EUROPEAN UNION

ASEP

EU – Philippines
Access to Sustainable Energy Programme

Productive Uses of Renewable Energy (PURE): Experience in 3 small pilots in Davao and Pangasinan

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Key Expert

Acknowledgements

Many of the slides and information in this presentation were contributed by ASEP experts:

- **Sam Andrews** – Technical Design & FS
- **Laurie Navarro** – Micro-business development
- **Ces Rodrigues** – Community Preparation

ASEP: €60 Million EU grant to PH (2016-2019)

3 Components	Type of Intervention	Funding/ Management
1. ASEP-TA	**Technical Assistance Activities only** ❑ Rural Electrification ❑ Energy Efficiency	• EUR 7 million: 2 KEs +4,000-man days NKEs • Implemented by GIZ /ICF Team at DOE. • *Managed by EUD.*
2. Investment Support/TA	**Investments + TA to ECs** ❑ Rural Electrification	• EU 21 million EUR + GPOBA 3 million USD • Implemented and *managed directly by WB*
3. Call for Proposals	**Investments** ❑ Rural Electrification ❑ Canters of Excellence	• EU 29 million EUR • Implemented by awardees. • *Managed directly by EUD*

Background of the ASEP Productive Uses of RE Initiative

"PV MAINSTREAMING" (PVM) PROGRAM"

EU- ASEP WORLD BANK-MANAGED

45,000 solar home systems (SHS) for offgrid areas of Mindanao

Productive Uses TA :

Objective : Increase household incomes to improve capacity to pay monthly service payments to ECs

Source: GIZ (2015)

***In boldface**: also for offgrid

Examples of Small Productive Uses of Renewable Energy in the Agricultural Sector*

	Agriculture
lighting	**Poultry rearing, fishing**
ICT	**mobile phones charging**
cooling/heating	**Small fridges and cold storage, dryers**
machines	**Power tools for carpentry, milling**

***Source**: GIZ (2015)

Many challenges for promoting PURE in offgrid areas…

- Need to build **stand-alone energy** source.
- **Low Income** ("Base of the Pyramid")
- **Micro scale** of potential business
- **Far from markets**
- **Lack of local entrepreneurial** capacity
- **Sustainability** problems (technical, financial)
- Need **investment support**

Generally poor record of past PURE projects by donors…

WHAT HAS CHANGED ?

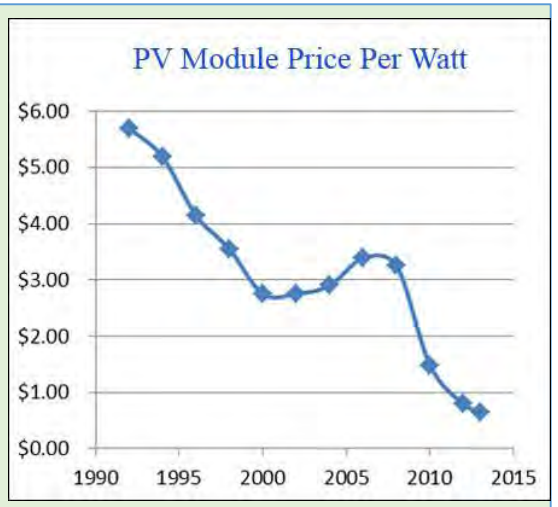
Biggest development:

- **Dramatic decline in PV prices**

1978: **$60/Watt;**

1990: **$6/Watt;**

2018: **<$0.60/Watt!**



- **Other technology changes :**
  - **Post-harvest equipment available in DC**
  - **Electronic prepayment systems**
  - **wider cell phone usage >>> payments with “mobile money”, etc**

PURE: Collaboration by ASEP, TeaM Energy, Foundation, Inc, Electric Coops and DOE

ASEP-TA: **Financed from EU funds experts** for Feasibility Study, Installation and Startup, as well as for Community Organization and Business Organization

