Off-Grid Solar: Looking Beyond Economics – A Case Study of the Philippines

Chris Starling

20th September 2017

POWER-GEN ASIA

As part of ASIA POWER WEEK

THE LANTAU GROUP

strategy & economic consulting

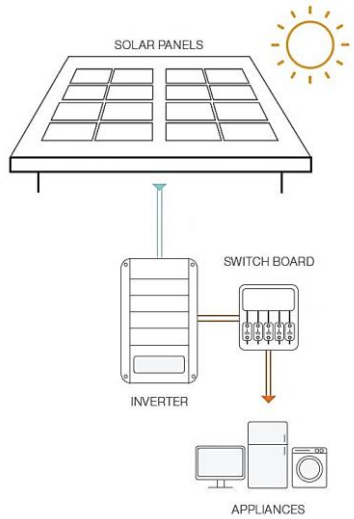
Overview: Success on rural electrification projects is not guaranteed

- Requires careful program design at both the institutional and operational level
- Tenders need to attract participation and competition, but also need to strike a careful balance to ensure:
  - ‘Constraints’ added to the process do not potentially exclude bidders
  - ‘Requests’ added to the process do not unnecessarily add cost to the product

Planning ahead and understanding the local context is essential

So why not just keep extending the grid?

Country-specific variations
Development costs, financing conditions, solar resources…



