



The importance of LVDC standards for Newly Industrializing Countries

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Questions

- **Are there significant numbers of people in your country who do not have electricity?**



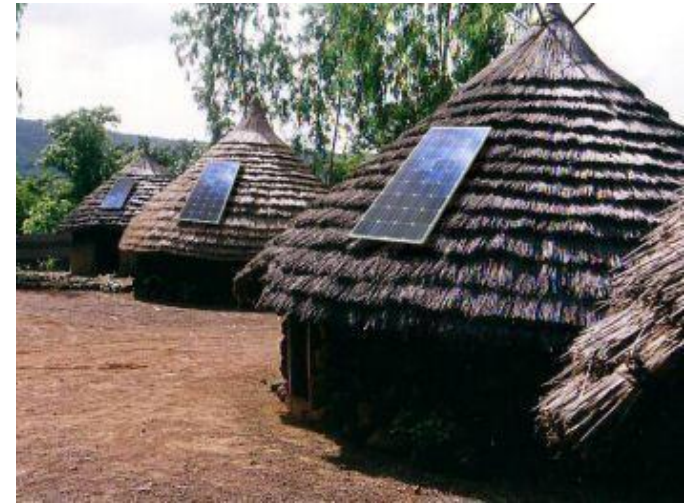
Questions

- **Are there significant numbers of people in your country who do not have electricity?**
- **...and are there significant numbers who have electricity, but find it's unreliable or expensive, and they'd like an alternative?**



They need a different solution!

- **For village-scale and smaller solutions, there are alternatives to the grid:**
 - **Generate solar electricity close to where it's needed**
 - **Simpler, less expensive, less dependent**
- **Most loads are actually now DC, and require the AC to be rectified internally**



Optimising voltage



- The 220-240V* level for AC mains is to allow up to 3kW per appliance
 - *...but...*



- Almost all DC appliances need less than 20V
 - So don't raise the voltage to a dangerous level, and then reduce it again!
- 300watts is enough for everything except cooking
- So choose a lower standard voltage:
 - 12/24/48V are being discussed

* 115-0-115V in the US

The urgent need to standardize



- **Plug-n-Play Solar Home Systems are CLOSED systems – sold as a package including all appliances**
 - **If you want something else – bad luck! 😞**
- **Today, there are no agreed standards for domestic LVDC systems – not even voltage**
 - **Without standards, and with millions of units already installed, there will soon be chaos!**



Three more questions

- Would off-grid electricity users in your country like as wide a choice of appliances as grid electricity users?



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- Do you think users of these small electricity systems will have an understanding of what they can and can't do with them?



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- Would off-grid electricity users in your country like as wide a choice of appliances as grid electricity users?
- Do you think users of these small electricity systems will have an understanding of what they can and can't do with them?
- Once they have a small amount of electricity, do you think they will want more?



Why not just add an inverter?

- It is of course possible to add an inverter, to turn DC from solar or a battery into 230VAC, but....



Photo: AIMS Corp

- **You introduce safety issues**
- **Your inverter is wasting power all the time**
- **Some mains appliances will not work reliably on an inverter**
- **The only possible argument for adding an inverter is that mains appliances are cheaper and more widely available than DC ones ...today**
 - **This won't always be true - India may achieve AC-DC appliance price parity within 12mos**



Why you must be involved!

- If new standards are to be appropriate for Newly Industrializing Countries, you *must* participate in their creation
 - Without this, standards are liable to focus on higher power ultra-reliable systems, and not sufficiently consider low-cost low-power products





Thank you!

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