



'Voices' ENRich 2018

11 December 2018



A message from Regina Mayor

The energy industry is an incredibly exciting place to be right now. We've experienced a growing sense of optimism among our sector in the last several years. In our recent CEO Outlook, 77 percent of global energy CEOs reported confidence in the growth prospects of our industry. With the introduction of electric vehicles, the momentum of the energy transition, and new technologies transforming the grid, there's no denying that our industry is driving the future. When applied in the right way, we can even help to reduce poverty by making electricity more accessible to those without power.

However, while there is much optimism among industry executives, there is also uncertainty. Stronger regulations need to be implemented to bring electricity to those in need. The pace of energy innovation needs to drastically quicken. The price of oil remains in flux as tensions around geopolitics, trade policy, and tariffs plague our industry. Businesses face significant issues around trust, transparency, and increasing customer demands.

Despite these challenges, our industry as a whole is working hard to find solutions, and we're experiencing unprecedented cross-border collaboration toward progress. We're lucky to have innovative digital technologies on our side to help speed the pace. More CEOs than ever are piloting or using artificial intelligence to help streamline business operations. This is profound.

Energy leaders are optimistic that technology will improve productivity and efficiency working alongside existing employees. We now have the capacity to create models that can predict behavior or outcomes more accurately. This can help improve safety on rigs, dispatch crews faster, and manage customer expectations around electricity outages. Some companies are even exploring how to power infrastructure for self-driving cars... imagine the day when our roads can charge our battery-operated cars as we "drive"!

It's an exciting time for all of us and we are just at the beginning of an incredible journey. I look forward to being a part of this revolutionary time for our industry!



Regina Mayor

Global and U.S. Sector Head,
Energy & Natural Resources

KPMG United States of America

Changing electrification paradigm will require stronger interaction between grid and decentralised systems



Nishant Bhardwaj

Energy Advisor,
Department for
International Development

“

Access to energy services is a pre-requisite for poverty reduction and sustainable development. This has been universally accepted as part of the Sustainable Development Goal 7 (SDG 7) which aims to ensure universal access to affordable, reliable, sustainable and modern energy by 2030. India has initiated a number of programmes including extensive rural electrification, fast paced last mile connectivity to 30 million of the poorest un-electrified households etc. and is well on its way to achieve the set targets.

While the systematic programme-based efforts by the Government of India will ensure grid extension and connectivity; sustainable and viable service provision would require a range of new initiatives to complement these efforts of connecting the un-/under served. Research indicates that decentralised systems are much better placed to serve such consumers. Innovative business models that are able to bring together – decentralised and distributed renewable energy generation, new technologies to reduce cost to serve, affordable financing, and inclusivity by involving local communities, will be essential to serve such customers in a viable manner. Decentralised electricity system will need to co-exist within the larger grid, and interact with grid based system more strongly and symbiotically to keep the sector financially viable and affordable.

Given the federal nature of the electricity sector, states need to undertake – ‘integrated electricity planning using a whole systems approach’ that takes into account various possible scenarios of supply, demand and resources; and adopt pathways based on the most optimal scenario that meets the state’s vision and specific requirements.

”

The black swans of coal: A call to action



**Niladri
Bhattacharjee**

Niladri is a Partner with KPMG in India and leads the Metals and Mining practice for the firm. He works extensively with public and private sector organisations in this space, on strategy and operations solutions.

“

In his book "The Black Swan" (April 2007), Nassim Nicholas Taleb wrote that a small number of Black Swans (rare, unpredictable and extreme events) explain almost any consequential thing in our world, such as the course of historical events and even our own personal lives. Whereas predictable, incremental developments do not produce turn-arounds. Increasingly, policy and regulatory discontinuities are taking the form of black swans.

In so far as coal is concerned, coal block cancellations or Shakti auctions can be called black swans. It is possible to speculate about some of these unexpected events with deliberate effort. One can imagine a few situations like:

- Sharp reduction in spot e-auctions of coal over the next five to seven
- Steep rise in environmental tax on coal or fossil fuels over the next decade, due to a few damaging environmental events in rapid succession
- How about if logistical bottlenecks in the coal-fields take three to five years more to be resolved, due to local protests or
- Seaborne coal at sub-forty dollar levels?

There could be many more. Remember, black swans have very low probability. However, if they happen, how do they impact you? Luckily there are both positive and negative black swans. When coal-linkage auction happened for the first time, some companies got a great opportunity to secure supplies at a reasonable price and some didn't. Now, linkage auction premiums are hitting the roof. There will be some winners and some losers when black swans occur.

