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PRELIMINARY DASHBOARD****JT03481988**

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## *International Programme for Action on Climate (IPAC) – Preliminary Dashboard*

1. The International Programme for Action on Climate (IPAC) was established by the Council on 19 April 2021 [[C\(2021\)63/REV1](#)] and launched at the Part One of the 2021 MCM in May 2021.<sup>1</sup> IPAC will provide information and tools to monitor, evaluate and improve the effectiveness of participating countries' climate actions, and enable countries to measure and achieve progress in meeting their own climate goals. It will enable the sharing of good practices and provide targeted policy advice that is complementary to the United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement<sup>2</sup>.
2. IPAC is articulated around four components:
  - The **IPAC Dashboard**, composed of key climate-related indicators, will provide an overview of country progress and trajectories toward net-zero. The Dashboard derives from a broader set of climate-related indicators that provides additional detail. It takes the form of an interactive web page, with data visualisation tools.
  - The **Annual Climate Action Monitor**, based on the Dashboard and supported by a policy framework, will provide a digest of country progress towards their own climate objectives and their alignment with Paris Agreement goals<sup>2</sup>, and give examples of good practices and results. The first edition of a web-based monitor will be available for the COP26 in November 2021.
  - **IPAC Country Notes** with targeted policy advice, to assist in the design of coherent and phased mitigation and adaptation actions that are economically viable and sound, as well as socially acceptable (due to be available in 2022).
  - The IPAC **Interactive Platform** for dialogue and mutual learning across countries (due to be available in 2022).

### 1. The approach to IPAC indicators

3. The availability of harmonised and analytically sound indicators is a cornerstone of IPAC. The selection of IPAC indicators builds on the conceptual frameworks elaborated by the OECD for the development, measurement and use of environmental and green growth indicators, adapted to climate change issues. It builds on existing OECD and other international indicator sets, and on a large climate-related information base available from the OECD, the International Energy Agency (IEA), the International Transport Forum (ITF), the Nuclear Energy Agency (NEA) and other international sources, including the UNFCCC (Figure 1).
4. The IPAC indicator framework uses an adapted “pressure-state-response” model (Figure 2). This adapted model integrates the topics covered in the assessments of the IPCC and used in the United Nations Statistical Division (UNSD)<sup>3</sup> and United Nations Economic Commission for Europe (UNECE)<sup>4</sup>

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<sup>1</sup> [2021-Ministerial-Council-Statement-Part-I.pdf \(oecd.org\)](#).

<sup>2</sup> For countries that are Party to the Paris Agreement.

<sup>3</sup> [https://unstats.un.org/unsd/envstats/ClimateChange\\_StatAndInd\\_global.cshhtml](https://unstats.un.org/unsd/envstats/ClimateChange_StatAndInd_global.cshhtml)

<sup>4</sup> <https://unece.org/statistics/climate-change>

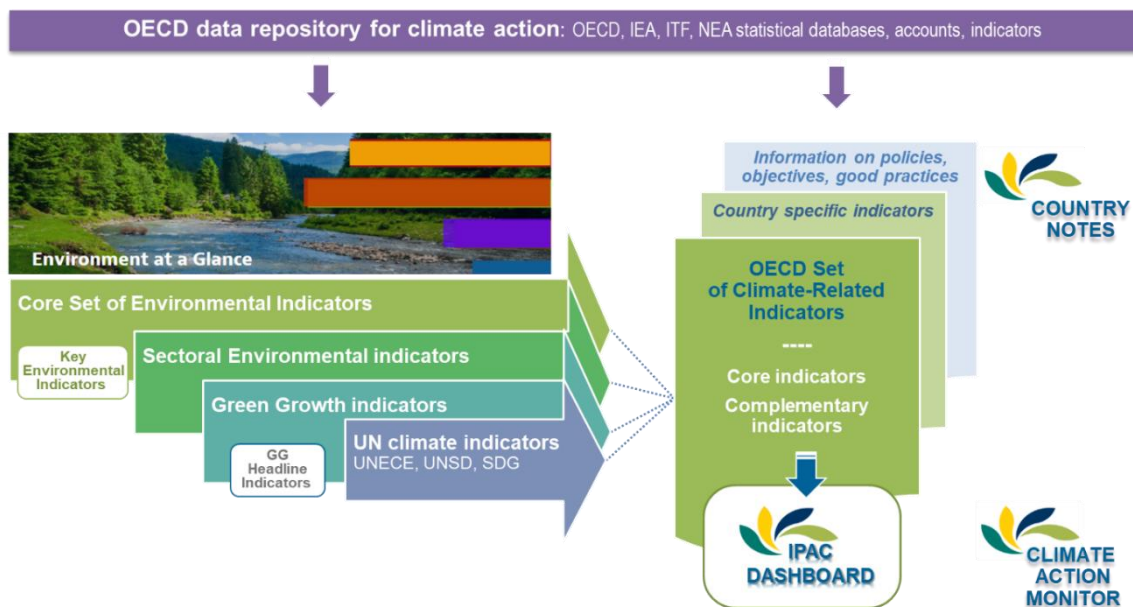
indicator frameworks. Synergies with the IMF Climate Change Indicators Dashboard on which the OECD co-operates are also being used.<sup>5</sup>

