

Efficient Power Generation 2011

Roundtable 4: Efficient use of energy in the end-use sector

Moscow, 20 September 2011

Improving Energy Efficiency in Buildings

International Best Practices

Yamina SAHEB

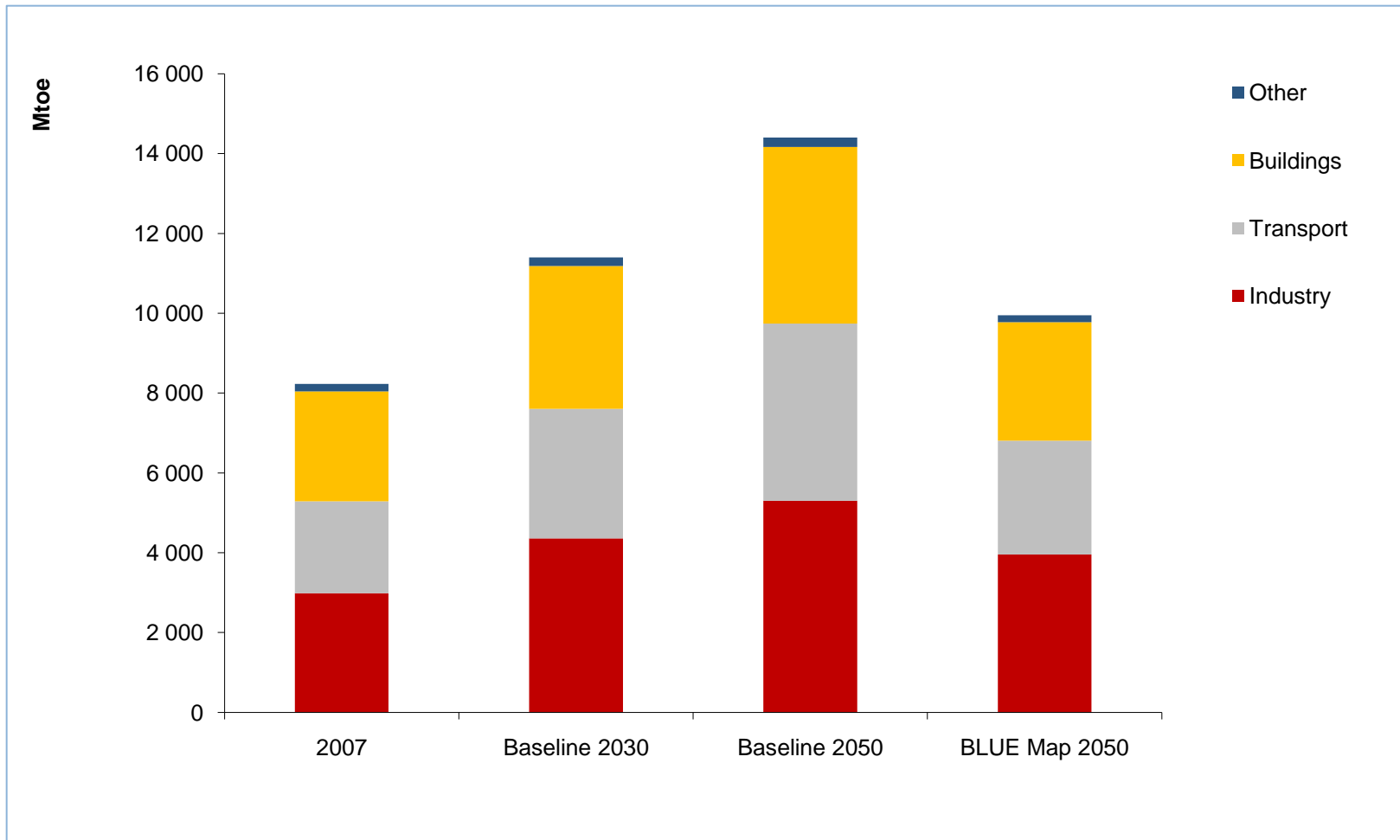
Yamina.saheb@iea.org

International Energy Agency



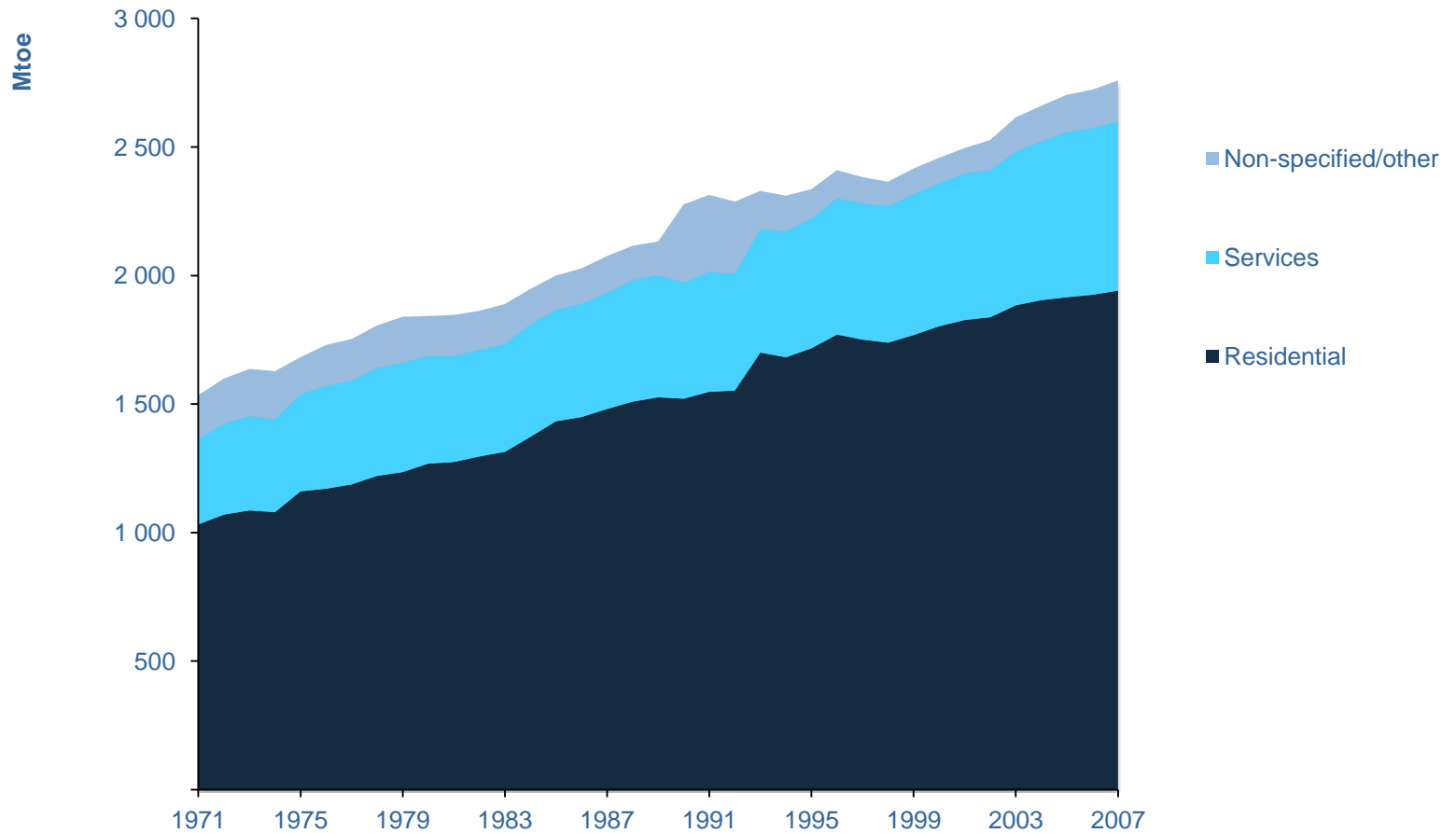
International
Energy Agency

