KEYNOTE ADDRESS

Smart and Sustainable cities
Policy options for energy and sustainability

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IGEM @International Urban Sustainability and Green Buildings
11 Oct 2017 | 9 to 10 am | KLCC
Presentation outline

- Aspiration: SDG, NEM, RMK11
- Policy and strategies in Malaysia
- MyCREST
- Implementation issues
- Three-take-away items

“Cycling culture could be the most potent changing agent from reactive to proactive lifestyle on sustainability”

Zaini Ujang (2017)
2015 TOP DESTINATION CITIES
- London
- Bangkok
- Paris
- Dubai
- Istanbul
- New York
- Singapore
- Kuala Lumpur
- Seoul
- Hong Kong

2013 BEST SHOPPING CITIES
- New York
- Tokyo
- London
- Kuala Lumpur
- Paris
- Hong Kong
- Buenos Aires
- Vienna
- Dubai
- Madrid
COP15 COPENHAGEN

“... Malaysia is adopting an indicator of a voluntary reduction of up to 40 percent in terms of carbon emissions intensity of GDP (gross domestic product) by the year 2020 compared to 2005 levels …”

YAB Datuk Seri Najib Razak
Prime Minister
(UN Climate Change Conference, Copenhagen, 17 Dec 2009)

COP21 PARIS

Malaysia is aiming to cut greenhouse gas emissions for each unit of economic growth 35% from 2005 levels by 2030. With international support, that could increase to 45%.
● Holistic perspectives
● First thing first
● Sustaining the sustainability
Environmental Sustainability

- The currency is **Carbon** (C)
- Beyond localized pollution load

**Approach?**

- Reduce C emission
- Increase C sink

**Methodology (e.g.)?**

- Green technology
- Green cover

**System?**

- Green lifestyle
- Circular economy
Presentation outline

- Aspiration: SDG, NEM, RMK11
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- Implementation issues
- Three-take-away-items
SDG mirror the New Economic Model and 11th Malaysia Plan

Sustainable Development Goals, 2015-2030

- Social
- Environment
- Economy

New Economic Model 2010-2020

- Inclusivity
- Sustainability
- High Income

11th Malaysia Plan 2016-2020

- Anchoring Growth on People

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### Policy alignment of SDG in Malaysia

