USIBC Energy & Infrastructure Mission Report (India), 2021

Energy & Infrastructure Mission

With a team in the United States and India, Energy, USIBC's Environment, &Infrastructure Committee members promote best practices and market-based solutions at the national and subnational level across the full spectrum of their businesses. To drive success, Energy & Infrastructure sought a nuanced and insightful understanding of India's strategic policy as well as the legal and regulatory provisions that drive results in the sector. USIBC thanks our members, mission participants and our knowledge partner, J. Sagar Associates, for their passion, energy, and ideas that make this Mission a success.

Nisha Desai Biswal
President

Mahesh Palashikar
President, General Electric, South Asia

Nitin Prasad
Chairman – Shell Companies in India

Amit Kapur
Joint Managing Partner

Table of Contents

Summary

Summary and Key Takeaways

India is expected to be an engine of global growth in the coming years. The International Monetary Fund (IMF) forecasts that the Indian Economy will grow at 9.5 percent in 2022makingitone of the few major economies expected to register a double-digit growth amidst the fall-out of the COVID-19 pandemic. Indeed, despite the COVID induced slow down, riding the robust economic growth over the last decade, India is pursuing its goal to become a $5 trillion economy by FY 2024-25.

India has taken up ambitious sustainability goals for a developing economy–nudging changes in consumption patterns and steadily moving to net-zero emissions. A critical driver of this transition would be the pace of incubating cleaner energy solutions and innovation. India intends to play a leadership role along with friendly nations like the United States in tackling the challenges posed by climate change.

Energy, environment, and innovation are central themes for deliberations of the Mission. This paper examines the role of the infrastructure and energy sector in making this aspiration a reality while catering to modern lifestyle, enhancing competitiveness, job-creation, and dealing with the disruptive effects of climate change and rapid technological development.

A cornerstone for this focus and growth centres on the National Infrastructure Pipeline with a projected investment of $1.5 trillion over 5 years, backstopped by the recently announced monetization of brownfield infrastructure projects. The Mission shall explore specific initiatives to strengthen the investment climate to actualize this agenda and give an impetus to much need investments.

Themes

Decarbonization and Make in India for India and the world.

Opportunities

Gas-based Economy and the role of increased liquified national gas(LNG) and infrastructure, round-the-clock (RTC)power, renewables, and export-oriented manufacturing.

Goals

Predictable market and stable policy, export incentives, and clearing outstanding payments.

Recommendations

- **Ensure a predictable roadmap for a strong project pipeline in renewables**
  - Renewable energy (RE)auction roadmap: Investors need clear visibility on volumes and timelines for at least two years, including state auction mechanisms, to provide certainty and increase reliability in the supply chain.
  - RTC power tenders which bundle all firm sources, including gas, with RE to pave the way for utilization for stranded gas assets.

- **Promote stable and consistent policy framework**
  - Execution-focused alignment of national policies at the state level.
  - Consistency in the rules of the auction so that sites can be identified and pre-developed with clarity.
- **Expediting outstanding payments from central/state utilities to industry**
  - The payment security mechanism within the new liquidity package is to be strengthened to ensure payments reach developers and original equipment manufacturers (OEM)in a timely manner, thus improving their liquidity (cash flow/revenue) position. This will enable OEMs to make payments down the value chain to micro, small and medium-sized enterprises (MSME) and vendors, thereby ensuring their sustainability.
- **Export incentives to facilitate Make in India for the world**

  Exports from Export Oriented Units (EoU), et al., are not cost-competitive since the withdrawal of incentive schemes such as the Merchandise Exports from India Scheme (MEIS), and there is limited clarity on the applicability of new schemes.
  - The Remission of Duties and Taxes on Export Products (RoDTEP)scheme may be extended to EoUs and Free Trading Warehousing Zones (FTWZ) and advance license holders given the large proportion of exports from these units.
  - The Production Linked Incentive (PLI) scheme for component manufacturing (e.g., wind blades) could promote a manufacturing growth trajectory.

Decarbonization and development of clean energy solutions

Given the United States and India's shared interests and close relationship at a strategic level realization of the shared climate and sustainability ambitions of both governments would require more and cleaner energy with a clear pathway towards decarbonization. It needs to be ensured that the infrastructure we build is compatible with social and environmental goals, for instance, by limiting air and water pollution, promoting resource efficiency and integrated urban development, and ensuring access to zero- or low-carbon energy and mobility services for all.

Some of the key focus areas could be as follows:

- Develop a low carbon/net-zero carbon growth strategy targeting 2050 with sectoral decarbonization pathways for each area of the Economy.
- Create a carbon pricing policy mechanism with financial incentives to reduce emissions and direct investment towards low-carbon technologies.
- Develop a vibrant and competitive low-carbon manufacturing industry to support decarbonization in order to mitigate export challenges to the European Union (EU) and other geographies, which might be planning restrictions on the import of high carbon products.
- Create a policy framework for nature-based solutions (NBS) under Article 6 of the Paris Agreement to help balance global emissions, encouraging forestry sinks as carbon removal units while ensuring large scale afforestation, regenerative agriculture and livelihood opportunities for rural communities.

- Given the above, increased prominence to low carbon energy such as biofuels, hydrogen, renewables, and Carbon Capture Utilization & Storage (CCUS) along with infrastructure for electric vehicle (EV) charging.
- While many of the above-mentioned technologies require research and development (R&D) support to make them commercially ready and economically viable, as an interim step, develop an open market structure to create a gas-based economy resulting in lowering emissions in power generation, mobility and industrial sector; for improvement in air quality, strong policy push needed to replace coal with gas and renewables.
- In power increasing share of intermittent RE, generation requires a complementary supply system to keep the grid in balance, and gas-based power generation is eminently positioned to provide this service. Create a modern, efficient, technology-driven system with service competitiveness established through digitalization and transparent market-based mechanisms - while moving away from the current system of administrative price determination involving complex subsidy arrangements.

Action Required

For the above objectives to be met at the country level, it is important these should be captured as a part of an institutional framework with a clear way forward for both the government and the industry and mobility sectors to ensure that there is a demand for these low carbon products with a suitable policy ecosystem in place. Such commitments by both the Government and industry are essential for driving a clean energy value chain.

Key Takeaways

1. **The U.S.-India Business Council (USIBC)** convened its **Destination India: Energy and Infrastructure Executive Mission to India** with industry leaders from multiple sectors and key stakeholders from the Government of India (GOI), the U.S. Government (USG)and states of Gujarat and Andhra Pradesh.

   The three-day Summit promoted exchange between industry and GOI around energy, climate and sustainability, and infrastructure in the U.S.-India strategic and commercial relationship. The importance of collaboration in areas such as decarbonization, water, energy, emissions reduction, finance, efficiency, and technological collaboration (to include partnerships, research and development) were reiterated throughout.The importance of industry input, best practices, supply chains and manufacturing, and partnership were echoed by all. Mission participants met with:

   - Secretary, Ministry of Finance, Department of Investment and Public Asset Management (DIPAM), **Tuhin Kanta Pandey**
   - U.S. Embassy, Chargé D'Affaires **Don Heflin** and Country Team
   - Director General, International Solar Alliance, **Dr. Ajay Mathur**
   - Additional Secretary, Ministry of Environment, Forest and Climate Change (MoEFCC), **Ravi Agrawal**
   - Andhra Pradesh Energy Secretary, **Sri N Srikant**
   - Gujarat Energy Minister, **Shri Saurabh Bhai Patel**

2. Special emphasis was laid by the Mission on the role that U.S. companies (and their Indian subsidiaries) can play in:

   a) The emergent and critical need for climate action;

   b) The actions necessary to galvanize growth in the renewables space;

   c) The role of natural gas in India's growth story and energy transition efforts;

   d) The need for clean and potable water; and,

   e) The role of technology (both software and hardware) in India climate mitigation efforts.

GE Perspective

GE Perspective

Decarbonization and supply chain alignment maybe central themes for deliberations of the Mission. Given the shared vision and commitment of the Biden Administration and Modi Government regarding decarbonization and sustainability, there are tremendous opportunities for collaboration between the two countries. Another central theme and imperative may be enhancing liquidity in the system by expediting payments by central/state utilities to the industry. Some key focus areas which may be considered are outlined below:

Decarbonization: India, driven by the twin concerns of climate change and energy security, is accelerating its multi-pronged decarbonization strategy, which entails a strong renewable growth trajectory with installed capacity at over 90 GW; a sustainable coal fleet and an increased role of gas in India's energy mix.

- **Strong Renewables Trajectory via the Ministry of New and Renewable Energy (MNRE):** With ambitious RE targets of 175 GW by 2022 and 450 GW by 2030, there are opportunities for investments across the renewables value chain. A predictable, transparent, and sustainable policy environment would give an impetus to investments in this sector thereby ensuring that the growth momentum for renewables is maintained. Towards this end, some key policy levers that are necessary include:
  - **Clear visibility on volumes and timelines** for at least two- year time frame (4 auctions a year maybe considered), including state auction roadmaps essential to ensure a framework of certainty for investors, thereby ensuring supply chain viability.
  - **Stringent enforcement of revised Renewable Purchase Obligation (RPO)** to ensure RE power off-take by obligated entity(s).
  - **Consistency in the rules of the auction** so that sites can be identified and pre-developed with clarity.
  - **Market-based tariff discovery to be honored** with guaranteed power off-take at a tariff discovered through tariff-based competitive bidding (TBCB).
  - **Tie-up of project equipment to be a mandatory condition** precedent to a letter of award (LoA) issuance for strong & timely project execution. The Government will benefit from having certainty on the viability of bids, readiness of projects backed by supply.
  - **The Inter-State Transmission System (ISTS) charges waiver and losses** to be computed factoring low CapacityUtilisation Factor (CUF) of RE sources.
  - **Streamlined project execution** at the state level.
    - Alignment on execution of central policies at the state level.
    - Clarity on developer permits (DPs) for upcoming Solar Energy Corporation of India Limited(SECI) auctions as well as for the inter-state sale of power on Power Exchange/3rd party sale in Gujarat; (engagement with the Gujarat Government).
    - RE parks implementation way forward plan, state and Power Grid Corporation of India Limited (PGCIL) plans on RE parks.

