Opening remarks at CEEW

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1. To reach a HDI comparable with that in advanced countries, India would need around 4 Btoe of total energy supply annually. Of this electricity (around 8000 BU) would constitute ~20% of total energy supply. We are likely to reach this level by around 2040 -2050. India's total energy consumption at that time would correspond to around 20 – 25% of the current global energy consumption.
2. As per draft National Electricity Plan, Electricity requirement at the end of year 2021-22 is projected to be
   1,611 BU (after considering DSM measures). The share of non-fossil based installed capacity (Nuclear + Hydro + Renewable Sources) will increase to 46.8 % by the end of 2021-22.
3. I believe that management of global climate, which may not be very far from the tipping point, is a globally shared responsibility and will succeed only if development aspirations of all countries continue to remain guaranteed. Clearly this has been a major challenge. India should thus secure her development as early as possible while remaining responsible on climate front and not allow development to slow down while pursuing climate related actions over aggressively.
4. The total commercial primary energy supply basket of around 0.83 Btoe in the year 2015-16 consisted of around 44.8% Coal and Lignite, 28.2% Oil, 5.1% Gas, 1.9% Renewables (including Hydro), and 0.4% Nuclear. A significant part (20%} of domestic energy needs was met by the use of biomass in conventional mode. Around 42% of total energy was imported. The energy import which comprised of oil (56.7%), coal (39.1%) and gas (4%).

5. In 2016, India imported 80% of her crude oil needs and about 40% of its gas need. The increasing energy requirements coupled with a slower than expected increase in domestic fuel production has meant that the extent of imports in energy mix is rising rapidly. This should be a matter of significant concern, given the volatility in hydrocarbon prices and national energy security concerns.
6. Going forward, electricity and gas are expected to increase their share at the energy consumption end. This is consistent with the global trend and the three domestic key drivers for energy systems development e.g. universal energy access, development and economic growth. This would also mean a better match with domestic energy resources.
7. A significant part of current energy consumption (around 20-25%) is met by biomass primarily for cooking in rural areas. One thus needs large scale deployment of efficient biomass based smokeless cook stoves as well as affordable cooking gas distribution network in rural domain. Technologies are nearly ready for large scale utilisation of practically any kind of biomass for conversion to liquid / gas fuels. Biomass thus represents a significant energy source to meet at least present requirements.

8. Government of India has been aggressively pushing development of renewable energy to produce electricity from non-fossil energy sources. The country is expected to realise the target of 175 GWe installed capacity consisting of solar PV (100 GWe), wind (60 GWe), bioenergy (10 GWe) and small hydro (5 GWe) by the year 2022. Similarly, GoI has been strongly supporting development of nuclear energy as can be seen from the recent sanction of 10 - 700 MWe nuclear plants of indigenous design to be constructed in fleet mode with assured annual equity support for the purpose. In addition, around 20 nuclear plants are to be set up through international co-operation. This would add around 32700 MWe to current operating capacity of 6680 MWe in operation and 6700 MWe in construction.
9. Nuclear is the only non- fossil energy source available for base load generation. All other non-fossil sources are variable involving additional grid integration costs. There should be level playing field for all of them in this context as well as in the context of incentives/subsidies for their promotion.
10. Given our burgeoning energy import bill, use of domestically available primary energy resources, like coal, solar, bio-mass and nuclear, for production of hydrocarbon fuels for use in current and future energy use assets, needs serious consideration.
11. Coal bed methane, coal gasification (insitu/exsitu), gas hydrates, 2G biofuels, solar thermal, splitting of water for hydrogen etc. need to be quickly developed apart from aggressive E&P activities.
12. Electric mobility to be promoted. With this a much larger (~additional 20%) user need can be addressed through electricity obviating the need to import corresponding quantities of hydrocarbon.