



Part L 2007 –
The implication of 40%
improvement for designers

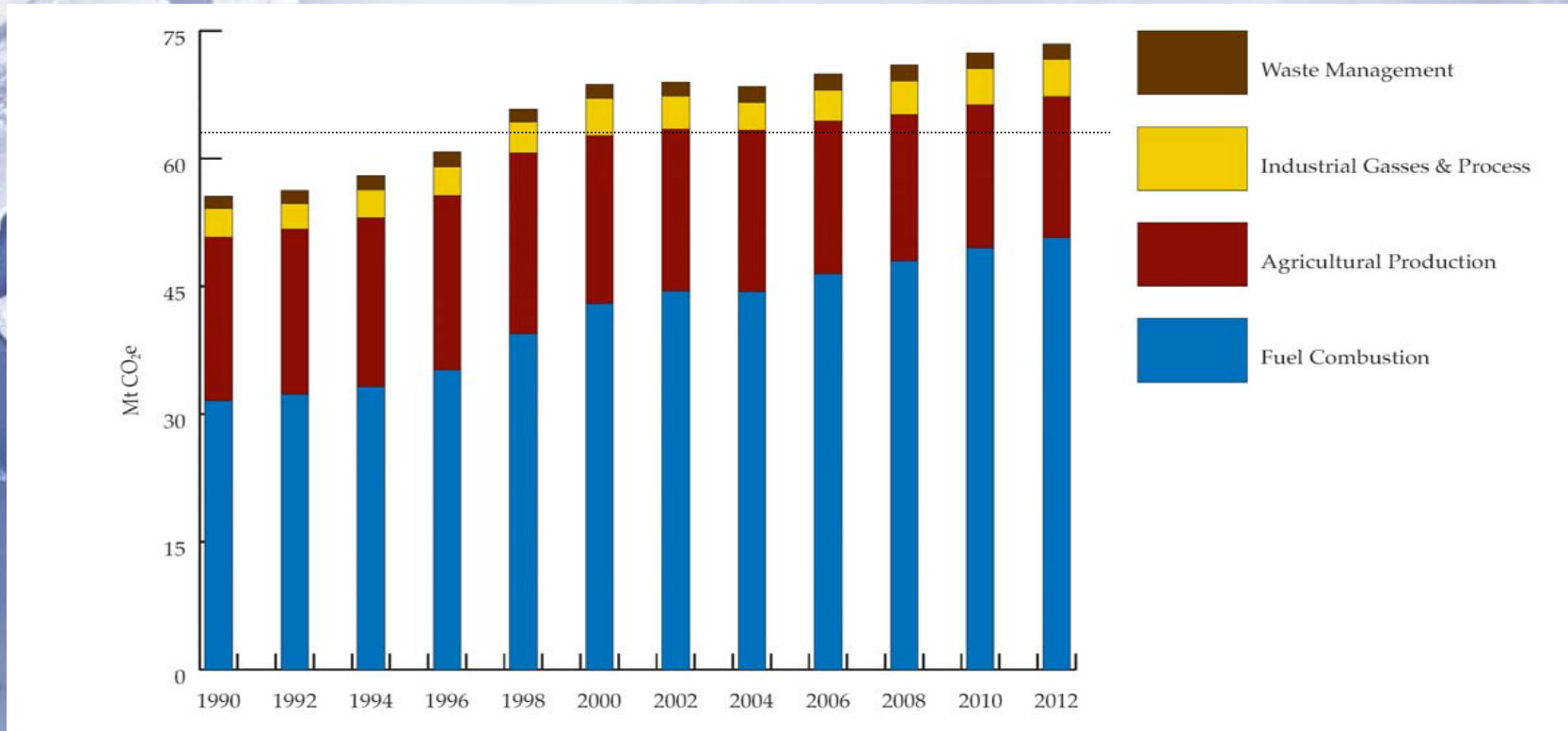
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DoEHLG



