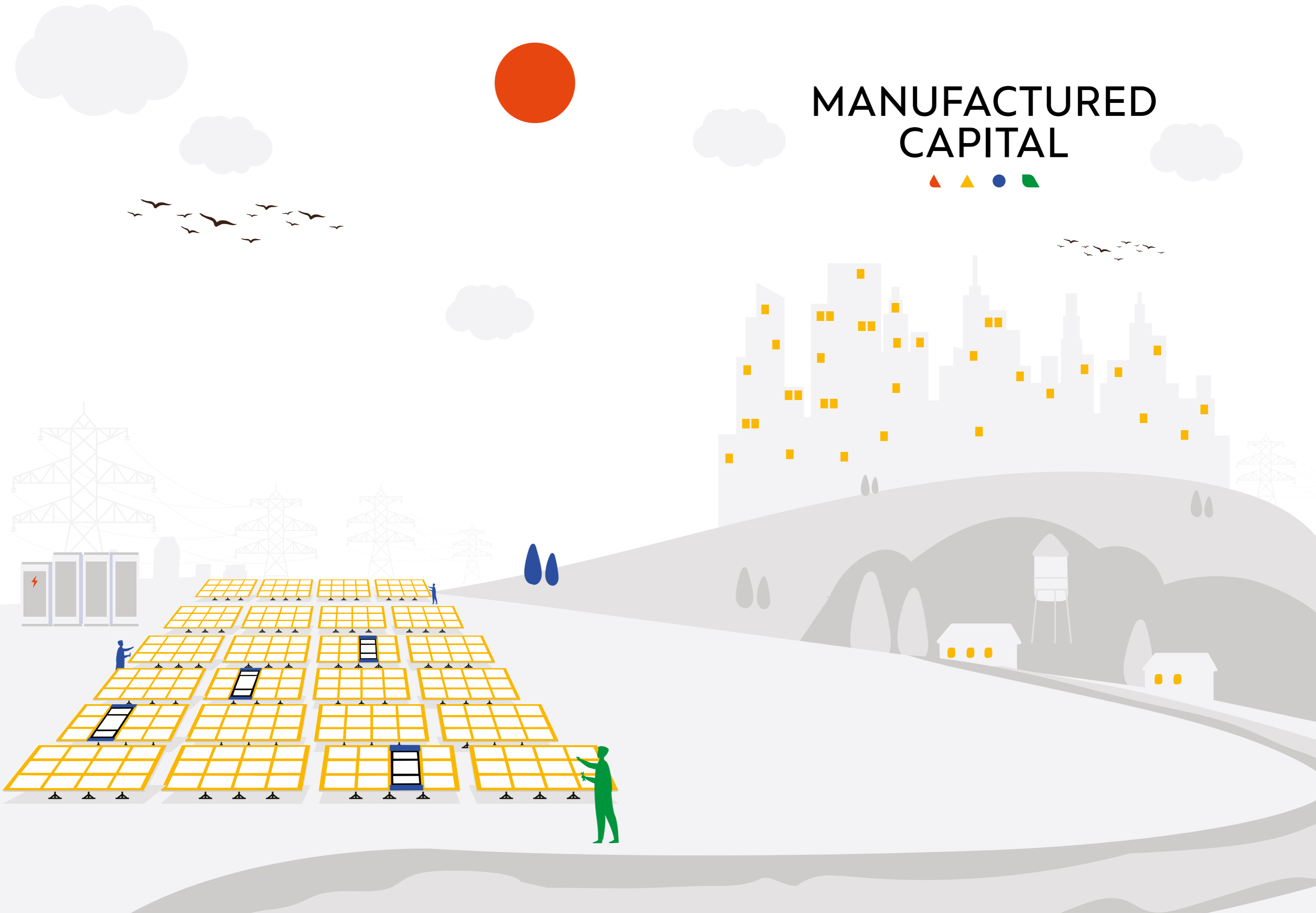


MANUFACTURED CAPITAL



MANUFACTURED CAPITAL

Energy is a critical component in the advancement of the world order. Over the years, however, while the energy requirements of the world have increased, we have found cleaner and greener ways of making it available. The aspirations of the world may have grown manifold but so have the ways in which they are being fulfilled. Apraava Energy embarked on a low carbon path by entering the Renewable Energy (RE) segment from 2009 onwards. Within a short period, we were successful in consolidating our position through steady cash flow, resource optimisation and greater safety standards.

