



Market Signals for Solar in the Philippines

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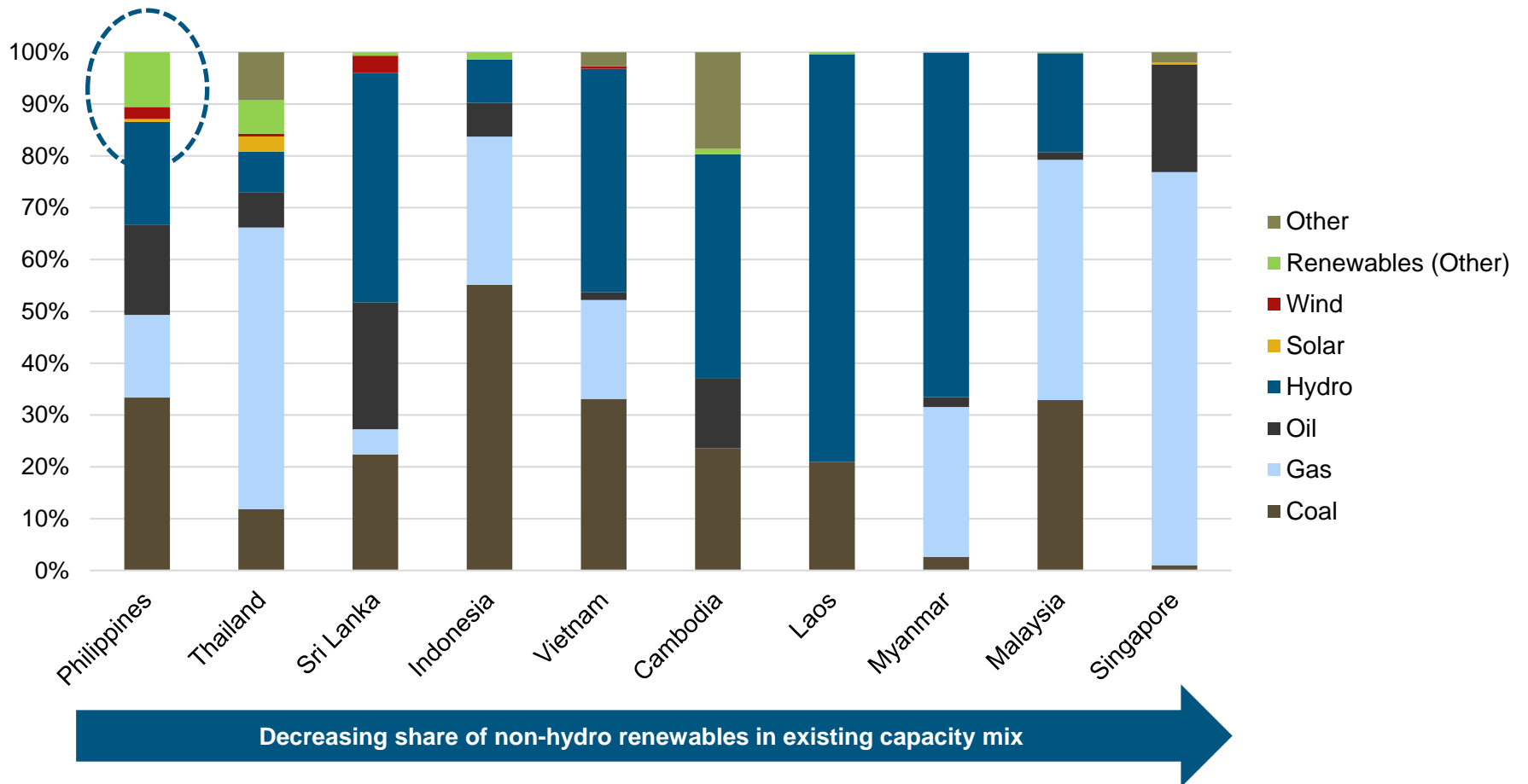
1st September 2016