Presentation

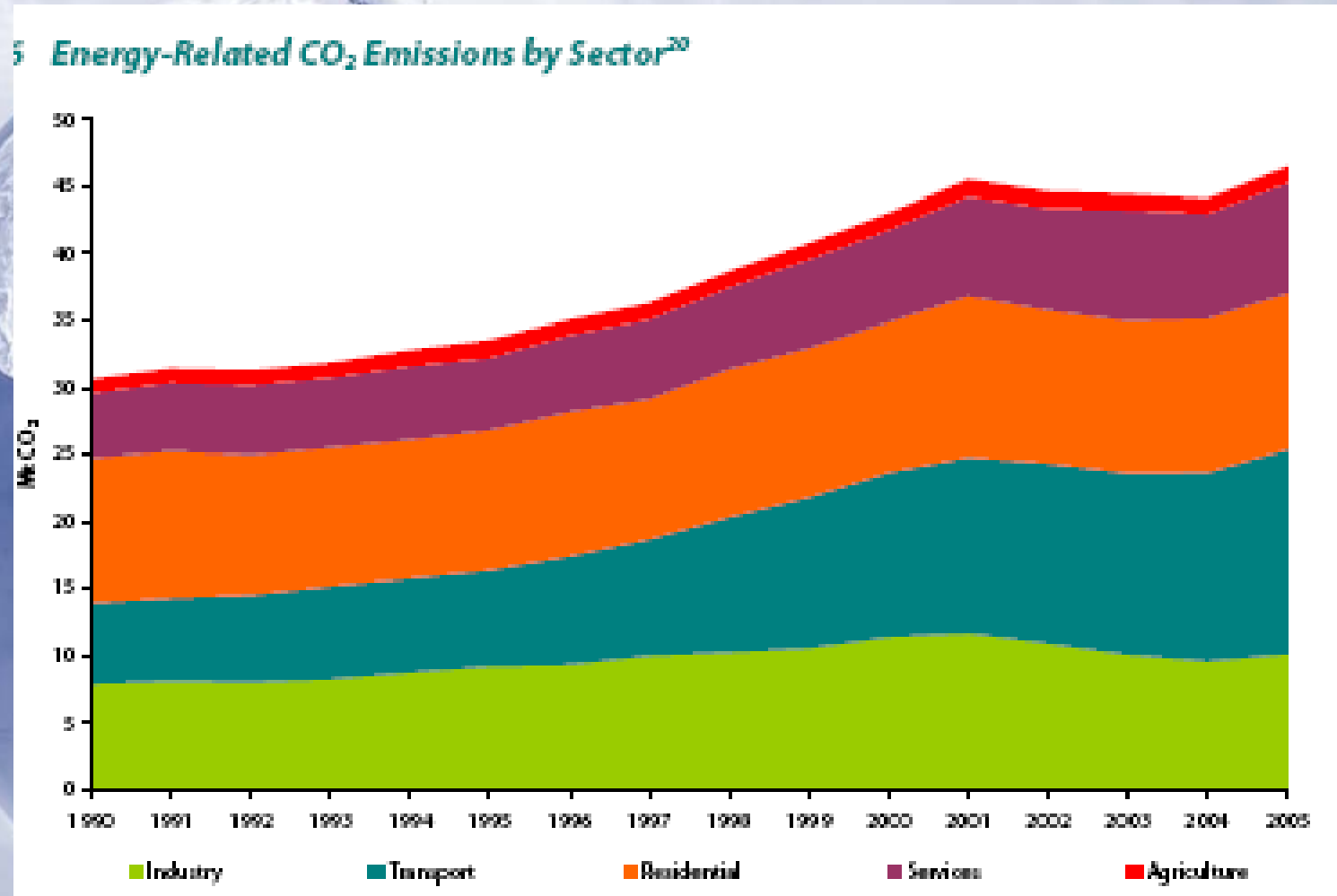
1. Background Information
2. Part L – The road map
3. Part L 2007 – The contents
4. Typical Semi-Detached to Part L 07

What are the main sources of our Greenhouse Gas emissions?