5. A number of criteria are used for validating the choice of the indicators. It is important that the indicators be policy relevant and of value for users, as well as be analytically sound and measurable.<sup>6</sup>

6. The IPAC Dashboard seeks to provide a common means of understanding to measure progress toward climate goals. Together with the Climate Action Monitor and a broader set of IPAC indicators, it will provide key insights on climate action and progress.

7. The broader set of indicators, from which the Dashboard is derived, will inform the IPAC Country Notes and other climate-related work undertaken in the OECD. Together they will provide a basis for better understanding the performance of specific policies or policy packages and assist in evaluating their outcomes. The broader set will be accompanied with country-specific indicators and information on national climate policies and targets (e.g. NDCs) to enable tailored assessments and policy recommendations at the country level<sup>7</sup>.

**Figure 1. Climate-related indicators for IPAC – Foundations and architecture**

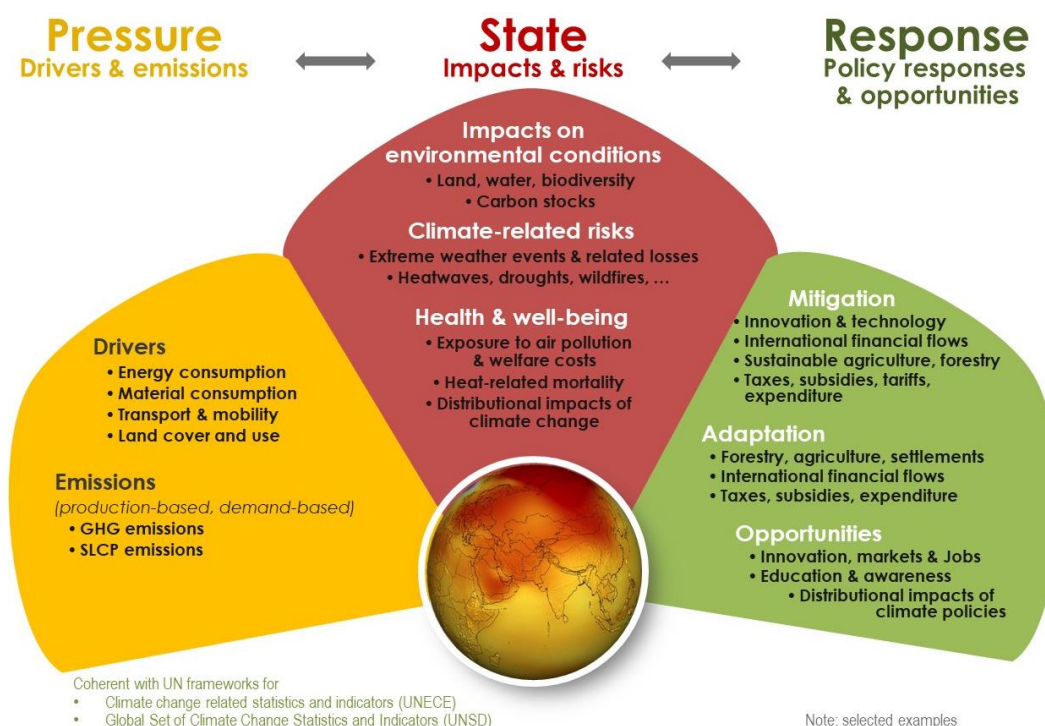


<sup>5</sup> <https://climatedata.imf.org>

<sup>6</sup> Data will be sourced from official sources or otherwise validated by countries or OECD Committees. No additional regular reporting on data underlying the indicators is expected from governments.

<sup>7</sup> The broader set of indicators is being refined and an updated version is expected to be available in mid-2022.

Figure 2. The OECD conceptual framework for climate-related indicators



## 2. The preliminary IPAC Dashboard

8. The IPAC Dashboard endeavours to provide key messages and a balanced snapshot of climate action and progress towards climate goals, and to display an overarching strategic vision to become a reference. It is important that it includes indicators that are different and complementary to indicators already used in other fora.

9. The key indicators selected for the preliminary Dashboard derive from the broader IPAC indicator set that covers additional aspects and provides further detail. Many of these indicators are available and regularly used in OECD work. Some indicators still require further refinement and specification. A few need more methodological and measurement work.

