

Greetings Alex;

Alternatives North has reviewed the YEI solar feasibility report. We are a bit handicapped in that we do not know what directions or guidelines were given for the study, so some comments may be beyond what was expected in the report.

- Overall, the report is hard to follow with many assumptions and conclusions being poorly explained.
- The most glaring example is why they chose to use a residential power rate rather than the commercial rate at which NTPC sells electricity to NAKA power (which is much lower than the residential power rate) or the avoided cost of diesel (which is much higher than the residential power rate) ... using the avoided cost of diesel makes far more sense!
- They present a useful idea for panel orientation - using vertical, bifacial panels facing east/west - it looks like an interesting option.
- There is not much detail on how they handle low water years vs high water years and how solar PV could be integrated with the various strategies NTPC uses to run the generators - they spend a lot of effort analyzing the few % in change between various panel angles, but much less on the bigger issues of what happens when Solar PV is not offsetting diesel use. It looks like they just assume that all Solar PV electricity produced could be sold at residential rates - regardless of if it was displacing diesel or hydro power.
- Their cost estimate of \$13 M for 5MW is much higher than what we had estimated at \$16 M for 10 MW, but they are proposing to use more expensive bi-facial panels. At this stage we are both in the same ball-park - hard to really know until we get some actual quotes.
- We note that GHG emission estimates for diesel fuel only included those for combustion, yet emission costs for solar included the upstream processes of material extraction, installation, operation and maintenance plus downstream processes of decommissioning and disposal. All of these elements would apply to diesel fuel annually, as opposed to one-time costs for solar (for most of the elements). If seeking supportive grants, GHG emissions will play an important role in justification.

Conclusion - they've done some useful research on bifacial panels, orientation and cost estimates, but assuming that they can sell ALL the solar electricity produced at residential power rates invalidates the conclusions about economic viability.

Alex, please let me know when the report has been finalized, and is there a time we could meet by Zoom to discuss possible next steps? I'm happy to discuss these comments as well of course.

Thanks, and we will stay tuned.

Bob