Taleb prescribes that it is important to continuously position oneself to harvest the positive black swans and guard against negative ones. The main task is to think hard and position/de-risk your business.

”

Sustaining the gains from e-mobility through local manufacturing



Biswanath Bhattacharya

Biswanath is a Partner with the Management Consulting practice of KPMG in India, he is an operations transformation expert.

“

The benefits to the nation and the economy of a developed electric mobility ecosystem will be realised fully only if a strong and globally competitive manufacturing ecosystem is co-developed along with adoption of electric vehicles and e-transport systems in India.

The alternative, that of importing key components and sub-systems of the electric drive train like the batteries and battery management systems and associated components, will in essence lead to potential loss of economic activity that is today contributed by the vibrant ICE engine and drive train manufacturing ecosystem. This ecosystem has helped make Indian manufacture of small cars and two wheelers amongst the most competitive in the world, and contributed substantially to exports and manufacturing output.

The establishment of a new and globally competitive manufacturing ecosystem will not come about without concerted effort and policy support from all stakeholders. If subject to purely commercial considerations, large scale capacities coming up in East Asia, will likely be leveraged for serving the Indian market also, by original equipment manufacturers (OEMs) in the initial years. The scale, innovation capacity, and ecosystem built in these initial years, will become formidable barriers for Indian companies to overcome in later years. Hence a mix of the following developments are needed, to ensure that electric drive trains become a viable manufacturing proposition in the Indian market:

- Indian OEMs need to be encouraged through policy support to either partner and / or invest in electric drive train manufacturing capabilities, in ways that enhance their cost competitiveness and supply chain security
- Global majors in battery and electric drive train manufacturing are provided global best in class incentives for locating their manufacturing base in India, including in locations that enable them to export their output competitively, and import components with ease
- Innovation and research in all aspects of e-mobility is encouraged by Indian research institutes, and supported fiscally through specific support programmes.

”

Strong institutions with empowered leadership will be at the core of driving change in the power sector



Apurva Chaturvedi

Senior Clean Energy Specialist, USAID/India

“

The Indian power sector is in the midst of a paradigm shift as it gears up for a more distributed and consumer-centric energy future where two-way power flows and increased intelligence are likely to become the norms. These transformations are shaping the future of discom ecosystem that will need to gear up fast to capitalize on this opportunity space being created. There is need for concerted efforts from various stakeholders in the sector to induct new processes, skills, technologies and resources, to embrace this new energy future.

Need for strong institutions with empowered leadership to drive the power sector of the future cannot be underscored. Agility in planning and decision making will need to be core attributes of such institutions that are responsive to the emerging sector needs and growing customer aspirations. Such institutions will also need access to global know how, best in class technical expertise, data driven tools and methods, technology based decision support tools etc. The new policies and programmes in the power sector increasingly need to incorporate these aspects into their frame, and create avenues for institutions and leadership to flourish at multiple levels.

”

Electricity markets as enablers for reliable RE integration



Puneet Chitkara

Puneet Chitkara is an Executive Director with KPMG in India and is a power system economist and modeler by interest, training and experience.

“

Electricity sector needs to urgently plan to address the risk of variability in electricity prices and make provisions for reliable supply through market mechanisms. Distribution companies (discoms) cannot afford to plan supplies by attributing zero capacity value to renewable energy (RE) based generation. The volatility in day-ahead and intraday is typically governed by the following fundamentals:

- If the day-ahead demand is largely expected to be met from conventional sources and RE capacities are likely to contribute insignificantly, the day-ahead prices would be high
- The prices in day-ahead market (DAM) might decrease if RE generation is expected to contribute significantly (especially in states like Tamil Nadu, Karnataka, Rajasthan on a day ahead basis)
- In real-time, if RE generation actually increases beyond what was expected in DAMs, intraday prices will get suppressed. On the other hand, if intraday day RE generation remains low, the intraday prices will be high.

The burden of planning supplies on day ahead and intraday basis could be taken off discoms, who just concentrate on demand forecasting and placing bids for their demand in the day-ahead markets. They could cover themselves with capacity contracts though. Supplies, in such a set-up, could be made available through the markets, where generating companies/ traders offer and get cleared. Risk in electricity markets has both temporal and spatial dimensions. ‘Temporal’ revenue risk for generating companies/traders and cost risk for discoms could be taken care of through contracts for differences (CfDs). CfDs could hedge risks for market participants in both day ahead and intraday markets. ‘Spatial’ risk is managed through congestion revenue rights (CRRs). Increasing RE penetration poses huge risk for coal/gas plants too, which need to be operated for balancing power systems. The profitability of fossil fuel based plants is linked to ‘spark spread’. In this context, it is pertinent that mechanisms for CfDs and markets for CRRs and spark-spreads be immediately evolved.