Cost per kWh

Grid parity

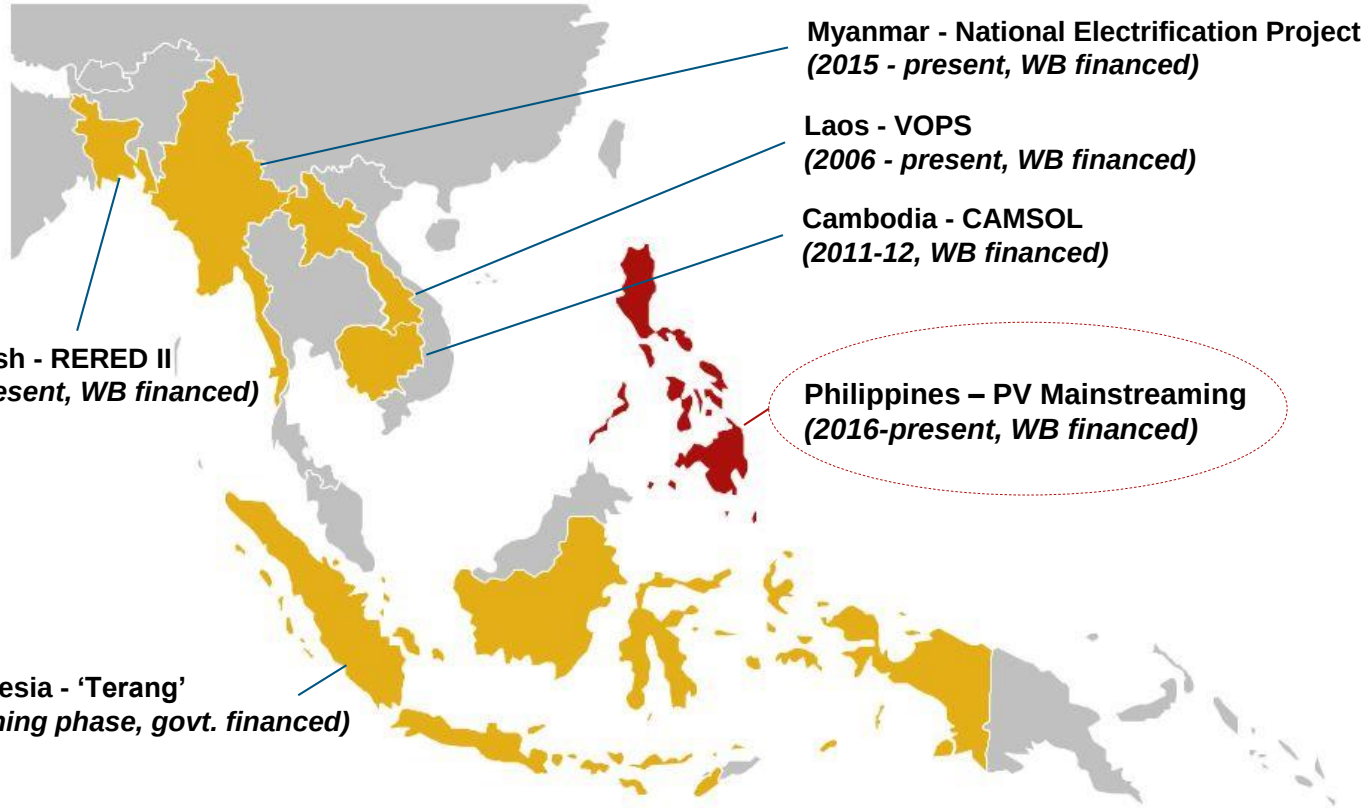
‘04 ‘06 ‘08 ‘10 ’12 ’14 ’16 ’18 ’20 ’22

Cost of Electricity from PV

Conventional Electricity Costs

THE LANTAU GROUP
strategy & economic consulting

South East Asia has already seen a number of rural electrification projects using solar



Myanmar - National Electrification Project
(2015 - present, WB financed)

Laos - VOPS
(2006 - present, WB financed)

Cambodia - CAMSOL
(2011-12, WB financed)

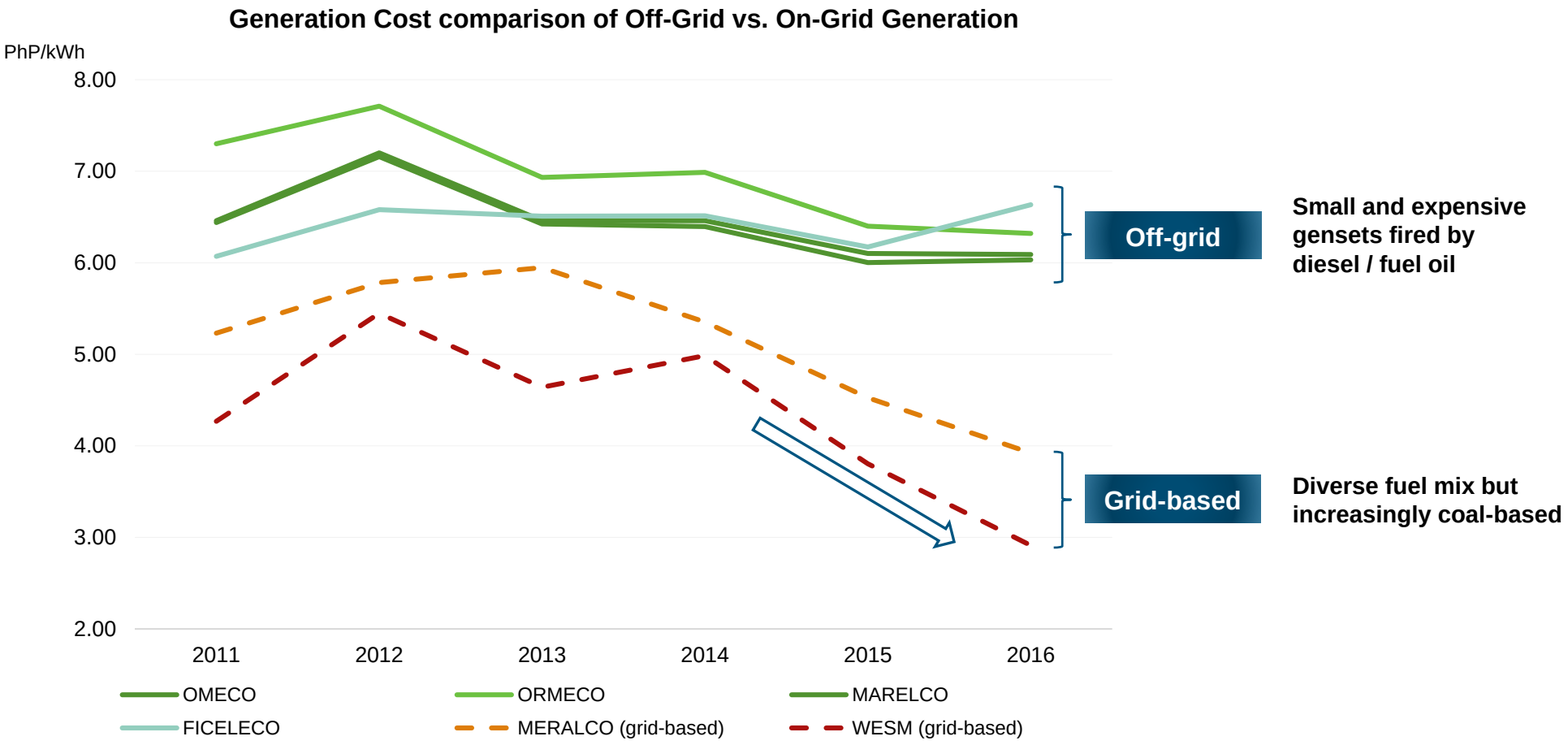
Bangladesh - RERED II
(2012 - present, WB financed)

