



Quarterly
Forecast Tracker
Global progress against
IPR policy scenarios

Quarterly Forecast Tracker

Update of global energy/land policy and
technology developments




Q4 2022

January 25, 2023



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
<div></div> <div>IPR 1.8°C Forecast Policy Scenario (FPS)<ul style="list-style-type: none">Models impact of forecasted policies on the real economyGlobal emissions fall by 80% by 2050, aligned with warming below 2C (1.8°C)</div>	<div>IPR 1.8°C FPS Policy Details</div> <div>IPR 1.8°C FPS Energy and Land Use System Results Summary</div> <div>See Appendix for summary of key FPS forecasts</div>	<div>IPR FPS 2021 Value Drivers</div>
<div></div> <div>IPR 1.5°C Required Policy Scenario (RPS)<ul style="list-style-type: none">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</div>	<div>IPR 1.5°C RPS Energy and Land Use System Results including Policy Details</div> <div>See Appendix for summary of key RPS requirements</div>	<div>IPR RPS 2021 Value Drivers</div>
<div></div> <div>IPR Forecast Policy Scenario + Nature (FPS + Nature)<ul style="list-style-type: none">First integrated climate and nature scenario for use by investors</div>	<div>IPR FPS + Nature detailed results</div>	<div>IPR FPS + Nature Value Drivers</div>

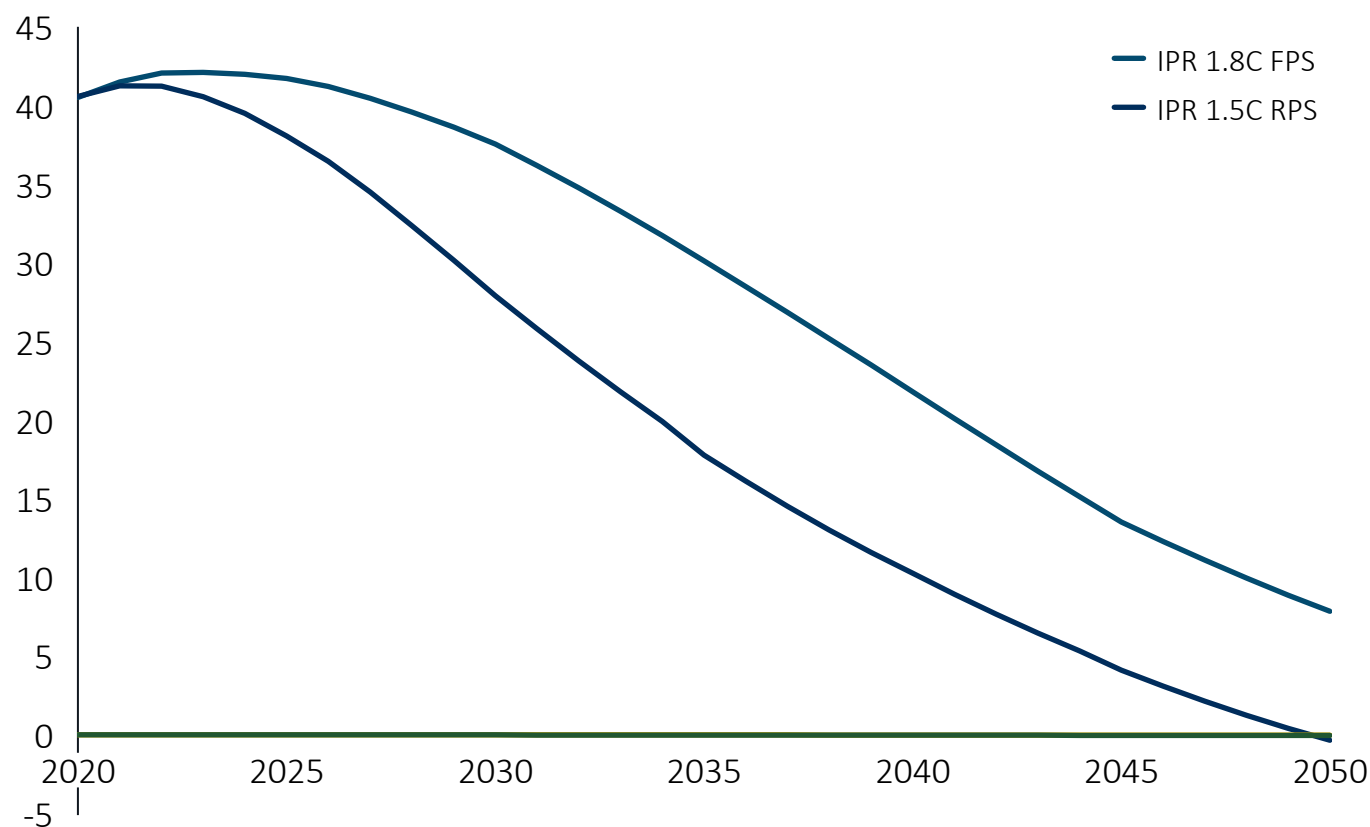
IPR has published a set of publicly available outputs from the 1.8°C FPS and 1.5°C RPS that offer significant granularity at the sector/country level, allowing investors to assess their own climate risk across 4,000+ variables

Disclaimer: This is not intended to constitute policy advice or any specific advice. This is a summary of policy developments drawn from government announcements and documents and how they align to the IPR forecasts.

The IPR FPS (2021) results in total CO₂ emissions (land and energy) equating to 1.8°C. The IPR 1.5°C RPS requires emissions below zero by 2050

Inevitable Policy Response 1.8°C FPS and 1.5°C RPS scenarios

Billion metric tons CO₂-equivalent (MtCO₂e)



- IPR's **Forecast Policy Scenario (FPS)** models the impact of forecasted policies on the real economy, where global emissions fall by 80% by 2050, aligned with warming below 2°C (1.8°C)
- **IPR 1.8°C FPS (2021)** sees emissions rising in the short term through 2025/6 before they start declining. **IPR 1.5°C RPS (2021)** declines slightly by 2025.
- IPR forecasts policy action **by 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

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Summary: Q4 climate and technology developments show an acceleration beyond the IPR 2021 FPS (1.8C) emerging in key regions and sectors



Following the last QFT, published pre COP27, there have been numerous significant announcements we track in this update (57 policy and 32 energy technology and land announcements relevant to the IPR 1.8 FPS)



A significant number of policies are scored acceleration (17):

- The **EU, US, Canada and Australia** show evidence of **acceleration in policy ambition across clean power, industry, transport and buildings** and policies tackling **methane** from oil & gas operations and agricultural sources are beginning to emerge
- In non-OECD countries, **Just Energy Transition Partnerships** in **South Africa, Indonesia** and **Vietnam** could **accelerate coal generation phaseout timelines** if sufficient private capital can be deployed
- **Brazil** has recommitted to forestry protection and a COP 27 initiative aims to translate the Glasgow Pledge into action. These along with complementary policies from the EU (e.g., targeting forest product imports) and financial flows into nature-based solutions raise prospects for **ending net deforestation by 2030**, although firmer policies and commitments are still required



Of the **32 technology announcements**, several hydrogen announcements in particular suggest innovation at a greater pace than previously anticipated

This QFT is accompanied by a new key paper written by Kaya, “[Race to the top on clean energy – the US and EU response to China’s dominance](#)” that further explores this dynamic



When combined with the significance of the Inflation Reduction Act along with the increased imperative of energy security following the Ukraine war, both of which Kaya has written on extensively¹, this points towards an acceleration in clean energy deployment (e.g. **renewables and technologies such as heat pumps**) in the **medium term in Europe and China** beyond our IPR forecast assumptions last updated in the October 2021 FPS



We continue to track the increasing importance of **Just Transition concepts** in international climate policy making. An accompanying [assessment](#) by LSE finds JT elements are taking on increased prominence in climate policy formulation and stronger than previously seen

1. <https://www.unpri.org/inevitable-policy-response/the-us-discovers-its-climate-policy-a-holistic-assessment-and-implications/10575.article>,
<https://www.unpri.org/inevitable-policy-response/ukraine-war-the-new-geo-politics-of-energy-and-implications-for-climate-policy/9766.article>



Key Q4 policy developments

New policies in the fourth quarter signal an acceleration in ambition relative to the FPS compared to earlier QFTs



COP27 saw important agreement on **loss and damage funds**, **increased NDC ambition** (Mexico, Vietnam and Turkey) and coal phase **out plans**, and affirmation from countries on the importance of 1.5°C. However, language on “low-emissions” technologies received criticism on providing an opening for fossil fuels and carbon removals over clean energy

Just Energy Transition Partnership details were announced for South Africa and Indonesia followed by Vietnam in December

A partnership was launched to **drive action on the COP26 Glasgow forestry pledge**, however, many countries are yet to sign

UN ICAO set non-binding **2050 net zero target for aviation**, notably signaling a shift away from offsets and towards direct mitigation measures from planes and fuels



Negotiations on EU ETS and CBAM as well as ICE bans have concluded, supportive of FPS 1.8C forecasts. Agreements to fast-track renewables projects and include shipping in the EU ETS, signal an acceleration in renewables deployment and shipping decarbonization relative to FPS 2021

As this report was going to publication, European Commission President Ursula von der Leyen proposed a "Net Zero Industry Act" which aims to make Europe the home of clean technology and industrial innovation on the road to net-zero CO2 emissions by 2050



China reaffirmed climate goals despite economic headwinds, announcing plans for **performance standards to achieve carbon neutrality** objectives, and drafting a **national strategy for reducing methane emissions**, however, China also **pushed back its target for peaking building sector emissions** from 2025 to 2030



The U.S. floated a **carbon border adjustment tariff on steel and aluminum via cooperative climate clubs** alongside approving a programme scaling **voluntary carbon markets amongst rural farmers**. Proposals to target federal emissions (e.g. buildings and supply chain) were announced as well as plans for **further regulation of F-gases and oil & gas methane**



Key Q4 technology/sector developments

Multiple announcements support or in some instances suggest an acceleration in innovation, deployment and cost reduction (e.g., for renewables, hydrogen, battery and storage technologies)



Significant ramp up in renewables observed worldwide supportive of 1.8 FPS outlook and in some regions such as Europe evidence of acceleration in the medium term is emerging



Increased investment in infrastructure and storage capacity to manage increasingly decarbonized grid and EV penetration



Heat pump deployment outpacing nearer term outlook in Germany



Continued innovation in **hydrogen** technologies, including electrolyzers, new strategies and announcement for large projects signal an acceleration relative to 1.8FPS



Alternative proteins experienced significant growth and the US FDA approved a study on safety of cultivated chicken



Several announcements on capital raised flow **towards alternative funds focused on forestry and agriculture including carbon**

IPR Quarterly Forecast Tracker Methodology



IPR categorizes policy announcements according to the following:

- **Legislated** covers any enforceable or funded policy from policymakers or regulators¹
- **Announced** but not yet legislated



Legislated or announced policies can:

- **Be supportive** of our policy forecasts, but where further strengthening of policies may be required
- **Be confirmatory**, or align closely with 1.8°C FPS forecast thereby moving the forecast into current policies
- Signal an **acceleration** or **deceleration** in policy forecast



In addition to legislated policy, IPR policy forecasts rest on a view that selected announced policies that are supportive or confirmatory will either become directly legislated or impact the real-world economy.

On top of this the IPR 1.8C FPS forecasts policies expected but not yet announced.

The IPR FPS Policy Forecast therefore goes beyond NDCs, and current policy commitments and ambitions.

