Multi Purpose Hospitals

Covid-19 with its exponential growth across the world is overwhelming the existing healthcare system. It is important to have a contingency plan for all resources including hospital space, trained medical personnel, medical equipment, disposables and administrative staff. I previously touched on the hospital beds capacity ramping up through Indian Railways as a short term solution. Here, I would like to propose a medium term solution that can increase the bed capacity significantly and cost nothing to the taxpayer and bring national unity. In summary this idea includes combining the idea of construction a steel building that can have multiple purposes. It will serve as a hospital with simple design for the current situation. The same space can be used for grain storage facilities that developing countries badly need. On top of these buildings, we can have solar generation to power the local communities.

Q. What purposes do these buildings serve?

These buildings serve three purposes.
First, they serve the immediate needs of surge of Covid patients.
Second, they provide space for rooftop solar for distributed power generation.
Third, Same space used for patients can be converted to a grain storage warehouse after the pandemic is over.

India has a need for all of these facilities close to the Cities and towns that we all live in.

Q. What is the patient catchment area?

It's the whole country. We need distributed multipurpose hospitals all across the country. Divide the cities into three sizes. After this, calculate two probable scenarios. High case load and low caseload for the given city size. Then calculate the land requirements for the population and proceed quickly with the next steps.

Q. Where do you anticipate these buildings to be located ?

Just outside current city limits. A general benchmark is, during the 40s and 50s India built a lot of Tuberculosis Sanitorium hospitals just outside the city limits. We should use a similar approach. These facilities should be outside the city, but not too far to negatively affect the transportation or resource management.

Q. How much land do you think this idea would need?

It should be based on the size of the population and the projected need for hospital space.

10 Acre sites should provide the following.
10,000 Square Meters of covered hospital space.
It should help with a 2 MW solar site with conditions applicable for most sites in India based on average solar radiation.

Quick financial feasibility studies using NREL SAM and PVSyst softwares are already completed. They will be provided in the github repository. Both of these are industry standard for solar project technical feasibility and bankability calculations.

Q. We see a lot of projects in India getting delayed in deployment even after signing the contracts? What seems to be the problem and what can be done to mitigate?

Most of the projects that are won in the reverse bidding process in India get delayed. There are a lot of reasons, but access to capital is one major concern. Developers greed to extend the construction time to the last minute to take advantage of the declining module and other component prices is another concern.

To address the first concern, we suggest an alternative approach to capital raising. Instead of relying on the private sector to raise the capital, it would be better to issue solar bonds for local residents that would give them free power during the life of the project. This is similar to virtual net metering or the community solar followed in western world these days very commonly. Given the scale of the construction, it would be cheaper than a residential rooftop. At the same time, given these projects are closer to the cities, we can expect this electricity to be consumed in distribution voltage and not burdening the transmission system.

As for the second concern, the government should provide the constitution only contacts to reputed companies that can demonstrate availability of construction equipment and laborforce to complete the projects. There could be provisions placed for timely construction.

Q. What about the cost to construct? Is this going to cost a lot to the government and then taxpayers?

Solar power generation already has reached grid parity in India and most of the world. It is cheaper than coal or gas fired power generation. Except, this model needs a lot of upfront capital, this is still a good investment for the community.

By going with the “community ownership model”, we can not only raise the capital quickly, it would also bring the community together in this uncertain period.

Q. There are a lot of projects across the country and multiple departments involved. Don’t you think it would take a lot of time?

Here we have to be smart and use technology to our advantage. Using a GIS based system would bring all of the departments and resources together very quickly. We can show a demo of such a program. Setting up the GIS system would be the first step and the rest of the resources can be managed with birds eye view for the key stakeholders in real time.

Q. Can we do this in a short timeframe? How much time do you think it will take?

We have developed Project management Gantt charts and talked with industry experts including component suppliers. If the regulatory issues are addressed within 2-4 weeks, projects can go live in under 4 months.

Again, we don't need to have solar projects completely developed in 4 months. We need the hospitals built in 2-3 months. Solar on top of these facilities can be developed over the next few months. But having solar engineering completed at the same time as building hospital buildings.

Q. We are discussing a lot about social distancing and self isolation these days. How can we take up large construction projects during this period?

If we use heavy construction equipment and technologies, it is likely we can minimize the crowded situation in construction. With appropriate precautions, this can be achieved with minimal risk to the building workers.

If you have any comments and are willing to contribute to this project, I request you to check the project on GitHub at
https://github.com/LetsFightCovid/MultiPurposeHospitals

A Bulletin Board is being built to share this and other ideas that might help us to fight Covid.

Sincerely,

Nagendra Prasad Reddy

CC:
Government:
PMO Office via email and website.
Central Electricity Authority via email
MNRE via email
Ministry of Health via email
Health Secretary of India via email

Industry:
Adani Power
Waaree Energy
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