Task Force 2
Climate Change, Sustainable Energy & Environment

Policy brief

INTERNATIONAL COOPERATION TO ACCELERATE THE DEVELOPMENT AND DEPLOYMENT OF THE CIRCULAR CARBON ECONOMY

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ABSTRACT

The lack of international cooperation and agreement surrounding GHG emissions impedes energy transition pathways, including the Circular Carbon Economy (CCE) approach endorsed by the 2020 G20 Summit to advance hard-to-abate sectors towards carbon neutrality. This Policy Brief recommends that the G20 support the development of and adherence to consistent measuring, reporting, and certifying of emissions by industries, along with energy usage. It proposes the G20 adopt a three-point action plan and create a body to implement it: (a) **measuring** emissions over products' lifecycles; (b) **reporting** emissions according to standardised and transparent Generally Accepted Emissions Accounting Principles; and (c) **certifying** GHG-content following internationally recognised methodologies. This plan is indispensable for successfully implementing the CCE and climate change response measures.

CHALLENGE

The main challenges for global energy policy continue to centre around expanding access to the 3 billion people still without clean and sustainable energy[1] while reducing greenhouse gas (GHG) emissions by 7.6% annually until 2030 to keep global temperature rise below 1.5°C of pre- industrial levels, as mandated by the Paris Agreement.[2]

Energy transition pathways must deliver continued economic growth, universal energy access as per UN SDG 7, climate change mitigation as per SDG 13, and decarbonisation targets according to the Paris Agreement. To achieve this, we need to rely on all technologically feasible and economically affordable solutions for reducing emissions to net zero, by 2050 or thereafter, including low-carbon fossil-based fuel technologies.

Various market-based efforts are being pursued to achieve emissions neutrality, including emissions trading and carbon taxes. Article 6 of the Paris Agreement includes three mechanisms for "voluntary cooperation," and sets up a new global carbon market system to achieve decarbonisation at lower costs.[3] Numerous institutions attempt to measure and/or certify emissions.[5] Protocols have been introduced for companies to measure[4] and report their GHG emissions, most comprehensively through the World Resources Institute and the World Business Council for Sustainable Development. Further, the Saudi-presided G20 (2020) endorsed the Circular Carbon Economy (CCE) as a holistic, integrated, and pragmatic approach to managing emissions during the energy transition. The CCE framework – to Reduce, Reuse, Recycle and Remove carbon emissions – can be incorporated in various decarbonisation pathways. Several 2020 T20 Policy Briefs (such as Mansouri et al. 2020) recommended the G20 to enhance CCE in various ways, such as by supporting innovations in carbon management technologies, supporting new internationally led efforts to measure and enhance geological carbon sinks, and coordinating the expansion of a new global low-carbon hydrogen market.

Yet, effectively implementing these decarbonisation pathways and CCE recommendations is currently not feasible due to the lack of international agreement and cooperation on how to quantify, report, and certify emissions, including those from the hard-to-abate sectors that are likely to continue relying on fossil fuel use, possibly for decades. This gap also undermines carbon taxation and raises carbon leakage and incentives to free-ride or under-report.

The difficulty results from and is manifested by the following:

1. There is no single, universally agreed pathway, given countries' different and sometimes competing priorities.[6]
2. Existing globally accepted climate targets are not binding on governments.
3. There is no widely agreed methodology for measuring, reporting, and certifying emissions.

4. Existing GHG standards and protocols are not binding on companies, so the latter are under no legal obligation to measure and report emissions.
5. There are no agreed rules governing carbon market mechanisms (Article 6), transparent reporting requirements, or "common timeframes" for climate pledges and market trading (especially trading surpluses under the clean development mechanism[7], emissions double counting[8], and overall mitigation measures).[9]
6. There is no shared climate governance framework, which permits some countries' measures to have unintended negative implications on others, and on the climate.

PROPOSAL

In order to accelerate decarbonisation pathways and the CCE, enhanced international co-operation is required to standardise the measuring, reporting, verifying, and certification of the emissions content of internationally traded products.

Given the aforementioned challenges, an international institutional and regulatory landscape should be established, while simultaneously offering flexibility and support for domestic implementation in ways that account for each country's resources and development potential.