Philippines – PV Mainstreaming
(2016-present, WB financed)

Indonesia - 'Terang'
(planning phase, govt. financed)

Solar Home Systems (and Pico Systems) are particularly attractive for 'last mile' electrification in remote, rural locations

In the Philippines, the cost of serving existing off-grid demand is much more expensive compared to grid-based power



^ ECs shown are four of the largest by peak demand, 2016
Source: Meralco; NEA; NPC-SPUG; WESM

THE LANTAU GROUP
strategy & economic consulting

Source: C Steley (2016)

But past programs in the Philippines have faced a number of institutional and operational issues, leading to a collapse in collection efficiency

Institutional

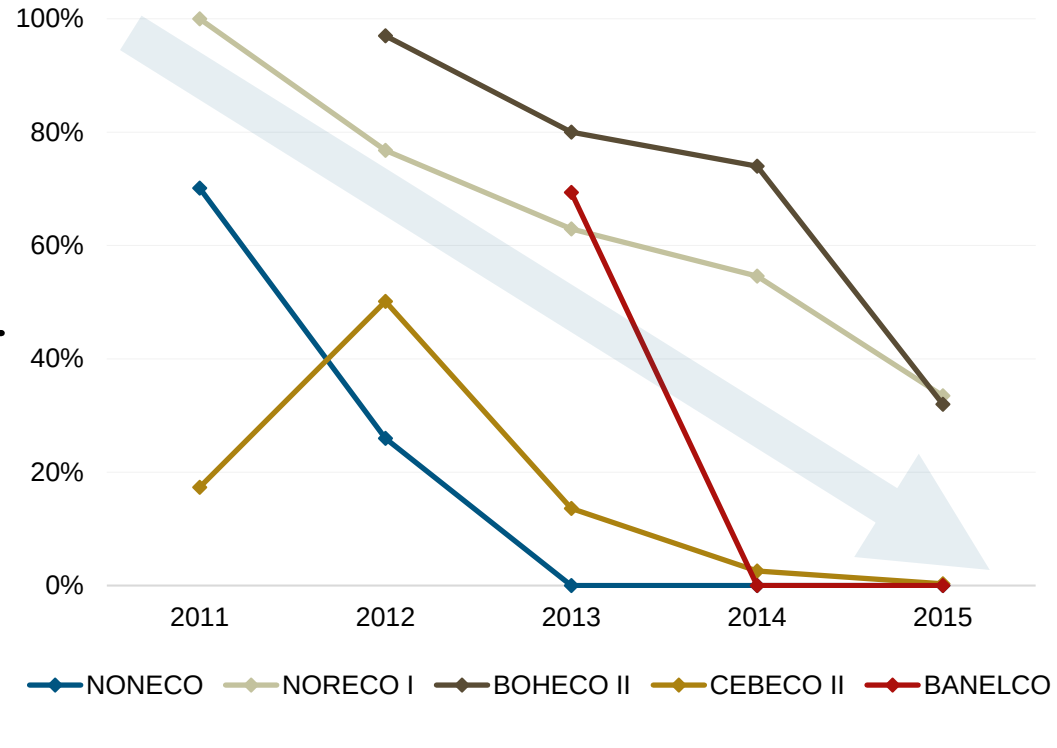
- Political intervention in selection of recipients
- Misconception as being free assistance

Operational

- Insufficient scale
- Lack of dedicated EC personnel / technical support
- Lack of access to recipients, long distances between HH
- No contingency in EC budgets for battery replacement
- Specification non-compliance, QA issues, lack of spares

NO LEGAL OBLIGATION TO PAY !