- **Gas at competitive pricing vis-à-vis the Ministry of Petroleum and Natural Gas(MoPNG), Ministry of Power (MoP) and MNRE):** A key facet of India's decarbonization strategy is the Government's move towards a gas-based economy, and we applaud the target of 15 percent of gas in India's primary energy mix by 2030. Gas-based power will be instrumental in also addressing the grid balancing demands which will arise as India moves to meet its ambitious RE targets. Policy interventions that will enable a greater role for gas-based power include:
  - **RTC power tenders** that bundle all firm sources, including gas with RE will pave the way for utilization for stranded gas assets -driven by an intervention by the Indian Government to include firm power from all sources for bundling with renewables.
  - **Enabling new gas turbines** in addition to in use and under operation gas turbines for providing RTC power.
  - **Peaking Power Policy** envisaging greater use of gas-based power.
- **Sustainable Coal Fleet:** Indian Government's (MoEFCC/MoP) efforts in promoting/implementing stringent emission norms for coal-fired plants in India to ensure an environmentally sustainable coal fleet is a step in the right direction. It's important to ensure from a policy perspective:
  - **Momentum for implementation of emission control equipment** installation in coal-fired plants continues **to be on track** with no roll-back or slow down.
  - Any **relaxation in timelines to be on a merit basis** and maybe limited to a small number of specific projects.
  - **Semi-dry flue gas desulfurization (FGD) technology for units upto 300 MW and 15-year residual life** given the low lifecycle cost due to lower capex (25-30 per cent) will enable access to a broader technology portfolio with supply chain capacity available; also aligned with the Government's Make in India initiative with over 90% domestic content.
- **Enhancing liquidity, expediting payments from central/state utilities to industry:** The liquidity package of $13 billion announced in May 2020 and further supported by a package are steps in the right direction. Some measures that may be considered include:
  - Payment security mechanism within the new liquidity package to be strengthened to ensure payments percolate down the supply chain to developers/OEMs. This will enable OEMs to make payments down the value chain to MSME vendors, thereby ensuring their sustainability.
- **Atmanirbhar India (manufacturing hub):** As India moves to become a manufacturing hub and Make in India for India and for the world and align with global supply chains, some policy interventions/incentives to give a boost to local manufacturing that may be deliberated upon include:
  - **Export incentives to boost exports from India.** For example, the RoDTEPscheme may be **e**xtended to EoUs and FTWZs, and advance licence holders given the large proportion of exports from these units via the Ministry of Commerce and Industry (MoCI).
- **Incentives to manufacturers to address the high steel prices** which is a basic raw material via the Ministry of Steel.

- **Exemption from meeting Bureau of Indian Standard (BIS) requirements for stainless steel imported as raw material** for use in manufacturing components that are 100 per cent exported will be instrumental in enabling manufacturing in India for the world (Ministry of Steel).
- **Incentives to support investments in heavy industry** and enable collaboration with U.S. companies considering shifting supply chain from China to India (Department of Heavy Industry).

Shell Perspective

Shell Perspective

Shell has an ambition to be a net-zero emissions energy business by 2050 including all emissions (Scopes 1,2 and 3) in step with society. We aim to achieve this by providing our customers with zero- and low-carbon energy and helping them store and offset any residual carbon, while also reducing and offsetting all our own operational emissions. We aim to reduce our carbon intensity, measured by Net Carbon Footprint, by 45% by 2035 and 100% by 2050.

The new U.S. Administration has a vision in terms of reaching net zero-carbon emissions by 2050, development of cleaner energy solutions and rallying the world to meet the threat of climate change. The aspect on climate change includes an effort to get every major country to ramp up the ambition of their domestic climate targets with such commitments being transparent and enforceable.

The GoI is also actively promoting cleaner sources of energy while reducing reliance on imports as is evident from several policy pronouncements relating to gas, biofuels, renewables, hydrogen, EVs, and statements by the Prime Minister envisioning growth at a lower carbon footprint, resonated by MoPNG, MoP, MNRE, MoEFCC, Minister for Road Transport, and other senior functionaries.

The forthcoming COP 26 summit in Glasgow would be an important platform for all countries to give an impetus to their own climate ambitions while also aligning the larger global community, including industry and environmental organizations, on the measures needed to combat climate change and develop a low-carbon energy ecosystem. The U.S. and India given their shared interests and close relationship at a strategic level would be expected to play a key role.

Given the above, realization of the shared ambitions of both the governments would require more and cleaner energy with a clear pathway towards decarbonization. It needs to be ensured that the infrastructure we build is compatible with social and environmental goals, for instance by limiting air and water pollution, promoting resource efficiency and integrated urban development, and ensuring access to zero or low-carbon energy and mobility services for all.

Some of the key objectives of the Energy and Infrastructure Mission as well as the USIBC Energy, Environment, and Infra Committee could be as follows:

- Development of a low carbon/net-zero carbon growth strategy targeting 2050 with sectoral decarbonization pathways for each area of Economy.
- Creation of a policy framework for NBS under Article 6 of the Paris Agreement to help balance global emissions, encouraging trading of forestry sinks as carbon removal units while ensuring large scale afforestation and livelihood opportunities for rural communities.
- Creation of a carbon pricing policy mechanism with financial incentives to reduce emissions and directing investment towards low carbon technologies.
- Enactment of a policy framework that incentivizes switching to low carbon fuels redirect economic resources towards low carbon & bridges long term cost differential between low/no carbon fuels and fossil fuels.
- Development of a vibrant and competitive low-carbon manufacturing industry to support decarbonization mitigating export challenges to EU and other geographies, which might be planning restrictions on import of high carbon products.

- With respect to improvement in air quality, strong policy push needed to replace coal with gas and renewables.
- Given the above, increased prominence to low carbon energy such as biofuels, hydrogen, renewables, and CCUS along with infrastructure for EV charging.
- While many of the above-mentioned technologies require R&D support to make them commercially ready and economically viable, as an interim step, develop an open market structure to create a gas-based economy, resulting in lowering emissions in power generation, mobility, and the industrial sector.
- Specifically, in the power sector, the increasing share of intermittent RE generation requires a complementary supply system to keep the grid in balance and gas-based power generation is eminently positioned to provide this service.
- Creation of a modern, efficient technology driven system for the power sector with service competitiveness established through digitalization and transparent market-based mechanisms - while moving away from the current system of administrative price determination involving complex subsidy arrangements.
- For the above objectives to be met at the country level, it is important these should be captured as a part of an institutional framework with a clear way forward for both the Government (including raised ambition at COP 26) and the industry and mobility sectors so as to ensure that there is a demand for these low carbon products with a suitable policy ecosystem in place. Such commitments by both the Government and industry are essential for driving a clean energy value chain.

J. Sagar Associates Perspective

J. Sagar Associates Perspective

Sustainability and Decarbonisation in India's Energy Sector: State of Play, Challenges and Path Ahead

1. Sustainability Imperative

Continued Economic Growth

- India is expected to be an engine of global economic growth in the decades to come, despite a slowdown in recent months resulting from the black-swan event that is the COVID-19 pandemic. Indeed, India has set its sights on becoming a $5 trillion economy by the financial year 2024-25.
- In keeping with present trends, a concomitant of this growth will be rapid urbanization, increased industrialization, a growing population, and greater energy consumption. Coupled with the clear and present threat of climate change, these factors create an imperative that such development does not come at the cost of the environment.