TEFI: Financed all **Equipment Costs**

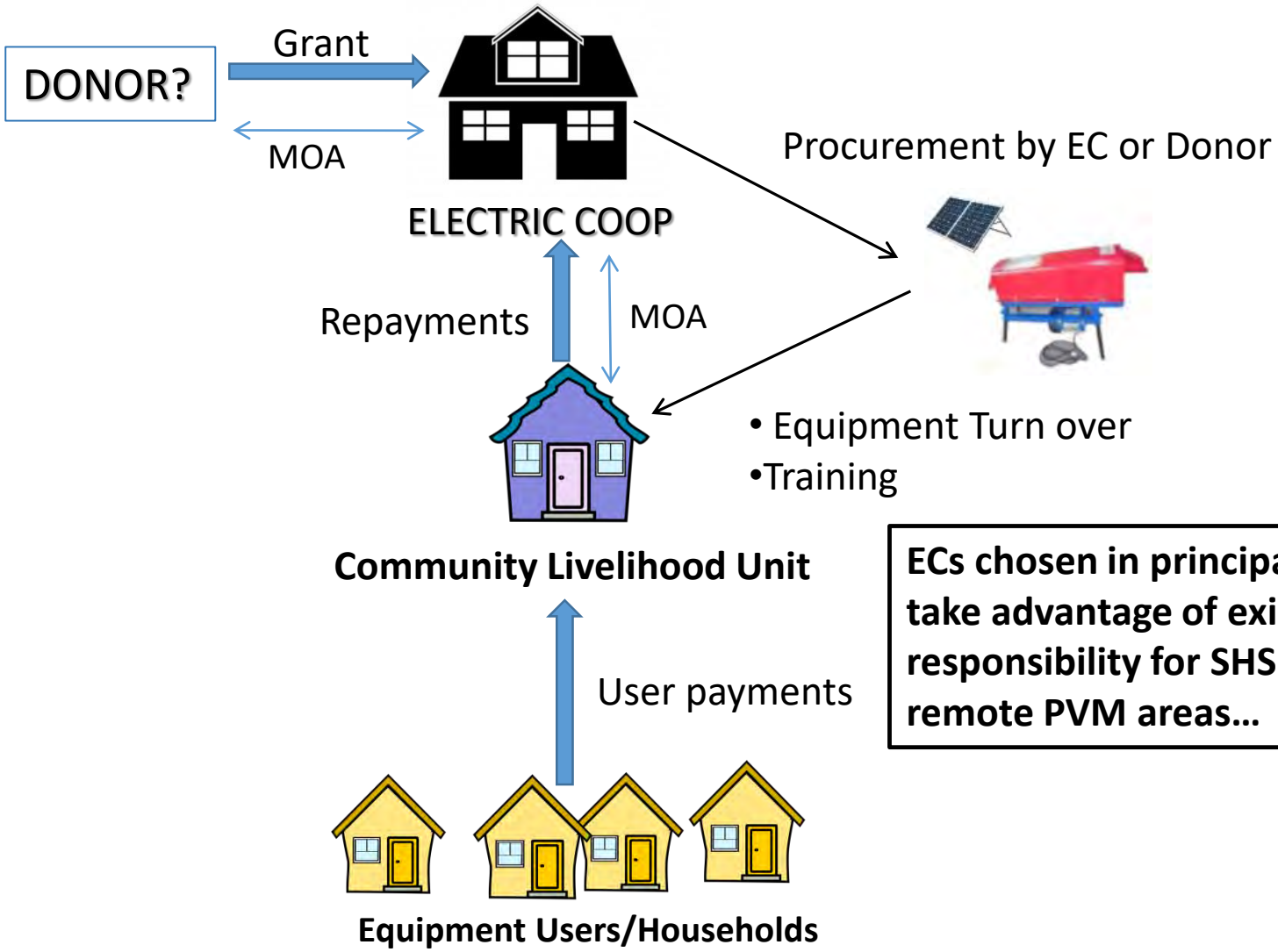
ELECTRIC COOPS: Provided **technicians and logistical support**. Overall responsibility for PURE Projects in EC Franchise Areas.

Responsibility and oversight for **all energy policies and programs** in the country

