Inevitable Policy Response 2023 Policy Forecast

Preparing financial markets for climate-related policy and regulatory risks

Deep dive on transition implications in APAC region

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INEVITABLE POLICY RESPONSE

IPR WAS COMMISSIONED BY THE PRI[1] AND IS SUPPORTED BY WORLD CLASS RESEARCH PARTNERS AND LEADING PHILANTHROPIES, FINANCIAL INSTITUTIONS, & NGOS

1. Principles for Responsible Investment
2. The conclusions of the report are solely those of Energy Transition Advisers and Theia Finance Labs

Commissioned by PRI

In 2018, the Inevitable Policy Response was commissioned by PRI to advance the finance industry's knowledge of climate transition risk & support investor efforts to incorporate climate risk & opportunities in portfolio assessment

PRI Principles for Responsible Investment

A Climate Research Consortium

This report was produced by Energy Transition Advisers and Theia Finance Labs.[2]

NGO partners include Carbon Tracker, Climate Bonds & Planet Tracker

Energy Transition Advisors ETA

THEIA FINANCE LABS

Strategic Partners

In 2021, leading financial institutions joined the IPR as Strategic Partners to provide more in-depth industry input, and to further strengthen its relevance to the financial industry

FitchRatings

BNP PARIBAS ASSET MANAGEMENT

quinbrook infrastructure PARTNERS

TEMASEK

Core philanthropic support

The IPR is funded in part by the Gordon and Betty Moore Foundation through The Finance Hub, which was created to advance sustainable finance, and the ClimateWorks Foundation striving to innovate and accelerate climate solutions at scale

THE FINANCE HUB

GORDON AND BETTY MOORE FOUNDATION

climateworks FOUNDATION

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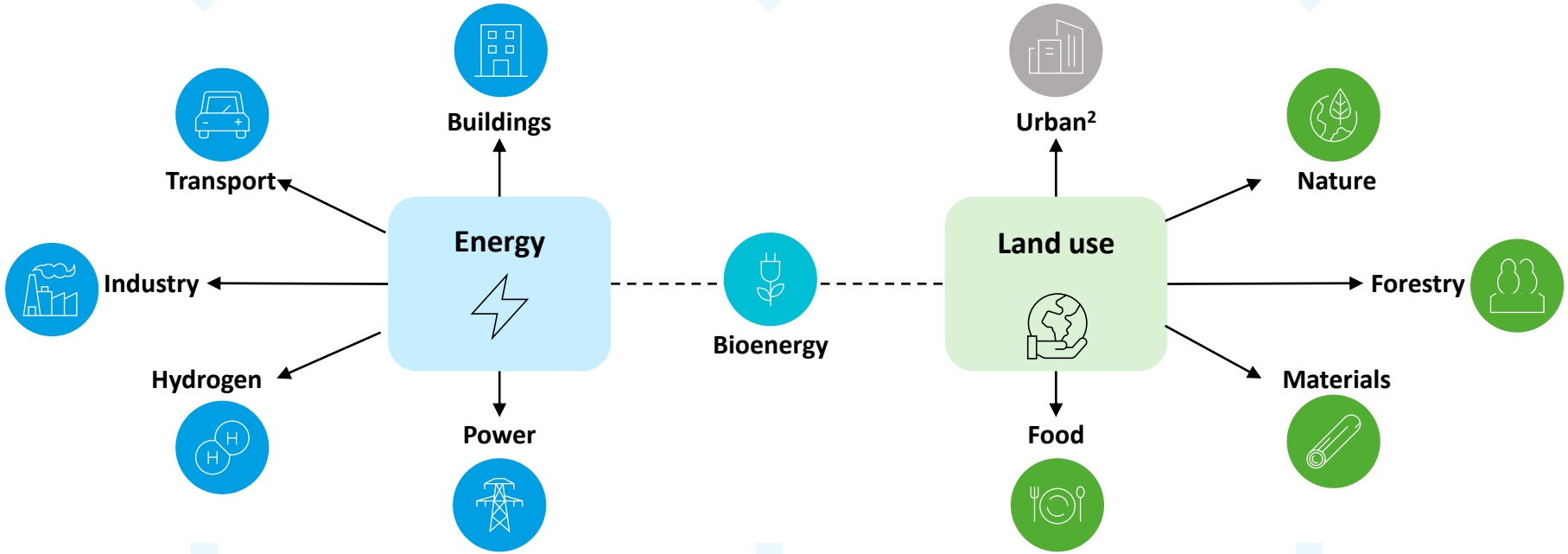
IPR OFFERS A RANGE OF APPLICATIONS TO HELP FINANCIAL INSTITUTIONS NAVIGATE THE CLIMATE TRANSITION