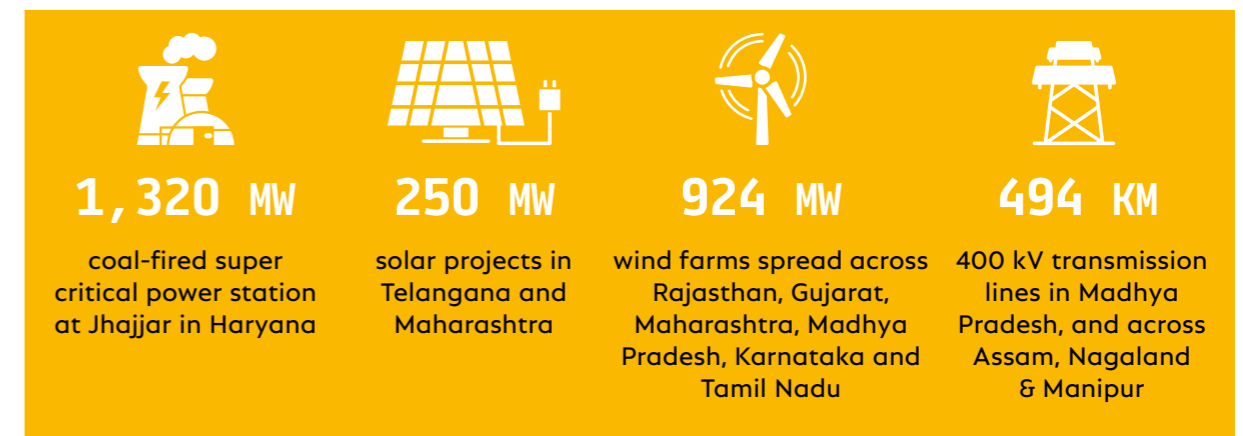
Material Topics

- Operational Excellence
- Performance Monitoring and Management
- Adoption of Advanced Technology



Power Assets

Apraava Energy's Power Generation Assets (as on 31 March 2023)



Details of Total Energy Sent Out from our plant sites

Source-wise Energy Sent Out

Sources	Unit	FY 2020-21	FY 2021-22	FY 2022-23
Coal	GWh	4,546	7,242	7,634
Solar	GWh	471	454	472
Wind	GWh	1,536	1,664	1,551

250 MW Under Construction Wind Site Located at Sidhpur, Gujarat



Apraava Energy's Total Energy Consumption

Sources	Unit	FY 2021-22	FY 2022-23
Coal	TJ	72,118.21	75,441.73
HSD	TJ	64.57	54.27
Diesel	TJ	10.40	12.71
Petrol	TJ	0.02	0.13
Purchased Electricity - Grid	TJ	34.18	49.76
LPG	TJ	1.53	1.72
Total Energy Consumption	TJ	72,228.91	75,560.32
Energy Intensity	TJ/MWh	0.0077	0.0078

Jhajjar Power Limited (JPL)

Our thermal power plant, Jhajjar Power Limited (JPL), with a 1,320 MW generation capacity, located in Haryana is the only plant in Northern India which is 100% compliant with emission norms and amongst the most efficiently operated and maintained plants in north India. It is the first and only thermal plant in North India to be equipped with a Flue Gas Desulphurisation (FGD) unit along with a hybrid Electrostatic Precipitator and Fabric Filter accompanied by low Nitrogen Oxide (NOx) burners.