3 ASEP PURE Pilot Sites: Overview of Installations

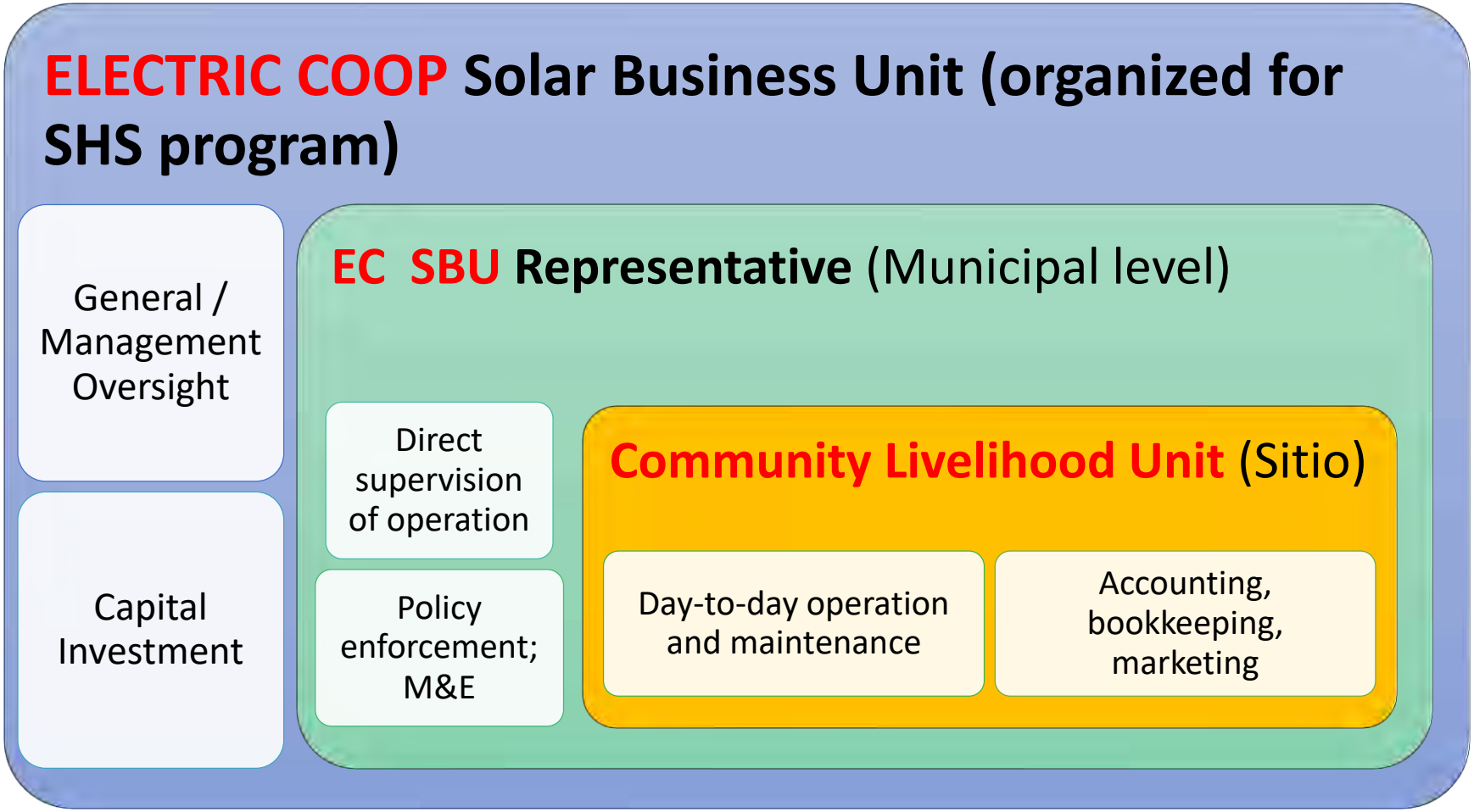
Location	Crops	Technology	CapEx	Payback/ IRR	HH Income Generation
Mahayag, Mindanao	**Corn**	Crop dryer, Corn sheller, Corn mill 2kW Solar + 10kWh batt	PHP1.1mill	4.2yrs/6.6%	PHP420/ month
New Mabuhay, Mindanao	**Abaca**	2x Abaca Spindle Mach. 1.3kW solar + 8kWh batt. (each)	PHP0.9mill	4.0yrs/8.5%	PHP641/ month
Pangasinan , Luzon	**Rice**	2.3kW Solar + 10kWh batt	PHP1.3mill	6yrs/6.0%	PHP850/ month

Funds Flow for PURE Pilots



ECs chosen in principal role, to take advantage of existing responsibility for SHS in the remote PVM areas…

Business Model



Beautiful but hard to reach offgrid sites…

Ex: Pilot Site 1: Sitio New Mabuhay, Malita, Davao
Population 150 households.
Livelihood: abaca is major product