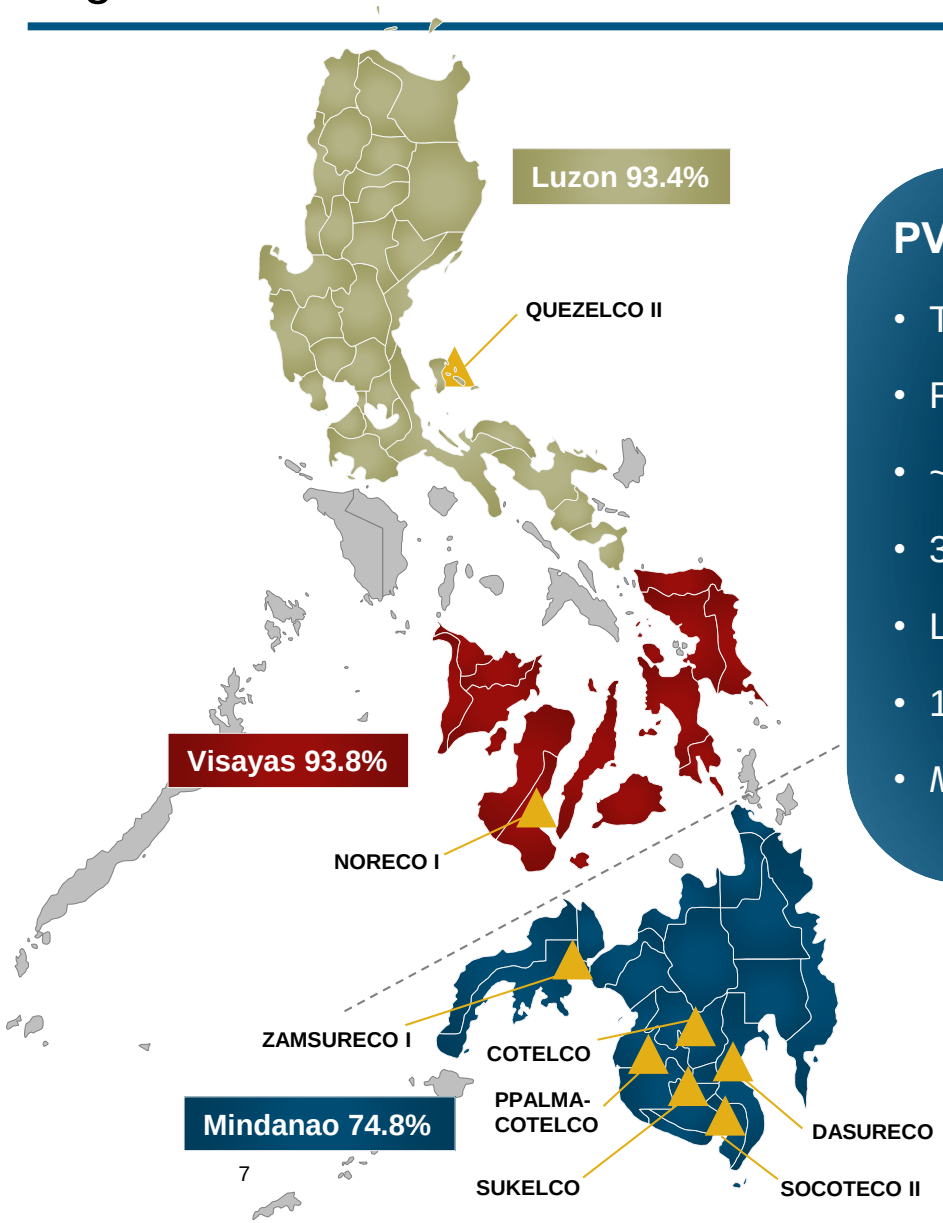
Collection Efficiency achieved by ECs piloting SHS



Source: IED; respective ECs; TLG analysis

THE LANTAU GROUP
strategy & economic consulting

Despite progress in electrification, there are still large differences between regions – electrification rates in Mindanao still sit at pre-EPIRA levels

