

Outlook for Wind Energy Development in ASEAN

– Lessons Learnt on Necessary Technical and Commercial Challenges to Overcome for Successful Project Deployment –



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Session Topics

- **Overview**
 - Mott MacDonald Introduction
 - Renewable Experience: Wind
 - Key ASEAN Countries and National Targets
- **Key Challenges**
 - Turbine Technology and Design
 - Highly Specialist Skills
 - Community Buy-in
 - Clear and Appropriate Regulation

Mott MacDonald Introduction

16k

staff



We work in

140

countries



£1bn

turnover



**Employee
owned**

Renewable Experience: Wind

- A top global firm in power sector consultancy with pioneering role in the solar and wind sector for 15 years
- Strong **global track record: > 37GW** for onshore wind
- Strong presence with **over 1000 engineers in Asia Pacific**
- Supported commercial scale power projects in the region
 - **11 of 12** to reach financial close in **Thailand**
 - **First** one to seek financial close in **Indonesia**
 - **Two of the first** in the **Philippines**



Current National Targets

- **Thailand:** National target of 1,800 MW wind power by 2022
- **Philippines:** Current national target of 200 MW wind power by 2015, potentially extending to 500-700 MW
- **Vietnam:** National target of 1,000 MW and 6,200 MW wind power by 2020 and 2030 respectively
- **Indonesia:** 250 MW electricity from wind energy on grid in the year 2025

Turbine Technology and Design

- High hub height becoming trend in some countries in the region
 - Disproportionally higher tower costs
 - Limited availability of cranes
- Turbine component manufacturing quality control
- WTG class selection adequacy (extreme wind conditions in the Philippines in particular)
- Foundation design challenges:
 - Poor foundation designs due to inexperienced local designers (IEC standards not always followed)
 - Multiple concrete pour designs proposed for costs effectiveness lead to buildability issues requiring experienced contractors and additional time

Highly Specialist Skills

Skills	Project Phase		
	Planning	Construction	Operation
Wind energy yield analysis	<input type="radio"/>		
Managing interfaces and commercial terms with turbine manufacturers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heavy crane logistics (imported?)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turbine transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turbine foundation design / construction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing grid operator requirements and interconnection/offtake risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Community Buy-in

- Upfront engagement key
- Explanation of technology
 - Visit existing wind farms
 - Detail construction impacts and mitigations
 - Detail benefits to the community
- Grievance mechanism for construction period
 - Address issues such as road damage, other access blockages, dust, crop damage etc
- Community support funds



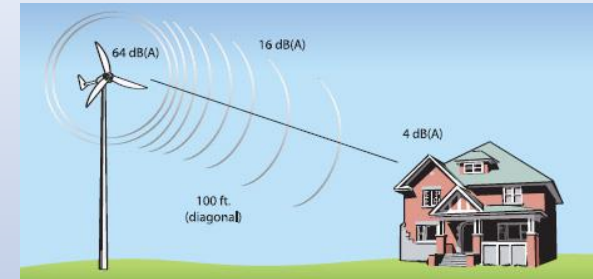
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Clear and Appropriate Regulation

- Lack of clear regulatory framework
 - Telecommunications and radar interference
 - Noise (Regulatory limits not strict, but still need to be a good neighbour...)
 - Visual Impact, shadow flicker
- Specific grid code requirements for wind farms?
 - Lack of clarity on “priority dispatch” terms for renewable generators (no compensation in the of grid outage, limited information on load-flow or network upgrades?)



Round up

- Southeast Asia's wind power industry is active, but projects remain complex and require careful analysis of risk:
 - Appropriate regulation
 - Technology selection for site conditions and manufacturing quality
 - Sourcing skills to manage construction risk; risk allocation
- Standards for wind project financing need to be established
 - Lender's teams still climbing the learning curve, and establishing lending norms for wind power
 - Lender preference for an EPC contractual wrap?
 - Make use of experienced Owner's Engineer and Lender's Technical Advisor to bring international standards and reduce project risk

THANK YOU FOR YOUR ATTENTION



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