10. The preliminary IPAC Dashboard will be enhanced and extended as data and methodologies evolve. It is complementary to the OECD “Dashboard to Monitor a Strong, Resilient, Green and Inclusive Post-COVID-19 Recovery” [C(2021)95]. The Post-COVID-19 Recovery Dashboard considers environmental factors alongside economic and social factors, consistently with the broader OECD statistical agenda “on GDP and beyond”. Its environmental pillar focuses on monitoring progress towards achieving a people-centred green transition with IPAC-consistent indicators on climate change, renewable energy, circular economy, biodiversity and the environmental quality of life. Main findings from the Post-COVID-19 Recovery Dashboard would inform the IPAC Annual Climate Monitor and highlight the role of climate action in countries’ post-COVID 19 recovery.

11. Table 1 presents the 7 indicators and 3 placeholders for indicators yet-to-be developed, their sub-indicators, the rationale behind the indicator choices, the data sources and the tentative deliverables for the COP26.

12. The structure of the IPAC Dashboard uses the OECD Pressure-State-Response model (Figure 2) adapted to climate change. Building on the OECD’s expertise and value added, it focuses on direct

“pressures” (i.e. emissions) and on “responses” (i.e. actions and opportunities) that are at the heart of IPAC. A few “state” indicators complete the picture by reflecting some key impacts and risks arising from climate change.

### 3. Pressure indicators

13. “Pressure” indicators focus first on GHG emission trends and trajectories that indicate whether countries are on track to reach their targets. The objective is to measure progress towards national targets and GHG neutrality. The proposed key indicators show emission trends, distance to targets, and net-zero trajectories for countries that have committed to this path. They reflect direct pressures on climate and the results of policy action.

14. The indicator on net-zero emission trajectories poses specific measurement difficulties. The best way to define, measure and present net-zero trajectories will be further discussed with countries and experts in the months ahead. Achieving net-zero GHG emissions has become a pillar of efforts to support the long-term temperature goal of the Paris Agreement (Article 4.1)<sup>8</sup>, and a growing number of countries are committing to reach net-zero around 2050. However there are significant differences between countries’ targets and their scope, some diversity as regards the timeframes for achieving net-zero, and a gap between these long-term commitments and the concrete actions being implemented in the near-term<sup>9,10</sup>. This makes it difficult to compare the different approaches and targets and assess their implications for the global temperature goal. There are also questions surrounding the concept of net-zero, and uncertainties remain in tracing a net-zero trajectory, due to the difficulties of accounting for carbon sinks and the varying rhythms of emission decreases that depend on national circumstances.

