Policy Frameworks at the National Level

Incentives and Constraints

Hezri Adnan, Ph.D

Knowledge Transfer for Implementing the Green Economy in Malaysia and Southeast Asia

2-3 April 2013, Langkawi Island
The Green Economy Framework: Some Concepts
Evolution of Sustainability

Period
- 1960s-1980s
- 1990s-present
- 2006-present
- 2009-present

Landmark Conferences and Publications
- UNCED 1972
- Limits to Growth 1972
- World Conservation Strategy 1980
- Our Common Future 1987
- Rio Summit 1992
- Kyoto Protocol 1997
- Fourth IPCC Report 2006
- Stern Review 2006
- Copenhagen Climate Change 2009
- UNEP Green Economy 2010
- Rio+20 Summit 2012

Mainstream Concepts
- Conserving the Environment
- Merging Environment and Development
- Combating Climate Change
- Building Green Economy

Constituent Issues and Policies
- Environment
  - Nature preservation
  - Pollution control
  - Wildlife conservation
- Sustainable Development
  - Agenda 21
  - Biodiversity
  - Climate change
- CO₂ mitigation
- Climate adaptation
- Low carbon development
- Green growth
- Green technology
- Green financing

Financial Crisis 2008
Types of ‘Greening’

PRE- AND POST-RIO 1992

2006 – 2009

2010 – NOW

Integrated / Holistic Greening

Market & Technology Redesign
Problem-Oriented
Reactive

Ecological Modernisation
Sector-Oriented
Incremental

Piece-meal Greening

Food

Fuel

Finance
### KEY FEATURES

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<th>Connectivity:</th>
<th>Conflict-based linkage</th>
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<tr>
<td>Driver:</td>
<td>Caused by industrialization</td>
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<tr>
<td>Solution:</td>
<td>End-of-pipe solution</td>
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<tr>
<td>Principle:</td>
<td>Limits to growth</td>
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<td>Instrument:</td>
<td>Basic environmental law</td>
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<td>Process:</td>
<td>Environmental agencies</td>
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<table>
<thead>
<tr>
<th>Connectivity:</th>
<th>Negotiation-based linkage</th>
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<tr>
<td>Driver:</td>
<td>Driven by 'sustainability' agenda</td>
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<td>Solution:</td>
<td>Integrated management</td>
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<tr>
<td>Principle:</td>
<td>Govern. reform &amp; policy integration</td>
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<tr>
<td>Instrument:</td>
<td>New policy instruments + law</td>
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<tr>
<td>Process:</td>
<td>Participatory structure &amp; process</td>
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<tr>
<th>Connectivity:</th>
<th>Co-benefits linkage</th>
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<td>Driver:</td>
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<td>Solution:</td>
<td>Low carbon alternatives</td>
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<tr>
<td>Principle:</td>
<td>Investment, innovation, technology</td>
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<tr>
<td>Instrument:</td>
<td>Market instruments (?)</td>
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<td>Process:</td>
<td>Greening business, consumption</td>
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### MALAYSIA’S RESPONSE

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Federalization of Environmental Policy (1971-76)</th>
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<tr>
<td>EQA 1974</td>
<td>Department of Environment</td>
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<tr>
<td>Department of Environment 3rd Malaysia Plan</td>
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<td>EIA Order 1987</td>
<td>Birth of environmental advocacy</td>
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<tr>
<th>Stage 2</th>
<th>Crisis and Consolidation (1977-88)</th>
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<th>Emergence of Sustainable Development (1989-2000)</th>
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<td>Capacity building</td>
<td>Strategic planning</td>
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<td>Policy statements</td>
<td>Pilot projects</td>
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<td>MoNRE 2004</td>
<td>MEA engagement</td>
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<td>State-based initiatives</td>
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<th>Stage 4</th>
<th>Policy Integration for Sustainable Development (2001-2009)</th>
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<th>Stage 5</th>
<th>Low Carbon Economy (2009 to present)</th>
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<td>MEGTW</td>
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<td>Green Technology Policy</td>
<td>Waste Mgmt. Act 2007</td>
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<td>Renewable Energy Act 2010 (?)</td>
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Malaysia should embrace a leadership role in green technology and become a strategic niche player in high value green industries and services that play to our competitive advantages. The commercialisation of our natural biodiversity into high-value products and services will be a major national challenge. But it is also an excellent avenue for partnership between the private and the public sectors.

