

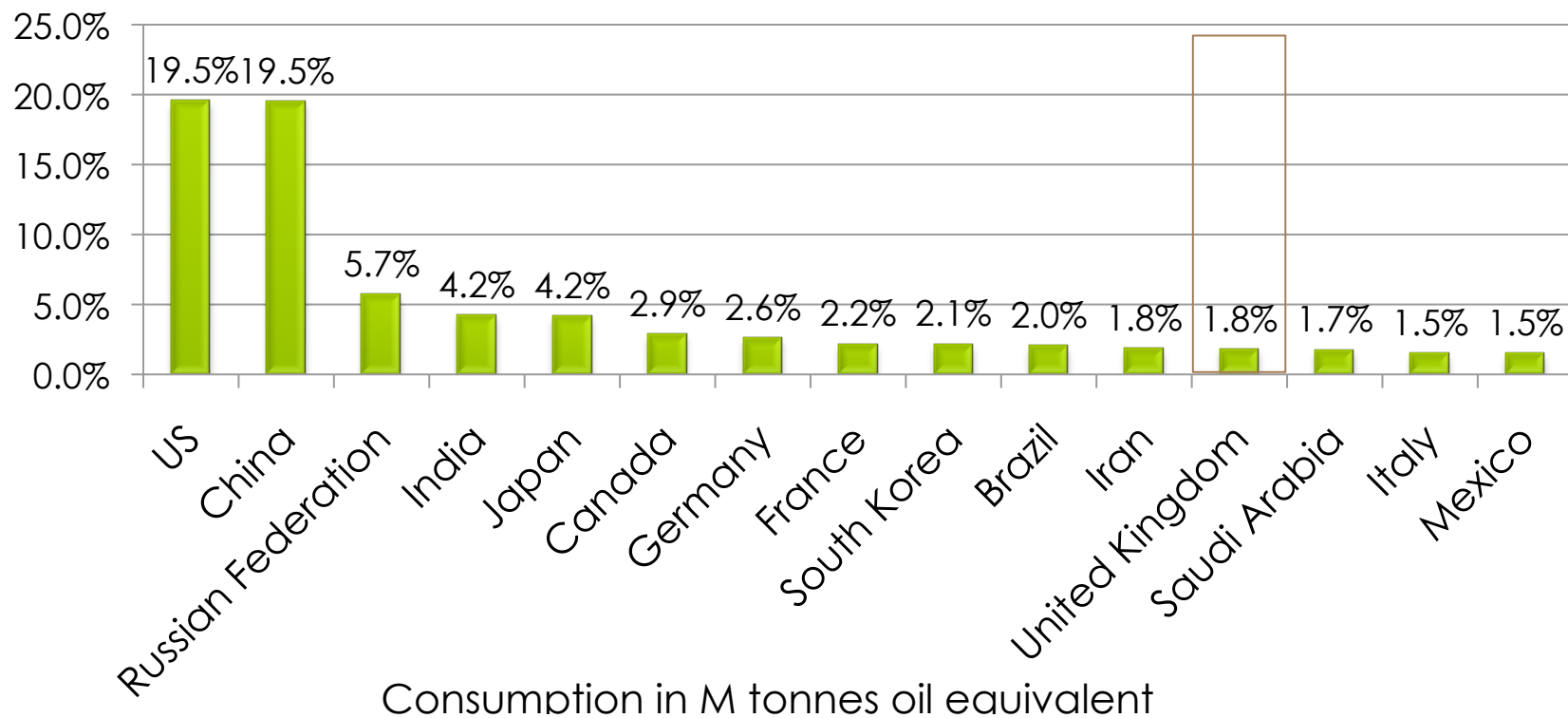


# Sustainability and Energy Consumption

Team Strathclyde

# Global View