Various improvement and innovative measures were undertaken at JPL during last year which has resulted in improved energy efficiency, reduced operational risk and reliable operations. Few of such notable initiatives are listed below -

Sr.No.	Technology Absorption	Benefits to the Company
1.	Deployment of centralised cybersecurity solution and virtualisation of Balance of Plant PLC network	Strengthened cybersecurity controls have been established including the Balance of Plant PLC network
2.	Hopper level detection based on Naturally Occurring Gamma Rays (NOGS) sensor technology	Increased accuracy ensuring level-based ash conveying for ash hoppers. This has resulted in reduction of service air consumption as well as auxiliary power savings
3.	Ballast-less concreting of 48 meter-area of rail track wagon tippler-B	This has resulted in avoidance of rail track settlements, effective coupling of side arm charger and wagons, lesser damage to couplers, maintenance-free work and safer work area

Sr.No.	Innovative Initiatives at JPL	Benefits of the Initiative
4.	Installation of new high efficiency indigenous FGD booster fan motor	This has resulted in increased reliability and savings in auxiliary power consumption
5.	Unit 1 AVR upgradation from Unitrol 5000 to Unitrol 6000	Upgradation with an advanced system has resulted in additional features for better monitoring and recording of events. This will increase system reliability. Also, PCBs have reduced by 30% resulting in lower maintenance
6.	Robotic inspection of U1 FGD absorber tower slurry headers and nozzles	Robotic inspection has resulted in a more effective dechoking of slurry headers, thereby contributing in improving the absorber tower efficiency

Taking forward our Advanced Process Control (APC) system implementation in FY 2021-22, JPL has now successfully commissioned it in both of units. APC implementation has resulted in overall improvement of Station Heat Rate. Additionally, we have also observed several other benefits like improved frequency response, accurate MW control, reduced oscillation in pressure control and faster load ramp rate resulting in more stable and efficient operation of JPL.

JPL's Operational Efficiency

KPI	Unit	FY 2020-21	FY 2021-22	FY 2022-23
Net Thermal Efficiency	%	36.25	36.11	36.40
Plant Load Factor	%	42.14	67.08	70.45
Availability	%	91.70	85.83	86.23
Auxiliary Power Consumption	%	6.71	6.64	6.28

Fuel Consumption of JPL

Sources	Unit	FY 2020-21	FY 2021-22	FY 2022-23
Coal	TJ	44,920	72,118	75,442
	MT	2,863,124	4,738,330	5,040,563
High Speed Diesel (HSD)	TJ	54	65	54
	kl	1,471	1,764	1,483
Specific Coal Consumption	MT/MWh	0.59	0.61	0.62
Specific Oil Consumption	ml/kWh	0.30	0.23	0.18



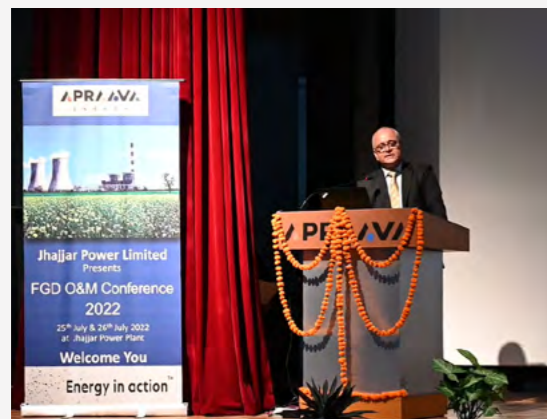
Flue Gas Desulphurisation Conference at JPL

Jhajjar Power Limited (JPL) hosted a first-of-its-kind Flue Gas Desulphurisation (FGD) Operations and Maintenance (O&M) conference on 25 and 26 July 2022 to discuss and explore joint opportunities for innovation, knowledge exchange, expertise sharing, and value creation for India’s power sector. The conference brought together major power producers and value chain partners.

FGD technology reduces sulphur dioxide emissions from stack gases of refineries and power plants, thus minimising adverse effects on natural ecosystems and human communities. JPL is currently the only thermal power plant in the Delhi-NCR region with FGD technology, having installed it as early as in 2012.

It was attended by more than 50 representatives of India’s ten major power producers, including National Thermal Power Corporation Limited (NTPC), Vedanta, Larsen & Toubro Limited (L&T), Haryana Power Generation Corporation Limited (HPGCL), Aravali Power Company Private Limited (APCPL), Reliance, Adani, Tata Power, and JPL, as well as seven of their value chain partners - Sick India, Simona India, Runh Power, Knauf India, Forbes Marshall, L&T Energy, and Melco India.