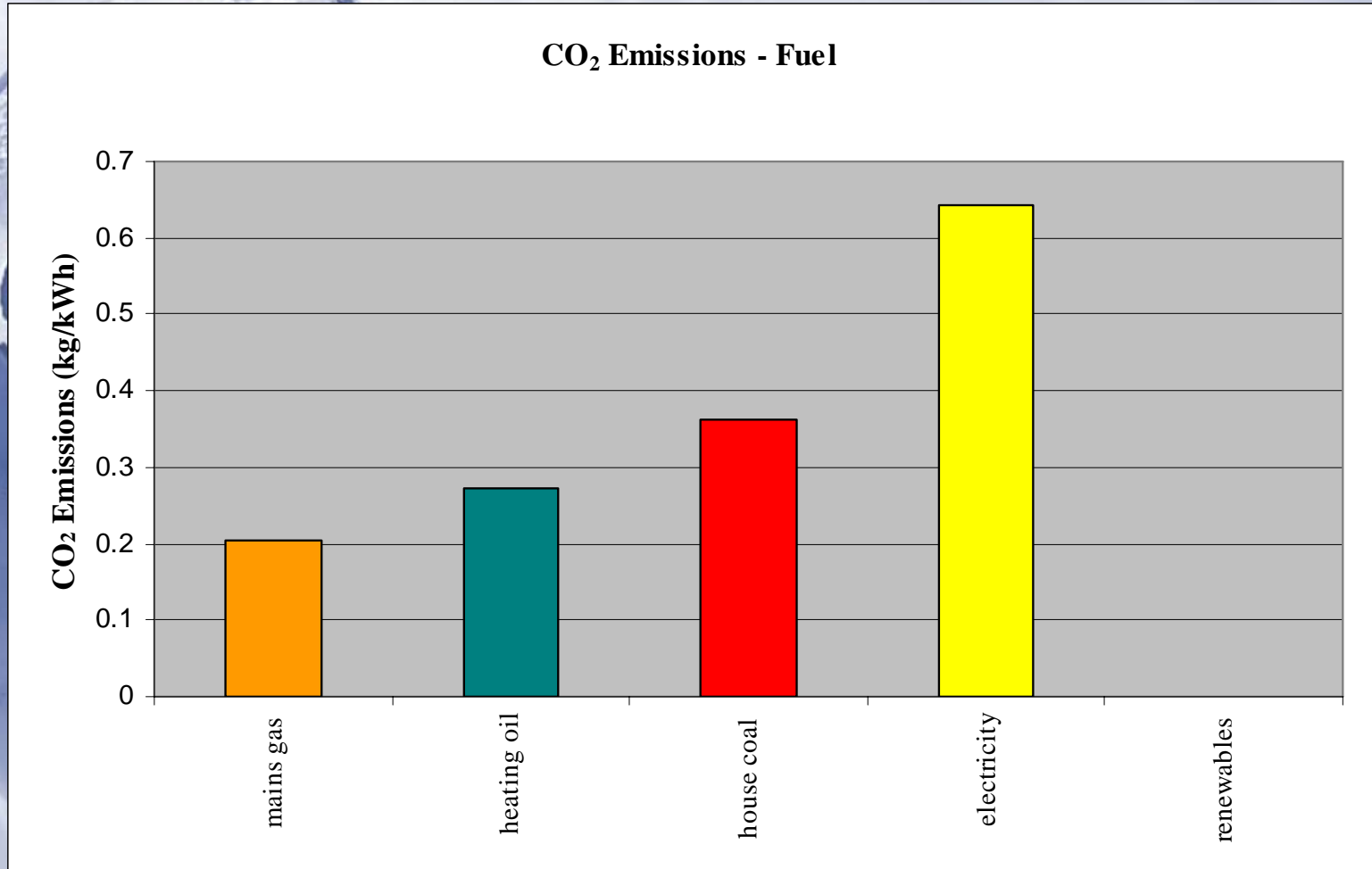
Source: DOEHLG

Who uses all this energy?