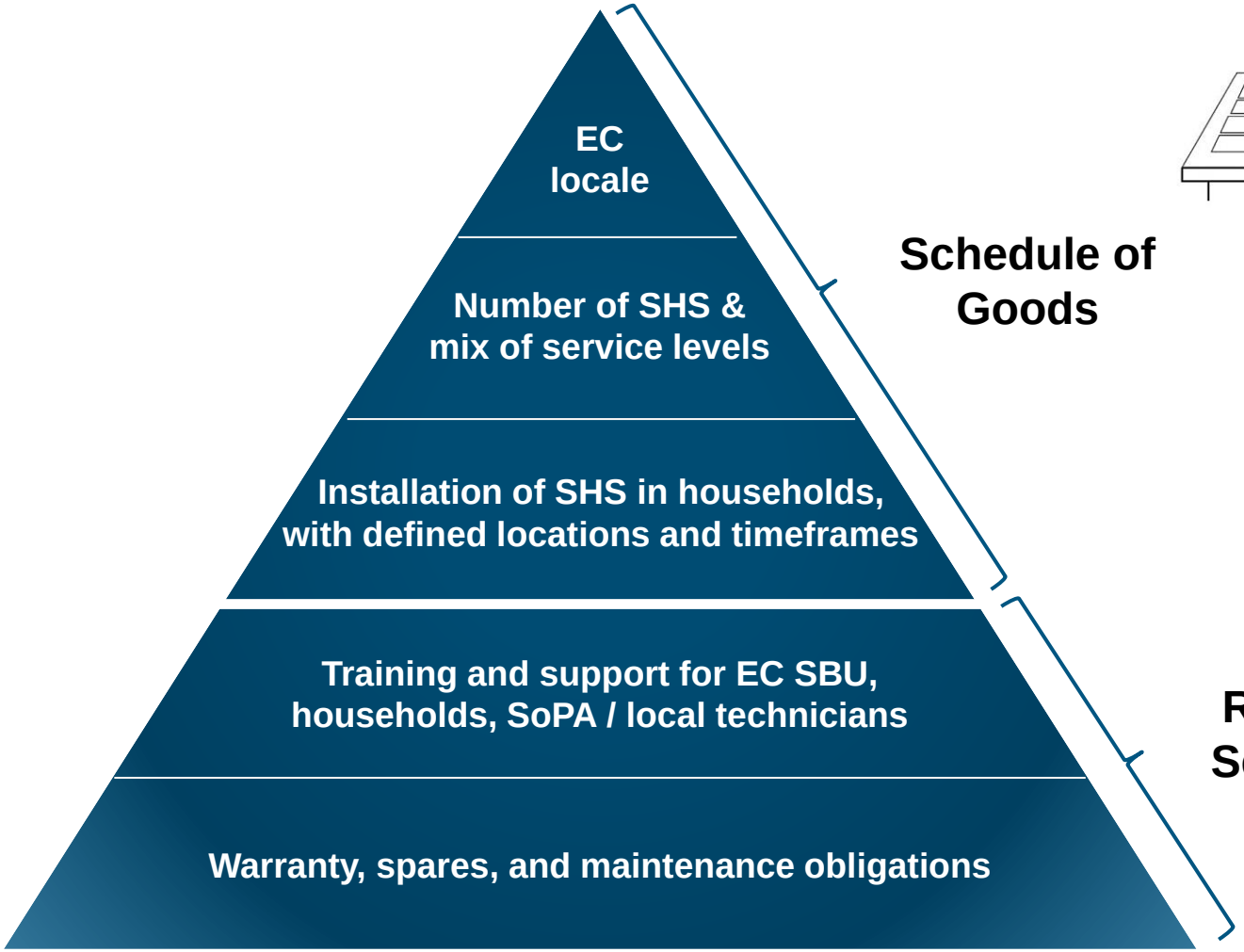


PV Mainstreaming is 'last-mile' rural electrification

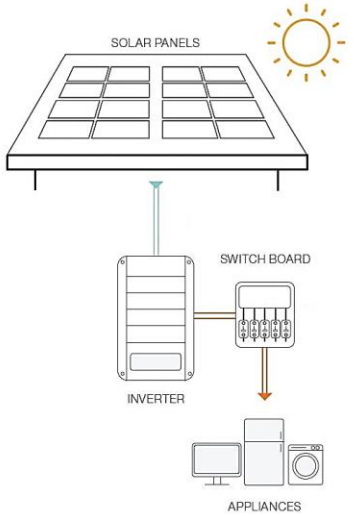
- Target of 40,500 SHS systems
- Focus on remote and rural locations within Mindanao (ECs)
- ~ US $16 million funding from GPOBA, the EU, & the DOE
- 30Wp & 50 Wp systems: lights, phone charger, radio
- Li-Ion battery, LG certified, and 1 day autonomy
- 1st competitive tender launched in April 2017 (10,000 units)
- *Mainstreaming* element, managed by ECs (SaaS)

^ National Electrification Administration (2017)

What constitutes a transaction ‘lot’, and what are bidders expected to supply?