Policy Forecast

IPR produces **>300 high-conviction policy forecasts** covering 21 countries and 10 policy areas across energy and land use

Policy forecasts feed into a fully **integrated climate and nature scenario model** that elicits the impact of the forecasted policies on the energy, land use, and nature systems up to 2050, tracing detailed effects on all emitting sectors[1]

Modeling



Value drivers

IPR's integrated scenario model outputs detail value drivers across energy and land use. See Value Driver Visualizer

Applications

Fitch Ratings, Morning Star, Paris Agreement Capital Transition Assessment (PACTA), Planetrics, *tilt (*Climate data for SMEs)

1. IPR also develops a '1.5˚C Required Policy Scenario'(1.5˚C RPS) building on the IEA NZE by deepening analysis on policy, land use, emerging economies, NETs and value drivers. The RPS scenario is also run through the model and can be used by those looking to align to 1.5˚C. 2. Urban areas are not modelled in detail in IPR

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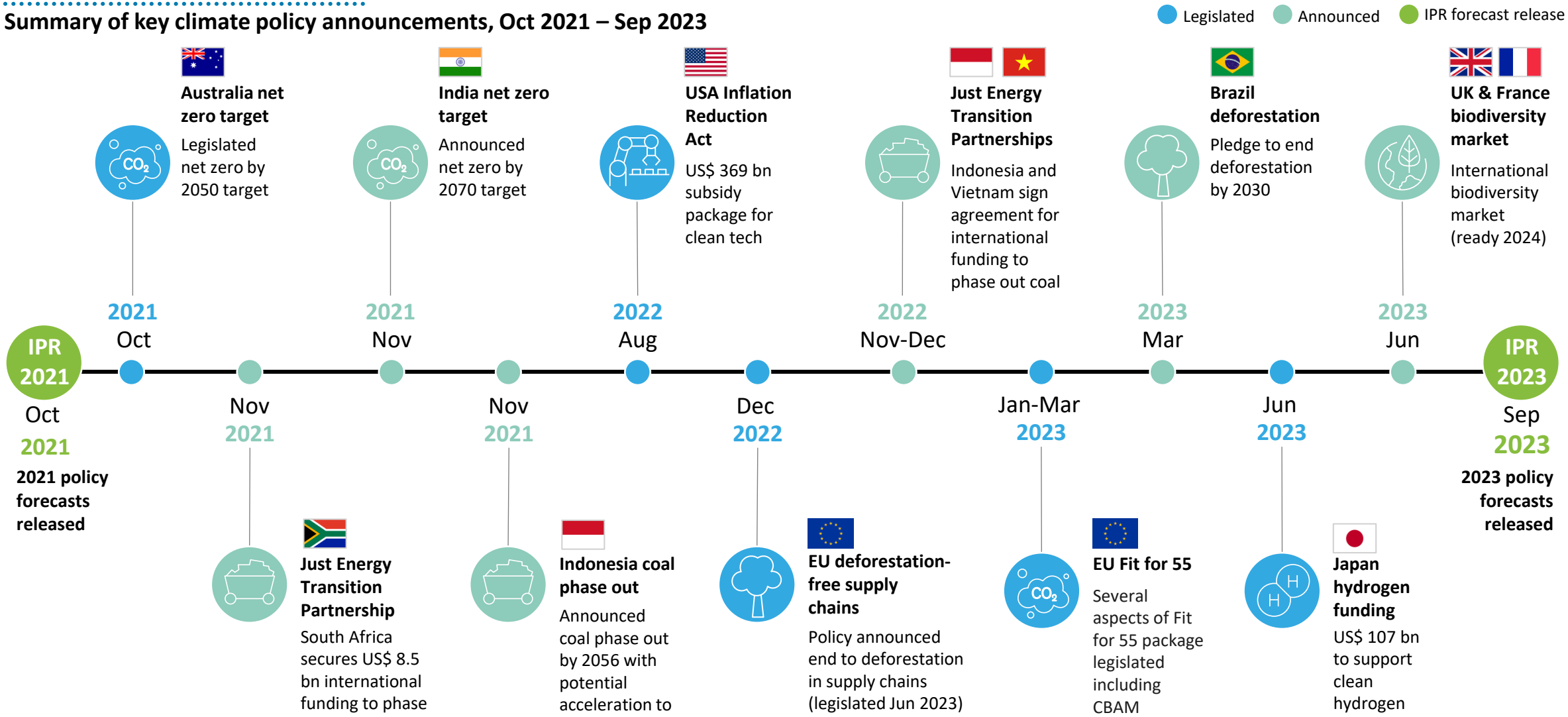
IPR TRACKS MAJOR CLIMATE POLICY DEVELOPMENTS LIVE TO ENSURE THE BEST AVAILABLE EVIDENCE BASE INFORMS THE POLICY FORECASTS

