CEEW
THE COUNCIL

Prompt for breakout discussion b) for Roundtable 1 Mitigation, including response measures (RT: M/RM)

Topic: Transforming energy and industrial systems: Assessing collective progress in and enhancing mitigation efforts in energy production and consumption as well as industrial and transportation systems

Expert: Arunabha Ghosh
Facilitator: Kaveh Guilanpour

Short summary of relevant findings from TD1.1

Emissions in the last couple of decades has been on the rise, even while countries negotiate historical responsibility, finance technology, transfer and many such issues. This clearly indicates that there is a gap between all our understanding, efforts, real actions and implementation that are required on the ground. There are multiple technology, policy and finance aspects to this transformation, and we want to shift the focus from "what to "how".

In 2019, out of the total anthropogenic GHG emissions, 34% (20 GtCO2-eq) came from the energy supply sector, 24% (14 GtCO2-eq) from industry, 22% (13 GtCO2-eq) from agriculture, forestry and other land use (AFOLU), 15% (8.7 GtCO2-eq) from transport and 6% (3.3 GtCO2-eq) from buildings (IPCC AR6, 2022). To meet the Paris agreement, each of these sectors will need to bend the emission curve.

Opportunities to accelerate mitigation across various sectors are clear, as we need to ramp up energy efficiency, electrification, fuel switching, and more renewable energy and reduce the reliance on fossil fuels across energy, transport and industry sectors. Yet, the implementation aspects will need better policies, public-private cooperations, finance, technology co-development (global north and global south), monitoring and verification to be able to truly bend the emission curve.

According to IPCC findings, mitigation in the transport and energy sector (solar and wind) are cost-effective while mitigating emissions from industries are relatively more expensive till 2030. These mitigation potentials and relative costs will evolve in the future (IPCC AR6, 2022).

Energy - The energy sector is the largest emitter and will need to decarbonise through rapid deployment of renewable energy technologies. Today, renewable energy in power generation accounts for 39.5% (IEA, 2021a). Investments over the past few years in renewable energy have increased and stand at 753 billion dollars (2019 USD), driven primarily renewable energy and energy efficiency investments (IEA, 2021b). Technical Dialogue TD 1.1 highlighted the drop in costs for solar PV and wind power (UNFCCC, 2022).

Countries around the world have used renewable purchase obligations, feed-in-tariff, net-metering, tendering etc. for boosting renewable energy integration (IRENA et al., 2018). Even developing countries like India, have deployed many such policies. Some of these policies have done well, while others need more improvement in implementation, monitoring and compliance. One very important element is the phasing out of fossil fuel subsidies to make cleaner technologies more attractive.

Transport - In 2021, transport had the highest reliance on fossil fuels, accounting for 37% of CO2 emissions from end-use sectors (IEA, 2022c). Rapid electrification of road vehicles, operational and technical energy efficiency measures, commercialisation and scale-up of low-carbon fuels, especially in the maritime and aviation sub-sectors, and policies to encourage a modal shift to lower carbon-intensive travel options will reduce emissions from the transport sector.

100% electrification targets by countries across the globe (IEA, 2022d), biodiesel blending policies in various countries, electric vehicle subsidies, regulatory standards - EU's agreement that all cars will be zero emission by 2035 (EU, 2020) have been some of the key policies. But, incentive structures must evolve once with time. Additionally, congestion charges, parking fees, road pricing and tolls have also been used to encourage a shift towards rail, public and active transport modes by reducing the appeal of private vehicle use.

Industry - Energy efficiency measures, renewable power, and fuel substitution will reduce only 40-50% of current emissions in existing coal-based cement and steel capacity. There will be a need for CCU/S and R&D to accelerate industrial decarbonization globally.

Net zero commitments of Global Cement and Concrete Association (GCCA) members (GCCA 2022), ArcelorMittal (ArcelorMittal 2020) and others are remarkable initiatives. Yet, there are challenges because some of the hard-to-abate sectors rely on the purchase of carbon offsets, which do not lead to an absolute reduction in emissions (Goswami 2022). Demand for green commodities needs scaling up globally through policy and market mechanisms and organisations need to evolve and adjust to incentivise the trading of green commodities.

Prompts for discussion at TD1.2

1. How do the energy, transportation and industrial systems transform in a world where the Paris global temperature goal is met?

   How would countries around the world bend the emission curve from the energy, transport and the industry sector? TD 1.1 explicitly talked about system transformation approach, how do we see it playing out and how do we accelerate it? Participants may wish to also consider what immediate steps can be taken toward this transformation and the lessons from adopting policies and creating enabling conditions for emission reductions across topics such as, increasing investment in available state-of-the art low carbon technologies and infrastructure, removing implementation barriers, avoiding stranded assets, and cross-cutting policies, including but not limited to carbon pricing and policy packages, demand side measures, and behavioural changes.

2. What are system specific lessons from progress in reducing emissions from a) energy production, distribution and consumption and b) industry and transport, including within international bunker fuels

   Initiatives have been deployed and are expanding in many countries around the world, what are some of the key lessons? In considering mitigation actions in these systems, participants may wish to consider good practices, strategies for addressing barriers and challenges and opportunities for greater mitigation within each of these systems, including near term system specific emission reduction targets as well as relevant non-party initiatives commitments and their accountability.

References

ArcelorMittal. 2020. *"ArcelorMittal sets 2050 group carbon emissions target of net zero."* 30 September 2020. https://corporate.arcelormittal.com/media/press-releases/arcelormittal-sets-2050-group-carbon-emissions-target-of-net-zero

EU 2022, Fit for 55 package: Council reaches general approaches relating to emissions reductions and their social impacts
https://www.consilium.europa.eu/en/press/press-releases/2022/06/29/fit-for-55-council-reaches-general-approaches-relating-to-emissions-reductions-and-removals-and-their-social-impacts/

GCCA. 2022. *Concrete Future.* https://gccassociation.org/concretefuture/

Goswami, Avantika. 2022. *"Corporate net zero promises found to be insufficient and relying on cheap offsets"*. DownToEarth, 09 February 2022. https://www.downtoearth.org.in/blog/climate-change/corporate-net-zero-promises-found-to-be-insufficient-and-relying-on-cheap-offsets-81472

IEA 2021a, Global Energy Review, 2021, https://iea.blob.core.windows.net/assets/d0031107-401d-4a2f-a48b-9eed19457335/GlobalEnergyReview2021.pdf

IEA 2021b, World Energy Investement 2021, https://iea.blob.core.windows.net/assets/5e6b3821-bb8f-4df4-a88b-e891cd8251e3/WorldEnergyInvestment2021.pdf

IEA 2022c, Transport, Paris. https://www.iea.org/reports/transport

IEA 2022d, Global EV Outlook 2022, Paris. https://www.iea.org/reports/global-ev-outlook-2022

IPCC AR6 2022, Working Group III, *Mitigation of Climate Change: Summary for Policymakers* https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf

IRENA, IEA and REN21 (2018), 'Renewable Energy Policies in a Time of Transition'. IRENA, OECD/ IEA and REN21, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_IEA_REN21_Policies_2018.pdf

UNFCCC 2022. *Summary report on the first meeting of the technical dialogue of the first global stocktake under the Paris Agreement*. https://unfccc.int/sites/default/files/resource/GST%20TD1_1_sreport_26_09_2022_Final.pdf