- Failing to forecast power demand may lead to blackouts or renewable curtailment. AI can help spot complex patterns & combine with historic consumption data to predict consumer demand, both at the individual and aggregate level.

- Such forecasts can help reduce the dependency on fossil-fuelled standby "buffer" plants, proactively manage the growth of variable energy sources and increase the variable renewable capacity that can be accommodated in the grid.

Source: World Economic Forum *https://www3.weforum.org/docs/WEF_Harnessing_AI_to_accelerate_the_Energy_Transition_2021.pdf*

The opportunity: AI applications to fighting climate change (3)

Early warning systems for floods, fires and hurricanes



The new Google FloodHub at g.co/floodhub shows forecasts for riverine floods. Forecasts are now available in 18 additional countries: Brazil, Colombia, Sri Lanka, Burkina Faso, Cameroon, Chad, Democratic Republic of Congo, Ivory Coast, Ghana, Guinea, Malawi, Nigeria, Sierra Leone, Angola, South Sudan, Namibia, Liberia, South Africa.

Source: Google Flood Hub

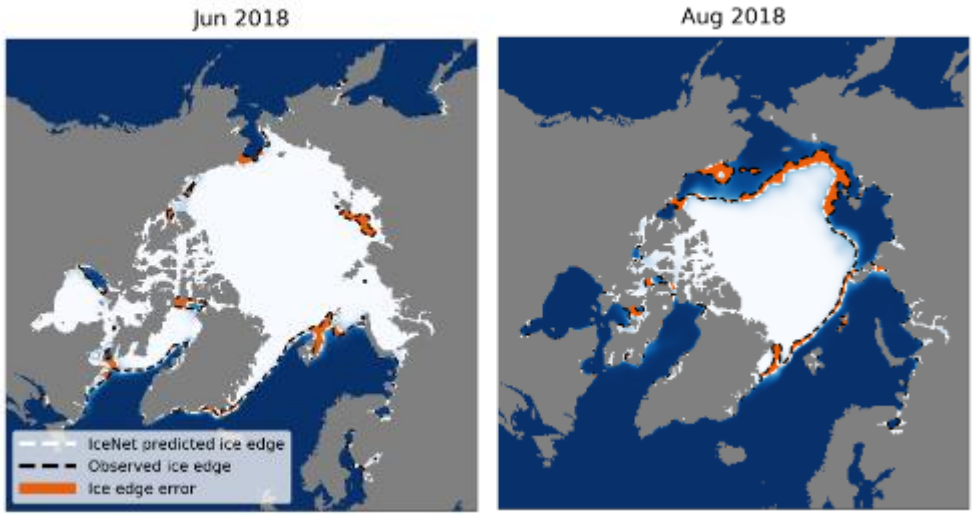
- Floods affect more than 250m people every year. Google's flood forecasting initiative uses machine learning models to issue detailed alerts. In 2021, 115m flood alert notifications were sent to 23m people across the world.

- AI models based on satellite imagery can also help show real-time location of wildfire boundaries in Google Maps and assist firefighting operations. So far, this is only available in US, Canada, Mexico and parts of Australia.

- AI-powered detailed forecasts can show a storm's predicted trajectory, while ML can be used to analyse satellite imagery after disasters to identify which areas need help.

The opportunity: AI applications to fighting climate change (4)

Predicting Arctic sea ice loss



Heatmaps showing IceNet's 1-month-ahead forecasts for the probability of Arctic sea ice over the 2018 melting season (June-August). Overlaid are the predicted and true ice edges, and the error between them

Source: The Alan Turing Institute
https://www.turing.ac.uk/news/artificial-intelligence-help-predict-arctic-sea-ice-loss#:~:text=A%20new%20AI%20(artificial%20intelligence,impacts%20of%20sea%20ice%20loss.

- Sea ice is very vulnerable to increasing temperatures due to climate change but is very difficult to forecast. Over the past four decades the summer Arctic sea ice area has halved, equivalent to the loss of an area around 25 times the size of Great Britain.
- Researchers at the British Antarctic Survey and the Alan Turing Institute have developed IceNet, an AI predictive tool that is almost 95% accurate in predicting whether sea ice will be present two months ahead.
- The tool fuses data from satellite sensors with the output of climate models to deliver forecasts of sea ice that can be used as early warning systems for risks associated with rapid sea loss.