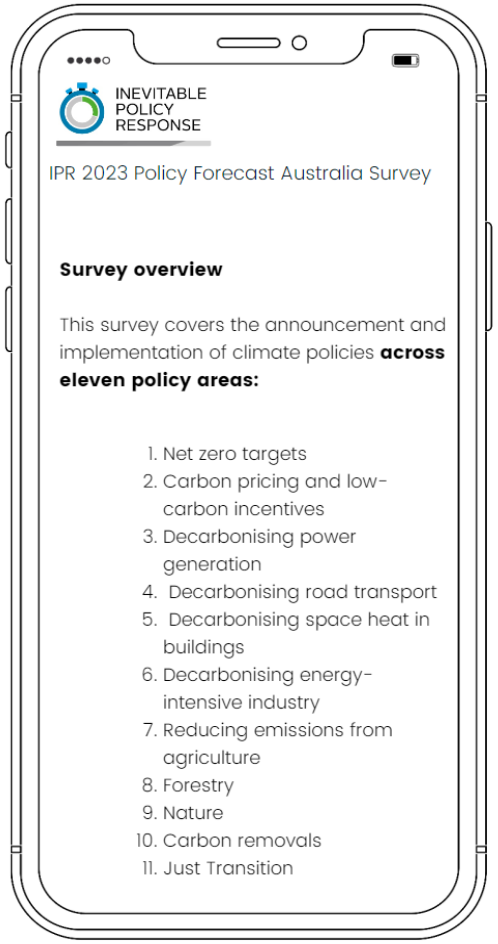
Summary of key climate policy announcements, Oct 2021 – Sep 2023



