Clean Air in Singapore: Strategies in Air Quality Management

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Agenda

1. Importance of Clean Air in Singapore
2. Singapore's Air Quality Journey
3. Managing Air Quality in Singapore – some Policies & Plans

1 Importance of Clean Air in Singapore

Importance of Clean Air in Singapore

Singapore is one of the most densely populated cities in the world. There are more than 5 million residents in an area over 700 km^2.

Industrial Developments

Commercial Developments

Close to a million vehicles

Importance of Clean Air in Singapore

We view good air quality as a non-negotiable necessity for the **protection of public health and** the **environment**.

2 Singapore’s Air Quality Journey

Singapore's Air Quality Journey

Singapore embarked on industrialization journey

Anti Pollution Unit (APU) set up under the Prime Minister's Office

APU transferred to the Ministry of the Environment (ENV)

1960s

1970s

1980s

Ambient air quality monitoring initiated

Introduced European emission standards for passenger cars

Clean Air Act enacted to control pollution from industries and trade premises

(Photo sources: Jessica Cheam, Forging a Greener Tomorrow, Singapore Press Holdings)

Singapore's Air Quality Journey

1991

Pollutant Standards Index (PSI) introduced based on 5 compounds

Introduced emission standards for diesel vehicles

1994

Ambient air quality monitoring upgraded to real-time telemetric air quality monitoring network

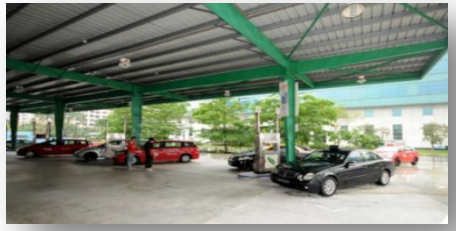
Code of Practice on Pollution Control published for industry stakeholders to understand Singapore's environmental requirements

2013

Industries required to use 10 ppm Sulphur in diesel fuel

2017

Euro VI for petrol vehicles



2018

Euro VI for diesel vehicles

3 Managing Air Quality in Singapore – Some Policies & Plans

1. Environmental Planning

The Urban Redevelopment Authority (URA) coordinates long-term integrated urban and industrial planning under the Concept Plan under which various land-uses are properly sited

(Source: The Straits Times, 1 Feb 2013)

2. Controlling emissions from industries

Control emissions from industries by tightening emissions limits and imposing a Sulphur cap

Promote switch to cleaner fuels (e.g. LNG)