This Policy Brief (PB) builds upon relevant 2020 T20 Policy Briefs[10] by expanding necessary efforts toward carbon reduction and neutrality in hard-to-abate sectors to achieve the G20's net-zero emissions target by 2050 or thereafter.

Specifically, this PB recommends that the G20 promote the consistent measuring, verifying, reporting, and certification of GHG emissions by all energy and energy-intensive industries, identify institutions able to undertake these processes, and encourage countries' and corporations' adherence to them.

To that end, this PB proposes that the G20 should adopt the following three-point action plan as a framework for enhanced cooperation, and should establish a mixed-membership (public-private) body to implement the plan:

- First, **measure** carbon content in a way that consider products' lifecycles from inception through energy intermediates to final processing;
- Second, **report** and verify emissions in a way that is uniform and transparent following our proposed Generally Accepted Accounting Principles for Emissions (GAAP- E); and
- Third, **certify** GHG-content based on an internationally recognised methodology for relevant internationally traded products.

This action plan is anchored in a standard established at the global level but implemented locally.

The following sections detail the rationale, process, and procedural proposal of the action plan, followed by recommendations for the G20 and expected benefits of the proposal.

RATIONALE

Following the Paris Agreement and related decarbonisation efforts,[11] the upcoming COP26 in Glasgow lays additional emphasis on achieving net-zero emissions by all means possible. Reducing both carbon and methane emissions and leakage is imperative for climate protection and the future of energy. New technologies are being incorporated or tested to

reduce emissions from upstream and production processes.[12] Hydrogen is being considered as a potential low-carbon ("blue") energy carrier produced from natural gas with CCUS (Carbon dioxide Capture, Utilisation and Storage/ Sequestration) or as a "green" carrier produced from renewables.

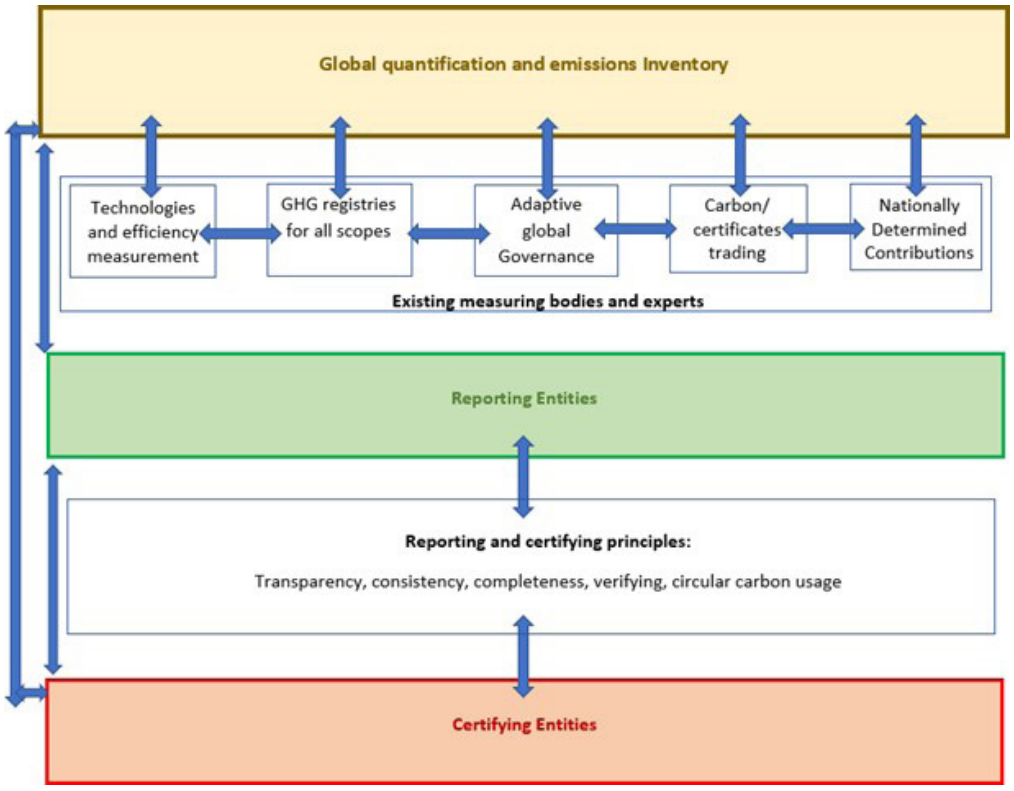
Nevertheless, the lack of international agreement and cooperation has resulted in disparity in the ways of measuring and reporting emissions and in varying national climate policies, threatening the effective use of decarbonisation pathways and CCE implementation.

