Statistics on Energy Consumption in Households

Implementation of *Commission Regulation (EU) No 431/2014 of 24 April 2014 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics*

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Energy Community – 12th Energy Statistics Workshop

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Summary

- Introduction
- Obligations resulting from the amendment to ESR
- Questionnaire [ESH]
- Current situation [analysis of results from voluntary reporting for ref. years 2010-2014]
- Questions raised
- Recommendations in terms of data collection

Introduction – *setting the context*

- Eurostat amended the Energy Statistics Regulation (ESR – *Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics*) in 2014 in order to introduce a more detailed reporting of the *Final Energy Consumption* (FEC) in the *Residential / Households* sector
  - ✓ *Commission Regulation (EU) No 431/2014 of 24 April 2014*

- The amended Regulation introduces the obligation for *Member States (MS) / reporting countries* to provide details about **different types of end-uses** for *final energy* consumed by (residential) households
  - ✓ Annual reporting is mandatory for all MS / EEA States starting with reference year 2015 (deadline for transmitting the data to Eurostat is 30 November 2016)

Introduction – *reasoning*

- Need for more accurate and detailed data on the 'consumption side' due to recent evolutions:
  - ✓ Increase in the number of households and high demand for individual comfort
  - ✓ New electronic devices increasing the consumption of energy for charging 'small electronic equipment'
  - ✓ Need to monitor progress in terms of energy efficiency [*Energy Efficiency Directive* & *Heating and Cooling Strategy*]
  - ✓ Energy use and costs are of high interest not only for policy makers but also for the media and the public opinions!

  - ✓ *Art. 9* of ESR gives Eurostat and the members of the *European Statistical System* (ESS) the task of *improving the quality of […] final energy consumption statistics […] with a view to establishing breakdown keys for final energies by sector and main energy uses […]*

Introduction – *brief history of the proposal*

- Task Force 2008
  - ✓ Recomendation on requirements and evaluation of information available
- SECH Project (2009-2010)
  - ✓ Grants for investigating / developing the new data collection (17 MS participated)
- Preparation of a Manual (MESH) – published in November 2013
- Amendment of the ESR
  - ✓ Derogations granted to several reporting countries (BE, EE, EL, SK; exemption for IS)
- Questionnaire for reporting (ESH) developed

New obligations resulting from the ESR

- Disaggregation of the statistics on *Final Energy Consumption* (*FEC*) by **type of end-use**
  - ✓ *Residential / Households* sector (part of *Other sectors*)
    - *Space heating*
    - *Space cooling*
    - *Water heating*
    - *Cooking*
    - *Lighting and electrical appliances (electricity only)*
    - *Other end-uses*

- Reporting countries are in charge of collecting and validating the data taking into account their national / local specificities

- No harmonized reporting instructions but consistent and commonly agreed definitions in the ESR (*Annex A*) further detailed and explained in the MESH

ESH – questionnaire layout

- **ESH_AQ** (Energy Statistics for Households Annual Questionnaire)
  - ✓ *Cover* page
  - ✓ *Definitions* page
  - ✓ *Calorific values* (CV)
  - ✓ ***Table*** – automatic totals
  - ✓ 6 pages for entering data series (for each type of *end-use*)
    - *Space heating*
    - *Space cooling*
    - *Water heating*
    - *Cooking*
    - *Lighting and electrical appliances*
    - *Other end uses*
  - ✓ *Remarks* sheet
- To be transmitted to Eurostat via the eDamis single entry point (data collection flow ENERGY_ESH_A)

Questionnaire – *Cover page*

eurostat

Questionnaire for statistics on energy consumption in households

The following data concerning the energy consumption in households by type of end-use are reported according to *Regulation (EC) 1099/2008 on energy statistics* and its amendments.

Submission country: Other

If *'Other'*, please specify:

Contact details for the questionnaire at country level:

Name: Cristian Fetie

e-mail: Cristian.Fetie@ec.europa.eu

Telephone number:

Definitions | Space heating | Cooking
TABLE | Space cooling | Lighting and electrical appliances
Calorific Values | Water heating | Other end uses
Remarks

Member States of the European Union are asked to send this electronic questionnaire to Eurostat via the Single Entry Point (SEP) following the implementing procedures of **eDAMIS** (electronic Data files Administration and Management Information System).

