

Use of Renewable Energy in Singapore

34th APEC EGNRET Meeting
KL, Malaysia, 26-27 Apr 10



Summary

Introduction

Potential for RE utilisation

Solar Energy

Why Solar Energy?

Alternative
Energy

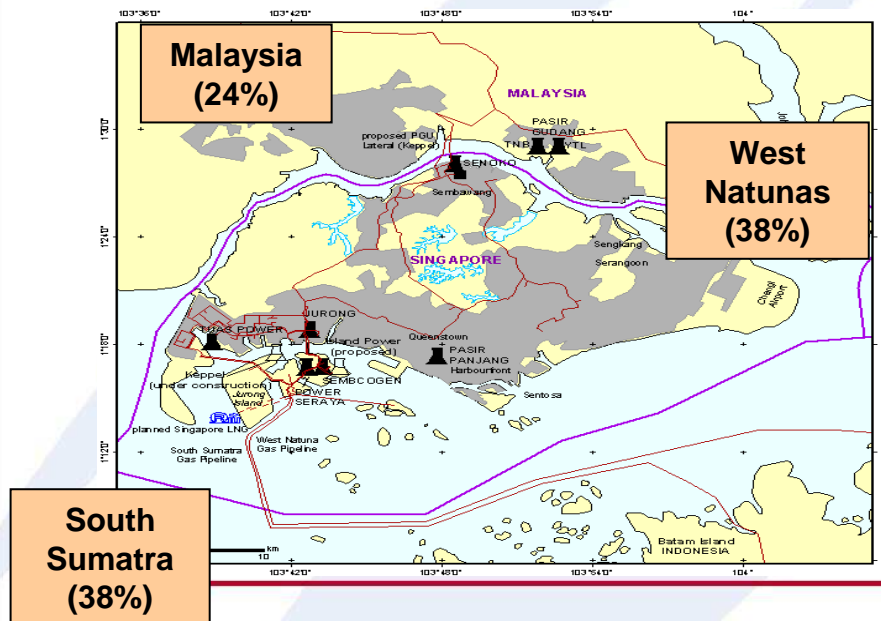
Uses of other RE

R&D in RE

Business opportunities in RE

Potential for RE in Singapore

- Singapore is alternative energy disadvantaged
- The liberalised electricity industry has encouraged gencos to use NG (80% of fuel mix) to stay competitive;
- Although the industry is open to other technologies, currently RE is still expensive. Also RE is only able to replace a small proportion of power from fossil fuel



- Nevertheless to address the twin challenges of climate change and energy security, options such as coal, electricity imports, solar are being explored

- Singapore is also developing the clean energy technology solutions through R&D investments

Why Solar Energy?

- Solar Energy has potential in Singapore given our location in the tropical sunbelt with average solar yield/ unit of installed capacity of 1,150 kWh/kWp/year;
- Although expensive, R&D in solar energy is deployed as pilot projects funded through Schemes with Government grants;



- 4 IPs with total capacity of 251 MW generating 2% of total power demand

- As at Dec 09, total grid connected solar capacity is about 1.8 MWp ;

- There are plans to increase this to 4 MWp under the Government Scheme

Solar PV Industry Players

- Singapore is an effective base for companies to develop cutting edge technologies for the tropical Asian climate.
- Leading industry leaders have established a presence here including Norway's *Renewable Energy Corporation* (REC)'s manufacturing plant in Singapore, which is the world's largest plant, is close to completion;
- Germany's *Solar Energy Power* manufactures ultra-thin wafer-based solar cells in Singapore. In addition, *SolarWorld* and *Conergy* have their Asia Pacific headquarters based in Singapore