”

Digital in mining: Role of the ecosystem



Sanjeev Chopra

Principal Secretary,
Industries, Govt. of
Odisha and Chairman,
Odisha Mining
Corporation (OMC)

“

Today, most mining companies in the world are looking at IT-enablement and digital solutions to automate their core operational processes across the entire value chain. In India also, many mining companies – private as well as central/state PSUs – have invested in information technology in the areas of mining operations and support functions. Case in point, the largest state mining corporation in India, Odisha Mining Corporation Ltd. (OMC) is on SAP since 2005 and has an aggressive vision of expanding its digital footprint.

However, in comparison to their global peers, the Indian counterparts have been lagging far behind in realizing the benefits of digital, especially in the areas of core mining operations, asset management, logistics etc. by making use of real-time operational data. It seems there is a lack of an enabling digital ecosystem which is perhaps the most significant inhibiting factor. The ecosystem comprises equipment suppliers/ original equipment manufacturers (OEMs), software solution/ IT technology providers, locally available maintenance support service providers, regulators who collect operational data from the mines, etc. – all working seamlessly together on a common platform. Needless to say, it also requires adequate policy support from the government as well as suitable industry standards.

Only recently on 1st Dec, 2018 the Drone Regulations 1.0 came into force. This is a crucial enabler - both for survey as well as surveillance. These regulations took approximately four years to come to fruition. Deployments of automated mining solutions have been limited due to interoperability and integration issues – for example, integration of the miner's systems with the government's IT based mineral administration systems is still in its infancy. The capability of an OEM owned dashboard tool to port data from another OEM's system due to protocol mismatch, is another significant issue in the mining industry. As a result, digital intervention in mining in India has not been able to progress much beyond Operator Independent Truck Dispatch System.

Given that India is currently in its early stages of digital adoption, it is imperative that the approach to transformation is right. The journey towards greater efficiency and higher value realization through adoption of digital solutions would require collaborative efforts from all stakeholders.

”

To call our renewables and storage journey a success we need to get the technology story going



Anish De

Anish leads Energy and Natural Resources for KPMG in India and is passionate about energy strategy, organization transformation and technology.

“

Solar power deployment is a success story in the making for India. We set out ambitious goals, and are on the path to achievement. However that positive story is shrouded by the failure to capture the rest of the value chain. India produces less than half of the modules required for deployment in the country and a negligible part of the solar cells. As a country we are almost entirely out of the core silicon manufacturing play.

India needs to aspire for manufacturing leadership principally because manufacturing brings in jobs for a country that clearly needs more jobs. Yet there is not just enough to show by the way of results. My own view is that we have set the bar too low and the objectives too narrow and tactical. Instead we should have set a clear goal of technology leadership in select sectors and manufacturing, research, skilling, etc. would all follow. This is what China has done and is unflinchingly following that path despite huge challenges. We had and still have most of the advantages that China enjoys - a large and growing economy, large consumer base, entrepreneurship, and innate technical capabilities.

All of this can be channelised right if we ask the right questions, set the right goals, and stay on course. It is not too late. We still can, provided aims are clear, our philosophy is articulated well and we align all stakeholders to those worthy goals. While solar is now a mature game and catch up is difficult, the battery storage story is still under development. We need to work to get that right through the value chain and not just become the largest users of batteries designed, developed and produced by others. And we need to do this as market leaders and not with the crutches of extended state support.

”

Structural changes coupled with good governance is the need of the hour



Vikas Gaba

Vikas is a Partner with the Power & Utilities practice at KPMG in India. He believes that a lot of answers to the issues in the power sector lie in 'starting with the customer and working backwards'.

“

20+ years of experimenting with reforms in the power distribution space has taught us several important lessons. Some of the important ones are that 'strong governance' and 'political buy-ins' are key for any reforms to succeed.

States that have had these attributes have performed well even in the public controlled environment. These states are also the ones that have responded well to various reform schemes like R-APDRP, FRP, etc. and continue to respond well under the DDUGJY, IPDS, and the UDAY* programme that integrated large number of initiatives under one umbrella. States where these attributes went missing, the outcomes have been difficult to achieve, despite the efficiency focus and accountability that these schemes aimed to bring in.