Buildings sector share of the total energy consumption

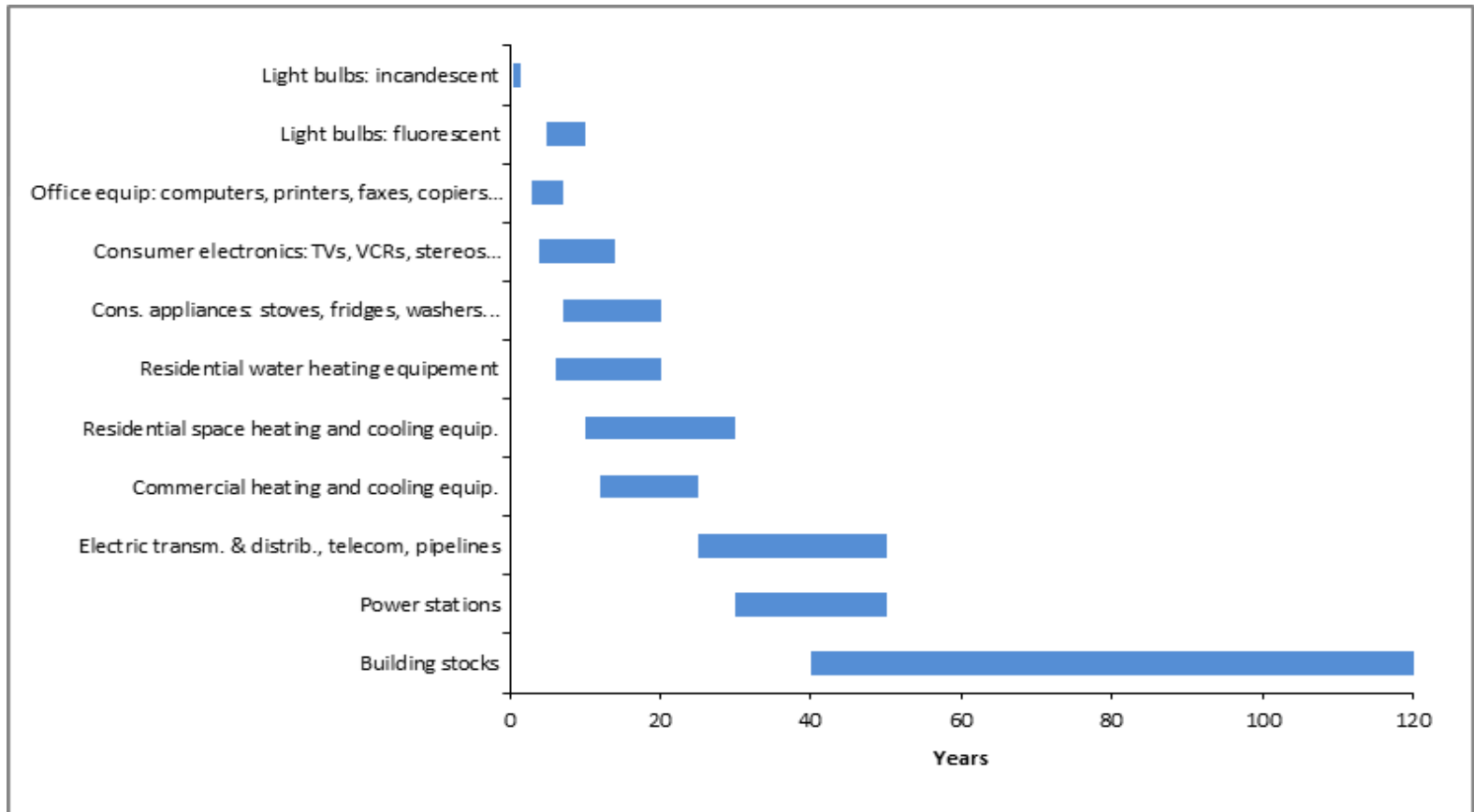


ETP 2010

Global Energy consumption per building type

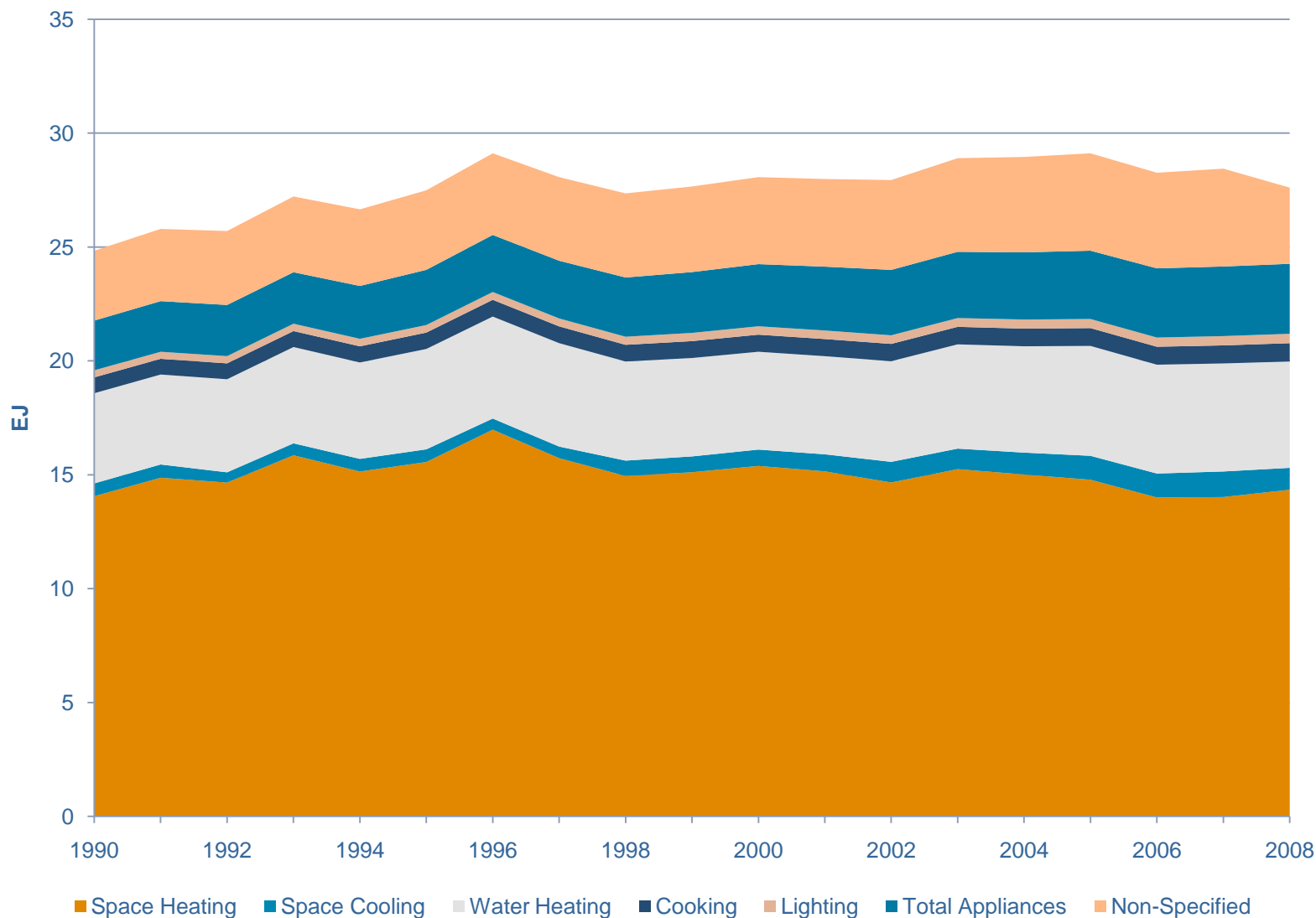


Where should we start?