1. This includes significant announcements from governments such as China



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** in policy forecast
- 9-10 indicates **increasing evidence for acceleration** in policy forecast

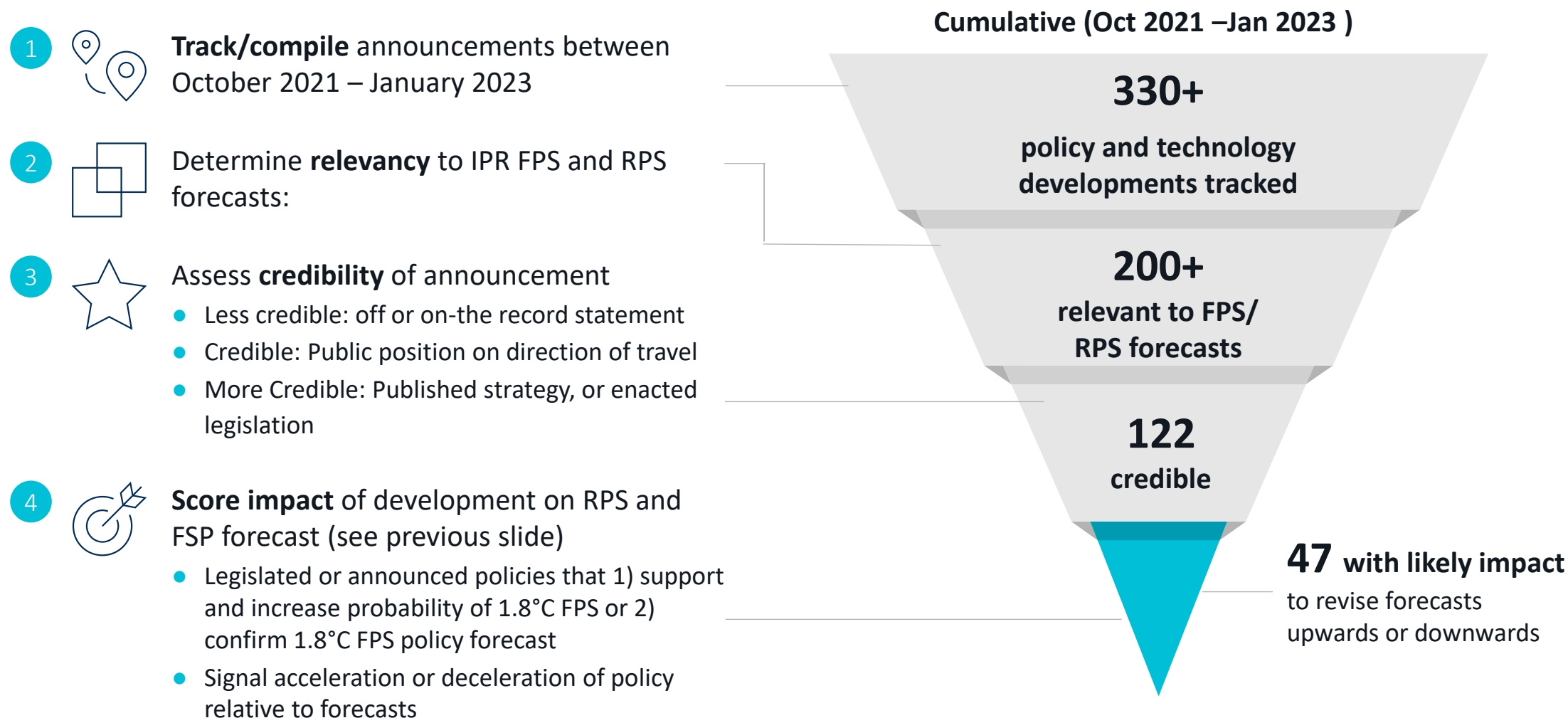
A similar 10-point scale is applied to energy/land technology developments

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	Legislated or announced policies that 1) support and increase probability of 1.8°C FPS or 2) confirm FPS policy forecast	No change to 1.8C FPS 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

Summary - IPR QFT assessment from Oct 2021 to Jan 2023 - multi-step approach to assessing key policy & technology developments impacting 1.8°C FPS & 1.5°C RPS




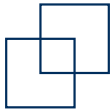


Q1-Q4 2022 climate announcements have reinforced the 1.8°C Forecast Policy Scenario pathway and in some instances shown evidence of acceleration

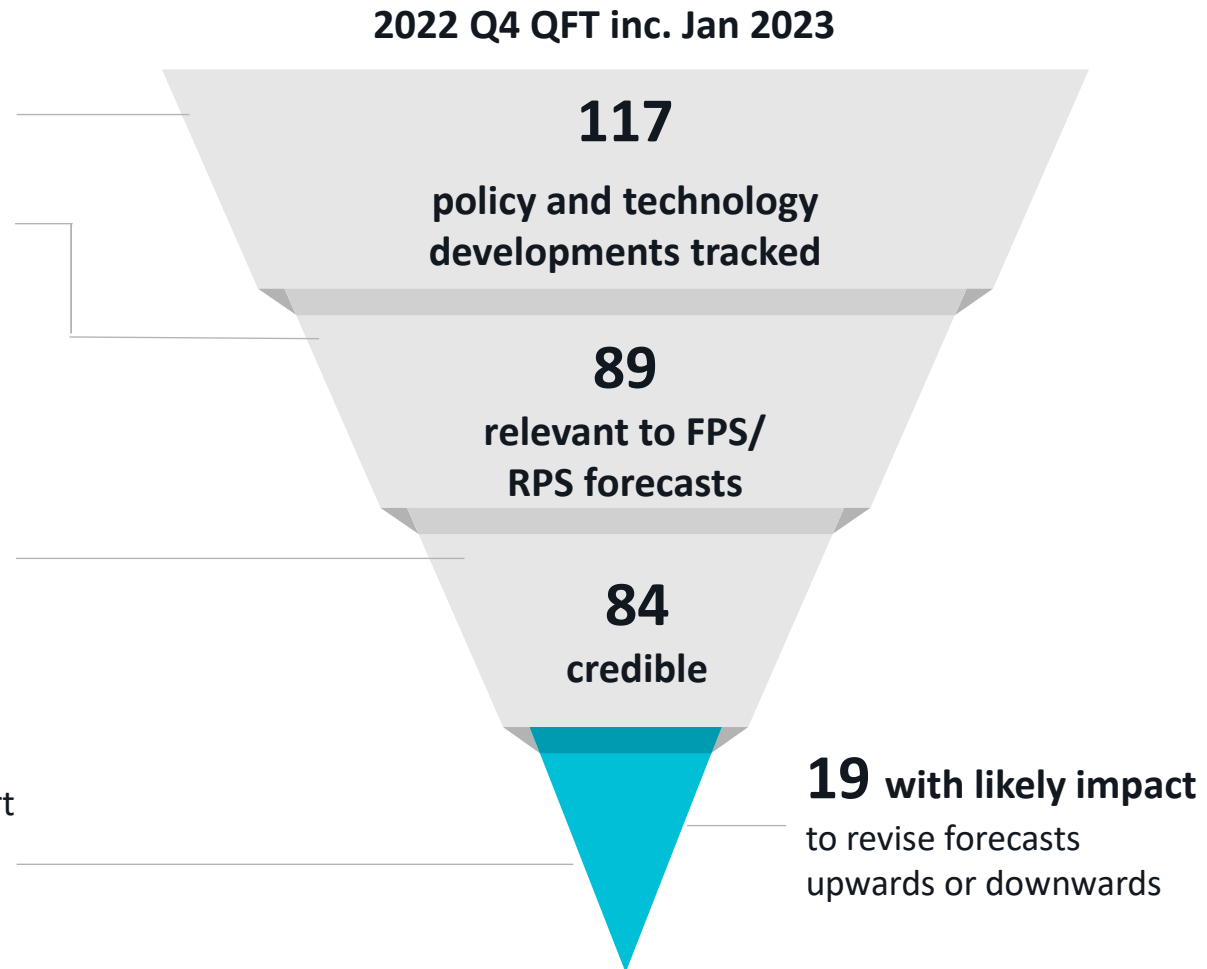
	Greater likelihood of 2.3°C IEA STEPS* scenario					1.8°C IPR FPS				Greater likelihood of 1.5°C IPR RPS scenario		
	Significant deceleration	Large deceleration	Moderate deceleration	Small deceleration	Marginal deceleration	No change to policy forecast	Marginal acceleration	Small acceleration	Moderate acceleration	Large acceleration	Significant acceleration	
Score	0	1	2	3	4	5	6	7	8	9	10	Total
Global					3	21	3	Catalytic global impact from US IRA [see IPR/Kaya Report]				27
US				1	3	32	3					39
China					1	12	4					17
EU						25	3					28
Germany						7	5					12
France						2	3					5
UK					1	13		1				15
Brazil					4	7	1					12
India						7						7
Indonesia						3	1					4
Canada						3	1		1			5
Nigeria						5	1					6
South Africa						3						3
Saudi Arabia						2						2
South Korea						2						2
Japan						4	2					6
Australia						8	4					12
Mexico						2						2
Vietnam						1	1					2
Turkey						0	1					1
COP announcements					1	3						4
Total				1	13	162	33	1	1			211

i. This assessment covers the period from COP 26 (in 2021) to January 2023.

ii. 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.

IPR QFT in Q4 2022

- 1  **Track/compile** announcements between end of October 2022 – January 2023
- 2  Determine **relevancy** to IPR FPS and RPS 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 previous slide)
 - Legislated or announced policies that 1) support and increase probability of 1.8°C FPS or 2) confirm 1.8°C FPS policy forecast
 - Signal acceleration or deceleration of policy relative to forecasts



Q4 2022 climate announcements have reinforced the 1.8°C Forecast Policy Scenario pathway and in some instances shown evidence of acceleration

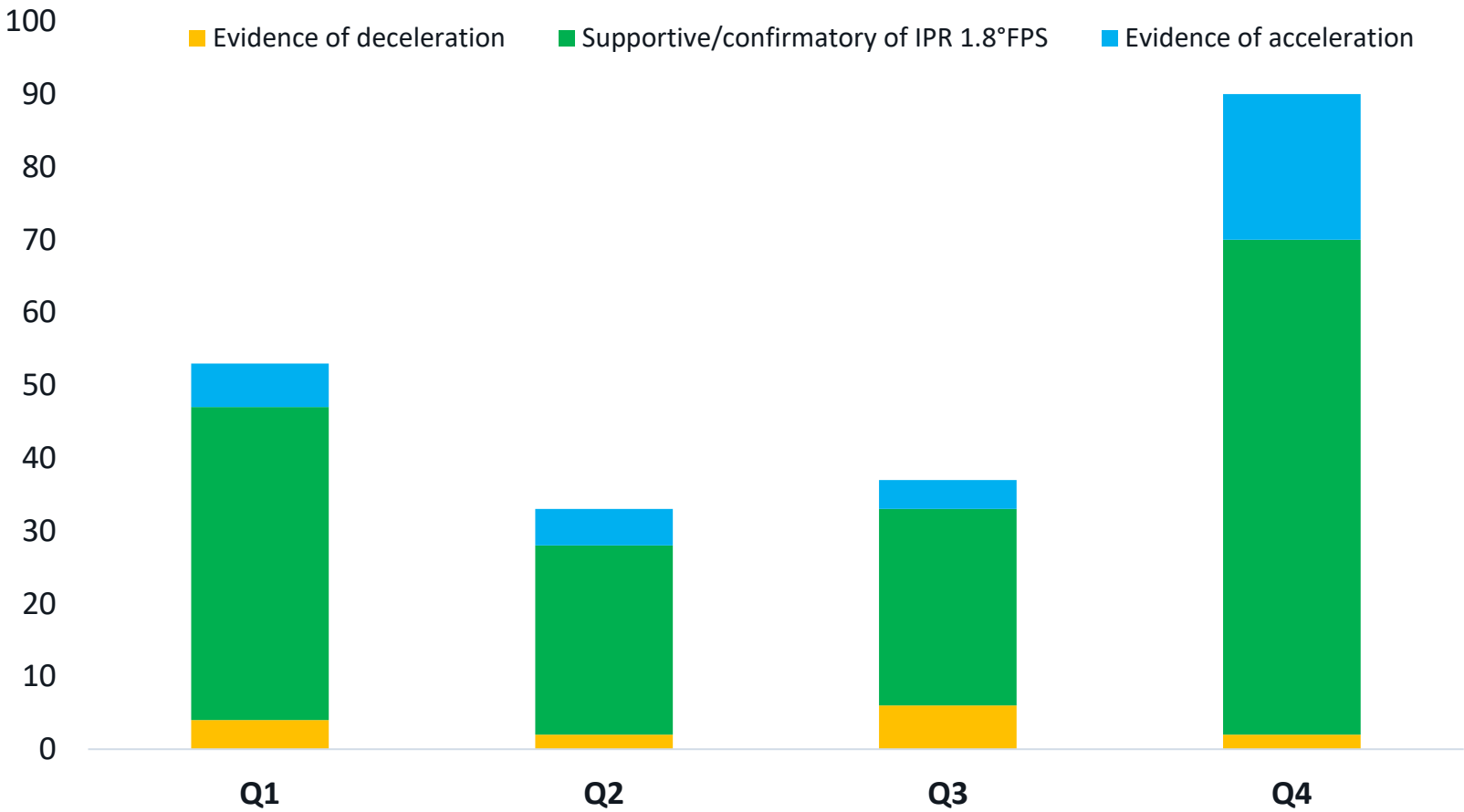
	Greater likelihood of 2.3°C IEA STEPS* scenario					1.8°C IPR FPS		Greater likelihood of 1.5°C IPR RPS scenario				
	Significant deceleration	Large deceleration	Moderate deceleration	Small deceleration	Marginal deceleration	No change to policy forecast	Marginal acceleration	Small acceleration	Moderate acceleration	Large acceleration	Significant acceleration	
Score	0	1	2	3	4	5	6	7	8	9	10	Total
Global						7		Catalytic global impact from US IRA [see IPR/Kaya Report]				7
US						13	3					16
China					1	4						5
EU						12	3					15
Germany						3	2					5
France						2	2					4
UK						6						6
Brazil						2						2
India						2						2
Indonesia						0	1					1
Canada						1	1					2
Nigeria						1	1					2
South Africa						2						2
Saudi Arabia						1						1
South Korea						1						1
Japan						2	1					3
Australia						4	4					8
Mexico						1						1
Vietnam						1	1					2
Turkey						0	1					1
COP announcements					1	3						4
Total					2	68	20					89

i. This assessment covers the period from COP 27 to December 2022

ii. 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

A trend of acceleration in policy announcements relevant to the 1.8°C FPS forecasts is emerging

