Smart meters: The basic infrastructure for a green future

Key Takeaways

- Smart meters are essentially a data play - offering unprecedented data that can be used to bring online more green energy, curb electricity loses and reduce costs for consumers.
- The sector has immense depth – USD 30 bn over just the next 2-3 years.
- Large appetite for smart meter concession from global investors – largely due to robust payment mechanism and revenue protected concession model.
- Potential for high IRR – with low cost ESG debt and capital recycling from the substantial revenue generated during the construction phase.
- Underlying technology has larger application – including in the emerging water sector.
- Not yet qualified as infrastructure; not InvIT eligible

References to green energy or energy transition is usually associated with renewable sources of electricity generation such as solar panels and wind turbines. For the longest time, the main challenge was the ability to generate renewable electricity at a large scale and at commercially viable costs. This has now been largely achieved, with solar energy being the cheapest source of electricity today with costs of generation continuing to drop.

Only because of the massive success in developing efficient renewable energy generation tools, has the energy transition moved to its second phase. Broadly, the first phase was focused on generation and now the second stage – where the underlying electricity infrastructure is retooled to be able to support the increased generation of renewable electricity.

This underlying infrastructure has received relatively little attention so far, though this is rapidly changing led by addition of some legacy technologies such as transmission lines and innovative products such as smart grids and smart meters – to support the unique nature of most renewable sources of electricity – i.e., intermittency in production.

Renewable energy generation is heavily dependent on external factors such as the weather (whether it is sunny or windy) and is not consistent with patterns of usage. This is a challenge as electricity cannot be easily stored and the fossil fuels (such as coal) that renewable sources are displacing offer more predictable and stable generation capabilities.

This is where smart meters come in. Very simply, smart meters capture "**how much**" electricity is used and "**when**" each unit of electricity is used compared to regular meters which only measure "how much" electricity is used. This in essence means access to data, which smart meters also provide on a near real-time basis, in a sector which was largely a data desert that significantly hamstrung planning and execution efforts.

This access to real time data allows for a host of activities:

1. Time of day tariff: In effect this is congestion pricing, with electricity costlier during peak usage and cheaper during off-peak hours. This encourages users to more efficiently plan their electricity consumption in some controllable areas such as EV charging to align with the production pattern of renewable energy thus aligning usage patterns with consumption patterns and removing the obstacle of having to store excess production of electricity.

2. Reduction in losses for DISCOMs: Real time data, and insight into electricity throughout the grid, helps plug leakages and theft. It also allows for remote bill generation and tracking helping mitigate billing and collection inefficiencies. This is a major problem in India, where state run DISCOMs are only able to collect payments for little more than 77 out of every 100 units of electricity provided.

3. Control over usage: With real time monitoring of electricity usage, consumers have

more control over their finances and are less likely to be hit with surprise bills or face inconvenience due to incorrect or delayed readings.

Why now?

The push for smart meters has largely come from a Union Government scheme called the RDSS Scheme which is focussed on reducing DISCOM losses and incentivises the installation of pre-paid smart meters through a carrot based approach.

All state run DISCOMs (which serve the vast majority of consumers in India) are provided subsidies in the form of grants for the installation of smart meters provided they also adopt a standard set of documents for the concessions - known as the SBD-4 (standard bid document version 4).

The SBD4 is the cornerstone of investor interest in the sector, as it provides a standardised approach which lends certainty, lower cost of participation and helps achieve economies of scale by largely harmonising requirements.

State DISCOMs are largely seen as unreliable counterparties by investors. They are plagued with heavy huge losses (with losses in FY22 estimated at USD 6.5 billion), largely a result of electricity theft and collection inefficiencies. Their stretched finances lead to consistent delays in payment to electricity generators and other vendors. The RDSS scheme through the SBD4 also mitigates this counterparty risk through a few important components in the payment structure of the concessions.