The major benefit of our green, high income, and inclusive strategy is that future generations of Malaysians (and world citizens) will continue to enjoy the clean air and water, and natural environment that they deserve and work so hard to preserve and enhance. Malaysians can feel proud that we are setting the pace in treasuring our heritage and delicate ecology for the mutual benefit of all mankind.
Green Economy in Malaysia since 2009

Currently: 2% of GDP from green business
By 2015: 8% of GDP from green business
THROUGH TARGETED EMPHASIS ON GREEN TECHNOLOGY

- **Introduction of a ministerial portfolio** in the Federal administration Established Ministry of Energy, Green Technology and Water (replacing Ministry of Energy, Water, and Communications);

- **Formulation of a national policy statement on green technology** – The central role of green technology was emphasized by the release of the National Green Technology Policy overseeing ‘greening’ in four sectors, namely energy, buildings, water and waste management and transportation;

- **Establishment of an implementing agency** – On October 2009, Malaysia’s Energy Centre was restructured and rebranded as the Malaysian Green Technology Corporation to implement the Ministry’s agenda for green technology;

- **Formation of an inter-ministerial council as a decision-making body on green technology** – Prime Minister established and chaired the Green Technology Council with senior memberships from government and public sectors. The Council was later merged with the Climate Change Council;

- **Registration of a green building association** – Malaysia Green Building Confederation (MGBC) was established in 2009 to support the government’s objective of promoting sustainable built environment. The Green Building Index had also been launched to enable green grading and certification of Malaysian buildings;
Green Economy in Malaysia since 2009

Currently: 95,000 green jobs
By 2015: 500,000 green jobs forecasted
THROUGH TARGETED EMPHASIS ON GREEN TECHNOLOGY

• **Initiation of a green financing scheme** – In 2010, a soft loan incentive, the Green Technology Financing Scheme was launched to create a policy environment that will attract innovators and users of green technology;

• **Launching of green townships framework** - Green Township Framework would outline comprehensive guidelines for new and existing townships in the country to go green by incorporating environmental friendly technologies;

• **Introduction of green procurement in all government agencies** - Green procurement manual, procedures and standards are currently under development

• **Formulation of legislation to promote renewable energy** – The Renewable Energy Act 2011 (Act 725) provides for the establishment and implementation of a special feed-in-tariff system to catalyse the generation of renewable energy in Malaysia. The law will be administered by the Sustainable Energy Development Authority.

• **Formulation of Green Growth Act** is currently underway
Green Economy and the Energy Sector
Green economy and energy

PRESENT SCENARIO
Fossil-fuel based Economy

Challenges
Peak Oil
Climate Change

Solutions
Energy Transition
Policy Choice

FUTURE SCENARIO
Green Economy

HSBC Global Research forecasts that the global market for clean energy and energy efficiency investment opportunities will triple to US$ 2.2 trillion by 2020 (Robins et al. 2010)

How to break out of the current lock-in to fossil fuels?
<table>
<thead>
<tr>
<th>Country</th>
<th>Pricing Carbon</th>
<th>Energy Efficiency</th>
<th>Renewable Energy</th>
<th>Forestry</th>
<th>Other land use</th>
<th>Transport</th>
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India is chronically short of electrical power. But even with that handicap, no thanks to its crippling dependence on imported fossil fuel, it has grown to be a global economic powerhouse. The country is clear about what it has to do to get out of that energy trap. Nearly 20 years ago, it started to literally catch the wind to run turbines, using unproven technology. It is today one of the top five countries in the wind sector. Now, it aims to do the same with the sun, harnessing irradiation for energy. It also wants to be a world leader in biomass energy. There will be a lot of opportunities in this sector in the next ten years because of the huge targets set. As at March this year, about 11% of India’s power mix is from renewables. The plan is to lift this to 20% by 2020.
Evolution of power generation mix by fuel type, Malaysia, 1977-2011


