POLICY AND TECHNOLOGY ROUNDTABLES

Electricity sector

Background

Climate Change is one of the defining issues of our time, and moving forward, technology will play a significant role as we pursue efforts through the Paris Agreement to limit global average temperature rise to well below 2°C or 1.5°C above pre-industrial levels. Meeting the temperature challenge would necessitate dramatic decarbonization of economies in the 21st century, and in enabling these transitions, technology is a powerful solution for simultaneously addressing climate change and advancing development. Given that the choices that the country makes on technology selection and investments will have profound and long-term impacts on climate change, it is important to take adequately informed decisions on technological choices. There are also practical institutional challenges in devising and successfully implementing policies at the domestic level which will successfully promote the needed innovations.

As the electricity landscape in India undergoes transformation, becoming more complex than ever before, with rapidly evolving technologies, emerging innovative business models and shifting regulatory landscape, we decided to explore promising technology trends in the sector to understand their potential influence on long term decarbonisation. Through this technology roundtable, we hope to bring together experts (technology innovators and pioneers, representatives from industry- utilities, renewable developers, equipment manufacturers, automakers) to discuss broad technology trends in the sector, barriers and challenges associated with specific promising technologies, and develop recommendations collaboratively for facilitating the accelerated adoption of these technologies by building the supporting domestic policy environment.

Focus Areas

The four broad technology trends/advancements that the workshop will focus on are:

- **Electricity utilities of the future**
- **Improvements in solar PV efficiency**
- **Electric mobility**
- **Building automation and applainces**

While these topics may seem like distinct areas of work within the electricity sector, the delicate interlinkages make it vital to explore technology trends and advancements in these areas jointly to be able to understand and shape industry transformation holistically. The future of the power utilities in the country is set to transform with a number of forces impacting the industry i.e. the rising penetration of

renewable energy in the grid, consumer choices dictating the way, advent of digitatization as well as new developments in storage and electric vehicles that can alter power dynamics. Hence, automotive technologies (electric/hybrid, hydrogen, fuel cell cars etc.) and consumer technologies (smart appliances, building automation with smart meters, data feeds to personal devices etc.) have become just as important today as operational technologies (smart grid, embedded systems, process equipment etc.) and energy technologies (solar, wind, fuel cells, energy storage, distributed energy generation). For example, while the movement to a renewable-based energy system with the concurrent introduction of electric vehicles poses a challenge, it also gives rise to an opportunity. The increasing complexity caused by renewables in the grid has created the need for more flexible resources, and electric vehicles, with their ability to mitigate duck curve issues and eventually produce some positive feedback for the grid, are being considered an important part of the integrated resource planning process. Another example is that of households which could significantly influence the electricity system in the future by generating much of the energy they need themselves (including rooftop solar), using Demand Side Management technologies to arm themselves with greater data on power use and demand, plugging in theirs car into their own houses for charging, among other cultural and behavioural changes. The convergence of all these technology trends will have a profound impact on the electricity sector and specially on the power utility industry.

Only by achieving information symmetry and connecting all the available dots in terms of sectoral trends and technolgies can economies today maximize their chances at achieving decarbonization efficiently and at the pace needed in line with climate science.