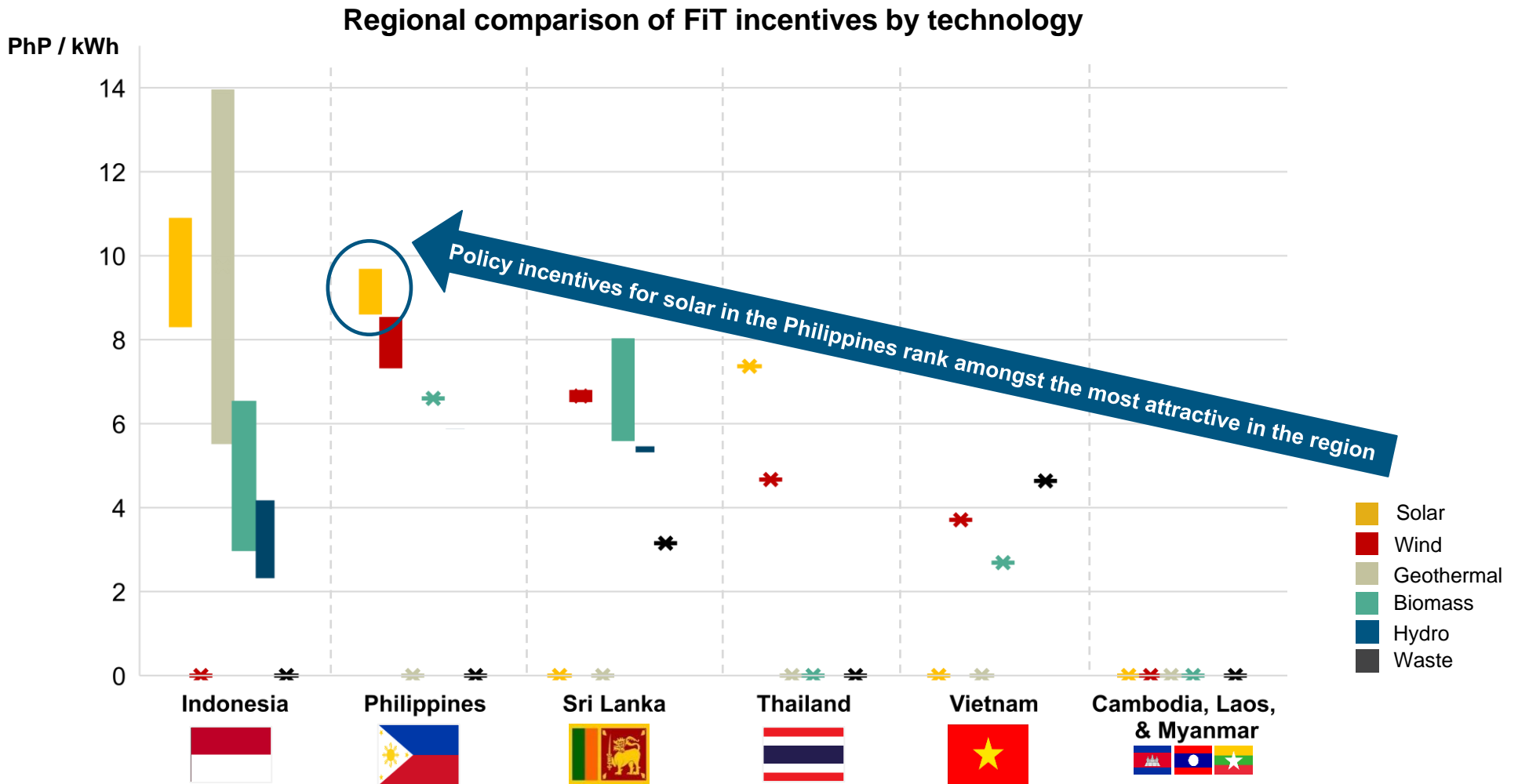
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From a regional perspective, the Philippines is one of the most progressive countries in terms of renewables

- The Philippines has embraced renewables, with solar, wind, and other forms of non-hydro RE accounting for more than 13% of installed capacity.

