Training Seminar

Evaluation of energy efficiency trends and potentials

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Estimation of household energy consumption by end-use

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Household energy consumption by end-use: who produces the information?

- 4 countries do not have energy consumption data split by main end-use for households: Belgium, Ireland, Portugal and Luxembourg;
- In addition, breakdown of electricity consumption by main appliance not available for 3 more countries Spain, Finland,and Norway; data for France, Sweden and Italy are not updated
- Limit to a good assessment of energy efficiency trends(ODEX))
- Need to transfer/exchange of experience among countries
- Survey on 10 countries :100% rate of answer

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Household energy consumption by end-use: who produces the information?

A variety of situation

Producer of information	Administration	Consultant (for administration)		Agency, Utilities Association Others
Main end-uses	Austria, Denmark, Norway, Finland (heating only)	France, UK, Sweden		Italy, Netherlands Greece, Germany,
Electrical appliances	Austria, Norway	Denmark, UK, France (3 categories: cold appliances, washing appliances and lighting)		*Italy* (until 1999), Greece, Germany,

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Methodology of production of household consumption by end-use?

Use of modelling in half of the countries; methods rather similar but more or less sophisticated

Methodology	Fuel Allocation	Estimates	Modelling
Main end-uses	Germany, Denmark	Netherlands, Greece, Sweden, Italy	Austria, UK, France, Norway, Finland
Electrical appliances	Germany (lighting, motive power and ICT	Netherlands, Greece	Austria, Denmark, UK, Norway

What data are used for the modelling / estimates of household consumption by end-use?

Methodology	Stock of appliances	Specific consumption	Other	
Main end-uses	Norway, Netherlands, France, UK, Austria, Greece, Italy	Norway, Netherlands, France	Norway, France, UK, Italy	
Electrical appliances	Greece, UK, Netherlands, Denmark	Greece, UK, Netherlands, Denmark		

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*Source of data used for the modelling / estimates of household consumption by **main end-use**?:*

4 countries rely on annual panels: UK (20 000), France (4 000), Netherlands (3 000), Sweden (9 000)

Source of data	Stock of appliances	Specific consumption		
National Household survey	France, Austria (every 2 years), Greece (every 10 years), Italy			
Panels	UK, France, Netherlands, , Denmark, Norway (one year), Sweden (heating)	UK, France, Netherlands , Denmark, Norway (one year)		

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Source of data used for the modelling / estimates of electricity consumption by electrical appliance?

Source of data	Stock of appliances	Specific consumption
Household survey	Netherlands, France, UK,Austria (2 years), Greece (10 years), Denmark	
Panels	UK (GfK), Netherlands, Denmark	UK (GfK), Denmark (estimates)
Estimates		Greece, Denmark , Netherlands

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What can be done to improve the data availability for countries with limited data

- Breakdown by main end-use : heating, cooking, hot water and others
  - Fuel allocation method as it is simple and not costly
  - Allocation shares for each fuel can be based on existing survey ,even quite old (e.g Eurostat survey), and from allocation for similar countries
  - Allocation shares to be defined for each fuel at normal climate
  - Allocation to be calculated for each fuel, first at normal climate, then at real climate of the year
  - Electricity most difficult : use of appliance stock and unit consumption

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Methodology of fuel allocation by end-use?

	LPG	Oil	Gas	Heat	Coal	Lignite Peat	Wood	Elec
Heating								
Cooking				X	X	X	X	
Water heating								
Others	X	X	X	X	X	X	X	

- % water heating/space heating in total heating+water heating can be specified exogenously for wood, coal, lignite and peat
- electricity : most difficult

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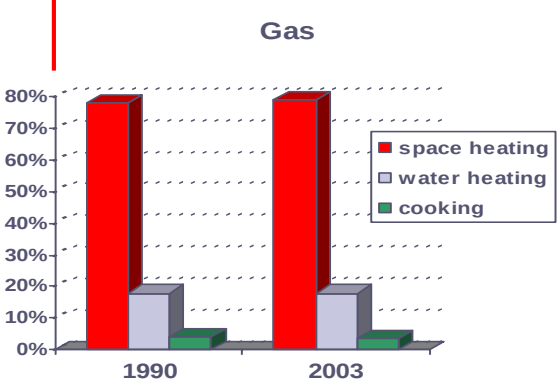
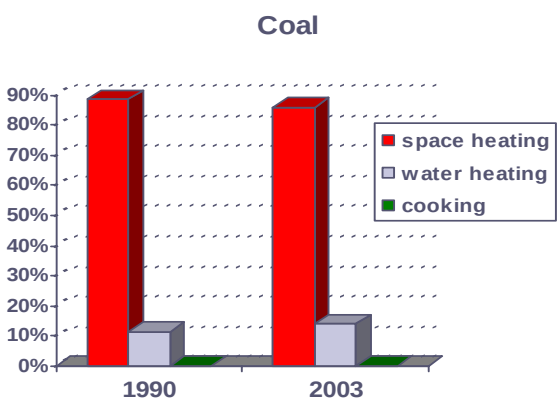
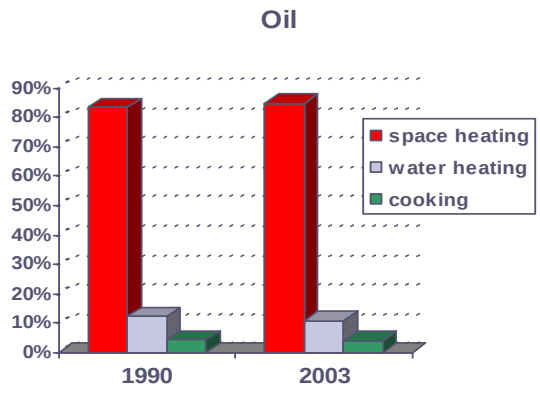
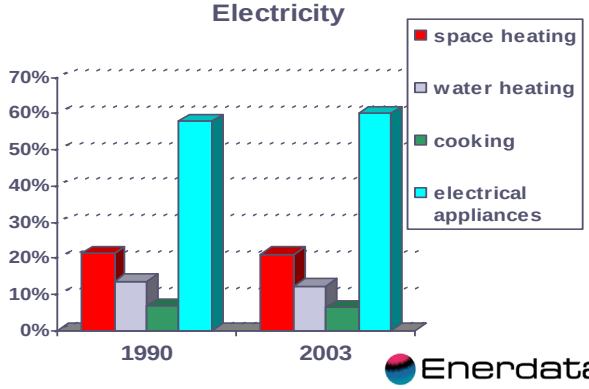
Example of allocation by end-use