Three years into the UDAY programme, the results are not difficult to assess, at least directionally. Overall results have been positive despite the headwinds – in FY18, annual financial losses are down to ~INR 15,000 Cr (post subsidy booked), and the aggregate technical and commercial (AT&C) losses at ~19 per cent¹. The states that have been able to demonstrate stronger ownership and governance have been leading the outcomes. However, wide disparity exists among discoms, and also areas within discoms where co-opting the local leadership and creating acceptance becomes important. Even as pockets of successes have emerged, earlier lessons remain.

Time is opportune for states to introspect and evolve a reform path that will work for them. We can no longer afford to continue with incremental actions. We need to look at alternative structures that help in accelerating the improvement trajectory, and bringing stronger accountability and governance into discom operation.

”

**R-APDRP - Restructured - Accelerated Power Development Reform programme; FRP – Financial Restructuring Plan; DDUGJY-Deen Dayal Upadhyaya Gram Jyoti Yojana; IPDS – Integrated Power Development Scheme; UDAY – Ujwal Discom Assurance Yojana; AT&C – Aggregate Technical and Commercial Losses*

Source: ¹UDAY Portal

Need a shift in governance style: from a reactive approach to a proactive one



Santosh Kamath

Santosh is a Partner leading the Alternate Energies practice at KPMG in India. He believes the trinity of alternate energy, storage and digitalisation technologies can be mankind's answer to climate change.

“

The history of our power sector shows that utilities and the stakeholders have always taken a reactive approach to changes that have hit them. Let's look back and start with the power deficits in the 1990s and 2000s. Generation was de-licensed and private participation was encouraged. A flurry of investments in generation materialised, soon to realise that we did not address discom issues adequately. When the focus turned on unbundling and addressing discom issues, administrators did not see fuel side challenges emerging. Now, while we are in the process of addressing fuel and discom issues, we may not be doing enough to address the impacts of high renewables and distributed generation.

We need to move away from responding in crisis mode to a calibrated, and well thought out approach to address emerging changes. For the emerging future, I see the need to focus on the following:

- Flexibilisation of the coal plants to accommodate high RE
- Immediate focus on improving the efficiency of the state gencos and the coal supply chain, else many of these assets could get stranded in the coming decade; or otherwise slow down the legitimate rise of clean energy
- Making the distribution grids prepared to accommodate distributed generation and electric vehicles.

Emergence of distributed generation and storage technologies will be driven by market forces as economics start becoming compelling and utilities, hitherto living in the comfort of a monopoly environment, could be left merely watching.

”

Evolving role of behavioural energy efficiency



Vishal Kapoor

Director (Distribution),
Ministry of Power,
Government of India

“

The concept of behavioural energy efficiency (BEE) is gaining ground to promote efficient electricity consumption amongst consumers. It leverages the human penchant for decision making based on heuristics and beliefs, thereby allowing them to make active choices on their consumption patterns. However, the path towards BEE is fraught with significant challenges.

Like any other consumer influence exercise, targeting the right consumers along consumption lines is of utmost importance. An effective BEE measure should bring back saliency of electricity into the consumers mind with the underlying principle ‘what is salient gets done’. Economic signals are the most effective method to alter human behaviour. Thus, time of day (TOD) is the most potent instrument available to enable behavioural shifts in pattern of electricity usage. However, if the economic signal is weak, or doesn’t make a significant impact on the expenditure basket of the consumer, the intervention would fail.

As a non-financial signal, a human penchant for adherence to social norms holds promise towards propelling consumers towards efficient energy consumption, especially if the electricity bills or mobile notifications indicate comparators of their electricity consumption with their neighbourhood. Since losses always loom much larger than gains, framing messages to consumers in form of financial loss messages due to inefficiency is more likely to evoke behavioural shifts than messages promising savings if energy is used efficiently.

However, there are several barriers to the path of non-financial BEE messaging. For example, consumers using digital ecosystem of payments of direct billing and payment through credit cards many times don’t even see their electricity bills. Or, some affluent consumers have errand boys to take care of their needs, who aren’t likely to pass the message to the owners. Further, several competing notifications on mobile phones could crowd out carefully crafted BEE nudges. To top it all, behavioural interventions need a continual change to overcome human abilities to adapt to the new normal quickly, beyond which the measures become non-salient.

Therefore, utilities and policy makers have to put in considerable diligence, while crafting their BEE measures to ensure that these seemingly easy interventions deliver well.

”

From oil to chemicals - is the petrochemicals transition diversification or survival?



Manas Majumdar

Manas is a Partner with KPMG in India in the Energy & Infrastructure practice and his areas of focus are oil & gas, chemicals and process industries, power & utilities. He leads the business transformation group specialising in operations transformation with digital at its core.