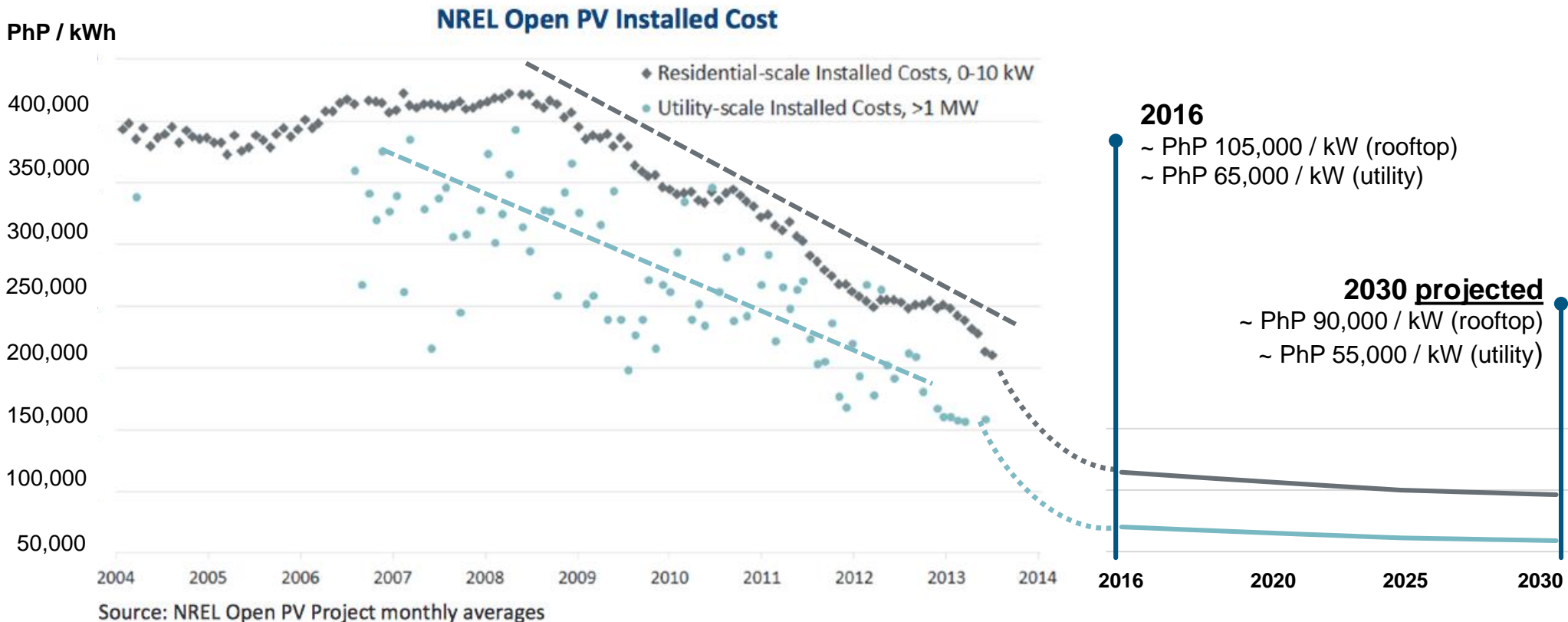


Solar has been given a kick-start at the policy level using a FiT, with the Philippines ranking as one of the most attractive places in the region



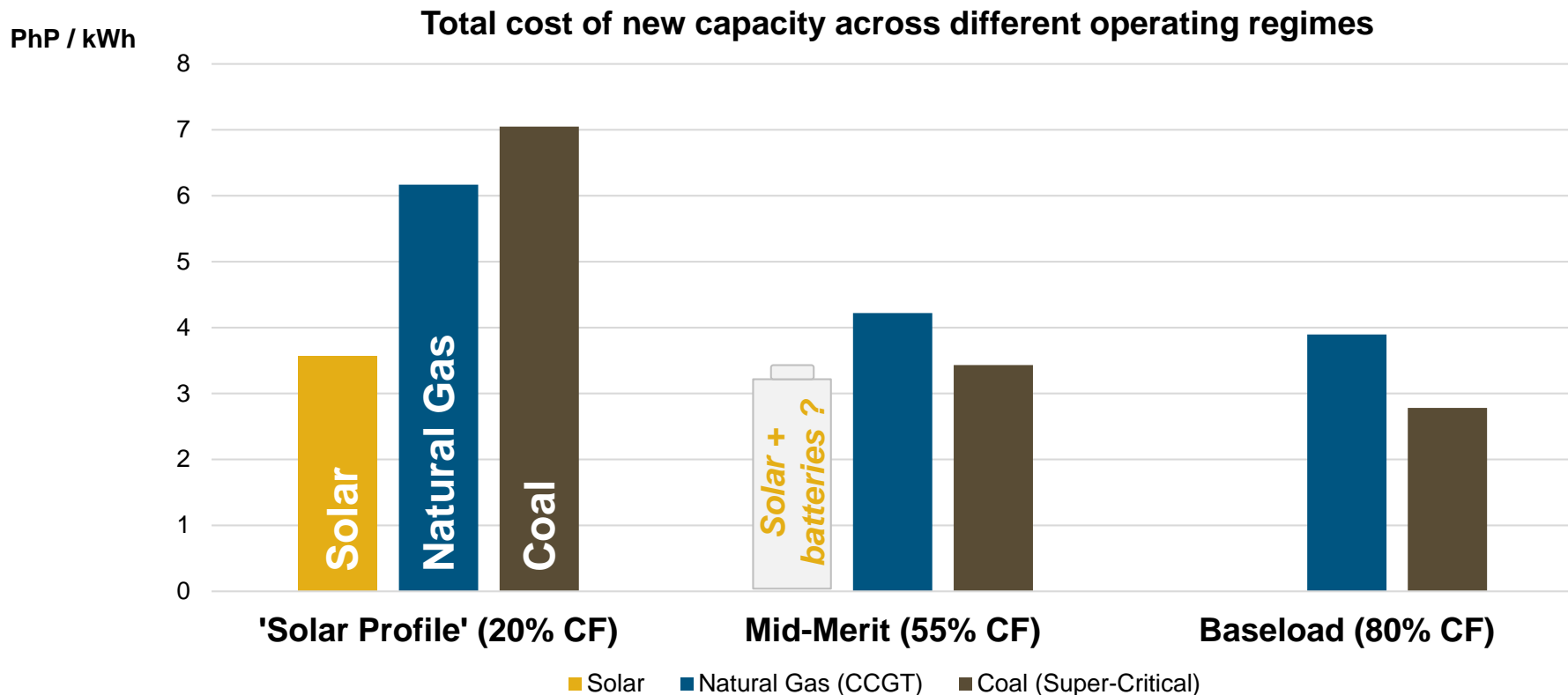
Meanwhile, costs for solar have been falling and are modestly expected to continue to fall...