The rationale behind this PB's action plan is to propose a process that is feasible and implementable. Thus, it must (a) enable countries to agree on and implement global standards; (b) incentivise corporations both to comply with global standards and to invest in emissions-reducing technologies; and (c) facilitate the international trade of goods with certified emissions. The proposal reflects these aims and the complexity of meeting ambitious climate targets which require the integration of climate policy, technology and innovation, trade, and economic sustainability.

THREE-POINT ACTION PLAN PROCESS

The above three-point action plan is based on the following underlying process (Figure 1).

FIG. 1 - PROCESS OF PROPOSED THREE-POINT ACTION PLAN



FIRST: MEASURING

The first action consists of the (on-site) **measuring** of the emissions content of products, initially commencing with major industrial products, considering the lifecycle of each product from inception through energy intermediates (whether power, hydrocarbons, hydrogen, ammonia, petrochemicals, or aluminium) to final production.

This action is important to fill existing gaps and contradictions in measurement methodologies. While the concept of life-cycle emissions is conceptually clear, it is difficult to implement in practice. The various measurement methodologies implemented by different actors for diverse purposes are competing and/or non-convergent. Measurement purposes vary from enhancing energy efficiency to GHG registries, policy requirements, corporate pressure, climate change mitigation, Nationally Determined Contributions (NDC) reporting, carbon pricing, and markets for carbon/certification trading. The use of disparate methodologies for measuring carbon content in the absence of widely accepted rules generates scepticism and accusations of greenwashing.

The common categorisation of emissions in scope 1, 2 and 3 is prone to multiple double counting and fosters confusion; thus, it is badly in need of rethinking and redefinition.

The G20 should therefore leverage existing emissions accounting work done by various (non-) governmental organisations, service companies and experts (including energy and technology enterprises) to validate standard measurement methodologies and mandate the transparent transfer or sharing of emissions content information between different entities and across the supply chain and life cycle of each product. Such sharing can be done through the creation of an emissions inventory similar to that currently proposed for methane by the UNFCCC, in a way accessible to all parties.

The process of measuring emissions should be as follows. It should be specific to each product and production site, rather than just based on industry averages or technology-related parameters. Further, the lower the emissions content of products, achieved through innovative technologies, the more careful and attentive implementation of proven technologies should become; otherwise, incentives to achieve technology progress disappear. Third, measuring emissions should be done on a life-cycle basis throughout the supply chain. The reason is that the specific emissions content of even relatively uniform products, such as a steel bar or aluminium ingot, depends on the GHG emitted during the whole process and therefore on the mineral used, the specific fuel(s) used in the process or in the generation of electricity needed for the process, the implementation of emission-abating measures or lack thereof, and so on. Therefore, the adoption of best practices must open the door to preferential treatment.

While the measurement of the emissions content of diversified manufactured products may be impossible at an early stage of implementing the Action Plan, such measurement is needed immediately for the products of the energy industry (fuels and electricity) and of energy-intensive industries such as petrochemicals, steel, aluminium, cement, glass, and paper.

SECOND: REPORTING AND VERIFYING

The next action is to ensure that measured emissions are reported in a way that is uniform and transparent across countries and industries, and supports net carbon measurement or CCE goals.

There are significant policy gaps in reporting to the UNFCCC for NDC purposes. Domestic regulations towards reporting are neither inclusive nor consistent.[13] Finally, hard-to-abate sectors might not report due to the lack of obligations and/or commercial considerations. The reliance on self-reporting in the absence of agreed standards provides incentives for the misreporting or under-reporting of emissions to attract lower border adjustments, or help companies appear green. Inconsistent reporting for intermediates means their emissions are often neither reported nor included in the net emissions of the final products that use them.[14]

The G20 should create reporting entities globally and nationally to ensure that reporting and verifying are done according to globally accepted standards and principles, namely transparency, consistency, and completeness.