Name of the electronic data collection: ENERGY_ESH_A

Should you have any questions regarding the functions of this file or other logistics please do not hesitate to contact:

Name: Cristian Fetie
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Telephone: +352 4301 37347

Submission country: Other

If *'Other'*, please specify:

Contact details for the questionnaire at country level:

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Questionnaire – *Definitions*

DEFINITIONS OF TERMS USED IN THE ANNUAL QUESTIONNAIRE ON ENERGY CONSUMPTION IN HOUSEHOLDS	Back to Cover

Households / Residential sector	*Household* means a person living alone or a group of people who live together in the same private dwelling and sharing expenditures including the joint provision of the essentials of living. The *household sector*, also known as the *residential* (or domestic) sector is therefore, a collective pool of all households in a country. To be reported are fuels consumed by all households including "households with employed persons". This should cover *NACE Divisions 97 and 98*, as defined for "*Other sectors – Residential*" in the other annual energy questionnaires (*Coal*, *Natural gas*, *Electricity and heat*, *Oil and petroleum products* and *Renewables and wastes*). Collective residences which can be permanent (e.g. prisons) or temporary (e.g. hospitals) should be excluded as these are covered by consumption in the *Service sector*. Energy used in all transport activities should be reported in the *Transport sector* and not in the *Households sector*. Energy consumption associated with significant economic activities of households should also be excluded from the total household energy consumption. These activities include agricultural economic activities on small farms and other economic activities carried out in a household's residence and should be reported in the corresponding sector.

The following specific definitions apply for this questionnaire:

<u>Energy consumption in households – end uses</u>

Space heating:	This energy service refers to the use of energy to provide heat in an interior area of a dwelling.
Space cooling:	This energy service is referred to the use of energy for cooling in a dwelling by a refrigeration system and/or unit. Fans, blowers and other appliances not connected to a refrigeration unit are excluded from this section, but should be covered in the *lighting and electrical appliances* section.
Water heating:	This energy service is referred to the use of energy to heat water for hot running water, bathing, cleaning and other non-cooking applications. Swimming pool heating is excluded, but should be covered in the *other end uses* section.
Cooking:	This energy service is referred to the use of energy to prepare meals. Appliances for auxiliary cooking (microwave ovens, kettles, coffee makers, etc.) are excluded; they should be covered in the *lighting and electrical appliances* section.
Lighting and electrical appliances (electricity only):	Use of electricity for lighting and any other electrical appliances in a dwelling not considered within *other end uses*.
Other end uses:	Any other energy consumption in households such as use of energy for the outdoor and any other activities not included into the five energy end-uses mentioned above (e.g. lawn mowers, swimming pool heating, outdoor heaters, outdoor barbecues, saunas etc.).
Total Residential / Households	This aggregate is the sum of all end uses detailed above: it represents the consumption of the respective fuel in the households sector (for **space heating, space cooling, water heating, cooking, lighting and electrical appliances** and **other end uses**). This figure should be equal (for each fuel or energy product) to what is reported under *Final energy consumption*, for *Other sectors – residential* in the respective annual questionnaires.

Questionnaire – *CV*

CV units are identical to those mentioned in the *Regulation* (and in the joint annual questionnaires)

Final Energy Consumption in the Residential / Households Sector by type of end use

Calorific values

Product		Unit	2010	2011	2012	2013	2014
ELECTRICITY							
DERIVED HEAT							
GAS							
SOLID FUELS		MJ/t					
TOTAL OIL & PETROLEUM PRODUCTS		MJ/t					
Of which:	*LPG*	*MJ/t*					
	Other kerosene	*MJ/t*					
	Total gas/diesel oil	*MJ/t*					
TOTAL RENEW. & WASTES							
Of which:	*Solar thermal*						
	Solid biofuels excluding charcoal						
	Biogases						

Questionnaire – *End-uses*

Same units as in the *Joint Energy Annual Questionnaires* / ESR

New reference periods are added each year, when the annual questionnaire is published and sent to the reporting countries.