2. Controlling emissions from land transport

Tighten emission standards and Mandatory periodic testing

Improve fuel quality

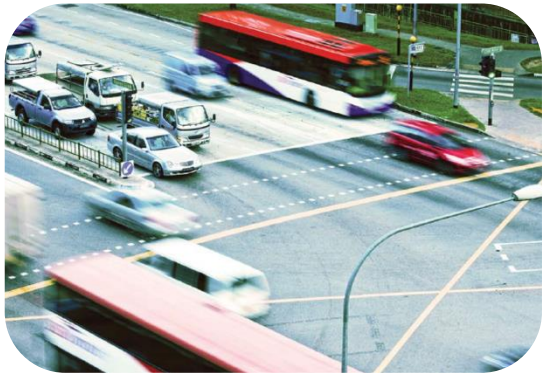
Manage local vehicle population

Encourage use of public transport

2. Controlling emissions from land transport

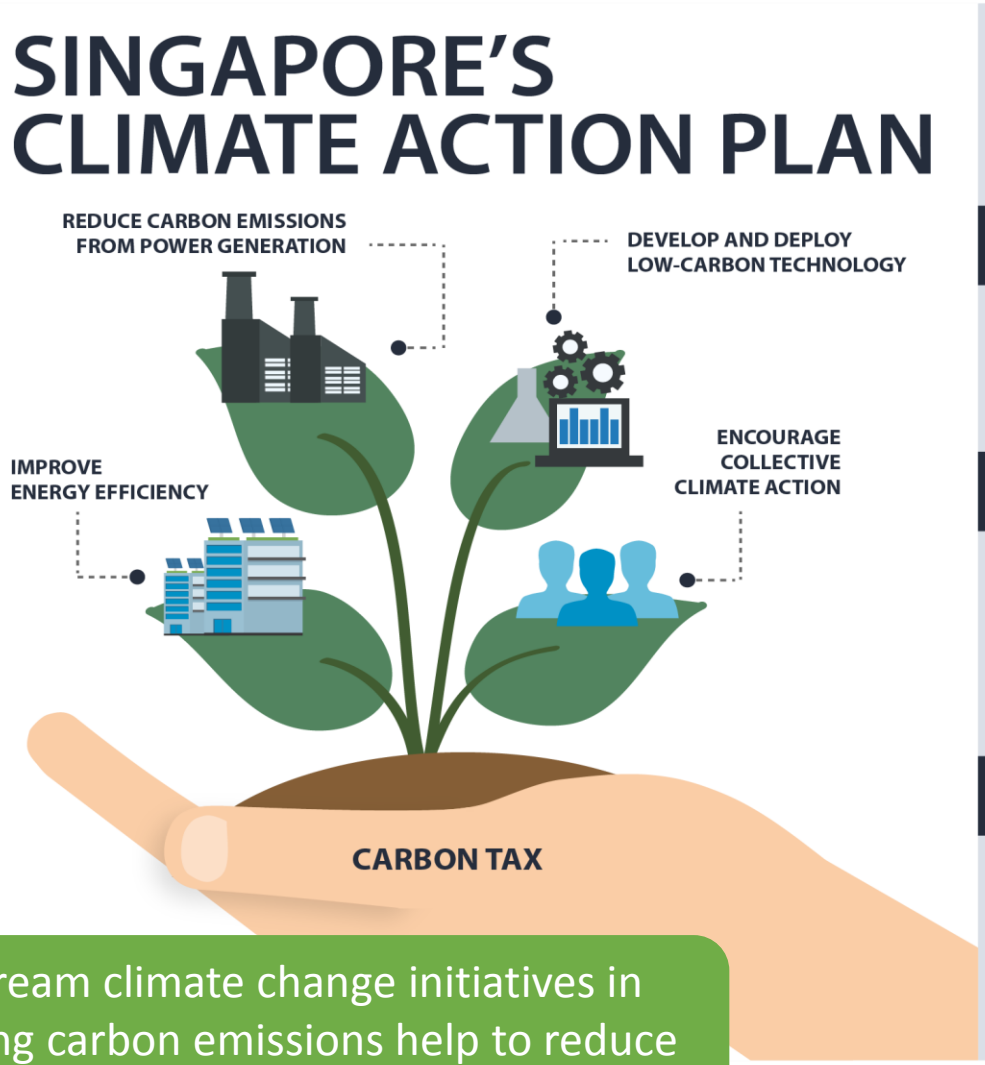
Enforcement of smoky vehicles

Promoting cleaner vehicles



Tax rebates for CNG, Hybrid and Electric vehicles

3. Co-benefits from Sustainability and Climate Change



HOW A CARBON TAX WORKS

1 INTRODUCE A TAX ON EMISSIONS

- Carbon tax will generally be applied upstream, for example, on power stations and other large direct emitters.
- Businesses can choose to reduce emissions or pay a carbon tax.

2 ENCOURAGE ENERGY EFFICIENCY & SUPPORT MORE GREEN ACTIONS

- Businesses are motivated to improve their energy efficiency.
- Consumers are encouraged to use less electricity and save energy.
- Carbon tax revenue will help to fund measures by industry to reduce emissions and provide appropriate measures to ease the transition.

3 LOWER CARBON, GREENER ECONOMY

- Lower emissions lead to a greener planet.
- Businesses become more resource-efficient and sustainable.
- More opportunities in green growth sectors, such as clean technology.

Upstream climate change initiatives in reducing carbon emissions help to reduce other pollutant emissions

(Source: National Climate Change Secretariat)

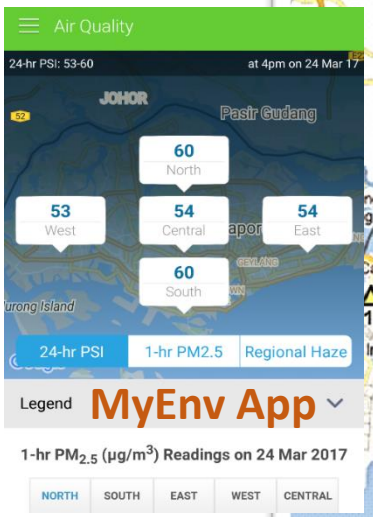
3. Co-benefits from Sustainability and Climate Change