The discussions and networking sessions during the event were replete with insightful deliberations on topics such as energy security, decarbonisation, future & technological advancements as well as FGD O&M challenges and best practices. The conference concluded with participants visiting the JPL plant to observe the facility’s world-class safety and compliance features.



Renewable Energy Assets

Apraava Energy is committed to an accelerated growth path for its renewable energy business. Our renewable energy capacity was 1,174 MW as on 31 March 2023. Solar energy constitutes 23.33%, while wind energy constitutes 76.66% of the total renewable portfolio.

Operational Efficiency Across RE Assets

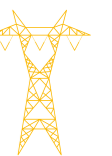
	KPI	Unit	FY 2020-21	FY 2021-22	FY 2022-23
Wind	Plant Load Factor	%	18.97	21.07	19.16
	Availability	%	95.62	96.46	92.66
Solar	Plant Load Factor	%	21.16	20.88	21.30
	Availability	%	95.85	89.77	93.60

Note: Plant Load Factor is calculated on Energy sold out

Apraava Energy ensures optimal operational efficiency through the application of real time monitoring of its wind and solar assets. As part of our digital transformation strategy, we have initiated the implementation of Central Monitoring Facility (CMF) at all of our RE sites. Our systems and processes are designed to supplement efforts of Original Equipment Manufacturers (OEMs) in early detection of any slippages and opportunities to resolve production and transmission related issues.



Our **largest wind farm project with a 250 MW capacity**, located in Sidhpur, Gujarat has recently **cleared all regulatory approvals** and is under construction/commissioning.



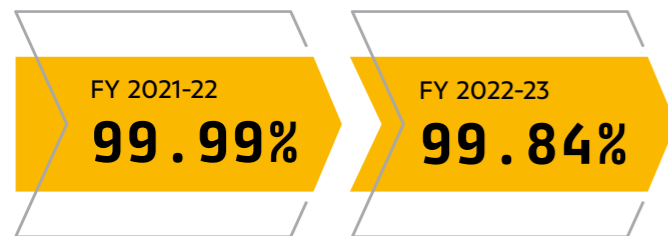
Power Transmission

Apraava Energy acquired Satpura Transco Private Limited (STPL) from Kalpataru Power Transmission Limited (KPTL) in FY 2019-20. The intrastate double circuit transmission line of 400 kV, spans over 240 kms from Sarni (Betul) to Ashta (Sehore) in Madhya Pradesh. STPL has effectively and consistently achieved 99.99% system availability in the last three financial years due to efficient Operations & Management (O&M) standards and proactive maintenance measures.

We increased our equity stake in our second transmission line project, Kohima-Mariani Transmission Limited (KMTL) to 74% in February 2023 from KPTL and Techno Electric & Engineering Company Limited. The remaining 26% will be acquired as per the terms of the transmission service agreement. KMTL passes through three states i.e., Manipur, Nagaland and Assam. It is an inter-state transmission project consisting of a 254-km double circuit 400 kV transmission line along with a substation in the north-eastern part of India. This asset has been operational since December 2020. KMTL has been created for long-term transmission customers and has been developed on a Build, Own, Operate & Maintain (BOOM) basis. The O&M of the transmission line shall be carried out by KMTL for 35 years since the commissioning of the project.

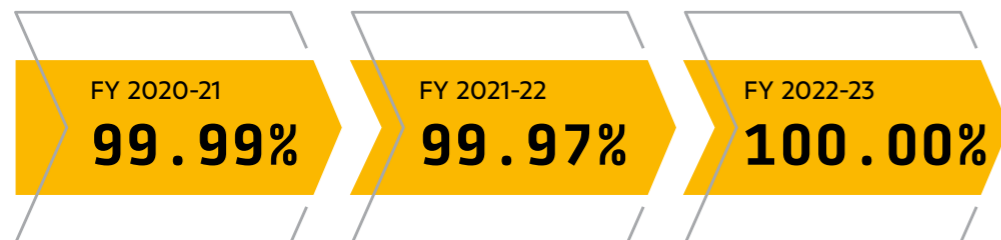
KMTL has been operating successfully since acquisition and has achieved cumulative availability of 99.92% vis-à-vis budgeted availability of 99.35% in the last two financial years.