Lighting and appliances						
Product	**Unit**	**2010**	**2011**	**2012**	**2013**	**2014**
ELECTRICITY	GWh	256 355,074	248 855,736	257 215,956	278 304,936	259 594,404

Product	**Unit**	**2010**	**2011**	**2012**	**2013**	**2014**
ELECTRICITY	GWh	91 423,831	71 420,856	81 312,387	89 116,376	65 764,735
DERIVED HEAT	TJ	57 807,877	103 241,599	96 755,630	143 425,992	123 584,801
GAS	TJ (GCV)	2 189 551,887	1 607 124,493	1 970 918,061	1 973 648,823	1 582 693,866
SOLID FUELS	kt	2 086,572	1 886,757	1 620,625	1 853,740	1 595,739
TOTAL OIL & PETROLEUM PRODUCTS	kt	12 597,010	10 237,913	10 871,450	12 017,499	9 707,946
Of which: LPG	*kt*	*1 337,620*	*1 071,997*	*1 073,121*	*1 134,481*	*889,826*
Other kerosene	*kt*	*2 179,672*	*1 623,107*	*1 830,364*	*1 787,059*	*1 601,755*
Total gas/diesel oil	*kt*	*8 827,971*	*7 497,110*	*7 843,689*	*9 152,252*	*7 175,028*
TOTAL RENEW. & WASTES	TJ (NCV)	616 517,042	551 554,246	596 767,494	771 152,946	675 900,758
Of which: Solar thermal	*TJ (NCV)*	*4 382,458*	*4 335,996*	*4 199,100*	*4 744,218*	*4 442,483*
Solid biofuels excluding charcoal	*TJ (NCV)*	*602 625,215*	*537 824,935*	*582 965,774*	*756 007,533*	*662 011,242*
Biogases	*TJ (NCV)*	*5,794*	*20,487*	*22,391*	*29,353*	*36,994*

Questionnaire – *Remarks*

REMARKS	Back to Cover

- **Gross inland deliveries**
  - Non-energy use
  - **Energy use**
    - **Final energy consumption**
      - Transformation
      - Energy sector
      - **Other sectors**
        - Transport
        - Industry
        - **Residential / Households**
          - **Space heating**
          - **Space cooling**
          - **Water heating**
          - **Cooking**
          - **Lighting and appliances**
          - **Other end-uses**
        - Agriculture & forestry
        - Fishing
        - Commercial & public services
        - Not elsewhre specified

Current situation – *first results*

- Voluntary reporting for reference years 2013 and 2014 (and historical series back to 2010 when available)
  - ✓ 14 reporting countries participated (incl. *Energy Community Contracting Parties* AL and XK)
  - ✓ Reported data published on Eurostat's website
- Most reporting countries did provide data for all reference years 2010 to 2014
  - Some of them only participated during the first year (ref. 2013)
- Figures are globally consistent with the aggregated data reported in the joint energy annual questionnaires (AQ's)

