INEVITABLE POLICY RESPONSE | Quarterly Forecast Tracker
Global progress against IPR policy scenarios

Quarterly Forecast Tracker

Update of global energy/land policy and technology developments

Q1 2022

April 27, 2022

PRI Principles for Responsible Investment

PRI commissioned the Inevitable Policy Response in 2018 to advance the industry's knowledge of climate transition risk, and to support investors' efforts to incorporate climate risk into their portfolio assessments.

:vivideconomics putting economics to good use

Energy Transition Advisors ETA

A research partnership led by Energy Transition Advisers and Vivid Economics conducts the initiative's research in collaboration with Kaya Advisory for the Quarterly Forecast Tracker (QFT) project.

Kaya

Table of Contents

Section

Inevitable Policy Response (IPR) Policy Forecast and Scenarios Overview

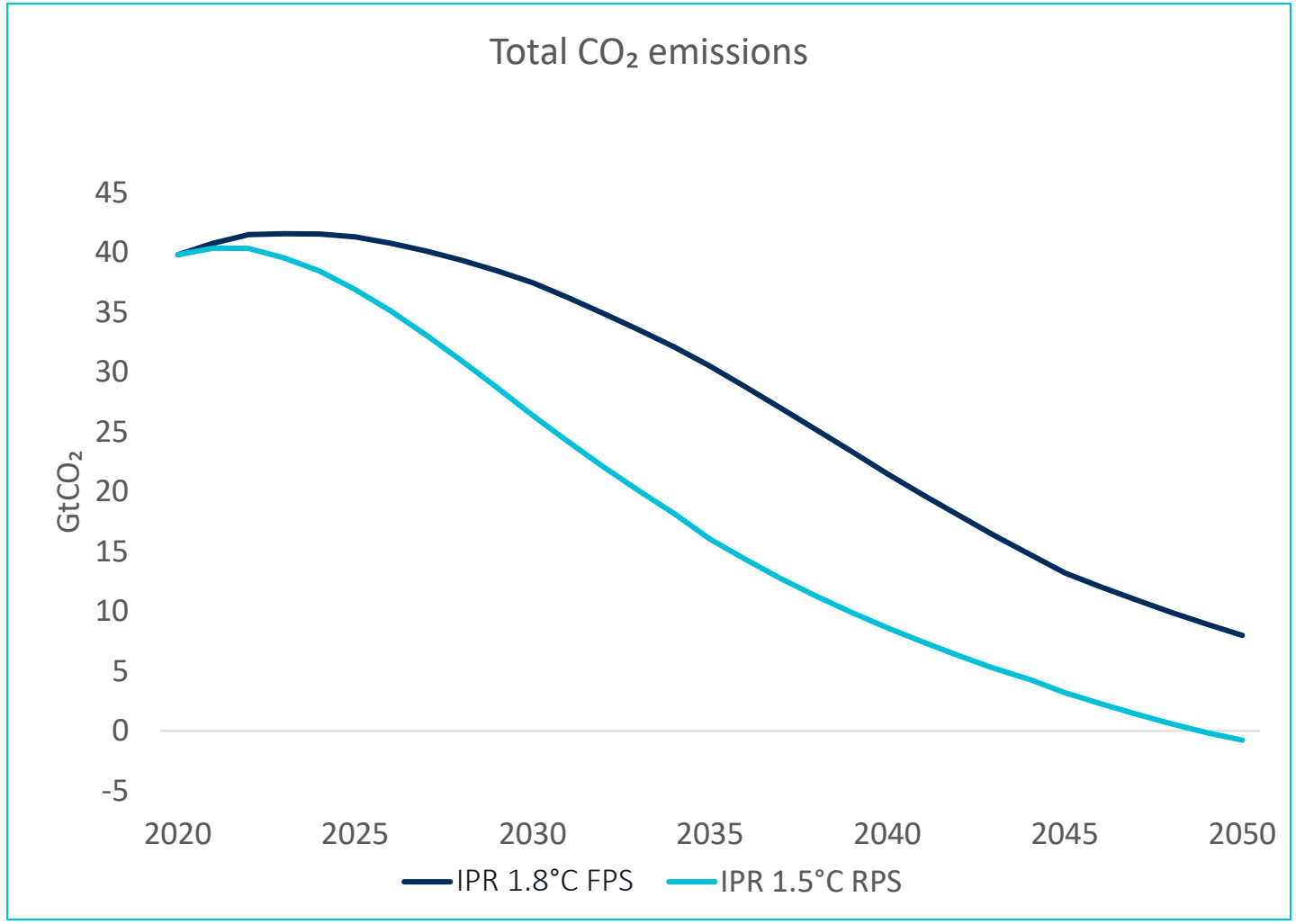
IPR has developed **high-conviction policy-based forecasts of forceful policy responses to climate change and implications for energy, agriculture and land use**, across two scenarios

Please see the IPR Home Page on the PRI website for further details.

Scenario	Policy Forecast Details	Open Access Database
 **IPR 1.8°C Forecast Policy Scenario (FPS)** • Models impact of forecasted policies on the real economy. • Global emissions fall by 80% by 2050, aligned with warming below 2C (1.8°C)	**IPR 1.8°C FPS Policy Details** **IPR 1.8°C FPS Energy and Land Use System Results Summary** *See Appendix for summary of key FPS forecasts*	**IPR FPS 2021 Value Drivers**
 **IPR 1.5°C Required Policy Scenario (RPS)** • Required policies to align to a **1.5°C objective** building on the International Energy Association's Net Zero scenario and deepening analysis on policy, land use, emerging economies and value drivers	**IPR 1.5°C RPS Energy and Land Use System Results including Policy Details** *See Appendix for summary of key RPS requirements*	**IPR RPS 2021 Value Drivers**

IPR has published a set of publicly available outputs from the 1.8°C FPS and 1.5°C RPS that offer significant granularity at the sector/country level, allowing investors to assess their own climate risk across 4,000+ variables

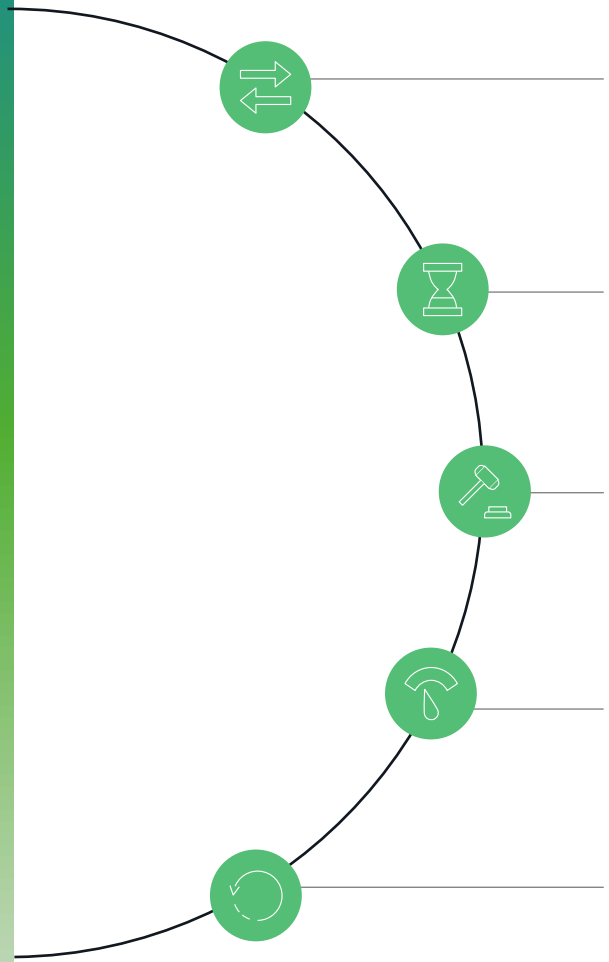
Relative to the IPR 1.8°C FPS (2021), total CO_2 emissions (from land and energy) in the IPR 1.5°C RPS decline rapidly, and are below zero by 2050



- IPR 1.8°C FPS sees emissions rising **in the short term** through 2025/6 before they start declining. RPS declines slightly by 2025
- IPR forecasts policy action **before 2025** that drive momentum from then through to 2050
- When we assess **quarterly policy developments in the QFTs** we do this against **these longer-term outcome forecasts**

INEVITABLE POLICY RESPONSE

In 2022, Quarterly Forecast Trackers (QFTs) assess how policy developments could impact IPR scenarios



QFTs assess quarterly global policy, technology and land use developments which drive the energy and land transition

Recent IPCC Sixth Assessment Reports (AR6) reinforce IPR and express the urgency of immediate policy action, finding climate change already causing widespread adverse impacts, some irreversible, and that a 1.5°C climate objective is achievable but will require an immediate action across all sectors, countries and levels of government

As realities of climate change become increasingly apparent, it is **inevitable** that governments at national and international levels **will be forced to act more decisively** than they have so far

Energy Security has emerged as a central driver since the war in Ukraine

IPR uses the SSP2* **GDP outlook**; we do not attempt to adjust for cyclical developments (e.g. COVID). Whether the war in Ukraine affects the fundamental SSP2 outlook remains to be seen.

*Shared Socioeconomic Pathways: Middle of the road scenario follows a path in which social, economic, and technological trends do not shift markedly from historical patterns.