CONERGY



Market Authority

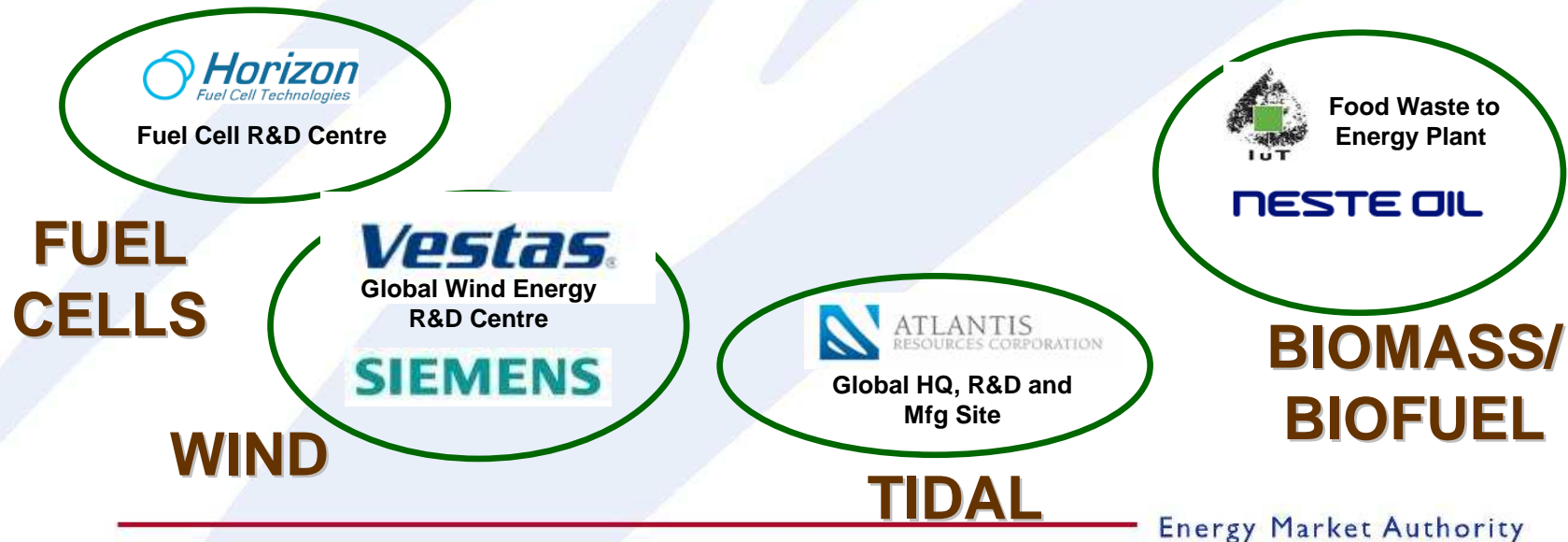
Other Renewable Energy

- Market for alternative energy is set to soar due to energy security and climate change concerns;
- Clean technology solutions is expected to contribute US\$2.5 bil (S\$3.4 bil) and 18,000 jobs by 2015;
- Finnish energy firm *Neste Oil* is currently building the world's largest biodiesel plant(800,000 metric tonnes p a) in Singapore.



