Electricty & Water cost Moderation - Learnings

Electricity Related

1. **Usage of power saving LED lights**: LED's to be implemented for corporate office, sales offices, sample flats & any other upcoming locations where cost is borne by Lodha in the long run (>= 4 years)due to the following:
   a. The unit consumption coefficient of LED v/s CFL works out to 0.375
   b. LED fixture cost is 1.5 times of CFL cost, which could be further negotiated and brought down considering the volume. However, the Life cycle of the LED lamps is four times that of the CFL's. If LED cost is > 1.5 x CFL, LED usage is not mandatory.
   c. ROI period is approx 25 months.

2. **Standalone Ac's** in cabins & meeting rooms to be installed in locations where cost is borne by Lodha in the long run (>= 4 years) to enable user controlled on/off switch facility, thus saving on wasteful spend on electricity on central AC for un-occupied areas. Inverter based A/C to be used to avail better efficiency resulting in cost saving in opex.

A/C Type	Capex (Rs)	Power Consumption per Tr	Refrigerant Gas
Rotary Compressor 5star Rating	19000	1.15kW	R22
Inverter Based Compressor	26000	0.75kW	R410 environment Friendly

Considering above capex is higher for inverter based A/C however power consumption is 40% less for the same resulting in better saving in opex.

3. **Power Factor:** All non-construction locations to have capacitor banks to maintain power factor to 0.9 & move upto 0.95 to gain power factor incentives. We need to install power factor controllers for all construction sites with HT metering to attain PF >.9, which will entitle Lodha to gain bonus 1%-7% on the billed amount and optimize the infrastructure of the distribution/utilize it more efficiently, enabling us to load Lodha owned transformers to higher %.

4. **Penalty on exceeding contract demand:** While applying for the meter, the correct projection of required electrical load for the next 12 months should be envisaged methodically, to prevent over loading penalty charges being paid. The site MEP/CM team should forecast the hike in load to increase the contract demand in timely manner to avoid laving of penalty.

5. **Commercial meters:** All sales offices should plan for commercial meters from the date of commencement, to achieve better tariff rates.

6. **Power distribution panel: T**he power distribution panel in respect to the with-material contract is provisioned by the contractor. The delay in installation of power distribution panel enhances power distribution losses. Similarly, in case of labour contract, Lodha has to provision the same. The underline point being made is that the right power distribution panel should be timely installed to minimize power losses during distribution.

7. **Prompt Pay Discounts** – Ensure timely remittance of the electricity bills to avail prompt pay discounts.

8. **HVAC timings** during winter (Nov - Mid Feb) to be limited between 10 am to 5 pm. Throughout year, all AC's to operate & maintain 24 C ambient temperatures.

9. **Use of tinted films** on exposed glass facade to be considered to enable lesser load on AC's resulting in electricity savings.

10. **Double doors/Air curtains** to be incorporated in the design for Sales offices as per requirement to prevent loss of cooled air during entry/exit.

11. **Motion sensors** to be installed in cabins & meeting rooms thus saving on wasteful spend on electricity for lighting for un-occupied areas.

12. **Auto switch off/standby mode** to be activated for all photocopiers/ monitors/ laptops/ vending machines to save on electricity when not in use for more than 5 minutes.

13. **Switching over from Reliance energy to Tata Power** where feasible to avail better tariff rates.

14. **Labour camp electricity supply** to be switched off between 9 am to 5 pm on all working days.

15. **Avoid unwanted printing** by effective usage of emails communications to save paper, printing & electricity costs.

16. **Energy saving equipments** like 4-5 star rated electrical equipments to be used corporate office, sales offices, sample flats & any other upcoming locations maintained by Lodha in a long run. All other equipment can be three star rated.

17. **Timely installation of electricity meters** for handover flats so that the cost of their electricity does not hit the company's CM budget**.**

18. HT Metering for all sites: For load s above 150 kva, HT temporary meters will be put for all CM activities. However it should be noted that, the sales office should have the LT-commercial connection where the load is less than 150 kva & club houses depending on the load HT/LT commercial meters to be installed.