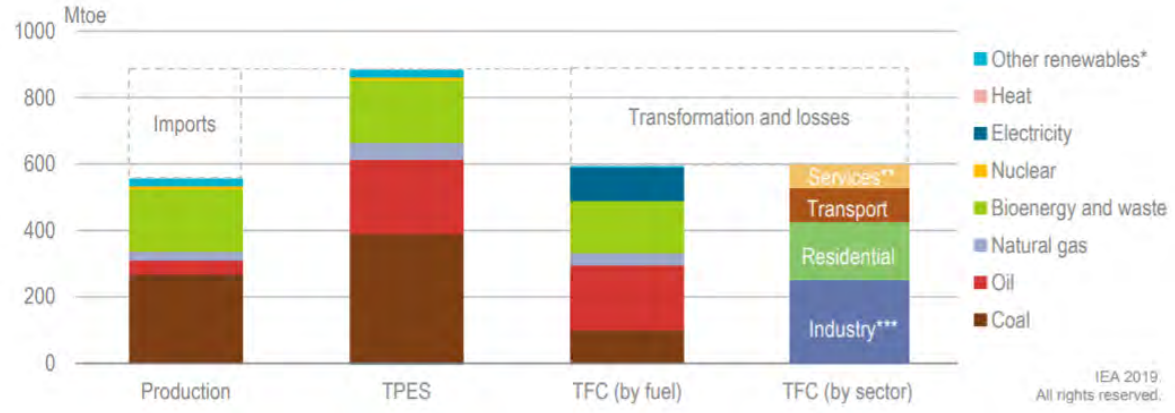
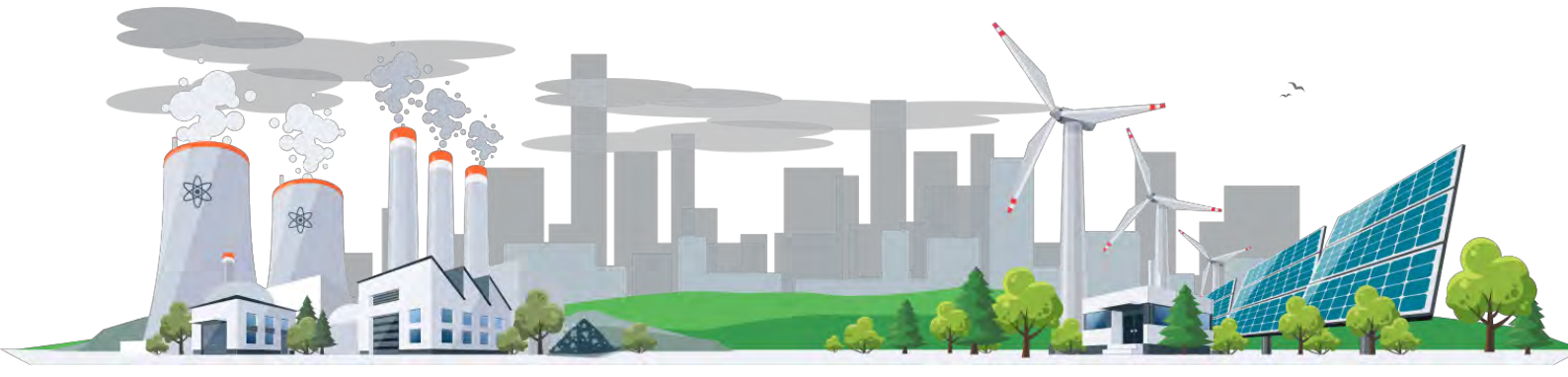


Fig. 1: Overview of India's energy system by fuel and sector, 2017 (Source: IEA)

India and Climate Change

- Being one of the fastest-growing economies of the world and the third largest emitter of fossil greenhouse gases (next only to U.S. and China), Indian action on climate change is material. India is an important link in the global chain of climate change players.



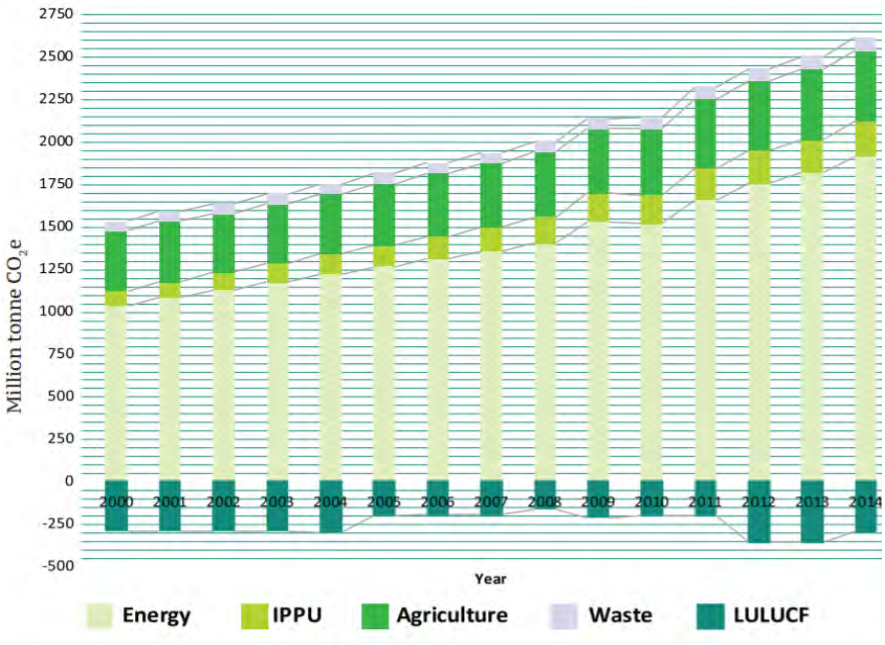


Fig. 2: India GHG inventory (*Source*: Second Biennial Update Report to UNFCCC)

- India has, pursuant to the Paris Agreement, submitted ambitious targets, including, inter alia, the following:
  - To adopt a climate-friendly and cleaner path than the one followed hitherto by others at a corresponding level of economic development.
  - To reduce the emissions intensity of its GDP by 33–35% by 2030 from the 2005 level.
  - To achieve about 40% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030; and
  - To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.
- These commitments are significant in that; while India's participation in global environmental protection efforts dates back to the Stockholm Declaration of 1972 (and later, the Rio Declaration of 1992 and the United Nations Framework Convention on Climate Change in 1996), it had never bound itself to measurable domestic actions to protect the environment and address climate change.

Transitioning to the 'Green Economy'

To this end, several factors will aid and abet India's climate action and decarbonization efforts, including increasing the renewables footprint, electrification of vehicular fleets, development of 'convergent' business models, establishing a carbon market, and transitioning to a hydrogen economy.

2. The Push for Renewables

Growing Renewables Footprint

- One of the positives of India's climate action efforts has been the growing footprint of renewables in the country. The installed capacity of renewable energy has steadily grown in the past decade and currently stands at 92.5 GW. This figure is even more impressive when one considers that it constitutes nearly a quarter of the total installed electricity generation capacity in India and the fact that approximately 89 GW has been developed by the private sector. Indeed, both in terms of absolute numbers as well as their share in total capacity, India is amongst the global leaders in renewables development.
- In this regard, the push for renewables has been boosted by the Indian Government has set an ambitious target of achieving 175 GW of renewable capacity by the year 2022 – this includes 100 GW from solar, 60 GW from wind, 10 GW from biopower and 5 GW from small hydro power.

Incentive Regimes

Encouragingly, authorities at the federal and state levels have put in place a series of policy and legislative measures to encourage deployment of renewables, including the imposition of 'renewable purchase obligations' (mandates for purchasing a certain portion of electricity consumed from renewables), preferential tariffs for renewable energy, encouragement of solar parks, grant of capital subsidies, waiver of statutory/regulatory fees, etc. These measures have had a positive impact, with India having been consistently ranked amongst the top global destinations for renewables investments in recent years.

Outstanding Issues

Nevertheless, the industry has faced pressures and challenges on account of non-compliance with the renewable purchase obligations, unpredictability and lack of visibility in the conduct of auctions, delays in the obtainment of evacuation approvals/ infrastructure (which lead to 'idling' of capacity), difficulties in obtaining land and right of way for projects (as well as the attendant issue of converting the permitted usage of such land), resistance from certain stakeholders to easing the deployment of solar rooftop installations, and, latterly, the low tariffs discovered in auctions, which have made the industry sensitive or susceptible to market changes (e.g., the imposition of duties on imports, restrictions on supply from certain countries, etc.).

3. Energy Transition

Electric Mobility

- Electric or hybrid vehicles (e-vehicles) will play a major role in India's strategy to reduce emissions pursuant to its commitments under the Paris Agreement. It is estimated that savings of 846 millionTonnes (MT) of net CO_2 emissions and oil savings of 474 megatonnes of oil equivalent (MTOE) are achievable by sales penetration of 30% for private cars, 70% for commercial cars, 40% for buses, and 80% for two or three-wheelers by 2030.
- As part of this strategy, the central and State governments have announced a slew of subsidies and other fiscal and monetary incentives geared towards promoting e-vehicles. In parallel, in a bid to reassure investors, various regulatory pronouncements have sought to clarify and explicate the legal framework for the sector.

- However, the industry is still in its nascency, with issues of 'range anxiety' (lack of charging infrastructure and the time taken for complete charging), high costs (both upfront and lifetime), and local peculiarities (appropriate battery technologies with long-lasting throughput that can function efficiently in India's high temperature) having to be overcome before this new form of mobility can begin comprehensively replacing internal combustion-based transport.
- However, the opportunities that the nascent e-mobility ecosystem offers in India far outweigh the challenges that exist.

Convergence

- The drivers of the electricity industry are very different from those that shaped the market structure. These drivers include international commitments to decarbonization, the falling cost of renewables and storage, national commitments to increasing the share of variable renewable electricity, digitization of the grid, the growth of e-mobility, and the growing need to provide modern energy services responding to the needs of the consumer.
- These drivers are converging to enable new business models to emerge around the world, threatening to disrupt traditional utilities by providing energy, ancillary services, and energy services in new ways. These new business models can produce multiple economic, environmental, and social benefits compared to traditional energy only supply business models.
- In particular, energy storage (in the form of batteries) is going to be vital to achieving India's sustainability and climate goals, given its role in effectively integrating renewable energy (being intermittent in nature) with the grid; setting up microgrids with diversified loads or stand-alone systems, addressing peak demand deficits (presently combatted using costly power, and providing other ancillary market services (such as grid support, etc.).
- However, business models and the regulatory framework for the deployment of energy storage solutions are still evolving, given the rapid technological developments underway in the sector (including the emergence of cost-effective energy storage technologies) and the new and emergent applications of this technology.

Smart Grids

- Smart grids are electrical grids that are based on state-of-the-art technology in the fields of automation, communication and information technology (IT) systems that can monitor and control power flows from points of generation to points of consumption. Smart grids aim to improve the reliability of the network and make the grid amenable to renewable energy inputs through distributed generation. Smart grids are viewed as a key tool to achieve transformation towards a more digital and consumer-centric grid.
- The GoI launched the National Smart Grid Mission, an institutional mechanism for planning, monitoring, and implementing policies and programmes related to smart grid activities in India. The Mission, amongst other things, focuses on the development of smart grids, development of micro grids, consumer engagement, and capacity-building.
- Going forward, certain issues would have to be addressed to ensure the efficacious roll-out of smart grids, including the high cost of deploying smart grids and the interoperability of technology components in a utility environment.

