

RESEARCH FOR URBAN CLIMATE RESILIENCE

Universiti Sains Malaysia

ASSOC. PROF. DR. MOHD WIRA MOHD SHAFIEI

Director

*Centre for Education and Training in Renewable Energy,
Energy Efficiency and Green Technology (CETREE>)*

Urbanisation

Urbanisation and Climate Change

Mitigating Climate Change

Green Technology Researches in USM

- The scale and speed of urbanisation is unprecedented
 - more than half of the world population live in urban areas
 - each week the global urban population increases by 1.3 million.
- By 2050, the global urban population is expected to be 64 % to 69 % of the world population.
- Urban areas generate around 80 % of global Gross Domestic Product (GDP)

- The shift from rural to more urban societies is a global trend with significant consequences for
 - greenhouse gas (GHG) emissions and
 - climate change mitigation.
- Urban areas account for between 71% and 76% of CO₂ emissions from global final energy use.
- The anticipated growth in urban population will require a massive build-up of urban infrastructure, which is a key driver of emissions across multiple sectors.

- Thousands of cities are undertaking climate action plans, but their aggregate impact on urban emissions is uncertain.
- There has been little systematic assessment regarding the overall extent to which cities are implementing mitigation policies and emission reduction targets are being achieved, or emissions reduced.
- Broader land-use planning strategies and cross-sectoral measures to reduce sprawl and promote transit-oriented development.

The development and application of products, equipment and systems used to conserve the natural environment and resources, which minimizes and reduces the negative impact of human activities.

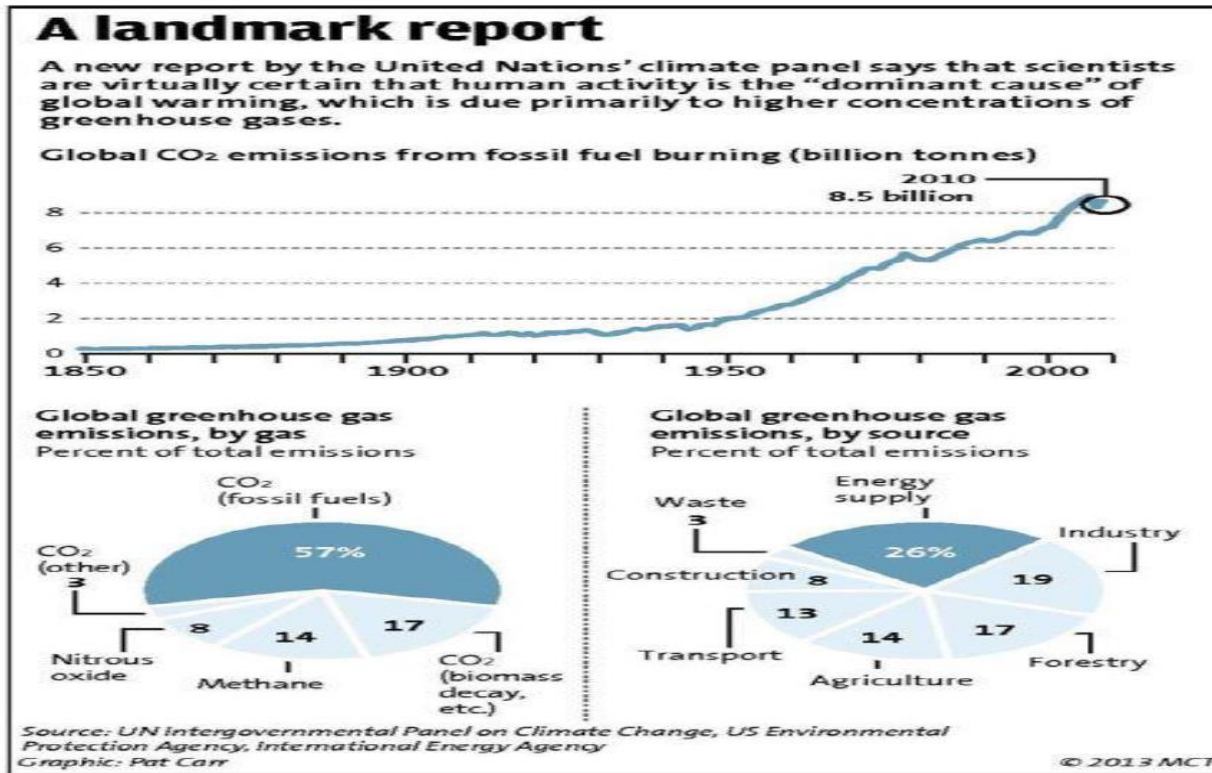
CRITERIA OF GREEN TECHNOLOGY

- Minimizes degradation to the environment;
- Has zero or low green house gas (GHG) emission;
- Safe for use and promotes healthy and improved environment for all forms of life;
- Conserves the use of energy and natural resources; and
- Promotes the use of renewable resources