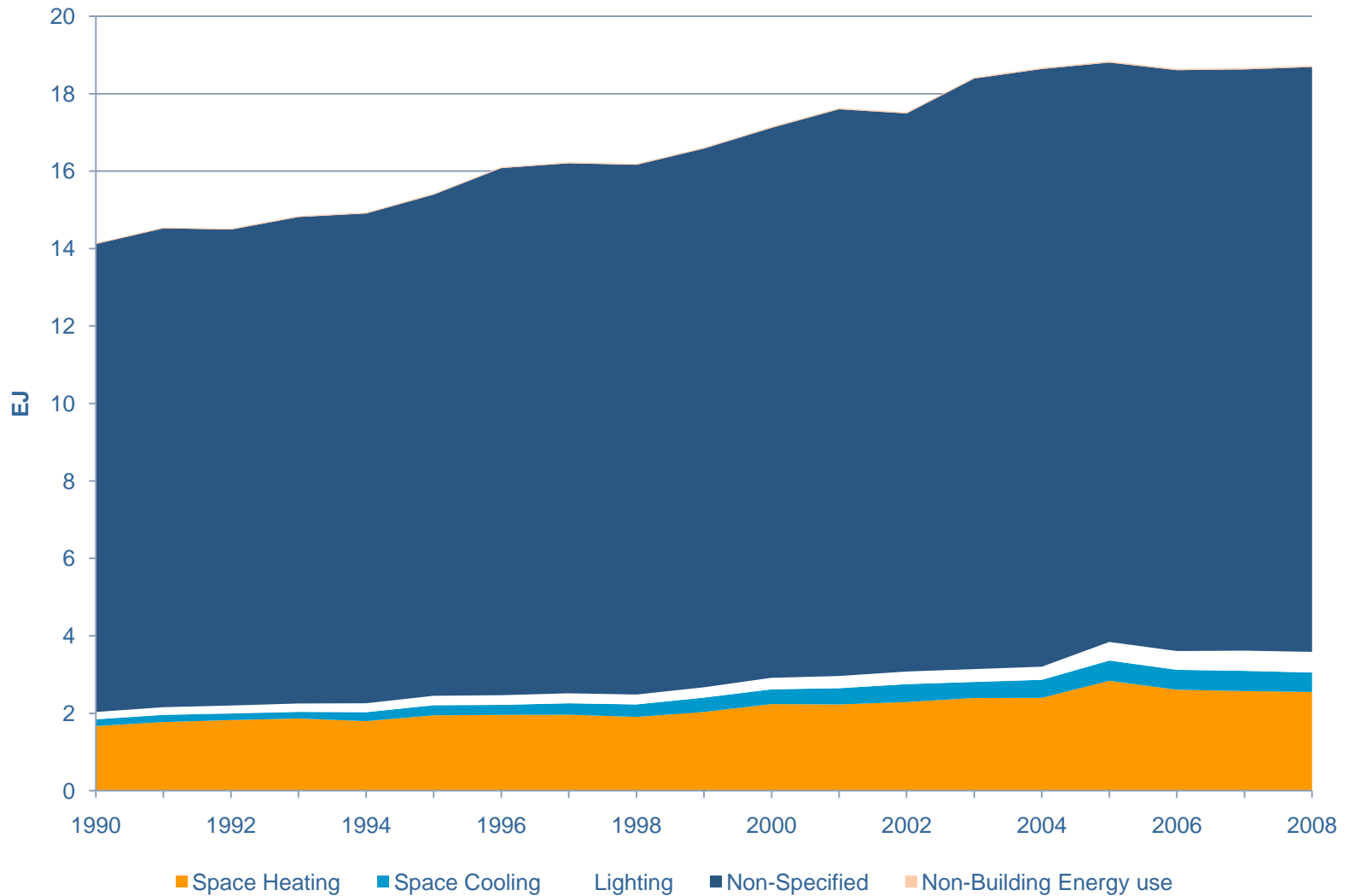


Based on Philibert and Pershing 2002, ETP 2010

Residential end-uses energy consumption (IEA 28)



Services end-uses energy consumption (IEA 28)



IEA 25 Energy Efficiency Policy Recommendations

1. Across sectors

- 1.1 Measures for increasing investment in energy efficiency;
- 1.2 National energy efficiency strategies and goals;
- 1.3 Compliance, monitoring, enforcement and evaluation of energy efficiency measures;
- 1.4 Energy efficiency indicators;
- 1.5 Monitoring and reporting progress with the IEA energy efficiency recommendations themselves.

2. Buildings

- 2.1 Building codes for new buildings;
- 2.2 Passive Energy Houses and Zero Energy Buildings;
- 2.3 Policy packages to promote energy efficiency in existing buildings;
- 2.4 Building certification schemes;
- 2.5 Energy efficiency improvements in glazed areas.

3. Appliances

- 3.1 Mandatory energy performance requirements or labels;
- 3.2 Low-power modes, including standby power, for electronic and networked equipment;
- 3.3 Televisions and “set-top” boxes;
- 3.4 Energy performance test standards and measurement protocols.

4. Lighting

- 4.1 Best practice lighting and the phase-out of incandescent bulbs;
- 4.2 Ensuring least-cost lighting in non-residential buildings and the phase-out of inefficient fuel-based lighting.

5. Transport

- 5.1 Fuel-efficient tyres;
- 5.2 Mandatory fuel efficiency standards for light-duty vehicles;
- 5.3 Fuel economy of heavy-duty vehicles;