4. Low-carbon Economy

Carbon Market

- The Indian Government is mulling over a domestic emissions trading scheme for the country, similar to or inspired by the dispensation in the EU and other jurisdictions where such schemes are in vogue. Such a move will mark a shift from hitherto 'command and control' dispensation towards market-based and market-driven solutions to the threat of climate change. The frameworks in the EU and the United Kingdom (UK) have been developed on a 'cap and trade' principle, whereby:
  - A 'cap' or limit is set on the total amount of greenhouse gases that can be emitted by installations covered by the system.
  - The cap is converted into tradable emission allowances.
  - Allowances are, in the first instance, granted by means of auction or free allocation. Subsequently, they may be traded amongst participants.
  - Participants are required to surrender allowances equivalent to their annual emissions.

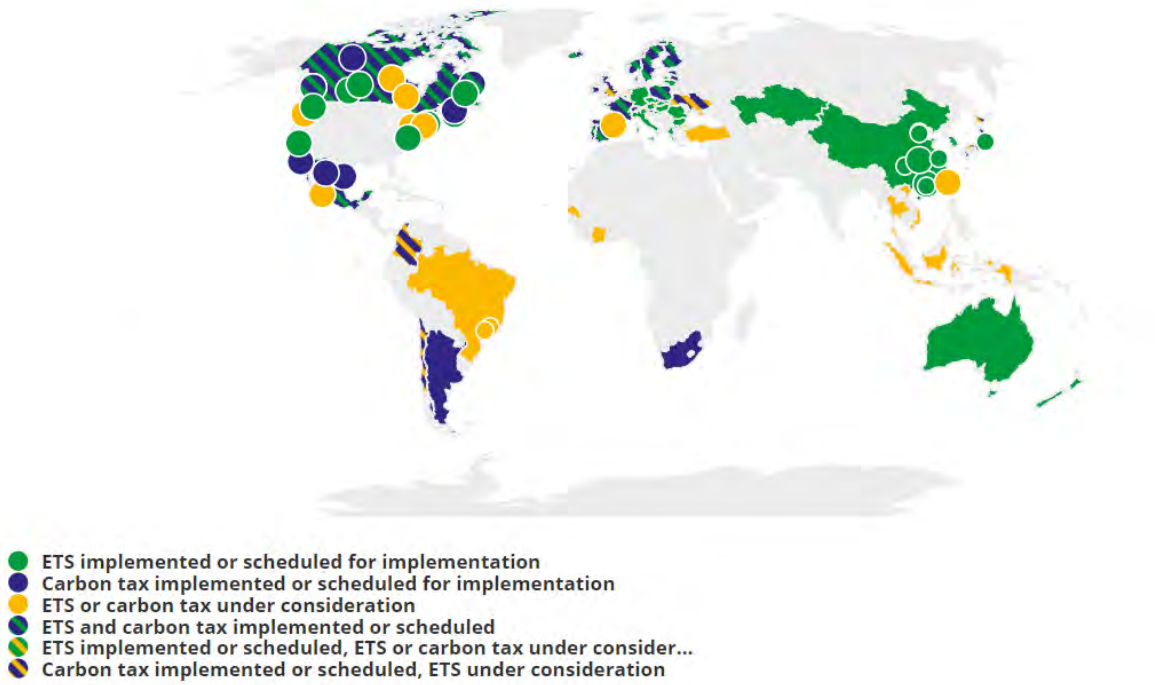


Fig. 3: Map of Carbon Pricing Initiatives (*Source*: World Bank)

- While an emissions trading scheme offers the opportunity to foster environmental sustainability in carbon-intensive industries (e.g., coal-fired power plants), it waits to be seen what industries/ sectors will be covered under the proposed indigenous scheme to ensure maximum efficacy and whether emissions allowances will be allocated in a manner that maximizes their value. It is important that any carbon market framework for India should create additional/ new economic activity (i.e., new market, new instruments, new incentives/ disincentives), else it risks merely being another procedural compliance requirement.

The Hydrogen Economy

- A paradigm shift in the energy sector is expected to be imminent in the coming years on account of the 'hydrogen economy. Burning hydrogen gas is free of carbon emissions – it produces clean by-products in the form of heat and water – thus, hydrogen can be used as fuel in power plants or in fuel cells to power vehicles or buildings.
- The declining cost of producing the gas offers the potential for it to replace conventional fuels such as oil and natural gas. Indeed, the Hydrogen Economy Outlook estimates that deployment of clean hydrogen soon offers a cost-effective means of cutting up to 34% of global greenhouse gas emissions.
- India's Prime Minister had while speaking at the 3rd Re-inVest Conference in November 2020, announced plans to launch a comprehensive National Hydrogen Energy Mission. The Union Budget for FY 2021-22 announced that a Hydrogen Energy Mission is proposed to be launched in 2021-22 for generating hydrogen from green power sources.

Reviving Natural Gas

- Gas-based power has faced several challenges (high cost and sourcing issues being the primary ones) that have effectively idled capacity in India. However, the sector has recently been given a fillip in the form of procurement of 'round the clock' power, whereby non-renewable sources, including gas, can be bundled with renewable energy.
  - Allowance of blending is aimed at addressing the issues of intermittency, limited hours of supply and low-capacity utilization of transmission infrastructure.
  - The original dispensation only contemplated blending with coal-based thermal power but has since been revised to include any non-renewable sources of power (including gas) from plants that are partly or fully commissioned before the issuance of bids or are under construction at the time of issuance of bids.
- The gas sector may be given additional succour by means of envisaging procurement of power from gas-based power plants to meet peak deficits.

5. Way Forward

Structural Reforms

- The electricity market had earlier been dominated by state-owned vertically integrated electricity boards that were responsible for the generation, transmission, and distribution of power. The market has since witnessed a gradual shift away from public sector dominance towards increased competition and private sector participation, particularly in the generation sector, under the oversight of independent expert regulators tasked with, amongst others, setting tariffs on a cost-reflective and economic basis.

- However, distribution continues to be dominated by the public sector – as a result, the major purchaser of power generated by the private sector continues to be the State. In this regard, poor payment records on the part of off-taking utilities continue to hamper the industry. Generating companies are compelled to make payments to their vendors and sub-vendors but face a liquidity crunch owing to non-payment by the buying utility. The distribution segment is beset with problems of operational inefficiencies, liquidity, and financial solvency. There is a need to ensure that discoms remain healthy and can pay for power purchased, thereby averting negative impact on the electricity sector.

Make in India

- The 'Make in India' initiative was launched in 2014 with a view to facilitating investment, foster innovation, building best in class infrastructure, and make India a hub for manufacturing, design, and innovation. The development of a robust manufacturing sector continues to be a key priority of the Indian Government. As part of this initiative:
  - Steps have been taken to improve 'Ease of Doing Business' through simplification and rationalization of existing processes).
  - Corporate Tax has been reduced.
  - Public procurement has been rejigged to promote domestic manufacturing.
  - The laws on insolvency and labour have been amalgamated, simplified and rationalized.
  - Empowered cells/ committees have been constituted in the Government to fast-track investments and thereby grow the pipeline of investible projects.
- With a view to ensuring that this initiative continues to yield the best results and enhances Indian manufacturing capabilities both in terms of meeting domestic needs (particularly given the recent emphasis on reducing reliance on Chinese products) as well as ensuring international competitiveness of Indian industry, it may be considered to lay special emphasis on logistics and supply chain management.

Path to Recovery

India, along with the rest of the world, is working toward building a post-COVID-19 economic revival, having suffered the human and economic toll of this unprecedented tragedy. However, the need to pick up the pieces and rebuild also presents a golden opportunity to chart the course of economic revival in a manner that is responsive to the dire and pressing demands for climate action, both present and future.

The Role of Infrastructure in India's $5 Trillion Economy

Prepared by:
J. Sagar Associates

The Role of Infrastructure in India's $5 Trillion Economy

1. India: Engine of Economic Growth

The IMF forecasts that the Indian Economy will grow by9.5 percent in 2022, making it one of the few major economies expected to register significant growth amidst the fall-out of the COVID-19 pandemic. The IMF has stated that the Union Budget 2021-22 rightly focuses on health, education, public infrastructure, which can help increase India's growth potential.

India is also ranked 63rd globally in the 2020 Ease of Doing Business rankings issued by the World Bank, with the report observing that:

"India has improved its rank by 79 positions in five years (2014-19)."

2. The Vision for $5 Trillion Economy

- The Union Budget 2021-22 has a vision for AatmaNirbhar Bharat. The Budget proposals aim to double farmer's incomes, strengthen infrastructure, usher in good governance, create opportunities for youth, provide education for all, empower women, and ensue inclusive development.

  Vision for the decade

  "Our Economy was at approximately US$ 1.85 trillion when we formed the Government in 2014. Within 5 years, it has reached US$ 2.7 trillion. Hence, it is well within our capacity to reach the US$ 5 trillion in the next few years."

- Not surprisingly, a high and robust economic growth rate along with high levels of investment are required to achieve this goal. Aside from legal and regulatory reforms, internal and external macroeconomic factors will play a role in making this aspiration a reality.

3. Blueprint for Achieving the Target

Three significant documents lay down the strategy and blueprint for achieving this ambitious target. These are the National Infrastructure Pipeline released on December 31, 2019, the Union Economic Survey for FY 2020-21 released on January 31, 2021, and the Union Budget for FY 2021-22 presented to the Parliament on February 1, 2021.

