FOR IMMEDIATE RELEASE

Contact: Arsheen Kaur, arsheen.kaur@ceew.in (+91 9891021997);
Alina Sen, alina.sen@ceew.in (+91 9953204658)

Integrating Renewable Energy Key to India's Low-Carbon Transition

New Delhi (1 May 2018) – India is making significant strides towards meeting climate commitments and is on course to surpass its Nationally Determined Contribution (NDC) targets before 2030, according to an independent study released yesterday by the Council on Energy, Environment and Water (CEEW). The study 'Sustainable Development, Uncertainties, and India's Climate Policy: Pathways Towards Nationally Determined Contribution and Mid-Century Strategy' finds that non-fossil fuel energy sources, largely due to rapid growth of solar energy, will garner a share of at least 48 per cent in India's electricity generation capacity by 2030. However, India will need to bear the cost of integration which will increase as the share of solar and wind increases. Also, energy sector CO_2 emissions intensity (EI) of GDP will decline by at least 48 per cent between 2005 and 2030, on the back of significant developments in energy efficiency of end-use sectors such as residential, transportation, and industrial sectors. But, if the efficiency improvement in these sectors occurs at a lower rate, energy demand in the economy increases at a faster rate, and share of electricity in meeting industrial energy demand remains stagnant, then the EI of GDP will be higher by 11 per cent in 2030. The study was released at a Dialogue on 'India's Energy and Climate Policy: Pathways towards NDC and Mid-Century Strategy'.

In 2015, in the lead up to the Paris Agreement, India had committed to cutting its EI by 33 to 35 percent below 2005 levels by 2030, and to achieving 40 percent of its electricity generation from non-fossil sources by the same year.

India's economy and power generation sector have changed significantly since 2015. The change has been mainly driven by a rapid ramp up of solar energy deployment, substantial decline in the costs of solar and wind-based electricity, and multiple developments in the end use-sectors. The Council's study, an uncertainty assessment encompassing more than 200 cost and economic growth scenarios to understand key uncertainties related to electricity generation and end-use sectors, presents pathways to meet our NDC targets of non-fossil-based capacity in 2030's electricity generation mix and decline in emission intensity of GDP, as well as informs India's Mid-Century Strategy.

In his opening remarks at the Dialogue, Dr Anil Kakodkar, Trustee, CEEW, and Former Chairman, Atomic Energy Commission, said, "India's future energy mix must focus on universal energy access, social development, and economic growth. We must consider nuclear energy, as it is the only reliable non-fossil fuel source of electricity. All other energy sources are unpredictable and variable. We need to set up 20 nuclear plants with a 32 GW capacity, with international collaborations. In addition, we must focus on other technologies, including coal-bed methane, coal gasification, splitting water for hydrogen, solar thermal, etc."

During his keynote address at the Dialogue, Mr Montek Singh Ahluwalia, Trustee, CEEW, and Former Deputy Chairman, Planning Commission, Government of India, said, "Historical responsibility matters and we need to build a basis of differentiated responsibility. In recent years, climate change discourse has seen the focus shift to renewable energy. Going forward, equal importance must be given to energy-efficient technologies. I compliment The Council's research focusing on internalising our longstanding sustainability goals."

Who will pay the cost of integrating renewable energy into the grid?

The Council's study identifies the cost of integrating variable renewable energy (VRE) into the electricity grid as a key element of India's energy transition to a low-carbon economy. The cost of integrating VRE consists of grid infrastructure costs, grid balancing costs, and utilisation effect caused due to reduced utilisation of thermal power plants.

Dr Vaibhav Chaturvedi, Research Fellow, CEEW, said, "As the share of VRE in India's total electricity generation exceeds 15 per cent, the cost of integration and its implications will become non-trivial. The political economy of the cost of VRE integration, and who bears it, matters for the electricity generation mix in the future and how ambitious can India be in terms of domestic developmental targets and international climate mitigation commitments. Indian policymakers and experts should undertake a detailed India-specific study to understand strategies to minimise the long-term cost of integration."