15. Emission intensities (per GDP and per capita) are added to facilitate the comparison of emission levels across countries, inform about countries’ contributions to global emissions and monitor the economy’s efficiency in decoupling emissions from output, considering countries’ different levels of economic development and growth. Emissions by source inform about main emitters and sectors where climate action is most needed. They can be linked to drivers such as energy and material use, transport and mobility, and to developments in sectors such as agriculture, forestry, construction.

16. CO<sub>2</sub> emissions from fuel combustion provide complementary information on the role of energy use in achieving climate goals. Demand-based measures (also called footprints) of CO<sub>2</sub> emissions provide a useful complement to production-based measures. They help understand how domestic final demand influences emissions abroad and how much of a country’s emission reductions is due to the implementation of domestic policies and how much to displacement or substitution effects. They also help raise awareness about the “indirect” contribution of a country’s final demand to global emission trends.

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<sup>8</sup> Article 4 of the PA specifies that, to achieve the long-term temperature goal, countries should aim to reach global peaking of GHG emissions as soon as possible, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks in the second half of the century.

<sup>9</sup> The 50 countries currently covered under IPAC are disproportionately likely to have a net-zero plan enshrined in law, proposed legislation, or policy document. As of July 2021, twelve countries had a net-zero plan enshrined in law, three had legislative proposals, and 18 had policy documents. Of the remaining countries without a net-zero national plan, 9 are EU member states covered by the EU-wide pledge. National approaches vary as regards the gases and sectors covered, the use of carbon markets. Although most countries covered aim to achieve net-zero by 2050, five have earlier targets and two have later targets. A few have no net-zero commitment. For a more in-depth analysis of net-zero, see S. Jeudy Hugo, L. Lo Re and C. Falduto (forthcoming) “Understanding Countries’ Net-Zero Emissions Targets”.

<sup>10</sup> Thirty-six countries covered under IPAC have submitted Long Term Strategies (LTS) to the UNFCCC.



#### 4. State indicators

17. “State” indicators reflect climate-related impacts on environmental conditions, climate-related risks and vulnerabilities, and impacts on well-being). Assessing climate-related impacts, risks or vulnerability is key to identify adaptation needs and guide adaptation measures. But finding a single key indicator suited to cross-country comparisons and easy to interpret is challenging. Climate-related impacts and risks are very specific to each country’s national and territorial circumstances; they vary across and within countries and across different social groups. For the preliminary Dashboard, it was therefore decided to focus initially on weather-related impacts, such as temperature anomalies or changes and extreme weather events. More work is needed to reflect seasonal and sub-national extremes, and to capture other important climate-related impacts. Climate-related vulnerabilities and inequalities in exposure to climate hazards have been left as a Dashboard placeholder for priority development (see Section 3). To note that other climate related impacts and risks are covered in the broader set of IPAC indicators.

#### 5. Response indicators

18. “Response” indicators focus on mitigation measures for which indicators are readily available and well developed (climate-related pricing, taxation and innovation). The focus is on general government measures directly aimed at (or having a direct bearing on) emissions, such as pricing and taxation, which cover many of the mitigation tools at countries’ disposal. These instruments are important for governments to shape relative prices of goods and services, and to decarbonise the more carbon-intensive sectors. An indicator on the stringency of climate policies, currently being developed, will capture a wider range of market- and non-market-based policies for climate change mitigation. An indicator on changes in the energy mix is added to reflect both drivers behind GHG emissions and the effects of policies that encourage a shift towards low-carbon energy sources.

19. Placeholders have been added in the preliminary Dashboard for a few highly desirable indicators that might be included in future editions and whose development is seen as a priority by many countries: climate-related budgets, expenditure and finance, adaptation measures and labour market opportunities arising from climate action. These are all key elements of countries’ climate action that, combined with other policy responses, play an important role in countries’ post-COVID-19 recovery. Other policy instruments are covered in the broader list of IPAC indicators, or will be addressed in the IPAC country notes.