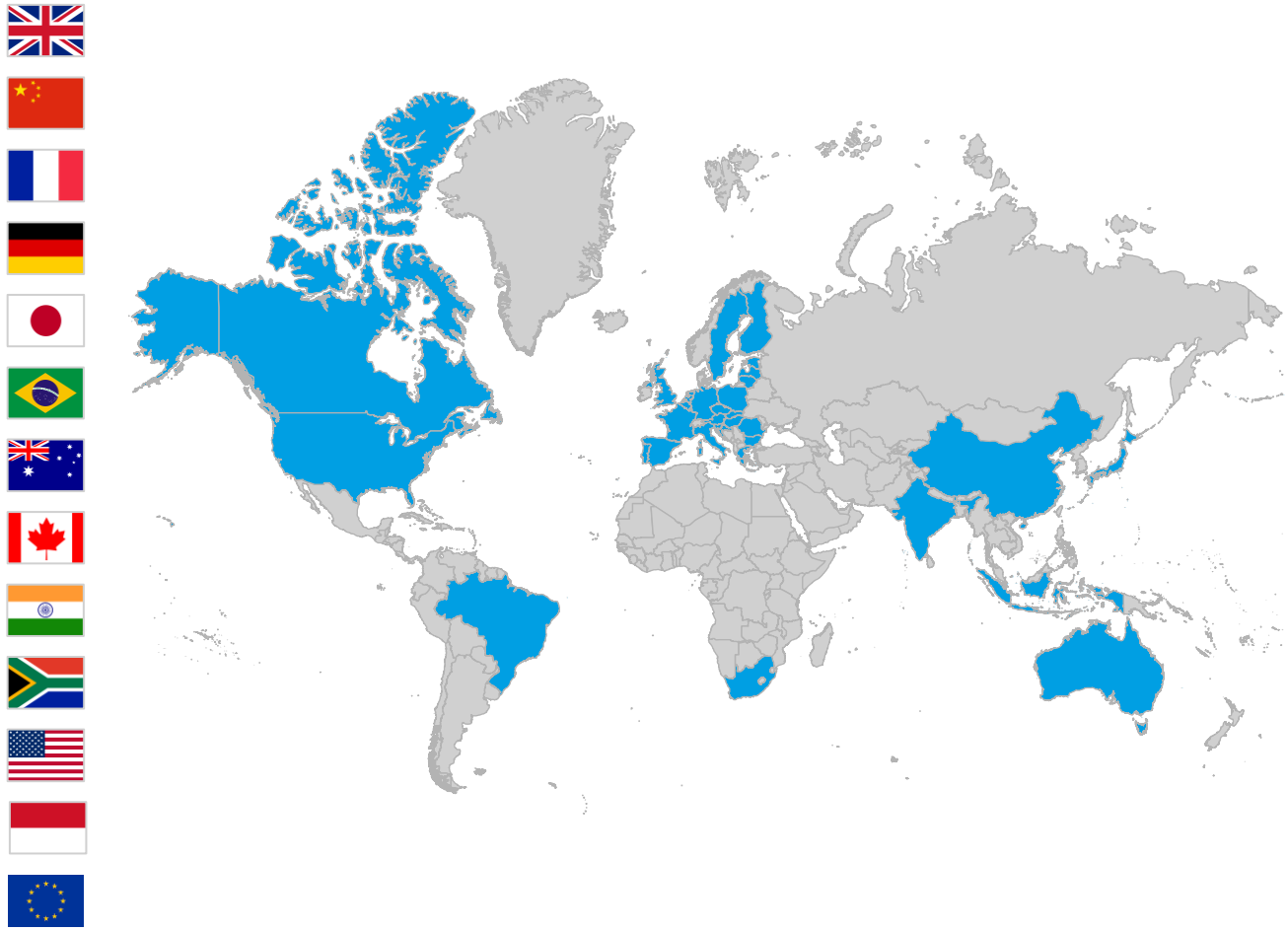
Sources are available in the annex

IPR FORECASTS ARE INFORMED BY A SURVEY OF CLIMATE POLICY EXPERTS COVERING 12 GEOGRAPHIES AND 11 POLICY AREAS

Survey Design



Survey demographics



Survey breakdown

108
Expert respondents[1]

35
Climate policy questions

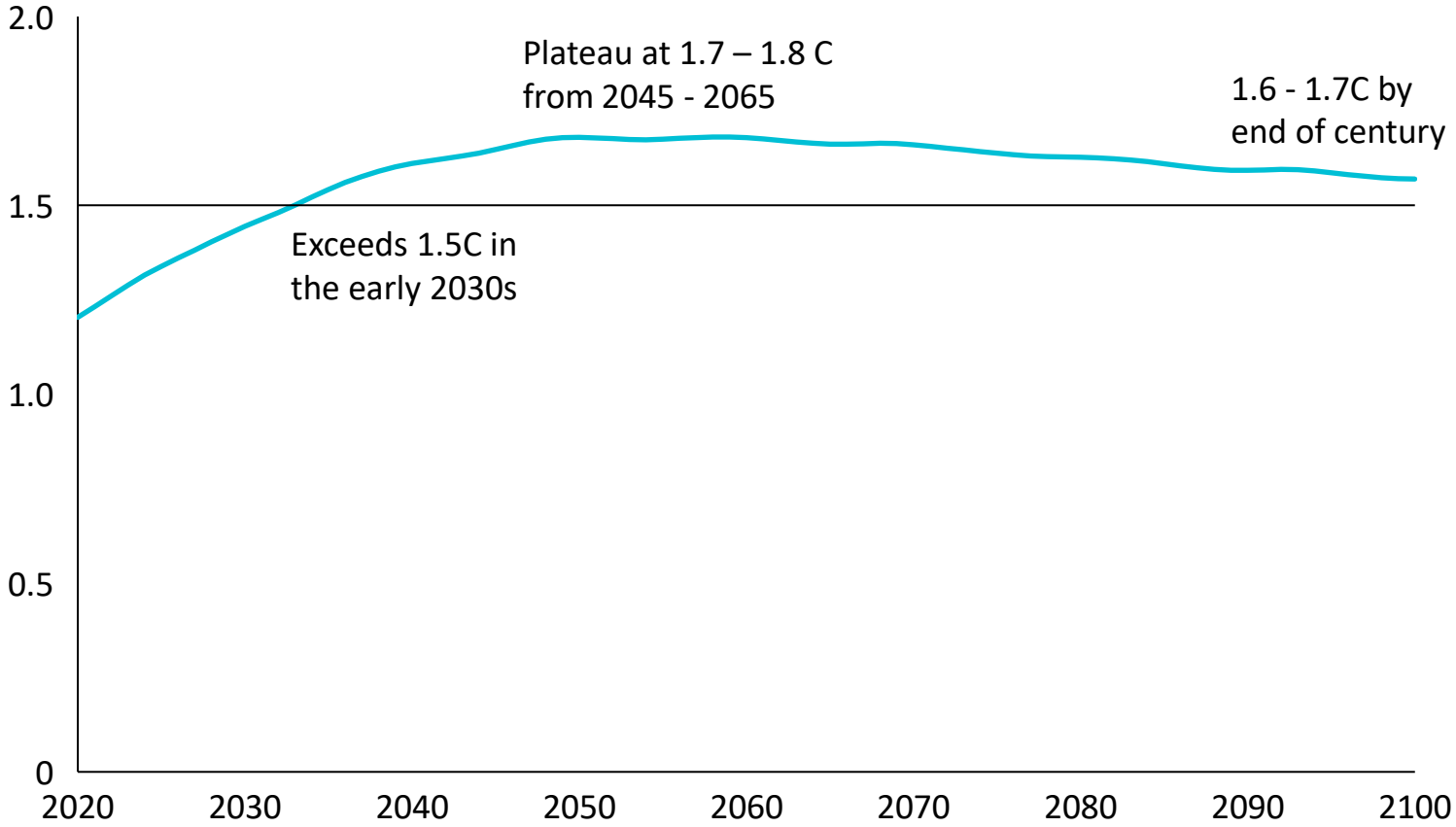
12
Geographies covered

11
Policy areas covered

1. See appendix for list of climate expert contributors who wished to be a named contributor to the 2023 IPR Policy Forecast.

FPS 2023 FORECASTS PEAK TEMPERATURES OF 1.7-1.8C AROUND 2045, DROPPING TO 1.6-1.7 C BY 2100 IF DACCS CONTINUES

Surface temperature anomaly, degrees C above pre-industrial reference period[1]