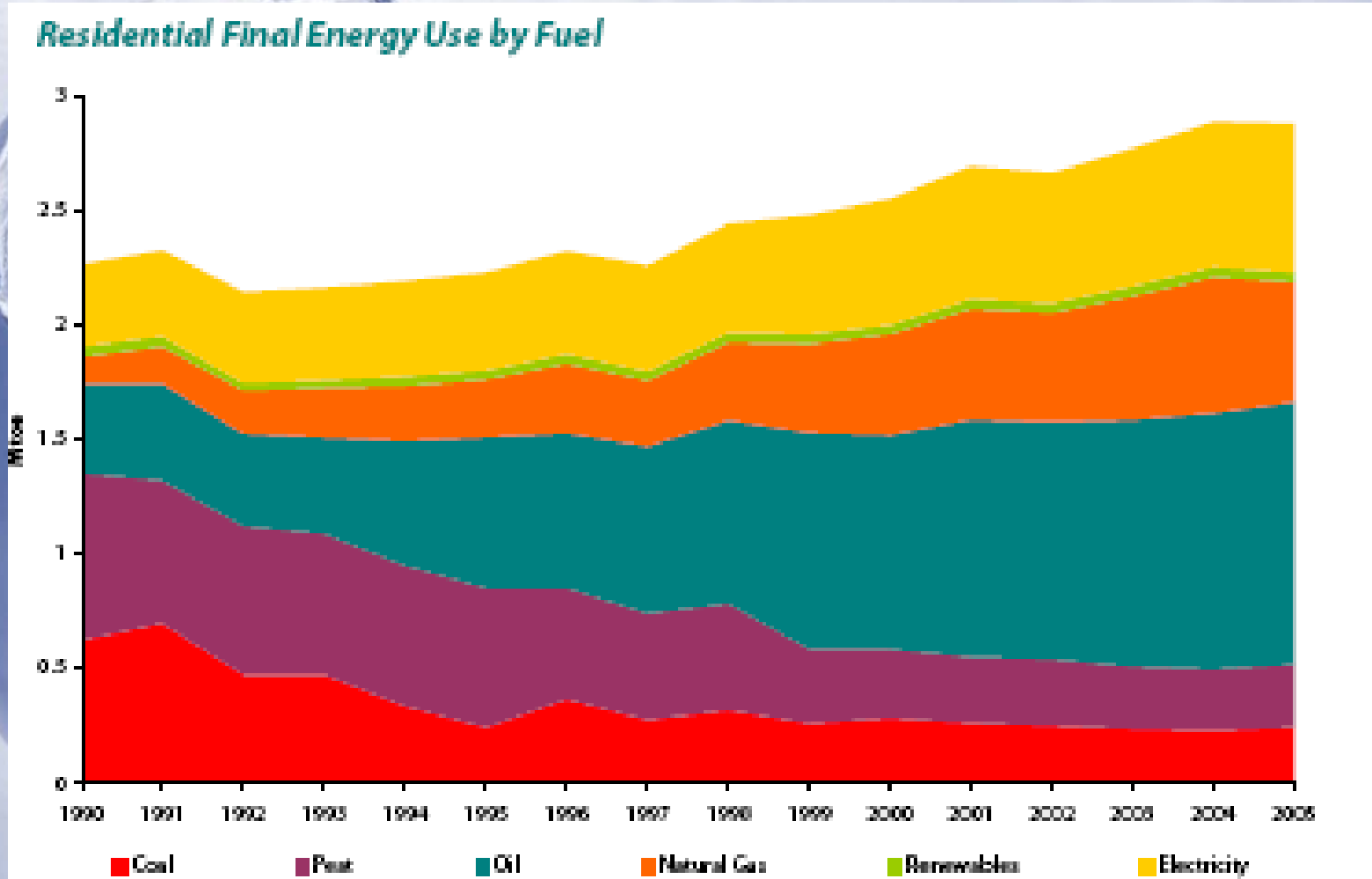
Source: SEI

Are some sources of energy worse than others?



Source: DEAP

What sources of energy do we use in our homes?



Source: SEI

What is the road map for Part L?

2002 Standards for domestic sector increased

2005 Basis of compliance for domestic sector changed - DEAP

Standards for non-domestic sector increased

2007 Standards for new domestic sector increased - 40% improvement on 2005

2008 Basis of compliance for non-domestic sector to be reviewed

2010 Standards for new domestic sector to be reviewed

The Future → ZERO CARBON ...

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The Future → ZERO CARBON ...

What is the objective of Part L 2007?