- Solar costs have been on a clear downward trajectory for the past 8 to 10 years, a trend which is likely set to continue



... Which has resulted in solar competing head-to-head with gas-fired generation to serve peak demand

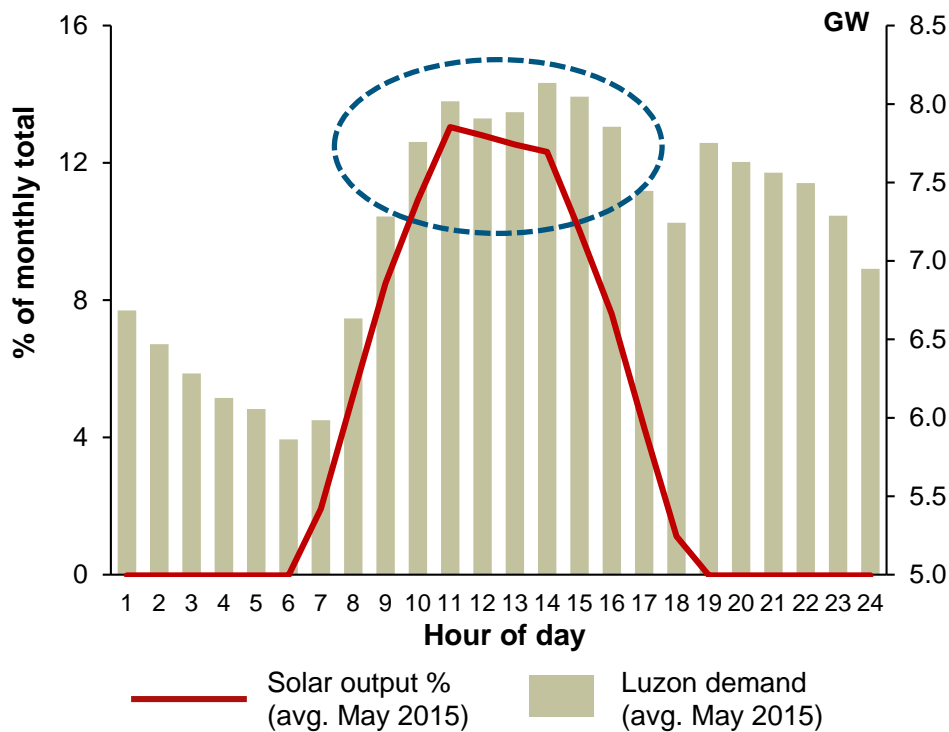
- The economic entry of solar is increasingly viable and, compared against natural gas, is highly competitive in a peaking application.
- Looking forward, the advent of 'solar-plus-battery' systems on a commercial basis is likely to further disrupt the status quo.