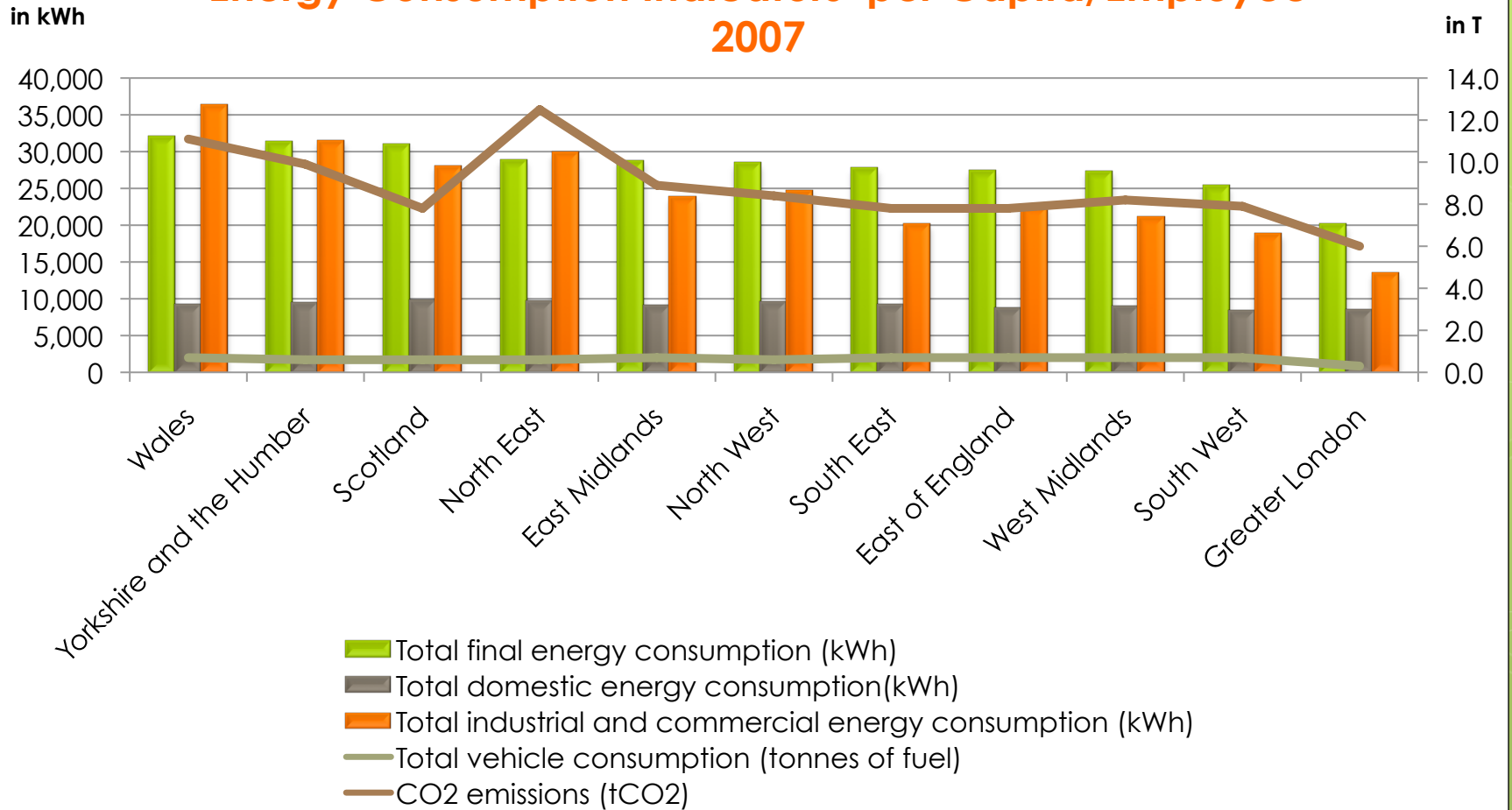
## Energy Consumption 2009



Source: BP – Statistical Review of World Energy 2010.