1. Direct Debit facility: All online payments by consumers of electricity is pooled into a single escrow like account from which the concessionaire or the “AMISP” is paid before the DISCOM can access any cash. While the DISCOM is also mandated to ensure at least a 5x payment cover – practically the cover is usually larger due to the relatively low monthly charges, which are usually about INR 70- INR 100. This offers significant comfort as there is no DISCOM intervention to require payments to flow to the AMISP.

   While the bills are to be paid within 45 days, practically this happens much earlier – and the recent provision of at least 1/10th of the bill being paid each day promises to further shorten the revenue cycle.

2. Restricted ability to dispute invoices: The DISCOM is obligated to payout the entire amount invoice by the AMISP, even if there is any dispute raised on the amounts. If the DISCOM does not clear all payments within 45 days then interest at 12.55% (400bps over 1 year SBI MCLR) and if any payments are still delayed for a further 45 days, then it can be an event of default under the concession agreement and the AMISP can move to terminate.

3. Standardised documents: The entire set of documents – from the technical documents

to the tender forms are largely standardised and allow for a balanced distribution of risk – with most risk post installation being borne by the Utility. If DISCOMs make any unapproved changes to the documents they lose out on the grant from the Union Government.

What about the DISCOM bankruptcy risk?

Even in the unlikely scenario that a state run DISCOM undergoes insolvency process, it is very unlikely to affect the revenues of the AMISP – as the meters are critical to ensuring operations of the DISCOMs and are likely to be retained by insolvency professionals (the people who run the company when it is undergoing an insolvency process) who are mandated to maintain the company as a going concern. The SBD4 also makes it clear that payments to the AMISP is to be seen as operational expenditure.

Stopping payments to AMISPs is also not a practical option due to the very nature of the meters which unlike conventional meters require constant technical expertise to operate and maintain, and run on specialised software, none of which are readily available with DISCOMs.

Bankruptcy remains a far-out risk, as while DISCOMs are infamous for delaying payments, they have yet to be declared insolvent and enjoy a shadow state guarantee.

How does a typical concession under the AMISP concession scheme work?

The concession is a based on a DBFOOT, TOTEX model – essentially the bidder is responsible for end to end planning, installation and operations of the smart meter system including financing the capex and opex (TOTEX).

Anyone with experience in the infrastructure sector can bid for smart meter concessions, with no restrictions on foreign players. Bidders have to fulfil two basic criteria (“credentials”): (a) net worth requirement - amounting to 50% of the estimated project cost; and (b) technical requirements - the total quantum of projects executed (whether in India or otherwise) in the infra space should amount to at least 1/3rd of the estimated project cost.

These credentials can also be borrowed from a 26% equity shareholder.

The tender documents are exhaustive and contain detailed information including on payment timelines, the quantum of lump sum amount (which is fixed upfront), the duties of the AMISP and the Utility, and there is no post-contract negotiation of terms. The bidder is required to submit a quote for the meters expressed as a monthly charge amount, the type of tenders vary sometimes, with the usual single-bid tenders the standard, while reverse bidding has also been implemented in quite a few recent tenders.

The typical life cycle of a concession:

1. **Month 0-6** – the project planning stage. Right after the concession is signed, the concessionaire usually negotiates contracts with their suppliers and agrees on a project implementation schedule with the utility. During this time, the AMISP is also required to carry out consumer awareness programmes.

2. **Month 7-27** – the installation phase - this is when the installation of smart meters are undertaken. Revenue starts to flow-in from month 7 and is calculated on a per meter per month basis – i.e., payments are made for each meter that has been operational for the past month.

3. **Month 28-Month 120** – the O&M phase – installation has been completed. The SMIP now only provides operations support in running the system. This continues until the earlier of (a) the AMISP collecting the total revenue provided in the contract, or (b) the outer time limit of 120 months. Typically, this ends in month 111, unless there have been delays in installation of meters.

How are revenues structured?