- 5.4 Eco-driving.

6. Industry

- 6.1 Collection of high quality energy efficiency data for industry;
- 6.2 Energy performance of electric motors;
- 6.3 Assistance in developing energy management capability;
- 6.4 Policy packages to promote energy efficiency in small and medium-sized enterprises.

7. Utilities

- 7.1 Utility end-use energy efficiency schemes.

Building Energy Codes

Mandatory building energy codes and minimum energy performance requirements

Governments should require all new buildings, as well as buildings undergoing renovation, to be covered by energy codes and to meet minimum energy performance requirements (MEPs) that aim to minimise life-cycle costs. Energy codes and MEPs should be enforced, regularly strengthened and take a holistic approach that includes the building envelope and equipment.



Frankfurt/M Germany
Sophienhof
FAAG/ABG Frankfurt
Architect Fuessler

New Buildings
Blocks of Flats

160 dwellings
14 767 m²
Passive House Technology
15 kwh / m² per year

Payback = 9 – 10 years
Buildings stay
for 50 – 100 years !



Aiming for net zero energy consumption in buildings

Governments should support and encourage the construction of buildings with net zero energy consumption and take initiatives to make such buildings commonly available in the market when economically viable based on a life-cycle cost analysis.

Policies should include:



Objectives for market share of net zero energy consumption buildings in all new construction by 2020.