“

The global transition:

Under the surface of the burgeoning petrochemical industry there is a profound transition that has been playing out – from regional players and specific polymer product focus to oil and gas majors with expanded petrochem portfolios and enhanced technology developments. With this petrochemicals has become the significant global trade it is now - annual ethylene production has almost doubled to 150 million MT over last 15 years. The petrochemical market is expected to grow at a CAGR of 10 per cent till 2030 with a market size of INR 4900bn¹.

The India story: diversification as well as survival:

Truth be told, fossil fuels are not the future fuels and a large scale shift towards alternate energy is inevitable.

In addition, the demand for petrochemicals in India is strong, driven by increasing urbanization and rising consumption levels (current per capita consumption is just 1/4th of global average). Further, petrochemicals are a margins boost to the oil refiners and more companies are planning to add capacity over next few years, Indian refiners are moving towards production of C5 derivatives and aromatics trying to replicate the success story of C2 and C3 derivatives in the domestic market and also target exports.

Key challenges and future plan of action:

While petrochemicals has seen growth in India, there are challenges such as feedstock volatility and competition from imports. In addition, technology has to be licensed from outside, hence going forward Indian companies need to invest more in R&D.

Further, companies need to be ahead of the curve before margins shrink and demand from existing areas tapers – there is need to focus on productivity and efficiency as well as innovate products for emerging uses and target new segments and regions.

”

Source: ¹U.S. Energy Information Administration

Expanding short term power markets



Rajesh K Mediratta

Director(BD), Indian Energy Exchange

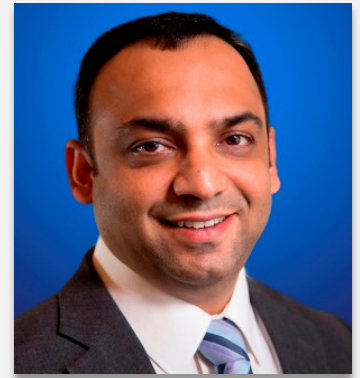
“

The short term power market, having been considered as a segment which fulfills the objectives and vision set out in Electricity Act 2003, of encouraging competition in supply of electricity, has stagnated over the last seven to eight years. We in India, still consume only about 8 per cent of our total electricity consumption through short term markets. In the recent discourses with market stakeholders that include policy makers, regulators, utilities and large consumers, all alike have expressed that competition and therefore short-term markets must grow to at least 20 per cent.

Unfortunately, the coal supply chain has contributed substantially to stunted short term markets. To manage coal shortage conditions, the coal allocation policy took unwarranted course. Coal linkages from mines got rationed to generating plants with long-term power purchase agreements (PPAs). Such policy increased prices to as high as double of those with linkage and many merchant plants who otherwise could sell in short term markets, were either forced to look for medium and short term PPAs or lost opportunities of improving the bottom line. Some became insolvent in this process. Also, merchant markets could not grow and at the same time the sector lost merchant plants. It will be very unfortunate that India with reserves of 315 billion tonnes is unable to increase its coal production and supply by 100mtpa, which is needed at this moment, since enough generating capacity has been created. It's high time that all out efforts should be made to increase coal production and supply through Coal India, commercial mining and at the same time allow coal linkages to merchant generating plants.

”

Bankable projects need a bankable delivery mechanism to become a reality



Puneet Narang

Puneet is a Partner with the Major Projects Advisory practice and he is on a mission to help build our country's infrastructure by enabling our clients strengthen their delivery capabilities.

“

Leaving the political debate aside, the Statue of Unity came up in time because the delivery ecosystem supported it (being monitored by the highest office, is a part of a stringent monitoring and review mechanism).

Delhi Metro (1st phase, 2005¹), Charanka Solar Park (2013²), J&K power transmission line project (Oct 2018³) supplying power from Punjab to Kashmir valley - these are examples that show projects can be delivered successfully in our country.

India is witnessing an unprecedented development boom, and infrastructure construction is at the heart of this. Approximately 50 lakh crore will be invested up to 2022 to sustain this growth⁴; a strong pipeline of projects and large programmes are underway. As we get into an election year there will be heightened public scrutiny on the actual implementation and outcomes of some of these programmes. Infrastructure development involves long gestation periods, at times transcending government terms, and is often closely intertwined with public opinions impacting outcomes. With private investment almost drying up, the thrust is on public sector projects.

I am listing out just four simple points that could help create a bankable delivery mechanism important for projects to succeed:

- Reforming public procurement of construction services and supplies, strong contract management
- Strong pre-planning and site readiness before mobilization
- Strengthening stakeholder management for land and regulatory issues
- Improved governance that leverages new technologies (4/5D Building Information Modelling (BIM), blockchain, drone-based monitoring).