AMISPs are paid in two phases: (a) a lump sum payment – this is received in the month after installation of a meter, and typically amount to ~10% of the total revenue per meter; and (b) monthly AMISP charge – this is the monthly payment per meter which is paid out eery month after installation.

Unlike a typical user pays infrastructure model where there is some risk involved in projecting demand, for instance traffic numbers for highways – AMISP concessions are de-risked, with the AMISP being paid based on availability rather than usage.

Risks to revenue is further mitigated as the Utility backstops against any damage to the smart meters after installation i.e., if for instance meters are damaged due to floods, then the Utility will pay for the replacement of these meters or will continue to pay the contracted monthly rent for the life of the concession.

What is a typical business model?

Though the industry is fairly new, it has seen a lot of interest due to the unique nature of the concessions – where substantial revenue generation occurs during the construction phase allowing for recycling of cash and a rather capital efficient project.

The legacy players are mostly constrained by the lack of capital since smart meters cost 6-7 times that of legacy metes and the cost is borne upfront with a payout period of 10 years. This, along with the low barriers for entry has led to the emergence of many infra players participating in tenders, though they largely prefer to supply capital and outsource the entire execution of the concession back to the legacy meter suppliers.

Essentially, this is a typical platform model with (a) a bidding entity, (b) AMISP solution suppliers (there are usually multiple non-exclusive suppliers), and (c) the Project SPV.

A bidding entity, such as the Genus-GIC platform bids for a concession, which is then implemented by a Project SPV (AMISP). Bidders usually tie up supplies after signing a contract - there are various components in a smart meter system and there are usually multiple suppliers due to the specific eligibility criteria set out in the SBD4.

The smart meter system consist of 5 largely specialised services:

(a) the physical smart meter itself;

(b) the Head end system (HES);

(c) Meter data management system (MDMS);

(d) communication module (RF/Cellular); and

(e) system integration.

With many components involved, preferably players who have integrated inhouse solutions tend to execute better and are less prone to delays.

One of the more important considerations in structuring a smart meter deal from an investor protection angle is on the matter of credentials, which ideally should accrue to the platform entity for value consolidation. For credentials, the structure of the platform also plays a crucial role due to the interplay of domestic Indian legislation and practical concerns in relation to the bid documents, for instance while a pure play foreign bidding entity or an InvIT/ AIF bidder may be allowed, an Indian bidding vehicle should be a preferred option. Also, with a platform deal there are usually several concerns such as the NBFC-CIC risk, and rolling over to InvITs along with the more operational partner related matters such as exclusivity and pricing.

With a typical infra debt to equity ratio of 70:30, the overall payment structure results in a very low cost requirement from sponsors – with the possibility of only having put up to 10% of the project revenue as their contribution.

Though the typical concession length is only a maximum of 10 years, and no concessions have yet reached this mark AMISPs can expect these projects to be a continuous cycle as Utilities would require new meters (the outer limit for smart meters seems to be around 15 years) and the technical expertise and software to operate existing meters.

The sector boasts enviable depth, with the Union Government looking to install 250mn smart meters by 2025-26, a more than USD30bn opportunity which is growing larger by the day with an estimated annual growth rate of 4% in new electricity connections.

What about project level debt?

Though this a relatively nascent sector, it is a high rated ESG play and existing players have already tapped concessional lines of funding from international development institutions such as DFC and there is significant appetite from lenders due to the robust payment security.

In addition, the protections provided to lenders under the concession documents including the right to substitute the AMISP in a contract coupled with asset ownership vesting with the AMISP during the concession are seen as credit positives though the unique nature of the asset – being situated at homes requires work with lenders who are more accustomed to typical rights in infra projects which may not be feasible.

With projects generating revenue during the construction phase, for optimisation of returns the accounting of project revenues as equity contribution is usually preferred though to achieve this requires some amount of work with traditional bank lenders who tend to hew to the view of direct equity infusions as the only comfort. Recently, with a large number of concessions reaching construction stage, some lenders seem to be deriving more comfort with such structures allowing for much lower equity infusions and boosting returns.