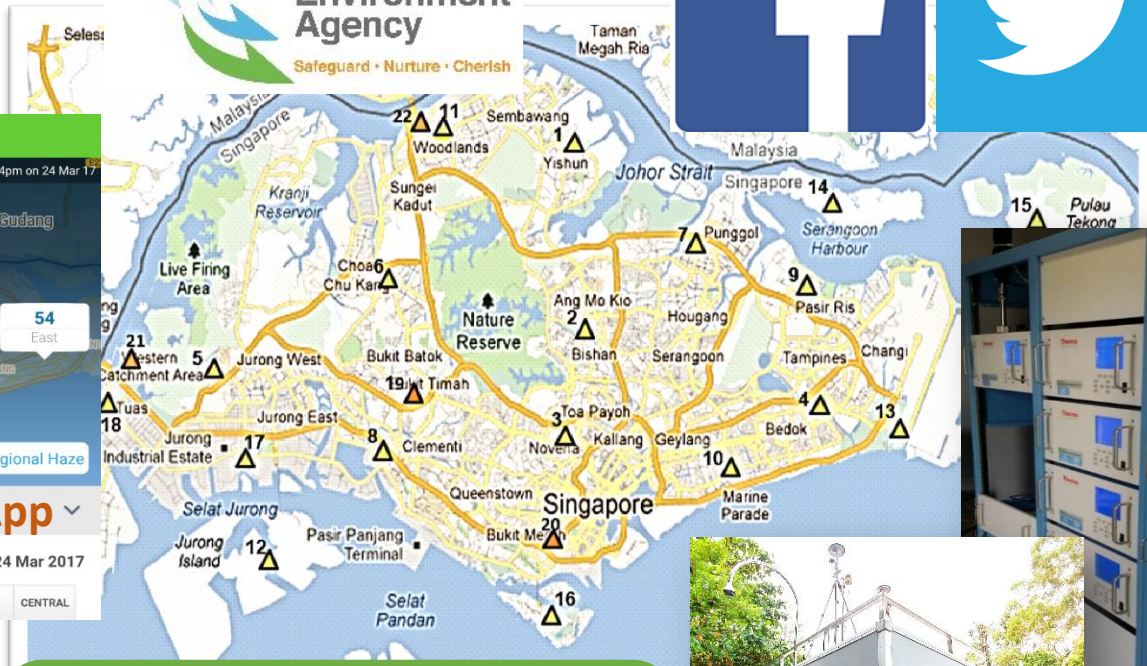
Investment in clean energy:
Solar panels on rooftops of government housing (Housing & Development Board) flats reduce dependency on power generation from power stations

(Source: HDB, The Straits Times, 1 Sep 2017)