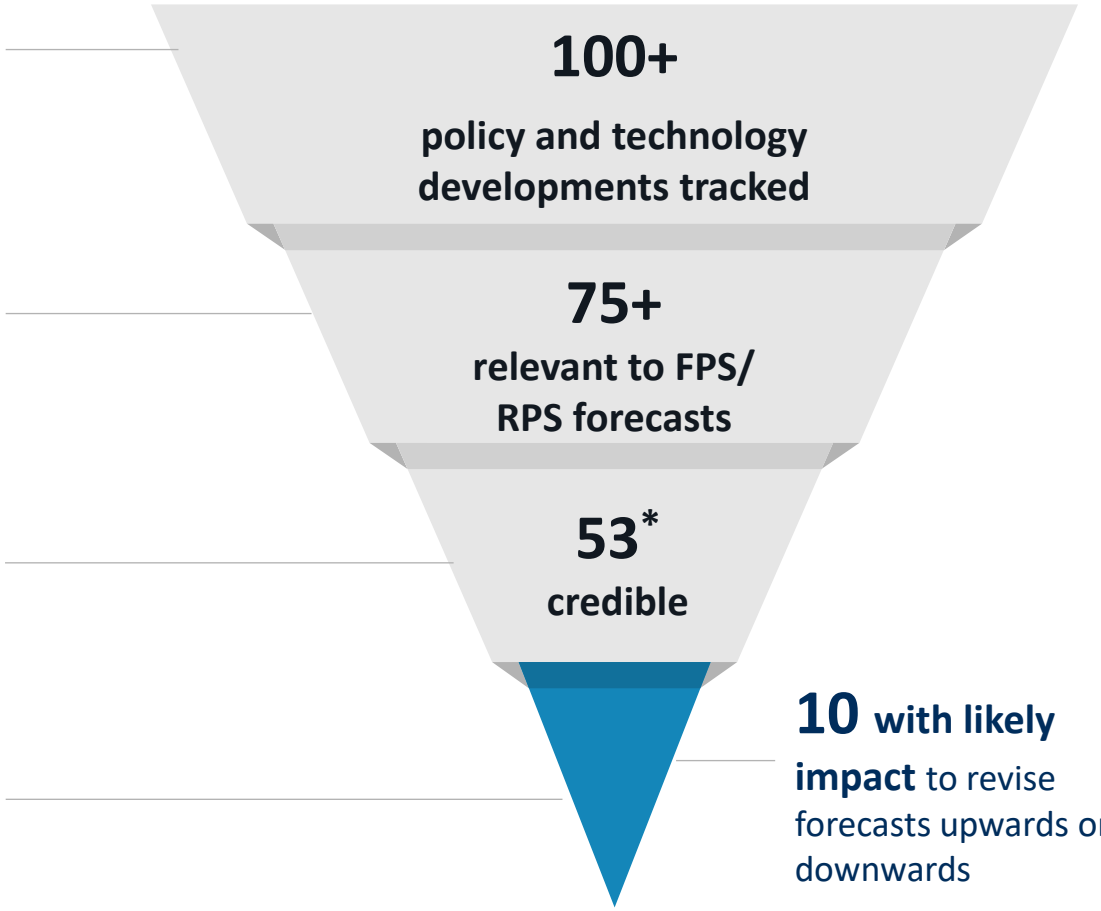
IPR QFT assessment adopts a multi-step approach to assessing key policy and technology developments impacting 1.8°C FPS and 1.5°C RPS

1. **Track/compile** announcements between October 2021 – April 2022
[COP 26 and post-COP 26 developments]

2. Determine **relevancy** to IPR FPS and RPS forecasts:
   - Confirmatory/reinforce forecasts
   - Signal acceleration or deceleration of policy relative to forecasts

3. Assess **credibility** of announcement
   - Less credible: off or on-the record statement
   - Credible: Public position on direction of travel
   - More Credible: Published strategy, or enacted legislation

4. **Score impact** of development on RPS and FSP forecast (see next slide)



* Sources for announcements/developments provided on slides 65-68

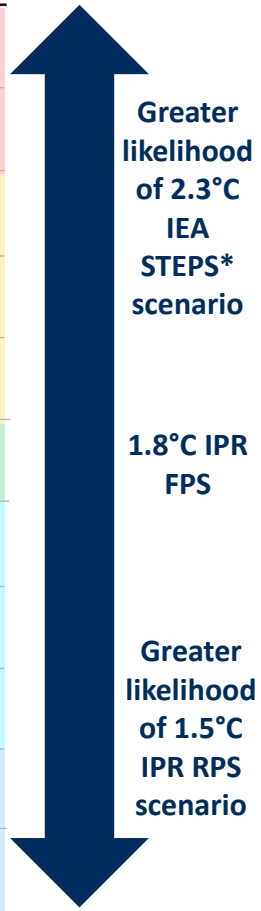
Policy developments are scored using a 10-point scale to indicate magnitude and direction of impact on IPR scenario forecasts

A 10-point scale applied to policy developments to indicate impact on IPR 1.8°C FPS policy forecasts (implications for the 1.5°C RPS policy forecasts can also be drawn)

- 0-1 indicates **increasing evidence for deceleration** in policy forecast
- 2-4 indicates **evidence for deceleration** in policy forecast
- 5 indicates **no change** in policy forecast
- 6-8 indicates **evidence for acceleration** policy forecast
- 9-10 indicates **increasing evidence for acceleration** in policy forecast

A similar 10-point scale is applied to energy/land technology developments

Scale	Details	Impact on policy forecast
0	Evidence for significant deceleration in policy forecast	Potential for 10+ year downgrade
1	Evidence for large deceleration in policy forecast	Potential for 10-year downgrade
2	Evidence for moderate deceleration policy forecast	Potential for 5-year downgrade
3	Evidence for small deceleration in policy forecast	Potential for <5-year downgrade
4	Some evidence for marginal deceleration in policy forecast	Monitor developments
5	Confirmatory (reinforces and increases probability of 1.8°C FPS)	Does not change forecast
6	Some evidence for marginal acceleration in policy forecast	Monitor developments
7	Evidence for small acceleration in policy forecast	Potential for <5-year upgrade
8	Evidence for moderate acceleration in policy forecast	Potential for 5-year upgrade
9	Evidence for large acceleration in policy forecast	Potential for 10-year upgrade
10	Evidence for significant acceleration in policy forecast	Potential for 10+ year upgrade



*The IEA's 'Stated Policy Scenario' or STEPS reflects current policy settings based on a sector-by-sector assessment of the specific policies that are in place, as well as those that have been announced by governments around the world

In Q1, Quarterly Forecast Trackers (QFTs) have confirmed long term forecasts, with some evidence of deceleration of forecasts in the shorter term

This first QFT update covers the period from **October 2021** (when the 2021 FPS 1.8°C FPS and 1.5°C RPS was released, pre-COP 26) **to mid April 2022**

Major events in late 2021 and developments in early 2022 have **confirmed/reinforced** IPR **long term forecast impacts**, with some signaling an **acceleration in policy action** coming from COP 26, Germany, France, UK and China:

- At **COP 26**, over 100 countries including Brazil pledged to end deforestation by 2030, a stronger statement on forestry than in previous COP sessions
- **Germany** announced plans to bring forward coal phaseout timeline from 2038 to 2030, **France** is accelerating plans for clean power by announcing increased nuclear capacity, and the **UK** is exceeding its forecast IPR targets for EV deployment
- **China** has published new policy documents on greening the Belt and Road Initiative and has signalled an increased awareness of agricultural emissions, including mentioning of cultivated meat in its Five-Year Agricultural Plan (released January)

There has also been some **evidence of stagnation or deceleration of policy action** that needs monitoring in the US and Brazil

- In the **U.S**. new climate legislation has not yet passed, banned solar component imports could contract the sector and slow the adoption of renewables short term; and court action against EPA could limit the ability to reduce power sector emissions absent federal legislation
- In **Brazil**, a proposed bill allowing mining on indigenous lands, combined with its recent NDC and high current deforestation levels could impact IPR forecasts for deforestation end dates

The war in Ukraine has led to policymakers to increase focus on ‘security’ as a driver and **while short term there is some disruption, longer term developments are likely to favor clean energy**

Between COP 26 and mid-April 2022, majority of energy/land policy & technology developments confirm IPR forecasts and move world closer to a 1.8°C pathway*

Greater likelihood of 2.3°C IEA STEPS scenario** ← **1.8°C IPR FPS** → **Greater likelihood of 1.5°C IPR RPS scenario**

Scale	0 Significant deceleration	1 Large deceleration	2 Moderate deceleration	3 Small deceleration	4 Marginal deceleration	5 Confirmatory (increased probability of 1.8°C FPS)	6 Marginal acceleration	7 Small acceleration	8 Moderate acceleration	9 Large acceleration	10 Significant acceleration	Total
COP26 announce-ments						7	1					8
US				1	1	6						8
China						7	2					9
EU						2						2
Germany						2	1					3
France							1					1
UK						2		1				3
Brazil					2	2						4
India & Indonesia						4						4
Other G20 countries						11						11
Total				1	3	43	5	1				53

*This assessment excludes energy and land policy developments related to the war in Ukraine which are discussed in greater detail on slides 10-16
**The IEA's 'Stated Policy Scenario' or STEPS reflects current policy settings based on a sector-by-sector assessment of the specific policies that are in place, as well as those that have been announced by governments around the world

War in Ukraine: emerging energy and land policy response

INEVITABLE POLICY RESPONSE

Special Focus on the war in Ukraine: The implications for energy and climate policy

We express our sympathies with all those suffering in this war

For IPR Forecasts we see 3 meta developments* at this stage:

1. **Reinforcement of medium** (3-5 Years) and **long term** IPR renewable energy and Green Hydrogen policies and sector forecasts
2. **Short term** (1-2 Years) **energy supply crisis for EU** with many uncertainties, local gas and coal use and sourcing of fossil fuel supplies outside of Russia which points at least short term to an "all of the above" approach. Implementing security back-ups could leave fossil fuels in the system longer.
3. **To achieve current IPR forecasts, it would require policy makers to avoid locking in actual generation or high-capacity utilisation of these fossil fuel assets.** Energy security will come at a cost but there does not have to be a trade-off with climate policy.

For the **IPR Forecast Policy Scenario (FPS)** this means that the **fossil fuel sector supply dynamics will need reassessing** e.g. split between piped natural gas and LNG, geography of origin etc.

But we **do not see any divergence from trend in demand side sectors**, if anything in **medium term** an eventual acceleration towards more green outcomes**

Link to paper: Ukraine War: The new geo-politics of energy and implications for climate policy

*The implications of the invasion of Ukraine are rapidly evolving and are inherently uncertain. As a result, this assessment and analysis, should be treated as a best-efforts perspective at a specific point of time.
**Recent green index report for example finds financial market interests converging with EU decarbonisation power sector in context of Russia-war in Ukraine: https://www.1in1000.com/russia-ukraine-war

GDP outlook under IPR scenarios

- IPR leverages the **Shared Socioeconomic Pathways: Middle of the road scenario*** (SSP-2) outlook for economic growth out to 2050; where scenario, social, economic and technological trends do not shift markedly from historical patterns
- IPR does not attempt to adjust for cyclical developments (e.g. COVID)
- Whether war in Ukraine affects the SSP2 outlook remains to be seen, but impacts could be significant for EU, particularly in the short term (e.g. Germany GDP growth outlook has recently been reduced)
- Long term SSPs may need to be revised and if so, this would imply revisiting and updating assumptions under IPR scenarios at a future date

*Source: https://unece.org/fileadmin/DAM/energy/se/pdfs/CSE/PATHWAYS/2019/ws_Consult_14_15.May.2019/supp_doc/SSP2_Overview.pdf

War in Ukraine: Energy policy response (1/3)

The war in Ukraine's impact on energy supply has shifted focus on energy security in the EU, which in the short term could increase both fossil fuels and renewables in an "all of the above" security approach. To meet current targets, the utilisation of fossil fuels would need to be constrained in the medium term.