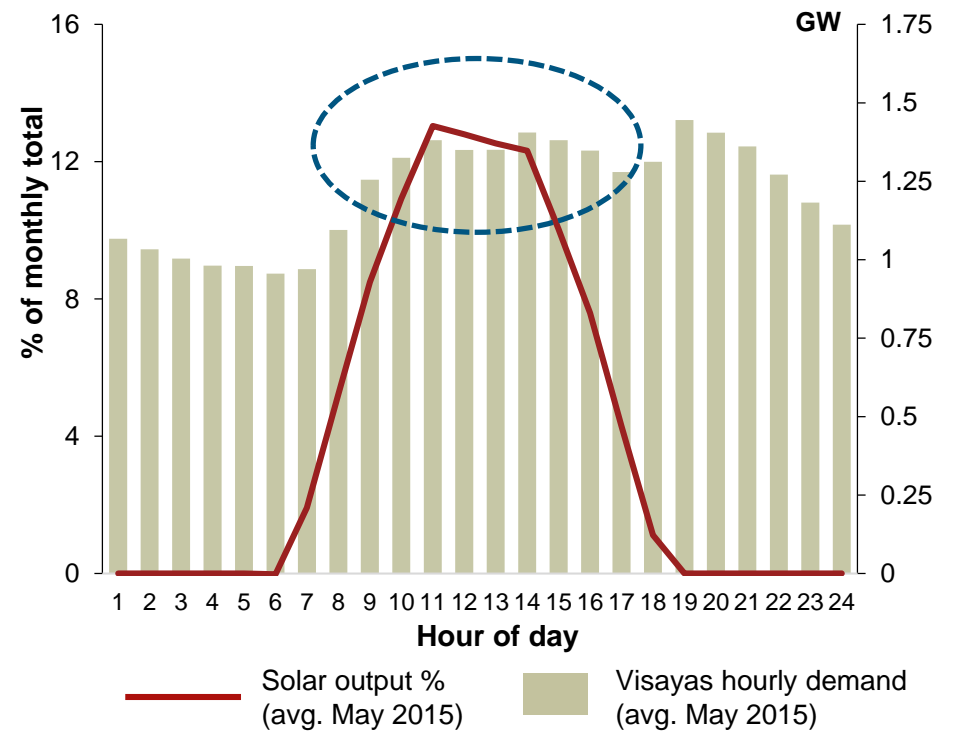
In fact, power demand in the Philippines is well aligned with the solar generation profile, and typically able to capture the most profitable hours

- On average, there is a strong match between average peak demand and the solar resource, particularly in Luzon where peak demand (and thus higher prices) fall during the middle of the day.