Business Opportunities in RE

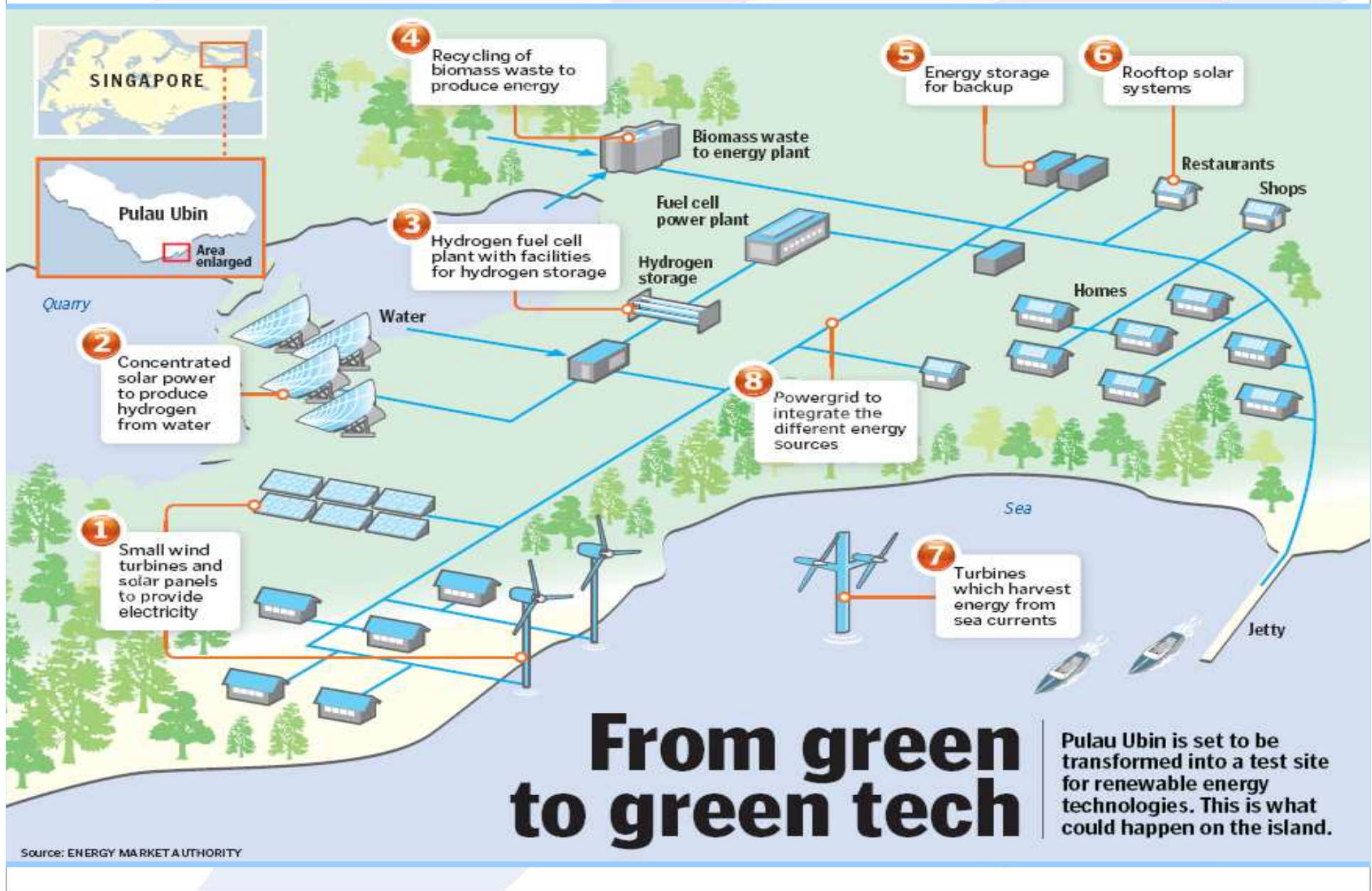
- Clean technologies is a strategic growth area for our economy
- Singapore's strong technological base coupled with supply chain capabilities and linkages to the region allows us a headstart in the RE industry;
- Made great strides in attracting leading companies to develop Singapore's CE industry
- Denmark's *Vestas Wind Systems*, the world's top wind technology company, opened its regional headquarters in Singapore in 2007