1. make maximum practicable contribution to Government CO₂ targets
2. meet the target of 40% improvement on current standards for new dwellings
3. be comparable with the best in Europe
4. be clear, unambiguous, and reflect Government policy on Better Regulation

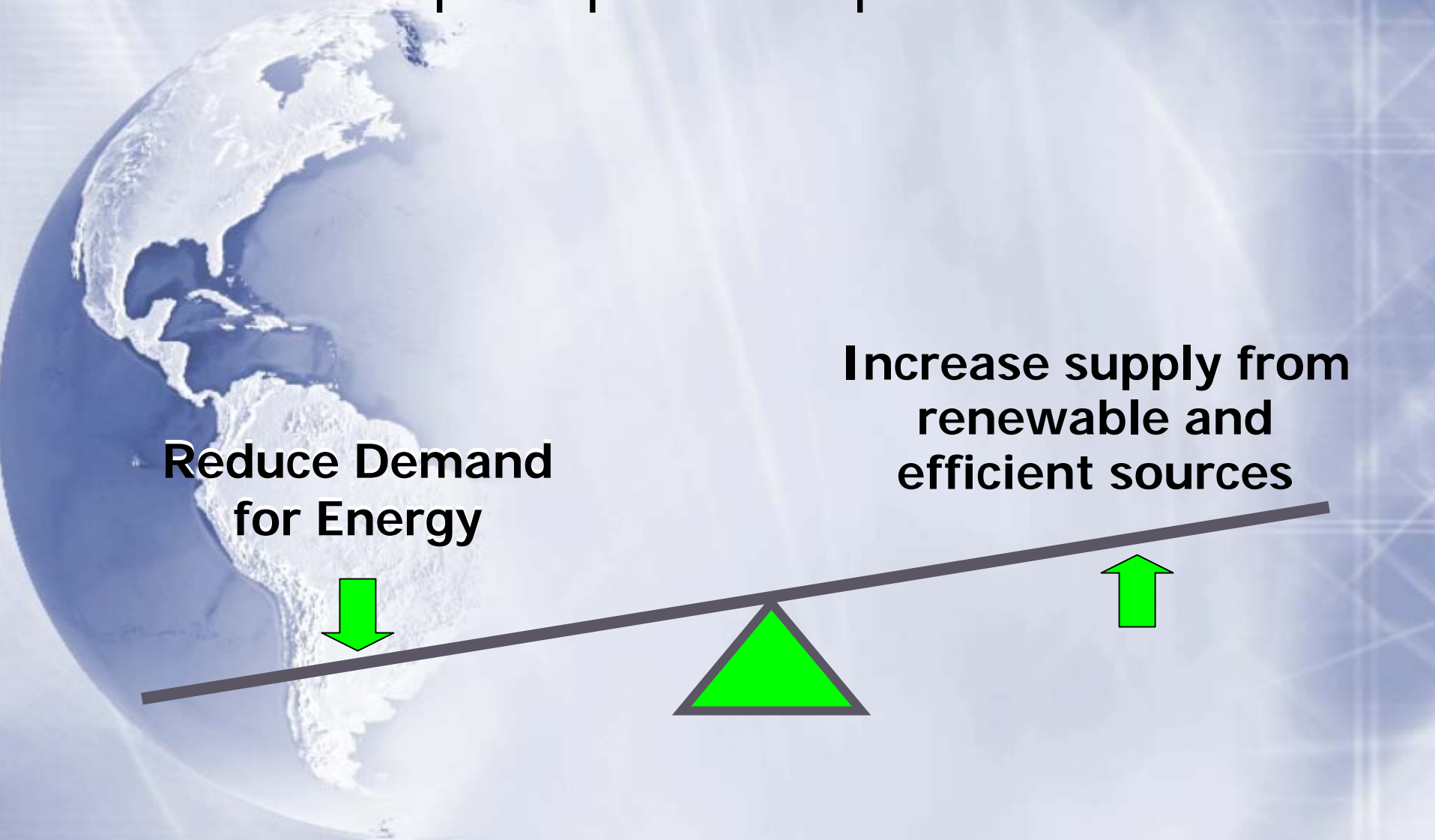


What principle underpins Part L?


**Reduce Demand
for Energy**




**Increase supply from
renewable and
efficient sources**



What are the main provisions of the Regulations for new dwellings?