Current situation – *consistency*

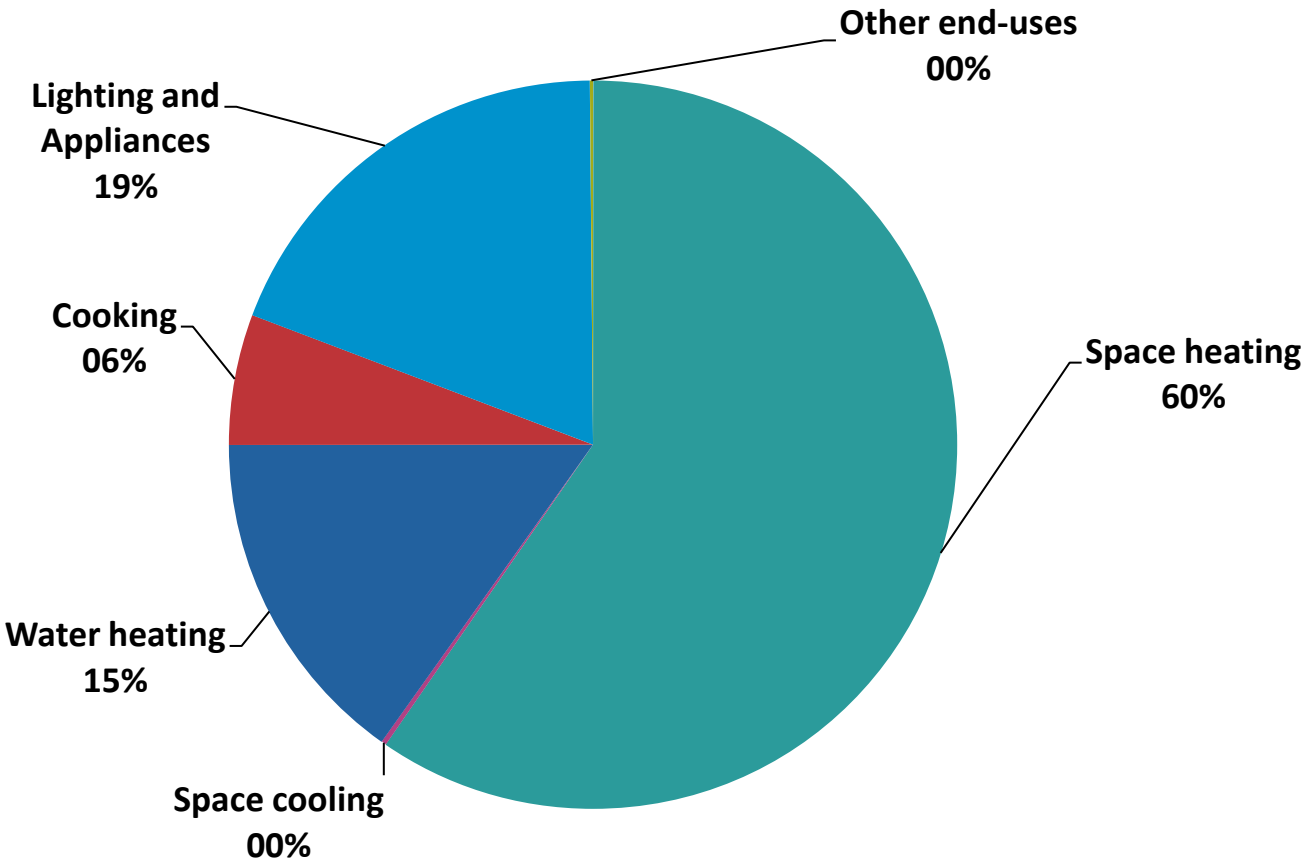
Energy product	Total *Final Energy Consumption* in the *Residential / Household* sector (ref. year 2014) (*)		
	Data reported in joint energy annual questionnaires	Data reported in ESH questionnaire (voluntary)	Difference (%)
Electricity	409 581	408 863	99,8%
Derived heat	153 604	153 554	100,0%
Gas	2 125 093	2 125 344	100,0%
Solid fuels	1 793	1 792	99,9%
Total Petroleum Products (without biofuels)	12 757	12 748	99,9%
Liquified petroleum gas (LPG)	*2 683*	*2 683*	*100,0%*
Other kerosene	*2 052*	*1 915*	*93,3%*
Total gas/diesel oil (blended with bio components)	*7 995*	*8 015*	*100,2%*
Renewables	752 139	762 432	101,4%
Solar thermal	*21 469*	*20 035*	*93,3%*
Solid biofuels (excluding charcoal)	*728 930*	*730 288*	*100,2%*
Biogas	*45*	*45*	*100,8%*

(*) - Comparison made on data available from 11 MS (AT, BG, EE, ES, LU, NL, PT, RO, LV, SI, UK)