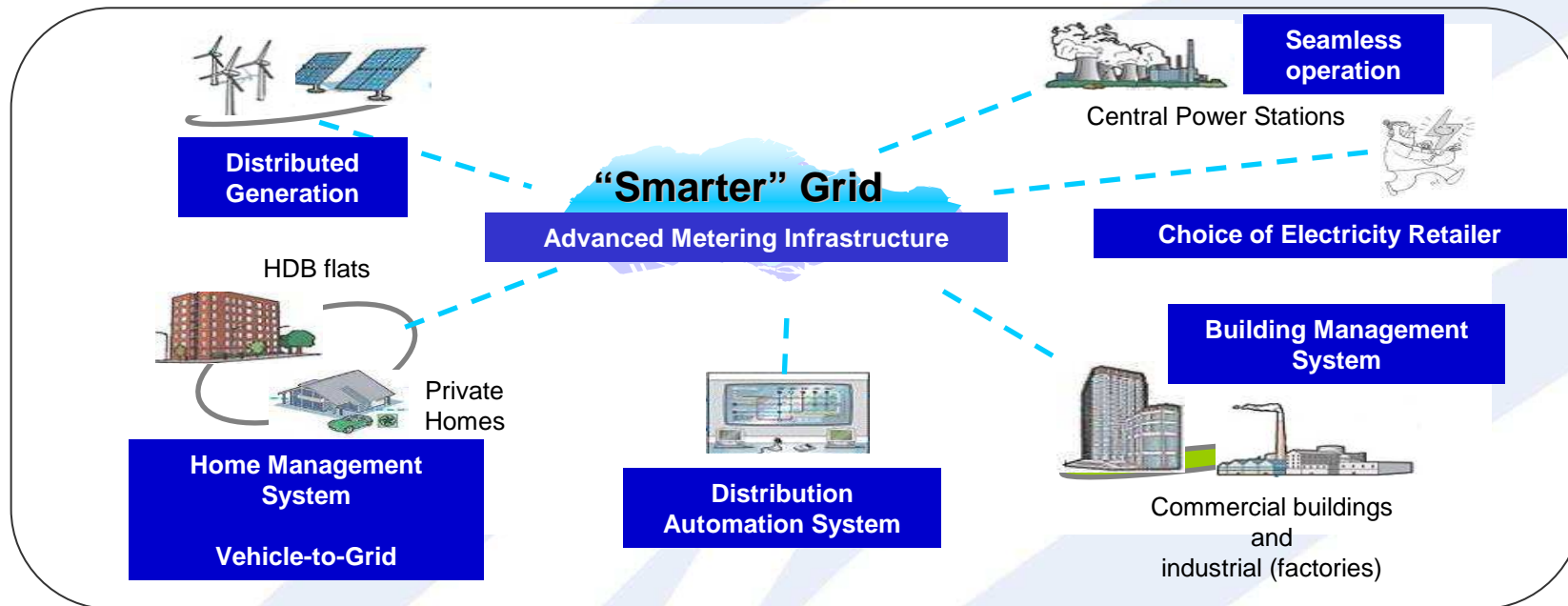
R&D in RE

- S\$20mil Solar Capability Scheme to encourage design, integration and adoption
- S\$17mil CE Research & Test-bedding to develop and trail CE applications in public sector;
- S\$50mil CE Research Program supports R&D in Institution & industries;
- S\$5 million Market Development Fund (MDF) to encourage adoption of RE solutions by offsetting market charges associated with selling renewable energy into the electricity grid

Test-bedding of RE solutions at Pulau Ubin



Pilot Project on the Intelligent Energy System



Develop a smarter grid: Intelligent Energy Systems

- Interlaying of Information and Communication Technology (ICT) with the power grid to empower consumers through demand response, shave peak loads and thereby enhance overall efficiency and energy savings.
- Provides us the flexibility to integrate options listed below like V2G

Singapore International Energy Week (SIEW) 2010

27th October to 4th November 2010

Key highlights:

- Singapore Energy Lecture by PM Lee Hsien Loong
- Clean Energy Expo Asia
- Power-Gen Asia
- Singapore Electricity Roundtable
- Carbon Forum Asia



SINGAPORE INTERNATIONAL ENERGY WEEK 2010



SAVE THE DATE
27 October - 4 November 2010



Energy Market Authority

SINGAPORE INTERNATIONAL ENERGY WEEK 2010



Thank You