

# **RESEARCH FOR URBAN CLIMATE RESILIENCE**

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**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 CO<sub>2</sub> 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.**

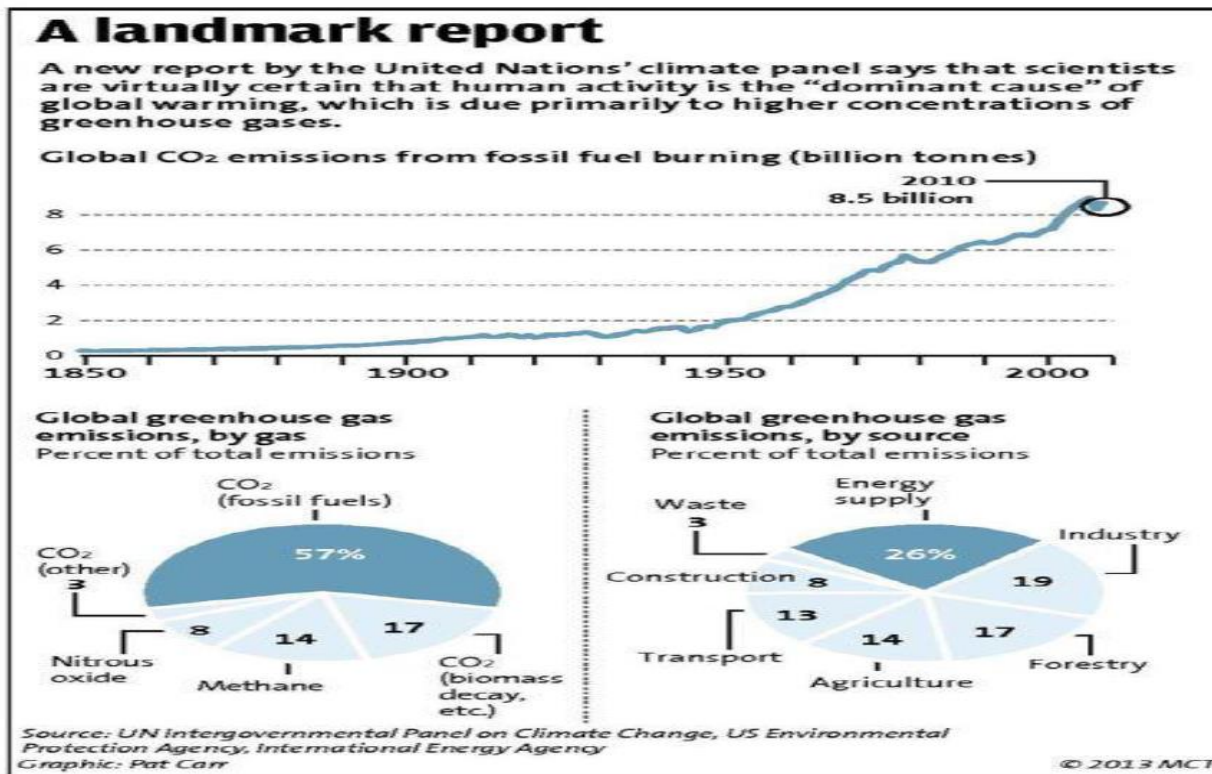
## CRITERIA OF GREEN TECHNOLOGY

- **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**



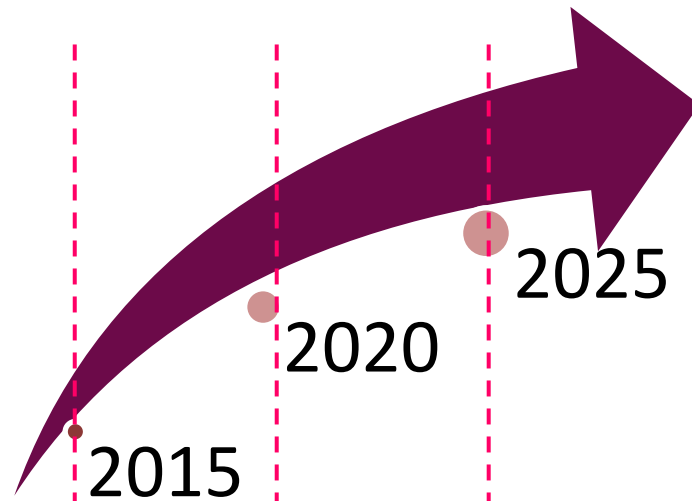
# GT RESEARCHES IN USM

- 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&GT's GT LONG TERM PLAN (2015-2025)



