







What our company, PT Inovasi does is to empower rural communities through innovation. We do this through four activities: Engage community members, design a plan for growth, manage the implementation, and monitor progress



Enough about us, let's talk mini grids





## THE YEAR 1827

A village was born



No modern access to electricity



Next came this for \$1 per night, 4 hours (18:00 to 22:00)



The year 2015, the community came together to help the contractor install a solar PV system.

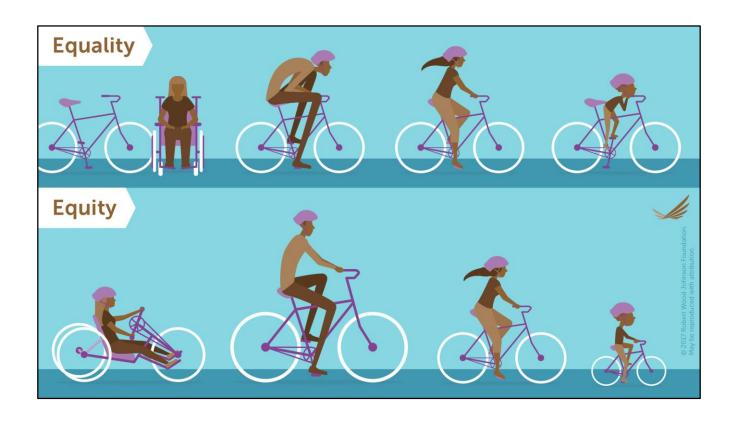


190 years after the village was incorporated, they finally have modern access to electricity. 155kWp of solar PV system for 3 communities, 500 households in total finally have 24 hours access of electricity. Thanks to the Ministry of Energy and Mineral Resources, Directorate General of New and Renewable Energy and Energy Conservation (MEMR-DGNREEC).

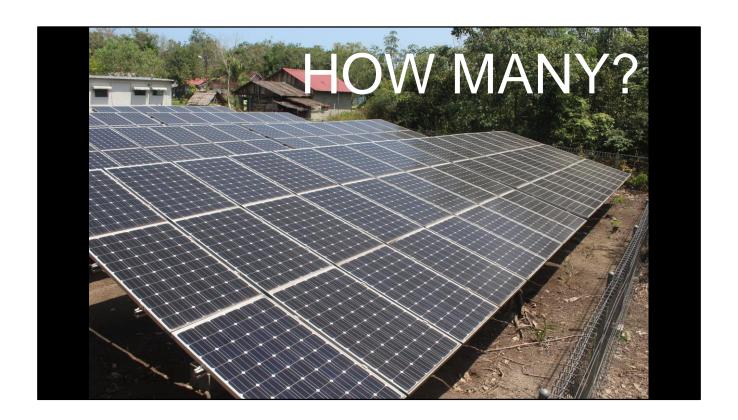




PT Inovasi team members properly trained the local field operators for basic maintenance and operations. We also involved and encouraged women who are interested to be trained and be operators.



Finally, the village received an equitable opportunity for growth. Instead of waiting for the utility company to come and provide them with electricity at the same, equal rate as everyone else, they are given the tool appropriate for their needs. So now they are in a more equitable position as many of us in the cities as far as energy access is concerned. Instead of 11 cents/kWh that people in the Indonesian cities are paying, the community is paying 34 cents/kWh. But at least they have access to energy now.

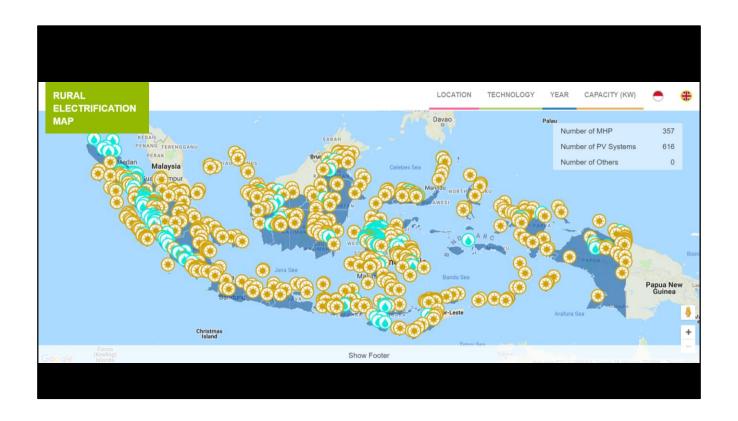


Now help me think about this for a minute. How many minigrids have been installed in India? In Africa? How many institutions installed them? How many minigrids have a single entity installed?