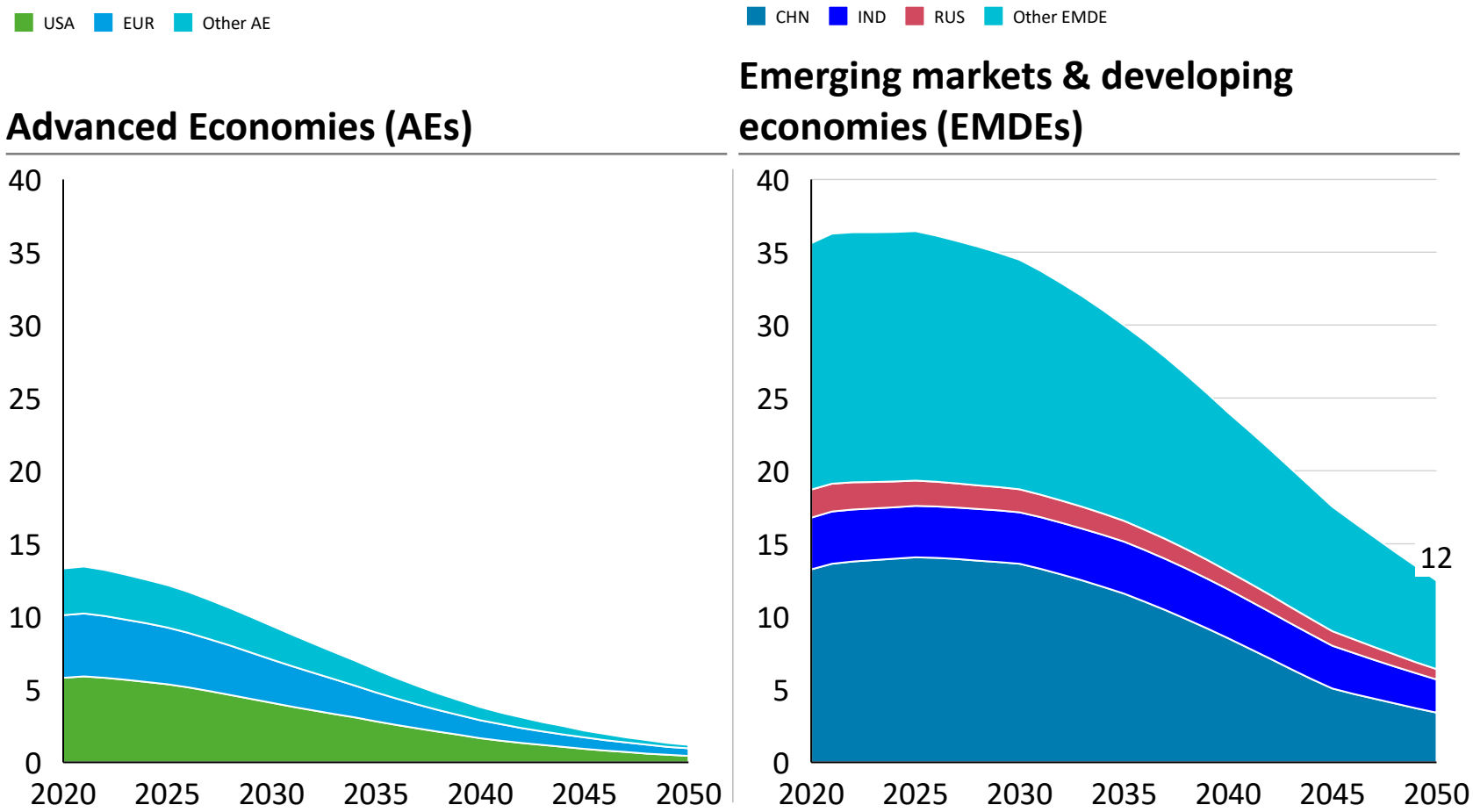
1. The pre-industrial reference period is 1850 to 1900, defined in Kelvin. Temperature anomalies in Kelvin and Celsius are equivalent.
2. Based on MAGICC 7
3. Assuming only impact of continuation of DACCS levels

IPR FPS 2023 forecasts[2]

- An exceedance of 1.5C in the early 2030s
- Peak temperatures of 1.7 - 1.8C around 2045 - 2065
- A decline to 1.6 – 1.7C by 2100 and 1.5C by 2130[3], based on direct air carbon capture and storage (DACCS) deployment estimates
- Net-zero CO_2 emissions around 2060 and net-zero GHG emissions around 2080
- Overall likelihood of staying below 2°C warming is at >90%

ADVANCED ECONOMIES REACH NEAR-ZERO GHG EMISSIONS BY 2050, WITH SUBSTANTIAL EMISSIONS IN EMERGING AND DEVELOPING ECONOMIES

Energy and Land GHG emissions[1] by region, $GtCO_2e$/year



1. Emissions on a production basis. Includes carbon removals from BECCS but not DACCS

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- Except for the uptick in emissions following the recovery in activity post-COVID, **AEs see GHG emissions fall rapidly** to near-zero by 2050. **AEs could reach net-zero energy** emissions with CO_2 removals from DACCS (not shown)
- In EMDEs, **emissions continue to grow throughout the 2020s** due to growing population and incomes. **They still emit 12 $GtCO_2e$ in 2050** mainly from industry. Even easier-to-decarbonize sectors like power and transport do not do so fully
- Emissions reductions in both AE and EDME land systems are driven by NBS