KMTL Availability



STPL has been operating successfully since acquisition and has achieved cumulative availability of 99.99% vis-à-vis budgeted availability of 99.04 % in the last three financial years.

STPL Availability



STPL has been certified under ISO 45001:2018, ISO 9001:2015 and ISO 14001:2015. An Integrated Management System (IMS) certification for the KMTL asset is under progress.

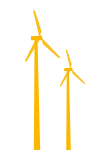
Apraava Energy takes consistent measures to maintain high operational and safety standards at both the transmission assets so that their performance is aligned with business objectives. For instance, regular monitoring and review of O&M processes, third party audits and joint inspection

of railway crossings among other measures have been undertaken to ensure compliance, safety and operational efficiency of these assets.

In FY 2022-23, we won bids for two greenfield transmission assets through Tariff Based Competitive Bidding (TBCB) project- a 224 km and a 21 km double circuit 400 kV transmission line and another 400/220 kV Air-Insulated Substation (AIS) in Fatehgarh, Rajasthan.



A Transmission Tower at Kohima-Mariani Transmission Line





Foraying Further on the Low Carbon Path: Our Advanced Metering Infrastructure Business

In a developing nation like India where the demand for power is constantly on the rise, both for industrial and residential consumption, it is imperative to balance the supply side with demand. Grid operators need to forecast power demand accurately and prepare a supply plan accordingly to ensure grid stability. An easy and logical way to improve predictability is through deployment of smart meters. These devices facilitate real time demand-supply balancing of power, efficient billing, provide instant record of power consumption, on/off status and more to distribution companies (DISCOMs). All this enhances the efficiency and effectiveness of the power grid.



Smart Meter installed at Bongaigaon, Assam

The Government through reforms-based and results-linked, Revamped Distribution Sector Scheme (RDSS) plans to strengthen supply infrastructure in the power sector. The central aim of the scheme is to address the massive Aggregate Technical & Commercial (AT&C) losses suffered by DISCOMs as a result of power theft, meter tampering, inaccurate billing and the length of time between a meter reading and a payment. At the heart of the scheme is the Smart Meter National Programme (SMNP), which aims to upgrade India's 250 million conventional meters with smart replacements. Smart meters promise a range of benefits to both DISCOMs and consumers which includes digitally empowered consumers/DISCOMs to understand and manage their electricity consumption/supply patterns, enabling them to devise ways to efficiently economise the usage.

Apraava Energy has taken the first step towards contributing to the vision of making India's grid 'smarter' and empowering electricity consumers by becoming the Advanced Metering Infrastructure (AMI) service provider for Assam Power Distribution Company Limited (APDCL).

The project implementation started from March 2023 for a period of ten years in the Bongaigaon and Kokrajhar regions of Assam involving installation of smart meters for 693,077 consumers. Apraava Energy has secured another project with Paschim Gujarat Vij Company Limited (PGVCL) for installation of 23.67 lakhs of smart meters in the Kutch and Saurashtra region of Gujarat. These two projects marks the entry of Apraava Energy into the AMI business, in line with its focus on investing only in low-carbon growth areas.

As part of the agreement between Apraava Energy and APDCL, the advanced metering infrastructure including end-to-end prepaid smart metering, and the hardware and software will be implemented on Design, Build, Finance, Own, Operate, Transfer (DBFOOT) basis. It would also include the development of consumer engagement initiatives to educate people and potential consumers about the benefits of smart metering.

Project Management Governance System (PMGS)

The Project Management Governance System (PMGS) is a framework that provides systems and procedures for delivering world-class projects. It offers consistent and process-driven project management systems, and an accessible set of project management guidelines and toolkits. It enables governance of the project management process in various phases of the project through gates and checkpoints which are reviewed and approved by relevant authorities/project steering committee. These gates and checkpoints have standard requirements which need to be complied with by the project team.