<table>
<thead>
<tr>
<th>Working Committee</th>
<th>Inclusivity</th>
<th>Well-Being</th>
<th>Human Capital</th>
<th>Environment &amp; Natural Resources</th>
<th>Economic Growth</th>
<th>Sustainable Cities and Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1</strong></td>
<td>No Poverty</td>
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<td><strong>Goal 2</strong></td>
<td>Zero Hunger</td>
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<tr>
<td><strong>Goal 5</strong></td>
<td>Gender Equality</td>
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<td><strong>Goal 10</strong></td>
<td>Reduced Inequality</td>
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<td><strong>Goal 3</strong></td>
<td>Good Health &amp; Well-being</td>
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<tr>
<td><strong>Goal 16</strong></td>
<td>Peace, Justice and Strong Institutions</td>
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<tr>
<td><strong>Goal 4</strong></td>
<td>Quality Education</td>
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<td><strong>Goal 6</strong></td>
<td>Clean Water and Sanitation</td>
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<td><strong>Goal 7</strong></td>
<td>Affordable and Clean Energy</td>
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<tr>
<td><strong>Goal 12</strong></td>
<td>Responsible Consumption and Production</td>
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<td><strong>Goal 13</strong></td>
<td>Climate Action</td>
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<td><strong>Goal 14</strong></td>
<td>Life Below Water</td>
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<td><strong>Goal 15</strong></td>
<td>Life on Land</td>
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<td><strong>Goal 8</strong></td>
<td>Decent Work and Economic Growth</td>
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<tr>
<td><strong>Goal 9</strong></td>
<td>Industry, Innovation and Infrastructure</td>
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<tr>
<td><strong>Goal 11</strong></td>
<td>Sustainable Cities and Communities</td>
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<td><strong>Goal 17</strong></td>
<td>Partnerships for the Goals</td>
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<td>Sustainable Development Agenda</td>
<td>Malaysia’s Roadmap</td>
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<tr>
<td><strong>Goal 7:</strong> Ensure access to affordable, reliable, sustainable and modern energy for all</td>
<td><strong>STRATEGY</strong></td>
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<td>Managing resource diversity for security of supply in the electricity sector</td>
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<td>Increasing share of renewables in energy mix</td>
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<td>Development of comprehensive demand side management policy on energy sector in Malaysia</td>
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<td>Implementation of Energy Efficiency programs under the 11th Malaysia Plan</td>
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<td>Cross-border energy transfer within the region into Malaysia</td>
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<td><strong>ACTION PLAN/ INITIATIVES</strong></td>
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<td>Comprehensive Power Development Plan</td>
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<td>Large Scale Solar Net Energy Metering</td>
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<td>DSM Policy Study in place, to be completed in 2017</td>
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<td>Energy Audit, Retrofit and Energy Management in Government buildings</td>
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<td>Energy Audits in Commercial Sectors</td>
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<td>Energy Audits in Industrial Sector</td>
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<td>ASEAN Power Grid</td>
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<tr>
<td>Sustainable Development Agenda</td>
<td>MALAYSIA'S ROADMAP</td>
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<tr>
<td><strong>Goal 11:</strong> Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation</td>
<td><strong>STRATEGY</strong></td>
<td><strong>ACTION PLAN/ INITIATIVES</strong></td>
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<td>Increasing coordination on waste management</td>
<td>Implementation of separation at source program</td>
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<td>Encouraging reuse, reduce and recycle</td>
<td>National Recycling Day (11th Nov)</td>
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<td><strong>Increase adoption of the Low Carbon Model Town by local authorities</strong></td>
<td>Engagement with the state planning committee and local authorities</td>
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<td>Encourage green building / ISO 1525 certification by developers/ property owner</td>
<td>Implementation of Dasar Fizikal Negara and Dasar Perbandaran Negara</td>
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<td>Inculcate awareness level about the importance of green lifestyle and practices among public</td>
<td>Engage and encourage private sector to produce green blue packaging.</td>
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<td>Reduce plastic and polystyrene by introducing green blue packaging for food packaging</td>
<td>Engage Local Authority to participate in the green blue packaging initiative by creating more Premis Makanan Hijau (Green Food Premises).</td>
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LCCF is used together with *Green Neighbourhood Guideline (GNG)* of the Town and Country Planning Department Peninsular Malaysia, specifically to measure carbon emission value of the municipalities.
Putrajaya

● 40% green cover
● Cycling trails: 38 km along Promenade; 68 km along protocol roads; 4.2 km along Boulevard
● 13 parks (Taman Wetland - 200 hectares, Taman Botani, Taman Warisan Pertanian, Taman Saujana Hijau, Taman Putra Perdana, Taman Ekustrian, Taman Pancarona, Taman Rimba Alam, Taman Cabaran etc.)
● Carbon emission (tCO2eq/ca): From 13 (2007) to 5 (2025)
● Biggest initiative for carbon reduction towards 2025: Transportation
Performance Criteria for LCCF

Four elements for GHG reduction in city and town

- Urban Environment
  - Site Selection
  - Urban Form
  - Urban Greenery & Air Quality

- Urban Transportation
  - Shift of Transport Mode
  - Green Transport Infrastructure
  - Green Vehicles
  - Traffic Management

- Urban Infrastructure
  - Infrastructure Provision
  - Waste
  - Energy
  - Water

- Buildings
  - Low Carbon Building
  - Community Service

*Performance Criteria are measurable strategies to reduce carbon emission through:-
Policy control, technological dev., better process & product management, change in procurement system, carbon capture, consumption strategies & others.
Ideal of Sustainable Low Carbon City

Energy Efficient/ Low Carbon Buildings

Solar Township/ Buildings

Renewable Energy for decentralise energy generation

Electric Vehicles/ Energy Efficient Vehicles

More Green Spaces & Green Connectors

Plant more high sequestration trees

Low carbon emission

Improve standard of living

Government effort is visible & motivates people to value the Environment

Energy & Water consumption reduction

Reduction of Municipal Waste

Transit Oriented Development – reachable by walking and cycling

Lesser/ negligible traffic congestion

Efficient & Effective Mass Public Transport

Catalyst of Change and Inspiration to other cities and communities

Malaysia’s Inspiration

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Malaysia Green Technology
Master Plan 2017-2030

Green Technology and Climate Change Council • 2 March 2017 • Chaired by Prime Minister
Green Technology Master Plan outlines the strategic direction in achieving the immediate goals.

