In the 1950s & 60s...

However, this had led to serious environmental problems...

An intensive industrialisation programme was implemented to provide employment after Singapore’s independence in 1965

Poverty and unemployment were serious concerns

Environmental Management in Singapore

Lee Yuen Hee
CEO
National Environment Agency
Houses without proper sanitation

Pollution from river boats

Street hawkers

Pollution from factories

Pollution from hawker stalls

Today…
Singaporeans enjoy clean air, water, land and high standard of public health today.

**Fundamental Principles**
1) Control pollution at source
2) "Polluter Pays" Principle
3) Pre-empt and take early action

**Key Strategies**
1) Integrated landuse planning
2) Environmental infrastructure
3) Legislation & enforcement
4) Monitoring
5) Education

Political vision and leadership is key to balancing economic development, social progress and environmental objectives.

"After independence, I searched for some dramatic way to distinguish ourselves from other Third World countries. I settled for a clean and green Singapore. One arm of my strategy was to make Singapore into an oasis in Southeast Asia, for if we had First World standards, then businessmen and tourists would make us a base for their business and tours of the region."

*Lee Kuan Yew*

Land-use planning plays a pivotal role.
Siting of Industries
To optimise land use and minimise impacts from pollution,
• site industrial estates for clean and light industries close to residential areas
• site general and special industries farther away from residential areas in Jurong and Tuas Industrial estates, and on Jurong Island

Legislation & Enforcement
Conduct checks on industries and mobile sources
• Ensure air pollution control measures in place and operational
• Trade effluents comply with standards for discharge into sewers/watercourses
• Control, manage and dispose of hazardous substances and toxic industrial wastes
• Control of smoky vehicles on roads

Comprehensive environmental infrastructure put in place at early stage of economic development is key in minimising pollution
• Solid Waste System • Sewerage System

Monitoring
Air and water quality monitoring
– To assess nature and magnitude of any pollution problem
– Assess adequacy and effectiveness of control programmes
– Carry out regular review of policies and standards
– For guidance on future land use, transportation planning and energy systems

Educating the public to instill environmental awareness
Adopt a pragmatic and progressive approach in tightening environmental regulations to control pollution
Done well so far…

But in future?

Singapore still has some way to go before achieving environmental sustainability

Here are some of our challenges…


Singapore is also planning for an increase in population from current 4.5 million to 6.5 million people
A larger population and a thriving economy is good for Singapore but will put additional stresses on the environment – more pollution, more waste, more noise, more litter and higher chances of disease transmission.

We meet US EPA’s ambient air quality standards for all pollutants, except PM2.5. Continue to work towards bringing the PM2.5 levels down.

How will Singapore manage this without compromising our quality of environment?

Noise...
Rising expectations of the public as a measure of quality of life
Tightened noise standards over the years
Continue to tighten our standards relevant to int’l practices

What more can we do?
Fundamental Principles

1) Control Pollution at Source
2) "Polluter Pays" Principle
3) Pre-empt and take early action
4) Innovation/Technology
5) Environmental Ownership

Leverage on Technology

Trigen Plant

- Absorption chiller
- Heat recovery steam generator
- Hot exhaust gas 500°C
- Steam for plant processes
- Chilled water
- Gas turbine + generator
- Electricity
- NG supply

Public-Private Partnership (PPP)

Providing new environmental infrastructure and services - Develop, Build, Operate and Own (DBOO)

Singapore is a place of opportunities and investment for the environment industry

Promoting Innovation & Industry Development

- National Research Foundation (NRF)
  - $5 billion for 5 years
  - To fund R&D initiatives that would reap economic benefits for Singapore in the areas of Environmental and Water Technologies
- $20 million Innovation for Environmental Sustainability (IES) Fund
  - To encourage and assist Singapore-registered companies to undertake innovative environmental projects to meet the government's goal of environmental sustainability

Innovation

Offshore sanitary landfill - Semakau Landfill

Leverage on Technology

- Trigen Plant
- Public-Private Partnership (PPP)
- Promoting Innovation & Industry Development
**S$50 million Sustainable Energy Fund**

**Singapore Packaging Agreement**

Signatories:
- Food and Beverage Industry
- NGOs
- Waste Management & Recycling Association of Singapore
- Public Waste Collectors

**Mission:**

"Ownership"

**Recycling rate 54%**

Target >60% by 2012

**Singapore Packaging Agreement Signatories:**
- Food and Beverage Industry
- NGOs
- Waste Management & Recycling Association of Singapore
- Public Waste Collectors

**National Climate Change Strategy**

- Public Awareness
- Mitigation
- Adaptation
- Competency Building

- Increase energy efficiency and cut greenhouse gas emissions by 5% annually
- Spread roll-out of carbon capture technology by 2020

**Energy Efficiency Programme Office**

- NEA
- BCA
- SBS
- A*STAR
- ERPTA
- MTA
- IEA
- Greenhouse Gas Emissions
- Energy Efficiency in Buildings
- Renewable Energy
- Sustainable Urban Development
- Clean Energy
- Energy Efficiency in Industry
- Transportation
- Residential
- Infrastructure
- Water
Education

- Public campaigns, e.g. Clean and Green Singapore
- Training courses for professionals, industries, etc
- Seminars, workshops, etc, for industries, businesses, etc
- Dialogues with industries, professional institutions, etc

International Agreements

Singapore is Party to several International Conventions related to the environment:

- Vienna Convention & Montreal Protocol on Substances that Deplete the Ozone Layer (1989)
- United Nations Framework Convention on Climate Change (1997)
- Kyoto Protocol (2006)
- Beijing Amendment to Montreal Protocol (2007)

Regional & International Cooperation

- In ASEAN, we play our part to help achieve a clean, green and environmentally sustainable ASEAN
  - Singapore (NEA) chaired the ASEAN Working Group on Environmentally Sustainable Cities from 2003-2007
  - Hosts the ASEAN Specialised Meteorological Centre (ASMC) to provide timely updates on regional weather and haze information to the region

International Agreements

International & Regional Cooperation

Work closely in partnership with the international community to pursue environmental sustainability through bilateral, regional and international collaborations

Active participation in regional & international environmental fora

Regional Level

- In ASEAN, we play our part to help achieve a clean, green and environmentally sustainable ASEAN
  - Singapore (NEA) chaired the ASEAN Working Group on Environmentally Sustainable Cities from 2003-2007
  - Hosts the ASEAN Specialised Meteorological Centre (ASMC) to provide timely updates on regional weather and haze information to the region

Regional Participation

Indonesia-Singapore Collaboration on Jambi Province to Deal with Land & Forest Fires

Regional Participation
International Participation

Sino-Singapore Tianjin Eco-City

We have positive ratings...

ECA International’s Survey on Expatriates Living Conditions

For 2 consecutive years, Asian expatriates ranked Singapore as the best place to live in the world for its safe and clean environment.

Positive Ratings

for our clean and green efforts

We have positive ratings...

PERC report on ‘How Expatriates Perceive the Issue of Pollution’

Singapore ranked 2nd in striking the right balance between environmental protection and economic development.

We are only behind Australia, and ahead of other Asian countries.

We have positive ratings...

Readers’ Travel Awards ‘07 Top 100 cities list

Singapore ranked 9th best city on the Top 100 cities list, an improvement from 10th position in 2006 and the best in Asia!

However, Sydney beat Singapore to being the cleanest city.

Moving Forward
Inter-Ministerial Committee on Sustainable Development

- Resource efficiency
- Pollution control
- Maintaining our clean & green environment

Thank You