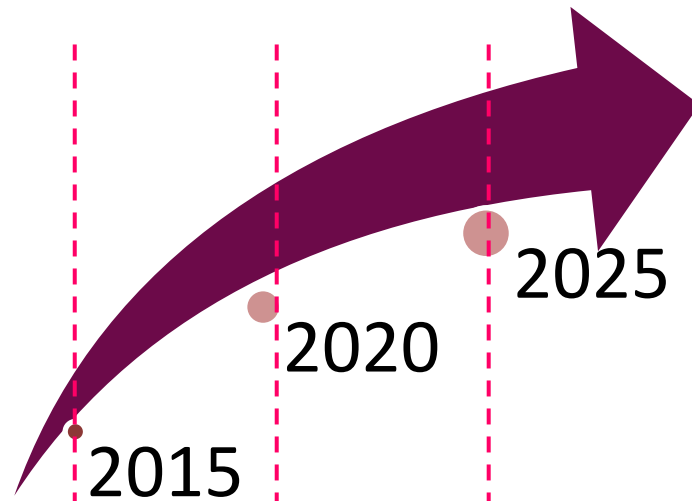


GT RESEARCHES IN USM

- Nearly 4000 GT-related research topics in USM
- Involvement of researchers from various disciplines
- Covering across all economic sectors defined by IPCC targeted for mitigation plans and policies



CETREE>'s GT LONG TERM PLAN (2015-2025)



**INITIATIVES IN
2014**

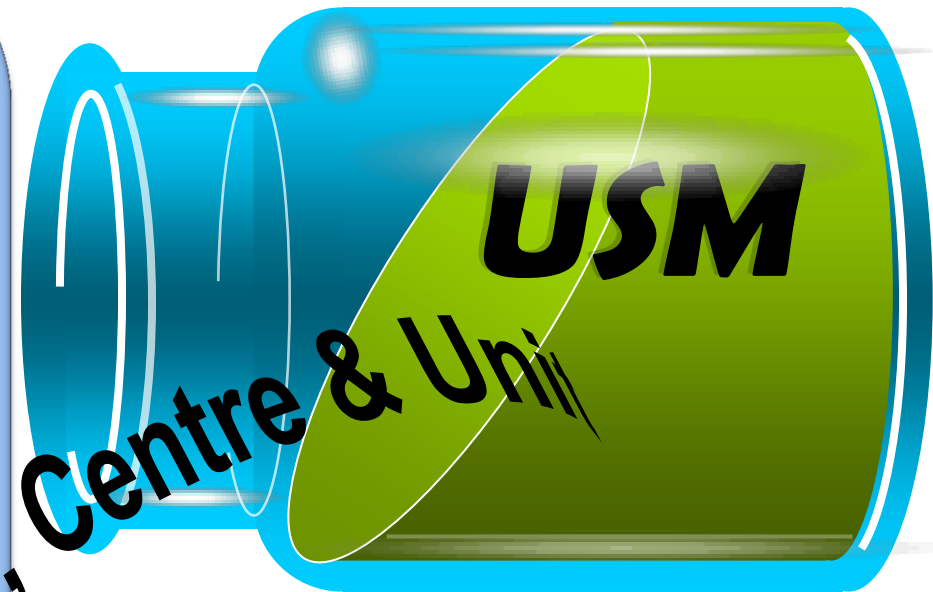
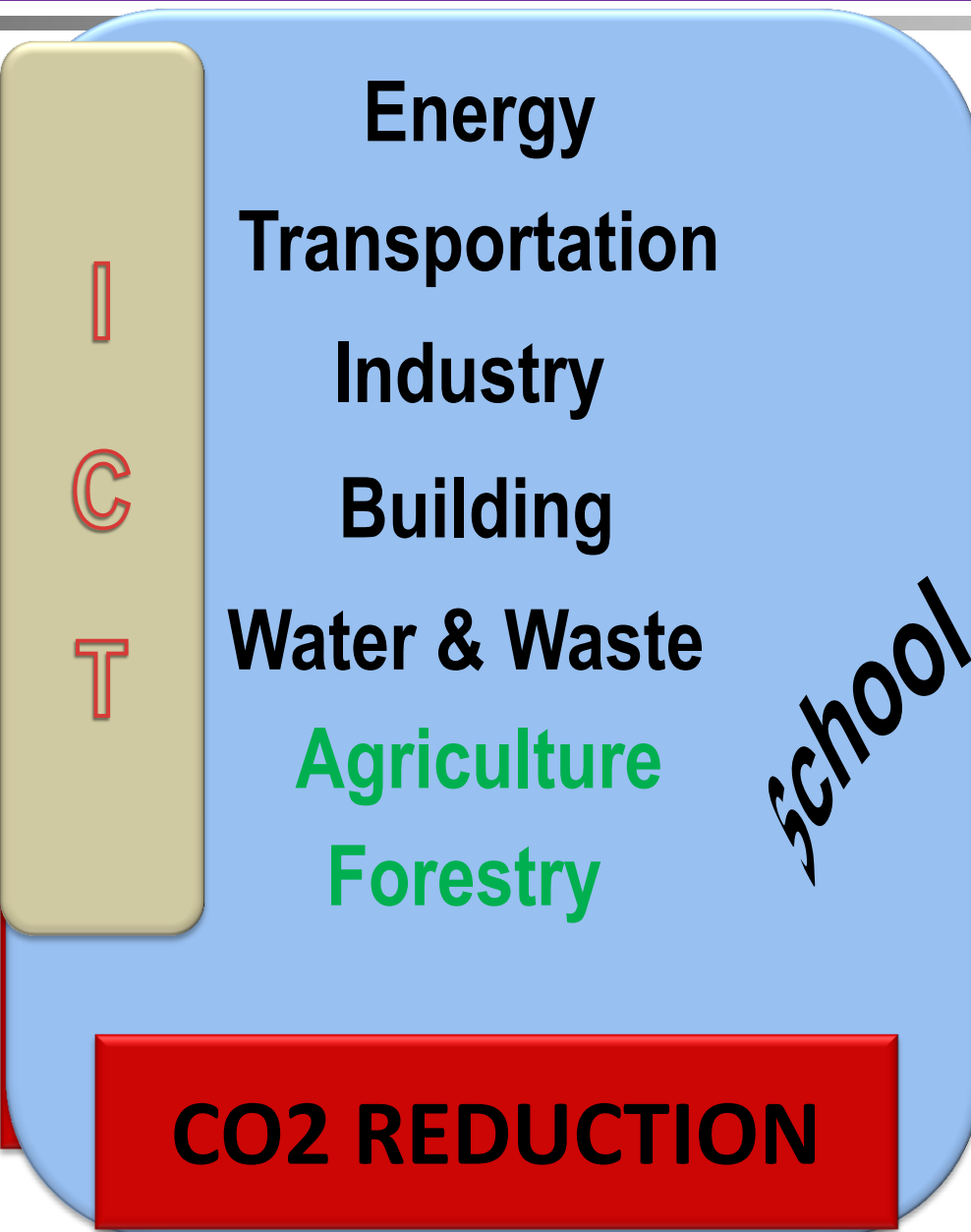
milestone