Schedule of Goods

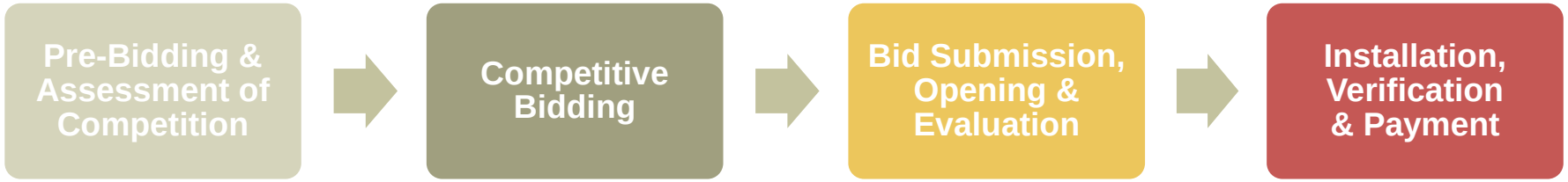


Related Services

THE LANTAU GROUP
strategy & economic consulting

Our focus was to design a competitive and robust transaction for the program

- Ensure and promote a competitive transaction to achieve best value with funding by maximising the uptake of SHS.
- Attract qualified bidders with the necessary operational, technical, and financial skills.
- Design an end-to-end transaction model for PVM subsidy:



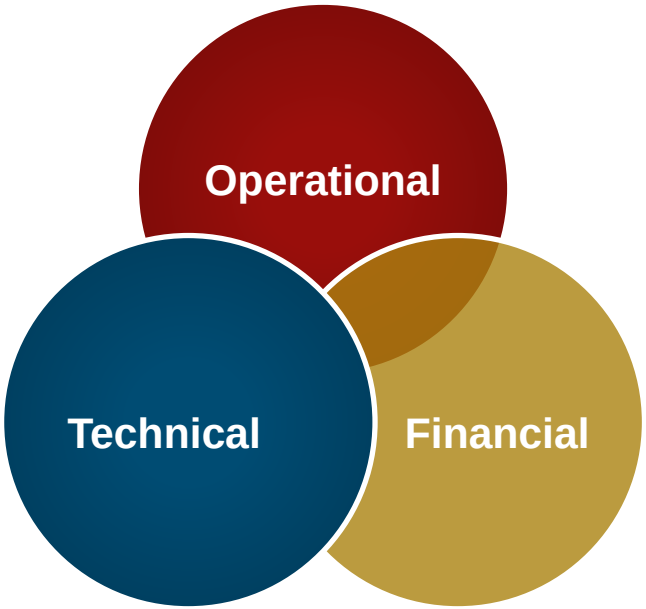
- Attracting & mobilising bidders
- EOI and Business Plan
- Assessment of competition *(what makes PVM different)*

- Attractiveness of lot sizes and economic scale
- Bidding rounds
- Lot size flexibility & continuity

- Bid Security
- Least Cost Evaluation
- Margins of Preference

- Installation format & timeframes
- Construction bond
- Validation and sampling approach
- Payment cycle

Given the mix of international (OEM) and local suppliers, intervening and engaging ahead of time was essential