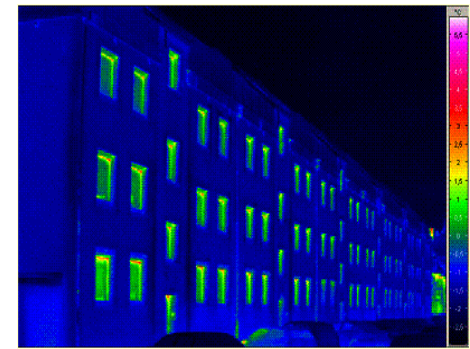
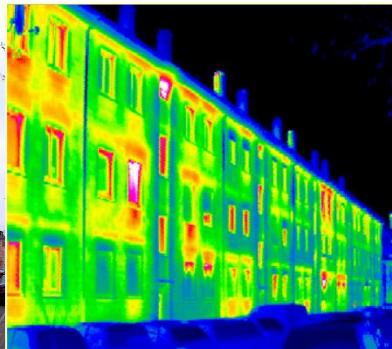
The use of net zero energy consumption buildings as a reference for mandatory MEPs in future updates of building codes.

Improving the energy efficiency of existing buildings

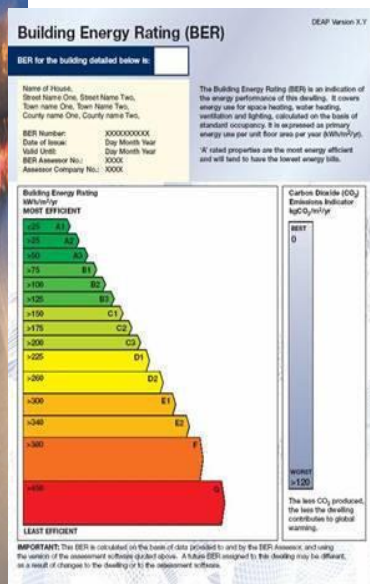
Governments should implement a package of policies to improve the energy efficiency of existing buildings with emphasis on significant improvements to building envelopes and systems during renovations.

Policies should include:

- *An ambitious timeline and renovation rate for cost-effective reduction of the energy consumption in existing buildings.*
- *MEPs for the building as a whole, including key building-envelope components and energy-using systems, to be met during renovations.*



Building energy labels and certificates

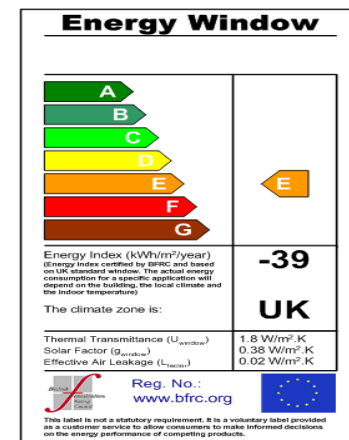


Governments should require building energy performance labels or certificates that provide information to owners, buyers and renters.

Package of policies for windows and HVAC products

Energy performance of building components and systems

Governments should establish policies to improve the energy efficiency performance of critical building components, such as windows, and heating, ventilating and cooling systems, in order to improve the overall energy performance of new and existing buildings.