At the organisational level, PMGS helps in:

- Consolidating and leveraging best practices from across Apraava Group companies and facilitate knowledge transfer
- Improving predictability of results through standardisation
- Enabling senior management guidance and oversight from investors

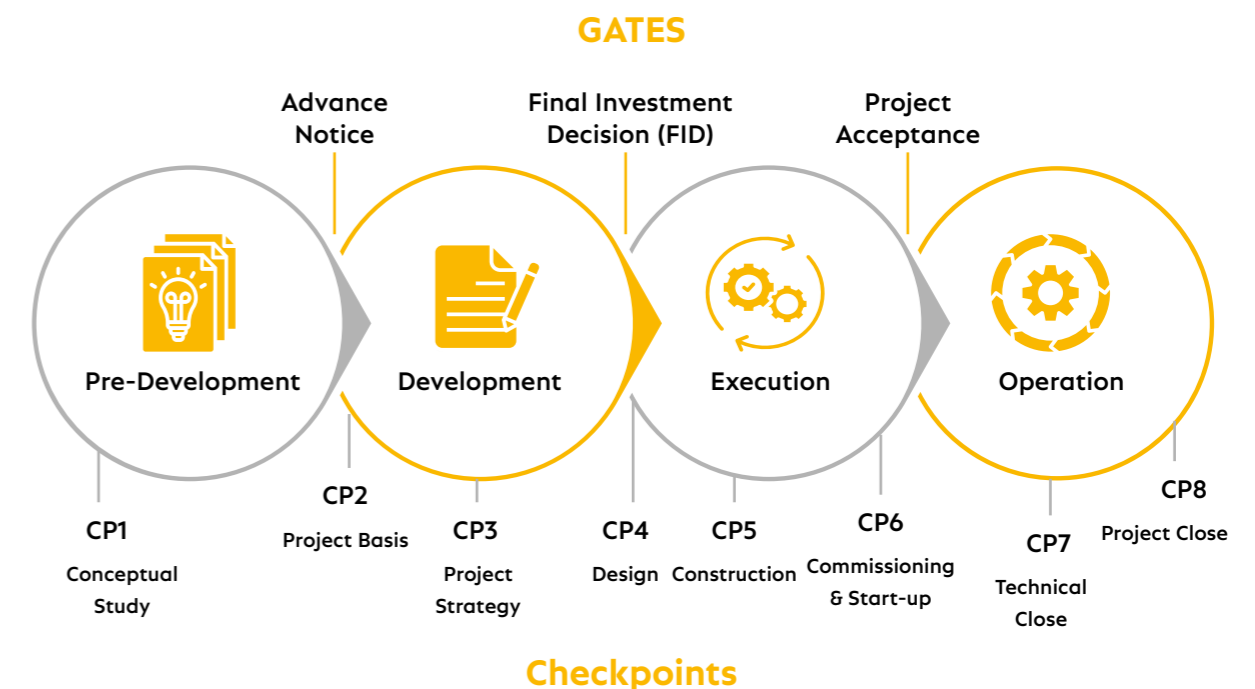
PMGS helps ensure delivery of projects while:

- Ensuring clear accountability and responsibility for project management at all levels within the organisation
- Complying with all applicable codes, standards, laws and regulations
- Adopting a proactive approach to dealing with project risks at all stages of the project lifecycle

PMGS helps improve projects by:

- Continuously enhancing and developing knowledge, awareness, behaviour and competence in project management through sharing of lessons learned

Project Lifecycle as per PMGS



Project Phases as per PMGS

Pre-development Phase	Early stage of project development when a project is initially conceived and tested for alignment with Company goals	Culminates in the 'Advance Notice' gate when a decision is made on whether or not to proceed with the project
Development Phase	Project Execution Plan (PEP), cost estimate, schedule and risk assessment are developed	Culminates in the 'Final Investment Decision (FID)' gate when the project receives funding to proceed ahead
Execution Phase	Majority of the actual physical work and resources are expended on a project	Culminates in the 'Project Acceptance' gate when the project is turned over to the Asset Owner
Operation Phase	Project is closed out, punch list items are cleared, defect liability period is completed, final accounts are closed, and lessons learned are reviewed & documented	

In the medium to long term, Apraava Energy will continue to explore other low-carbon and non-generation related areas within the energy sector even as we consolidate our footprint within the forays that we have already made.



Twilight View of JPL