QFT 2022 announcements by quarter



The fourth quarter of 2022 saw an increase in both the number of policy and technology announcements, and their level of ambition compared to previous QFTs this year

Policy gap analysis update – developments supporting IPR 1.8°C FPS across G20+ economies¹

- In November 2022, IPR published an assessment of policy progress to date against IPR scenarios
- An update of the gap analysis is provided below, with key upgrades in EU (clean power), Australia (coal phaseouts and clean power), Indonesia and Vietnam (coal phaseouts); new announcements and policies in Brazil raise prospects for ending net deforestation in 2030, all in alignment with 1.8C FPS

■ FPS policy gap ■ Acceleration
■ Confirmatory ■ Supportive ■ Deceleration

	Carbon markets	Coal phase-outs	Clean power	Clean LDVs	Clean HDVs	Zero-carbon heating	Clean industry	Agriculture	Forestry
China	Announced	FPS policy gap	Announced	Legislated	Legislated	Announced	Announced	Announced	Announced
United States	FPS policy gap	FPS policy gap	Legislated	Legislated	Announced	Announced	Announced	Announced	Announced
European Union	Legislated	Announced	Legislated	Legislated	Legislated	Legislated	Announced	Announced	Announced
India	Announced	Announced	Legislated	Legislated	Announced	n/a	Announced	Announced	Announced
Russia	FPS policy gap	FPS policy gap	FPS policy gap	Announced	FPS policy gap	FPS policy gap	FPS policy gap	FPS policy gap	Pledged
Japan	Announced	Announced	Announced	Legislated	Announced	FPS policy gap	Announced	Announced	Pledged
Canada	Legislated	Legislated	Legislated	Legislated	Announced	Announced	Legislated	Announced	Announced
South Korea	Legislated	Announced	Announced	Announced	Announced	FPS policy gap	FPS policy gap	FPS policy gap	Legislated
Indonesia	Announced	Announced	FPS policy gap	Announced	FPS policy gap	n/a	FPS policy gap	Pledged	Pledged
Saudi Arabia	FPS policy gap	n/a	Announced	Announced	FPS policy gap	n/a	FPS policy gap	n/a	n/a
Brazil	Announced	FPS policy gap	Legislated	Announced	FPS policy gap	n/a	FPS policy gap	Pledged	Announced
Mexico	Announced	FPS policy gap	FPS policy gap	Announced	FPS policy gap	n/a	FPS policy gap	Announced	Announced
Australia	Announced	Announced	Announced	Announced	Announced	Announced	Announced	Legislated	Legislated
South Africa	Legislated	Announced	Announced	FPS policy gap	FPS policy gap	FPS policy gap	FPS policy gap	FPS policy gap	FPS policy gap
Turkey	FPS policy gap	FPS policy gap	Announced	FPS policy gap	FPS policy gap	FPS policy gap	FPS policy gap	Announced	Announced
United Kingdom	Legislated	Legislated	Announced	Announced	Announced	Announced	Announced	Announced	Announced
Vietnam	Announced	Announced	Legislated	FPS policy gap	FPS policy gap	n/a	FPS policy gap	Announced	Announced
Argentina	Legislated	FPS policy gap	FPS policy gap	Announced	FPS policy gap	FPS policy gap	FPS policy gap	Pledged	Announced
Nigeria	Announced	Announced	Announced	FPS policy gap	FPS policy gap	n/a	FPS policy gap	Pledged	Announced

1. Based on major announcements and developments tracked in IPR 2021 Policy Forecast Detailed resource (March 2021) and 2022 QFTs: <https://www.unpri.org/inevitable-policy-response/the-inevitable-policy-response-2022-quarterly-forecast-trackers/9910.article>
 Notes: Countries/regions ranked by current emissions (EDGAR, IEA). n/a indicates sectoral policy forecast not relevant to regional forecast (e.g. for zero-carbon heating, space heating less relevant in certain jurisdictions). See slides 21-28 for a detailed sector-by-sector assessment. While this table focuses on policy developments, IPR scenarios also account for technology and economic drivers of low-carbon technology uptake and behavior change.

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COP27 policy announcements/developments (1/2)

COP27 concluded with an agreement for a new loss and damage fund to provide financial support to developing countries impacted by climate related disasters, increased NDC ambition/coal phase out plans and affirmation from countries of importance of 1.5C and deep reductions required to achieve this, however, language included on “low-emissions” technologies alongside renewables as future energy sources has been criticized for allowing for loopholes for fossil fuels (e.g. natural gas).


Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
COP27 	 Adaptation	Agreement on loss and damage fund to provide financial support to developing countries to rebuild social and physical infrastructure destroyed by climate related disasters. It has not yet been agreed how the financing will be provided, or where it will come from.	1.8°C FPS: • n/a	Announced, tailwinds. Significant development addressing disaster relief while maintaining focus on mitigation. Details to emerge.	5 Announced; supportive
	 Net zero targets	Final agreement recognizes need for deep, rapid sustained reductions in GHGs to limit global warming to 1.5C above pre-industrial levels but language on “low-emissions” technologies alongside renewables leaves potential opening for fossil fuels. <ul style="list-style-type: none"> At G20 meeting, countries also pledged to strive to limit warming to 1.5°C after earlier attempts this year to renege on this target. This follows IPCC and UNEP reports earlier this year that raised questions on the feasibility of 1.5°C without significant overshoot based on existing (pre-COP27) NDC pledges. The new COP27 pledge includes commitments to increase the pace of unabated coal phase out¹ and to phase out subsidies for inefficient fossil fuels. 	• IPR’s FPS 2021 forecast shows rapid policy acceleration is likely by the 2025 Paris Ratchet, which could result in warming being held to well below 2C.	Announced, headwinds. IEA estimates that if fully achieved, new COP27 commitments could limit global temperature rise to 1.7°C. These results represent a 0.1C improvement against the 1.8C estimated outcome from COP26. However, the final COP27 text included a commitment to limit temperature rise to 1.5C in the science section rather than the mitigation section, which provides a weak procedural basis for future action.	5 Announced; supportive
		India lays out plan for long-term decarbonization to meet its Net Zero by 2070 pledge. Included are rapid expansion plans for renewables, a greater role for nuclear energy, a ‘rationale’ use of fossil fuel resources and the closing of inefficient coal power plants ¹ . Vietnam, Turkey and Mexico announced more ambitious GHG reduction targets for 2030.²	• Various	Announced and supportive. As flagged in previous QFT, India is making strides to advance emissions reductions, following pledges made at COP26. IPR FPS forecasts increase in NDC ambition alongside supportive policies.	5 Announced; supportive

1. See slide 36 for more details on India developments.

2. See sides 38, 42 and 47 for more details on Mexico, Turkey and Vietnam announcements/developments.

COP27 policy announcements/developments (2/2)

Just Energy Transition Partnership details announced for South Africa (announced at COP26) and Indonesia (US\$10B, announced at G20 summit) followed by Vietnam in December. A partnership was launched to drive action on COP26 Glasgow forestry pledge, however, many countries are yet to sign.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
COP27 	 Coal phase outs	South Africa, Indonesia and Vietnam announced plans for phasing out of coal. South Africa and Indonesia plans include international climate financing with a plan from Vietnam announced in December. ¹ South Africa released detailed investment plan alongside donor government commitment (US\$85.B), \$10B in finance from U.S., Japan, and EU countries announced towards Indonesia, and Vietnam plans subsequently announced in December.	1.8°C FPS: <ul style="list-style-type: none"> Phaseout of existing unabated coal by 2040 for South Africa Phaseout of existing unabated coal by 2060 for Vietnam and Indonesia 	Announced and supportive. Significant development that could accelerate coal generation phaseout timelines in relevant countries.	6+ Announced; signals an acceleration relative to FPS forecast
	 Forestry	Partnership launched to drive action on Glasgow forestry pledge but many countries have yet to sign. <ul style="list-style-type: none"> Last year 145 nations representing 90% of the world's forests promised to strengthen their efforts to conserve forests. At COP27 as the pledge firmed up into active partnership, most signatories have yet to sign (notably absent were Russia, Brazil, China, DRC and Peru). Brazil did announce objective to achieve zero deforestation and degradation of biomass by 2030, including plans announced to prohibit timber cutters and miners from exploring indigenous lands. 	1.8°C FPS: End deforestation by 2025	Announced. COP26 pledge was strongest statement on ending deforestation compared to previous COPs, however a failure of many countries to sign COP27 action plans signals inertia This reinforces COP15 pledges of protecting and restoring biodiversity-rich areas at least 30% of land and sea is supportive of ending net deforestation.	4 Announced; Monitor developments
		'OPEC for rainforests' launched by Brazil, DRC and Indonesia at COP27, to establish economic incentives to prevent deforestation.	1.8°C FPS: End deforestation by 2030	Announced. This will require development of robust carbon market to support deforestation efforts, with rules/roles to be determined by UN Environment Assembly (in February 2024).	5 Announced; supportive

1. Please see slides 36, 41, and 47 for more details on coal phase out announcements from Indonesia, South Africa and Vietnam.

Global policy announcements/developments

Just Energy Transition Partnership details announced for South Africa (announced at COP26) and Indonesia (US\$10B, announced at G20 summit) followed by Vietnam in December. A partnership was launched to drive action on COP26 Glasgow forestry pledge, however, many countries are yet to sign.

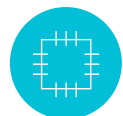
Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Global 	 Aviation	<p>In October, UN's International Civil Aviation Organization (ICAO) agreed to set a long-term net zero emissions target for 2050</p> <ul style="list-style-type: none"> • This decision is non-binding on members as ICAO cannot impose rules • Signals a shift away from offsetting emissions and towards direct mitigation measures from planes and fuels • Does not assign individual targets to states nor set intermediate goals but instead encourages member states to regulation emissions themselves 	<p>1.8°C FPS: Conservative assumptions regarding clean technology uptake in aviation with an associated 30% increase in aviation sector emissions due to growth in demand and continued reliance upon oil</p>	<p>Announced. This target is aspirational and lacks country-specific targets but signals an acceleration in ambition given its emphasis on direct mitigation rather than purchasing emissions credits or offsets in other sectors. To continue to monitor developments including country-specific actions.</p>	<div> 6+ Announced; signals an acceleration relative to FPS forecast </div>

Global policy announcements/developments: COP 15 (December 2022) resulted in global biodiversity framework for 2030

Over 190 countries have agreed to adopt a global biodiversity framework following the COP 15 summit in Montreal in December 2022. The framework “aims to catalyze, enable and galvanize urgent and transformative action by Governments, subnational and local governments, and with the involvement of all of society to halt and reverse biodiversity loss.” It sets **23 global targets** to be achieved by 2030,¹ which include:



Protecting at least 30% of land and sea by 2030, focused on areas of importance for biodiversity and ecosystem functions and services, covering terrestrial land, inland water, coastal and marine ecosystems



Restoring at least 30% of degraded ecosystems by 2030, covering terrestrial land, inland water, coastal and marine ecosystems²



Taking action to halt biodiversity loss, including by bringing loss of areas of high biodiversity importance close to zero by 2030 and reducing rates of introduction and establishment of known or potential invasive species by at least 50% by 2030



Increasing financing for nature, through leveraging public and private sources, including via innovative schemes such as biodiversity offsets and credits, payments for ecosystem services and green bonds



Reducing nature-harmful subsidies, by at least USD 500 billion per year by 2030, starting with the most harmful incentives, whilst scaling up positive incentives for the sustainable use of biodiversity







Ensuring company-level disclosure on nature, through regular assessment and disclosure of risks, dependencies and impacts on biodiversity along operations, supply and value chains and portfolios³

1. The full framework is available [here](#). 2. Target 2 covers land under effective restoration, which includes land on which restoration is underway or completed. 3. Target 15 includes encouragement and enabling of disclosure, ensuring disclosure for large and transnational companies and financial institutions.