3.1. National Infrastructure Pipeline

In his Independence Day speech for 2019, Prime Minister Narendra Modi highlighted that INR 100 lakh crore ($1.3 trillion) would have to be invested in infrastructure over the next five years to make India a US$ 5 trillion economy by FY 2024-25. To achieve this objective, the Ministry of Finance constituted a task force to identify technically feasible and financially/ economically viable infrastructure projects that can be initiated in FYs 2020-25. The report of

the task force (NIP) was published on December 31, 2019. The overall objectives of the NIP are to:

- Identify technically feasible and financially/ economically viable projects.
- Estimate annual infrastructure investment/capital costs.
- Guide the ministries in identifying appropriate sources of financing.
- Suggest measures to monitor projects, so that cost and time overruns are minimized.
- Details of the proposals of the NIP are set out in the succeeding section.

3.2. Economic Survey

The Union Economic Survey for FY 2020-21 was dedicated to saving lives and livelihoods. India decided to take short-term pain for long-term gain at the onset of the COVID-19 pandemic with an intense lockdown. Despite the challenge that provided a win-win strategy to save lives and preserve livelihoods via economic recovery in the medium to long term. India adopted a four-pillar strategy of containment, fiscal, financial, and long-term structural reforms. Calibrated fiscal and monetary support was provided, cushioning the vulnerable during the lockdown and boosting consumption and investment while unlocking a favourable monetary policy ensured abundant liquidity and immediate relief to debtors while unclogging monetary policy transmission. A V-shaped recovery was seen in a 7.5% decline in GDP in Q2 and recovery across all key economic indicators *vis-à-vis* the 23.9% GDP contraction in India's Q1real GDP to record an 11.0% growth in FY2021-22 and nominal GDP to grow by 15.4%, which is the highest since independence.

3.3. Union Budget

The Union Budget for FY 2021-22 rests on six pillars — health and well-being, physical and financial capital and infrastructure, inclusive development for aspirational India, reinvigorating human capital, innovation and R&D; and 'Minimum Government, Maximum Governance. The GoIis estimated to spend Rs 34,83,236 crore ($479.55 billion) during 2021-22 which is an annual increase of 14% over 2019-20.Out of the total expenditure, revenue expenditure is estimated to be Rs 29,29,000 crore ($403.249 billion) (12% annual increase over 2019-20) and capital expenditure is estimated to be Rs 5,54,236 crore ($76.304 billion) (29% annual increase over 2019-20). Nominal GDP is expected to grow at of 14.4% (i.e., real growth plus inflation) in 2021-22.

Key excerpts from the Budget are set out below:

"I want to confidently state that our Government is fully prepared to support and facilitate the Economy's reset. This Budget provides every opportunity for our Economy to raise and capture the pace that it needs for sustainable growth."- Nirmala Sitharaman, Minister of Finance.

Sector	Key Budget Announcements
Energy (Power and Renewables)	• A framework will be put in place to give consumers alternatives to choose from among more than one distribution company • A revamped reforms-based result-linked power distribution sector scheme will be launched with an outlay of INR 3,05,984 crores ($ 41.918 billion) over five years. The scheme will provide assistance to DISCOMS for Infrastructure creation, including pre-paid smart metering and feeder separation, up-gradation of systems, etc., tied to financial improvements • A comprehensive Hydrogen Energy Mission is proposed to be launched in 2021-22 for generating hydrogen from green power sources - INR. 1,000 crore ($ 136.9 Million) infusions for SECI, and INR 1,500 ($ 205.5 Million) crore infusion for Indian Renewable Energy Development Agency - The Government will release a phased manufacturing plan for solar cells and solar panels. Duties on imported solar inverters will be increased from 5% to 20%, and on solar lanterns from 5% to 15% • Custom duty on solar inverters has been raised from 5% to 20% and on solar lanterns from 5% to 15%
Environment	• To tackle the burgeoning problem of air pollution, the Government proposed to provide an amount of Rs. 2,217 crores ($ 303.7 Million) for 42 urban centres with a million-plus population • The World Health Organisation (WHO) repeatedly stressed the importance of clean water, sanitation, and a clean environment, as a prerequisite to achieving universal health. Hence, the Jal Jeevan Mission (Urban) will be launched in this fiscal year, aiming at a universal water supply in all 4,378 urban local bodies with 2.86 crores household tap connections, as well as liquid waste management in 500 AMRUT cities. It will be implemented over five years, with an outlay of Rs. 2,87,000 crores ($ 39.32 Billion) • To render urban India clean and hygienic, the Government intends to focus on complete faecal sludge management and wastewater treatment, source segregation of garbage, reduction in single-use plastic, reduction in air pollution by effectively managing waste from construction-and-demolition activities, and bioremediation of all legacy dump sites. The Urban Swachh Bharat Mission 2.0 will be implemented with a total financial allocation of Rs. 1,41,678 crores ($ 19.4 Billion) over 5 years from 2021-2026 • The Government announced a voluntary vehicle scrapping policy to phase out old and unfit vehicles. This is expected to encourage fuel-efficient, environment-friendly vehicles, thereby reducing vehicular pollution and oil import bill

Sector	Key Budget Announcements
Oil & Gas	• An independent gas transport system operator will be set up to coordinate booking of common carrier capacity in all-natural gas pipelines. • Extension of Ujjwala scheme covering more beneficiaries and gas pipeline project in Jammu and Kashmir. • The Government will add 100 more districts to the City Gas Distribution Network in the next three years. • A "National Monetization Pipeline" of potential brownfield infrastructure assets will be launched. An Asset Monetization dashboard will also be created for tracking the progress and to provide visibility to investors. Some important assets proposed to be monetized include: – Transmission Assets of PGCIL – Oil and Gas Pipelines of GAIL, Indian Oil Corporation Limited (IOCL) and Hindustan Petroleum Corporation Limited (HPCL)
Others	• The NIP is a specific target which this Government is committed to achieving over the coming years. The following concrete steps are proposed to increase funding both from the Government and the financial sector. – Creating the institutional structures. – A big thrust on monetizing assets; and – Enhancing the share of capital expenditure in central and State budgets. • An Asset Reconstruction Company Limited and Asset Management Company would be set up to consolidate and take over the existing stressed debt and then manage and dispose of the assets to alternate investment funds and other potential investors for eventual value realization. • A conciliation mechanism is proposed to be set up and mandated to use for quick resolution of contractual disputes. • Some of the conditions (relating to prohibition on private funding, restriction on commercial activities, and direct investment in infrastructure) for 100% tax exemption to foreign sovereign wealth funds and pension funds on their income from investment in Indian infrastructure will be relaxed. • Notified Infrastructure debt funds will be made eligible to raise funds by issuing tax-efficient zero-coupon bonds. • A bill will be introduced to set up a professionally managed development financial institution (DFI). A sum of INR 20,000 crores ($ 2.739 Billion) is proposed to capitalize this institution. It is envisaged that the DFI will have a lending portfolio of at least INR 5 lakh crores in three years' time. • Debt financing of infrastructure investment trusts (INVITs) and real estate investment trusts (REIT) by foreign portfolio investors will be enabled by making suitable amendments in the relevant legislations. This will further ease access of finance to INVITS and REITs, thus augmenting funds for infrastructure and real estate sectors.

4. Pipeline of Projects

4.1. The NIP underscores that creating and upgrading infrastructure is key to India's competitiveness and an imperative for achieving the target of becoming a $5 trillion economy since infrastructure creation will boost short-term and potential GDP growth, as well as generate employment and income (which would further spur domestic demand).

Strategic Goals of NIP

- Provide a positive and enabling environment for significant private investment in infrastructure at all three levels of Government.
- Design, deliver and maintain public infrastructure projects to meet efficiency, equity, and inclusiveness goals.
- Design, construct and maintain public infrastructure to meet disaster resilience goals.
- Create a fast track institutional, regulatory and implementation framework for infrastructure.
- Benchmark infrastructure performance to global best practices and standards.
- Leverage technology to enhance service standards, efficiency, and safety.

The NIP, which was announced in December 2019, is the first-of-its-kind, whole-of-government exercise ever undertaken by the Government of India.

4.2. The NIP sets out proposals for investment of INR 102,50,704 crore ($1.4 trillion) over the next five years. Key sectoral allocations are:

Sector	INR Crore	$Bn	~Share of Total
Energy (including renewables)	2,454,249	335.46	24%
Transport (roads, railways, ports, airports)	2,346,787	320.77	34%
Urban Development	1,629,012	222.66	16%
Irrigation and Rural Infrastructure	1,545,443	211.24	16%
Digital Infrastructure	320,498	43.8	3%
Social Infrastructure	356,701	48.76	3%
Industrial Infrastructure	307,462	42.03	3%

Mission of NIP

- Develop a 5-year plan of infrastructure development for India in key sectors.
- Facilitate design, delivery, and maintenance of public infrastructure as per global standards.
- Facilitate generic and sectoral reforms in regulation and administration of the public infrastructure services as per global best practice.
- Push India up in global rankings in public infrastructure.

4.3. While emphasizing the importance of infrastructure in India becoming a $5 trillion economy, the NIP recognizes the following complexities of infrastructure development:

- Lack of infrastructure is the primary constraint on economic growth.
- Lead times associated with infrastructure development mean that decisions taken in the present will shape the future.
- The Government is increasingly looking to partner with the private sector, for which effective co-working models need to be devised.
- Vital strategic decisions need to be made in the present, and to promote changes in behavior, before the speed and severity of climate change are fully known.
- An increase in natural disasters or unpredictable events will test the resilience of infrastructure in terms of the reconstruction as well as supply-chain disruptions.
- New technologies (e.g., the internet of things, artificial intelligence) will make infrastructure more efficient and sustainable.
- Solutions have to be found to the issue of financing infrastructure of the scale needed.