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IPR 2023 FORECASTS HIGHER CLIMATE POLICY AMBITION ACROSS 10 POLICY LEVERS COVERING ENERGY, LAND USE, AND NATURE

Net zero

- Interim emissions target
- Net zero CO_2 long-term target

Carbon pricing

- Carbon taxes
- Emission trading systems
- Carbon border adjustment mechanisms (CBAMs)

Clean power

- Targets for a fully decarbonised electricity system
- Renewable capacity auctions
- Renewable subsidies
- Nuclear power targets and and strategies

Low-carbon buildings

- Prohibiting regulations for fossil heating systems
- Purchase subsidies for low-carbon heating systems
- Thermal efficiency regulations for buildings
- Minimum energy performance standards for new appliances

Low-carbon agriculture

- Subsidies for low-emissions practices and technologies
- Emissions regulation including via tax or cap-and-trade systems
- Farmer education and technical assistance programs

Coal phase-out

- Regulations prohibiting coal build
- Emissions performance standards
- Electricity market reforms

Zero emissions vehicles

- ZEV consumer subsidies Targets to fully decarbonise the new sales of road vehicles
- Manufacturer ZEV obligations

Clean industry

- Emissions performance standards for industrial plants
- Subsidies for new or retrofit clean industrial processes

Forestry

- Incentives for reforestation and afforestation
- Penalties for deforestation, supported by consumer pressure
- Mandates to ensure deforestation free supply chains

Nature-based solutions

- Land protection and restoration policy
- Nature incentives for landowners to protect biodiversity hotspots and habitats
- Voluntary biodiversity credit markets

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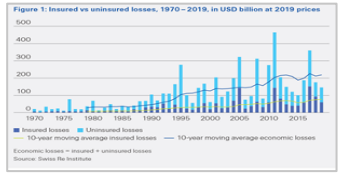
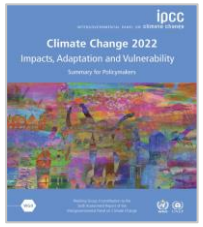
THE DRIVERS OF POLICY MOMENTUM MAKE AN INEVITABLE AND FORCEFUL POLICY RESPONSE MORE LIKELY…SOCIAL TIPPING POINTS ARE KEY

Changes in physical & monetary costs		**Increased pressure from society, markets & regulators**		**Changes in geopolitics, energy security and research**	
Extreme weather events		Financial markets pressure for net zero		US IRA impact on industrial policy	
Increase in wet-bulb globe temperature		Civil society advocating for 1.5C		Impacts on security	
Uninsurable world		Financial regulator interventions		Improved climate collaboration	
Cheaper renewable energy		Pressure for global institutions to support EDMEs transition		New climate research	

RATCHET PRESSURES INCREASE THE LIKELIHOOD THAT GOVERNMENTS WILL STRENGTHEN POLICY BY 2025, AND AGAIN TO 2030 AND BEYOND

Paris Ratchet process triggers a cumulating policy response into 2025, 2030, and beyond

2021

Countries communicate their updated or 2nd round of climate pledges

2023

Global Stocktake (GST) on climate, mitigation, and finance

2025

2025 Ratchet

Countries submit their 3rd round of climate pledges (NDCs)

2028

Second Global Stocktake (GST) on climate, mitigation, and finance

2030

2030 Rachet

Countries submit their 4th round of climate pledges (NDCs)

Policy announcements are expected to continue in 2023 -2025, with continued acceleration in 2028-2030. Recognition of Overshoot grows from 2025.