TANESCO — over 100 minigrids http://www.wri.org/blog/2017/10/electrifying-africa-mini-grids-five-lessons-Tanzania

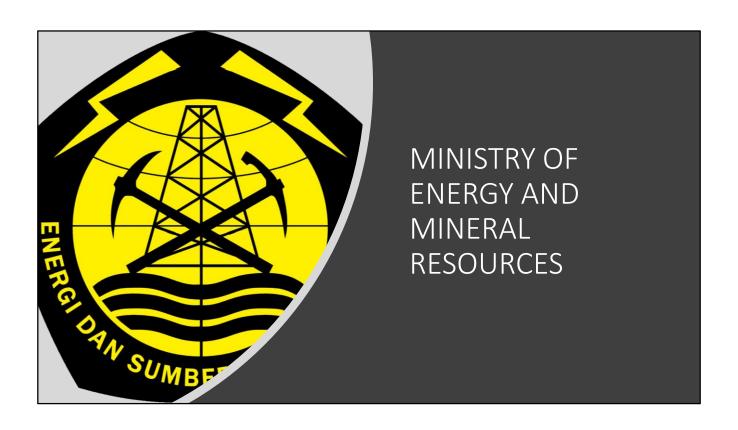
Smart Power India – 106 minigrids http://www.powerforall.org/blog/2017/9/28/policy-spotlight-nigeria-india-lead-on-mini-grids

## INDONESIA: 9 MINIGRIDS ? 97 MINIGRIDS ? ANSWER: 973



Total solar PV minigrids: 28MWp

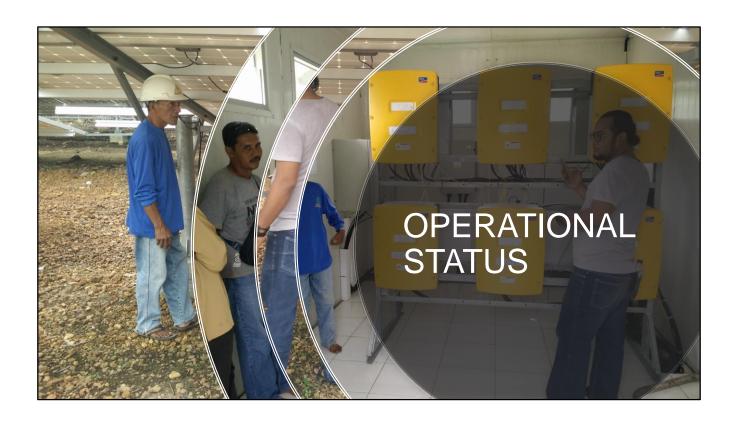






Besides being a single entity that has implemented the most number of mini grids in the world, the directorate general of new and renewable energy and energy conservation have also challenged 3 myths about government funded minigrids:

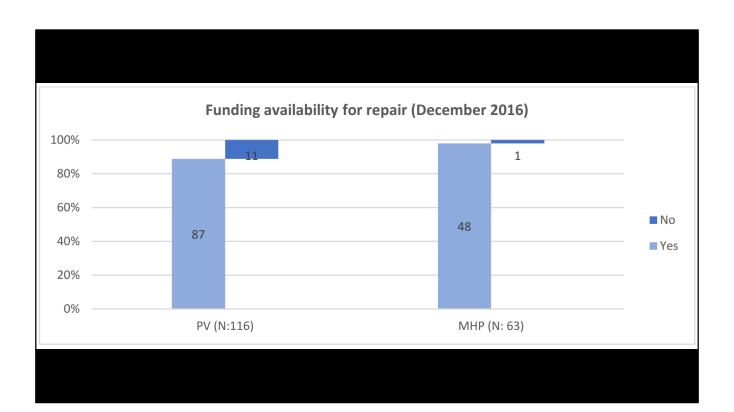
- 1. they're not sustainable
- 2. They're low quality
- 3. They're expensive