Region/ Country	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU	Cross-cutting	The conflict has provoked a paradigm shift towards strategic autonomy, with the EU pivoting to energy security and industrial policy on top of "Fit for 55", with focus on all levers. Key developments include: • **RePower EU Communication[1]:** Focusing on ending imports of fossil fuels and focus on solar/wind/heat pump rollout: ◊ **Out of gas**: Commission **RePower EU proposal** to reduce dependency on Russian gas by two-thirds this year and on fossils broadly "well-before" 2030, with a suggestion of 2027 ◊ Strong focus on **energy efficiency**, including heat pump roll out ◊ Boost **biogas** and **hydrogen** ◊ Streamline **authorisation process for renewables** ◊ Concrete proposals in May 2022 • **Coal sanctions[2]:** 5th sanction package includes a ban on Russian coal imports	• **1.8°C FPS:** Various including ◊ **Coal phase out:** Strong policy signal that coal generation to be made unlawful or unprofitable by 2030 ◊ **Clean power:** policy to deliver 100% clean power by 2045	• Focus on energy security and industrial policy • **More fossil:** LNG, coal + nuclear short term • **Renewables:** Ramp-up, finance available, potential for supply chain issues, hydrogen push accelerated **Short term (1-2 Years):** energy supply crisis for EU with many uncertainties, local gas and coal use and sourcing of Fossil Fuel supplies outside of Russia **Medium to long-term:** reinforces IPR; renewable energy and green hydrogen policies and sector forecasts, including move away from fossil fuel utilisation	4 Monitor developments 6 Monitor developments

War in Ukraine: Energy policy response (2/3)

The U.S. energy response focuses on the short-term e.g. in the US, short term LNG agreements. Supply chain disruptions could impact US renewables build.

Region/ Country	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
US 	**Cross-cutting**	• Sanctions/Russian energy import bans include oil, LNG and coal[3] • Short term focus on LNG exports, releasing strategic reserves and supplying EU with 15 bcm this year rising to a total of 50 bcm in coming years[4] • Potential for new climate-related legislation before end of the year[5]	• **1.8°C FPS:** Various including ◊ **Clean power:** policy to deliver 100% clean power by 2040	• Focus on energy security • Limited direct impact on forecast given the US is not a major importer of Russian energy	5 Confirmatory

War in Ukraine: Energy policy response (3/3)

The China energy response is focusing on the short-term. IPR will continue to monitor coal activity in China and assess potential impact on forecasts.

Region/ Country	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
China	**Cross-cutting**	• Some Chinese state-owned enterprises advised by lenders to stay away from Russian coal[6] • EU has asked China not to undermine sanctions against Russia[7] • Concerns over secondary sanctions as a result of the Ukraine war is causing some offshore oil and gas producers to prepare for exiting operations in Britain, Canada and in the US.[8] • Chinese climate target remains in place and the government is signalling that China should be a global leader in the manufacturing industry, including on RE rollout[9]	• **1.8°C FPS:** Various including: ◊ **Coal phase out:** Policy and reforms targeting ending new unabated coal by 2025 and generation by 2045 ◊ **Clean power**: strong policy signal to deliver 100% clean power by 2050	• Confirmatory • Focus on energy security • 2060 commitment looks robust with continued rollout of RE but short term more coal – maybe also longer term • Pivotal role in global RE supply chains	5 Confirmatory

War in Ukraine: Land policy response

The impact on food and fertiliser supply is increasing food prices and incentivises a shift away from energy intensive fertilisers. In the EU and US a focus on food security/increasing production may impact ability to achieve previously set out environmental objectives (e.g. sustainable farming).

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Global	Agriculture	• Support policies (e.g. export bans, price controls, tariffs) that reinforce food security and support locally sourced food[11] • Diversify cereal suppliers in the short run. Ukraine and Russia make up 30% of cereal exports, which could be heavily disrupted[12]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025 in leading Tier 1 countries, and from 2035 in Tier 3 countries	• Aligned with forecast • There may be a greater policymaker focus on "peak meat" to reduce dependence cereals and associated fertilisers coming out of Russia, which would reinforce IPR forecasts for agriculture emissions	5 Confirmatory
EU	Agriculture	• EU and Member States likely to decrease environmental and climate ambitions in agriculture. Demonstrated by delay of EU proposals of sustainable farming and nature, reincorporation of fallow lands in production, national CAP strategic plans, among others. [13]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025 in leading Tier 1 countries, and from 2035 in Tier 3 countries	• Aligned with forecast • Focus on food security	5 Confirmatory
US	Agriculture	• Support to fertiliser production for American farmers[14]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025 in leading Tier 1 countries, and from 2035 in Tier 3 countries	• Aligned with forecast • Focus on food security, shifting production to US	5 Confirmatory

Q1 2022 Policy and Technology Assessment Summary

INEVITABLE POLICY RESPONSE

Between COP 26 and mid-April 2022, majority of energy/land policy & technology developments confirm IPR forecasts and move world closer to a 1.8°C pathway*

Greater likelihood of 2.3°C IEA STEPS scenario** ← **1.8°C IPR FPS** → **Greater likelihood of 1.5°C IPR RPS scenario**

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**The IEA's 'Stated Policy Scenario' or STEPS reflects current policy settings based on a sector-by-sector assessment of the specific policies that are in place, as well as those that have been announced by governments around the world

Policy development summary: Key Q1 2022 developments signaling a potential upgrade or downgrade for forecasts (1/4)*

Banned solar component imports could contract the sector and slow the adoption of renewables short term; court action against EPA limits the ability to reduce power sector emissions absent federal legislation.

Region/Country	Sector	Policy Development	2021 IPR Forecast	Impact on forecast	Impact score
US 	**Clean Power** 	• In October, a bill signed banning imports of key solar panel material from Xinjiang, citing human rights abuses [15] • Xinjiang region accounts for ~45% of solar-grade polysilicon[15] • In March, US announced investigation and potential tariffs on Malaysia, Thailand, Vietnam, Cambodia imports based on allegations that Chinese manufacturers have shifted production to these countries to avoid paying U.S. duties.[16]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2050	• Likely downgrade of forecast • Could be consequential; building up domestic manufacturing takes time • Could lead to contraction in US market, rearrangement of trading arrangements	3 <5-year downgrade
		• In February, the Supreme Court has decided to hear a case on the authority of the Environmental Protection Agency to regulate greenhouse gas emissions from power plants under the Clean Air Act[17]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2035	• Indicates potential downgrade of forecast which should be monitored • One possible outcome is a restriction of the EPA's mandates to regulate GHG emissions, meaning a significant reduction in the ability to meet emissions reduction plans without Congress	4 Monitor developments

* See Detailed Policy Assessment Summary for full list of policy developments, including those that confirm/reinforce IPR forecasts (e.g. assessed as a '5')

Policy development summary: Key Q1 2022 developments signaling a potential upgrade or downgrade for forecasts (2/4)

Key policy developments: Germany is reinforcing IPR forecast with a coal phaseout plan while France is accelerating it by announcing plans for increased nuclear capacity.

Region/Country	Sector	Policy Development	2021 IPR Forecast	Impact on forecast	Impact score
Germany	**Coal phaseouts**	• In November 2021, Germany announced a coalition agreement to bring forward coal phaseout to 2030 from 2038[18] • This follows an April 2021 Germany court decision stating Germany lacks a plan for emissions reductions after 2031 and ordering enacting of provisions by the end of December 2022[19]	• **1.8°C FPS: Coal phaseouts: s**trong policy signal that coal generation will be made unlawful or unprofitable by **2038-2040**	• This indicates a potential upgrade of forecast relative to 1.8C FPS, however energy security crisis caused by war in Ukraine could put phaseouts on hold; to continue to monitor developments	6 Monitor developments
France	**Clean Power**	• In February the government announced plans for at least six nuclear reactors in coming decades, pivoting from earlier announcements to reduce reliance on nuclear energy, alongside plans for 100 GW of solar and 40 GW of offshore wind by 2050[20]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by **2035**	• This is a potential upgrade of forecast • Prioritisation of nuclear likely to be accelerated in current crisis, opening up import options for other EU countries • EU taxonomy including nuclear as sustainable under certain conditions will enable private/public investment • Case for renewables strengthened due to the war in Ukraine but there could be a short-term increase in coal	6 Monitor developments

Policy development summary: Key Q1 2022 developments signaling a potential upgrade or downgrade for forecasts (3/4)

China has published new policy documents on greening initiatives for coal and is signalling an increased awareness of agricultural emissions.

Region/Country	Sector	Policy Development	2021 IPR Forecast	Impact on forecast	Impact score
China	**Coal phaseouts**	• In March, four Chinese ministries published a key document on further greening of its Belt and Road Initiative (BRI), referring to retrofitting of existing coal plants to make less polluting, more efficient, or to install CCUS technology[21]	• **1.8°C FPS:** End construction of new unbated coal by 2025; coal generation phaseout by 2045	• Positive sign as replacing deployment of coal power with renewables	6 Monitor developments
	Agriculture	• China's Five-Year Agricultural Plan, released in January, includes a mention of cultivated meat for the first time, implying this area will receive an increase in government funding in future[22]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025	• This is a potential upgrade of forecast • Inclusion of cultivated meat in political messaging and policies indicates that China is moving towards reducing agricultural emissions; but does not specify a timeline or target • Agriculture and energy price shocks will be significant for China, there has been recent focus on reducing food waste under food security lens • China's 2022 economic and social development plans (released subsequently in March) appear to emphasise growth with less focus on emissions	6 Monitor developments

Policy development summary: Key Q1 2022 developments signaling a potential upgrade or downgrade for forecasts (4/4)

COP26 deforestation commitments are a stronger than expected commitments by many countries. Brazil, however, is not in line with expected deforestation targets.