Do it right in the first place

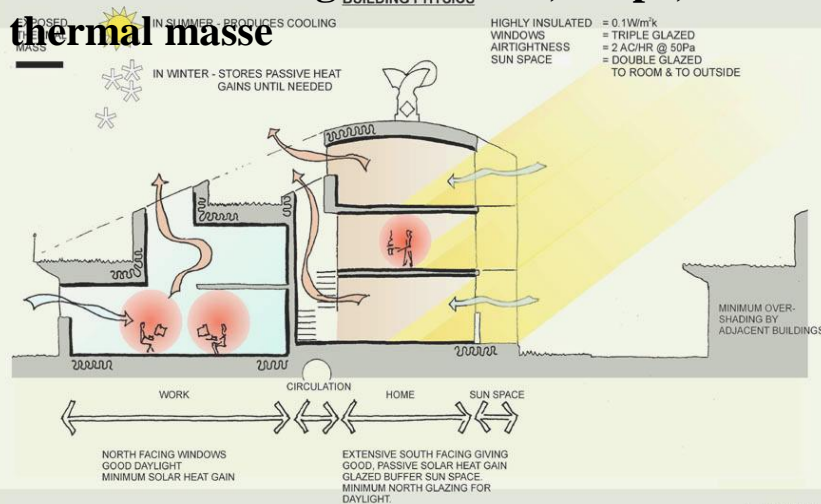
Assess optimal building size and use



BEDZED Road Names
15th May 2001

Consider building orientation, shape,

thermal masse



Specify high performance envelope



Maximize passive HVAC and daylight

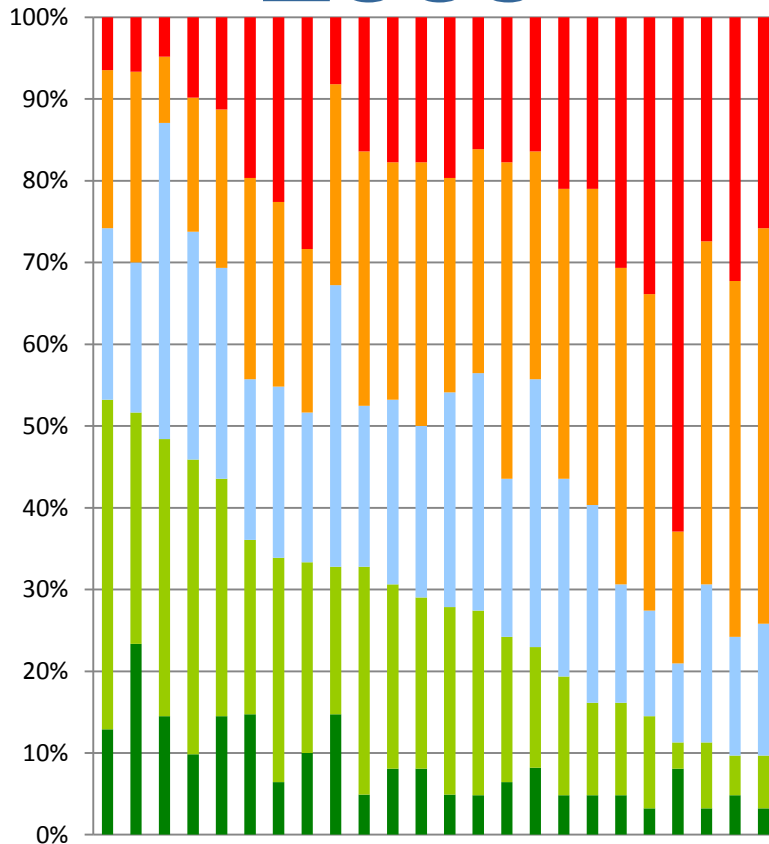


Install efficient equipment

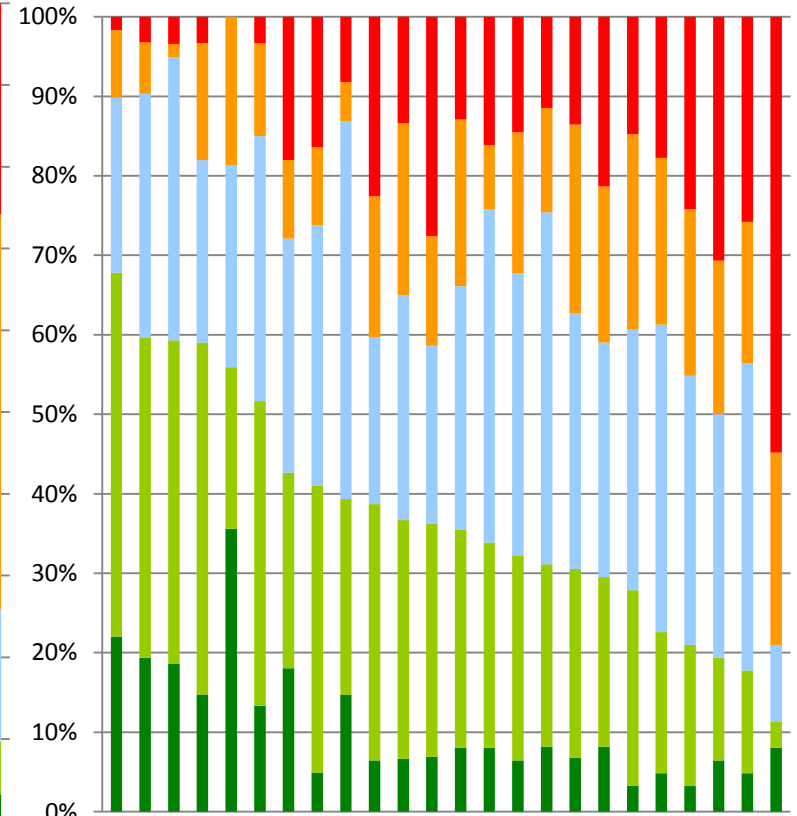


Policy implementation has improved....