82% of the contacted sites are still operational. Some of the systems contacted are 3-4 years old. Compared to previous survey periods, most experienced no change in status, some have even recovered, and only 3% worsened

According to a GIZ study and presentation https://energypedia.info/images/e/e5/Report\_Operational\_Status\_Survey\_-\_EnDev\_Indonesia\_ed.Dec\_2016.pdf





They're not low quality, using SMA inverters in many of their recent sites



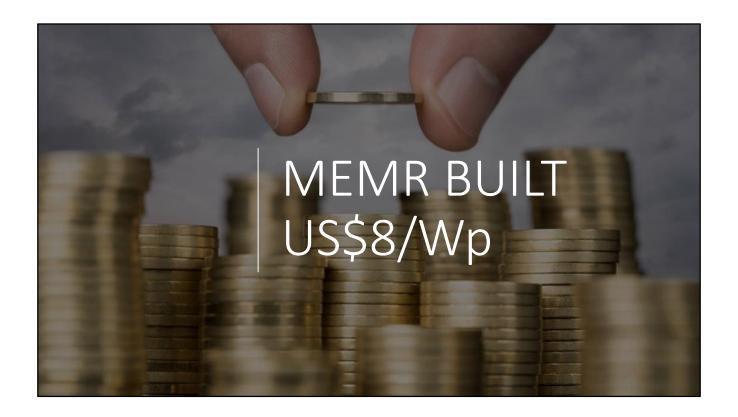
Or Schneider Electric

## **GRANT BUILT MINIGRIDS**

Location	Size	Technology	Project Value	Cost / Wp
Wakatobi, South Sulawesi	800 kWp	Solar PV	\$8,833,169	\$11.04/Wp
Mamuju, West Sulawesi	598 kWp	Solar PV	\$6,588,883	\$11.02/Wp
Mentawai, West Sumatra	700 kW	Biomass	\$13,417,229	\$19.17/W
Sumba, East Nusa Tenggara	492 kWp	Solar PV	\$10,091,279	\$20.51/Wp
Lombok, West Nusa Tenggara	1,320 kW	Hydro	\$10,845,788	\$8.22/W
Berau, East Kalimantan	1,243 kWp	Solar PV	\$10,705,875	\$8.61/Wp

Source : Millennium Challenge Corporation

How much do you think is the government built ones?



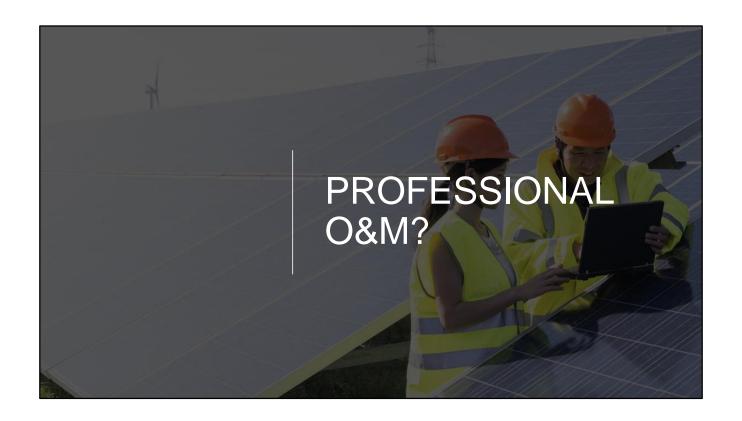
Utility grade poles and cables, energy limiters at each house, street lighting, mostly at VERY remote areas, and in the last couple of years, long life batteries have been specified (requiring de facto use of lithium ion batteries or zinc-air batteries). Despite this high requirements, the cost remain competitive



So what were the factors of success?



Technology? Nope, many of them still use lead acid batteries, good old AC coupled or DC coupled inverters (SMA, Schneider, Leonics). Technology is no longer an enabler, it's just a tool. A particular technology may work really well in one situation. But if we replace it with another that may not work as well in certain aspects, it doesn't mean that no other technology will work. There are others that will work okay but meets the needs just fine.