20. The IPAC focus on “responses” adds to the UNFCCC’s current focus on pressures. It will also complement and have synergies with the reporting envisaged under the MRV (monitoring, reporting and verification) requirements of the UNFCCC and the Enhanced Transparency Framework (ETF) of the Paris Agreement, which are in a transition phase towards a new consolidated reporting system. IPAC focuses on internationally comparable and sound policy indicators that go beyond the information to be provided in countries’ transparency reports. IPAC’s work is annual, starting in 2021, as opposed to the biennial nature of the Reporting under the ETF that will start in 2024.

**Table 1. PRELIMINARY IPAC DASHBOARD**

Indicator	Components/sub-indicators	Rationale	Data sources/availability	Deliverable for COP26*
<b>PRESSURE - Emissions</b>				
<b>1 GHG emission trends and trajectories</b>	<ul style="list-style-type: none"> <li>▶ <b>GHG emission trends</b> % change and distance to NDC targets (annual emissions, in CO<sub>2</sub>-equivalent, including and excluding LULUCF)</li> </ul>	<p>Monitoring GHG emission trends is at the core of countries' climate action and key to measuring progress towards national targets.</p> <p>Related indicators reflect both direct pressures on climate and the results of policy action.</p>	UNFCCC; OECD	Yes (except distance to targets)
	<ul style="list-style-type: none"> <li>▶ <b>Net-zero emission trajectories</b> (distance to GHG neutrality) for countries committed to net-zero To be developed (considering NDCs and LTS)</li> </ul>	<p>Visualising the emission trajectory towards GHG-neutrality is essential to guide policy action and close the gap between long-term commitments and concrete short-term actions.</p>	UNFCCC; OECD, IEA	To be developed
<b>2 GHG emission structure and intensities</b>	<ul style="list-style-type: none"> <li>▶ <b>GHG emissions by source</b> (inventory sector); (distance to targets, if in NDC)</li> <li>▶ <b>GHG emission intensities</b> per unit of GDP and per capita; level and % change</li> <li>▶ <b>CO<sub>2</sub> emissions from fuel combustion</b> production-based; demand-based (footprint)<sup>(5)</sup></li> </ul>	<ul style="list-style-type: none"> <li>▶ The emission structure by source helps identify the main emitters and the sectors where policy action is most needed.</li> <li>▶ Emission intensities per unit of GDP reflect the economy's efficiency in decoupling emissions from output.</li> <li>▶ Emission intensities per capita facilitate the comparison of emission levels across countries and inform about a country's contribution to global emissions.</li> <li>▶ CO<sub>2</sub> emissions from fuel combustion are a major source of anthropogenic GHG emissions and play an important role in countries' mitigation efforts.</li> <li>▶ Demand-based CO<sub>2</sub> emissions<sup>(5)</sup> help understand how much of a country's emission reduction is due to the implementation of domestic policies and how much to displacement or substitution effects.</li> </ul>	UNFCCC; OECD; IEA	Yes (except distance to targets)
<b>STATE – Impacts and risks</b>				
<b>3 Climate-related impacts on environmental conditions</b>	<ul style="list-style-type: none"> <li>▶ <b>Mean temperature anomaly</b> and surface temperature change</li> <li>▶ <b>Other impacts:</b> indicators to be defined</li> </ul>	<p>Temperature changes are a widely used indicator for global warming that can be related to GHG emissions. Monitoring the mean temperature anomaly at a national level helps understand the relative importance of year-to-year variability and the longer-term changes caused by human activities. To be complemented with information on sub-national and seasonal variations.</p> <p>Other physical measures, such as on precipitation, burned area and drought, would complete the picture by showing how climate change is affecting ecosystems.</p>	<p>Mean surface temperature data: FAO, NASA.</p> <p>Temperature anomaly: data by country require further work.</p>	Yes (surface temperature)