”

Source: ¹Delhi Metro Rail Corporation, ²The Economic Times, ³Sterlite Power, ⁴The Economic Times

Power sector: It's no longer déjà vu



Prabir Neogi

Chief Executive,
Corporate Affairs, RP
Sanjiv Goenka Group

“

Indian power sector has come of age. Archaic laws of the independence era that supported centralised planning and co-ordinated development have given way to new legislation which has striven to usher in a liberalised environment of demand-driven growth and investments. Policy making has entered public domain as stakeholder consultations and public engagement have become critical to implementing reforms in India's political economy. Strong growth has tested the adequacy of economic institutions and regulation as a discipline has required the application of law, economics and finance for framing licences, designing contracts and structuring operating rules. Load-serving entities with customer interfaces have had to merge their techno-commercial expertise with social engineering skills to face public debates and build sustainable business models based on recovery of realistic user charges. To align with welfare principles, examination of tariff affordability indices as a ratio of household expenditure or disposable income is as important as designing affordable tariff and funding support for the target population. Concurrently, design of cost-reflective retail tariff and eliminating cross-subsidies is a socio-economic challenge decision makers face in restoring the competitiveness of trade and industry and removing the barriers to market access for procurement of power.

New age technology will change the industry functioning in more ways than one. Predictive tools based on artificial intelligence and machine learning are necessary to accurately forecast and schedule variable solar and wind energy generation in order to optimise resources and select capacities for balancing markets and ancillary services operations. In an era of uncertain economic outlook, demand forecasting will have to follow probabilistic rather than deterministic models so as to undertake capacity planning to achieve load-generation balance under different scenarios. Repositioning of markets will be necessary to enable greater proportions of flexible trade via short term contracts and collective transactions via the power exchange to enable dynamic balancing of variable supply and demand. An immediate measure will be to liberalise the fuel market and allow short term trade and spot sales via a clearing house to converge with power market operations. Disruptions in power distribution are not too far off, as decentralised distributed generation and off-grid renewable energy services will challenge business as usual. Propelled by customer choice of suppliers and alternative forms of energy, new skill sets will be driving the course of technological changes, organisational reforms and business models.

”

Development of domestic RE equity markets: Key to an orbital shift in growth



Hitesh Sachdeva

Hitesh is a Partner in Special Situations Group (Infrastructure) practice at KPMG in India. He focuses on transactions in the conventional power, renewable energy and stressed assets space.

“

India achieved the distinction of the fifth largest investment market and largest auction market in renewable energy (RE) in year 2017¹. Growth has been created by supportive policy dispensation for RE developers further aided by falling levelised costs of energy, (LCOE) due to technological and cost efficiencies.

Capital is the most critical ingredient for RE developers and a vibrant market has been seen over the last four to five years. Pension funds, yield funds, growth capital private equity funds, global strategic independent power producers (IPPs) were a few class of investors who adopted Indian RE market as a playground.

While there have been a few international bond placements by renewable IPPs, the domestic debt capital providers stepped up to the challenge and have provided an overwhelming majority of the debt requirement of these projects.

On the other hand, equity investments have largely been foreign investor dominated. The recent oil price volatility in-turn leading to Indian Rupee volatility, impacts the returns to some extent and sentiment to a very large extent for the foreign investors. Further, the exit considerations of the investors in this space are also negatively impacted by such fluctuations.

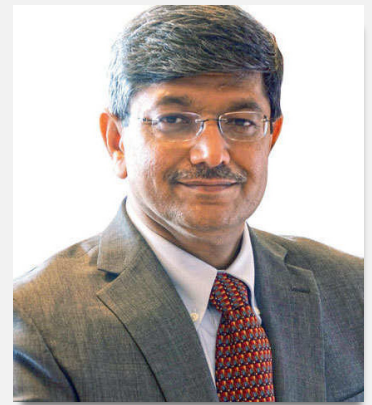
In our view, to build a sustained momentum, a counter-balance in terms of domestic equity market development for RE is needed. The following could be considered here:

- RE developers could look to explore domestic monetization options such as infrastructure investment trusts (InvTs), placement of equity with domestic institutional and individual investors
- Government may ease the investment norms for domestic pension and insurance capital to be channelized into RE
- RE developers may need to rationalize their return expectations by promising and delivering a slightly higher return to such investors to whet appetite and help develop this market.

”

Source: ¹Bloomberg New Energy Finance

Imperatives for long term sustainable growth of the power sector



Gurdeep Singh

Chairman and Managing Director, NTPC Ltd.