Key Policy & Reform Initiatives to Ramp up Infrastructure Investment

- Improve project preparation process
  - Robust project preparation framework comprising transparent policy and legislation.
  - Empowered public institution for infrastructure planning.
  - National standards/ guidelines (model bid documents, standard procedures, design considerations, including technology choices and disaster resilience).
  - Well-defined workflows for quality assurance.
- Enhance execution capacity of private sector participants
  - Effective enabling environment and capacity development of public and private sectors to plan/ design, prepare and deliver infrastructure projects.
  - Sectoral' national framework for infrastructure quality based on global/ national standards.
  - Improved compliance mechanism and alignment with environmental sustainability.
- Robust enabling environment (regulatory and contractual framework, including exits and reset mechanisms)
  - Robust policy and framework and strong, well-developed public institutional capacity
  - Well-framed contracts with optimal risk sharing.
    - Adopt and adapt international best practices such as the International Federation of Consulting Engineers (FIDIC), with clear procedures for exit, termination payments and reset.
    - Process integrity – commence bidding only after acquiring 90% of the land and obtaining all clearances.
  - Honouring contracts, with defined areas for deviation with a robust process/ mechanism considering the factors of public good, uninterrupted supply, value for money, affordability, viability, the time-value of money, impairment caused by delay, and impact on tariffs.

- Institutionalization and efficiency of dispute resolution
  - Invest in institutions under the Commercial Courts Act, 2015, Specific Relief (Amendment) Act, 2018 and New Delhi Arbitration Centre Act, 2019 to enable speedy resolution.
  - Ministry-level committees to resolve complex contractual disputes via mediation.
- Infrastructure financing reforms
  - Revitalizing bond and credit markets (credit enhancement fund to enhance credit ratings of infrastructure projects to access institutional investors through capital market instruments).
  - Opening up investment by pension/ insurance funds in infrastructure bonds.
  - Strengthening the municipal bond market (including addressing the gap in the creditworthiness of local governments through innovative credit enhancement structures).
  - Revitalizing monetization of operational assets (including through the use of InvITs, TOT, sale, securitization, value-capture financing, etc.).
  - Enabling user charges to finance both capital and operational investments in infrastructure by means of arms-length regulatory or contractual pricing mechanisms.
  - Long-term financing reform by encouraging usage of innovative mechanisms such as loan securitization, InVITs, etc.
  - Regulatory revamp to increase and the participation of foreign portfolio investors and foreign direct investment in infrastructure development funds, development finance institutions and securitization markets.
- Instituting a governance mechanism to monitor projects (covering the stages of – planning and conceptualization, preparing of DPRs, design of projects, conditions precedent, financial close, conditions subsequent (critical path), draw-down, implementation (milestones), etc.)

5. Imperatives and Winds of Change

Infrastructure is a critical element of India's ambition to become a $5 trillion economy through high growth. The need to develop infrastructure is also driven by other factors such as responding to a growing population, upscaling global competitiveness, provision of modern amenities to citizens, and responding to the present and potentially disruptive effects of climate change and technological developments.

5.1. Necessities of Modern Life

India's population is set to reach 1.52 billion by 2030, of which 42% will be urban (up from the current 31%). With increasing urbanization, infrastructure is key to determining the quality of life. Addressing deficiencies in infrastructure will, as per the NIP, "smoothen urbanization by promoting ease of living and facilitating economic activity."

Infrastructure up-gradation and development are also required to cater to the necessities of modern life (e.g., 24 x 7 power, metro rail, broadband Internet access) and ensuring high standards of living (e.g., reducing pollution through green and clean, renewable energy).

> "The changed demographics and environment will need the converged development of a host of infrastructure facilities. From the provision of housing, to water and sanitation services, to digital and transportation needs, there is a compelling demand for increased and improved delivery across the entire infrastructure spectrum."
>
> **– NIP**

5.2. Competitiveness and Efficiency

Creating new and upgrading existing infrastructure will also significantly boost Indian industry's (including MSMEs) global competitiveness. This is important, given India's ranking on the Global Competitiveness Index has fallen to 68th position in 2019 (ten places down from 58th in 2018). Infrastructure is a key pillar in determining a country's global competitiveness score.

The NIP also posits that corporate growth and investments can be hampered by the failure to bridge the infrastructure gap, estimating the costs at about 4–5% of GDP due to inefficiencies. Infrastructure development can aid in addressing these inefficiencies, thereby leading to economic growth and support stronger long-term growth.

5.3 Generating Employment

Development of infrastructure is a labour-intensive undertaking – indeed, the International LabourOrganisation has recognized the significant employment generated by the construction sector in all countries, pegging the number at about 220 million globally. An IDFC report has highlighted the job-creating potential of prioritizing investment in the infrastructure sector:

"Investment in infrastructure gives rise to three types of jobs — direct, indirect, and induced jobs. Direct jobs refer to those created for the purpose of building infrastructure. During the process of infrastructure provision, industries with linkages to this activity (such as industries supplying raw material) see a rise in demand, and therefore, an increase in the number of jobs. This is the indirect effect of infrastructure on job creation. Ultimately, growth in these industries leads to an increase in the incomes and consumption of those employed there, which boosts other industries and services. Furthermore, new businesses could come up because of this spending, leading to further job creation. Existing businesses benefit from the provision of infrastructure in various ways, such as reduced transportation costs due to improved transport connectivity or increased productivity due to reliable access to power and water. This gives rise to induced employment effects."

Thus, ramping up infrastructure development would resultantly lead to an increase in employment and employment opportunities. This employment generation would, in turn, fuel and rejuvenate domestic demand, which has a positive impact on economic growth. As noted in the NIP, "all of this together can aid in initiating a virtuous cycle of higher investments, growth and employment generation in the economy."

5.4 Dealing with Disruptions

Redeveloping and upgrading infrastructure capabilities is also a function of the disruptive changes unleashed by climate change and the digital and data revolution. These disruptions have impacted the supply and value chains of various products and services and can catalyze market reorganization. For example, increasing the renewables footprint and greater deployment of electric vehicles in a bid to tackle climate change are set to have far-reaching impacts on the energy and transportation sectors. On the technological front, developments artificial intelligence, the internet-of-things, robotics, fintech, *et al.*, have the potential to redefine and transform nearly every facet of our daily existence, from our homes to our offices, to our markets, to our education system to our manufacturing industry, and to our means of transport.

6. The Challenges Ahead

However, the proposed infrastructure push is not without its share of hurdles, which range from the financial ('show me the money!') to capacity-related (institutional and structural bottlenecks), to the challenge of allocating and mitigating risk (balancing welfare and viability and dealing with unforeseen risks), and to the need to speedily resolve disputes that stymie development efforts.

6.1. Challenges in Financing

Obtaining ready and cheap financing is key to scaling up infrastructure. However, the banking sector is still to fully recover from stress caused by multiple non-performing assets that resulted in a liquidity crunch which is limiting the availability of credit. The issue materialized in the early part of the past decade because of distressed borrowers being unable to repay the large sums borrowed from state-run banks to fund infrastructure. This led to the so-called 'twin balance sheet problem' where both the corporate and financial sectors were under stress.

Worryingly, this problem has spread to include non-banking financial companies and real estate companies, thus morphing into a '4 balance sheet problem'. Indeed, as noted by Arvind Subramaniam, the former Chief Economic Advisor:

> "For some time, India has been trying to solve its Twin Balance Sheet problem –overleveraged companies and bad-loan-encumbered banks […] But decisive resolutions of the loans, concentrated in the large companies, have eluded successive attempts at reform. The problem has consequently continued to fester: NPAs keep growing, while credit and investment keep falling."
>
> – Union Economic Survey for FY 2019-20

"India is now facing a Four Balance Sheet challenge – the original two sectors, plus NBFCs and real estate companies – and is trapped in an adverse interest-growth dynamic, in which

risk aversion is leading to high-interest rates, depressing growth, and generating more risk aversion."

The infrastructure sector has been further constrained by a mix of factors that have made financing infrastructure costly, viz.:

- The phenomenon of front-loading debt repayment – debt ordinarily becomes repayable within 8–10 years as compared to a 25–30-year revenue-generating life of an infrastructure asset.
- The absence of a secondary debt market that extends beyond banks to a broader range of players such as insurance, pension and mutual fund companies. This situation results in capital being stranded and limits refinancing options.
- The task force on the development of the secondary market for corporate loans constituted by the Reserve Bank of India recognized that such a market would lead to "lower cost of capital, greater credit availability".
- Time and cost overruns resulting from delays in acquiring or obtaining requisite access to land (right of way issues) and delays in obtaining requisite permits and clearances that have the insalubrious impact of heightening risk perceptions.

6.2. Capacity Constraints

The NIP, which envisages a significant role for the private sector in meeting the infrastructure goals, recognizes that such participation is contingent upon "a deep pool of experienced developers with required competence and execution capacity." The NIP also acknowledges the dearth of private sector players in most infrastructure sectors, which in turn impacts the pace of infrastructure delivery through the public-private partnership (PPP)-route.

Alongside this is the issue of the inadequate capacity of public institutions to conceptualize effectively and efficiently, plan, prepare, complete, deliver and operate infrastructure projects. This is typified by inefficient project procurement structures, ineffective contract governance mechanisms, and suboptimal project management and monitoring capabilities of public institutions.