Australia policy announcements/developments (1/2)

Several Federal and state-level announcements this quarter to support recently legislated 2050 net zero and 2030 43% reduction target. Queensland (a top coal-producing state) committed to transition to 70% renewables by 2032. Prime Minister and Premier of Victoria governments announce joint funding for renewable energy zones in Victoria.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Australia 	 Carbon pricing	<p>In January 2023, Australia proposed “safeguard mechanism” reformed plan to cut industrial emissions by 30% over the next seven years:</p> <ul style="list-style-type: none"> More than 200 of the country’s biggest industrial emitters will need to cut emissions by ~5% each year to 2030, to support meeting national 43% reduction target and net zero by 2050 AUS \$600M to be released to trade-exposed emitters to help reduce emissions Plan to be finalized in April and to be effective in July 	1.8°C FPS: US\$60 by 2030	Announced, tailwinds. Policies to support recently legislated net zero and 2030 target.	<div>5</div> Announced; supportive
	 Coal phaseout	<p>In September 2022, Queensland unveils \$40bn clean energy plan to slash reliance on coal.</p> <ul style="list-style-type: none"> Queensland Australia has announced it will convert its coal-fired power plants to renewable hubs by 2035 under a AUD\$62bn (\$40bn) clean energy plan. The plan sets out targets of 70% of electricity from renewables by 2032 and 80% by 2035, with a previous plan having a renewables target of 50% wind by 2030 quicker. 	1.8°C FPS: strong policy signal that coal generation will be made unlawful or unprofitable by 2038-2040	Announced, signals an acceleration in policy ambition. Queensland announcement could accelerate outlook for phasing out coal generation more broadly in Australia.	<div>6</div> Announced; Signals an acceleration in policy ambition;
	 Clean power	<p>In October 2022, ‘Rewiring the nation’: Albanese and Andrews governments to jointly fund renewable energy zones.</p> <ul style="list-style-type: none"> The Prime Minister and Premier of Victoria have made \$1.5bn available in concessional financing for renewable energy projects in Victoria. The \$1.5 bn is part of the Labor party’s \$20bn Rewiring the Nation plan and includes a plan to fast-track regulatory processes to deploy offshore wind quicker. 	1.8°C FPS: Strong policy signal to deliver 100% clean power by 2050	Announced, signals an acceleration in policy ambition. Policies to support recently legislated net zero and 2030 target.	<div>6</div> Announced; Signals an acceleration in policy ambition; monitor developments


Australia policy announcements/developments (2/2)

Federal government and New South Wales also announce transmission funding to connect renewable energy zones with grid.
Australia signed Global Methane Pledge introduced at COP26 (2021) targeting a 30% reduction in methane emissions by 2030 from 2020 levels, reinforcing the 1.8°C FPS outlook for emissions reductions and sector decarbonization pathways.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Australia 	 Clean power	<p>In December, Governments strike \$7.8bn deal to connect Snowy 2.0 and NSW renewable zones to the grid.</p> <ul style="list-style-type: none"> The federal government and state New South Wales (NSW) government have announced a A\$7.8bn deal to connect New South Wales Renewable Energy Zones (REZs) and the Snowy 2.0 hydro project to the Australian electricity grid. The deal will back eight transmission and REZ projects. Funding includes A\$4.7bn committed by the federal government and A\$3.1bn from the NSW government. 	1.8°C FPS: Strong policy signal to deliver 100% clean power by 2050	Announced, signals an acceleration in policy ambition. Policies to support recently legislated net zero and 2030 target.	<div>6</div> Announced; Signals an acceleration in policy ambition; monitor developments
	 Agriculture	<p>In October 2022, Australia signs up to global pledge to cut methane emissions by 30% by 2030.</p> <ul style="list-style-type: none"> Australia has signed up to the Global Methane Pledge which targets a reduction in methane emissions by at least 30% in 2030 relative to 2020 levels, at a global level. The Labor government has reserved \$3bn to support agricultural methane reduction and other clean tech initiatives. 	1.8°C FPS: Net zero by 2050 Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock by 2030	Announced, tailwinds. Funding commitments in addition to signing pledge broadly supportive of agricultural emissions reduction pathways.	<div>5</div> Legislated; supportive



Brazil policy announcements/developments

Newly elected President Lula pledged to achieve zero deforestation in the Amazon by 2030 and encourage revitalization of degraded pastures. The new government signed a decree repealing prior government's initiative to open land for deforestation and reinstated the Amazon Fund. These actions were bolstered by the introduction of U.S. sanctions against entities responsible for deforestation in Brazil.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Brazil 	 Land use and Forestry	<p>In November, newly elected President Luiz Inacio Lula da Silva announces country is 'back' to fight deforestation although hurdles await. Pledged to achieve zero deforestation and degradation of biomes by 2030. Bolsonaro also announced plans to prohibit timber cutters and miners from exploring indigenous lands.</p> <p>In January, Lula appoints Amazon defenders Marina Silva and Sonia Guajajara as ministers (former of renamed Ministry of the Environment and Climate Change and the latter of new ministry for Indigenous peoples).</p>	1.8°C FPS: End net deforestation by 2030; Deliver afforestation at scale by 2030	Announced and supportive. Signals an acceleration of the 'zero illegal deforestation' target set by President Bolsonaro at COP26 and affirms commitment to forestry protection and indigenous rights.	5 Announced; supportive
		<p>In January, one his first day of presidency, Lula issued six decrees revoking measures made by his predecessor, Jair Bolsonaro.</p> <ul style="list-style-type: none"> One decree reopens the Amazon Fund, originally established in 2008, that enables international countries to finance Brazil deforestation efforts. A second decree annuls mining activity in both indigenous and protected land. A third restarts previous plans to reduce deforestation in Amazon and Cerrado biomes. 	1.8°C FPS: End net deforestation by 2030; Deliver afforestation at scale by 2030	Legislated and supportive. Reversal of policies impacting forest protection, reopening up fund for foreign investment to control deforestation.	5 Legislated; supportive
		<p>In November, the U.S. announces plans to sanction Brazil's deforesters. Following announcements in June at the Summit of the Americas, the US government plans to crack down on individuals responsible for increasing deforestation in Brazil using penalties such as Magnitsky sanctions (which punish individuals or entities responsible for human rights abuses and corruption by freezing US assets and barring all Americans and US companies from dealing with them).</p>	1.8°C FPS: End of deforestation by 2030	Announced and supportive. Originally proposed in response to high deforestation rates under prior government.	5 Announced Supportive





Canada policy announcements/developments

Canada has made accelerated announcements targeting the oil and gas sector to reduce methane emissions from operations and infrastructure.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>Canada</div> <div></div>	<div>Multiple including</div> <div> Net zero targets</div>	<div>In November, Canada targeted oil and gas methane emissions with new law proposal.</div> <div><ul style="list-style-type: none">Canada’s new rules will target a 75% cut in methane emissions from the oil and gas sector by 2030, with a proposed monthly requirement for oil and gas companies to find and fix methane leaks in their infrastructure.</div>	1.8°C FPS: Net zero by 2050	Announced, signals an acceleration in policy ambition. Emerging policies to tackle significant emissions sources.	<div>6</div> <div>Announced</div> <div>Signals an acceleration in policy ambition relative to FPS; monitor developments</div>




China policy announcements/developments (1/2)

China reaffirmed climate goals despite economic headwinds, announcing plans for performance standards to achieve carbon neutrality objectives, and drafting a national strategy for reducing methane emissions with an initial focus on improving monitoring.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
China 	 Net zero targets	In October, China reaffirms climate goals (peaking CO2 emissions by 2030 and achieving carbon neutrality by 2060+) but analysts expect energy security and geopolitical tensions to pose challenges to its decarbonisation process.	1.8°C FPS: Net zero by 2060	Announced. This development aligns with China NZ by 2060 forecast. Details on decarbonisation process to be monitored.	5 Announced; Supportive
		In November, China announced plans for emissions-related standards by 2025 <ul style="list-style-type: none"> Chinese regulators have jointly released an implementation plan to establish a wide range of emissions-related standards by 2025 to realise carbon neutrality. 	1.8°C FPS: Net zero by 2060	Announced and supportive. While key details on what emissions-related standards entail are yet to be released, this development aligns with China NZ by 2060 forecast.	5 Announced; Supportive
	Multiple including  Net zero targets  Agriculture	In November, China drafted national strategy on methane: <ul style="list-style-type: none"> Xie Zhenhua, China's climate envoy, announced a new strategy that will target the three main sources of methane emissions – energy, agriculture and waste. Targets will initially be preliminary and focus on improving monitoring capabilities given China's currently 'weak statistical capability in this area'. 	1.8°C FPS: For the agriculture sector, nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock (including methane) from 2035.	Announced and supportive. Signals potential intent to join global methane pledge.	5 Announced; Supportive



China policy announcements/developments (2/2)

China pushed its target for peak emissions in the building sector back from 2025 to 2030, although this target year is still consistent with its broader national carbon peaking goal. In October, China issued an implementation plan for developing green low-carbon products (e.g. chemicals, steel, non-ferrous metals, building materials).

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
China 	 Buildings	<p>In November, China announced it will push back its building materials sector carbon peak from 2025 to 2030.</p> <ul style="list-style-type: none"> The peaking of emissions by 2030 for building materials is in line with China's national carbon peaking goal, but previously the cement industry had proposed peaking its carbon footprint by 2023 while the building material sector as a whole proposed carbon peaking by 2025. 	1.8°C FPS: End the installation of fossil heating systems by 2045	Announced, deceleration. This announcement is a slight deceleration in original policy ambition, although still consistent with broader national carbon emissions peaking goal.	4 Announced; Monitor developments
	 Industry	<p>In September, four Chinese government bodies jointly issued a notice about the raw materials industry.</p> <ul style="list-style-type: none"> The Chinese Ministry of Industry and Information Technology together with three other government bodies issued a notice on an implementation plan of the raw materials industry, which "proposes the development of green low-carbon products" The sectors of focus include petrochemical and chemical, iron and steel, non-ferrous metals, building materials and other industries, with the plan including a focus on strengthening green product evaluation standards and establishing a carbon emissions database for the lifecycle of key products, among other focuses" 	1.8°C FPS: 100% new zero carbon production facilities from 2050	Announced and supportive. This joint statement by government bodies is in line with FPS target of 100% new zero carbon production facilities from 2050.	5 Announced; Supportive






European Union policy announcements/developments (1/7)

The EU raised its emission reduction target from 55% to 57%, leading to a mandatory increase of 10% in GHG reduction targets by 2030 for member states compared to 2005 levels

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 Net Zero targets	In November, Fit for 55: Deal on carbon sinks goal increases EU 2030 climate target. <ul style="list-style-type: none"> The EU has increased its emission reduction target from 55% to 57% by 2030, compared with 1990 levels. The increase results from an EU agreement to raise the ambition of the bloc's carbon sinks target by 15% relative to the original Fit for 55 proposal. 	1.8°C FPS: <ul style="list-style-type: none"> Net zero by 2050 End net deforestation by 2030 	Announced, tailwinds. FPS trajectory for EU embedded 55% target, 57% target signals slight acceleration in ambition but long term 2050 target still holds.	5 Announced Supportive
		In November, The EU Parliament and Council agreed on stricter rules for members' emissions . <ul style="list-style-type: none"> The European Parliament and the Council have reached a provisional agreement on stricter regulation of greenhouse gas (GHG) emissions in EU member states. They have agreed on a revision of the effort-sharing regulation (ESR), which sets binding annual GHG emission reductions for member states. The most notable change includes an increase in the mandatory GHG reduction target for 2030 at EU level from 30% to 40%, compared to 2005 levels. The target applies to the buildings, road transport, agriculture, and waste sectors which collectively account for 60% of the EU's greenhouse gas emissions." 	1.8°C FPS: <ul style="list-style-type: none"> Net zero by 2050 	Announced. The agreement reached is supportive of the IPR FPS forecast.	5 Announced Supportive




European Union policy announcements/developments (2/7)

The EU Council and Parliament provisionally agreed on key legislative proposals under Fit for 55, including amending the ambition of the ETS to cover 62% of emissions by 2030, agreeing on CBAM sector coverage and the establishment of the Social Climate Fund to address the impact of carbon pricing on vulnerable households and micro-enterprises.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	Multiple including  Carbon pricing  ICE ban  Buildings	<p>In December, the European Council and Parliament reached a provisional deal on the EU emissions trading system and the Social Climate Fund:</p> <ul style="list-style-type: none"> Agreement to increase the ambition of emissions reduction in sectors covered by the ETS to 62% by 2030 relative to 2005 levels. Free allowances will be phased out between 2026-34, with a slower rate of phase out at the beginning and a quicker phase out towards the end Mechanism to dampen excessive price fluctuations reinforced with potential automatic releases of allowances onto the market (e.g. if price of allowances exceeds €45 over a given period of time). Agreement on ETS2 to cover buildings and road transport, with scheme applying to fuel distributors in these sectors with a start date in 2027, unless energy prices are exceptionally high, in which case it will start in 2028. Establishment of Social Climate Fund to support vulnerable households and businesses. 	1.8°C FPS: <ul style="list-style-type: none"> US\$75 by 2030 100% ZEV sales from 2035 End sale of fossil fuel heating systems by 2035 	Announced and supportive. After delays, EU lawmakers reach agreement on ETS expansion as part of Fit for 55. EU ETS has seen more robust pricing this year but outlook for emissions reduction under Fit for 55 package and proposals remains in line with FPS 2021.	<div>5</div> <div>Announced</div> <div>Supportive</div>
	 Industry	<p>The European Council and Parliament also reached a provisional agreement on a new carbon border adjustment mechanism, CBAM, to establish a level playing field when free allowances under the EU ETS are phased out. The CBAM is set to cover cement, aluminium, fertilisers, electric energy production, hydrogen, iron and steel, as well as some precursors and a limited number of downstream products.</p>	1.8°C FPS: <ul style="list-style-type: none"> 100% new zero carbon production facilities from 2040 for Tier 1 countries (including most of EU) 100% new zero carbon production facilities from 2050 for Tier 2 countries 	Announced and supportive. CBAM advancing through EU legislative process is promising for policy framework around industrial decarbonization. U.S also considering new steel, aluminium tariffs based on carbon emissions under climate club agreement.	