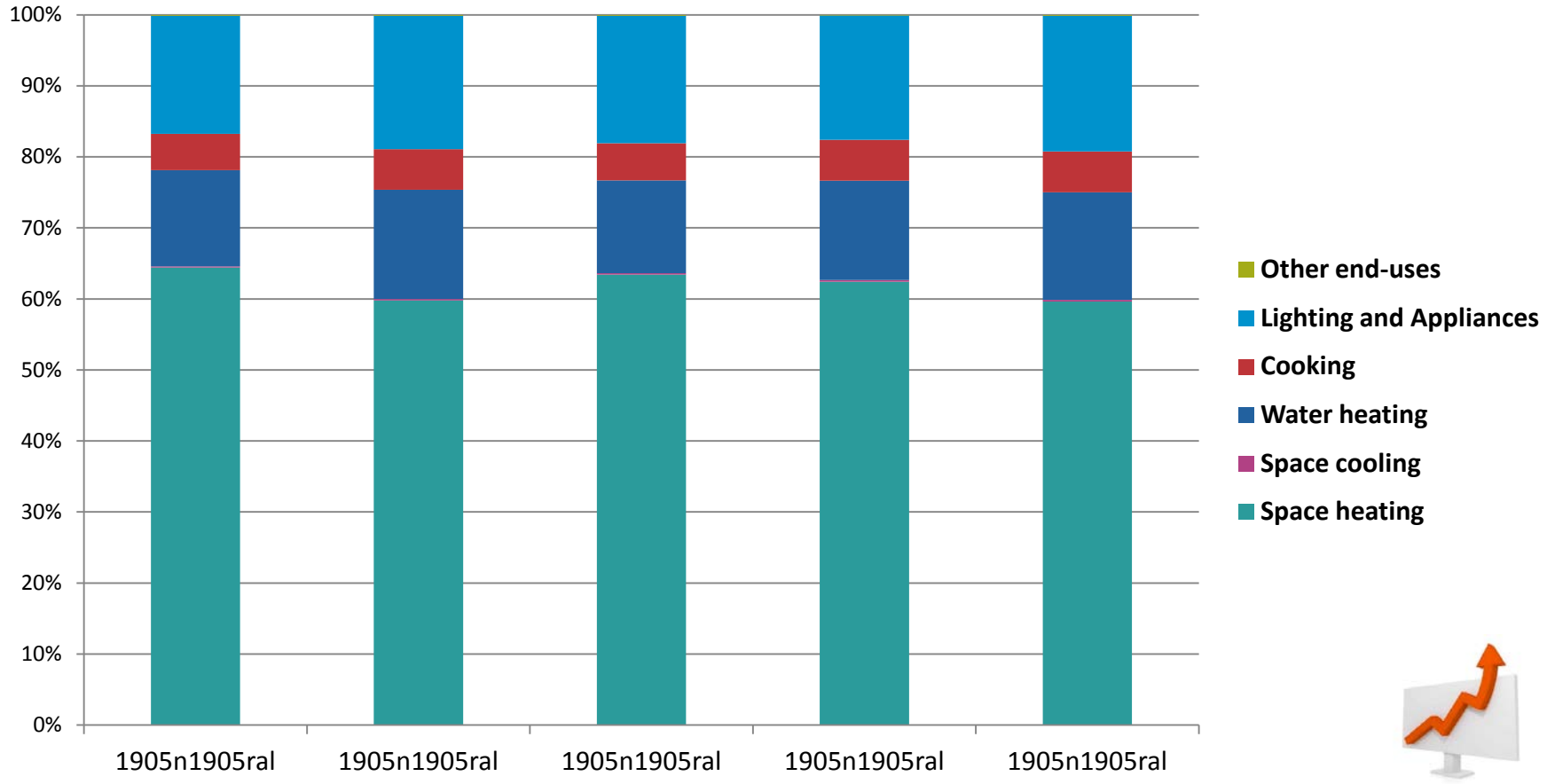
Current situation – *representativity*

Share of EU28 *Final energy consumption* (FEC) in the *Residential* sector already detailed by type of end-use (ref. year 2014)			
Energy product	**EU28 total FEC in *Residential / Household* sector**	**Data available from voluntary submissions (*)**	**%**
Electricity (GWh)	785 157	408 863	52,1%
Derived heat (TJ)	854 386	153 554	18,0%
Gas (TJ-GCV)	4 287 588	2 125 344	49,6%
Solid fuels (kt)	16 485	1 792	10,9%
Oil & Petroleum Products (kt)	32 447	12 748	39,3%
Liquified petroleum gas (LPG)	*5 229*	*2 683*	*51,3%*
Other kerosene	*2 735*	*1 915*	*70,0%*
Total gas/diesel oil	*24 261*	*8 015*	*33,0%*
Renewables (TJ)	1 677 750	762 432	45,4%
Solar thermal	*66 209*	*20 035*	*30,3%*
Solid biofuels (excluding charcoal)	*1 606 410*	*730 288*	*45,5%*
Biogas	*1 751*	*45*	*2,6%*
Total products (TJ-NCV)	*11 020 281*	*4 895 868*	*44,4%*
(*) - Data available for 11 MS (AT, BG, EE, ES, LU, NL, PT, RO, LV, SI, UK)			

FEC in households by type of end-use (2014 ref. year, voluntary reporting)



FEC in households by type of end-use – evolution since 2010 *(based on voluntary reporting)*