Thus, this PB recommends that the G20 adopt and facilitate the creation of standardised reporting procedures, namely a set of Generally Accepted Accounting Principles for Emissions (GAAP-E). Establishing GAAP-E is an urgent task that requires the active cooperation of specialists, corporations, and international institutions.

To facilitate the decarbonisation of hard-to-abate sectors and to accelerate development of the CCE, GAAP-E should cover all levels of the supply chain and require the sharing of reported emissions data along with the sale of products.

On the basis of the identified GAAP-E, producers of goods and relevant energy-intensive services will be required to report the carbon or emissions content of their products, including through the use of blockchain technology, opening the door to the proper assessment of carbon pricing in all jurisdictions that choose to implement GAAP-E, independently of the specific decarbonisation pathway implemented. This would ensure appropriate accounting for CCUS and incentivise investments in net-zero carbon technologies without penalising producers or technologies that use high emitting goods in their processes. Implementing GAAP-E would also ensure that producers do not move to jurisdictions with less strict emissions reporting and climate policies, thereby reducing carbon leakage.

THIRD: CERTIFYING

The third action is to define and implement GHG emissions content certification by specific recognised bodies, following internationally recognised measuring and reporting methodology for relevant internationally traded products. The certifying body must also rely on common principles, namely transparency, consistency, independence, and completeness including the proper certification of net emissions or CCE usage.

The G20 should promote the definition of a set of GAAP-E as an urgent task that requires the active cooperation of specialists, corporations, and international institutions. This task can only be effectively performed by entities specialising in accounting, reporting, and certification. Industrial associations and other institutions of cooperation among corporates should be tapped to suggest realistic solutions under the guidance of select international regulators.

The imposition of border corrections on internationally traded products will be allowed exclusively on the basis of carbon contents measured according to the GAAP-E and certified through the implementation of blockchain technology under agreed supervision.

The above is an extension of certification experiences which already exist in international trade (such as those for organic products, wool products, and non-genetically modified products). It is proposed to build on the existing capability to aim at reasonable and rapid implementation, initially restricted to a limited range of homogeneous products with comparable specifications, and progressively extended to diversified industrial products and services.