European Union policy announcements/developments (3/7)

The EU agreed to include maritime shipping emissions within the scope of the EU ETS to support achieving its 57% emission reduction target by 2030. A new proposal was announced to see carbon credits certifications standardised to enforce quality and consistency across member states.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>EU</div> <div></div>	<div></div> Shipping	<p>In November, EU legislators reached a preliminary agreement to include shipping within the ETS:</p> <ul style="list-style-type: none">Ships travelling domestically within EU must pay 100% of their emissions while ships travelling internationally from or to the EU to a non-EU port must pay for 50% of their emissions.The proportion of emissions covered starts at 40% in 2024, increasing to 70% in 2025 and then 100% by 2026, with shipping operators paying for emissions in the previous year.Non-CO2 emissions, including methane and nitrous oxide, included from 2026.Agreement was finalised under wider ETS reform negotiated between the EU Council and EU Parliament.Parliament chief negotiator has stated that agreement could lead to 120 million tonnes of carbon savings (double that of the EU’s recently announced ban on ICE vehicles).	1.8°C FPS: n/a	Announced, signals an acceleration in policy ambition. FPS 2021 assumptions for decarbonization of international shipping have been conservative; emerging policy frameworks (e.g. coverage of EU maritime emissions under ETS) could accelerate pathways.	<div>6</div> <div>Announced; Signals an acceleration in policy ambition relative to FPS; monitor developments</div>
	<div></div> Multiple including: Forestry	<p>In November, the EU commission proposed certification of carbon removals to help reach net zero emissions.</p> <ul style="list-style-type: none">The European Commission has approved a proposal for a voluntary framework that will certify ‘high-quality’ carbon credits.The proposal includes a set of rules for the independent verification of removals, and rules to apply when recognising certification schemes that will demonstrate compliance with the EU framework.	1.8°C FPS: <ul style="list-style-type: none">Various	Announced, tailwinds. This could spur development of robust carbon market to support forestry and other nature-based solutions.	<div>5</div> <div>Announced Supportive</div>



European Union policy announcements/developments (4/7)

The EU amended the REPowerEU plan to make it easier to consider, approve and permit renewable projects. The permitting processes are split between projects within renewables go-to-areas and those outside the go-to-areas, which following the lapse of the stated period will automatically be approved.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 Clean Power	<p>In December, the Council reached an agreement on targeted amendments to the renewable energy directive, proposed under the REPowerEU plan.</p> <ul style="list-style-type: none"> For renewable go-to areas, the Council agreed that permit-granting processes should not take longer than one year for renewables projects, and two years for offshore renewables projects. In duly justified extraordinary circumstances the period may be extended by up to six months. For the repowering of plants and for new installations with an electrical capacity of less than 150 kW, co-located energy storage facilities as well as their grid connection, the processes should be limited to six months, and one year if they concern offshore wind energy projects. In duly justified extraordinary circumstances, for example overriding safety reasons, the period may be extended by up to three months. For areas outside go-to areas the permit-granting processes should not exceed two years, and three years for offshore renewables projects. In duly justified extraordinary circumstances the period may be extended by up to six months. For solar equipment, member states agreed that the permit-granting process would not exceed three months. 	<p>1.8°C FPS:</p> <ul style="list-style-type: none"> Strong policy to develop 100% clean power by 2045 	<p>Announced, signals an acceleration in policy ambition. Supportive of REPowerEU renewable energy objectives.</p>	<div>6</div> <p>Announced</p> <p>Signals an acceleration in policy ambition relative to FPS; monitor developments</p>



European Union policy announcements/developments (5/7)

In addition to the ban on new fossil fuel cars from 2035, the EU has legislated that new cars sold from 2030 must cut their carbon emissions by 55% compared to the earlier target of 37.5% relative to 2021 levels. Further, the inclusion of circular economy legislation on batteries will boost the EU's chance of achieving ZEV sales by 2035

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 ICE ban	In October, EU approved effective ban on new fossil fuel cars from 2035: <ul style="list-style-type: none"> The European Parliament and the EU Council have come to their first final agreement on a component of a Fit for 55 package, phasing out cars and vans with tailpipe CO2 emissions by 2035. The deal also includes a 55% cut in CO2 emissions for new cars sold from 2030 relative to 2021 levels - higher than the existing target of a 37.5%. Under the plan, new vans must comply with a 50% cut by 2030 and a 100% CO2 cut by 2035 relative to 2021 levels. 	1.8°C FPS: <ul style="list-style-type: none"> 100% ZEV sales from 2035 	Announced, supportive. Yet to be adopted but would confirm IPR FPS 2021 forecasts for ZEV transition.	5 Announced; supportive
		In December, EU agreed a deal on new rules for design, production and waste treatment of batteries. <ul style="list-style-type: none"> Parliament and Council reached a provisional agreement to overhaul EU rules on batteries and take into account technological developments and future challenges. The agreed rules will cover the entire battery life cycle, from design to end-of-life and apply to all types of batteries sold in the EU: portable batteries, SLI batteries (supplying power for starting, lighting or ignition of vehicles), light means of transport (LMT) batteries (providing power for the traction to wheeled vehicles such as electric scooters and bikes), electric vehicle (EV) batteries and industrial batteries. 	1.8°C FPS: <ul style="list-style-type: none"> 100% ZEV sales from 2035 	Announced, tailwind. This proposal for legislation targeting lifecycle emissions is the first of its kind and could set precedent for future material efficiency policies; complementary/supportive of ZEV transition as recycling of critical minerals could remove barriers, including public opposition.	5 Announced; supportive




European Union policy announcements/developments (6/7)

The EU agreed a ban seaborne imports of Russian oil alongside introducing an oil price cap with the aim of reducing Russian oil income while mitigating potential future spikes in oil prices

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 Clean Power	<p>In December, the European Union (EU) agreed to a plan which will ban seaborne imports of Russian oil and introduce an oil price cap at \$60 a barrel.</p> <ul style="list-style-type: none"> A group – led by Hungary but also including the larger Russian energy importers Germany and Austria, plus France – argues any overly aggressive market cap will risk destabilizing global energy markets. The price cap, a G7 idea, aims to reduce Russia's income from selling oil, while preventing a spike in global oil prices after an EU embargo on Russian crude takes effect on Dec. 5. 	<p>1.8°C FPS:</p> <ul style="list-style-type: none"> Strong policy to develop 100% clean power by 2045 	<p>Announced, supportive. Intended to alleviate price shocks and limit revenues to Russia. A price cap of US\$60/barrel does not deviate from long-run market expectations of oil prices and is unlikely to impact FPS assumptions.</p>	<div>5</div> <p>Announced; supportive</p>




European Union policy announcements/developments (7/7)

The EU Council agreed on energy performance standards for new and existing buildings to be zero emission by 2030 and 2050, respectively. The EU also agreed on undertaking due diligence and enforcing bans on imported and exported products linked to deforestation

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 Buildings	In October, European Council agreed on stricter rules for the energy performance of buildings. <ul style="list-style-type: none"> All new buildings should be zero-emission buildings by 2030, and existing buildings should be transformed into zero-emission buildings by 2050. From 2028 new buildings owned by public bodies would be zero-emission buildings while from 2030 all new buildings would be zero-emission buildings. Council to start negotiations with the European Parliament and once a political agreement is reached, the final text will be formally adopted by the Council and the Parliament. 	..1.8°C FPS: <ul style="list-style-type: none"> 100% zero carbon heating in new installations by 2035 	Announced and supportive. Supportive of outlook for phaseout of fossil fuel-based heating installations in EU.	<div>5</div> Announced; supportive
	 Land use and Forestry	In December, EU agreed law to crack down on deforestation in supply chains. <ul style="list-style-type: none"> The EU Council and European Parliament have decided on a deal, subject to final formal adoption in both institutions, to set mandatory due diligence rules for all operators and traders who 'place, make available or export' key commodities associated with deforestation. These include palm oil, beef, timber, coffee, cocoa, rubber and soy, and several derived products such as chocolate, furniture, printed paper and selected palm oil-based derivatives. Operators covered by the rules will be required to trace the products they sell back to the land where they were produced. Products linked to deforestation will be banned from import and export to the EU. 	1.8°C FPS: <ul style="list-style-type: none"> End net deforestation by 2025 in Eastern Europe End net deforestation by 2030 in Western Europe and most other countries (Brazil, Indonesia, U.S., etc.) 	Announced. Supportive policy of Glasgow Leaders' Declaration on Forests and Land Use, would increase scrutiny around supply chains.	<div>5</div> Announced; supportive



France policy announcements/developments

France announced new energy savings plan and advanced on new nuclear capacity goals, pursuing legislation to reduce red tape to build approximately 14 nuclear reactors. France also proposed bill on the acceleration of the deployment and use of renewable energy projects

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
France 		Multiple including Low-carbon buildings In October, France announces ‘ambitious’ energy saving plan France. <ul style="list-style-type: none"> Aims to reduce energy consumption by 10% by 2024, following a binding target of 5% reduction in electricity consumption during peak hours set out by the EU Commission. Includes 15 key measures including reducing heating to 19C (66F) in offices, encouraging car-pools; encouraging day-to-day energy saving practices. 	1.8°C FPS: Net zero by 2050	Announced and supportive. Energy saving measures to implement EU target.	5 Announced Supportive
		Clean Power In October, France drafted new legislation new law for nuclear. <ul style="list-style-type: none"> Intent to reduce red tape related to nuclear power projects. Intent to start construction on its first next-generation EPR2 reactor by May 2027 as part of plan to build at least six EPR2 reactors, and potentially eight additional reactors. The bill will be put out for public debate in October. 	1.8°C FPS: Strong policy signal to deliver 100% clean power by 2035	Announced, signals an acceleration in policy ambition. Legislation to support new nuclear following earlier announcements this year on increased nuclear ambition. In conjunction with new renewables plans, this could accelerate France’s pathway towards power sector decarbonization.	6 Announced Signals acceleration in policy ambition; monitor developments
		In November, France drafted bill aimed at accelerating implementation of projects and the production of renewable energies, in particular wind power, photovoltaic panels, and biogas plants, by proposing temporary emergency measures.. <ul style="list-style-type: none"> Recognition that France is falling behind relative to other European countries due to lengthy permitting processes. 	1.8°C FPS: Strong policy signal to deliver 100% clean power by 2035	Announced, signals an acceleration in policy ambition. Could accelerate renewables build out relative to FPS outlook.	6 Announced Signals acceleration in policy ambition









Germany policy announcements/developments

Germany announces significant investment in electric vehicle charging infrastructure to support delivering 100% ZEV sales from 2035.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Germany 	 ICE ban	<p>In October, Germany announced €6.3bn spend on push for electric car charging points.</p> <ul style="list-style-type: none"> The German government is investing €6.3bn in electric vehicle charging stations over three years. The investment is planned to provide a 14 times increase in the number of charging stations in the country from 70,000 to 1 million by 2030. The number of EVs is planned to reach 15 million by 2030 from around 1.5 million at present. 	<p>1.8°C FPS:</p> <ul style="list-style-type: none"> 100% ZEV sales from 2035 	<p>Announced and supportive. Investment in infrastructure to support EU ICE ban policies.</p>	<div>5</div> <div>Announced</div> <div>Supportive</div>