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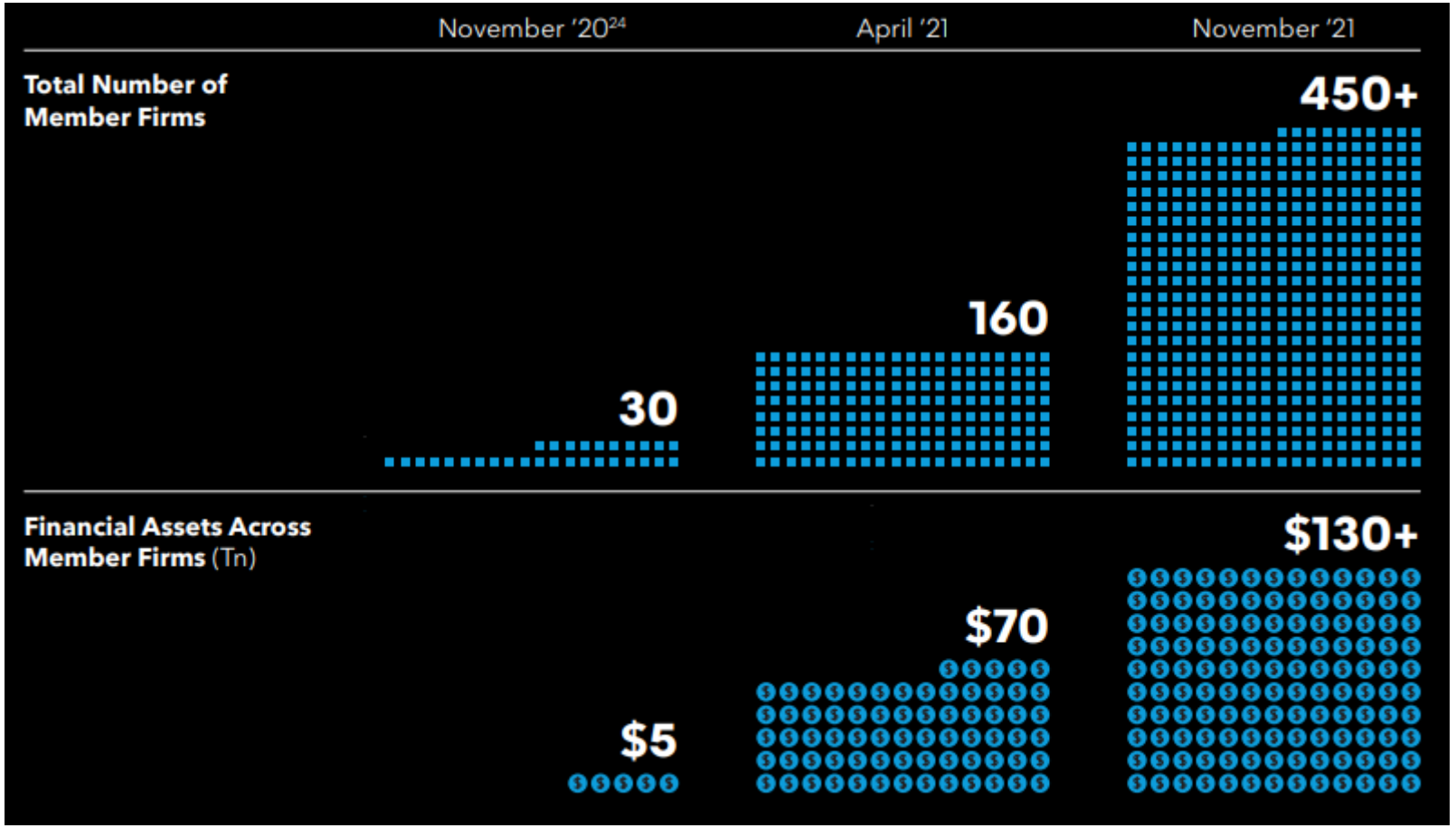
COP26: Rare moment in time, 'the financial stars align'

GFANZ and race to zero membership and the financial assets they represent



Source: GFANZ progress report

COP27: Shine wearing off?

Bloomberg

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Climate Capital Climate change + Add to myFT

US banks threaten to leave Mark Carney's green alliance over legal risks

Lenders fear lawsuits if they stick with Gfanz

Banks Try Quiet Quitting on Net Zero

Last year's enthusiasm for GFANZ turns into anxiety.