**GTMP framework and its objectives**

**KEY PRINCIPLES**
- Aligns the strategic goals within RMK11
- Does not overrule the existing plans and policies
- Provide guidance to leverage on green tech

**OBJECTIVES**
- Potential economic contributions
- Outline ways to shift from technology adoption to technology production
- Outline ways to reduce 45% GHG emission intensity by GDP by 2030
16 sub-sectors are identified to be the key areas with high potential to facilitate green growth in the country:

- Electricity generation
- Energy efficiency (residential & commercial)
- Integrated river basin management
- Water treatment and distribution technology
- Water utilisation technology
- Water harvesting technology
- Wastewater treatment technology
- Waste treatment and disposal
- Resource recovery
- Public transportation
- Private transportation
- Cleaner fuel
- Industrial process efficiency
- Green building
- Sustainable construction practices
- Green building materials
Energy: Creating a sustainable power generation mix and energy efficiency as the new source of energy

Electricity generation and energy efficiency

1. RE mix in installed capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>RE Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>22.4%</td>
</tr>
<tr>
<td>2020</td>
<td>23%</td>
</tr>
<tr>
<td>2025</td>
<td>25%</td>
</tr>
<tr>
<td>2030</td>
<td>30%</td>
</tr>
</tbody>
</table>

RE mix targets in selected countries by 2030:
- European Union: ≥27%
- Canada: 30%
- Japan: 22 – 24%
- Korea: 11%

Source: European Commission, Alberta Government, Japan’s Ministry of Economy, Trade and Industry, Korea Energy Management Corporation

2. Efficiency in power generation

- Imposition of clean coal technology requirement for new coal-fired plants
- Encouragement of co-generation

3. Reduction in electricity consumption (Residential and Commercial)

<table>
<thead>
<tr>
<th>Year</th>
<th>Reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1.5%</td>
</tr>
<tr>
<td>2025</td>
<td>10%</td>
</tr>
<tr>
<td>2030</td>
<td>15%</td>
</tr>
</tbody>
</table>

Source: National Energy Balance Reports 2010-2014, KeTTHA

Electricity generation diversity
Herfindahl-Hirschman Index (HHI) < 0.5

Aspirational target which is benchmarked against European Union, adjusted to Malaysia’s existing performance, dependent on the roll-out of green technology products and services in the country, and also the presence of conducive ecosystems including supporting policies and market economics (e.g. electricity tariff rate and carbon tax etc). Subject to review by 2019/2020.
Transport: 3-pronged approach to reduce C emission of the sector progressively

### Public transport

1. **Public transport modal share**
   - **2013**:
     - Greater KL/Klang Valley: 20.8%
     - Other Cities: 20.8%
   - **2020**:
     - Greater KL/Klang Valley: 40%
     - Other Cities: 20%
   - **2030**: 40% (All cities)

### Private transport

2. **Private vehicles**
   - **2015**:
     - Total industry volume was EEV: 32.6%
   - **2020**:
     - Total industry volume to be EEV: 85%
   - **2025**: 45%
   - **2030**: 100%

### Emission Reduction (2013 - 2020)

- **Rail-based public transport**
  - Emission Reduction (2013): 214.9 ktCO₂eq
  - Target Emission Reduction (2020): 977.5 ktCO₂eq

- **Private vehicles**
  - Emission Reduction (2013): 41.0 ktCO₂eq
  - Target Emission Reduction (2020): 199.7 ktCO₂eq

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Source: RMK11 (Strategy Paper 13), Malaysia's Biennial Update Report (BUR) to the UNFCCC, 2016

Source: Malaysia Automotive Institute, Malaysia's Biennial Update Report (BUR) to the UNFCCC, 2016
**Building: Green and low carbon building – future of the construction industry**

1. **Number of green buildings**

   - **2013**
     - Federal Government Buildings
       - Emission reduction: 10.9 ktCO$_2$eq (2014)
       - Targeted Emission reduction: 98.2 ktCO$_2$eq
     - Private buildings
       - Emission reduction: 60.4 ktCO$_2$eq
       - Targeted Emission reduction: 858.4 ktCO$_2$eq

   - **2020**
     - Green buildings by 2020
       - 550*

   - **2030**
     - 1,750*

*Aspirational target based on Malaysia’s existing performance, dependent on the roll-out of green technology products and services in the country, and also the presence of conducive ecosystems including supporting policies and market economics (e.g., electricity tariff rate and carbon tax etc.). Subject to review by 2019/2020.

