

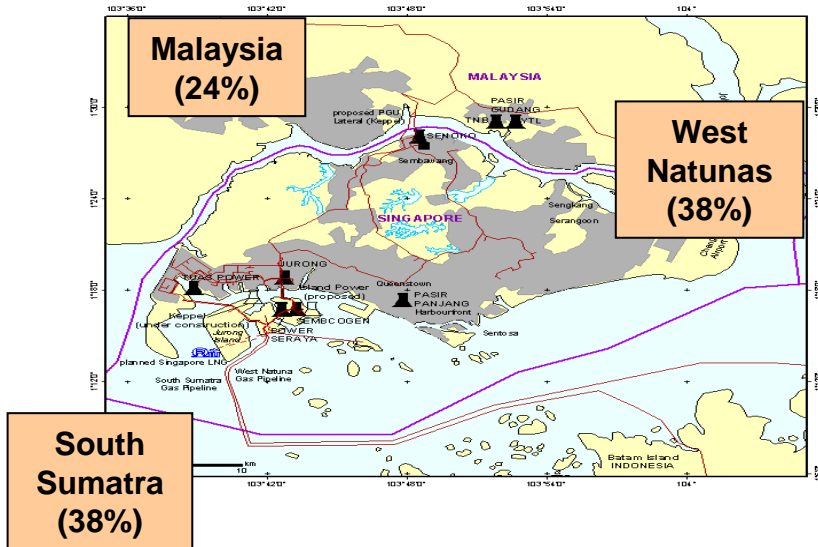


Renewable Energy Grid Integration in Singapore

APEC EGNRET 35 • Workshop on RE Grid Integration • Kawasaki, 12 Oct 2010

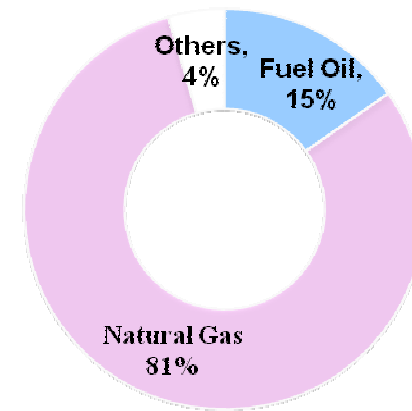
Singapore's present fuel mix for power generation

- About 80% of electricity is generated from piped natural gas (PNG) from Malaysia & Indonesia

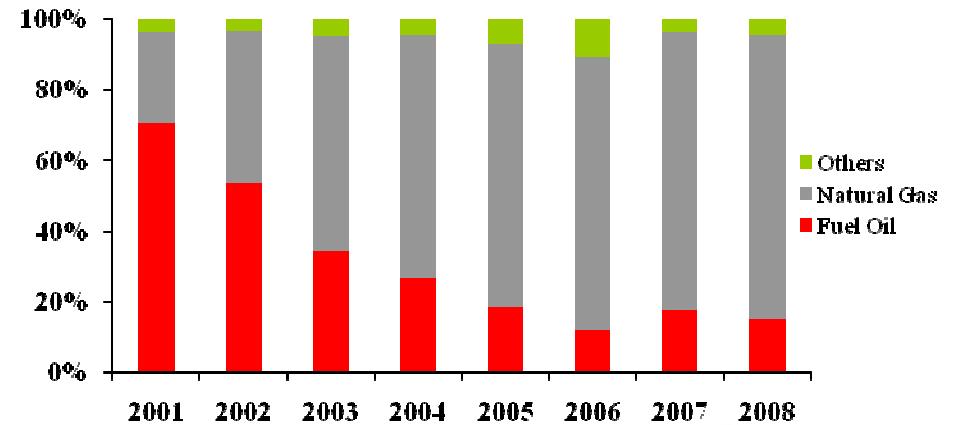


Singapore is an energy importer that is highly dependent on fossil fuels to power our economy

Singapore's Electricity Fuel Mix (2009)



Singapore's Fuel Mix (2001-2008)



Although renewable energy offers intrinsic benefits, it is not a viable option for Singapore for now