COMMERCIAL BANKING

Pushback from U.S. banks softens GFANZ climate rules

By Jordan Stutts November 01, 2022, 5:08 p.m. EDT 3 Min Read

GFANZ 'quiet quits' the UN's Race to Zero Campaign

Civil society responds on controversial move from GFANZ

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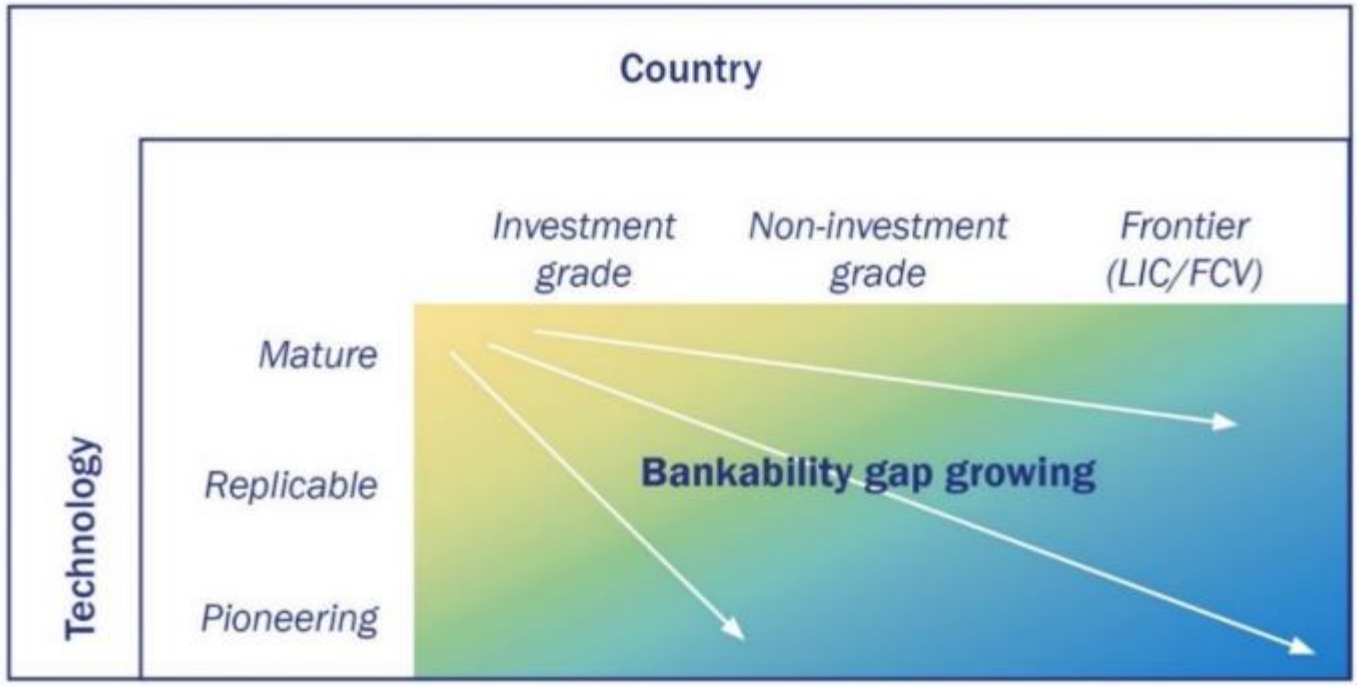
Despite opportunity & supply of savings, finance fails to connect to needs (first mover disadvantage in face of mkt failures)

Bankability gap at the geographic and technological frontiers



Source: Blended Finance for Scaling up Climate and Nature Investments, GRI (2022) https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2021/11/Blended-Finance-for-Scaling-Up-Climate-and-Nature-Investments-1.pdf

Why? High perceived risks translate into high required returns

Return expectation from solar projects in EMDCs

Country	S&P Rating	Required return from solar project (%)
Germany	AAA	7%
USA	AA+	9%
UAE	AA	10%
Saudi Arabia	A-	12%
Chile	A	12%
Morocco	BBB-	15%
India	BBB-	17%
Algeria	B	18%
Oman	BB-	18%
Peru	BBB	20%
Costa Rica	B	21%
Namibia	BB-	21%
Ghana	B-	22%
Brazil	BB-	22%
Nigeria	B+	22%
Bolivia	B+	24%
Tanzania	B	24%
Egypt	B	28%
Zambia	CCC-	38 %
Argentina	CCC+	52%

Source: Climate Policy Initiative (forthcoming)

How can the financial system re-align itself?