“

Electricity is emerging as a solution for meeting many energy needs. With 100 per cent household electrification slated to be achieved by end of 2018, electricity will be a game-changer in India's pursuit for inclusive growth, self-reliability as well as green energy mix. The sustainability of the sector, therefore, has far-reaching consequences.

Growth in electricity demand has already been higher than last year and this uptrend will continue as efforts of the Government through SAUBHAGYA, DDUGJY and IPDS* shall ensure accessibility. Availability and affordability would be the responsibility of generators and suppliers of electricity. This will enable the electrification of the energy basket including mobility and cooking, apart from industries, commercial, domestic needs, agriculture, etc. Electrification of the energy basket would mean improvement in efficient use of energy and cleaner environment.

Growth in renewable share is inevitable, which will bring in new challenges for conventional generating sources. India's base load is supplied by coal based power and this will continue for quite some time, albeit with substantial requirements for flexible operations. Hence, there is need for upgrades in conventional generators to meet flexibility requirements and environment compliance, which would be required to be completed over the next few years.

It is essential that sanctity of contracts and power purchase agreements is maintained. Focus must be on long-term sustainable growth through a mechanism that works for all stakeholders.

Adoption of digital tools to enhance productivity, improve asset management, achieve higher accuracy in demand forecasting, improve receivables management and increase transparency is the key to long-term sustainability of the sector.

”

**SAUBHAGYA - Pradhan Mantri Sahaj Bijli Har Ghar Yojana; DDUGJY - Deen Dayal Upadhyaya Gram Jyoti Yojana; IPDS - Integrated Power Development Scheme*

Renewable energy and digital technology to transform the power sector



Praveer Sinha

CEO & Managing Director,
Tata Power

“

The power sector is undergoing paradigm shift with the rapid rise of renewable energy and distributed energy resources. These developments will lead to a significant change in how our grids are managed and how we provide access to power to millions of consumers in urban and rural areas. The rise of renewables means that grids have to become adaptable to handle the variability that comes with it, and this calls for edge of the grid solutions enabled by digital technologies. Demand side flexibility through demand response solutions, storage technologies and demand side management are needed to address these situations on real time basis. Regulations and market mechanisms will need to quickly evolve to enable these solutions. Solar rooftop will proliferate in a big way as economics works out favourably and consumer awareness develops. Energy storage, distributed energy resources and demand side solutions as also penetration of electric vehicles will make the grid complex and integrated and this can be effectively operated on real-time basis to manage the peak and off peak requirements.

Significant innovations are possible in how we deliver and manage rural electricity supply. Decentralised distributed generation through solar and other renewable technologies, in hybrid with storage technologies and digital solutions offers innovative possibilities to meet rural power supply needs in a reliable and cost effective manner. Governments and policy makers should enable innovative models to attract private investment and entrepreneurship in this area. It can help address an important social and developmental objective to provide reliable electricity to millions of our rural households and enable economic empowerment of our villages and communities in tune with Gandhian economic principles.

”

Future of cleantech in India



Simon J. Stolp

Country Lead (India) -
Energy and Extractives,
The World Bank

“

Despite significant challenges that India faces in bringing shared prosperity to its population, it has embraced cleantech and a sustainable energy future, in a way that many countries have not had the foresight or courage to do. India has understood the nature of the energy transition that the world is currently undergoing, and is seeking a leadership position within this, and I strongly believe that this will provide it with significant future opportunities. Firstly, to shape its own clean energy future and accelerate its transition to new technology, and also to shape a global agenda and position itself within this – either as a high-level technical contributor, manufacturer or financier and developer.

The World Bank has been supporting India in its journey towards renewable energy since our earliest engagement in hydropower, back in the late 1950s. We have also been financing new renewables as early as 1992, with the USD190 million India Renewable Resources Development project. Our current support for solar power development helps mobilise private and commercial finance for grid connected solar parks, and also catalyses much stronger financial flows to distributed solar, particularly within the rooftop solar sector. In the last year and a half alone we have committed over USD 1 Billion to support the development of the solar power market, and USD 300 million in financing for scale up of the Government’s energy efficiency programmes.

We will continue to look for ways to advance technology development, open and accelerate clean technology markets, and increase the levels of affordable financing to these markets. On the immediate horizon we are providing catalytic financing for a significant solar-wind hybrid and battery storage project in Andhra Pradesh, and for floating solar PV across a number of states. We will also continue to provide financing and technical assistance to grid-scale and distributed solar. We believe there are real opportunities for India’s state governments, and private sector, in working with the models that we have developed alongside IFC and SBI (our partner in providing financing to solar rooftops). We are also hoping to work with these models to support the development of India’s battery storage and off-shore wind markets. We see great opportunities for e-mobility in India, and will work with public and private counterparts both through technical assistance and financing to support the development of this market. Lastly, we will continue to work on grid-integration of new renewable technologies, both through the development of India’s wholesale power market, and through the development of infrastructure which will provide storage and or balancing capacity for renewables – including tradeable hydropower.