19. TOD tariff:

Timings	Rs. (addition/unit)
6 am to 9 am	0.00
9 am to 12 noon	0.50
12 noon to 6 pm	0.00
6 pm to 10 pm	1.00
10 pm to 6 am	-0.75

Scheduling the non-priority activities during the low tariff hrs to save on the electricity spends. E.g. water pumps running at late night or early morning.

20. **DG's with MTU engines:** Due its capability to optimise the diesel consumption based on the varying loads, DG's with MTU engines should be procured for all construction activities. All DG's procured for standby/prime rated shall be procured such that the rating matches the rating of the permanent generator to be installed at site. This will facilitate installing the same generator with required overhaul/maintenance to the project enabling reducing the capex cost on Lodha.

21. Since electricity and water is supplied free of cost to contractors, it should be clarified in contract (and enforced on site) that any equipment they use should have a non-electricity based fuel, if such option is available in market eg. diesel pump v. electricity pump. Only when no feasible option is available in market, will electricity driven appliances be permitted to be used by contractors (eg. cranes/lifts).

22. **VFD:** Use of VFD (variable frequency devices) controlled devices in tower cranes would save on electricity, due its ability to sense & control the supply the electricity based on the load applied. All manlifts used for vertical transportation to be VFD driven. Contractors should be discouraged to use conventional transformer based welding machine. All major welding loads should be inverter based.

23. For all construction site usage of halogen based lamps to be stopped replacing it with CDMT(metal halide) lamps for area lighting and T5/T8 lamps for building internal lighting. This will reduce power consumption and reinforce Power factor.

24. **Wind Energy**: This model will provide an opportunity for cost saving by application of open access route. Proviso in this is single meter minimum load should be 1 MW and a contract period of minimum of 5 years. The tariff inclusive of wheeling charges should be compared to current HT tariff applicable, to check profitability.

25. **Solar Energy**: The ideal business model for usage of solar energy would be vendor financed wherein 30% capital subsidy is available for roof top solar projects which are less than 100kw in size and Lodha gets the benefit of low tariff with no capex investment. However, the proviso in this would be long term agreement which would range between 10 to 15 years for it to be viable. Design should consider usage of roof of all non-residential structures

(office, mall, school, STP, club etc.) for generation of solar power - provided Lodha (not FM) shall benefit from the solar power generation (ROI) enough to justify the investment. Even if ROI is not sufficient, this may be considered in select projects like Palava as a strong marketing/environmental stance.

26. **Gas Power**: The margins are low, requires capex and varying fuel cost borne by us could negatively impact. The ROI/savings will be low and break even period would be longer. Limited application for commercial properties.

27. **Franchise model for power distribution:** The profitability is 7% and opex/capex cost will be adjusted from it. It provides 7% rebate on construction electricity expense for the node which would continue for longer duration i.e. 15-20 years during the lifetime of Palava Township. Given the present average expense of 60-70 lacs per month for Dombivali, it would generate a saving of approx 54 lacs/per annum (less opex/capex cost) and has the potential to increase with increased planned activity in future.
28.

Water Related

29. **Plan bore wells & ring wells** at the commencement of construction work at the new sites to avoid intake of tanker water thus saving on spends for water. RO filters to be installed to use the same water for drinking at Labour camps.

30. **Prevent leakages/theft of corporation water enroute**: It would also be pertinent to cross check the quantum of water received at the first point of inlet in Lodha premises v/s supplier (eg. MIDC) billing based on the water meter installed at the source of supply at the point of tapping. This is especially applicable for Dombivali site.

31. **Exploit alternate/natural sources of water**: Sites having alternate source of water like river nearby, should preferably exploit the alternate source of water. Rainwater harvesting can also be planned for monsoons adding to the cost relief.

32. **Install Water meters** for accounting purposes for each society as well as for FML civil contractors.