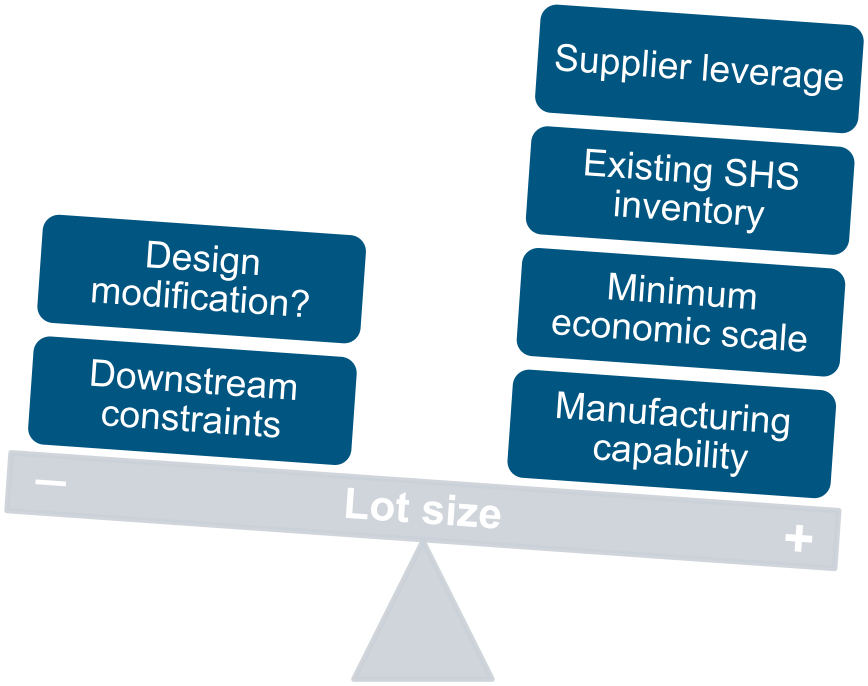
- Access to supply channels for procuring / delivering SHS… of sufficient scale and to quality certification requirements
- Ability to operate in remote, rural regions across the Philippines
- Organisational scale & manpower to install lot sizes of 1,000 - 5,000 units

- Assuring quality, from LG certification to storage & installation
- Technical skills and experience in off-grid solar
- Training plan for ECs SBUs and local technicians

- Access to working capital to pre-finance manufacturing, procurement, installation costs etc.
- Ability to extend credit to distributors and local partners

How do you decide how large the transaction lots sizes should be?

Factors influencing lot size

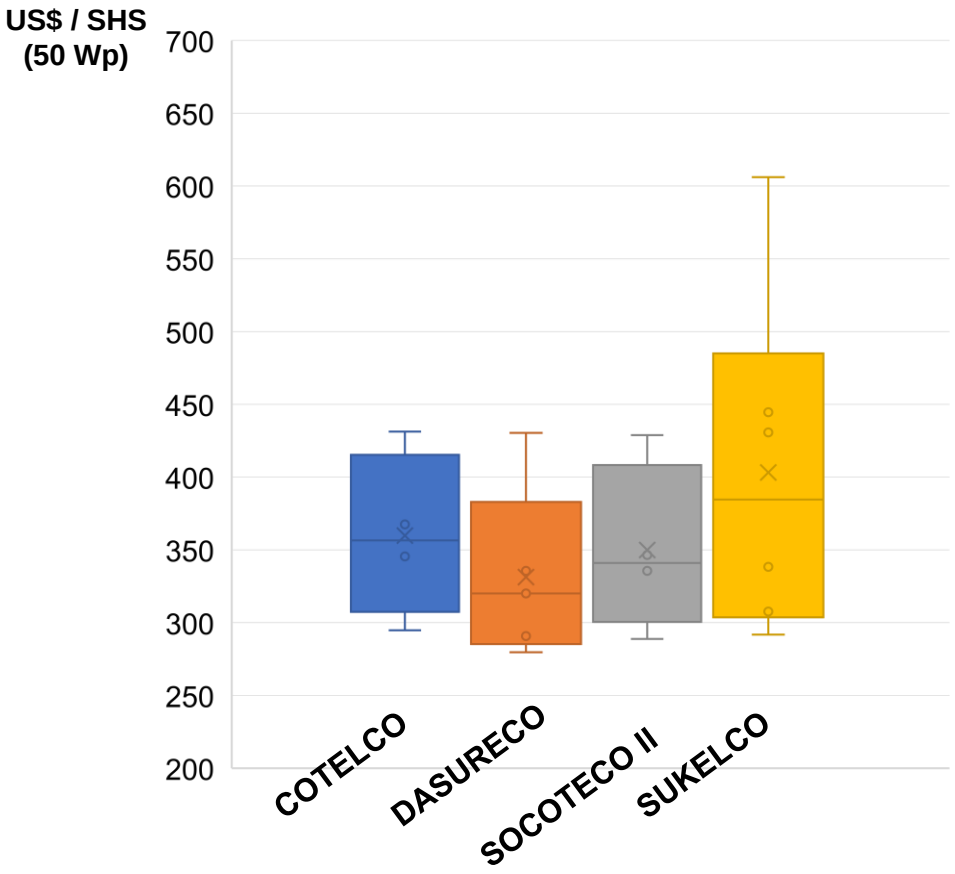


- Some bidders able to cope with 10,000+ units.
- Minimum economic scale of 1,000 - 3,000 units.
- Determined 2,500 SHS per lot was sufficient to ensure competition from both ends of the supply chain spectrum.