I’m very excited about the future of cleantech in India, and see this as being a core aspect of India’s transition to a prosperous, highly educated, healthy, secure, corruption-free, energy-abundant, environmentally sound, and globally influential nation.

”

The role of energy executives in driving innovation

“

Innovation is a critical success factor in enabling global energy leaders to respond to challenges in providing energy that is affordable, secure and sustainable.

The energy sector is undergoing a transformational change. We are moving from a centralised electricity model to one that is more distributed. Dramatic changes in enabling clean and flexible technologies, consumer preferences, and sustainable practices are moving at speed.

What are energy leaders doing well to drive innovation within their organisation?

Firstly, senior executives are leading by example and showing leadership. Successful leaders are setting the tone from the top. They are setting goals and making the agenda clear. They are clearly visible in the innovation activities within their teams. Many executives are researching and learning from other innovative leaders from peers and adjacent industries to take back insights within their own businesses.

Secondly, leaders are embracing workplace diversity in driving a culture of innovation. Multiple initiatives include: blending age, gender and ethnicity of project teams, working in collaboration with experts from other organisations, working with start-up organisations in new energy solutions i.e. blockchain, analytics, IoT, platforms and smart grids providers.

Finally, innovation needs to embrace inclusion within an organisation's workforce. Diversity alone is not enough. People's voices need to be heard so that innovation can flourish. Within the energy sector, inclusion brings the voices of a wide variety of stakeholders from the technicians in the field to the call centre operators dealing with consumers.

Global energy leaders are embracing innovation to drive business growth and respond to emerging opportunities and challenges. These ingredients will be vital in enabling energy executives to flourish with new partnerships in the new energy era.

”



Ted Surette

Global Head of Power & Utilities and National Industry Leader, Energy & Natural Resources
KPMG Australia

The solar roof top revolution – what could be the winning strategy?



Anvesha Paresh Thakker

Anvesha is an Executive Director with KPMG in India and focuses on the Alternate Energy space. She believes that technology would be critical for addressing opportunities as well as challenges, as the energy sector transforms in an unprecedented manner.

“

Renewable energy (RE) generation so far has been largely a utility focussed business. All that is set to change with the advent of distributed renewable energy solutions such as solar roof top with its power to disrupt the traditional power value chain.

In countries such as Australia, penetration of houses with solar panels is already more than 20 per cent¹. In India, power companies are beginning to realise the potential that the solution offers, as a more connected and aware consumer has started to look at ways to optimise electricity consumption as well as reduce his/her carbon footprint.

I believe that the possibilities are immense. The roof top business creates a first point of entry for developers in a customer's premise, which is only the beginning of a relationship which promises significant growth with potential layering of digitally-enabled value added services such as smart homes, energy management, demand response, smart electric vehicle charging, etc. Just like mobile telephony broke the rules of the game in the telecom sector by first minimizing communication costs and then combined with data, leading to a smart devices revolution in the telecom space, solar roof top combined with technologies such as digital can transform the energy paradigm.

There are challenges in a rapid scale up in this segment owing to aspects such as small size of each opportunity, widespread customer base, high transaction/ operating costs per customer, financing issues etc. Here innovations in business model with technology at its core for widespread outreach, reduction of conversion cycle, management of dispersed assets, workforce/ channel management etc., would be critical. Finally, ensuring customer 'stickiness' by providing the right customer experience may be the key.

As storage costs decline to levels where solar roof top cost combined with storage is cheaper than grid-supplied electricity, the solar roof top juggernaut may be hard to stop. At that stage true 'winners' may be those who have got the formula right.

”

Source: ¹PV Tech

All 'voices' are arranged in an alphabetical order (as per last names).

The views and opinions expressed herein are those of the persons quoted and do not necessarily represent the views and opinions of KPMG in India.



KPMG in India contacts:

Nilaya Varma

Partner and Leader

Markets Enablement

E: nilaya@kpmg.com

Anish De

Partner and Head

Energy & Natural Resources

E: Eanishde@kpmg.com



Follow us on:

kpmg.com/in/socialmedia



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2018 KPMG India, an Indian Partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. All rights reserved.

The KPMG name and logo are registered trademarks or trademarks of KPMG International.

Printed in India