Region/Country	Sector	Policy Development	2021 IPR Forecast	Impact on forecast	Impact score
COP 26	**Land use and forestry**	• In November, over 100 countries, including Brazil, **pledged to end deforestation by 2030**, in line with IPR forecasts of leading countries ending deforestation by 2025, with remaining countries to follow by 2030.[23] • In November, US-China agreed to cooperate on measures to lower methane, conserve forests, and phase out use of coal[24]	• **1.8°C FPS:** End deforestation by 2030 • **1.5°C FPS: RPS:** End deforestation by 2025	• This is a potential upgrade of the 2021 IPR Forecast • This is a stronger statement on ending deforestation than made in past COPs, however the impact on forecasts is not yet clear and needs to be monitored	6 Monitor developments
Brazil	**Land use and forestry**	• In March, President Bolsonaro pushed for a bill that would allow for more mining on Indigenous lands[25] ◊ Bill to allow mining on indigenous land ◊ Relaxing regulation on land grabbing ◊ Changing requirements for environmental licensing ◊ Loosening regulation on agrochemicals ◊ Cut-off date for claiming indigenous land • In April, Brazil submitted its second update of its first NDC. Analysts and NGOs note that while Brazil has nominally increased its 2030 target, its new target is less ambitious than a previously submitted target in due to use of a different emissions baseline; analysts further note the NDC does not yet incorporate methane reduction and deforestation pledges at COP 26[26]	• **1.8°C FPS:** End net deforestation by 2030, deliver afforestation at scale by 2030	• Increasing deforestation is moving Brazil away from forecasted land use trend • This announcement makes FPS forecasts appear optimistic, and continuing war in Ukraine will likely push this further	4 Monitor developments

Technology development summary: key Q1 2022 developments reinforcing IPR forecasts or signaling an acceleration or deceleration

The UK is exceeding targets for EV deployment while there is a need to monitor deforestation in Brazil given high current levels. Global announcements of new wind and solar power are in line with forecasts as is the US's announcement of a Clean Energy Demonstration Office and China's plans to build additional 450 GW of wind and solar by 2030.

Region/Country	Technology Sector	Policy Development	2021 IPR Forecast	Impact on forecast	Impact score
US	**Multiple technologies**	• In January, US Department of Energy pledged US$20 billion to establish Office of Clean Energy Demonstrations to support projects including clean hydrogen, carbon capture, grid-scale energy storage, small modular reactors[27]	• **1.8°C FPS:** Cost reduction across all major clean energy technologies	• Confirms forecast • 2021 IPR Forecast involves substantial innovation across all key transition technologies driven by public and private R&D and innovation	5 Confirmatory
Global	**Wind and Solar**	• Throughout the quarter, there were multiple announcements of new renewables projects and auctions[28]	• **1.8°C FPS:** Extensive deployment to 2030	• Observed ramp up of wind and solar PV globally in line with 2021 IPR Forecast	5 Confirmatory
China	**Solar**	• In March, Chinese government planning official announces plans to build 450 gigawatts of wind and solar power capacity in the Gobi desert by 2030[29]	• **1.8°C FPS:** 900 GW by 2030	• Large-scale project in China's most favourable geography for solar PV accounts for half of new capacity deployed to 2030 in IPR Forecast and confirms forecasts	5 Confirmatory
UK	**Transport**	• UK began 2022 above 20% Plugin EV Share and may end it close to 50%[30] • Plugin electric vehicle share was 20.4% in January 2022, up from 13.7% in January 2021. More than half (12.5%) of new plug-in vehicles were battery electric. However, overall auto volumes recovered slightly and are still around 25% below seasonal norms.[30]	• **1.8°C FPS:** 10% ZEV share in 2021	• UK EV sales are substantially higher than IPR Forecast in 2021, suggesting accelerated pathway relative to Forecast	7 <5-year upgrade
Brazil	**Land use and Forestry**	• Amazon deforestation: Highest deforestation levels (in square km) in first quarter of 2022 in six years[31]	• **1.8°C FPS:** End net deforestation by 2030, Deliver afforestation at scale by 2030	• This is in line with IPR forecasts in Brazil which assumes no action against deforestation under the current administration. However, the situation is worth monitoring	4 Monitor developments

Detailed Policy Development Summary

INEVITABLE POLICY RESPONSE

Detailed policy review

Detailed overview of key policy/technology developments by region/country since COP 26*

COP 26 *(multi-regional)*

European Union

United States

China

United Kingdom

France

Germany

Brazil

India

Indonesia

Australia

Japan

Canada

Nigeria

South Africa

Saudi Arabia

South Korea

Russia

*Key developments screened based on methodology described on Slide 6

COP 26 policy developments: many policy announcements were embedded in 2021 policy forecast (1/2)

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Net Zero targets	• New net zero announcements from Australia, India and Nigeria (Australia, Nigeria, and India, net zero by 2050, 2060 and 2070 respectively)[32] • Australia does not have intention to legislate its objective[33]	• **1.8°C FPS:** Australia and India would announce Net Zero forecasts	• Confirmatory of 2021 FPS forecasts	5 Confirmatory
Carbon pricing	• Article 6 rules to create a framework for a global carbon market were approved[23]	• **1.8°C FPS:** all major economies will have carbon pricing schemes covering emissions in power and industry by 2030	• Significant step in establishing framework, addressing how to avoid double counting emissions reductions (which has held up previous discussions) and confirms forecasts	5 Confirmatory
Coal phase outs	• More than 40 countries pledged to phase out coal, including promising to stop building and issuing permits for new coal plants (signatories include Canada, the EU, France, Germany, Indonesia, South Korea and Vietnam but notably the US, China, India and Australia did not sign the pledge) [23]	• **1.8°C FPS:** phaseouts on new unabated coal build from 2020 in first mover countries and by 2030 in Tier 3 countries; coal generation to phase out by 2030 in Tier 1 and by 2045 in Tier 3 countries • **1.5°C RPS:** requires this 10 years or more earlier in most cases	• Confirmatory of 2021 FPS forecasts • First COP agreement to explicitly call for phasing down of unabated coal and phase out of inefficient fossil fuel subsidies	5 Confirmatory
Clean power	• India committed to 50% renewable energy by 2030 • COP announcement was made alongside objective to increase low-carbon capacity to 500 GW by 2030 [34]	• **1.8°C FPS:** India will achieve 100% low carbon electricity by 2060 • **1.5°C RPS:** India will achieve 100% clean power by 2045	• Confirmatory of 2021 FPS forecasts	5 Confirmatory
Transport	• COP26 declaration on accelerating the transition to 100% zero emission cars and vans signed by 24 countries and major OEMs (GM, Ford, Volvo, etc.) to commit to zero-emissions cars and vans by 2040, and by no later than 2035 in leading markets (US, Germany, China, Japan and South Korea did not sign pledge)[35]	• **1.8°C FPS:** First mover countries will seek to ban ICE sales by 2035-40 • **1.5°C RPS:** First movers will ban ICE sales by 2030	• Confirmatory of 2021 FPS forecasts • Signals increasing momentum in government/businesses/industry driving transportation decarbonisation	5 Confirmatory

COP 26 policy developments: many policy announcements were embedded in 2021 policy forecast (2/2)

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Agriculture	• Global Methane Pledge launched, with 110 countries committing to reduce methane emissions by 30% between 2020 and 2030[23] • In April, Global Methane Hub launched with $340M in grants and technical support to implement pledge[36]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock (including methane) from 2025 in Tier 1 countries, 2030 in Tier 2 countries and 2035 in Tier 3 countries	• Methane emissions reductions in line with 1.8C FPS forecast for agriculture	5 Confirmatory
Land use and forestry	• Over 100 countries, including Brazil, pledged to end deforestation by 2030, in line with IPR forecasts of leading countries ending deforestation by 2025, with remaining countries to follow by 2030.[23]	• **1.8°C FPS:** End deforestation by 2030 • **1.5°C RPS:** End deforestation by 2025	• This is a potential upgrade of the 2021 IPR Forecast • This is a stronger statement on ending deforestation than made in past.	6 Monitor developments
Industry	• Clean Energy Ministerial Industrial Deep Decarbonisation Initiative (IDDI): UK, India, Germany and Canada announced intention to buy low-carbon steel and concrete from producers who make them available, interim 2030 targets to be revealed at next IDDI meeting, initiative opens door to more green public procurement initiatives[37] • First Movers Coalition brings together 30 businesses with emissions intensive supply chains (e.g. Amazon, Apple) to design corporate purchase commitments to advance decarbonisation technologies in aluminium, aviation, chemicals, cement, shipping, steel and trucking[38]	• **1.8°C FPS:** All new industrial production companies to be zero carbon by 2040 in Tier 1 countries, and by 2050 in Tier 2 countries	• Confirmatory of 2021 FPS forecasts • Increasing momentum in green procurement commitments by countries and major global businesses with carbon-intensive supply chains	5 Confirmatory

US energy and land policy developments (1/3)

Policy announcements confirm US forecasts, including the $1.2 trillion infrastructure package. Climate provisions in the Build Back Better plan still likely on table and supplemented by increased climate budget.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Multiple including: **Clean Power** **ICE sales bans**	• $2trn Build Back Better fails to pass, but climate provisions in bill, including clean energy tax credits may still be on table[39] • In November, US passed a $1.2 trillion infrastructure bill which includes $108 bn to upgrade the electricity grid, including accommodating new renewable power $7.5 bn in EV infrastructure and $5 bn for zero-emission buses [40] • In March, Biden announced budget bill which includes $45 bn climate funding, a $17 bn increase in funding compared to last year [41]	• **1.8°C FPS:** Deliver 100% clean power by 2040 • **1.5°C RPS:** Deliver 100% clean power by 2035 • **1.8°C FPS:** 100% ZEV sales from 2040 • **1.5°C RPS:** 100% ZEV sales from 2035	• Infrastructure bill provisions and climate funding confirmatory of 2021 FPS forecasts for clean power and transportation decarbonisation • It is still possible for climate-related proposals to pass in Congress this year	5 Confirmatory

US energy and land policy developments (2/3)