- Small land area: 710 km²
- No hydro or geothermal energy resources
- Negligible wind and low wind speed (2m/s)
- Variable and intermittent solar



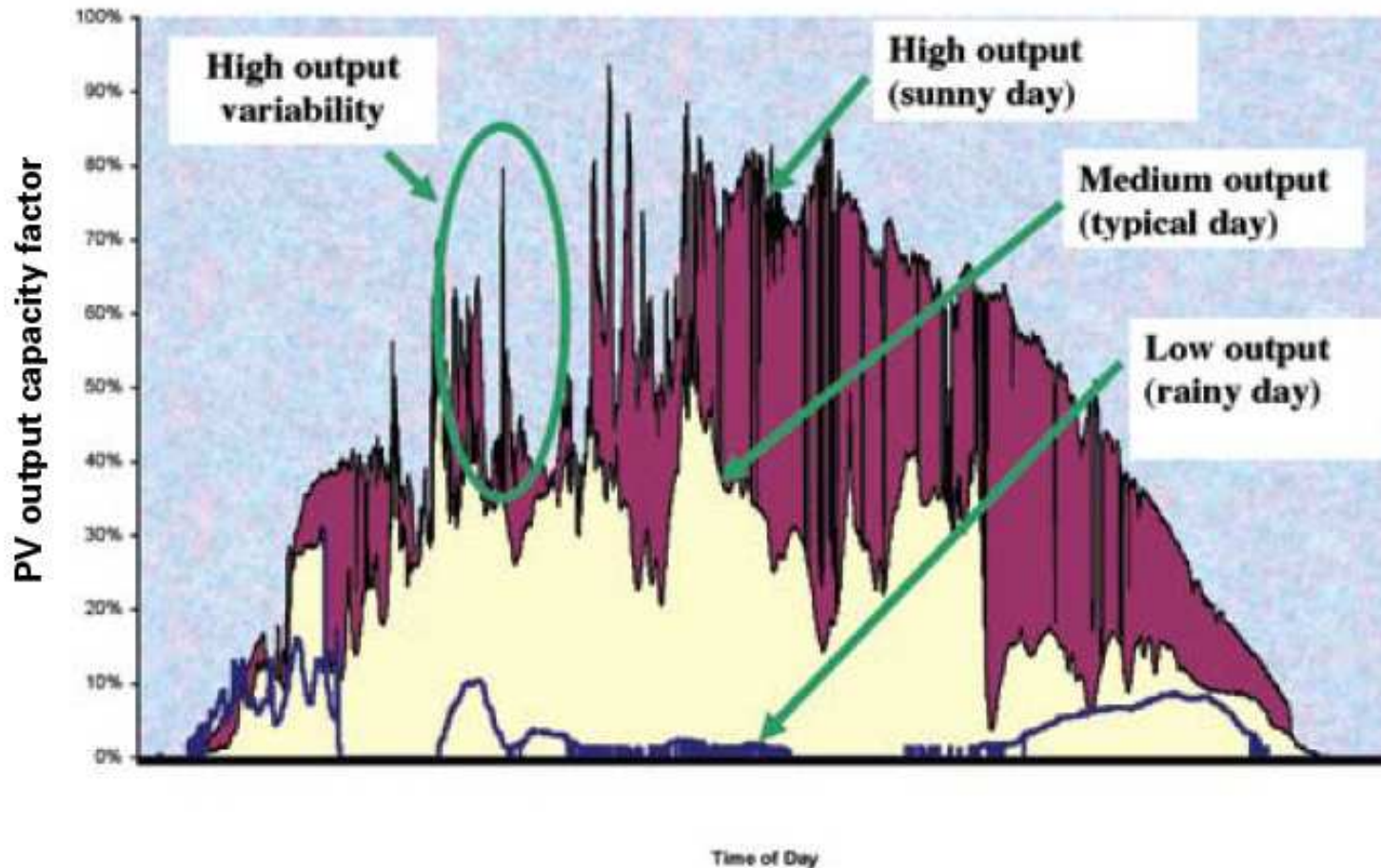
Diversifying our Portfolio – RE as Medium-Term Option