# UK View

## Energy Consumption Indicators per Capita/Employee 2007

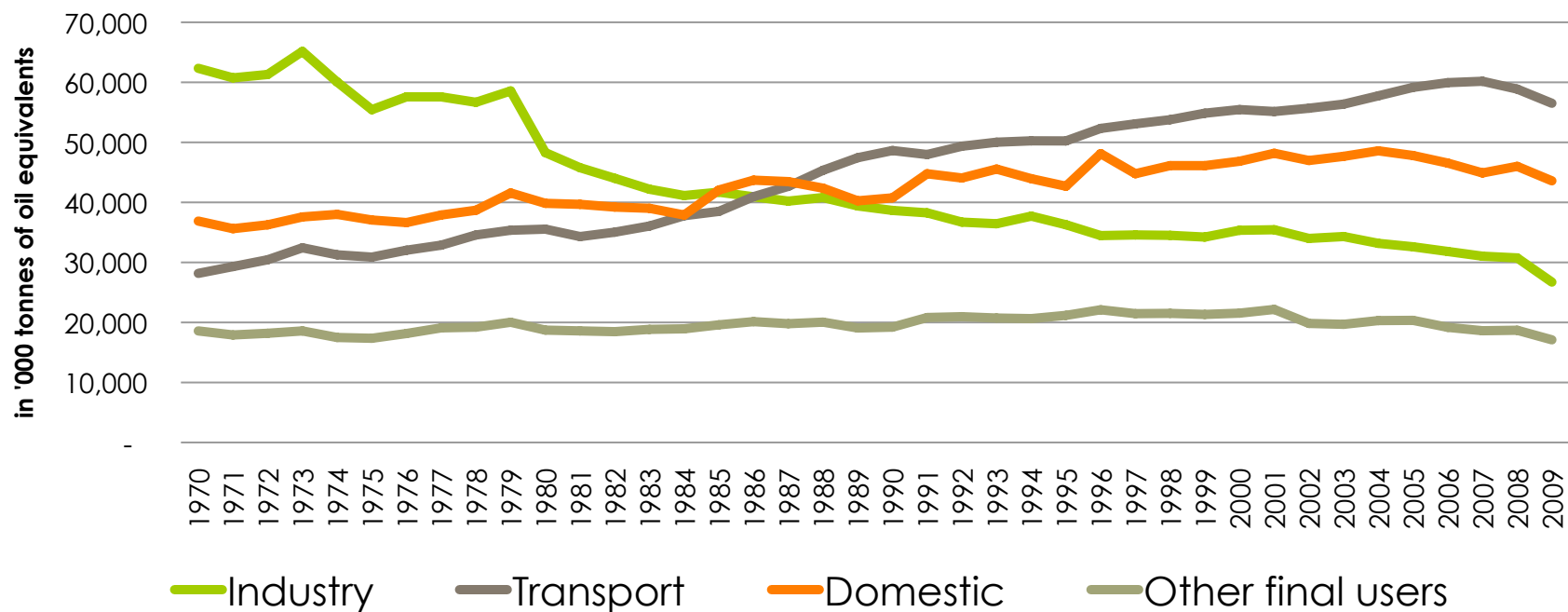


Source: Department of Energy & Climate Change - Statistics

# Citizen's role in Sustainability

- Is believed to be the biggest obstacle to environmental sustainability

## Final Energy Consumption by End-User



Source: Department of Energy & Climate Change - Statistics

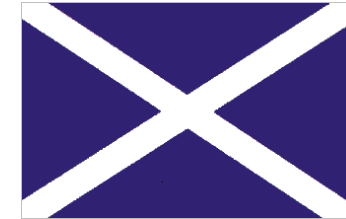
# Citizen's role in Sustainability

- Participation of citizen is necessary for the implementation and durability of sustainability packages of communities
  - instrumental for programs and policies enacted to promote sustainability
- High environmental awareness convinces local government to pursue sustainability programs
  - Spill-over effects on work places