Restrictions on renewable input imports and the potential for less agency by the EPA to regulate emissions could impact policy forecasts for clean power. However, recent announcement of $6 billion in aid to ailing nuclear plants could offset potential risk of shift to gas.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Clean Power	• In October, a bill signed banning imports of key solar panel material from Xinjiang (which accounts for ~45% of solar-grade polysilicon) [15] • In March, US announced investigation and potential tariffs on Malaysia, Thailand, Vietnam, Cambodia imports based on allegations that Chinese manufacturers have shifted production to these countries to avoid paying U.S. duties[17]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2050	• Signals a downgrade of the 2021 forecast; without Chinese imports renewable buildout plans come into question given building up domestic manufacturing takes time • Could lead to contraction in US market, rearrangement of trading arrangements	3 <5-year downgrade
	• In February, The Supreme Court decided to hear a case on the authority of the Environmental Protection Agency to limit greenhouse gas emissions from power plants under the Clean Air Act[18]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2035	• Signals a potential downgrade of the 2021 forecast; one possible outcome is a restriction of the EPA's mandates to regulate GHG emissions, meaning a significant reduction in the administration's ability to meet emissions reduction plans without Congress	4 Monitor developments
	• In April, the U.S. announced a $6 billion plan to resuscitate nuclear plants closing early due to declining economics (rather than permits expiring)[42] • To be funded from $1 trillion infrastructure bill (passed in November)[42]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2035	• Confirmatory; extending nuclear generation to useful lifetime could prevent potential shift to gas and offset any delays in renewables ramp up	5 Confirmatory

US energy and land policy developments (3/3)

Tougher regulation on vehicle emissions by EPA and in California, regulation to ban ICE vehicle sales by 2035 to be considered this summer. New support for low carbon manufacturing including hydrogen hubs.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
ICE sales bans	• In February, US EPA announced new tougher new vehicle emissions requirements[43]	• **1.8°C FPS:** 100% ZEV sales from 2040 • **1.5°C RPS:** 100% ZEV sales from 2035	• Confirmatory of 2021 FPS forecasts • US lacks a federal sales ban policy, with states leading the way; Biden has signed executive order focusing on govt. fleet (LDV emissions free by 2027) • This will be significant but is subject to court challenges	5 Confirmatory
	• In April, California introduced proposed measure to ban new gasoline-fueled cars by 2035 following to Governor Newsom's 2020 executive order; regulator (California Air Resources Board) to vote this summer after public comment period.[44]	• **1.8°C FPS:** 100% ZEV sales from 2040 • **1.5°C RPS:** 100% ZEV sales from 2035	• Confirmatory; California and other states forecast to lead the way in phasing out ICE vehicle sales, with rest of states forecast to follow	5 Confirmatory
Industry Decarbonisation	• In February, Biden administration announced new plan for commercialisation and support of low-carbon manufacturing including for green hydrogen hubs, buy-clean procurement, etc.[45]	• **1.8°C FPS:** 100% clean energy by 2060 • **1.5°C RPS:** 100% clean industry by 2050	• Confirmatory of 2021 FPS forecasts • A lot of this funding has already been earmarked in bipartisan infrastructure bill	5 Confirmatory

China energy and land policy developments (1/3)

China's updated energy plan documents, decreased emissions allowances and announced coal mining expansion is in line with forecast expectations.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Multiple (including power, transport, industry)	• On March 22 and 23, China's NDRC, the state planner, and National Energy Administration published overarching plan documents addressing new energy storage, modern energy systems, and hydrogen development [46]	• **1.8°C FPS:** ◊ **Power:** Strong policy signal to deliver 100% clean power by 2050 ◊ **Transport:** End sales of ICE LDVs by 2030-35, end sales of ICE HGVs by 2045 ◊ **Industry:** require all new production processes to be zero emissions by 2050	• Confirmatory of 2021 FPS forecasts • Energy shocks could impact these plans • China has been moving towards coal and this is likely to intensify	5 Confirmatory
Carbon pricing	• In January, China proposed to cut carbon quotas to help meet climate goals. Chinese regulators proposed cutting the amount of available allowances in emissions trading scheme by 1%* in an effort to raise prices.[47]	• **1.8°C FPS:** US$60 by 2030	• Confirmatory of 2021 FPS forecasts • Strengthening of carbon market	5 Confirmatory
Coal phaseouts	• In March, China approved coal mining expansions, NDRC (National Development and Reform Commission) wants to boost domestic production capacity by 300M tons and build 620M ton stockpile[48]	• **1.8°C FPS:** End construction of new unbated coal by 2025; coal generation phaseout by 2045	• This is not incompatible with IPR forecast but IPR will need to continue to monitor	5 Confirmatory

* Below the amount of carbon that market participants are expected to have generated'1

China energy and land policy developments (2/3)

China has published new policy documents on greening initiatives including on coal, is introducing a national power market and is releasing plans for clean energy production, which are aligned to forecasts.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Coal phaseouts	• In March, four Chinese ministries published a key document on further greening of its Belt and Road Initiative (BRI), referring to retrofitting of existing coal plants to make less polluting, more efficient, or to install CCUS technology[21]	• **1.8°C FPS:** End construction of new unbated coal by 2025; coal generation phaseout by 2045	• Positive sign as replacing deployment of coal power with renewables	6 Monitor developments
Clean Power	• In December, China announced plans for national power market by 2030 to boost decarbonisation efforts[49]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2050 • **1.5°C RPS:** Strong policy signal to deliver 100% clean power by 2040	• Confirmatory shift towards market-based national power market which can support integration of renewables into grid by enabling cross-province trade of electricity to support security of supply from intermittent sources • China's current stated target is 60% clean power by 2030 and carbon neutrality by 2060	5 Confirmatory
	• In March, China released its Five-Year Plan for Modern Energy System. China aims to increase the proportion of non-fossil energy consumption to 20% by 2025 and non-fossil power generation to 39% by the same year.[50]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2050 • **1.5°C RPS:** Strong policy signal to deliver 100% clean power by 2040	• Confirms forecasts • The document highlights securing supply and strengthening reserves.	5 Confirmatory

China energy and land policy developments (3/3)

China has announced a plan for neutrality in the iron and steel sectors, in line with IPR forecast expectations. An agricultural plan considers cultivated meat which implies an enhanced focus on agricultural emissions.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Industry Decarbonisation	• In February, China announced plans to achieve carbon neutrality in the iron and steel sector. China is producing a carbon neutral technology roadmap for the iron and steel sector and some Chinese steel companies set a target to achieve carbon neutrality in 2050[51]	• **1.8°C FPS:** 100% clean energy >2060 • **1.5°C RPS:** 100% clean industry by 2055	• To monitor developments; energy shocks could impact plans which could impact forecasts • China has been moving towards coal; to continue to monitor if this is temporarily or likely to have longer term impacts	5 Confirmatory
Agriculture	• In January, China's Five-Year Agricultural Plan, released in January, includes mention of cultivated meat for the first time, implying this area will receive an increase in government funding in future[22]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025	• This is a potential upgrade of the 2021 IPR Forecast • Inclusion of cultivated meat in political messaging and policies indicates that China is moving towards reducing agricultural emissions; but does not specify a timeline or target • Agriculture and energy price shocks will be significant for China, there has been recent focus on reducing food waste under food security lens • China's 2022 economic and social development plans (released subsequently in March) appear to emphasise growth with less focus on emissions	6 Monitor developments

EU energy and land policy developments

The EU is facing increased opposition to the expansion of the ETS and has included natural gas and nuclear as sustainable in the taxonomy, both of which are in line with the forecast expectations

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Carbon pricing	• In March, there was growing opposition in the European Parliament to the proposed expansion of the EU's ETS to the buildings and transport sectors[52]	• **1.8°C FPS:** Prices forecast to reach US$75 by 2030	• Confirmatory of 2021 FPS forecasts • Opposition to expansion of EU ETS is likely to increase as energy prices increase and supply is restricted • IPR forecasts for buildings and transport decarbonisation are not dependent on EU ETS	5 Confirmatory
Clean Power	• In February, European Commission proposed labelling natural gas and nuclear investments as sustainable[53]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2045	• Confirmatory of 2021 FPS forecasts • This could have nearer term impacts for coal use in EU, but the impact on longer term coal generation in EU is unclear	5 Confirmatory

Germany energy and land policy developments

Germany has accelerated their coal phaseout plans but this could be impacted by the energy security crisis. In line with this, they have committed to 80% renewables and the end of ICE by 2030 which confirm forecast expectations.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Coal phaseouts	• In November 2021, Germany announced a coalition agreement to bring forward coal phaseout to 2030 from 2038[19] • This follows an April 2021 Germany court decision stating Germany lacks a plan for emissions reductions after 2031 and ordering enacting of provisions by the end of December 2022[20]	• **1.8°C FPS:** Strong policy signal that coal generation will be made unlawful or unprofitable by 2038-2040	• This indicates a potential upgrade of forecast relative to 1.8C FPS, however energy security crisis caused by war in Ukraine could put phaseouts on hold; to continue to monitor developments	6 Monitor developments
Clean Power	• In November, Germany coalition government announced a commitment to 80% renewable energy by 2030[54] • In April, the government issued a legislative roadmap to achieve this with reliance on Russian energy adding to urgency of plans[55]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2045	• Confirms forecasts	5 Confirmatory
ICE sales bans	• In November, Germany announced intention to end the sale of combustion engine cars before 2035 with goal to have at least 15m EVs on road by 2030[56]	• **1.8°C FPS:** 100% ZEV sales from 2035	• Confirms forecasts but there are EV supply chain issues due to the crisis (e.g. nickel supply) which could impact rollout plans	5 (but could upgrade Germany) Confirmatory

France energy and land policy developments

France's announcement of new nuclear capacity has put them ahead of forecasted progress on clean energy.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Clean Power	• In February the government announced plans for at least six nuclear reactors in coming decades, pivoting from earlier announcements to reduce reliance on nuclear energy, alongside plans for 100 GW of solar and 40 GW of offshore wind by 2050[21]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2035	• This is a potential upgrade of the 2021 IPR Forecast • Prioritisation of nuclear is likely to be accelerated given the war in Ukraine, opening up options for other EU countries • The EU taxonomy's inclusion of nuclear as sustainable under certain conditions will enable private/public investment • The case for renewables is strengthened due to war in Ukraine but there could be a short term increase in coal to supplement impacted supply	6 Monitor developments