Reduces overall resource consumption while sustaining national economic growth

Malaysia a major producer of GT in the global market

Inculcation of GT in Malaysian culture

Expansion of international collaborations between local universities and research institutions with GT industries



Short Term Plan

Long Term Plan

1. ENERGY SECTOR

1.1 RENEWABLE ENERGY

- **42 Projects completed**

1.2. ENERGY EFFICIENCY

- **62 Projects completed**

1.3. OTHER NEW SOURCES

2. TRANSPORTATION

2.1 PUBLIC TRANSPORT

- **7 projects completed**

2.2. CLEAN VEHICLES

- **34 projects completed**

2.3. TRAFFIC

- **15 projects completed**

3. INDUSTRIES

3.1 GREEN INDUSTRY

- **SCHOOL : EE, MECHANICAL, CIVIL, AERO**

3.2. GREEN ICT

- **SCHOOL: COMPUTER, CIVIL, CETREE**

3.3. GREEN MACHINES

- **SCHOOL : MECHANICAL, EE, INDUSTRIAL TEC**

4. WATER & WASTE

4.1 WATER RESOURCES MANAGEMENT

- **170 projects completed**

4.2 WASTE WATER TREATMENT

- **103 projects completed**

4.3. OTHERS

- **133 projects completed**

5. BUILDING

5.1 GREEN BUILDINGD

- **5 projects completed**

5.2. TOWN PLANNING

- **65 Projects completed**

5.3. MAINTENANCE

- **SCHOOL : CIVIL, HBP**

6. AGRICULTURE

6.1 ENVIRONMENT

- **SCHOOL : CIVIL, HBP, CHEMISTRY**

6.2 TECHNOLOGY

- **SCHOOL: MECHANICAL, INDUSTRIAL TECHNOLOGY**

6.3 RURAL ENVIRONMENTAL CONCERN

- **SCHOOL : CIVIL, HBP, OTHERS**

7. FORESTRY

7.1 FOREST ECOSYSTEM

- **SCHOOL : BIOLOGY, CHEMISTRY,**

7.2. PLANTATION FOREST/INDUSTRY

- **SCHOOL: BIOLOGY, CHEMISTRY, PHYSICS**

7.3. NON FOREST TREE & TECHNOLOGY

- **SCHOOL : CIVIL, BUILT ENVIRONMENT ETC.**

GREEN AWARENESS

1. Assist GT act
2. Expand research on GT
3. RE, EE & GT roadmap
4. GT in water and waste



GREEN INFRASTRUCTURE

1. Intensity GT research
2. Hydrogen, Biofuel station
3. EV vehicle
4. Waste infrastructure



GREEN CULTURE

1. Reduce energy usage
2. Green lifestyle
3. Major GT producer
4. Improvement of GT rating



GREEN ECONOMY

1. Green campus
2. Green transport
3. Improved air & water quality



THANK YOU