**INITIATIVES IN  
2014**

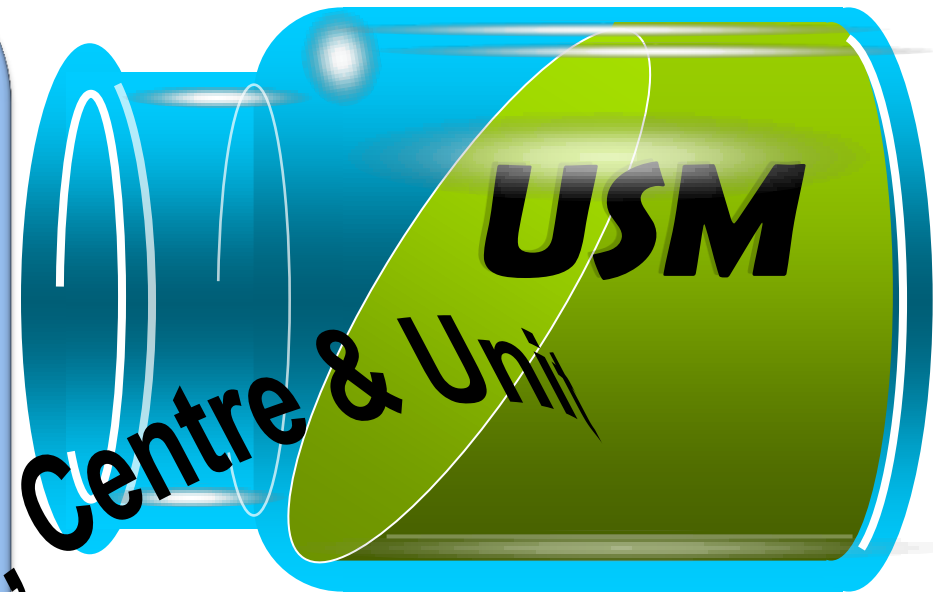
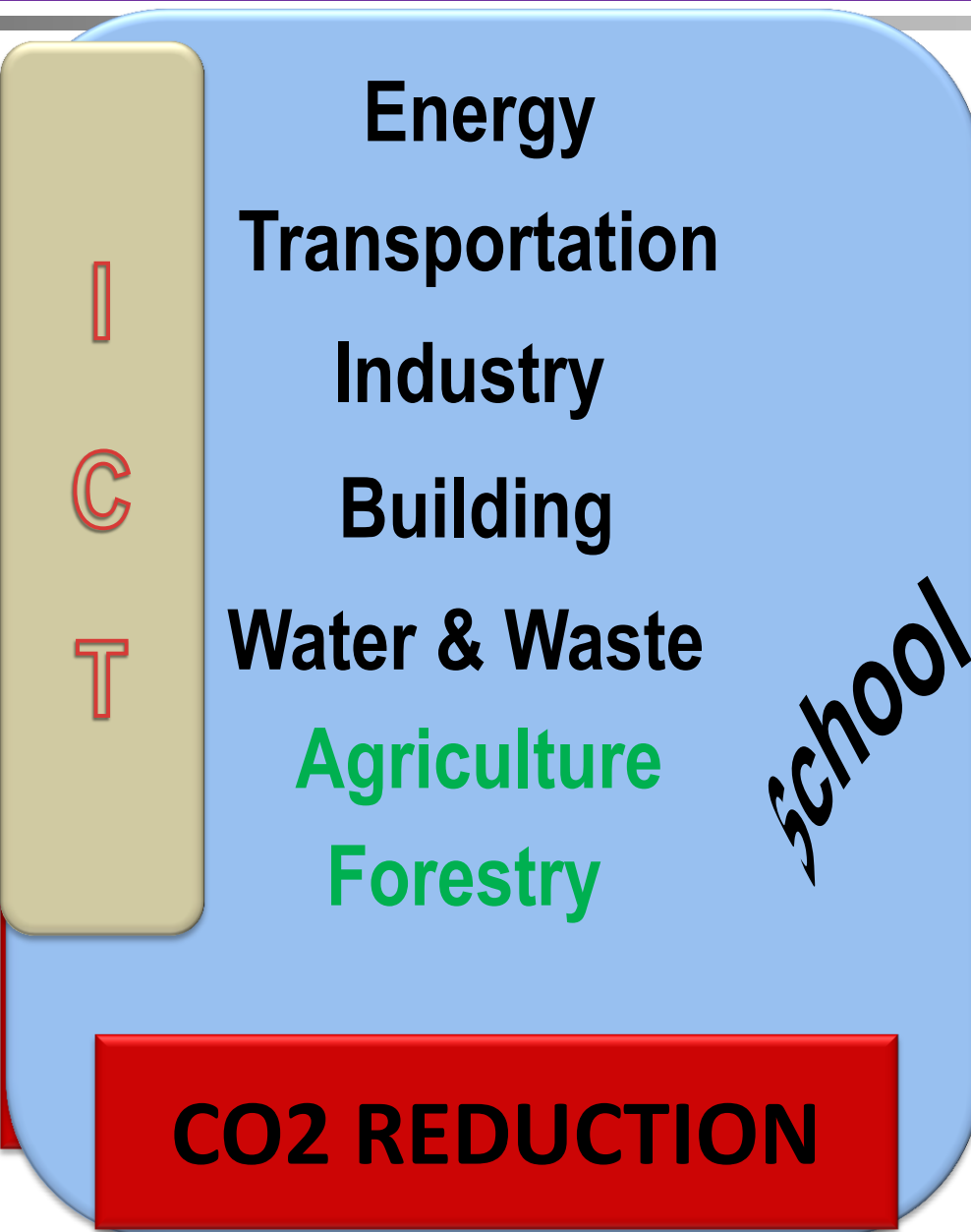
**milestone**

**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 competed**

# 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