Indicator	Components/sub-indicators	Rationale	Data sources/ availability	Deliverable for COP26*
<b>4</b> Climate-related risks: occurrence of extreme weather events (hurricanes, storms, wildfires, flooding, drought etc.)	<ul style="list-style-type: none"> <li>▶ <b>Number of events</b> or number of days per year when extreme weather events occurred.</li> <li>▶ <b>Number of deaths and missing persons</b> per 100,000 population</li> <li>▶ <b>Direct economic loss</b> in relation to GDP</li> </ul>	<p>Assessing climate risks is key to identify adaptation needs. The focus is on extreme events and related losses whose increase is an established fact (IPCC).</p> <p>The number and the variability over time indicate how climate change is affecting different countries and at what speed. To be complemented with information on sub-national and seasonal variations.</p>	To be explored Some data are available from reinsurance companies and the EEA <sup>(1)</sup>	Further work required
<b>5</b> Climate-related vulnerabilities and impacts on well-being	<p><b>Placeholder</b></p> <ul style="list-style-type: none"> <li>▶ Indicator(s) on the socio-economic inequality in the exposure to climate-related hazards (tbd)</li> </ul>	To guide adaptation we need to know what the risks are, where and for whom. As vulnerability tend to be context-specific, the challenge is to find an indicator that is relevant for most countries and territories.	Copernicus, JRC, NASA, JAXA, Global Precipitation Climatology Centre, OECD.	Under development
<b>RESPONSE – Actions and opportunities</b>				
<b>6</b> Changes in the energy mix	<ul style="list-style-type: none"> <li>▶ <b>Energy mix</b> in total supply in electricity production</li> <li>▶ Distance to targets (if in NDC)</li> </ul>	Widely used indicator that reflects both drivers behind GHG emissions and the effects of policies that encourage a shift in the energy mix (renewables including biomass; fossil fuels; nuclear).	IEA, NEA	Yes, except distance to targets
<b>7</b> Climate-related pricing and taxation	▶ (Net) <b>Effective carbon rates (ECR)</b> Share of CO <sub>2</sub> emissions priced, by benchmark price <sup>(3,4)</sup>	Carbon pricing encourages the shift of production and consumption choices towards low- and zero-carbon options. ECRs measure carbon pricing of CO <sub>2</sub> -emissions from energy use.	OECD	Yes for ECR Net ECR under development
	▶ <b>Climate related tax revenue</b> as % of total tax revenue and of GDP	Climate-related taxes are an important instrument for governments to shape relative prices of goods and services.	OECD	Yes
<b>8</b> Climate-related innovation	▶ <b>RD&amp;D budgets on renewable energy and other low-carbon technologies</b> as % of total public energy RD&D	Ensuring continuous improvements in renewable energy and other low-carbon technologies and their broad diffusion internationally is essential in a transition to net-zero emissions globally.	IEA	Yes (renewable energy)
	▶ <b>Development and international diffusion of climate change mitigation technologies</b> , patented inventions (a) as % of total technologies, by inventor's residence; (b) as % of foreign inventors, by patent office		OECD	Yes (technology development)
<b>9</b> Climate policy stringency	<p><b>Placeholder</b></p> <ul style="list-style-type: none"> <li>▶ <b>Climate policy index</b></li> </ul> <p>Composite indicator incorporating quantitative and qualitative information on policy instruments related to climate.<sup>(2)</sup></p>	Stringent climate policies are necessary to provide effective incentives to businesses and households to modify their consumption and production patterns or otherwise change their behaviour in ways that are less emission-intensive.	OECD	Under development
<b>10</b> Other policy responses and socio-economic opportunities	<p><b>Placeholder</b> for :</p> <ul style="list-style-type: none"> <li>▶ <b>Adaptation measures</b></li> <li>▶ <b>Climate budgets, expenditure, finance</b></li> <li>▶ <b>Labour market developments</b></li> </ul>	These placeholders reflect key aspects of climate action and of the associated socio-economic opportunities and for which indicators are needed.		To be developed

Notes: \* indicates whether the listed indicator or sub-indicators can be tentatively compiled in time for the COP 26.

(1) EEA data cover EEA member countries and the UK (fatalities, economic losses). Data on natural disasters are available from the UN SDG database (as of 2005).

(2) It will build on an adapted environmental policy stringency (EPS) methodology to capture a wide range of market- and non-market-based policies for climate change mitigation, including policies directed at the abatement of methane and nitrous oxide emissions. It will draw on and further expand the policy microdata in the OECD [PINE database](#) and other sources (e.g. the [“Climate Change Laws of the World inventory”](#)).