6.3. Welfare vs Viability

For infrastructure creation to be a viable and attractive option for private sector investors and developers, equity invested must earn a reasonable rate of return either through payments from the agency granting the infrastructure concession or through tolls/ revenues collected through users. In this regard, the sector has offered an attractive rate of return in the past decade (e.g., in the electricity sector, the regulated rate of return is in the range of 14-17%). However, infrastructure brings out significant public benefits beyond the infrastructure provider's private returns. Thus, as a recent publication on regulating the infrastructure sector aptly put it:

"[T]he challenges for Indian infrastructure regulation is to serve welfare though means that are economically viable in order to enable investment and supply."

6.4. Risk Allocation and Mitigation

Infrastructure contracts are usually long-term arrangements – they cannot cover all situations/ developments during a project's lifetime. Projects can come inherently under stress due to

risks not foreseen or addressed in the underlying contractual arrangements, giving rise to the need to renegotiate/ rebalance the contract. Notably, this aspect was the focus of the work awarded the 2016 Nobel Prize for Economics – in awarding the prize; the Academy observed that:

"[A] new branch of contract theory that deals with the important case of incomplete contracts. Because it is impossible for a contract to specify every eventuality, this branch of the theory spells out optimal allocations of control rights: which party to the contract should be entitled to make decisions in which circumstances?"

Currently, infrastructure contracts do not allow flexibility in contract rebalancing. Indeed, the infrastructure sector has witnessed several projects across sub-sectors severely affected by such unforeseen events (notable amongst which was the Indonesian coal issue in the power generation sector).

The absence of a defined framework to deal with such issues has inevitably led to disputes, which have in turn resulted in delays and cost-increases in infrastructure delivery. Renegotiation, if used properly, can be a positive instrument to address the inherently incomplete nature of infrastructure contracts and can enhance welfare.

6.5. Dispute Resolution & Cashflow Crunch

The infrastructure sector has been beset with several disputes, with prolonged dispute resolution times resulting in various time- and cost-overruns in project implementation. Even where the resolution mechanism contemplates reference to binding arbitration, frequent recourse to the courts (either in appeal or for interlocutory interventions) have stymied time-bound resolution. Indeed, the Union Economic Survey for FY 2018-19 had argued that the single biggest constraint to ease of doing business in India is the inability to enforce contracts and resolve disputes.

While there has been a move toward instituting dedicated bodies/ institutions for resolving sectoral disputes through non-judicial/ non-regulatory means, e.g., Society for Affordable Redressal of Disputes (SAROD) for the highways sector, and more recently for scheme-based competitively procured renewable energy projects with the view to streamlining and facilitating speedier dispute resolution, there is limited evidence to suggest that the same may be effectively replicated across sectors to reduce the pendency of disputes.

Disputes have also created cashflow problems since long pendency of disputes means that costs claimed are not recovered, resulting in developers being cash-strapped and unable to service debts. Even where awards favour contractors, the tendency for public agencies to prefer appeals coupled with the long appeals processes mean that funds are not immediately and entirely forthcoming.

The infrastructure sector is also affected by entities exercising the dual function of market participant and as well market regulator (e.g., National Highways Authority of India, Indian Railways, Airports Authority of India, etc.), which has led to them performing the roles of both umpire and player.

6.6. State Level Issues - Contract Sanctity & Lack of Project Trajectory

There is a need for improving certainty and business trajectory in terms of the implementation of projects. Whilst unforeseen changes will always continue to affect implementation of

energy and infrastructure projects; it is important that contract sanctity with flexibility to address unforeseen changes forms the bedrock for implementing the NIP. Besides the above, a robust contract enforcement mechanism based on viable risk allocation with emphasis on time value for money should form the bedrock for implementing projects at the centre and state levels (whether under power purchase agreements (PPAs), concession agreements or others).

6.7. Cybersecurity

India has witnessed a sharp rise in online payment cyberattacks, especially due to an increase in the overall attack surface. There is an increase in the percentage of malware campaigns employing COVID-19 related attack vectors. According to a study by the Data Security Council of India (DSCI), India needs one million cybersecurity professionals by 2020. India's current qualified cybersecurity professionals count stands at around 100,000 cybersecurity professionals, a shortage of 900,000 professionals. Adequate contractual recognition of such cyberattacks is also required, particularly in the context of reliefs for *force majeure*.

6.8. Water, Climate change and Sustainability

The deterioration in our natural environment, and the continuing and willful pollution of our water, air and land, take the heaviest toll on the poor but ultimately affects everyone. India is one of the most vulnerable countries to climate change. About half of India's population is dependent upon agriculture or other climate-sensitive sectors. About 12% of India is flood-prone, while 16% is drought-prone.

India is now the third-largest emitter of greenhouse gases in the world after China and the United States.

Thus, climate change and energy are now a focus of local, State, and national attention around the world. Though India earlier emphasized that it being a developing country with a historically low per capita emission rate, it is not responsible for past greenhouse gas emissions; however, India has now become a key player in international negotiations and has begun implementing a diverse portfolio of policies, nationally and within individual states, to improve energy efficiency, develop clean sources of energy and prepare for the impacts of climate change.

7. Drivers – How to Get There

India's structural reforms over the past few years, including new or amended laws and policies, have had a prominent role to play in its infrastructure growth. As part of the Indian transition from a controlled economy to a liberalized and delicensed one, vertically integrated state-owned enterprises have been unbundled and corporatized into distinct functional entities, introducing competition into most segments of the value chain. To capitalize on the potential of the NIP for enhancing infrastructure in identified sectors for the five-year period from 2020-25, it is imperative to identify the ways and means to best use this opportunity for infrastructure growth. The NIP is a major step for the overall growth of the Economy since high government spending in infrastructure energizes demand in other sectors and will lead to more fund flows to various sectors besides creating valuable assets. In the succeeding sections, we have identified some key 'Drivers' for achieving this objective.

7.1. Investments and Fiscal Incentives

Infrastructure has historically had a huge appetite for sovereign funding and more so in the Indian context since it is driven by India's strong growth potential, positive demographics and continued economic development. Government, domestic and international capital combined with attracting equity investments will continue to be a pivotal factor in determining the growth trajectory for the infrastructure sector.

The Indian Government is leaving no stone unturned to attract this healthy mix of capital in the infrastructure sector, and the establishment of the National Investment and Infrastructure Fund (NIIF) is in sync with the objectives proposed to be achieved by the NIP. NIIF is a sovereign-backed, independently managed fund seeking to leverage commercial institutional capital for investments in India's infrastructure. With a seed investment of $3 billion by the Indian Government, the purpose of the NIIF is to become a channel for supporting public-private capital, domestic-international capital and promote the infrastructure sector. The NIIF is an institution created with government backing to attract capital from sovereign wealth funds, foreign institutional investors, and pension funds to propel planned infrastructure growth in India. Wealth and state pension funds are expanding their horizons to private markets to complement an existing focus on stocks and bonds and this is where India present an opportunity for the deployment of long-term capital, the kind that sovereign wealth funds are ideally suited to provide.

Some of the key issues faced by the Economy are higher costs (including time and cost overruns), lower revenues and greater financing costs, including the impact of adverse foreign exchange rate variation on debts, which squeeze corporate cash flow leading to debt servicing problems. To cushion the impact on the overall Economy, public investment has been stepped up considerably, but this has still not been sufficient to prevent a fall in overall investment. The upsurge in foreign direct investment is mostly restricted to brownfield operating assets rather than new greenfield investments. Public investment needs to be supported ably by private investment and possible upscaling of PPPs in roads, transmission, rail, renewables, airports, urban infrastructure, telecom to reach the ambitious target set in the Union Budget. What is needed is an overall rehaul of the investment dynamics in the country to reach the target of a $5 trillion economy by FY 2024-25. In the recent Union Budget, liberal tax concessions were extended to sovereign and pension funds investing in the infrastructure sector, which is poised to have a positive impact on launching InVITs with a renewed vigour for both public and private sector players.

The fiscal incentives need to be managed with the right mix of public, private and PPP models for efficient asset monetization coupled with structural sectoral reforms. Relying exclusively on public investment to kickstart the investment cycle may not be sufficient due to the magnitude of funds required, and hence a viable mix of these models is imperative for growth. Capacity creation should be encouraged with new policies and incentives coupled with measures to resolve regulatory bottlenecks – ensure greater transparency and accountability, ease land acquisition norms, streamline consents and clearances and ensure a reasonable return on investment.

7.2. Structured disinvestments of prized PSUs & Public Asset Monetisation

Infrastructure creation requires significant upfront capital investments with long gestation periods and regulated returns. Its operation also requires steady working capital. Given the

limitations of private investment in the post-independence era, starting with the late 1960s, some of the key segments of the Economy witnessed increasing state control in pursuit of nation-building. This resulted in nationalization in segments such as banking, coal, oil and gas, railways and acquisition and merger of erstwhile private entities in Central Government controlled corporations like Oil and Natural Gas Corporation (ONGC), Coal India Ltd., GAIL, NTPC and PGCIL. However, thankfully, sooner than later, it was realized that the State-owned enterprises did not provide the required boost to the sector, resulting in increased private sector participation.