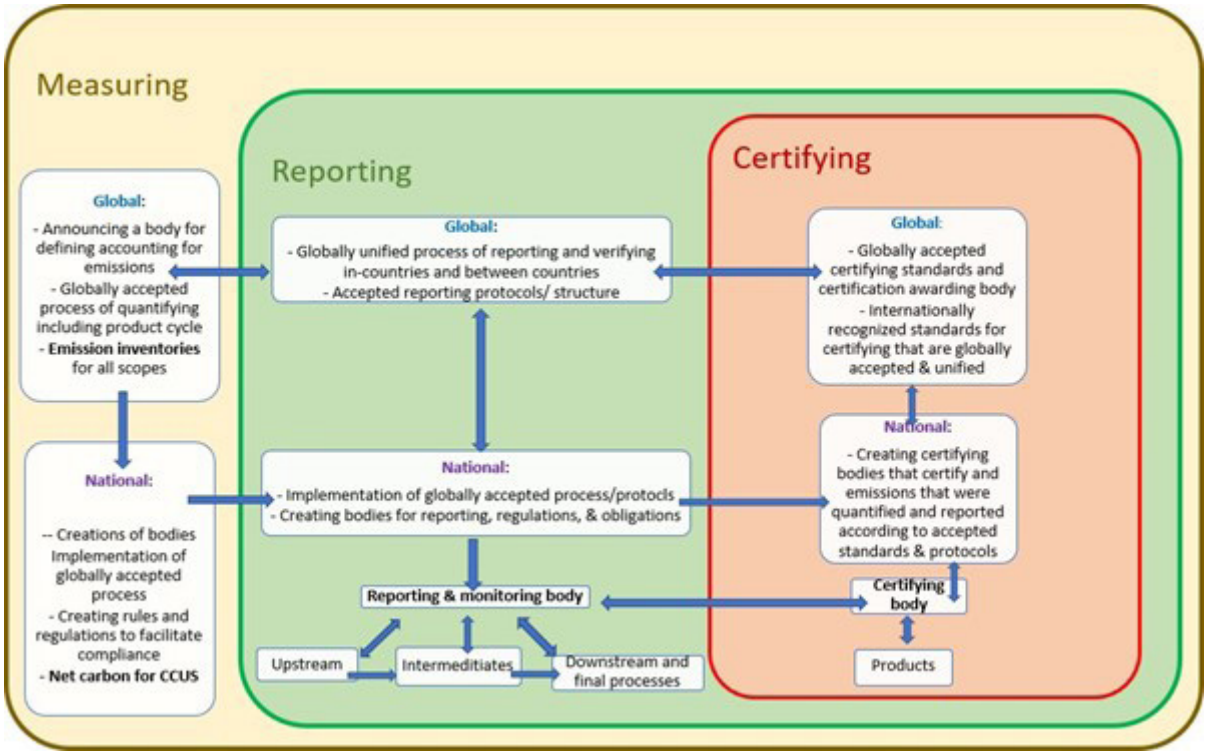
PROCEDURAL PROPOSAL

Proposal 22 of the 2020 T20 Communiqué on the CCE states “the G20 should institutionalise and incentivise heavy-industry and corporate-wide initiatives to manage emissions toward achieving climate goals” and “should provide a platform for cooperation among nations to consolidate efforts to manage emissions in hard-to-abate industries**”**. Proposal 23 proposes that the G20 should “strengthen cooperation on climate action… in the G20 countries, and beyond” (T20 Saudi Arabia, 2020), detailed in Appendix A.

To achieve these goals while overcoming the aforementioned challenges (Section 6), this PB proposes a procedure to implement the three-point action plan anchored in relying on global institutions for defining GAAP-E and mandates for national implementation.

The following conceptual diagram (Figure 2) illustrates our procedural proposal. The three actions (measuring, reporting, and certifying) are interlinked and presented in the order by which they need to occur: measuring is a necessary requirement for both certifying and reporting, and the latter is necessary for certification. The procedure involves horizontal coordination within each level (global or national) and vertical top-down cooperation between the global and national institutions.

FIG. 2 - PROCEDURAL PROPOSAL CONCEPTUAL DIAGRAM



ACTION AT THE INTERNATIONAL LEVEL

The proposed framework requires the designation of an international body to be responsible for defining principles for accounting, measuring, and reporting GHG emissions. This body would work with various global stakeholders of the G20 and the UNFCCC, along with neutral or apolitical non-governmental organisations or experts in emissions measurement and certification. It would be important for representatives from developing and developed countries to be present to ensure an inclusive process, but the instrumentalisation of measurement principles to serve national or particular interests must be avoided at all costs. While decarbonisation solutions and novel technologies (such as the hydrogen value chain and its derivatives) are being examined, international bodies should engage in technology and know-how exchange with private sector and industry representatives and those involved in bilateral/corporate schemes.

An independent body should be created to oversee both emissions measurement and reporting. Its main tasks should include: (a) creating a globally accepted process of measuring emissions through GAAP-E on a product lifecycle basis, and issuing emissions' content certificates for each product; (b) creating an emissions inventory to facilitate the sharing and reporting of emissions; (c) determining globally accepted emissions reporting guidelines and verifying protocols to be shared with and implemented by national entities; and (d) facilitating technological advancements such as blockchain for reporting emissions and net carbon/CCUS accounting. The accurate reporting proposed in our action plan will also be important for facilitating climate change mitigation measures, including global border tax adjustments.

A globally identified independent certifying body must be created to oversee emissions content certification and to mandate the provision of certificates for each internationally traded product.

IMPLEMENTATION CHALLENGES AND PROPOSED SOLUTIONS

In implementing the three-point action plan, the G20 will be challenged by a lack of credible and reliable independent companies for measuring and certifying emissions. There is a risk of dominance of a few oligopolistic companies over these processes, which would raise compliance costs and create opportunities for collusion and unethical violations.

To mitigate this challenge, the G20 should leverage existing work and reputable expertise, and create an international body that supports the creation of GAAP-E and its adoption by local actors.

To this end, the next G20 should invest one or more international public institutions, working cooperatively, to establish a global brainstorming and consultation process to elaborate the required GAAP-E within a defined time framework, which realistically could be of two years, and then report to the G20 and the COP. To ensure the proposed GAAP-E is doable and supported by companies, the consultation process should consider input from companies in energy and energy- intensive industries, as well as existing expertise in measuring, reporting, and certifying emissions. Experts should include those in general product certification, financial accounting, emissions accounting, energy and energy technologies, who should operate in or collaborate across numerous jurisdictions. The global body created to take charge of leading the framework should have domestic involvement, through local chapters, for capacity building and to provide acceptable references for emissions from certain industries and technologies.