1. Feasibility study starts with baseline surveys

to determine income sources, energy expenditures, amounts…

	A	B	C	D	E	F	G
1	SITE 1: SITIO NEW MABUHAY, BARANGAY LITTLE BAGUIO, MALITA, DAVAO OCCIDENTAL						
2	QUESTION /RESPONDENT	1	2	3	4	5	6
3	1. How many years have you been a resident of this sitio?	47	5	27	6	5	25
4	2. What do you do for a living?	Farming	farming	Farming	Farming	Farming	Farming
5	3. (If fishing) Does your household have it's own fishing boat?	NO	NO	NO	NO	NO	NO
6	4. (If farming) Where is the farm located?	Near n house					from house
7	5. Are you the head of the household?	yes					
8	6. Do you or anyone in your household own at least one active SIM and a working handset?	no					
9	7. How often, on average, do you charge your mobile phone?	N/A					
	8.Where do you usually charge your handset?	N/A					

Example: PURE 1 – New Mabuhay, Davao *Abaca Crop Processing*

1. Harvesting

2. Tuxying

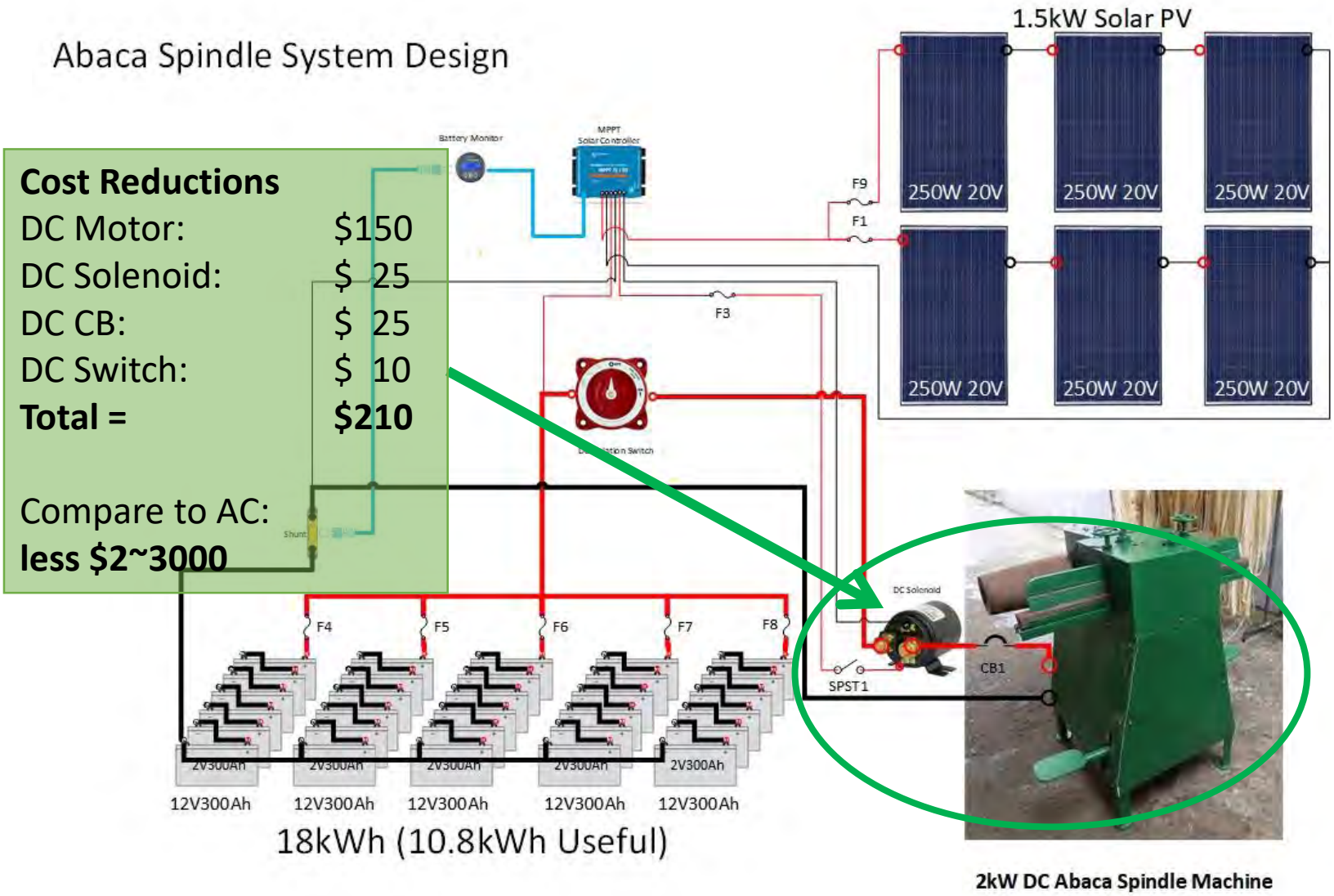
3. Stripping

4. Drying

Machine Processing 3x faster than manual processing

Abaca Spindle Machine

2. **Technical Design of System** – PURE Equipment and Stand-alone Power



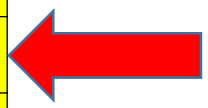
Cost Reductions

DC Motor:	$150
DC Solenoid:	$ 25
DC CB:	$ 25
DC Switch:	$ 10
Total =	**$210**

Compare to AC:
less $2~3000

3. Financial Analysis – *is it worth doing?*

Particulars	Community Operated
Investment Cost (PHP)	**₱983,270**
Number of Hired Operators	1
Annual Labour Cost (PHP)	₱38,298
Annual Repair and Maintenance (2.5%/yr)	₱24,581
Annual Operating Expenses (PHP)	₱62,879
Annual Revenue of Equipment (PHP)	₱306,380
Total Cost of Production inc CapEx (PHP/kg)	₱5.26
Annual Net Income	₱243,500
Lifetime Gross Income (PHP)	₱3,063,800
Lifetime Operating Costs (PHP)	₱628,793
Lifetime Profit after CapEx (PHP)	**₱1,451,737**
Payback (years)	**4.0**
IRR	**9.5%**



Assumptions:

- Life of System = 10years
- Lifetime Processing = 306MT
- Daily Processing Capacity = 120kg (x2 machines)
- Labour Cost = PHP150/day
- Lifetime R&M = 25% Capex
- Processing Fee = PHP10/kg

Solar powered abaca spindler
New Mabuhay, Malita, Davao
Comissioned by ASEP Experts
October 2018

PURE2: Sitio Mahayag, Davao, Mindanao

In Mahayag, corn is principal source of income. One harvest takes weeks to process manually and results in wastage

PURE 2: Mahayag - Site Installation

Installed in November 2018 - now in operation 12 months

Corn Sheller

Corn Mill

Solar/Biomass Dryer

PURE 3: Sioasio, Sual, Pangasinan

Rice Post-Harvest Processing

– Installed and made operational Oct 2019

NO DIESEL!