So has the program been a success?

- Bids were evaluated in June 2017, and future bidding rounds are forthcoming.

Price outturn from first PVM bidding round



- Prices of US $280 to US $295 per SHS
- ~ 5 to 6 bidders per lot
- Narrow distribution of prices from firms
- Lowest price achieved in the vicinity of Davao

Is the value we gain from adding a constraint or request greater than the cost to the process in potentially lost bidders and less competition?

- Competitive transactions work best when there are multiple bidders, each capable of undertaking the task at hand.
  - Every constraint that is added to the process potentially excludes bidders.
  - Every additional ‘request’ from the process potentially adds costs to the delivery of the product.

Thank you


GPOBA


NATIONAL ELECTRIFICATION ADMINISTRATION

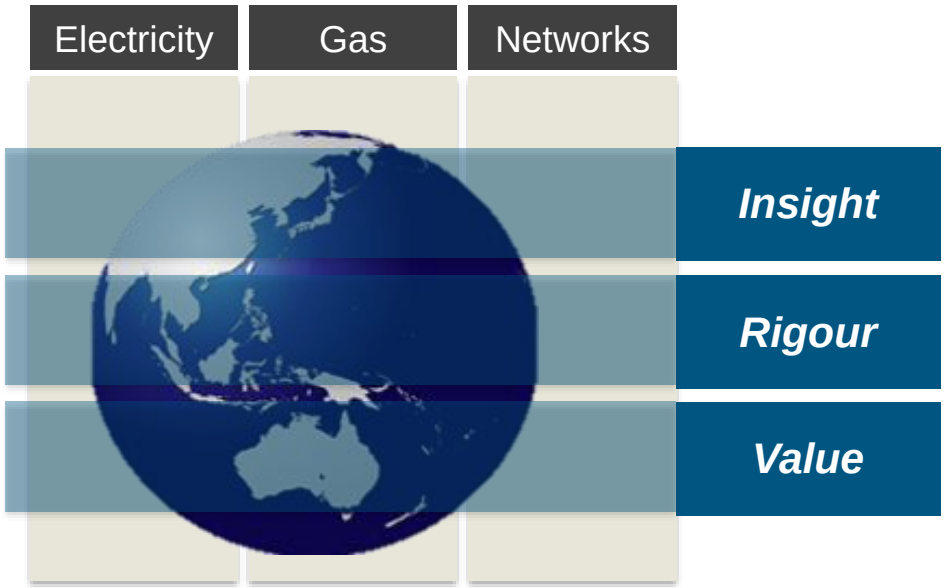

ASEP


THE LANTAU GROUP
strategy & economic consulting


LGUGC
LGU GUARANTEE CORPORATION


WORLD BANK GROUP

Contact us



For more information please contact us:

Chris STARLING, Manager
cstarling@lantaugroup.com

By phone
+852 2521 5501 (office)

By mail
4602-4606 Tower 1, Metroplaza
223 Hing Fong Road,
Kwai Fong, Hong Kong

Online
www.lantaugroup.com

THE LANTAU GROUP
strategy & economic consulting

About The Lantau Group

Consultants to the Energy Sector

- Competition, Markets, Regulation, Policy
- Decisions Support Analysis
- Disputes
- Market Analysis
- Asset Valuation
- Strategy and Advanced Analytics

THE LANTAU GROUP
strategy & economic consulting

Offerings:

- Strategic, commercial, and regulatory support
- Ability to connect the dots between fuel marke
- Analysis-based recommendations
- Highly relevant international experience
- Accessible experts focussed on the region
- Pricing, trends, drivers, risks

Languages:
English
Chinese
Korean*
Japanese
Hindi
Bahasa*
Tagalog*
Thai*
Vietnamese*

*External Advisors

All of our work is related to the profound commercial, regulatory, and policy factors shaping the energy sector