India policy announcements/developments

India published long-term decarbonisation plan to achieve net zero by 2070 with focus on power, buildings, transport, industry, and carbon removal technologies; sector specific decarbonization targets to be announced.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
India 	 Net Zero target	In November, India lays out plan for long-term decarbonization. <ul style="list-style-type: none"> The Indian government has released a report which provides the first insight on how it will meet its Net Zero by 2070 pledge made last year. 	1.8°C FPS: <ul style="list-style-type: none"> Net zero by 2070 Strong policy to develop 100% clean power by 2060 100% ZEV sales from 2040 100% zero carbon heating by 2050 100% new zero carbon production facilities from 2060 	Announced, tailwinds. As noted in Q3 QFT, India is making strides to advance emissions reductions and increase low-carbon power generation sources.	<div>5</div> Announced and supportive
	 Clean Power	<ul style="list-style-type: none"> The document sets out India's broad decarbonization framework across six sectors – energy, transport, buildings and cities, industry, carbon removal technologies and forests – and the finance required to do so. 			
	 ICE ban	<ul style="list-style-type: none"> India is planning a rapid expansion of renewables, a greater role for nuclear energy, a “rational” use of fossil fuel resources and the closing of inefficient coal power plants. 			
	 Buildings	<ul style="list-style-type: none"> The next step for India will be to introduce sector specific decarbonization targets. 			
	 Industry				
	 Clean Power	In December, following passing in the lower house in August, India's upper house, the Rajya Sabha, passed the Energy Conservation (Amendment) Bill, 2022, which seeks to increase energy efficiency and proposes a carbon credit system covering major electricity consumers.	1.8°C FPS: <ul style="list-style-type: none"> Strong policy signal to deliver 100% clean power by 2050US\$50 by 2030 	Legislated and supportive, policy tailwinds. Policies to deliver on net zero target.	<div>5</div> Legislated and supportive
	 Carbon pricing	<ul style="list-style-type: none"> Large electricity consumers will have to meet a certain proportion of their energy requirements through renewables. If they overachieve, they can earn carbon credits that they can sell, while if they underachieve then they will have to purchase carbon credits or be penalized. 			




Indonesia policy announcements/developments

Indonesia has agreed to a \$20bn PPP with Japan and the US to support the shut down of coal-fired plants and the transition to renewables, putting the phaseout of coal target by 2060 in sight.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Indonesia 	 Coal phase out	<p>In November, the US and Japan announce US\$20bn grant for Indonesia to shut its coal-fired plants.</p> <ul style="list-style-type: none"> A coalition of countries, led by the United States and Japan, have pledged to mobilise US\$20bn of public and private financing to help Indonesia shut its coal-fired power plants and bring forward its peak GHG emissions date to 2030 in the power sector - seven years earlier than the previous target. The plan includes an agreement by Indonesia to adopt a goal to reach Net Zero GHG emissions in the power sector by 2050, instead of the current 2060 target. It will additionally require an accelerated build-out of renewable energy so that 34% of the country's electricity will be generated by renewable sources by 2030. This deal follows the \$8.5bn transition agreement between several developed countries and South Africa to accelerate the country's shift away from coal-fired electricity generation. 	<p>1.8°C FPS:</p> <ul style="list-style-type: none"> Phaseout of existing unabated coal by 2060 Strong policy to develop 100% clean power by 2060 	<p>Announced, signals an acceleration in policy ambition. Significant development which could accelerate coal phase out timelines in Indonesia but will require mobilization of private sector funding.</p>	<div>6+</div> <div>Announced</div> <div>Signals acceleration in policy ambition; monitor developments</div>



Japan policy announcements/developments

Japan announced plans for a carbon pricing system. While a positive development, it remains far off from the 2030 target of \$60/tCO₂e

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Japan 	 Carbon pricing	<p>In December, Japan presented a draft plan for a proposed carbon pricing system:</p> <ul style="list-style-type: none"> The government plans to introduce a carbon pricing system by 2026 to fund Japan's transition to a greener society. It is expected to present a course of action by the end of the year on specific pricing measures, such as a carbon tax on companies according to their CO₂ emissions, and an emissions trading system. The government estimates that over \$1.1 trn in public and private investments will be necessary in the next decade to promote decarbonization. \$150bn will be raised by issuing new green transformation bonds. Currently, Japan has a carbon tax on the upstream production or importation of fossil fuels that amounts to ~\$2/tCO₂. 	1.8°C FPS: US\$60 by 2030	Announced. Japan currently has limited carbon pricing in place, a new plan for stronger carbon pricing scheme with more coverage will support decarbonization.	<div>5</div> Announced; Supportive
	 Clean Power	<p>In December, the Japanese government has formally adopted a plan to extend the lifespan of existing nuclear reactors beyond the previous 60 year limit.</p> <ul style="list-style-type: none"> The government has said Japan will push to develop “next-generation innovative reactors”. The plan follows Prime Minister Kishida in August 2022 calling for the expansion of nuclear energy use in response to the energy crisis. 	1.8°C FPS: US\$60 by 2030	Announced, signals an acceleration in policy ambition. The IPR FPS forecast a decline in nuclear capacity alongside an increase in renewable capacity and generation in Japan. This formal strategy of new nuclear alongside renewables could raise prospects for achieving 100% clean power at an earlier date in Japan.	<div>6+</div> Announced Signals acceleration in policy ambition;




Mexico policy announcements/developments

Mexico strengthened its 2030 NDC target by cutting GHG emissions by 35% relative to BAU compared to the earlier stated target of 22%

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>Mexico</div> <div></div>	<div></div> <div>Net Zero target</div>	<div>In November, Mexico set more ambitious GHG reduction targets for 2030.</div> <div><ul style="list-style-type: none">• Mexico has boosted its Paris Agreement pledge and committed to cutting GHG emissions by 35% by 2030 relative to a business as usual scenario.• The update replaces a prior target to reduce emissions by 22% below a business-as-usual scenario by 2030."</div>	<div>1.8°C FPS: TBC- no net zero target announced</div>	<div>Announced and supportive. Supportive of FPS expectation that countries will ratchet up NDC ambition, followed by supportive policies by the mid-2020s.</div>	<div>5</div> <div>Announced; supportive</div>



Nigeria policy announcements/developments

Nigeria announced plans to reduce oil and gas methane emissions in the energy sector

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>Nigeria</div> <div></div>	<div></div> <div>Net Zero target</div>	<div>In November, Nigeria targeted oil and gas methane emissions with new laws.</div> <div><ul style="list-style-type: none">Nigeria, has announced new rules to reduce methane emissions in the energy sector, including leak detection and repair, limits to flaring and controls on venting equipment.</div>	1.8°C FPS: Net zero by 2050	Announced. IPR FPS and RPS do not model explicit pathways for O&G methane reduction, but these policies target these significant emissions sources.	<div>6</div> <div>Announced</div> <div>Signals acceleration in policy ambition; monitor developments</div>
	<div></div> <div>Clean Power</div>	<div>In December, Nigeria announced plans to add 30 GW of power capacity by 2030 with 30% from renewables.</div> <div>Nigeria has announced a ‘30:30:30’ scheme that sets a target for 30 GW of power capacity by 2030, of which 30% would come from renewables, as part of the National Renewable Energy and Energy Efficiency Policy.</div>	1.8°C FPS: Strong policy to develop 100% clean power by 2060	Legislated and supportive. This supports clean power forecast for Nigeria and its transition plan to deliver upon its 2060 net zero target.	<div>5</div> <div>Announced and supportive</div>




Saudi Arabia policy announcements/developments

Saudi Arabia announced plans to launch a domestic carbon credit scheme at the start of 2023.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>Saudi Arabia</div> <div></div>	<div></div> <div>Net Zero target</div>	<div>In November, Saudi Arabia targeted Voluntary Carbon Markets as energy minister unveiled 2023 carbon market.</div> <div><ul style="list-style-type: none">Saudi Arabia has announced that it will launch a domestic carbon credit scheme at the start of 2023.The scheme plans to issue Paris-compliant credits for voluntary participants.</div>	1.8°C FPS: US\$35 by 2030	Announce and supportive. Supportive of Saudi Arabia’s plan to achieve net zero by 2060 and create greener economy.	<div>5</div> <div>Announced; supportive</div>



South Africa policy announcements/developments

South Africa approved USD 8.5bn in financing for the transition from coal to clean energy followed by the announcement of USD 83bn for a new Just Energy Transition Investment Plan (JET IP)

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
South Africa 	 Coal phase out	<p>In October, South Africa approved USD 8.5bn energy transition investment plan.</p> <ul style="list-style-type: none"> South Africa has approved an investment plan for USD 8.5bn package to push their transition away from coal and towards clean energy. The plan includes investments that are required to achieve the decarbonization commitments made by the South African government under a just transition for affected communities. This plan has been in the works for a while, formed by a partnership at COP26 and under negotiation by its funders (the UK, EU, US, France and Germany) since then. 	1.8°C FPS: Phaseout of existing unabated coal by 2040	Legislated and supportive. This plan offers model for ending reliance on coal in other regions.	<div>5</div> Announced; supportive
	 Clean Power	<p>In November, The South African government unveiled its ZAR 1,480bn (USD 83bn) Just Energy Transition Investment Plan (JET IP) 2023-2027, which aims to cut the country's carbon emissions.</p> <ul style="list-style-type: none"> The plan comprises USD 58bn for electricity financing needs, USD18bn for green hydrogen and USD 7.2bn for new energy vehicles. The plan also includes goals to build more than 100 GW of dedicated renewable electricity (both wind and solar) and more than 60 GW of electrolyser capacity. 	1.8°C FPS: Strong policy to develop 100% clean power by 2040	Announced and supportive. Will require private sector financing to unlock low-carbon generation and technology capacity targets and goals.	<div>5</div> Announced, supportive



Turkey policy announcements/developments

Turkey’s strengthened 2030 NDC target will see it cut GHG emissions by 41% relative to BAU compared to the earlier stated target of 21%, an acceleration of the IPR FPS forecast

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Turkey 	 Net Zero target	<p>In November, Turkey announced higher emissions goal and peak year in revised NDC.</p> <ul style="list-style-type: none">Turkey has released an updated NDC, almost doubling its GHG emission reduction target from 21% to 41% below business-as-usual levels by 2030.Greenhouse gas emissions are set to peak in 2038 at the latest, and net zero emissions achieved by 2053.	1.8°C FPS: Net zero by 2053	Announced and supportive. IPR FPS forecasts countries will ratchet up NDC ambition.	5 Announced; supportive




United Kingdom policy announcements/developments

The UK committed £1 billion towards insulating homes bringing the target of 100% zero carbon heating in buildings by 2035 into sight with £13.6bn now committed towards retrofitting low-cost insulation in homes to reduce the country's overall energy demand by 15%

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
UK 	 Buildings	<p>In November, UK government allocated £1bn in insulation funding for least-efficient homes.</p> <ul style="list-style-type: none"> The UK government will spend £1bn on grants for low cost insulation measures such as loft and cavity wall insulation in homes with poor energy efficiency rating and in lower council tax bands. Grants will be available from next spring, with the average cost per house expected to be £1,500. Further spending of £6bn from 2025-2028, on top of the £6.6bn being provided until 2025 is planned in a bid to reduce the country's overall energy demand by 15% by 2030. 	1.8°C FPS: 100% zero carbon heating by 2035	Announced and supportive. Energy efficiency funding and policies to support building decarbonisation.	<div>5</div> Announced; supportive





United States policy announcements/developments (1/3)

The U.S. floated a carbon border adjustment tariff on steel and aluminium via cooperative climate clubs alongside approving a program scaling voluntary carbon markets amongst rural farmers

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
US 	 Industry	<p>In December, the U.S. floated new steel, aluminium tariffs based on carbon emissions.</p> <ul style="list-style-type: none"> The US Trade Representative's office has proposed a tariff on steel and aluminium based on the carbon intensity of the production process. This proposal is to be negotiated with the EU and would be designed to create a global group of countries aiming to reduce carbon emissions. The proposal would mean a country exporting to another in the club would pay a levy for steel and aluminium depending on the carbon intensity in their production. If the exporting country has lower carbon intensity of production than the importing country in the club then they wouldn't pay a levy. Countries outside the club would be subject to a higher rate of tariffs. The proposals are in the early stages and require much more work. 	1.8°C FPS: 100% zero carbon production facilities from 2060	Announced and supportive. First proposal under cooperative climate club movement to develop favorable trade arrangements that support domestic industries while mitigating against climate change.	5 Announced; supportive
	 Agriculture	<p>In December. US Congress approves programme to support voluntary carbon market in omnibus spending bill.</p> <ul style="list-style-type: none"> The US lawmakers passed a \$1.7trn spending bill to fund the federal government which among its many provisions includes a programme to help rural stakeholders participate in the voluntary carbon market. 	1.8°C FPS: US\$65 by 2030	Legislated and supportive. Spurs market for carbon credits from climate-focused agriculture projects.	5 Legislated; supportive