What are the key risks?

1. <u>Underlying cost inflation risk</u>: The concessions are fixed price with no pass through of costs – they also usually allow for a reduction or increase of up to 20%/30% and therefore it crucial to ensure that all supply is secured from reliable suppliers on a fixed price basis with an option of varying quantities to meet revised orders.

2. <u>Supplier risk</u>: The AMISP system consist of 5 largely specialised services which are typically provided by specialised firms. This diversified supplier base provides challenges especially given the compact planning and implementation periods – some current AMISPs who have contracted out all functions back-to back to a diverse pool of suppliers are now facing lengthy delays due to problems with their suppliers. A straightforward way to mitigate such risks is to lock-down capacity with a n exclusive supplier who is able to provide a full suite of services – though the number of players who have such capabilities are very limited.

3. <u>Lock-in on shareholding</u>: The bidder is required to maintain a 51% equity stake in the AMISP for the duration of the concessions and 100% for the first 51 month, thus impeding any asset by asset sale. A HoldCo level exit should however be easier, with a recent amendment bringing in clarity on indirect sale, with the earlier provisions being ambiguous on HoldCo level change in shareholding which could have potentially blocked any direct exits.

InvIT eligibility – the ambiguity

There is some ambiguity on whether smart meter concessions are InvIT eligible. There is a strong case to be made that smart meters which are integral part of electricity distribution should be included under “electricity distribution” in the harmonised list, which determines the assets eligible to be housed in InvITs. However, the wrinkle comes in the form of an informal guidance from SEBI which opined that smart meter concessions were not InvIT eligible on the basis of a rather plain text reading largely based on smart meters not being explicitly called out in the harmonised list. Leading industry players are currently making a case for smart meters to be included in the harmonised list which will unlock more efficient structuring of investments and spur greater interest from the more traditional infrastructure investors among PFs and SWF.

Commercially, the nature of the concessions with a limited lifespan of 10 years and a construction period that takes up 30% of the concession life, along with structuring considerations around retention of credentials makes a transfer to InvITs quite challenging.

Conclusion

Smart meters are in essence a data play, bringing in visibility where there was none available earlier. This rests on a simple practicality - to be able to understand, you first need to be able to measure. Therefore, this technology has applications far beyond electricity and can be deployed across vast industries like water supply which face significant inefficiencies largely driven by a lack of actionable data.

The ESG benefit from smart meters is not only the direct effect i.e., the ability to integrate more renewable energy onto the grid but also the more ancillary benefits. This includes the ability to bring in more distributed sources of electricity, a power plant in each home (with solar panels), that will help create a more resilient grid. The positive effect it has on the finances of state DISCOM can lead to greater investments in the grid and bringing more renewable energy online (which has now largely become the domain of SECI). Importantly, smart meters are also a positive social play, as it promises to make electricity, which is an essential commodity, more affordable by bringing down the costs of power for regular consumers who are now essentially paying for their own electricity plus the 22% that is being lost or stolen.