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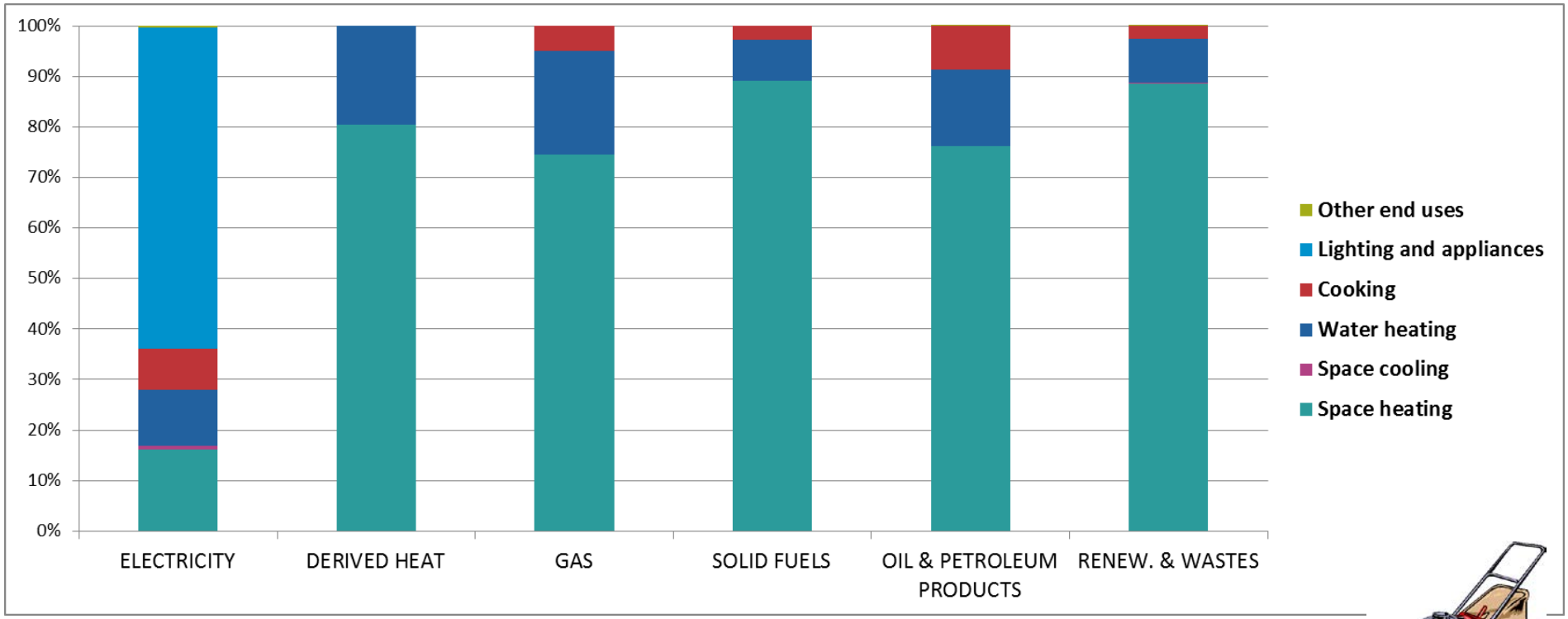
FEC in households by type of end-use and energy product (2014 ref. year, voluntary reporting)



Questions raised (1)

- Holiday houses / secondary dwellings
  - ✓ *Issues*: difficult to survey, consumption pattern might be very different than for main homes
  - ✓ High importance for some countries, less for others
  - ✓ Need to include such consumption in order to ensure consistency with joint energy annual questionnaires (top-down approach)
- Lack of activity data for modelling or estimates
- Annual reporting ≠ annual survey / data collection
  - ✓ However, high quality data is expected: use all data sources available, regular surveys and revision of factors related to technical features should be undertaken
  - ✓ Consistency with other relevant data is important (especially with similar data transmitted through the joint energy AQ's)

Questions raised (2)

- No harmonization of data collection across MS
  - ✓ Comparability of figures might be challenged
  - ✓ Not yet any detailed information on the different processes applied to collect / calculate / estimate the data (in principle such information would only be available after the next quality reporting cycle, most probably by 2020-2021)

- Reversible heating / cooling systems
  - ✓ Issue: need to estimate which amount of energy has been used for each end-use (e.g. estimate based on HDD, number of hours for each purpose, etc.)
  - ✓ Easier if the device is only complementary to a 'main' heating / cooling system (to be reported under *electrical appliances*)

Questions raised (3)

- Heat pumps:
  - ✓ Do not [still] report heat produced [ambient heat captured] but only input energy (e.g. electricity used to power the pump)
- 'Common' / specific consumption in multi-appartment buildings [lift]
- Biogas mixed in the network
- Electrical appliances
- Waterbed heating [?!!!!]