UK energy and land policy developments

The UK is reinforcing its commitment to developing clean power, with an increase in nuclear, and has committed to decarbonising agriculture although policy steps in this regard remain to be seen.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Clean Power	• In February, UK announced its renewables auctions for contracts for difference will be held annually instead of every two years to boost rollout of low-carbon power sources[57] • In April, UK releases Energy Security Strategy[58] ◊ Aim for UK to get 25% of electricity from nuclear power, with capacity of 24GW, by 2050 ◊ 50 GW offshore wind by 2030 ◊ Increase solar capacity by up to five times by 2035 ◊ Licensing round for new North Sea oil and gas projects planned to launch in Autumn	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2035	• Confirmatory of 2021 FPS forecasts • Shift in role of nuclear which has become much more important • Offshore wind increase is in line with expectations • Limited role for onshore wind	5 Confirmatory
Low-emissions agriculture	• In January, UK published a target to decarbonise agricultural emissions by a total of up to 6 million tonnes CO_2 equivalent per annum in Carbon Budget 6 (2033-37) and issues policy paper focusing on environmental land management schemes and incentives[59]	• **1.8°C FPS:** Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock from 2025	• Confirmatory of 2021 FPS forecasts • There is a gap between announced targets and current policies; will continue to monitor	5 Confirmatory

Brazil energy and land policy developments

Brazil's extension for coal use and expansion of the emission trading scheme are both in line with forecasts. Brazil has performed below forecast on land use and forestry with high levels of deforestation and increased scope for mining.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Carbon pricing	• In January, Brazilian energy ministry recommends multisectoral emissions trading scheme beyond power sector coverage and phasing out free allowances[60]	• **1.8°C FPS:** US$45 by 2030	• Confirmatory • Expanding the trading system to at least agriculture could have a strong impact, as it has almost the same emissions as the power sector	5 Confirmatory
Coal phase-outs	• In January, Brazil extends coal use to 2040 under new 'just transition' law where the government will buy, at a set cost, energy generated by a group of thermal plants in Santa Catarina[61]	• **1.8°C FPS:** End unabated coal generation by 2045	• Brazil's coal reliance for power is only 3%, but it originally intended to end subsidies in 2027. • This does not necessarily undermine forecasts but will be important to monitor	5 Confirmatory
Land use and forestry	• In March, President Bolsonaro pushes for a bill that would allow for more mining on Indigenous lands [25] ◊ Bill to allow mining on indigenous land ◊ Relaxing regulation on land grabbing ◊ Changing requirements for environmental licensing ◊ Loosening regulation on agrochemicals ◊ Cut-off date for claiming indigenous land	• **1.8°C FPS:** End net deforestation by 2030, deliver afforestation at scale by 2030	• Potential to undermine longer term net deforestation forecast for Brazil • This announcement makes FPS forecasts appear optimistic, and continuing war in Ukraine will push this further	4 Monitor developments

India energy and land policy developments

India has committed to phasing down coal but has not provided detail on timelines or a description of what this means. It has also announced net zero targets and renewable energy targets in line with the forecast.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Net zero targets	• In January, India strengthened climate targets, aiming for net zero by 2070[32] • In November, India announced plans to obtain 50% of its electricity generation from renewable sources by 2030, up from 40% previously[32]	• **1.8°C FPS:** Net Zero emissions by 2070	• Confirmatory of 2021 FPS forecasts • While the 2070 net zero target falls behind most other countries, it is in line with what many climate experts have modelled as the most feasible scenario • India is decades away from its peak in terms of economic growth and energy consumption, and India's energy demand is expected to grow faster than any other country over the next few years	5 Confirmatory
Coal phase-outs	• In November, India ministry affirmed it will be phasing down coal without providing details on timing and scale[62]	• **1.8°C FPS:** Coal to be made unlawful or unprofitable by 2045	• Lacking in detail, and use of phase down versus phase out provides uncertainty on level of commitment	5 Confirmatory

Indonesia energy and land policy developments

Deforestation in Indonesia continues as expected and the country has indicated intentions to phase out coal with international support.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Land use and forestry 	• In March, deforestation in Indonesia, Malaysia, and Papua New Guinea attributed to the development of oil palm plantations has fallen to its lowest level since 2017[63]	1.8°C FPS: • End net deforestation by 2030 • Deliver afforestation at scale by 2030	• Declining deforestation has been partly attributed to the economic contraction • The trend needs to be backed by strong policies, will continue to monitor	5 Confirmatory
Coal phase-out 	• In November, Indonesia signaled it could anticipate coal phase out with financial aid, following South Africa's model (whereby South Africa and donor countries developed a proposal for an $8.5 billion package of grants and concessional finance to accelerate the retire of coal plants and deployment of renewable energy)[64]	• **1.8°C FPS:** Coal to be made unlawful or unprofitable by 2045	• Confirmatory of 2021 FPS forecasts • Indonesia announced a target earlier this year to phase out unabated coal-fired generation by 2056 so a shift to 2040 would be a sizeable acceleration in timelines. • However, the financial need is much larger than the aid package provided to South Africa	5 Confirmatory

Australia energy and land policy developments

Australia's coal phase-out is on track with the largest coal plant announcing a close seven years earlier than planned.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Coal phase-outs 	• In February, Australia's biggest coal plant (Origin) to close in 2025, seven years earlier than planned[65]	• **1.8°C FPS:** End unabated coal generation by 2038-40	• Confirmatory of 2021 FPS forecasts • Provides evidence of declining economics of coal	5 Confirmatory

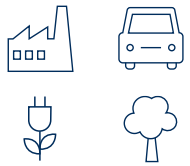
Japan energy and land policy developments

Japan has announced plans to introduce a carbon tax and a coal phaseout over the next two decades which support current forecasts but lack detail.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Carbon pricing	• In January, Environment Minister announced plans to introduce a carbon tax to achieve net zero emissions by 2050[66]	• **1.8°C FPS:** US$60 by 2030	• Supportive of FPS forecasts but lacking detail	5 Confirmatory
Coal phase outs	• In January, Japan Environmental Minister also announced that the country will gradually phase out coal-fired electricity plants over next two decades, without specific date for phase out[67]	• **1.8°C FPS:** Policy signals and market reforms targeting 2025	• Supportive of FPS forecasts but lacking detail	5 Confirmatory

Canada energy and land policy developments

Canada has announced its Emissions Reduction Plan and new investment tax credit for CCUS which supports forecasted policy developments.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Multiple (including green buildings, transport, energy, nature) 	• In February, Canada announces its 2030 Emissions Reduction Plan including: [68] ◊ a sales mandate of 20% new light-duty vehicles sales to be zero-emission by 2026, 60% by 2030 and 100% for 2035 ◊ develop regulation for medium- and heavy-duty vehicles to ensure 100% of sales are zero-emissions by 2040, depending on feasibility ◊ reduce methane emissions from oil and gas by 75% by 2030	• **1.8°C FPS:** ◊ **Clean power**: Policy to deliver 100% clean power by 2035 ◊ **ICE**: 100% ZEV sales from 2040 ◊ **Industry**: 100% new zero carbon production facilities from 2040 ◊ **Land use**: End net deforestation by 2025 ◊ **Land use**: Deliver afforestation at scale by 2025	• Confirmatory of 2021 FPS forecasts • Plan did not include a cap on oil and gas emissions, something that Trudeau promised at COP26. This is likely to be deferred until late 2022 or early 2023. It's unclear exactly how a cap would be implemented. A cap-and-trade system is one of a number of options under consideration.	5 Confirmatory
Clean Power  **Industry Decarbonisation** 	• In April, Canadian budget proposes a new investment tax credit for CCUS (2022-2030)[69] ◊ Credit to cost of purchasing equipment: 60% for DACs projects, 50% for all other CCUS projects, 37.5% in equipment for transportation, storage and use	• **1.8°C FPS:** ◊ **Clean power**: Policy to deliver 100% clean power by 2035 ◊ **Industry**: 100% new zero carbon production facilities from 2040	• Confirmatory of 2021 FPS forecasts; policies that support clean power and industrial decarbonisation	5 Confirmatory

Nigeria energy and land policy developments

Nigeria has announced net zero targets and plans to utilise large reserves of natural gas, in line with expectations.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Net zero targets 	• In November Nigeria announced aim to reach net-zero by 2060 and commits to annual carbon budgets to reach net zero under climate law. However, it stresses role of gas.[32] • The country has an untapped large reserve of gas, the ninth in the world, and is expecting to rely on it until 2040 without diverting from its commitments.[32]	• IPR forecast that Nigeria would set a net zero target but without a firm date for the announcement	• Confirmatory; anticipated in 2021 forecasts; policies that will support achieving net zero • Renewable energy investments have taken longer to gain traction in Africa. There are some African solar projects on the horizon, but the infrastructure for other clean energy sources like hydrogen remain underdeveloped.	5 Confirmatory

South Africa energy and land policy developments

South Africa's coal phaseout support is in line with expectations for a 2038-40 target.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Coal phase-outs 	• In November, South Africa $8.5bn finance package offers a model for ending reliance on coal[70] ◊ France, Germany, the UK, the US and the EU announced an $8.5 billion package of grants and concessional finance over 3-5 years for South Africa to accelerate the retirement of coal plants and the deployment of renewable energy. ◊ The $8.5 billion is an initial commitment and will be mobilised for the first phase of financing, through various mechanisms including grants, concessional loans and investments and risk sharing instruments, aiming to mobilise the private sector.	• **1.8°C FPS:** Strong policy signal that coal generation will be made unlawful or unprofitable by 2038-2040	• Confirmatory; these are policies which support phaseouts • While it provides an example for those countries getting financing from the largest historical emitters, the investment framework still must be agreed and funds will only be made available in line with the budgetary procedures and terms stipulated.	5 Confirmatory

Saudi Arabia energy and land policy developments

Saudi Arabia's policy developments on clean energy targets and announcement of a new strategy are in line with expectations and do not mention an impact on the production or export of oil.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Clean Power	• In January, Saudi Arabia announced it will publish a new energy strategy, looking at developing a nuclear programme and becoming a low-cost hydrogen producer[71] • In March, Saudi Arabia committed to generate 50% of energy from renewable sources by 2030[72]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2050	• Confirmatory but does not provide indication on future oil production	5 Confirmatory