2009

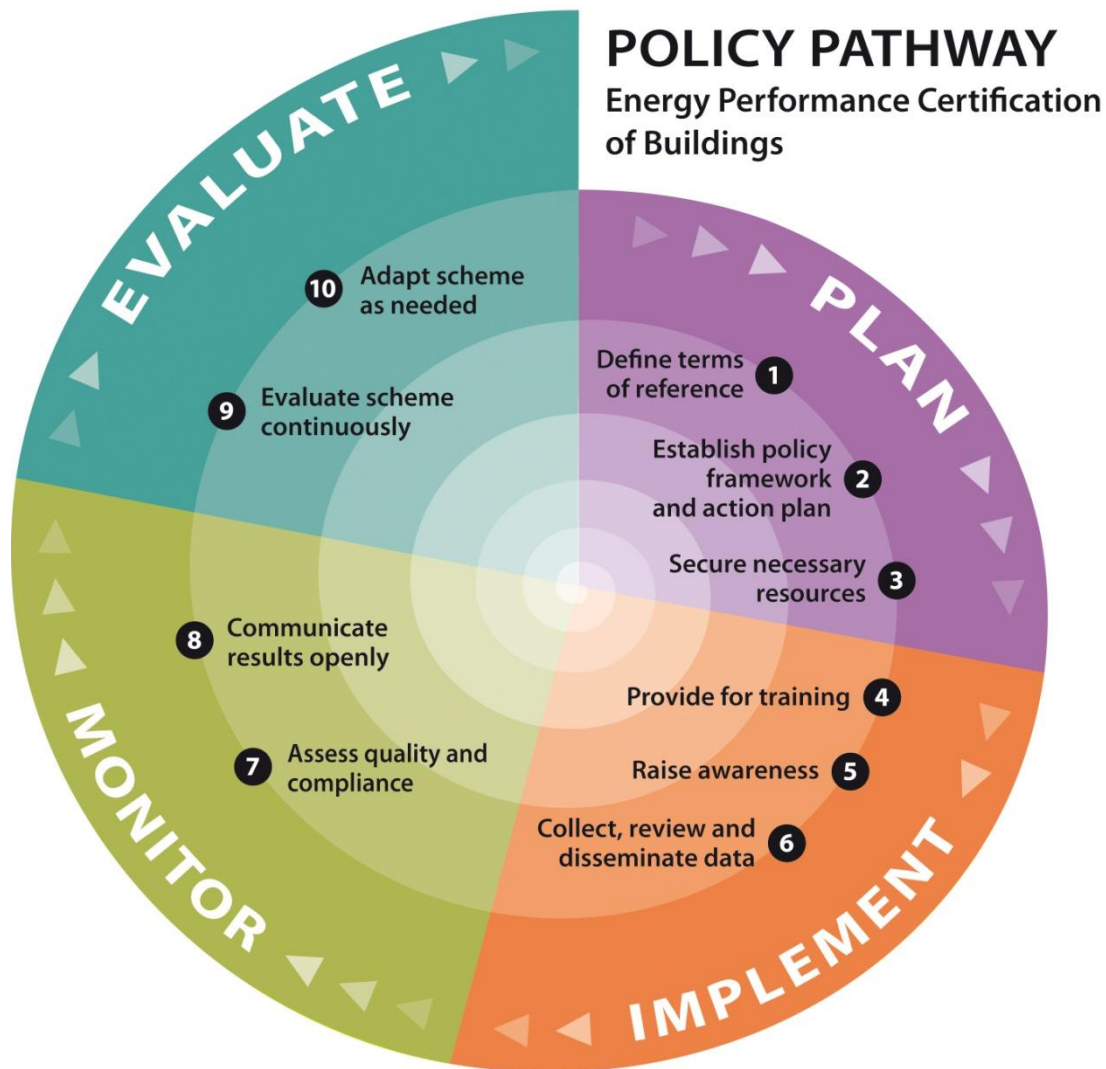


2011



- All countries have developed and implemented new energy efficiency policies
- Energy savings opportunities still exist.

The IEA Policy Pathways



Current IEA work program on buildings

- **Global buildings energy policies trends**
- **Worldwide mapping of building policies**
- **Estimation of energy savings potential per country**
- **Policies and Technologies for low energy buildings**

Key messages

- **Work together (industry, policy-makers, academia, NGOs)**
- **Share proven practices (developing countries, emerging economies, developed countries)**
- **But don't copy/paste**
- **Make buildings energy efficiency part of the solutions to local/national priorities**
- **Consider local climate, material & behaviour**

Thank you for your attention

Yamina.saheb@iea.org