

A way towards cleaner energy and energy efficiency – A Singaporean perspective

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ASEAN Centre for Energy (ACE) roundtable , SIEW Singapore
26 October 2017

About SERIS

The Solar Energy Research Institute of Singapore (SERIS) is the **largest solar energy R&D organisation in ASEAN**, based in Singapore. SERIS is equipped with **world class technical facilities** and provides **industry expertise** from solar cells, modules to systems as well as **project management & financial services**. One of our core focus areas is **Quality Assurance of PV installations and Asset Management** along a PV project's life cycle, covering the following aspects:

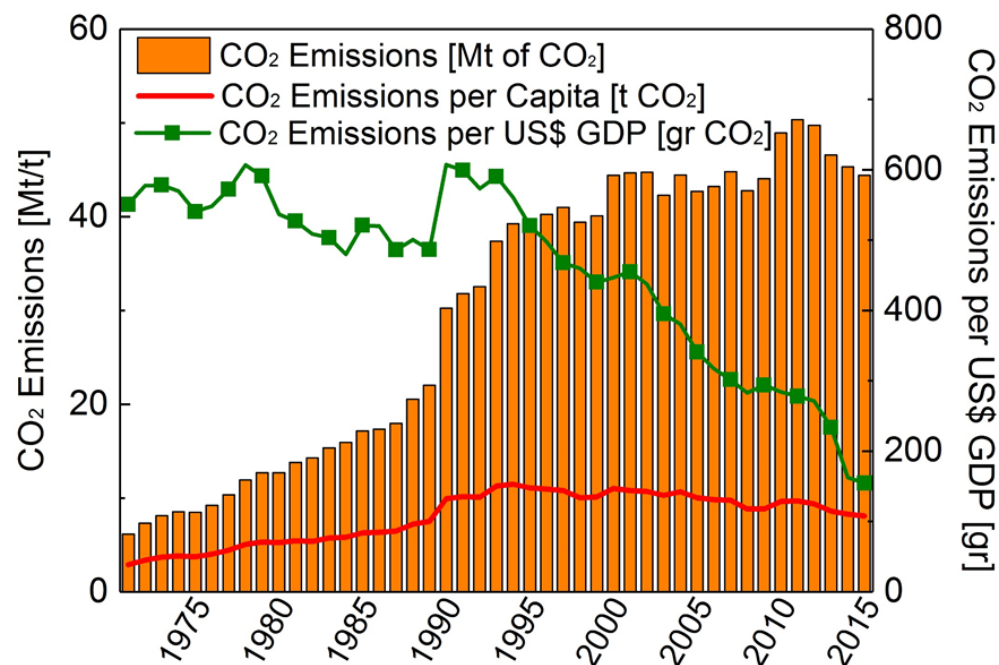
- Technical & Financial Feasibility
- Yield projections of PV systems
- Owner/Banker's Engineer Services
- Due diligence services
- PV system design and evaluation
- Quality control for PV Modules & Systems
- Real-time monitoring (irradiance, PV system performance)



How Singapore can make a difference

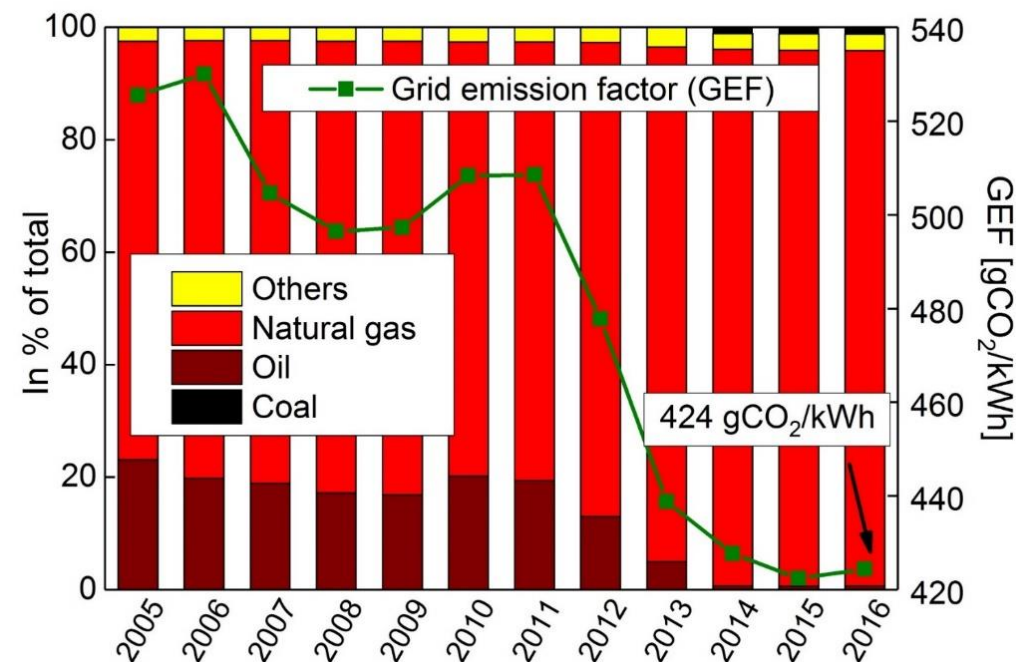
Two key pillars: energy efficiency & solar energy