Four-Fuel Policy

Five-Fuel Policy
Energy Policy Problem Definition (I)

The Final Energy Demand for Malaysia is expected to reach about 93 Mtoe in 2030 from 39 Mtoe in 2005

- Oil (> 50%)
- Gas (12%)
- Electricity (23%)
- Industry and transport (>70%)

Total Primary Energy Supply is expected to increase from 66 Mtoe in 2005 to 130 Mtoe in 2030
Energy Policy Problem Definition (II)

Over-dependence on Fossil Fuel

- The share of fossil fuels in the primary energy supply is projected to be around 90%, increasing from about 63 Mtoe in 2005 to 123 Mtoe in 2030
- Malaysia’s net import is expected to increase from -22 Mtoe in 2015 to almost 18 Mtoe in 2030

Increasing energy consumption per capita

- Energy demand per GDP per capita will increase from 1,535 toe per Capita in 2005 to 2,654 toe per Capita in 2030
Policy options for a sustainable future

Reduce the dependency on fossil fuel through:

- Diversification of energy mix - use more renewable energy sources, alternative sources of energy for electricity production (e.g., nuclear)
- Improvement in energy efficiency - supply and demand side
- Moving towards a low-energy intensive industry
- Transition to service-based economy
PRESIDENT OBAMA'S ENERGY PLAN:

FOLLOW ME TO THE PROMISED LAND OF CLEAN, RENEWABLE ENERGY AND INDEPENDENCE FROM FOREIGN OIL.

BUT THERE'S NO BRIDGE.
Policy options for a sustainable future

Policy Goal
- From ‘balanced development’ to decoupling?
  “...the Government will be guided by sustainable production practices to decouple economic growth from environmental degradation.” Tenth Malaysia Plan

Policy Design + Instruments
- Green Technology Policy 2009 / Climate Change Policy
- Renewable Energy Act 2011: featuring feed-in-tariff to finance renewable energy development + SEDA
- National Energy Efficiency Master Plan (in progress)
**Rural Electrification Using Renewable Energy Sources**

**Activity:** Installation of renewable energy units

**Objective:** Access to electrification and poverty eradication

**Location:** Bario and Long Lawen, Sarawak

**Mechanism:** government electricity provision, micro and mini hydro electric turbine

**Significance of the activity:** the most isolated rural communities in Malaysia suffer are constrained from participating in the modern economy and for some, escaping from poverty due to inadequate/expensive energy source (diesel generators) and government expensive on hard-path energy solutions
Rural Electrification Using Renewable Energy Sources - Challenges

FAILED HYBRID DIESEL-HYDRO PROJECT COSTED THE GOVERNMENT RM12.5 M

INADEQUATE PROJECT SCOPING
Rural Electrification Using Renewable Energy Sources – Is Latest Technology the Solution?

Consultant Report Recommended for 12 wind turbines, only 4 were installed due to limited cost

Turbines never functioned
Rural Electrification Using Renewable Energy Sources – Small Scale Local Solutions

SOLAR PV ELECTRIFICATION

MICRO-HYDRO ELECTRIFICATION
Greening the government?

- 128 government buildings use more than 6 million kWh a year.
- 28 hospitals consume 367,587,657 kWh at the estimated cost of RM114,091,659 per year (22%).
- 17 ministries consume 360,592,831 kWh at the estimated cost of RM112,901,615 per year (14%).
- 56 others (states/agencies) consume 603,464,085 kWh at the estimated cost of RM188,944,605 per year (44%).
- 25 universities consume 543,961,738 kWh at the estimated cost of RM170,314,420 per year (20%).