- 
- a) Primary energy consumption and associated CO2 emissions
 - b) Renewable energy sources
 - c) Building fabric
 - d) Space and water heating
 - e) Boiler efficiency
 - f) Owner information

a) Energy consumption and CO₂ emissions

- 
- Performance criteria = relative primary energy consumption & CO₂ emissions values for proposed and reference dwelling
 - Reference dwelling is similar to the proposed dwelling in form but complies with Part L 2005
 - The reference dwelling has gas fired space and water heating
 - Energy Performance Coefficient EPC
 - Carbon Performance Coefficient CPC
 - Maximum permitted EPC and CPC is set to ensure 40% saving in both for each dwelling

b) Use of renewable energy sources

➤ 10 kWh/m²/annum thermal energy

OR

➤ 4 kWh/m²/annum electrical energy

OR

➤ A combination

Alternatively

➤ Combined Heat and Power

❖ *Supporting database on renewable products (solar, heatpumps, biomass) by SEI*

c) Building Fabric

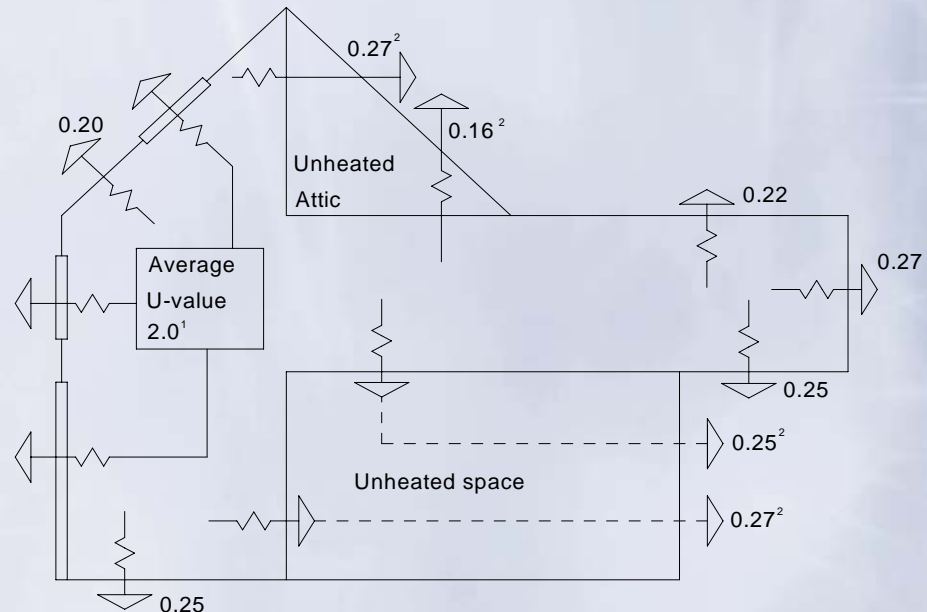
- Fabric insulation
- Thermal bridging
- Air infiltration



Building Fabric

Fabric insulation

- Area weighted average elemental u-values
- Area weighted average elemental u-value of doors, windows, rooflights reduced to 2.0 (opening area 25% of floor area)



Building Fabric

Thermal Bridging

- Demonstrate by calculation or by using accredited details that the all thermal bridges meet a table of acceptable values in TGD L
- Use alternative details that limit risk of mould growth and condensation using a calculation method for the temperature factor in TGD L
- Alternatively a more conservative multiplier

Building Fabric

Air Permeability/Tightness:

- Design approach
 - Primary air barrier
 - Accredited details
 - Inspection regime
- Limiting air infiltration – $10\text{m}^3/(\text{hr}\cdot\text{m}^2)$
- Pressure testing
 - typically 5%
 - greater for schemes < 40 ;
 - special provisions for schemes less than 3

d & e) Building Services

Boiler efficiency:

- Oil or gas fired boilers should have a seasonal efficiency should be not less than **86%** as specified in HARP → Condensing boiler
- Replacement boilers where practicable - an assessment document for existing dwellings



Building Services



Building Services Controls:

➤ controlling, as appropriate the demand for and output of space heating and hot water services provided

[broadly 2005 Part L for oil and gas]

➤ Support document covering range of systems and fuels to be published

Building Services



Insulation of pipes, ducts and vessels:

- limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air,
- broadly as existing TGD but pipes/ducts within fabric to be insulated

Building Services



Mechanical Ventilation Systems:

- Performance levels in GPG 268
- Specific Fan Power and Heat recovery efficiency specified
- Air permeability should be significantly better


f) User information

Operation and maintenance of the:

- Building
- Fixed Services



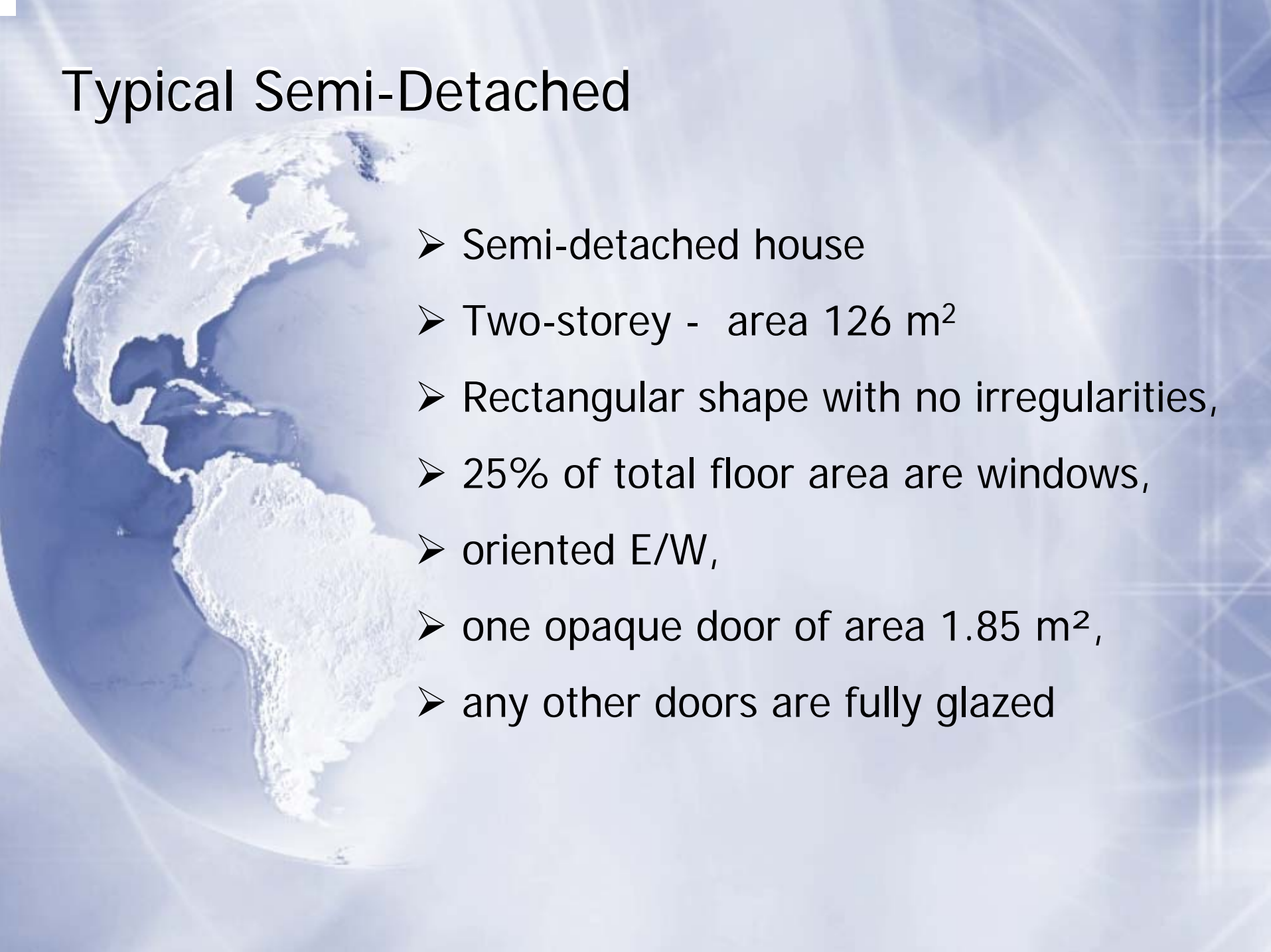
Compliance of completed dwelling

- 
- The completed building must comply
 - Checks and inspections on
 - fabric insulation
 - air permeability
 - thermal bridging
 - Heating systems should be commissioned to facilitate efficient operation.