(3) EUR 30/tonne of CO<sub>2</sub> represents a historic low-end price benchmark of carbon costs in the early and mid-2010s, consistent with a slow decarbonisation scenario by 2060; EUR 60/t represents a low-end 2030 and mid-range 2020 benchmark according to the High-Level Commission on Carbon Pricing. EUR 120/t represents a central estimate of the carbon price needed in 2030 to decarbonise by mid-century under the assumption that carbon pricing plays a major role in the overall decarbonisation effort.

(4) The environmental effectiveness of taxes and tradable permits on carbon may be hampered by direct and indirect government support to fossil fuels. The calculation of net effective carbon rates will reflect all subsidies on fossil fuels relevant to energy use beyond tax expenditure data already covered in ECR.

(5) Data on CO<sub>2</sub> emissions embodied in final domestic demand are available from the OECD. They are estimated using the OECD inter-country input-output (ICIO) database combined with bilateral trade data and production-based CO<sub>2</sub> emissions from fuel combustion available from the IEA.

## 6. Preliminary indicator development agenda

21. The preliminary list of Dashboard indicators and the broader set of indicators are a first step in the work on IPAC data and indicators. This work will evolve over time, as new or improved data and methodologies become available, and as discussions with countries and experts progress.

22. The Technical Expert Group (TEG) of IPAC has identified several measurement gaps on important aspects of climate action that are not yet well covered due to the lack of methodologically sound, policy-relevant and measurable indicators. In light of this, the TEG together with the Secretariat has prepared a preliminary indicator development agenda building on ongoing, planned and proposed development work across the OECD, IEA, ITF and NEA. Ongoing and planned work on indicators that could become available in the short- to medium-term, include work on measuring demand-based GHG emissions, quarterly and subnational GHG emissions, exposure to climate-related hazards, fossil fuel support with international benchmarks and climate policy stringency.

23. An important issue that will be addressed in the short term concerns the way to define the indicator on emission trajectories towards GHG neutrality. Here, concrete proposals on how to define the net-zero concept and on how to measure and present trajectories to net-zero need to be developed.

24. Indicator developments that could be prioritised relate to:

- The social aspects of climate action such as inequality of exposure to climate hazards, distributional implications of climate policy, climate-related jobs and skills, impact of climate policy on the labour market.
- Climate-related public budgets, expenditure and finance flows.
- Climate adaptation measures.
- The agriculture & forestry sector and the role of land use, land use change and forestry (LULUCF).

# Acronyms

CLG:	(IPAC) Committee Leadership Group
COP:	Conference of the Parties (UNFCCC)
ECR:	Effective Carbon Rate
EEA:	European Environment Agency
EPOC:	(OECD) Environmental Policy Committee
EPS:	Environmental Policy Stringency
ETF:	Enhanced Transparency Framework (Paris Agreement)
EU:	European Union
GDP:	Gross Domestic Product
GHG:	Greenhouse Gas Emissions
HP:	Horizontal Project on Building Climate and Economic Resilience in the Transition to a Low-carbon Economy
IEA:	International Energy Agency
IPCC:	Intergovernmental Panel on Climate Change
IPPU:	Industrial Processes and Product Use
ITF:	International Transport Forum
IPAC:	International Programme for Action on Climate
LULUCF:	Land Use and Land Use Change and Forestry
MCM:	(OECD) The Meeting of the Council at Ministerial Level
MRV:	Monitoring, Reporting and Verification (Paris Agreement)
NASA:	National Aeronautics and Space Administration (USA)
NDC:	Nationally Determined Contribution
NEA:	Nuclear Energy Agency
NOAA:	National Oceanic and Atmospheric Administration (USA)
RD&D:	Research and Development and Demonstration
SDG:	Sustainable Development Goal
TEG:	(IPAC) Technical Expert Group
UNECE:	United Nations Economic Commission for Europe
UNFCCC:	United Nations Framework Convention on Climate Change
UNSD:	United Nations Statistics Division