Source: Malaysia’s Biennial Update Report (BUR) to the UNFCCC, 2016

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Building: A life-cycle approach in greening the building sector

Sustainable construction practices and green building materials

<table>
<thead>
<tr>
<th>2</th>
<th>IBS Score</th>
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<tbody>
<tr>
<td>2013</td>
<td>24%</td>
</tr>
<tr>
<td>2020</td>
<td>100%</td>
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Percentage of public projects valued RM10 million and above to achieve 70 IBS score

<table>
<thead>
<tr>
<th>3</th>
<th>Green building materials</th>
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<tbody>
<tr>
<td>2013</td>
<td>14%</td>
</tr>
<tr>
<td>2020</td>
<td>100%</td>
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</tbody>
</table>

Percentage of private projects valued RM50 million and above to achieve 50 IBS score

Increased number of green building materials and policy amendments to allow the usage of recycled materials in construction

Source: Construction Industry Transformation Programme, Construction Industry Development Board
**TN50: Feedback on Energy, GreenTech & Water**

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<th>Name:</th>
<th>IC No.</th>
<th>Email:</th>
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<table>
<thead>
<tr>
<th>Metric</th>
<th>2017</th>
<th>2030*</th>
<th>2050</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>RE in Energy Mix</td>
<td>22.4%</td>
<td>30%</td>
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<tr>
<td>EEV (energy efficient vehicle)</td>
<td>32.6%</td>
<td>100%</td>
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<tr>
<td>Carbon (C) Emission (metric tons/capita/year)</td>
<td>8</td>
<td>6</td>
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<tr>
<td>Energy Efficiency</td>
<td>&lt;2%</td>
<td>15%</td>
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<tr>
<td>Treated Wastewater Recycling</td>
<td>&lt;1%</td>
<td>35%</td>
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<tr>
<td>Freshwater extraction rate</td>
<td>2%</td>
<td>15%</td>
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<tr>
<td>% Green Manufacturing SME</td>
<td>10%</td>
<td>50%</td>
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<tr>
<td>Green Building</td>
<td>244</td>
<td>1750</td>
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<tr>
<td>Sanitary Landfil/Non-Sanitary Landfill</td>
<td>14/147</td>
<td>50%</td>
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<tr>
<td>Solid Waste Recycling Rate</td>
<td>17.5%</td>
<td>50%</td>
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* Targets in Green Tech Master Plan 2017-2030

* Email: inu@kettha.gov.my / farrah.daud@kettha.gov.my / hadiddin.hashim@kettha.gov.my
Domestic Tariff A (Average) Comparison May 2016

Comparison for average usage of 278kWh per month

Sen/kWh

Note: For the purpose of the benchmark study, World Bank 2014/2015 PPPS have been adjusted by relative changes in market exchange rate through May 2016. The calculation takes into account electricity charges, adjustment of imbalance costs or changes in fuel prices (such as ICPT in TNB tariff), renewable energy surcharges, and sales tax, energy tax and any other exercise duties or levies applicable to electricity consumption.
Presentation outline

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An acronym for **Malaysian Carbon Reduction and Environmental Sustainability Tool**

- **MyCREST** is a Carbon Reduction Sustainable Tool for sustainable building rating system
- The tools own by Ministry of Work Malaysia, CIDB Malaysia and Public Works Department of Malaysia
- Aims – reduce build environment impact in term of carbon emission and environmental implication
Latest Progress on MyCREST Implementation

June 2017, 40 projects have been registered using MyCREST (24 are public, and 16 are private projects)

MyCREST for all public projects worth **RM50 million** and above

20 private industry developers have pledged their projects to be assessed with MyCREST

88 MyCREST Qualified Professionals have been certified

30 MyCREST assessors have been certified

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Green Initiatives

Tax incentives on green technology and services have been introduced to further promote a green culture and sustainability in Malaysia’s construction industry.