ACTION AT THE NATIONAL LEVEL

Appropriate measurement of emissions nationally is the cornerstone of global emissions accounting. Thus, an essential component in the proposed action plan is the establishment of national institutions to create and implement globally accepted regulations on measuring, reporting, verifying, and certifying emissions.

\Notwithstanding variations in structures among different national institutions, there must exist a designated entity responsible for overseeing emissions measuring, along with a designated (similar or different) entity responsible for receiving emissions reports from companies and undertaking regular random emissions verification. This body should require manufacturers to provide emissions data about their products along with the commodity or product sale (for final or intermediate use). This reporting mechanism would ensure that there is no double counting or non-counting of emissions produced by intermediates. A central body for overseeing and coordinating reporting can be incorporated with existing NDC reporting obligations, thereby reducing domestic compliance costs and increasing countries' support for adopting GAAP-E.

G20 countries should commit to creating certifying bodies that operate as a chapter or representative of the international certifying body, but have independent authority to issue certificates for emissions according to GAAP-E. Association with the international certifying body should be stated on locally issued certificates as a guarantee of reliability and compliance with international standards and to ensure that international certificates can be acceptable and tradable across jurisdictions. This process would also ensure that consistent protocols are followed, reduce national and corporate costs of implementation, and incentivise the development of energy transition pathways without favouring one pathway over others.

SUMMARY RECOMMENDATIONS FOR THE G20 AND EXPECTED BENEFITS

This PB recommends that the G20 support the implementation of and adherence to consistent measuring, reporting, verifying, and certifying of GHG emissions and energy usage by all industries, starting with the highest-emitting industries, and identify institutions capable of implementing these processes and ensuring countries' adherence to them.

This PB calls on the G20 to implement the proposed three-point action plan as a framework to realise enhanced international cooperation in the areas of measuring, reporting, and certifying emissions, and to establish a body to implement this framework.

- The G20 should implement the proposed process and procedure as a mandate to identify institutions and ensure the creation of international standards through the proposed GAAP-E as well as their domestic implementation in a manner that is standardised across and within countries.

- If mandated, this framework will allow the G20 to realise its commitments in the 2020 T20, including but not limited to enhancing the CCE, making climate sustainability a prevailing norm in national policy actions, and committing to methane emissions measurement.

- Implementing this action plan is essential to enable countries and corporations to quantify credible industry and national commitments and to deliver effective and credible emissions removal and reduction through different transition pathways. The proposed plan is indispensable for the successful implementation both of the CCE and of climate change response measures such as carbon pricing and certificate trading, while providing a level playing field for low-carbon development and adoption.

APPENDIX

EXCERPTS FROM RELEVANT PROPOSALS FROM THE 2020 T20 COMMUNIQUÉ

Proposal 22: Utilise a circular carbon economy approach to ensure carbon-neutral energy transitions

The concept of a circular carbon economy (CCE) offers a new way of approaching climate change mitigation goals that implicitly values all options and encourages all efforts to reduce carbon accumulation in the atmosphere through the four R's: Reduce the amount of carbon entering the system; Reuse carbon without chemical combustion; Recycle carbon with chemical combustion; and Remove carbon from the system.

The G20 should:

- Support innovations in carbon management technologies.
- Institutionalise and incentivise heavy industry and corporate initiatives to manage emissions toward achieving climate goals.
- Provide a platform for cooperation among nations to consolidate efforts to manage emissions in hard-to-abate industries.
- Unify support for a new internationally led effort to measure and value actions to enhance geological carbon sinks.
- Coordinate the rapid international expansion of a new global low-carbon hydrogen market.

Proposal 23: Strengthen cooperation on climate action to support sustainable and climate- resilient economic growth and recovery in the G20 countries, and beyond

The G20 should also consider the specific issue of assisting developing countries in achieving their mitigation and adaptation objectives. They should support sustainable economicdiversification by aligning climate mitigation and adaptation commitments with economic policiesfor a pragmatic and swift transition to sustainable and climate-resilient economic growth.