	Medium-Term			Long-Term
	<i>Coal</i>	<i>Electricity Import</i>	<i>Renewables</i>	<i>Nuclear</i>
Benefits	Cheap, widely available	Free up valuable land	Carbon free, indigenous resources	Zero carbon, base load contribution
Constraints	Carbon footprint	Cap on capacity due to system stability considerations	Currently not economically viable, limited scope	Complex challenges (e.g. safety considerations)

Aim to have 5% of peak electricity demand supplied from renewable energy sources by 2020

Solar Energy – The Most Promising RE Option

Varying daily power output profile of PV Installation at selected test site in Singapore



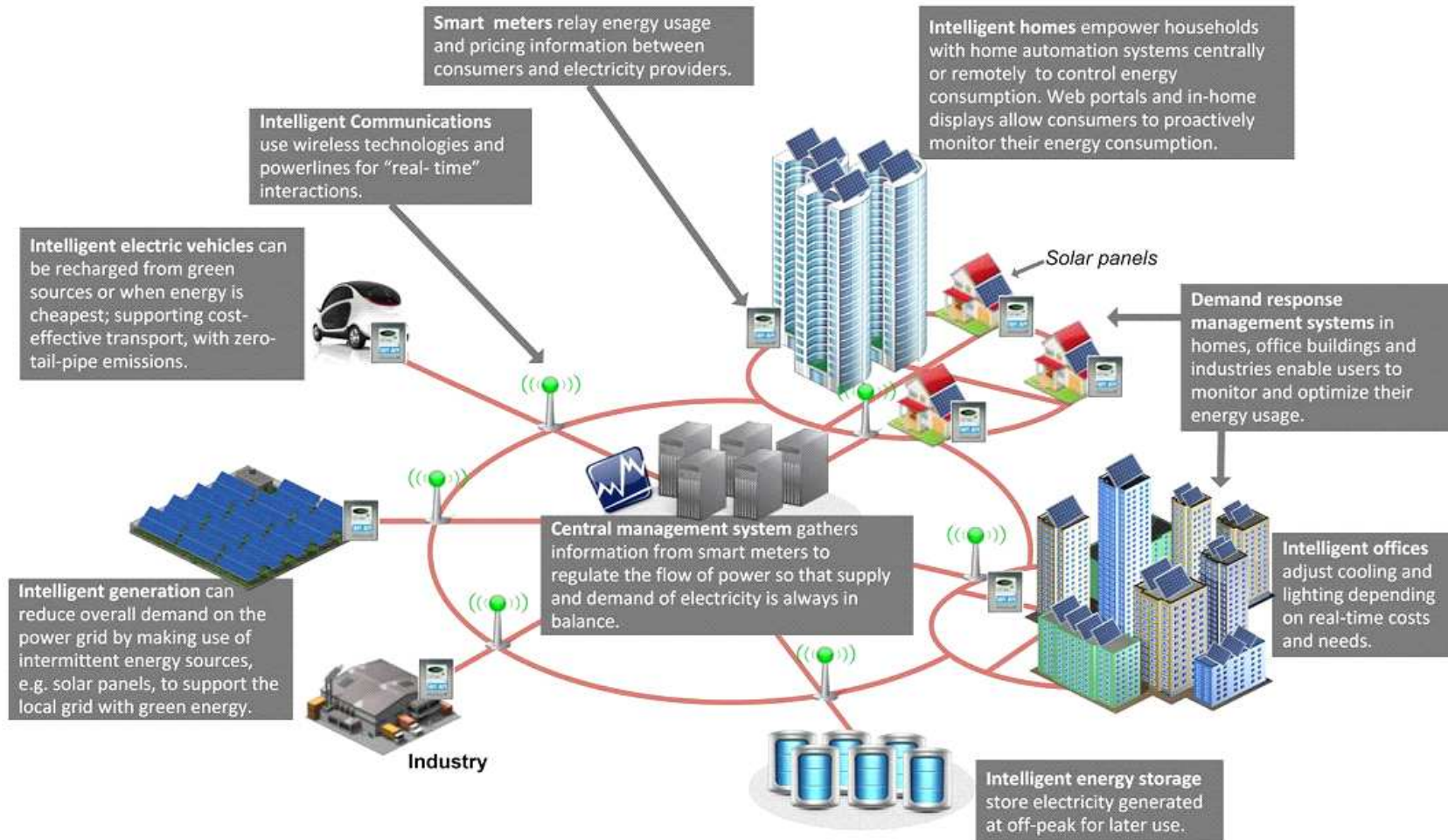
Solar Installations in Singapore



Creating an Intelligent Energy System (IES)