**Investment Tax Allowance (ITA)**
For purchase of Green Technology equipment and assets

**Income Tax Exemption (ITE)**
For Green Technology service providers

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Creating conducive environment via 5 strategic thrusts

- Tailored communication strategy
- Industry and business promotion via IGEM and other platforms
- Collaboration with primary and secondary educational institutions
- Government green procurement
- Green incentives
- Innovative financing
- Green cities
- International collaborations

- Governance (policy leadership)
- Policy planning
- Policy implementation
- R&D&C funding
- Public-private partnership

- Capability building in the public sector
- Capability building in the private sector
- Collaboration with higher education institutions
Benefits of a Bicycle

- Zero emissions
- Slows global warming
- Whizzes past traffic jams
- No need to pay for gas, parking fees, or auto insurance...hurray!
- Puts a big fat smile on your face
- Carries your goodies home
- Faster and easier than walking
- It feels like flying
- Gives you legs of steel
- It's as quiet as a mouse
- The Earth sends a little extra luv to those on bicycles (this is scientifically documented)

You know you’re in Copenhagen when:

- Three wheeler
- Two wheeler
- Bike + trailer

Based on 35,000+ cyclists over 10 hours through one intersection*

Number of kids:
- Empty or cargo
- One
- Two or more

Gender split:
- Three wheelers
- Two wheelers
- Bike + trailer
Cycle superhighways

Reduce your carbon emissions to zero choose to Bicycle

<table>
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<tr>
<th>Mode</th>
<th>CO2 Emission (pounds/pasenger mile)</th>
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<tr>
<td>Bicycle</td>
<td>0.20</td>
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<tr>
<td>Bus, 3/4 full</td>
<td>0.40</td>
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<tr>
<td>Carpool, 3 people</td>
<td>0.60</td>
</tr>
<tr>
<td>Average InterCity Train</td>
<td>0.80</td>
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<tr>
<td>Hybrid Car, solo driver</td>
<td>1.00</td>
</tr>
<tr>
<td>Bus, 1/4 full</td>
<td>1.20</td>
</tr>
<tr>
<td>Average Jet Plane</td>
<td>1.40</td>
</tr>
<tr>
<td>Average Car, solo driver</td>
<td>1.60</td>
</tr>
<tr>
<td>SUV, solo driver</td>
<td>1.80</td>
</tr>
</tbody>
</table>

zainiujiang@kettha.gov.my
Copenhagen, Denmark
Cycling super highways, London
“The big changes – and they can be huge – happen when a nation doesn’t see cycling as a hobby, a sport, a mission, let alone a way of life. They happen when it becomes nothing more than a convenient, quick, cheap way of getting about, with the unintended bonus that you get some exercise in the process.”

Peter Walker,

ECO-CULTURE

Vision

ECO-STRATEGY

OUTCOMES

Operational excellence

Tactics

ECO-TOOLS
(tech/structure)
Eco-strategy matrix

<table>
<thead>
<tr>
<th>LOW</th>
<th>ACCEPTANCE, DELIVERY</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>COST-DRIVEN</td>
<td>SKIMMING</td>
</tr>
<tr>
<td>Tech-focus</td>
<td>Regulatory</td>
<td>Green Subsidy, FIT</td>
</tr>
<tr>
<td>PENETRATION</td>
<td>PREMIUM</td>
<td></td>
</tr>
<tr>
<td>Education, Awareness</td>
<td>Carbon Policy</td>
<td></td>
</tr>
<tr>
<td>Green Tax</td>
<td>Public Participation</td>
<td>Eco-Culture</td>
</tr>
</tbody>
</table>
What encourage people to be part of Low Carbon Society?

- Education
- Policy, Legislation
- Trend, Branding
- Volunteerism
- Public engagement
- Infrastructure, investment
“A developed country is not a place where the poor have cars, it’s where the rich ride public transport”

Mayor of Bogotá, Colombia
Presentation outline

● Aspiration: SDG, NEM, RMK11
● Policy and strategies in Malaysia
● Implementation issues
● Three-take-away items
  ○ Energy efficiency initiatives – e.g. NEM, green products
  ○ MyCREST
  ○ Cycling culture, not cycling sports