United States policy announcements/developments (2/3)

The U.S. targeted Federal emissions by proposing rules on carbon disclosure reporting requirements for Federal contractors, which would cover 85% of emissions associated with its supply chain and announcing plans to achieve net zero by 2045 in all Federal buildings and largely decarbonise the postal fleet by 2026

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
US 	 Buildings	In December, Biden-Harris administration announced steps to electrify and cut emissions from federal buildings. <ul style="list-style-type: none"> The Biden administration have announced a new proposed rule that would fully decarbonise the on-site emissions of new federal buildings by 2030, helping to support the Biden administration's goal that all federal buildings are net zero emissions by 2045. 	1.8°C FPS: 100% zero carbon heating by 2040	Announced and supportive. Supportive of FPS pathway for buildings decarbonization in the U.S.	5 Announced; supportive
	 Multiple, including net zero targets	In November, Biden-Harris administration proposed plan to protect federal supply chain from climate-related risks. <ul style="list-style-type: none"> The rule would require major Federal contractors, receiving more than \$50 million in annual contracts, to publicly disclose their greenhouse gas emissions (including scope 1 & 2, as well as relevant categories of scope 3), disclose climate-related financial risks, and set science-based emissions reduction targets. The rule covers 85% of emissions associated by the Federal supply chain would be covered. 	1.8°C FPS: Net zero by 2050	Announced and supportive. This plan could lead to more scrutiny and target setting around supply chains more broadly as the US SEC continues to consider rules to enhance/standard climate-related disclosures for investors.	5 Announced; supportive
	 ICE ban	In December, the US Postal Service (USPS) proposed to electrify trucks by 2026. <ul style="list-style-type: none"> \$9.6 billion to be spent on 66,000 electric vehicles and associated infrastructure, including \$3bn from Inflation Reduction Act. By 2026, USPS expects to almost exclusively purchase zero-emission delivery trucks. 	1.8°C FPS: 100% ZEV sales from 2045 for HDVs, 2040 for LDVs.	Legislated, signals an acceleration in policy ambition. Accelerated timeline for decarbonizing postal fleet relative to broader U.S. forecast (2035-2045 100% ZEV sales).	6 Legislated; Signals acceleration in policy ambition;




United States policy announcements/developments (3/3)

The U.S. has set further targets of cutting F-gases to 40% below historical levels and methane emissions reduction targets for the oil and gas sector, accelerating its policy ambition of achieving net zero by 2050.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
	 Non-CO2 F-gases	<p>In October, the US Environmental Protection Agency announced plans to further reduce the emissions of hydrofluorocarbons (HFCs) which are widely used in air conditioning and refrigeration, and can be 1000x more potent than CO2:</p> <ul style="list-style-type: none"> The new rule cuts HFC emissions allowances to 40% below historical levels, starting in 2024. The new proposal was released in December following the US ratification of the Kigali Amendment which calls for a gradual reduction in the use and production of HFCs. 	n/a	Announced, tailwinds. No explicit forecasts for F-gases in FPS, but if fully implemented Kigali amendment could prevent an estimated maximum of 0.5C in warming by end of the century.	6 Announced Signals acceleration in policy ambition; monitor developments
	 Methane emissions	<p>In November, the U.S. targets methane in 'relentless' emissions focus.</p> <ul style="list-style-type: none"> President Joe Biden's administration is planning a crackdown on oil and gas industry methane leaks. Last year, the EPA announced a proposal which would require oil and gas operators to monitor 300,000 of its biggest well sites quarterly to find and fix leaks. The latest revision would see this target increased from 300,000 to 1 million well sites. 	1.8°C FPS: Net zero by 2050	Announced, tailwinds. No explicit forecasts for O&G methane but reducing these are critical.	6 Announced Signals acceleration in policy ambition; monitor developments

Vietnam policy announcements/developments

Vietnam reached an agreement with G7 nations for a \$15.5bn just transition away from coal dependency accelerating the coal phaseout target by 2060, in line with the 1.8C FPS

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Vietnam 	 Net Zero target	<p>In November, Vietnam's updated NDC increased its GHG emissions reduction targets for 2030.</p> <ul style="list-style-type: none"> Vietnam released an updated NDC in which it increased its unconditional GHG emission reduction target from 9% to 15.8%, and its conditional GHG emission reduction target from 27% to 43.5% by 2030. Targets are relative to a business-as-usual scenario and include land use, land-use change and forestry (LULUCF). In its new NDC, Vietnam restates its intention to reach carbon neutrality by 2050, announced in July 2022. Vietnam has also set the target to reduce its methane emissions by 30% in 2030 relative to 2020 levels. 	1.8°C FPS: Net zero by 2053	Announced and supportive, FPS forecasts countries will ratchet up NDC ambition by the mid-2020s.	<div>5</div> Announced; supportive
	 Coal phase out	<p>In December, G7 nations provided Vietnam with \$15.5 bn to cut coal use.</p> <ul style="list-style-type: none"> Vietnam has reached an agreement with G7 nations to finance the country's transition away from coal. This agreement is the third Just Energy Transition Partnership, following a deal for South Africa in 2021 and a deal for Indonesia last month at COP27. Most of the financing will be loans, with only a minor part being grants. 	1.8°C FPS: Phaseout of existing unabated coal by 2060	Announced, signals an acceleration in policy ambition. This Just Energy Transition Partnership funding is estimated to limit coal fired capacity to 30.2 GW rather than the 37 GW previously, bring forward emissions peaking from 2035 to 2030, and help Vietnam generate 47% of electricity from renewables sources by 2030 (from ~23% currently). This could bring forward timelines for phasing out of coal generation on system.	<div>6</div> Announced Signals acceleration in policy ambition; monitor developments

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Appendix

References







Technology developments: Hydrogen

Germany announces updated hydrogen strategy to meet EU targets, large hydrogen projects announced in the EU.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Germany 	 Hydrogen	<p>German hydrogen strategy revision aims to solidify target to double electrolysis capacity by 2030.</p> <ul style="list-style-type: none"> The German economy ministry (BMWK) aims to solidify targets to double the country's electrolysis capacity - which is needed to split water into hydrogen and oxygen - by 2030 by revising its National Hydrogen Strategy ahead of schedule. The economy ministry aims to reinforce a target of building generation plants with a total capacity of ten gigawatts (GW) by 2030 as stated in the government's coalition agreement. 	1.8°C FPS: Strong policy to develop 100% clean power by 2045	Acceleration. Increased ambition for green hydrogen targets, supportive of RePowerEU targets (10Mt production capacity, 10Mt imports).	<div>6</div> Signals acceleration in policy ambition;
EU 		<p>Integrated battery/electrolyser manufacturer Battolyser Systems to build 1GW factory in the Port of Rotterdam.</p> <ul style="list-style-type: none"> To be located in the M4H area of the port, the 14,000m2 production site is estimated to cost approximately €100m (\$104.2m). 	1.8°C FPS: Strong policy to develop 100% clean power by 2045	Acceleration. Large investments in hydrogen capacity to support RePowerEU targets.	<div>6</div> Signals acceleration in policy ambition;






Technology developments: Renewables (1/2)

Large renewables projects announced, with IEA anticipating significant acceleration in deployment over next five years relative to trend in last two decades. The U.S. and UAE announce US\$100B initiative to support 100GW clean energy globally.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Global 	 Renewables	IEA reports world is likely to add as much green power in next five years as in last 20, citing Ukraine war and high fossil fuel prices likely to trigger 2.4TWh of renewable capacity growth through 2027.	1.8°C FPS: update	Supportive. Significant ramp up in capacity and generation supportive of IPR FPS clean power forecasts.	5 Supportive
Global 		Egypt's \$11bn 15GW wind project aiming to power Europe and Saudi Arabia to be operational by 2030.	1.8°C FPS: Strong policy to develop 100% clean power by 2045 for the EU; by 2060 in Saudi Arabia	Supportive. Announcement of large renewables projects, with likely exports, supportive of achieving 100% clean power.	5 Supportive
Global 		In November, the US, UAE strike deal to spur \$100 billion of clean energy investments with goal to add 100 gigawatts of clean energy globally by 2035 and an agreement to spend \$100bn on clean energy projects. UAE and US will provide technical, project management and funding assistance for commercially and environmentally sustainable energy projects in other countries.	1.8°C FPS: <ul style="list-style-type: none"> Strong policy for the US to develop 100% clean power by 2040 No policy forecast for Saudi Arabia's clean energy sector 	Supportive. Increased investment in clean energy supportive of IPR forecast.	5 Supportive
Australia 	 Renewables	Iberdrola starts up the world's first wind-solar hybrid plant in Australia. The 317 MW total capacity project combines a 210 MW wind farm and a 107 MW photovoltaic plant (50 wind turbines and 250,000 solar panels).	1.8°C FPS: Strong policy to develop 100% clean power by 2050	Supportive. Supportive of Australia forecast for clean power.	5 Supportive




Technology developments: Renewables (2/2)

Solar and wind continue to see massive adoption by countries as the technologies evolve in size, efficiency, cost and capacity.

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Canada 	 Renewables	Canadian Solar to mass produce high-efficiency solar modules (25.0%, which is 1.5% higher than the average cell efficiency of the mainstream products in the market).	1.8°C FPS: Strong policy to develop 100% clean power by 2035	Supportive. Continued innovation/improved efficiencies of solar technology.	5 Supportive
China 		China installs the largest offshore wind turbine. The wind turbines have a unit power of 13.6 MW, blade diameter of 252 meters and are the largest in the world. The wind turbine can generate 63.5 million kWh per year, which can supply of 30,000 homes.	1.8°C FPS: Strong policy to develop 100% clean power by 2050	Supportive. Innovation in wind technology.	5 Supportive
France 		First offshore wind farm in France to be operational by year end (480MW).	1.8°C FPS: Strong policy to develop 100% clean power by 2045	Supportive. Supportive of 40GW offshore wind by 2050 target.	5 Supportive
South Korea 		South Korean city of Daegu signs agreement with Hanwha Asset Management to build 1.5 GW solar project at industrial site and on rooftops. Site will be the country's largest PV installation upon completion (in comparison to largest current solar project, a 200MW plant under construction at a former salt farm in Sinan country, South Jeolla province.	1.8°C FPS: Strong policy to develop 100% clean power by 2045	Supportive. Supportive of FPS pathways for South Korea power sector decarbonization.	5 Supportive




Technology developments: Nuclear

As scientists confirm major breakthrough in nuclear fusion paving the way for abundant clean energy, significant hurdles remain to see the technology turn into viable power plants

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
<div>US</div> <div></div>	<div></div> <div>Nuclear</div>	<div>US scientists confirm ‘major breakthrough’ in nuclear fusion.</div> <ul style="list-style-type: none">After more than a century of research, scientists have confirmed a major breakthrough in nuclear fusion. In the latest experiment, researchers pumped in 2.05 megajoules of laser energy and got about 3.15MJ out – a roughly 50% gain and a sign that fusion reactions in the pellet were driving further fusion reactions.Significant hurdles remain and the technology is far from ready to turn into viable power plants.	1.8°C FPS: Strong policy to develop 100% clean power by 2040	Supportive. Potential for commercial demonstration in the 2030s.	<div>5</div> <div>Supportive</div>
<div>UK</div> <div></div>		<div>£77 Million Funding for Advanced Reactors & Nuclear Fuel.</div> <ul style="list-style-type: none">The funding includes £77 million (€89m) to bolster nuclear fuel production and support the development of the next generation of advanced nuclear reactors.	1.8°C FPS: Strong policy to develop 100% clean power by 2040	Supportive. Government support for advanced nuclear reactors.	<div>5</div> <div>Supportive</div>



Technology developments: Heat pumps, direct air capture technologies

Increased heat pump penetration in Europe. The U.S. allocates \$3.7bn in Infrastructure Law funding to finance four direct air capture hubs

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Germany 	 Heat pump	<p>Heat pumps installed in over half of all new buildings in Germany in 2021</p> <ul style="list-style-type: none"> More than 170,000 heat pumps were sold in the country last year, half of which went into existing buildings. However, gas-fired heating systems still dominated the market overall, with 680,000 new heating systems being installed in new and existing buildings last year. In a bid to improve Germany's record in achieving emission reductions in the buildings sector, the German government has said it aims to install half a million new heat pumps a year, a target that has been described as "ambitious but feasible" by the industry. 	1.8°C FPS: 100% zero carbon heating by 2035	Supportive. This target, alongside REPowerEU likely upgrades deployment assumptions for HPs in Europe.	6 Signals acceleration in policy ambition;
US 	Direct air capture technologies	<p>In December, U.S. Energy Department announced USD 3.7 billion spend for carbon removal</p> <ul style="list-style-type: none"> The US Department of Energy has formally allocated USD 3.7bn to finance four direct air capture hubs, a plan that has previously been announced. The funding comes from the 2021 Bipartisan Infrastructure Law. 	1.8°C FPS: US\$65 by 2030	Supportive. Deployment of government funding to support commercialisation of direct air capture carbon removal technologies.	5 Legislated; supportive