4. Employing monitoring, modelling, research and analytical tools

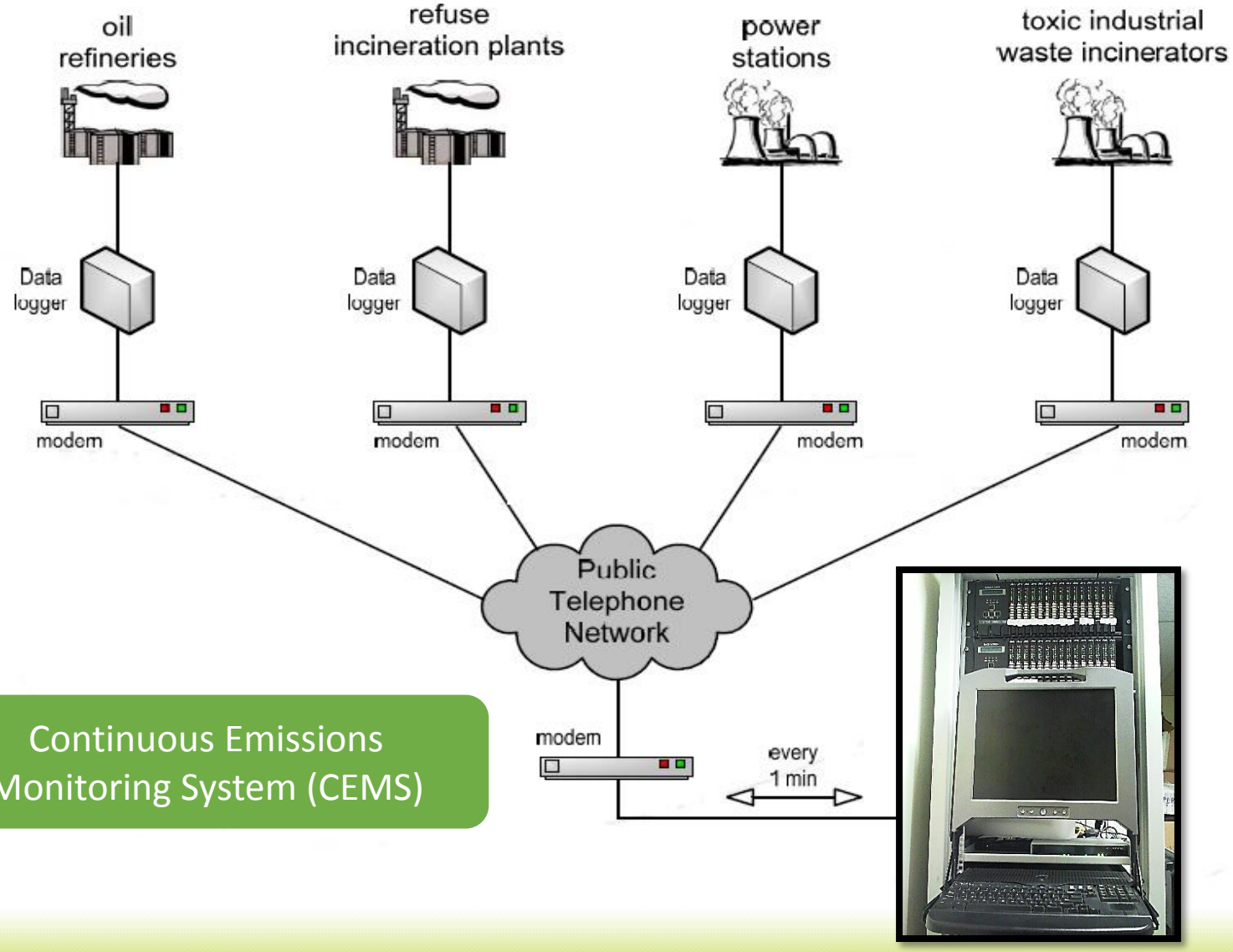
NEA and Haze Website





Network of real-time air monitoring stations which provides hourly Pollutant Standards Index (PSI) readings

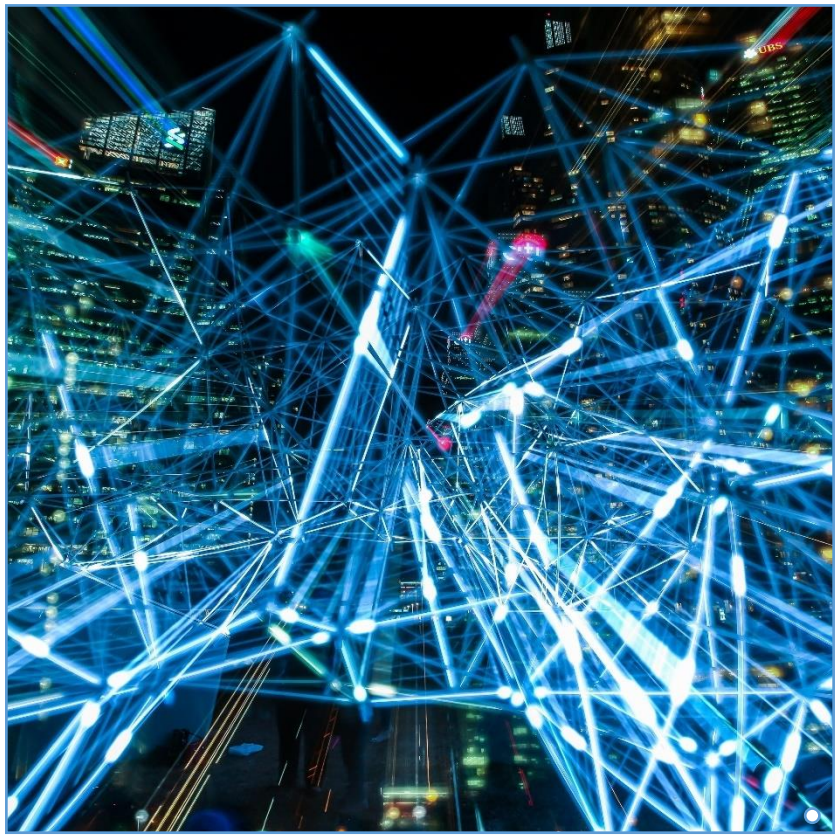
4. Employing monitoring, modelling, research and analytical tools



Continuous Emissions Monitoring System (CEMS)

4. Employing monitoring, modelling, research and analytical tools

Use of air quality dispersion models for assessment of air quality impact from new economic developments, source apportionment studies, predictive modelling etc.



4. Employing monitoring, modelling, research and analytical tools

Test-bedding of new technologies for air pollution monitoring and control

Low-cost air quality sensors with data analytics

Detection of black smoke from industrial stacks

4 Conclusion

Conclusion

To tackle current and future challenges in maintaining of good air quality with economic developments, Singapore uses a suite of policy interventions, measures and instruments to manage air pollution.

Legislation and Financial Incentives

Leveraging on Whole of Government (WOG) approach

Using data, research and technology

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