CO₂ emission trend:



- ❑ Singapore ranks well in terms of intensity but less favourable in terms of capita*

Conventional energy optimized:

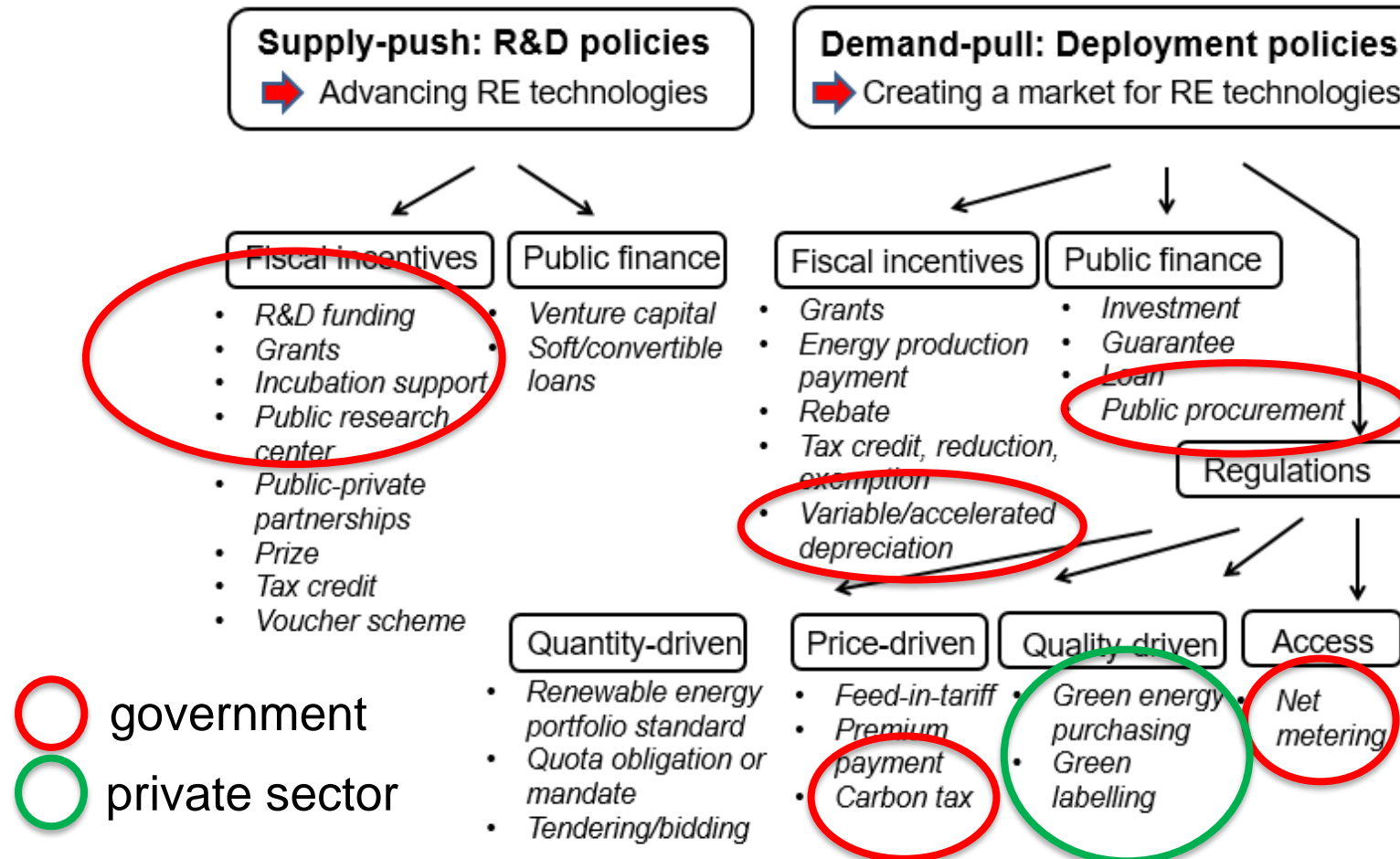


- ❑ Solar energy is the most abundant available renewable energy source for Singapore