"The government has more than 20,000 buildings."
Policy options for a sustainable future

Deeper policy interventions needed

- Subsidy rationalization (M’sia spent $47.1b on energy, 09)
- Incentives for efficient utilization of energy
- Restructuring the industrial structure
- More policy learning and lesson drawing from other countries (e.g. development of carbon pricing mechanisms, carbon tax)

Policy integration with other policy domains

- Sustainable transport system-efficient public transportation
- Waste management system (waste-to-energy)
- Communication strategy to raise awareness on GG & SD
- National policy on technological innovation to promote R&D culture towards Green Growth environment
Green Economy and the Transportation Sector
Current modalities based primarily on private motorized vehicles

Policies for greening transport:
• Avoid or reduce trips through integration of land use and transport planning
• Shift to environmentally friendly mode
• Improving vehicle and fuel efficiency
**Transport**

1. **Proposed Kuala Lumpur-Singapore High-Speed Rail Link**
   - Feasibility study on-going to determine viability and cost

2. **Hybrid and Electric Vehicles**
   - Tax exempted until 2013
   - Pilot demonstration projects with Proton and other stakeholders
   - Incentive regime for energy-efficient vehicles being finalised under National Automotive Policy review

3. **Mass Rapid Transit (MRT)**
   - Malaysia's largest infrastructure project
   - Land clearing work started on first of three lines
   - Total estimated cost: RM36.6 bil to RM50 bil

4. **Light Rail Transit (LRT)**
   - Contract awarded to extend existing Ampang line
   - Total construction cost: below RM7 bil

5. **Ipoh-Padang Besar Electrified Double-Tracking Railway Line**
   - Project started 2008, ends 2014
   - Gross development value: RM12.5 bil

**Game Changers in Malaysia's Green Economy**

The chart shows the CO2 emission percentage by sector:

- Transportation: 27.0%
- Electricity & Energy: 25.7%
- Manufacturing Industries & Construction: 22.3%
- Other Commercial, Public & Agricultural Sectors: 2.6%
- Residential: 1.4%
- Other Energy Industries: 9.2%
- Others: 12.4%
Green Economy and other Innovative Technologies
<table>
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<tr>
<th>Source of Water</th>
<th>2012</th>
<th>2060</th>
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<tr>
<td>Seawater desalination</td>
<td>10%</td>
<td>30%</td>
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<tr>
<td>Rainfall in reservoirs</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Reclaimed by NEWater</td>
<td>30%</td>
<td>50%</td>
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<tr>
<td>Imported from Malaysia</td>
<td>40%</td>
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More than 70 major water companies have set up shop and research facilities.

20 environment and water research facilities are doing cutting-edge research, some with funding from government.

There were 94 test-bedding projects with PUB from 2006–2010.

Government grows local companies and hand-holds start-ups.

Singapore companies landed S$7.7 billion worth of water projects overseas from 2006–2009.
China’s Environmental Protection Industry

- 67% of power sector dependent on coal, but ramping up RE

- 3.4 billion Yuan (1.4% GDP) invested under its 12th Five-Year Plan for pollution control

- Circular Economy project
The Nexus Approach recognizes interconnectedness of water, energy, and food across space and time. Its objectives are:

- Improve energy, water, and food security
- Address externality across sectors, and decision-making at the nexus
- Support transition to sustainability

Situating GE and the Nexus approach
Unfolding developments in Malaysia

Initiatives and studies by the government

- Coordination between KTThA and EPU
- EPU – Economics of climate change; Payment for ecosystem services; Sustainable consumption and production; National blueprint for sustainable development

Business and civil society

- Mushrooming eco-businesses and eco-entrepreneurs
- GT Festival 2014 to be organized by civil society to complement the government’s IGEM