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SUMMARY IPR 2023 POLICY FORECASTS ACROSS ENERGY, LAND USE AND NATURE IN IPR ASIA COUNTRIES

Policy ambition[1]: Tier 1 Tier 2 Tier 3

		Economy wide		Power			Build-ings	Transport		Industry		Agri	Land use		Nature	
	Country[2]	Net zero CO_2 emissions	Carbon price (/tCO2)	New coal phase out	All coal phase out	Clean power	Zero-carbon heating	Light-duty vehicles	Heavy-duty vehicles	Fuel combustion	Industrial process	Low-carbon agriculture	Net deforestation	Deforest-ation free supply	Protection & restoration	Nature incentives
Advanced Economies	Japan	2050	$70	2025	2045	2045	2040	2040	2040	2055	2065	2025	2025	2035	2030	2030
	South Korea	2050	$70	2025	2045	2045	2040	2035	2040	2055	2065	2030	2030	>2035	2040	2030
	Australia	2050	$70	2023	2038-40	2045	2035	2040	2045	2055	2065	2030	2025-30	2030	2030	2025
Emerging Markets & Developing Economies	China	2060	$50	2030	2045	2050	2045	2035	2040	2070	>2070	2030	2025	2035	2035	2030
	India	2065	$50	2025	2060	2060	N/A	2040	2045	>2070	>2070	2035	2025-35	>2035	2040	>2035
	Indonesia	2060	$50	2025	2050	2050	N/A	2045	2050	2070	>2070	2035	2030	>2035	>2040	2035
	Vietnam	2060	$50	2025	2050	2050	N/A	2040	2045	2070	>2070	2030	2025	>2035	>2040	2030

1. Tiers reflect different levels of climate ambition.
2. Ranked by CO_2 emissions, European Commissions Emissions Database

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WHILE SOME SECTORS HAVE SIGNIFICANT CLIMATE POLICY, SUCH AS POWER AND LDVS, OTHERS HAVE MANY GAPS, SUCH AS COAL PHASE OUT AND HGVS

Policy gap assessment relative to IPR 2023 forecast[1] — FPS policy gap | Acceleration | Confirmatory | Supportive | Deceleration

	Country[2]	Economy wide		Power			Build-ings	Transport		Indu-stry	Agri	Land use		Nature	
		Net Zero CO_2 emissions	Carbon price	New coal phase out	All coal phase out	Clean power	Zero-carbon heating	Light duty vehicles	Heavy duty vehicles	Industry decarb.	Low-carbon agriculture	Net deforestation [3]	Deforestation free supply	Protection[4] & restoration	Nature incentives
Advanced Economies	Japan	Legislated	Announced	Policy gap	Announced	Announced	Announced	Announced	Policy gap	Announced	Legislated	Policy gap	Policy gap	Legislated	Policy gap
	South Korea	Legislated	Legislated	Announced	Announced	Announced	Policy gap	Announced	Policy gap	Announced	Announced	Policy gap	Policy gap	Legislated	Policy gap
	Australia	Legislated	Legislated	Policy gap	Policy gap	Announced	Policy gap	Announced	Policy gap	Legislated	Legislated	Legislated	Policy gap	Announced	Announced
Emerging Markets & Developing Economies	China	Announced	Legislated	Policy gap	Policy gap	Announced	Announced	Announced	Policy gap	Announced	Legislated	Announced	Policy gap	Legislated	Legislated
	India	Announced	Announced	Announced	Policy gap	Announced	N/A	Policy gap	Policy gap	Legislated	Policy gap	Announced	Policy gap	Legislated	Policy gap
	Indonesia	Announced	Announced	Announced	Announced	Announced	N/A	Announced	Policy gap	Policy gap	Policy gap	Policy gap	Policy gap	Legislated	Policy gap
	Vietnam	Announced	Announced	Announced	Announced	Announced	N/A	Announced	Announced	Announced	Announced	Announced	Policy gap	Legislated	Legislated

Gaps in policies to phase out existing and new coal in Asia particularly distinct relative to rest of the world

1. Based on major announcements and developments tracked in IPR 2021 Policy Forecast Detailed resource (March 2021) and 2022 and 2023 QFTs
2. Countries in each bucket (AE and EMDE) are ranked in order of CO_2 emissions, European Commissions Emissions Database
2. End of deforestation is defined as reduction in average annual deforestation by more than 95% versus the 1990-2020 level, alongside a net increase in forest cover
4. Policy gap assessment is shown for land protection only