Nope, they're mostly operated by the community



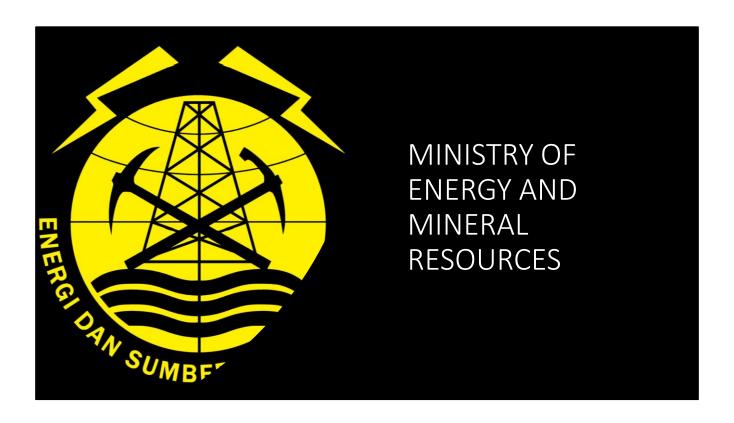
Nope, not that either







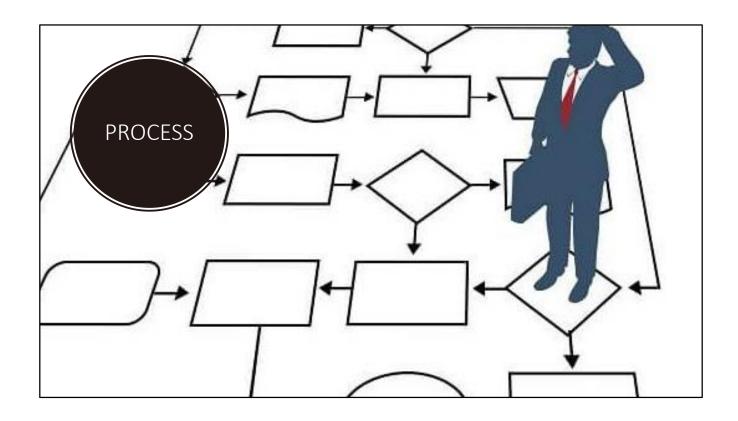
It's the people. Finding the right stories, and how to work with them.



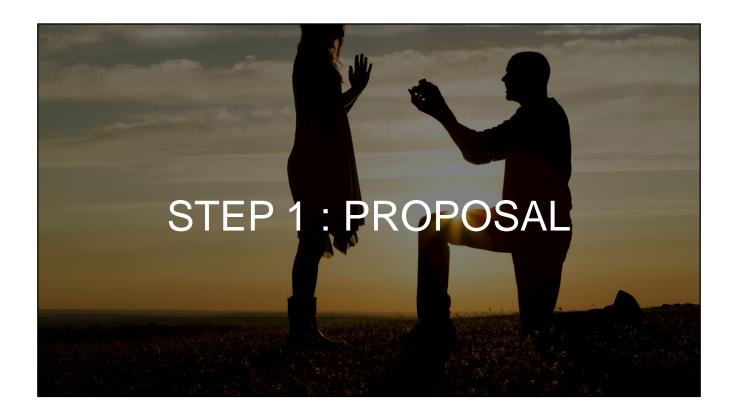
Throughout the years, not that many actually, since 2012, MEMR have learned how to engage the right people and put the risks and responsibilities to those who are best to bear them. And to give the benefits to the right people.



Updated in 2018 through MEMR Regulation 12/2018



This regulation defines the process under which the province can request for the villages to be electrified with the national budget. They have to agree to certain conditions



The requirements really are just like a wedding vow

At this stage, the province (or other ministries) must declare that:

- 1. Ready and willing to accept ownership and operate the assets
- 2. Ready to support and assist the operators and end users of the assets through the local government budget
- 3. Appoint the operating institution and the end users
- 4. Provide the land as required
- 5. Request permission from PLN

6. Technical documents such as feasibility study



Administrative and technical. Sometimes it includes site visits



The sites are determined and budgeted for the next year's cycle





Handover of the asset ownership to the institution who requested the minigrid to begin with. This is typically the province. In this case both the MEMR and the province will have to agree to the handover based on prevailing regulations and given that the assets are in good working order



## Operation and management of the assets:

- 1. An entity must be appointed as the operator or end user of the asset. They can be cooperatives, local government owned company, or a community group
- 2. The appointed operator MUST ensure fund allocation for operation and maintenance