# Citizen's role in Sustainability

- Driver for change in the industry based on growth of green consumerism
  - Raise of disposable income → selection and purchase of more eco-friendly products and services
  - energy-efficient home appliances – more economical and reduce electricity consumption
  - Influence on the production and design procedures of companies
    - Demand will be passed on through out the product value chain
- Force for CSR & demand driven R&D
  - Eg: P&G 10% CO<sub>2</sub> – Reduction by 2012; Marks & Spencer's "Plan A"

# Scotland



 Convention of Scottish Local Authorities (COSLA) recognises the importance of tapping the country's renewable energy potential

- Scotland is in an excellent position to gain from onshore wind power generation
- Wind farm planning applications predominate over other renewable schemes



40% of  
Scotland's  
electricity by  
renewable  
technologies



2020



Ideal for  
urban  
environments



Link to  
energy  
conservation

# Challenges

(Hamza & Gilroy, "Energy Policy", Feb 2011)

A lot of energy is consumed in the UK because –

- cultural inclination towards older housing
- increasing older population



Free and discounted  
insulation



Boiler Scrappage  
Scheme



Home Energy Check



# United Kingdom



Energy Bill  
2010-11



British  
Parliament

- Designed to provide a step change in –
  - Provision of energy efficiency measures to homes and businesses
  - Make improvements to our framework
- Open University course in Wales, “Energy measurements at home”

# Standards

- National Calculation Method (NCM) for the EPBD (Energy Performance of Buildings Directive) is defined by the Department for Communities and Local Government (DCLG)
- Calculations to be carried out either by -
  - An approved simulation software
  - A new simplified tool based on a set of CEN standards called the **SBEM**
- **Simplified Building Energy Model (SBEM)** –
  - Calculate the annual energy use for a proposed building
  - Compare it with the energy use of a comparable 'notional' building
  - UK specific although complies to European standards

# Definition of “Energy Footprint”

## Source of Energy

- Energy is created due to a chemical reaction in the presence of a catalyst

### Gas:

- Used for cooking
- Used for heating
- Used as fuel for vehicles

### Fossil fuels:

- Used as fuels for vehicles

Consumption measured by meters in units.

1 Unit = approx. 31.3 kW-H

Consumption is measured by the performance of the vehicle.

For e.g. 8 miles per gallon

## Energy

- Energy is generated by the movement of electrons in the conductor

### Electricity:

- Used in households to run appliances, heating and cooking equipments

Consumption is measured by meters in units.

1 Unit = 1kW-H

Individual's energy footprint

# Performance Indicators for Energy Efficiency

- Energy Use Ratings
- Fuel Cost ratings e.g: A to G rating
- CO2 Emission Rating
- Fuel poverty indicator

# Tools to assess energy performance

- SAP rating
- Environmental Impact rating
- National Home Energy rating

# Energy Performance Standards

- UK policy and CO2 reduction targets - 80%<sup>1</sup> reduction in CO2 emissions by 2050
- Minimum performance standards: SAP or NHER
- Best practice standards : Not cost effective for small houses

<sup>1</sup> <http://www.energysavingtrust.org.uk/business/Business/Local-Authorities/Social-housing/Reducing-emissions-from-social-housing>

# Recommendations

- Use of Smart meters
- Energy Efficiency Schemes: SAP or NHER rating
- Energy Performance Certificate
- Energy Analyzers and Calculators

# Energy Footprint For Companies

- Energy consumption: factor for CO2 emission
- 27%<sup>1</sup> of CO2 emission in UK comes from households
- Best Performance Standards in CO2 emissions can be achieved

<sup>1</sup> [http://www.direct.gov.uk/en/HomeAndCommunity/BuyingAndSellingYourHome/Energyperformancecertificates/DG\\_177026](http://www.direct.gov.uk/en/HomeAndCommunity/BuyingAndSellingYourHome/Energyperformancecertificates/DG_177026)

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