Data source: IEA Key World Energy Statistics, 2017, EMA, *126th out of 141 countries vs 25th

Singapore's policy approach

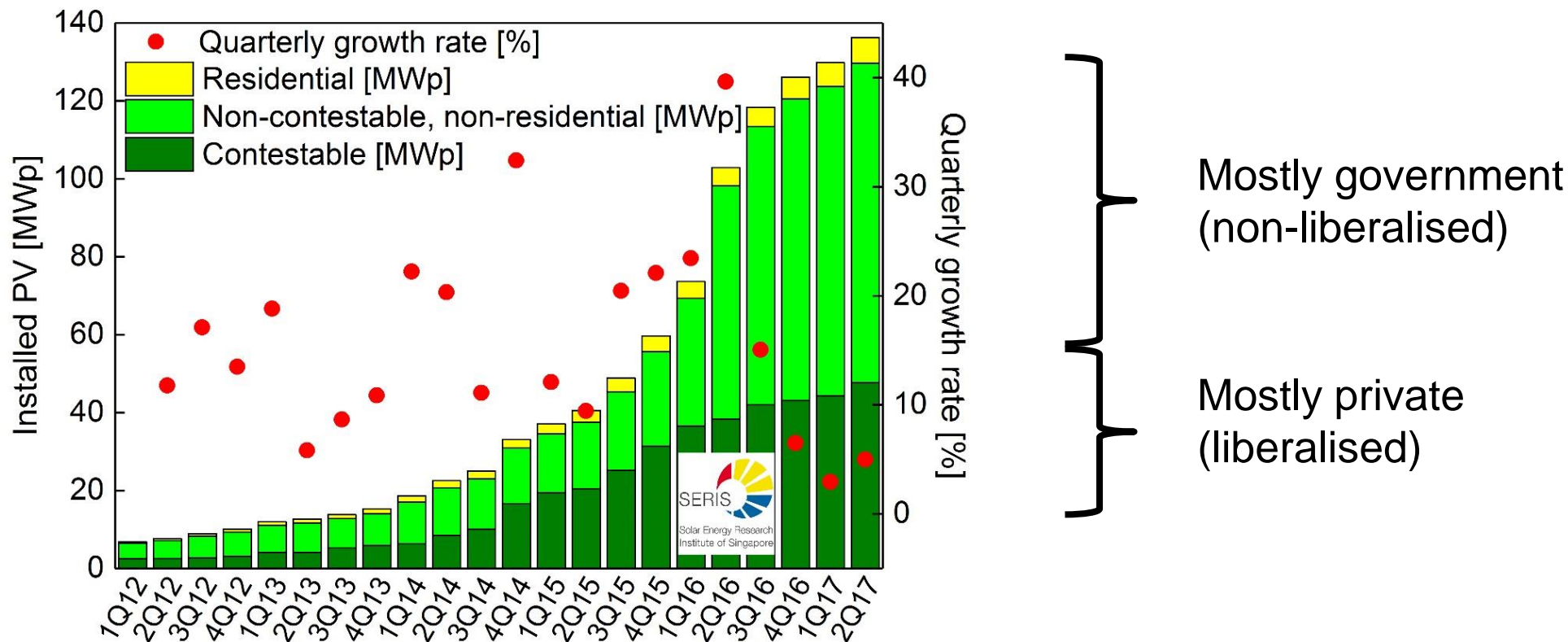
While there are no direct subsidies, there is indirect support...