The Council's study further finds that budgetary support of the order of USD 33 billion between 2015 and 2030, and USD 575 billion between 2030 and 2050, could be required to cover for the integration cost, if VRE producers were not to bear any integration costs, and integration costs increase from INR 0.75/kWh in 2030 to INR 1.1/kWh in 2050. Taxes such as coal cess could cover a part of the required budgetary support. From 2010-11 to 2016-17, USD 9 billion was collected via coal cess. The amount collected in the next 15 years could be big enough to provide significant, if not enough, financial support to address the cost of integrating VRE. This financial support would lead to an increase in the share of VRE in electricity generation to 52 per cent in 2050 – against 30 per cent if the integration cost were levied on VRE producers.

The study also highlights that if higher penetration of solar and wind increased the system-wide cost of integrating VRE in the electricity sector, and producers bore a part of this cost, coal-based generation would keep on increasing in the long run in the absence of an explicit policy aimed at reducing coal consumption. However, if the share of VRE increased rapidly in the electricity mix, and coal plants bore the cost in terms of reduced capacity utilisation, new coal additions will be severely hit by 2030 and onwards. Investing in coal could still be profitable under the new market design and architecture, wherein coal power would meet the requirements of mid-peak and peak load, and hence be much more expensive to produce, but still be profitable.

Under all scenarios, The Council's researchers found that solar-based electricity generation would grow rapidly for at least the next three decades. Electricity generation from wind energy would also see secular growth, and capacity additions would be higher than coal. However, its overall influence on India's energy mix would be limited unless off-shore wind becomes cost-competitive rapidly.

Gas-based power generation would not play a significant role in India's power sector unless international market dynamics shift for gas and the cost of gas-based power falls. Nuclear power plants will play an important role only if India succeeds in commercialising the indigenous nuclear power technologies, which are expected to be significantly cheaper than imported nuclear power plants.

Long-term CO_2 emissions and Mid-Century Strategy

The Council's research found that, in spite of a dramatic shift to non-fossil fuel energy sources, India's CO_2 emissions would keep growing even beyond 2050, in the absence of a rigorous emissions mitigation policy. Yet, India's CO_2 emissions would remain lower than the global average in the long-

run, unless countries across the world pursue deep decarbonisation policies. Electricity and industrial sectors would play a major role in India's energy sector-related CO_2 emissions, with respective shares of 40 per cent and 32 per cent, in 2050. CO_2 emissions from India's transportation sector would grow the fastest. However, its share in overall CO_2 emissions would be lower, 19 per cent in 2050.

To be consistent with the 2 °C target, India needs to cut its CO_2 emissions by at least 4.5 per cent per annum post 2030. The Council's study highlights that if emissions mitigation in transportation sector were minimal, then the share of non-fossil sources in India's electricity generation capacity needs to increase to 98 per cent by 2050 to be consistent to 2 °C target. Also, the share of electricity generation in industrial energy use needs to increase to 54 per cent by 2050, and energy sector CO_2 emission intensity of GDP needs to decline by 90 per cent between 2005 and 2050. The Council's research recommends that India's mitigation policy – focused largely on electricity generation and partially on transportation - must focus on the industrial sector now.

About CEEW

The Council on Energy, Environment and Water (CEEW) is one of South Asia's leading not-for- profit policy research institutions. The Council uses data, integrated analysis, and strategic outreach to explain – and change – the use, reuse, and misuse of resources. The Council addresses pressing global challenges through an integrated and internationally focused approach. It prides itself on the independence of its high-quality research, develops partnerships with public and private institutions, and engages with wider public.

In 2018, CEEW once again featured extensively across nine categories in the '2017 Global Go To Think Tank Index Report', including being ranked as South Asia's top think tank (14th globally) with an annual operating budget of less than USD 5 million for the fifth year in a row. In 2016, CEEW was also ranked 2nd in India, 4th outside Europe and North America, and 20th globally out of 240 think tanks as per the ICCG Climate Think Tank's standardised rankings. In 2013 and 2014, CEEW was rated as India's top climate change think-tank as per the ICCG standardised rankings.