What can finance ministries do?: Correcting market failures: economic toolkit of subsidies, taxes (e.g. on carbon), incentives, direct public investment

What can central banks do?: Embed climate variables in macro modelling, green prudential policy (e.g. transition plans and stress tests), responsible investment of portfolios

What can investors do? Net zero alignment, divestments, active ownership, sustainable investment

What can development banks do?: Derisking, concessional finance, issuing sustainable bonds, supporting sustainable capital markets

Pioneering country platforms across regions: SSA, MENA & APAC

South Africa Just Energy Transition Partnership (JETP)

- Launched at COP26
- $8.5bn commitment from France, Germany, UK, US, EU
- Intended to mobilise further finance to accelerate retirement of coal plants & shift to renewables

Egypt Nexus of Water, Food and Energy (NWFE)

- Launched at COP27
- $15bn commitment of concessional finance from US, Germany, EU, France, Netherlands, Denmark and UK
- Partnership with EBRD, IFAD and AfDB on three pillars

Indonesia Energy Transition Mechanism (ETM)

- Launched at G20 meetings in November 2022
- Blended finance approach with wide range of institutional partners including concessional country finance, philanthropies, MDBs, NDBs and private sector

Viet Nam Just Energy Transition Partnership (JETP)

- Launched in December 2022
- $15.5bn mobilisation target over the next 3-5yrs, split equally across public & private sector finance.
- Focused on decarbonisation of the electricity system through renewable energy, efficiency & strengthening the grid.

The good news: strong public pressure to address crisis, particularly from young people

Climate Change and Future Generations Lawsuit in Colombia: Key Excerpts from the Supreme Court's Decision

10-18-21 | WORLD CHANGING IDEAS

I'm a student activist: Here's how we pushed Harvard University to finally divest from fossil fuels

After years of pressure, the university announced it would remove oil, gas, and coal from the investments of its $53 billion endowment. One of the members of the student organization who worked on the campaign explains how—and why—they fought the country's richest school.

'Historic' German ruling says climate goals not tough enough

Judges order government to strengthen legislation before end of next year to protect future generations

estation, ruling
olombian
excerpts from

rt's decision was 'a huge win for the

But is COP fit for purpose?

Environment

1 minute read · December 12, 2022 5:17 PM GMT · Last Updated 2 months ago

G7 establishes Climate Club to support green transition

Reuters

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Science

COP27: Lack of women at negotiations raises concern

16 November 2022

Not only about managing risk, also about more attractive economies

Understanding the co-benefits - and linking through them climate action to issues that the public care about - can help policy-makers prioritise policy options that have a greater chance of public support for such changes (in the face of occasional public opposition to the transition)

- Sustainable investments are not only about managing risk, but can also lead to a more attractive form of development compared with the dirty paths of the past.

- **Health:** Better air quality from reductions in pollution; Healthier diets; increased wellbeing from access to energy efficient homes

- **Economic:** Savings on fuel bills (especially for energy importing countries; improvements in productivity through reduced traffic and better health

- **Social:** Reduced fuel poverty and inequality; protection from energy price increases

- **Resilience:** Reducing dependence on fossil fuels; improved energy and water security; reduced risk of conflict over access to resources

Summary: Key takeaways

- **Listen to the science & observe reality:** The climate crisis is worsening, its effects are growing in frequency, intensity & geographic spread. Demographic shifts will matter hugely, EMDEs at heart of the transition.
- **The "Africa COP":** Establishment of Loss & Damage Fund a positive, but devil is in the details. Most effective form of adaptation and of avoiding loss & damage in future is mitigation today. There, COP27 has underdelivered.
- **Technology & Innovation:** Competitive renewables, reaching of tipping points
- **Finance:** "Shine wearing off" GFANZ, but positive developments: JTEPs; Songwe-Stern HLEG; McKenna HLEG, focus on alignment of financial flows & reference to central banks in final text
- **Is COP fit for purpose?:** Inequality in access of vulnerable countries vs fossil fuel producers; Positive role of youth; Consideration of alternatives (G7 Climate Club)
- **Beyond climate:** Focus on nature & biodiversity (COP15) & social (just transition)
- **Look ahead to COP28:** Details on Loss & Damage Fund, Climate Finance (role of SWFs), more JETPs, trade & critical minerals.