Rice Winnower

Rice Mill

Rice De-stoner

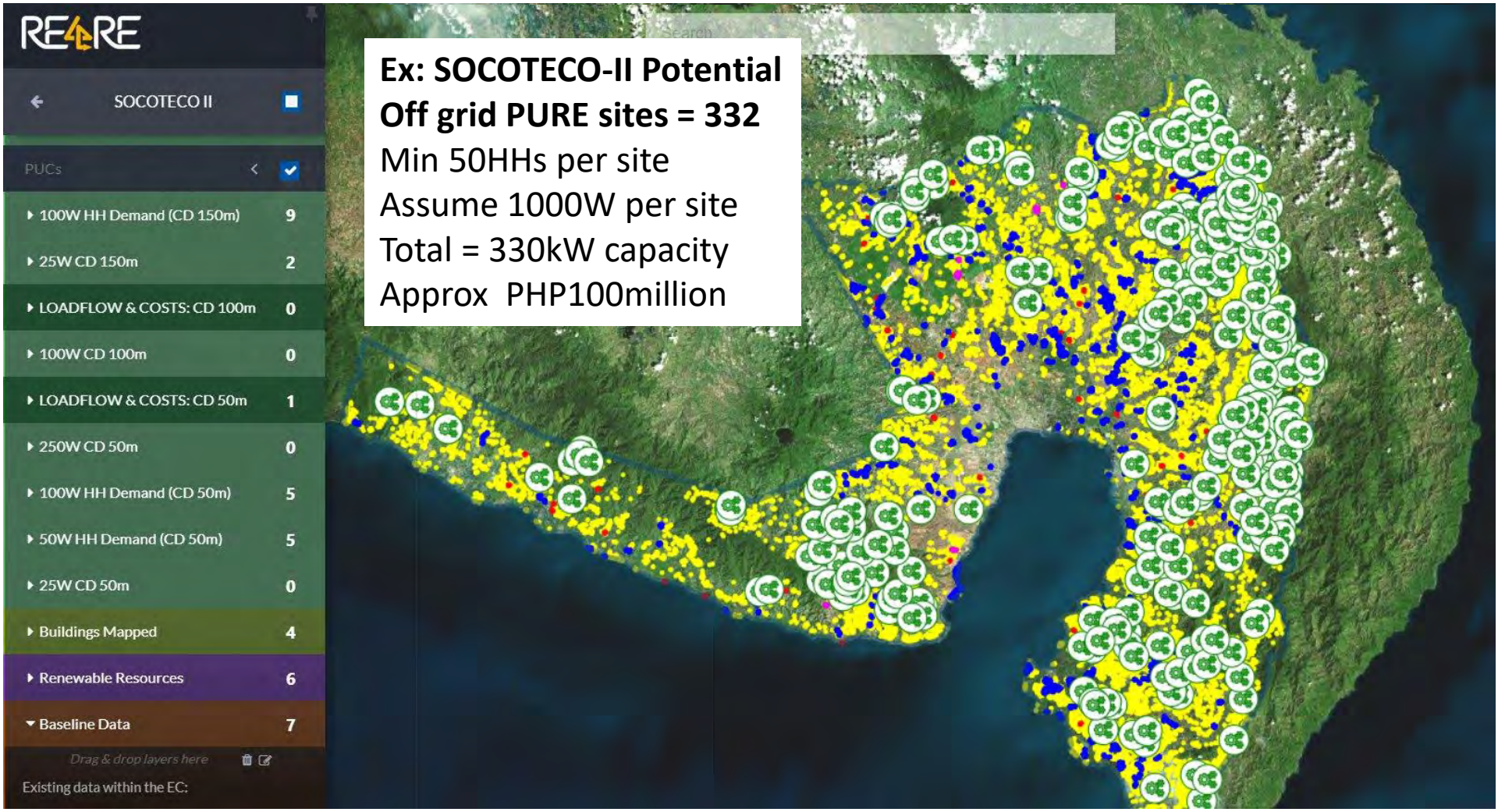
Sewing Machine

Some lessons learned…

"Buy-in" by community and local government is essential…

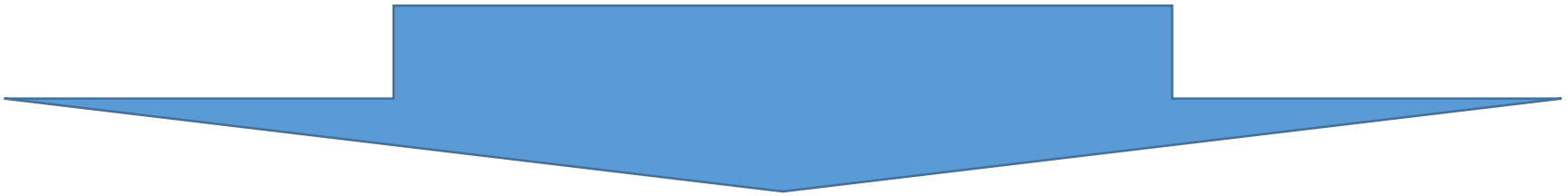
Need plan for sustainability: community organization and training in basic business practice & minor equipment maintenance, regular checks in first year

Nationwide PURE Replication : GIS Mapping – A Tool for Planning



Why do these small, remote projects?

Aside from directly helping remote communities, PURE projects have broader benefits for the country:



- **Increased productivity**
- **higher employment**
- **balanced regional development**
- **higher economic growth**

Some conclusions…

- Given remoteness and micro-scale investments, **unlikely to find** many PURE projects that can be fully financed by **private sector.**.
- Will still **need grant component**--from donors, CSR sources, government, or perhaps very soft ,loan component from MFIs, etc.
- Key is to do projects that are **not just technology demonstrations but have credible income generating possibilities** for communities**.**
- **Possible future mechanism**: Require all proponent of offgrid electrification projects needing Government subsidy to include a plan for PURE or show it's not feasible.

Thank you!

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