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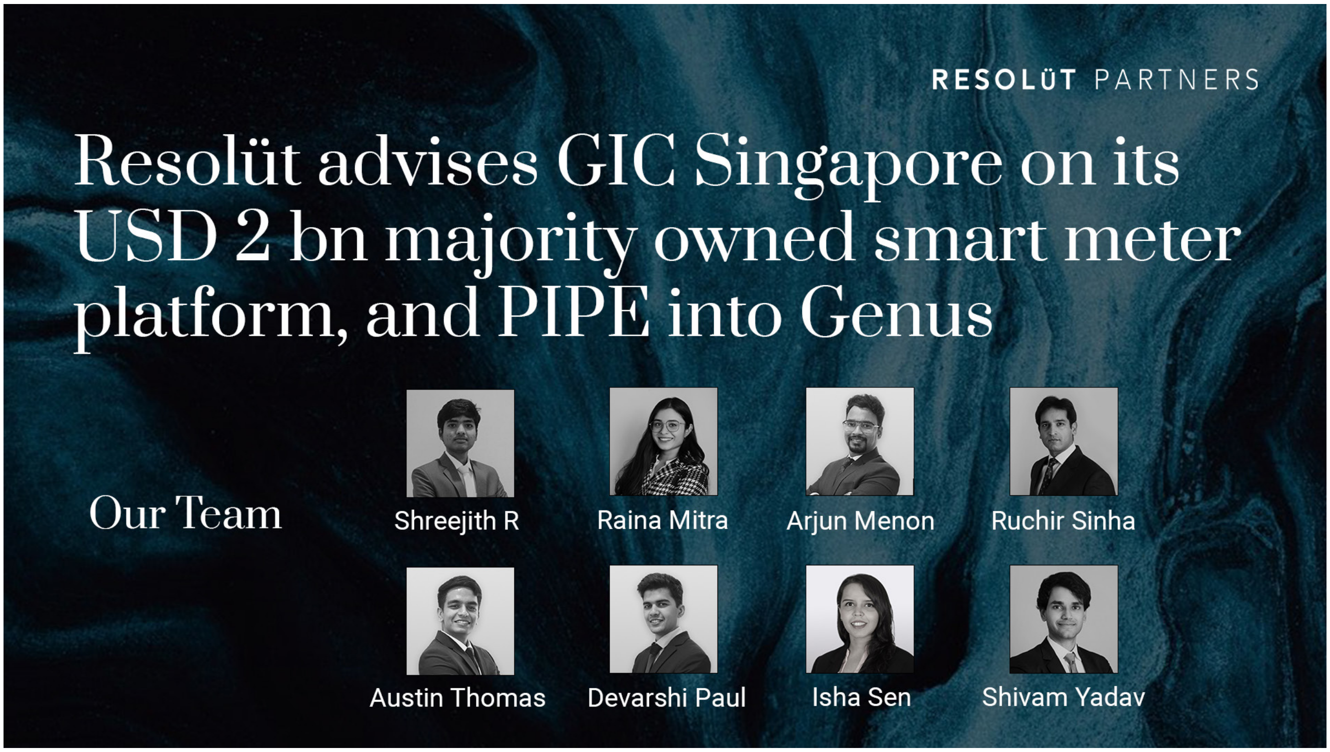

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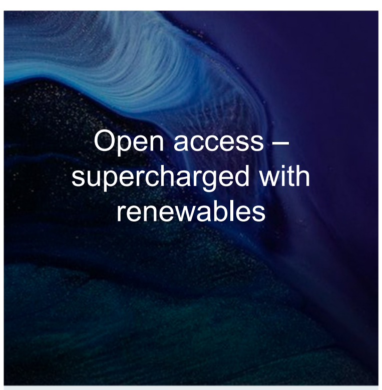

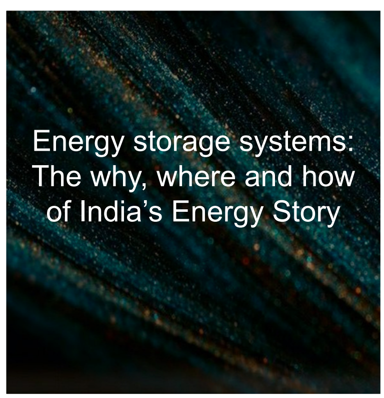

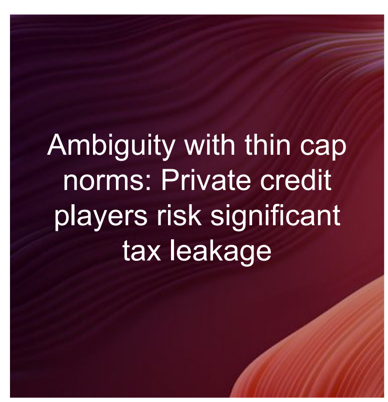

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