The G20 countries have the opportunity to make sustainability, climate, and environmental education a prevailing norm through national policy actions and curriculum changes.

The G20 countries should commit to measuring, reporting, verifying, and certifying methane emissions from fossil fuel production and natural gas value chains.

NOTES

[1] Currently, there are an estimated 620 million people without access to electricity (IRENA, 2020) and over 2.6 billion people without access to clean cooking fuel (IEA, 2020).

[2] Even if all Nationally Determined Contributions (NDCs) under the Paris Agreement, adopted in the Conference of the Parties (COP) 21, are implemented, the ensuing expected temperature rise will be 3.2°C (UNEP, 2019).

[3] The framework defined by Article 6 of the Paris Agreement is divided into three sections: (i) Article 6.2 allows countries to strike bilateral and voluntary agreements to trade carbon units; (ii) Article 6.4 creates a centralised governance system for countries and the private sector to trade emissions reductions anywhere in the world. This system, known as the Sustainable Development Mechanism (SDM), is due to replace the Clean Development Mechanism (CDM), established under the Kyoto Protocol; (iii) Article 6.8 develops a framework for cooperation between countries to reduce emissions outside market mechanisms, such as aid. Under the Paris Agreement, a share of proceeds from the markets needs to be deployed to help developing countries adapt to climate impacts. Whether this applies to the centralised SDM market only or to all trading, including from bilateral agreements, has not yet been agreed.

[4] Emissions measuring efforts include: Life Cycle Assessment (European Environment Agency, 1998), Ecolabelling, Carbon Footprinting, and the 2020 Columbia Carbon Project.

[5] Certification efforts include: Certified Carbon Neutral Global Standard, ISO Sustainability Standards– ISO 26000, and UN Forum on Sustainability Standards.

[6] The EU, for example, has a “smorgasbord” of policy instruments focusing largely on renewable sources. Meanwhile, hydrocarbon exporters might favour decarbonisation strategies that build upon carbon usage from fossil fuels.

[7] For example, Brazil, China, and India want to carry their surplus of old credits from previous CDM regimes over to new market set-ups under the Paris Agreement. Yet, to other countries, old credits should be of no value as they would otherwise undermine global efforts to curb emissions.

[8] Some countries have pushed back against rules preventing double counting emissions reductions, while others have argued that emission cuts cannot be claimed by both the country that made the emissions-emitting products and the country that brought the offsetting credit.

[9] The new market does not allow transfers of emissions reduction across borders without generating additional cuts. Countries need to agree on a way to ensure “overall mitigation”

of the market, but there has been disagreement over which of the three types of market (refer to Article 6 sections 6.2, 6.4, and 6.8) will be governed by this principle given that only Article 6.4 includes this goal.

[10] Relevant 2020 T20 Policy Briefs include: Mansouri et al. (2020), Michaelowa et al. (2020), Fattouh et al. (2020), and Mitchell-Larson et al. (2020).

[11] Such as Atmospheric carbon dioxide removal in land-use change and forestry (LULUCF) and carbon pricing.

[12] For details, refer to Zakkour et al. (2021). Emissions-reducing technologies include: Direct Air Capture (DAC), Carbon dioxide Capture, Utilisation and Storage/ Sequestration (CCUS), Bio-energy with Carbon Capture and Storage (BECCS), and other negative emissions technologies.

[13] To demonstrate, the UK's Streamlined Energy and Carbon Reporting (SECR) requires reporting energy usage and emissions but excludes some of the highest emission levels, because it is obligatory only for companies with turnover exceeding £ 36 million, a balance sheet exceeding £18 million, and employees exceeding 250.

[14] A case in point is transport, which generates 24% of direct carbon dioxide (CO2) emissions from fuel combustion (IEA, n.d.). Electric cars are reported to have zero tailpipe (or tank-to-wheel) emissions. Nevertheless, there are upstream emissions from manufacturing the cars' battery (which alone are between 61-106 kg CO2 equivalent per kilowatt hour) and from manufacturing cars' body (Carbon Brief, 2019). If accurate reporting is implemented, it would reveal a much higher emissions portfolio, allowing higher emitters to be held accountable, and prices (or both products and emissions) to reflect emissions levels.

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