The time is ripe to consider the structured disinvestment of some of the prized public sector unites (PSUs) for the greater good of the Economy – such as Bharat Petroleum Corporation Limited, Shipping Corporation of India, Air India, Bharat Heavy Electricals Limited to name a few (some of which are already underway or under active consideration). Most of these PSUs possess large scale logistical infrastructure but are often marred by inefficient management and state-controlled bias. Efforts must be made to reduce the governmental stake in entities that play a pivotal role in infrastructure. Notably, the Government has set a disinvestment target of Rs 1.75 lakh crore ($24.076 billion) for 2021-22. This is lower than Rs 2.1 lakh crore ($28.890 billion) it hoped to garner from disinvestment in 2020-21

With proper incentives and structural reforms, including policy decisions, disinvestment in PSUs can catapult the Indian infrastructure growth by leaps and bounds. The Government needs resources to reduce its fiscal deficit, and disinvestment in PSUs will provide such resources to be invested in infrastructure projects and provide much needed liquidity to the Economy. Some of these PSUs are working inefficiently and incurring huge losses year on year. Privatization of public enterprises through public sector disinvestment is also beneficial because this will enable these enterprises to attract private foreign investment in setting up joint ventures. It may be noted that capital inflow through private direct foreign investment is better than that procured through foreign aid or commercial borrowing from abroad. In November 2020, the total overdue amount of distribution companies, which was not cleared even after 45 days of a grace period offered by generators, stood at ₹1,29,868 crore ($17.860 billion) as against ₹93,215 crores ($12.819 billion) in the year-ago period.

Such disinvestment can only be achieved effectively if it is backed by proper timeframes prescribed for completion of the disinvestment process, the Government's support to increase the efficiency of non-performing/ loss-making PSUs and increasing investor confidence.

7.3. Regular payments by State-owned enterprises

Delayed payments by State-owned enterprises have posed a teething problem in the development of the infrastructure sector. There are significant delays in payments to vendors/ suppliers for various reasons such as delays in certification of bills, delays in settling changes-in-scope even after supplies/ services are made/ rendered, and even delays in payment after certification of bills. In addition, there is the issue of bank guarantees (advance/ performance/ retention) that are not returned in a timely manner.

To restrict such delays in payments, the Government has introduced certain measures like advance payments in the power sector by distribution companies for procuring power from generating companies. Such measures have helped in de-risking the revenue uncertainty of infrastructure projects while giving credible exit options to secure investors from expropriation risk.

Additionally, to tide over the liquidity problems of the power sector, exacerbated by the outbreak of COVID-19, the Government of India announced a Liquidity Infusion Scheme as part of Atmanirbhar Bharat Abhiyan. Under this intervention, Rural Electrification Corporation and Power Finance Corporation are extending special long term transition loans to Discoms for liquidating outstanding dues of generators. So far, loans to the extent of Rs.125,000 crores have already been sanctioned, and Rs.46,074 crores have been disbursed.The disbursement under the long-term transition loans have been linked with discoms undertaking certain reform measures such as installing pre-paid smart meters, as well as laying down the trajectory for preventing Aggregate Technical & Commercial (AT&C) losses, cost of supply/average revenue realized (ACS-ARR) gaps, recovery of subsidy and government dues.

7.4. Timely Dispute Resolution

There is an urgent need to fast track and strengthen dispute resolution in infrastructure projects by creating quasi-judicial authorities which can ensure contractual sanctity for investors. Infrastructure projects are long term projects and often face disputes at every stage of progress. Such disputes are relatable to land acquisition, right of way issues, engineering, procurement, and construction (EPC) contracts, environmental issues, time and cost overruns, supplier defaults and delays, unforeseen events/accidents, Insolvency and Bankruptcy Code (IBC), and mismatch with regulatory lag.

In this backdrop, the GoI has initiated some significant structural reforms for infrastructure during 2014-19:

- A key initiative was to recognize the twin balance sheet problem plaguing investment flows and the accumulation of stressed and bad loans (non-performing assets or NPAs). To tackle this situation, the Insolvency & Bankruptcy Code, 2016 was enacted by the federal parliament providing for time-bound, fast debt resolution and bankruptcy process recognizing that there is the time value of money. Some early resolutions indicate the great potential of reviving good quality operating assets at attractive values through this route.
- To get better enforcement of contracts, the Arbitration & Conciliation Act, 1996 was amended in 2015 to provide for time-bound completion, timely enforcement of awards with restrictions on court interference.
- An expert committee was appointed to evaluate and propose solutions for the problems faced by the public-private partnership model for infrastructure development under the stewardship of Dr. Vijay Kelkar. This culminated in a comprehensive report issued in 2015, pursuant to which the Government enacted significant changes in law and made necessary budgetary announcements. These include dispute resolution and contract enforcement through amendments to the Specific Relief Act in 2018 with a view to protecting infrastructure projects from stalling while providing for fast-track dispute resolution, using expert testimony. The several States that have established Special Courts and Superior Courts (Supreme Court and some High Courts) have noted with approved the amendment. The effectiveness of the institutional mechanism in implementing this change will be seen in the days ahead.

The last few years have seen a significant change in the judicial approach in enforcing vested contractual and statutory rights of private parties. Increasingly, courts of law have recognized the credit risk inherent in infrastructure investments moving away from the age-old approach of favouring public sector undertakings. Courts have recognized that capital (debt and equity) comes at a price; that profit is a return on investment considering the risk; and the significance of timely payment of ('time value of money) in the wake of rising debts and non-performing assets. This argues well in restoring creditworthiness to investments in these sectors[1].

[1]*See – Supreme Court Judgments in (a) **Energy Watchdog vs. CERC &Ors**, reported as (2107) 14 SCC 80; (b) **Uttar Haryana Bijli Vitran Nigam Limited &Anr. vs. Adani Power Ltd. &Ors**. reported as (2019) 5 SCC 325; Judgment of Appellate Tribunal for Electricity dated 20.11.2018 in Appeal No. 121 of 2015 titled **Sasan Power Ltd. vs. CERC &Ors**.*

Abbreviations

1. ACS-ARR - Average Cost of Supply/Average Revenue Realized
2. AMRUT - Atal Mission for Rejuvenation and Urban Transformation
3. AT&C - Aggregate Technical & Commercial
4. BIS -Bureau of Indian Standards
5. CCUS - Carbon Capture Utilization & Storage
6. CO_2 - Carbon Dioxide
7. CUF - Capacity Utilization Factor
8. DFI - Development Financial Institutions
9. DPRs – Detailed Project Reports
10. DPs - Developer Permits
11. EU - European Union
12. EV - Electric Vehicle
13. FGD - Flue Gas Desulfurization
14. FIDIC - International Federation of Consulting Engineers
15. FTWZ - Free Trade Warehousing Zones
16. GAIL - Gas Authority of India Ltd
17. GDP - Gross Domestic Product
18. GHG - Greenhouse Gas
19. GOI - Government of India
20. GW - Giga Watt
21. HPCL - Hindustan Petroleum Corporation Ltd
22. IBC - Insolvency and Bankruptcy Code
23. IMF - International Monetary Fund
24. INR - Indian Rupee
25. InVITs - Infrastructure Investment Trusts
26. IOCL - Indian Oil Corporation Limited
27. ISTS - Inter State Transmission System
28. IT- Information Technology
29. LNG - Liquefied Natural Gas
30. MEIS - Merchandise Exports from India Scheme
31. MNRE - Ministry of New and Renewable Energy

32. MNRE- Ministry of New and Renewable Energy
33. MoCI - Ministry of Commerce and Industry
34. MoEFCC - Ministry of Environment, Forest and Climate Change
35. MoP - Ministry of Power
36. MoPNG - Ministry of Petroleum and Natural Gas
37. MSME - Micro, Small and Medium-Sized Enterprises
38. MT - Million Tonnes
39. MTOE – Million Tonnes of Oil Equivalent
40. MW - Mega Watt
41. NBS - Nature-Based Solutions
42. NIIF - National Investment and Infrastructure Fund
43. NIP - National Infrastructure Pipeline
44. NPAs- Non- Performing Assets
45. OEM - Original Equipment Manufacturers
46. ONGC - Oil and Natural Gas Corporation
47. PGCIL - Power Grid Corporation of India Limited
48. PLI - Production Linked Incentive
49. PPAs -Power Purchase Agreements
50. PSUs - Public Sector Units
51. R&D - Research and Development
52. RE - Renewable Energy
53. REIT - Real Estate Investment Trusts
54. RoDTEP - Remission of Duties and Taxes on Export Products
55. RPO - Renewable Purchase Obligation
56. RTC - Round the Clock
57. SAROD - Society for Affordable Redressal of Disputes
58. SECI - Solar Energy Corporation of India Limited
59. TBCB - Tariff-Based Competitive Bidding
60. UNFCCC - United Nations Framework Convention on Climate Change
61. USG - US Government
62. USIBC - US-India Business Council
63. WHO - World Health Organisation

Team

USIBC Points of Contact

Lauren Diekman
Senior Director, Energy, Environment, Infrastructure, & Indo-Pacific
ldiekman@usibc.com

Raghvendra "Raghav" Upadhyaya
Director, Energy, Environment, & Infrastructure
rupadhya@USIBC.com

GE South Asia

Sharmila Barathan
President – Corporate Affairs & Policy
Board Member – GE India Industrial Pvt Ltd
sharmila.barathan@ge.com

Rasika Chandihok
Vice President, Energy Policy and Regulation
rasika.chandihok@ge.com

Shell

Ganesh Rajagopal
Director - Public Policy
r.ganesh@shell.com

Sidharth Prasad
Advisor, Government Relations
sidharth.prasad@shell.com

J. Sagar Associates – Key Contributors

Venkatesh Raman Prasad
Partner
venkatesh@jsalaw.com

Vishnu Sudarsan
Partner
vishnu@jsalaw.com

Other Contributors – Ashish Suman, Sugandha Somani Gopal, Vishrov Mukerjee, Akshat Jain, Kartikeya G.S, Shashank Mohan