Data source: schematic adopted by SERIS based on chapter 11 information from the Special Report of the Intergovernmental Panel on Climate Change on Renewable Energy Sources and Climate Change Mitigation.

Driver: government installations

Goal: > 1 GW_p beyond 2020, long-term potential: > 5 GW_p



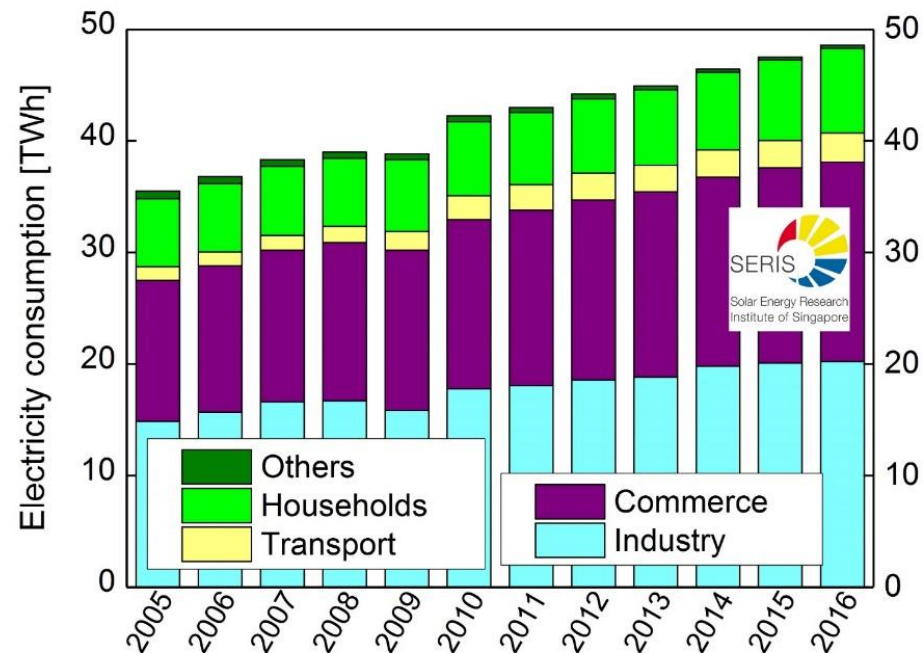
- Early years adoption accelerated via the Solar Capabilities Scheme (SCS) which provided up to 30% capital expenditure funding
- Private sector adoption lagging behind due to challenging economic viability conditions

Data source: EMA

Energy efficiency focus

Largest energy efficiency potential: industry and commercial sector

Electricity consumption mix:



□ Electricity demand growth remains in-line with economic growth*

Actions taken:

2005: Green Mark Scheme by BCA

- by 2030 at least 80% of commercial & residential buildings should be green-mark certified

2007: E²PO established

- multi-agency committee to improve energy efficiency in Singapore

2013/2017: Energy Conservation Act

- large power consumers to register with NEA for reporting energy usage and carbon emissions

Data source: EMA, *average over last five years: electricity demand 2.5%, GDP 2.8%, BCA = Building and Construction Authority, E²PO = Energy Efficiency Programme Office, NEA = National Environmental Agency

Examples of financing support in energy efficiency

1) Industrial and manufacturing facilities:

The Energy Efficiency Financing Programme, introduced by EDB, partnering with SDCL Asia, in order to provide:

- Upfront capital to invest in energy efficiency facilities
- Tailor-made sharing mechanisms of energy savings
- Risk transfer: procurement and construction risk taken by SDCL

The Energy Efficiency Fund (E2F), launched by NEA providing up to 50% co-funding for industrials to review the design of new facilities and do energy assessment, plus up to 30% capital financing

2) Buildings:

The Building Retrofit Energy Efficiency Financing (BREEF) Scheme, provided by BCA to offer financing to offset upfront costs through a performance contract arrangement

EDB = Economic Development Board, SDCL Asia = Sustainable Development Capital (Asia) Limited, BCA = Building and Construction Authority, NEA = National Environmental Agency

Thank you for your attention!

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More information at www.seris.sg
www.solar-repository.sg

We are also on:



Annual Report
2016

SERIS is a research institute at the National University of Singapore (NUS). SERIS is sponsored by the National University of Singapore (NUS) and Singapore's National Research Foundation (NRF) through the Singapore Economic Development Board (EDB).