Technology developments: Batteries (1/2)

Batteries have made substantial leaps in technology, innovation, and capacity in storage that will support the faster deployment of renewable projects as well as accelerate adoption of EVs

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
UK 	 Clean power	<p>Massive developments in batteries technology, production and capacity in Q4:</p> <ul style="list-style-type: none"> UK's Zenobē begins work on US\$900 million Scotland battery storage portfolio – three battery projects at Blackhillock, Kilmarnock South and Eccles in Scotland, which will total £750 million (US\$892 million) of investment will provide 4.4GVAs of inertia. Tesla builds 'Europe's largest battery' near Dogger Bank offshore wind power landfall - The storage technology giant built the 98MW/196MWh Pillswood battery using its Megapack technology for Harmony Energy Income Trust. Pillswood – which Harmony Energy says can store enough energy to power about 300,000 homes for two hours. UK clean energy developer Harmony Energy brings online a 98MW/196MWh battery energy storage system (BESS) project. It was originally planned to go online over two phases in December 2022 and March 2023; the plans, however, were accelerated to support National Grid in providing stability to the UK's power supply. 	1.8°C FPS: Strong policy to develop 100% clean power by 2040	Supportive. Investment in storage/grid services support/manage achieving 100% clean power.	<div>5</div> <div>Supportive</div>




Technology developments: Batteries (2/2)

Batteries have made substantial leaps in technology, innovation, and capacity in storage that will support the faster deployment of renewable projects as well as accelerate adoption of EVs

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
	 Battery technology	<ul style="list-style-type: none"> Continental Europe's biggest battery system inaugurated by Corsica Sole in Belgium - The system is the first of three 100MWh projects in Belgium that have been slated to come online before the end of the year. The system will help to ensure the stability of frequency in the European electricity network. Europe to hit 9.3GWh of residential battery storage by end of 2022 - Residential battery storage capacity in Europe is set to reach 9.3GWh by the end of this year, according to SolarPower Europe. That is in the solar PV industry trade body's Medium Scenario, which estimates the continent will reach 39.9GWh of residential storage by 2026. 	1.8°C FPS: Strong policy to develop 100% clean power by 2045	Supportive. Investment in storage projects to manage increasingly decarbonized grid.	<div>5</div> <div>Supportive</div>
	 Battery technology	<ul style="list-style-type: none"> Battery boom begins in Texas, California, amid concern over power grid - The Department of Energy estimates that 21 gigawatts of storage capacity will plug into U.S. power grids before 2026, more than two and half times the amount now in operation. Almost 8 gigawatts of batteries are expected to be built in Texas. Crimson Energy Storage 350MW/1,400MWh battery storage plant comes online in California - The newly operational standalone battery project is among the world's largest. 	1.8°C FPS: Strong policy to develop 100% clean power by 2040	Supportive. Investment in storage projects to manage increasingly decarbonized grid.	<div>5</div> <div>Supportive</div>









Technology developments: Electric Vehicles

Countries are investing in ramping up EV charging infrastructure to stimulate the adoption of electric vehicles and achieve their country targets in phasing out fossil fuel cars

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
US 	 EV charging infrastructure	<p>California Public Utilities Commission unveils five year, \$1 bn plan to build EV charging network for medium/heavy-duty trucks as well as multi-unit family dwellings.</p> <ul style="list-style-type: none"> Under the decision, 70% of the funds will go towards charging for medium-and heavy-duty vehicles, which are responsible for a disproportionate share of greenhouse gas (GHG) emissions and other air pollutants from the transportation sector, and 30% will go towards light-duty charging at or near multi-unit dwellings. 	1.8°C FPS: 100% ZEV sales from 2045	Supportive. Infrastructure to support heavy duty vehicle transition.	5 Supportive
UK 		<p>UK Councils are aiming to to double EV charging capacity.</p> <ul style="list-style-type: none"> UK councils are set to install more than 16,500 electric vehicle (EV) charging points over the next 12 months, which will double the number of public chargers currently installed by local authorities. <p>UK unveils first large-scale lithium refinery to boost EV supply chain.</p> <ul style="list-style-type: none"> The UK's first large-scale merchant lithium refinery has been announced, providing battery grade materials to bolster the electric vehicle (EV), renewable energy and consumer technology supply chains. 	1.8°C FPS: 100% ZEV sales from 2035	Supportive. Infrastructure to support EV deployment.	5 Supportive







Technology developments: Agriculture

The growth of alternative proteins is expected to continue with increased financing and regulatory approvals. Venture capital flows into climate-smart agricultural solutions

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Global 	 Agriculture	Venture capital groups invested US\$1.05 billion into alternative protein producers in the first half of 2022, a 174% increase from US\$384.13 million during the same period last year.	1.8°C FPS: Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock by 2030	Supportive. Private sector investment in alternative proteins.	5 Supportive
US 	 Agriculture	UPSIDE Foods receives U.S. FDA "Green Light" for Cultivated Meat: •FDA Accepts UPSIDE's Conclusion That its Cultivated Chicken is Safe to Eat.	1.8°C FPS: Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock by 2030	Acceleration. Increased prospects for regulatory approval of alternative proteins.	6 Signals acceleration
US 	 Agriculture	Agtech company Sound Agriculture announces US\$75M funding to advance climate-smart agriculture and sustainable food production. Funding to focus on nutrient efficiencies to increase nitrogen fixation and phosphorus solubilization, with potential to reduce need for synthetic fertilizer in corn by up to 50lbs per acre while maintaining (or enhancing) yields.	1.8°C FPS: Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock by 2030	Supportive. Innovation in nitrogen fixation, fertilizer efficiencies.	5 Supportive
UK 	 Food chain	UK-based investment manager Isara announces launch of £300M fund to improve efficiency, quality, sustainability of food supply systems across the UK, Ireland, and Western Europe.	1.8°C FPS: Nationwide market incentives to encourage farmers to reduce emissions from crop production and livestock by 2030	Supportive. Capital raised for sustainable food chains.	5 Supportive







Technology developments: Land Use and Forestry (1/2)

Multiple announcements of capital flowing into forestry and nature-based solutions projects

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
Global 	 Forestry	Kebony raises \$34M to make sustainable softwood behave like hardwood, using food waste.	1.8°C FPS: End of deforestation by 2025	Supportive. Innovation in sustainable timber production.	5 Supportive
Global 	 Nature based solutions	Robeco to launch Biodiversity Equities strategy to promote biodiversity. The strategy will invest in companies that support the more sustainable use of natural resources and ecosystem services, as well as the technologies, products and services that help to reduce biodiversity threats or restore natural habitats.	1.8°C FPS: End of deforestation by 2025	Supportive. Capital flows towards biodiversity protection.	5 Supportive
Australia 	 Forestry	Global investment manager New Forests launches new Australia New Zealand Landscapes and Forestry fund with goal to raise AUS \$600M over next 2-3 years to invest in sustainable forestry, natural capital, and agriculture.	1.8°C FPS: End of deforestation by 2025 for Australia	Supportive. Capital flows in forestry and nature-based solutions.	5 Supportive

Technology developments: Land Use and Forestry (1/2)

Multiple announcements of capital flowing into forestry and nature-based solutions projects

Region	Sector	Development	2021 IPR Forecast	Impact on forecast	Impact score
EU 	 Forestry	Circular economy leader NORNORM secures €110 million in scale up funding to extend lifecycle of office furniture by 3x.	1.8°C FPS: End of deforestation by 2025	Supportive. Emergence and scaling of finance for circular economy practices to reduce timber consumption.	5 Supportive
US 	 Forestry	Rubicon Carbon, a carbon credit firm created by US alternative asset manager TPG, to help companies offset their emissions, expects to raise \$1 billion in capital.	1.8°C FPS: End of deforestation by 2025	Supportive. Scaling of forest carbon finance.	5 Supportive
US 	 Forestry	A consortium led by Oak Hill Advisors bought 1.7M acres of hardwood timberland across US for \$1.8 Bn to reduce logging and boost forest carbon deals.	1.8°C FPS: End of deforestation by 2025	Supportive. Scaling of forest carbon finance.	5 Supportive

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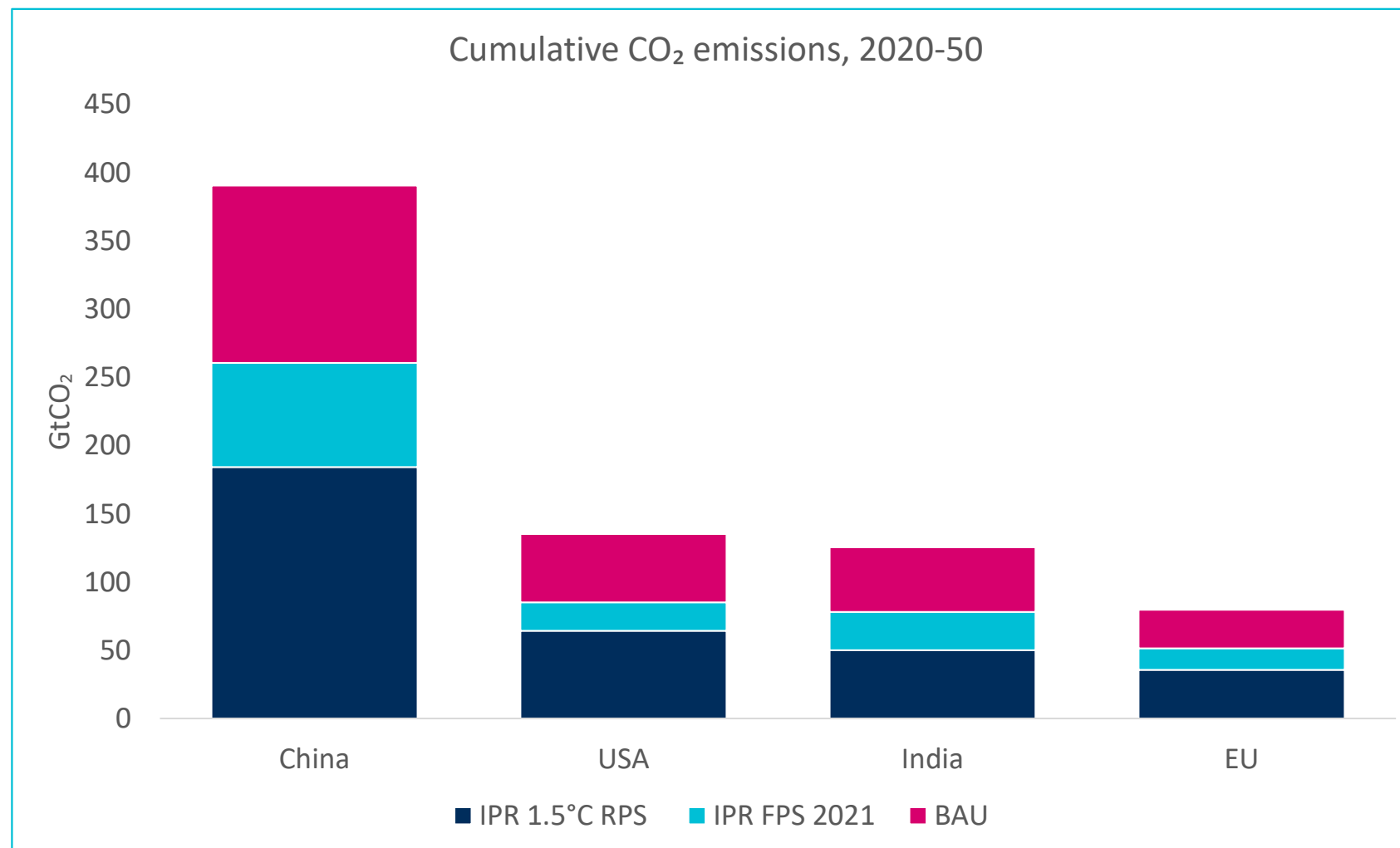
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Appendix

References

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

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 GtCO₂ reduction beyond FPS across all policies
- 4.9 GtCO₂ 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 GtCO₂eq reduction beyond FPS across all countries
- 4.3 GtCO₂eq reduction beyond FPS in India alone

IPR 2021 top ten policy forecasts

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/tCO ₂ 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.

Note: Emissions reduction are approximate and include come additional sector-specific CO₂ reduction such as energy efficiency

IPR 2021 top ten policy forecasts

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

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

Deforestation of natural forest halted through command and control policy

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

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

Some countries achieve net zero CO2 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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