What measures are needed for a typical dwelling to comply with Part L 2007?



Typical Semi-Detached

- 
- Semi-detached house
 - Two-storey - area 126 m²
 - Rectangular shape with no irregularities,
 - 25% of total floor area are windows,
 - oriented E/W,
 - one opaque door of area 1.85 m²,
 - any other doors are fully glazed

Solar Water Heating System
Flat Plate
Area 3.8m²
Orientation SE/SW at 30°
Radiators, Programmer,
Cylinder 250l
75mm Insulation

No Chimney
Gas fire, closed front
Balanced flue

Roof: $u=0.20 \text{ W/m}^2\text{K}$

Natural Ventilation
3No. Extract Fans
Air Permeability 0.4ac/h

Walls: $u=0.25 \text{ W/m}^2\text{K}$
Thermal Bridging
Multiplier = 0.08

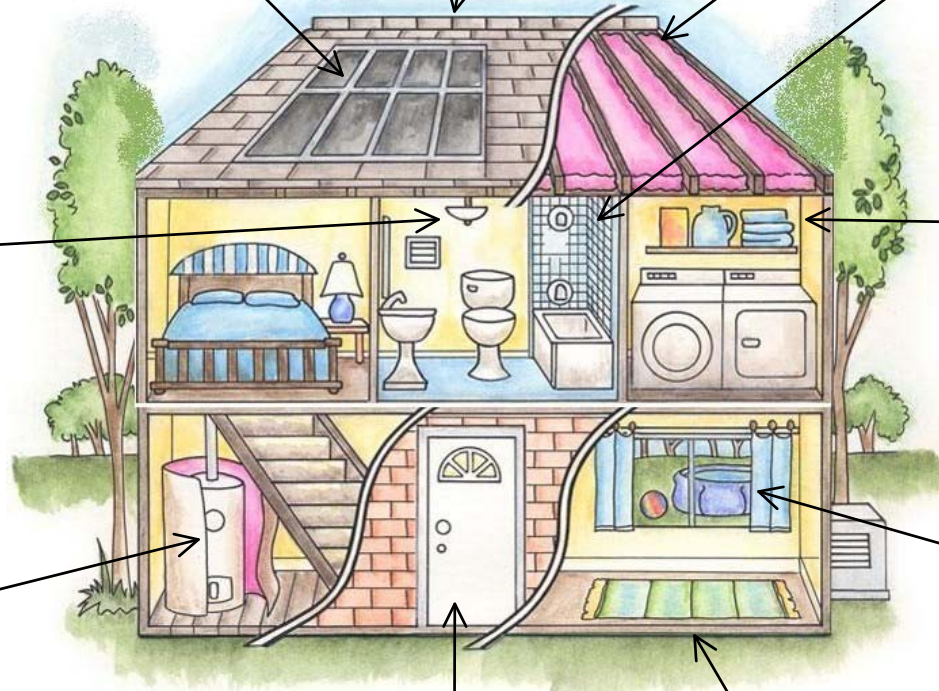
Windows: DG, LowE,
16mm Gap, Argon
filled, wood frames
 $u=1.7\text{W/m}^2\text{K}$

Floor: $u=0.15 \text{ W/m}^2\text{K}$

Doors: $u=3.0 \text{ W/m}^2\text{K}$

**75% Low energy
lighting**

Gas condensing boiler
Radiators,
Programmer, Room
Thermostat, TRVs,
Boiler interlock



Typical Semi-Detached to Part L 07 - Solution



Primary energy

90 kWh/m²/y

CO₂ emissions

18 kg/m²/y

EPC

0.60

CPC

0.55

Summary

Regulations require new dwellings:

- 40% better than 2005 Regulations
- Incorporate renewables
- Limit heat loss
- Incorporate efficient and controlled heating systems
- Accompanied with owner information

THANK YOU



FOR YOUR ATTENTION