South Korea energy and land policy developments

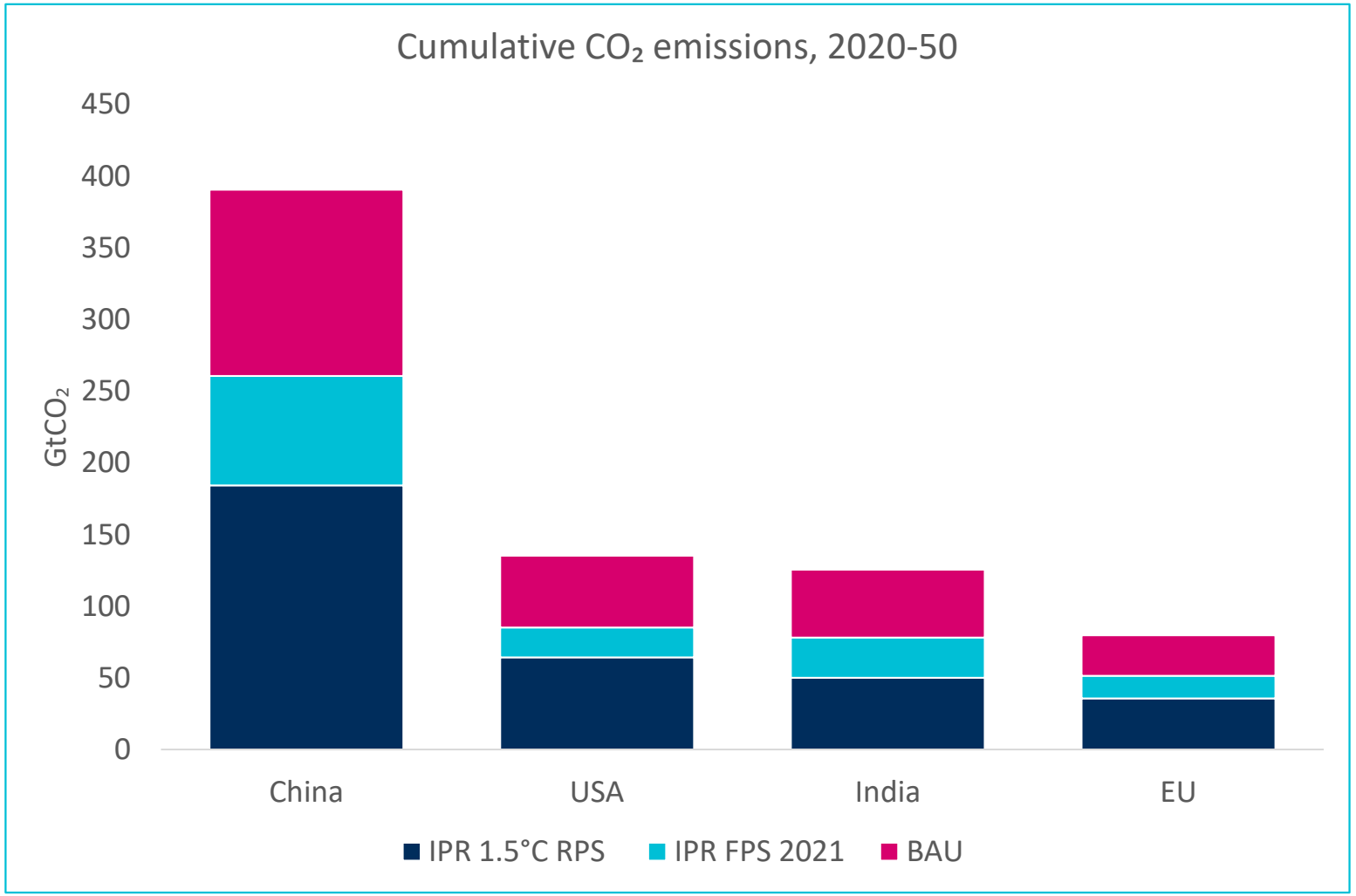
South Korea signals interest in nuclear power which confirms and could even accelerate South Korea's forecast.

Sector	Policy Development	2021 Forecast	Impact on forecast	Impact score
Clean Power	• New president, Yoon Suk-yeol, has stated he wants nuclear to account for 30% of total energy generation, in reverse from former president's intention to move away from nuclear[73]	• **1.8°C FPS:** Strong policy signal to deliver 100% clean power by 2045	• Reinforces or could possibly upgrade outlook for low-carbon power generation	5 Confirmatory

Appendix – Details on IPR 1.8°C Forecast Policy and 1.5°C Required Policies Scenarios

INEVITABLE POLICY RESPONSE

Embedded in the IPR FPS 2021 are substantial emissions reductions, additional reductions to achieve the IPR 1.5°C RPS will be challenging



- The IPR FPS 2021 represents a substantial reduction in emissions relative to a business-as-usual (BAU) scenario
- China's emissions are around 35% lower than under a BAU pathway
- The United States and India's emissions are around 40% lower
- The EU's emissions are around 35% lower
- Smaller additional reductions are needed to achieve the IPR 1.5°C RPS, though these will be more costly and challenging than those delivered under the IPR FPS 2021

Note: BAU based on emissions growth rates from IEA STEPS scenario

Policies with the greatest 2020-2050 Gt reduction between IPR 1.5°C RPS and IPR FPS 2021

Rank	Policy	Country	IPR 1.5°C RPS vs IPR FPS 2021 Gt reduction
1	Coal phase out	China	40.0
2	End deforestation and NBS	Sub-Saharan Africa, South East Asia and Latin America	19.0
3	100% clean industry	China	19.0
4	Coal phase out	India	14.1
5	100% clean industry	India	8.3
6	100% clean industry	MENA	7.2
7	100% clean power	MENA	6.7
8	Fossil vehicle phase out	China	6.3
9	Coal phase out	Indonesia	5.4
10	100% clean industry	South East Asia	5.2

Reduction is also substantial for OECD countries e.g. for the United States accelerated 1.5°C RPS policies deliver:

- **20 $GtCO_2$ reduction beyond FPS across all policies**
- **4.9 $GtCO_2$ reduction beyond FPS for 100% clean industry policy**

Reduction is also substantial for methane and nitrous oxide emissions that result from accelerated 1.5°C RPS policies related to animal protein demand:

- **24 $GtCO_2eq$ reduction beyond FPS across all countries**
- **4.3 $GtCO_2eq$ reduction beyond FPS in India alone**

Note: Emissions reduction are approximate and include come additional sector-specific CO_2 reduction such as energy efficiency

IPR 2021 top ten policy forecasts: Only change is US coal phase shift from 2030 to 2035

Carbon pricing	**1.**	Carbon Border Adjustments Mechanisms (CBAMs) for carbon will become increasingly a policy option. This could lead the United States to announce a national carbon pricing system by 2025 and signal a strong carbon price path to reach a backstop of $65 by 2030.
	2.	The European Union's evolving commitments will deliver substantial carbon prices. By 2030, we expect EU policy to backstop an EU ETS carbon price of $75/tCO2 to ensure long-term action toward decarbonisation in heavy emitting sectors.
Coal	**3.**	In India, rapidly evolving Indian policy and prospects for market reforms and pricing has already ended further investment in new coal.
	4.	China will end construction of new coal fired power production after 2025, driven by new policies to facilitate its 2060 net zero target, geopolitical trends and risk considerations*
	5.	The United States will end all coal-fired power generation by 2035, through a combination of emission performance standards and carbon pricing at the Federal and State levels, combined with market forces.

** Reinforced by China's recent announcement, along with Japan and Korea, to end financing of overseas coal projects*

IPR 2021 top ten policy forecasts: 6-10 remain unchanged since March 2021 Policy Forecast update

Clean power	**6.**	The United States will implement a binding and credible 100% clean power standard for 2040 ending unabated fossil electricity generation.
Zero emission vehicles	**7.**	China, France, Germany, Italy and Korea will end the sale of fossil fuel cars and vans in 2035. Jointly these large markets will accelerate the auto industry transition to electric drive, and precipitate further policy action internationally.
Industry	**8.**	All major industrial economies including the US, Germany, Japan and China will require all new industrial plants, led by steel and cement, to be low-carbon by 2040, through a combination of emissions performance standards and carbon pricing.
Agriculture	**9.**	The US, Canada, Australia and other major agricultural producers will have comprehensive mitigation policy in place by 2025 to reduce emissions from production of crops and livestock.
Land use	**10.**	Major tropical forest countries will end deforestation by 2030, with domestic policy responding to international climate finance and corporate supply chain pressures.

Instructions: how to read the following tables containing IPR policy forecasts

The following section provides an overview of the FPS and RPS forecasts for each country or region.

IPR 1.8°C Forecast Policy Scenario (FPS)

- Models impact of forecasted policies on the real economy.

IPR 1.5°C Required Policy Scenario (RPS)

- Required policies to align to a **1.5°C objective**

How to read the tables

Each table presents the **estimated time by which the forecast will be achieved for different countries or regions** around the world.

In the sample table below for Australia (AU), under the FPS coal will be phased out by 2040, whereas the RPS requires coal to be phased out by 2030.

Phase out of existing unabated coal

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia			RPS		FPS					10%	5%
Brazil				RPS		FPS				7%	4%
Canada		RPS	FPS							20%	10%
China				RPS		FPS				7%	4%
Central and South America				RPS		FPS				7%	4%
Eastern Europe			RPS		FPS					10%	5%
Eurasia						RPS			FPS	4%	3%

The final two columns show the annual reduction in coal necessary to achieve these targets.

To meet a global coal phase out of 2045, immediate policy action is required

Phase out of existing unabated coal

	Timeline								annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia			RPS		FPS					10%	5%
Brazil				RPS		FPS				7%	4%
Canada		RPS	FPS							20%	10%
China				RPS		FPS				7%	4%
Central and South America				RPS		FPS				7%	4%
Eastern Europe			RPS		FPS					10%	5%
Eurasia						RPS			FPS	4%	3%
Gulf States						RPS			FPS	4%	3%
India						RPS			FPS	4%	3%
Indonesia						RPS			FPS	4%	3%
Japan				RPS		FPS				7%	4%
Middle East and North Africa						RPS			FPS	4%	3%
Russia						RPS			FPS	4%	3%
Saudi Arabia						RPS			FPS	4%	3%
South Africa				RPS	FPS					7%	5%
SEAO						RPS			FPS	4%	3%
South Korea				RPS		FPS				7%	4%
Sub Saharan Africa						RPS			FPS	4%	3%
United Kingdom		Both								20%	20%
United States of America			RPS	FPS						10%	7%
Western Europe			RPS		FPS					10%	5%