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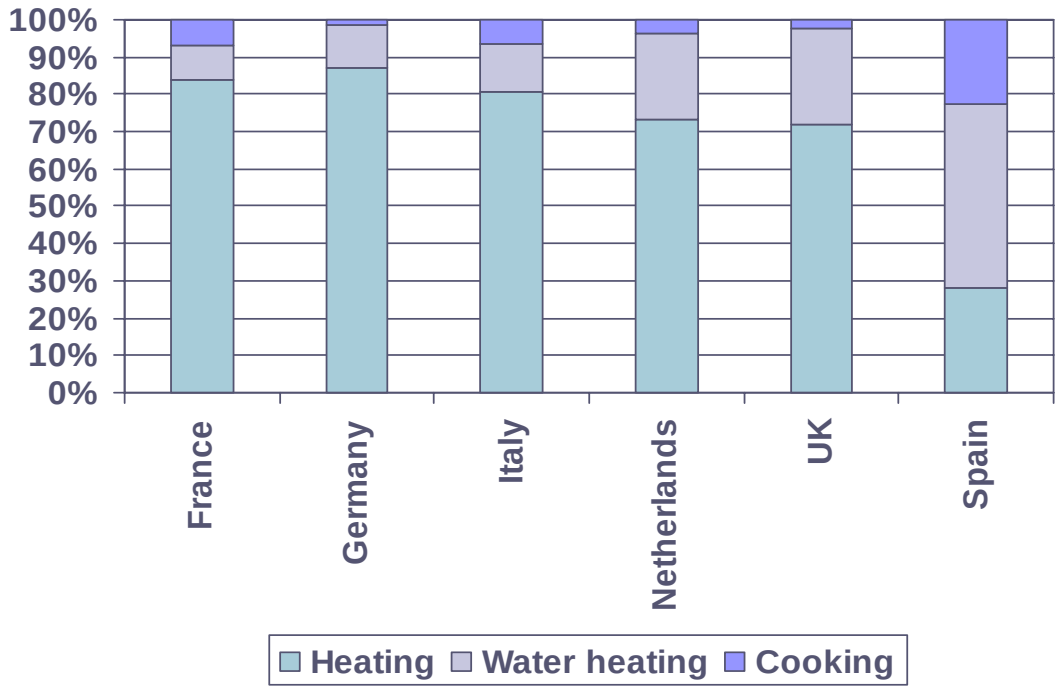
Example of allocation by end-use: case of gas



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What can be done to improve the data availability for countries with limited data

- **Breakdown of electricity consumption by main appliance**
  - Estimate through simple modelling on Excel of the consumption of cold appliances (refrigerators & freezers) , washing machine and possibly dishwashers
  - Modelling similar to the MURE/ E_Grids modelling) on the basis of :
    - Stock
    - Annual sales
    - Market share of labels A, B…
    - Specific consumption by label category (from average or Monitor study)

- Enerdata will provide a model on Excel

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Modelling of the consumption of large appliances

Sales of appliance by labels class (%)		1990-1992	1995	1996
A		1,8	3,8	5,5
B		8,1	19,8	23,7
C		16,2	28,8	28,8
D		24,7	21,7	17,8
E		24,0	12,1	11,1
F		15,6	8,0	8,0
G		9,5	5,7	5,1
		100,0	100,0	100,0
Unit consumption of new appliance	kWh/year	450	439	430
Stock	1000		224316	225696
Sales	1000			16334
Stock Energy Cons	GWh		118400	117980
Unit consumption of appliance stock	**kWh/year**		**530**	**523**
Label class	KWh/eqVol-y	kwh/yr		
A	0,79	253		
B	1,07	352		Calculated
C	1,28	429		
D	0,87	468		
E	0,88	476		
F	1,01	525		
G	1,50	601		
Life time	years	15		
Source: adapted from MURE/E-GRIDS (ISIS)				

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