The Intelligent Energy System (IES) Pilot Project Conceptual Overview

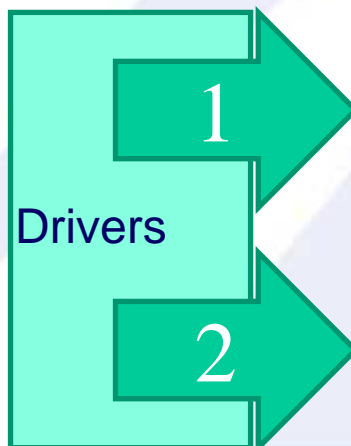
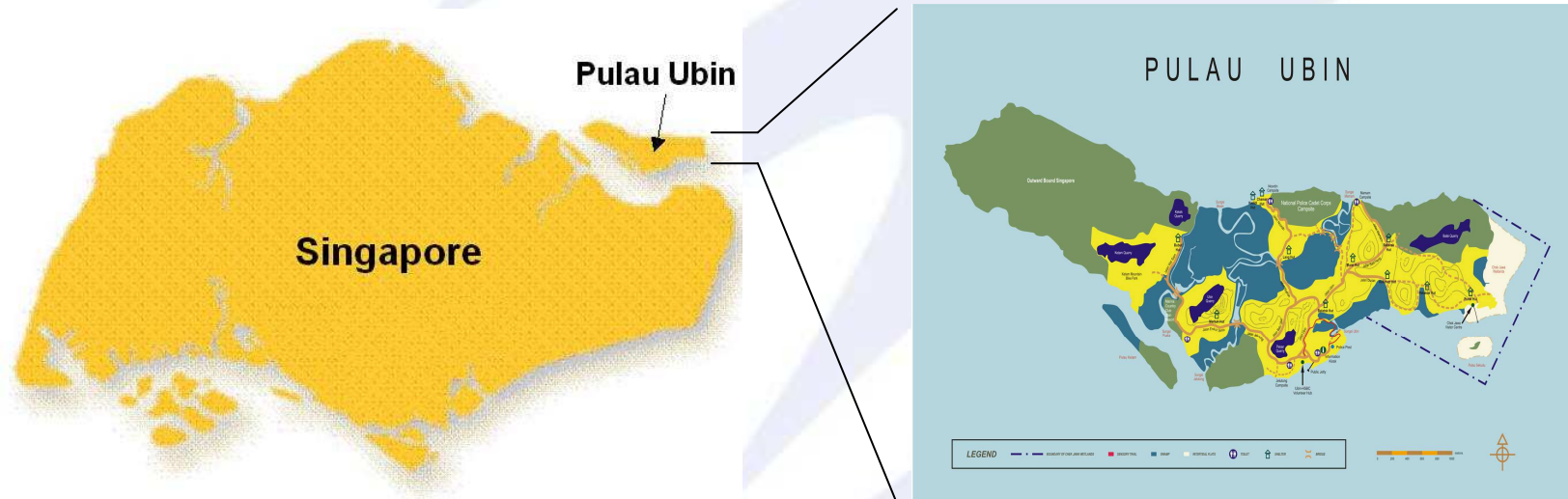
An energy ecosystem connecting intelligent homes, vehicles, communities, electricity network sensors and sources of green generation to promote reliability, sustainability and energy efficiency.



Test-bedding on Pulau Ubin

Vision

- To showcase an environmentally, socially and economically sustainable generation of renewable energy for an off grid community



To develop micro grid infrastructure with renewable energy to meet current and future total electricity demand of Pulau Ubin

To facilitate connection of close-to-market renewable energy technologies for demonstration or test-bedding purposes such as the following:

Thank You