** reduction in coal generation as a share of 2020 levels*

To meet 100% clean power by 2050, immediate policy action is required

100% clean power

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia					RPS		FPS			5%	3%
Brazil					RPS		FPS			5%	3%
Canada			RPS	FPS						10%	7%
China					RPS		FPS			5%	3%
Central and South America					RPS		FPS			5%	3%
Eastern Europe				RPS		FPS				7%	4%
Eurasia						RPS			FPS	4%	3%
Gulf States						RPS			FPS	4%	3%
India						RPS			FPS	4%	3%
Indonesia						RPS			FPS	4%	3%
Japan				RPS		FPS				7%	4%
Middle East and North Africa						RPS			FPS	4%	3%
Russia						RPS			FPS	4%	3%
Saudi Arabia						RPS			FPS	4%	3%
South Africa				RPS	FPS					7%	5%
SEAO						RPS			FPS	4%	3%
South Korea				RPS		FPS				7%	4%
Sub Saharan Africa						RPS			FPS	4%	3%
United Kingdom				RPS	FPS					7%	5%
United States of America				RPS	FPS					7%	5%
Western Europe				RPS		FPS				7%	4%

** reduction in power CO2 emissions as a share of 2020 levels*

Light duty vehicles: new fossil vehicles must be phased out between 2030 and 2045 under RPS, five years earlier than under IPR FPS 2021 policies

Fossil vehicle phase out (light duty)

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia				RPS	FPS					7%	5%
Brazil					RPS	FPS				5%	4%
Canada			RPS	FPS						10%	7%
China			RPS	FPS						10%	7%
Central and South America				RPS	FPS					7%	5%
Eastern Europe			RPS	FPS						10%	7%
Eurasia					RPS	FPS				5%	4%
Gulf States					RPS	FPS				5%	4%
India				RPS	FPS					7%	5%
Indonesia				RPS	FPS					7%	5%
Japan				RPS	FPS					7%	5%
Middle East and North Africa				RPS	FPS					7%	5%
Russia					RPS	FPS				5%	4%
Saudi Arabia						RPS	FPS			4%	3%
South Africa				RPS	FPS					7%	5%
SEAO				RPS	FPS					7%	5%
South Korea			RPS	FPS						10%	7%
Sub Saharan Africa						RPS	FPS			4%	3%
United Kingdom			Both							10%	10%
United States of America				RPS	FPS					7%	5%
Western Europe			RPS	FPS						10%	7%

** reduction in fossil vehicle sales as a share of 2020 levels*

Heavy duty vehicles: new fossil vehicles must be phased out between 2035 and 2050 under RPS, five years earlier than under IPR FPS 2021 policies

Fossil vehicle phase out (heavy duty)

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia					RPS	FPS				5%	4%
Brazil					RPS	FPS				5%	4%
Canada					RPS	FPS				5%	4%
China				RPS	FPS					7%	5%
Central and South America					RPS	FPS				5%	4%
Eastern Europe				RPS	FPS					7%	5%
Eurasia						RPS	FPS			4%	3%
Gulf States						RPS	FPS			4%	3%
India					RPS	FPS				5%	4%
Indonesia					RPS	FPS				5%	4%
Japan				RPS	FPS					7%	5%
Middle East and North Africa					RPS	FPS				5%	4%
Russia						RPS	FPS			4%	3%
Saudi Arabia							RPS	FPS		3%	3%
South Africa					RPS	FPS				5%	4%
SEAO					RPS	FPS				5%	4%
South Korea				RPS	FPS					7%	5%
Sub Saharan Africa							RPS	FPS		3%	3%
United Kingdom				Both						7%	7%
United States of America					RPS	FPS				5%	4%
Western Europe				RPS	FPS					7%	5%

** reduction in fossil vehicle sales as a share of 2020 levels*

Industry: the sector has a 30-year transition opportunity to net zero

100% clean industry

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	>2060	RPS	FPS
Australia							RPS		FPS	3%	2%
Brazil								RPS	FPS	3%	2%
Canada							RPS		FPS	3%	2%
China								RPS	FPS	3%	2%
Central and South America								RPS	FPS	3%	2%
Eastern Europe							RPS		FPS	3%	2%
Eurasia								RPS	FPS	3%	2%
Gulf States								RPS	FPS	3%	2%
India								RPS	FPS	3%	2%
Indonesia								RPS	FPS	3%	2%
Japan							RPS		FPS	3%	2%
Middle East and North Africa								RPS	FPS	3%	2%
Russia								RPS	FPS	3%	2%
Saudi Arabia								RPS	FPS	3%	2%
South Africa							RPS		FPS	3%	2%
SEAO								RPS	FPS	3%	2%
South Korea							RPS		FPS	3%	2%
Sub Saharan Africa								RPS	FPS	3%	2%
United Kingdom							RPS		FPS	3%	2%
United States of America							RPS		FPS	3%	2%
Western Europe							RPS		FPS	3%	2%

** reduction in industry CO2 emissions as a share of 2020 levels*

Buildings: new fossil heating systems must be phased out globally by 2040 under RPS, and by 2030 in regions with large heating needs

New fossil heating system phase out

	Timeline									annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
Australia			RPS		FPS					10%	7%
Brazil					RPS		FPS			5%	3%
Canada			RPS		FPS					10%	7%
China					RPS		FPS			5%	4%
Central and South America				RPS		FPS				7%	5%
Eastern Europe			RPS		FPS					10%	7%
Eurasia					RPS		FPS			5%	3%
Gulf States					RPS		FPS			5%	3%
India					RPS		FPS			5%	3%
Indonesia					RPS		FPS			5%	3%
Japan				RPS		FPS				7%	5%
Middle East and North Africa					RPS		FPS			5%	3%
Russia					RPS		FPS			5%	3%
Saudi Arabia					RPS		FPS			5%	3%
South Africa			RPS		FPS					10%	7%
SEAO					RPS		FPS			5%	3%
South Korea				RPS		FPS				7%	5%
Sub Saharan Africa					RPS		FPS			5%	3%
United Kingdom			RPS		FPS					10%	7%
United States of America				RPS		FPS				7%	5%
Western Europe			RPS		FPS					10%	7%

** reduction in fossil heating system sales as a share of 2020 levels*

Achieving 1.5°C RPS animal meat consumption reductions requires a shift in policy acceleration of five years compared to the IPR FPS 2021

	2020	2025	2030	2035	2040	Reduction in per capita meat consumption* 2020-2050 (%) IPR FPS 2021	IPR 1.5C RPS
Australia		RPS	FPS			42	51
Brazil		RPS	FPS			38	48
Canada		RPS	FPS			43	52
China				FPSRPS		35	45
Central and South America		RPS	FPS			34	45
Eastern Europe		RPS	FPS			40	50
Eurasia			RPS	FPS		30	42
Gulf States			RPS	FPS		25	37
India			RPS	FPS		0	14
Indonesia			RPS	FPS		18	31
Japan		RPS	FPS			40	50
Middle East and North Africa			RPS	FPS		28	39
Russia		RPS	FPS			36	46
Saudi Arabia			RPS	FPS		6	22
South Africa			RPS	FPS		-13	6
SEAO			RPS	FPS		20	33
South Korea		RPS	FPS			40	50
Sub Saharan Africa					FPSRPS	-13	6
United Kingdom		RPS	FPS			41	50
United States of America		RPS	FPS			42	51
Western Europe	RPS	FPS				40	50

*kcal per person

Large drop in SSA happens post 2035

Ending deforestation by 2025 in 1.5°C RPS and 2030 in IPR FPS 2021 will require immediate policy action

Deforestation of natural forest halted through command and control policy

	End of deforestation			Change in forest cover 2020-2050 (m ha)	
	2020	2025	2030	IPR FPS 2021	IPR 1.5C RPS
Australia		FPSRPS		3	3
Brazil		RPS	FPS	12	16
Canada	FPSRPS			1	1
China		RPS	FPS	92	92
Central and South America		RPS	FPS	10	14
Eastern Europe		FPSRPS		4	4
Eurasia		RPS	FPS	1	2
Gulf States	FPSRPS			0	0
India		RPS	FPS	13	13
Indonesia		RPS	FPS	2	6
Japan	FPSRPS			0	0
Middle East and North Africa		RPS	FPS	-1	1
Russia		RPS	FPS	1	2
Saudi Arabia	FPSRPS			0	0
South Africa		RPS	FPS	0	1
SEAO		RPS	FPS	3	11
South Korea	FPSRPS			0	0
Sub Saharan Africa		RPS	FPS	0	15
United Kingdom	FPSRPS			1	1
United States of America		FPSRPS		17	17
Western Europe		RPS	FPS	11	12

Under IPR scenarios, carbon pricing and NDC commitments could combine to stop net deforestation by 2030

Countries/region like CAN, GCC, Japan, SA, SK, UK have virtually zero net deforestation

Some countries achieve net zero CO_2 emissions on a territorial basis, while others require international carbon offsets to meet commitments

Contribution from each sector to total % change in CO2 emissions, 2020-50 and net zero year (territorial basis)

Group	Region	Power	Transport	Buildings	Industry	Land	Total	Net zero year
OECD	United States	-39%	-31%	-10%	-10%	-7%	**-100%**	2050
	EU	-30%	-27%	-14%	-14%	-10%	**-100%**	2050
	UK	-36%	-21%	-11%	-13%	-12%	**-100%**	2050
	Japan	-38%	-18%	-9%	-18%	-2%	**-89%**	not achieved
	Korea	-40%	-18%	-7%	-17%	-1%	**-87%**	not achieved
	Canada	-10%	-22%	-11%	-10%	-26%	**-89%**	2069
	Australia	-38%	-21%	-3%	-9%	-20%	**-94%**	2058
Non-OECD	China	-41%	-7%	-3%	-24%	-11%	**-91%**	2059
	India	-34%	-7%	-1%	-7%	-14%	**-66%**	2061
	Brazil	-3%	-10%	-1%	-5%	-81%	**-101%**	2050
	Russia	-24%	-10%	-5%	-9%	-7%	**-64%**	2087
	Indonesia	-19%	-14%	-2%	12%	-33%	**-57%**	2081
	South Africa	-42%	-11%	-5%	-9%	-8%	**-90%**	not achieved
	South East Asia	-21%	-15%	-1%	2%	-22%	**-60%**	not achieved
	MENA	-20%	-22%	-6%	8%	-4%	**-47%**	not achieved
	Central and South America	-16%	-19%	-4%	1%	-43%	**-83%**	2078
	Eurasia	-30%	-10%	-8%	-1%	-13%	**-69%**	2068
	Gulf States (GCC)	-26%	-21%	0%	1%	0%	**-50%**	not achieved
	South Asia	-18%	-4%	-3%	14%	-20%	**-29%**	2078
	Sub-saharan Africa	-3%	-3%	0%	8%	-59%	**-58%**	not achieved

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