Luzon: Hourly solar generation and demand



Visayas: Hourly solar generation and demand

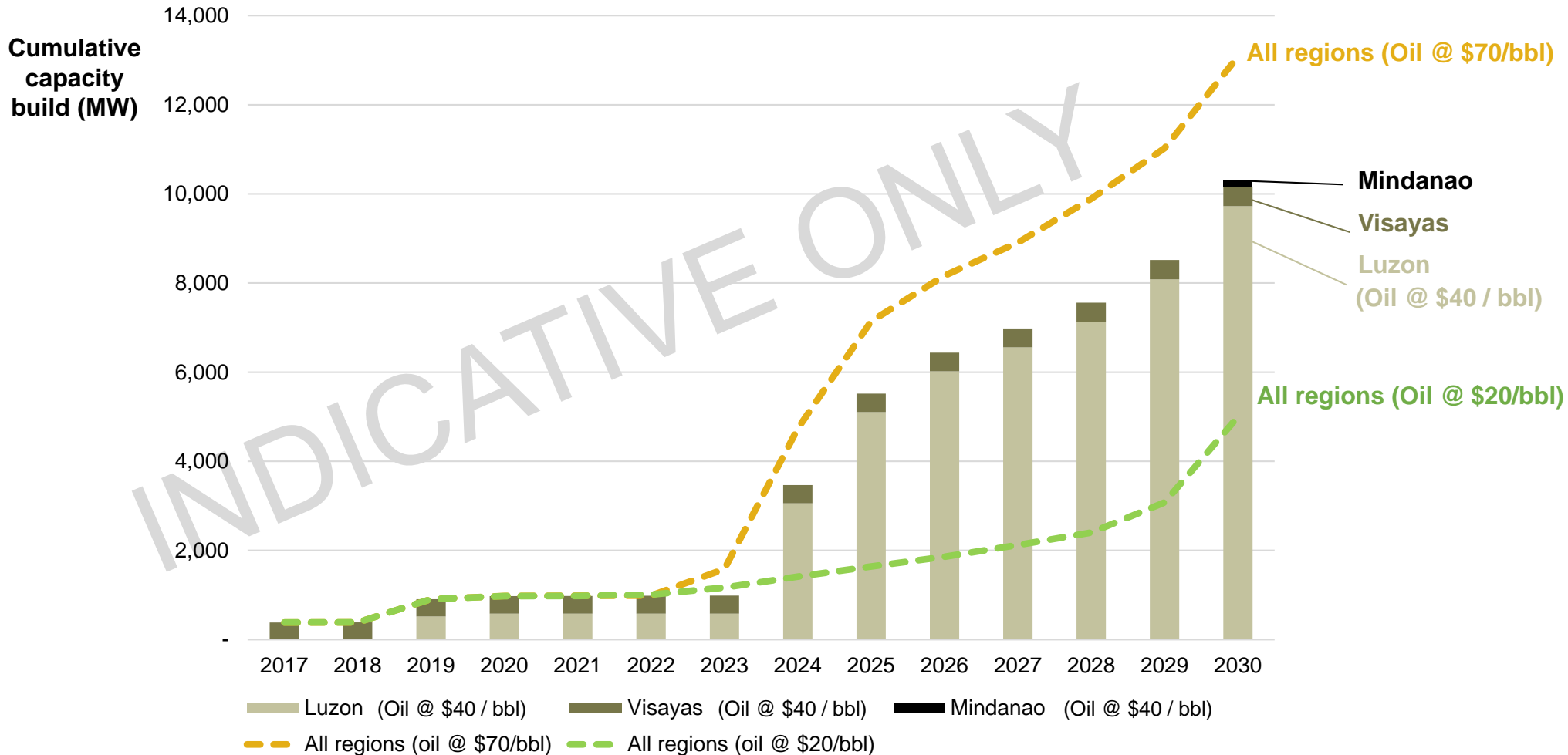


Looking ahead, there is increasing potential for solar capacity make significant inroads into the generation mix

- TLG have engaged with a number of clients to understand the future outlook for solar in the Philippines:
 - Market size for solar new build and modelling of generation economics
 - Analysis of a range of fuel price scenarios and policy permutations
- We have modelled the potential for solar in both a constrained configuration (which takes into account the economic costs of solar, such as ancillary services) and an unconstrained configuration (which ignores these additional economic costs, and thus is somewhat optimistic).
- Our most recent unconstrained analysis, set against a backdrop of robust demand growth and falling solar costs, sees over 10 GW of new solar capacity projected to be built over the next 10-15 years, assuming a conservative oil price of US \$40 / bbl.
- The ability for this market potential to be realised will be limited by practical challenges, including amongst others:
 - Site availability
 - Transmission grid requirements
 - Financing
 - Skills and resourcing

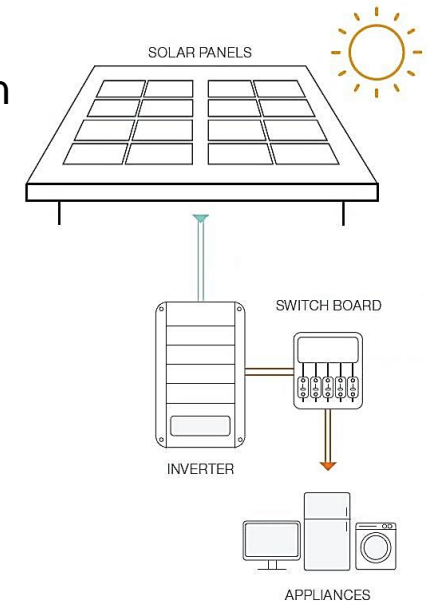
... With solar able to both capitalise on higher fuel prices, whilst being relatively resilient to a downturn in fuel prices

Unconstrained cumulative solar build from 2017



Solar home systems are the least-cost option for electrification in many cases

- Solar Home Systems (SHS) are becoming increasingly cost-effective for off-grid electrification, and meeting unserved demand.
- SHS is also highly versatile, particularly in rural settings with dispersed households, and where conventional electrification through grid extension is not viable.
- SHS programs have received significant financial assistance from international aid organisations in helping the Philippines to reach its electrification targets:
 - TLG is engaging in the DoE's 'PV Mainstreaming' program in conjunction with the World Bank
 - 415,000 households targeted, with an initial phase of 40,500
 - Working with ECs across Mindanao and Visayas
 - Competitive subsidy allocation for the solar supply chain
- Please contact sfairhurst@lantaugroup.com or cstarling@lantaugroup.com for more details of this opportunity



Thank You



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