Collecting the data

- No harmonized data collection [*principle of* '*subsidiarity*' applies]
- Essential to ensure the highest quality of the data provided while keeping the burden and cost under control
- All available methods shall be used depending on the actual situation in each country
- Availability of other data sources (admin data), business / household surveys already in place (and which can be modified accordingly), building of a model based on 'activity data', etc.
- Probably need for a global approach involving the use of several sources in order to get the best of each one

MESH – Manual for statistics on energy consumption in households

- Useful tool detailing the definitions provided in the ESR
  - ✓ Ensures a limited level of harmonization across reporting countries
- Provides **practical examples** of how to collect the data based on actual situations from several MS
- Includes explanations on various methods [*surveys*, *measurements*, *admin data*, *modelling*, etc.] and the necessary input for each of them

MESH
what the manual is not!

- Not an exhaustive list of methods to be used by reporting countries
- Not a harmonized and mandatory document serving as a list of reporting instructions for the subsequent data reporting
- Not a miracle solution – methods mentioned are not exclusive but rather complementary, in order to obtain the highest possible level of accuracy and consistency
  - **Resources and commitment are needed!**

Definitions (1)

- ***Private dwellings***
  - No collective residences which can be permanent (prisons) or temporary (hospitals, hotels, pensions,… prisons) => *service* sector
  - No energy used in transport activities (personal vehicle) => *transport* sector, where should ideally also be included the consumption for charging electric cars or bicycles at home.
  - No energy consumption associated with economic activities of households (agricultural economic activities on small farms, teleworking from home, etc.) => industrial or services sector
- **First challenge**: difficult to distinguish consumption from small home offices and similar uses from pure household (e.g. time dedication to home economic activity) => information that may be asked in the surveys in order to estimate economic energy use

Recommendations

- Not yet a clear view on how reporting countries collect / estimate the data
  - ✓ Only limited examples and theoretical approach
- Need to go beyond the Regulation
  - ✓ Nobody can tell exactly how much energy is consumed / delivered of cooking purposes!
- Collect data which allows a more detailed understanding of household energy use
  - ✓ Demographic and social variables
  - ✓ Dwelling variables
  - ✓ Energy technologies
  - ✓ Penetration of energy efficiency technologies
- Use various complementary methods to collect different pieces of information
  - ✓ Input for models

Useful information

- Examples of information to be collected
  - *Household characteristics*
    - Income, size, intensity of occupation (primary or secondary residence)
  - Housing stock characteristics
    - Type of dwelling, insulation, age
  - Expenditures
  - Type of equipment
    - Main heating system, air conditionning, age and category of electrodomestics
  - Use of renewables / sustainable systems
    - Solar panels, solar water heating, heat pumps, passive house
  - Information on habits of use of the equipment.

Topic	Description
Housing Stock Characteristics	Information on dwelling characteristics affecting energy consumption. These characteristics are: ownership type, dwelling type, age of building, insulation (wall, roof, window) availability, area heated / air-conditioned.
Household characteristics	Household characteristics affecting energy consumption (household size, income, intensity of occupation of the dwelling).
Consumption/Expenditure on Energy Commodities	Consumption and associated cost per type of energy commodity (electricity, heat, and major fuels).
Unit/specific consumption	Information on the energy consumption for energy services/uses compared to an indicator of activity (appliances, heating surface, air cooling surface, surface of house, etc.).
Energy Consumption by End-Use	The use of energy commodities by a household, in order to obtain a certain service (heating, cooling, hot water etc.). Five major energy end-uses are distinguished for the energy consumption in households: space heating, water heating, cooking, space cooling, and lighting and electrical appliances.
Space Heating	Information on the main / supplementary space heating system (fuel type, type of heating equipment, age of equipment); availability and type of temperature control instruments (thermostats).
Hot Water	Information on water heating equipment (fuel type, tank size, age). Information on the use of combi boilers (fuel type, age). Information on the Main Water Heating equipment (equipment providing most of the hot water to the dwelling) as well as on any secondary water heating equipment.
Penetration of Energy Efficiency Technologies	Penetration of eco-labeled appliances/equipment (by appliance type and energy classes). Improvement work (by type) carried out in the dwelling and its heating/cooling equipment with a view to an improved energy saving. Penetration of high efficiency condensing boilers and bulbs.
Cooking	Information on cooking equipment (fuel type, equipment type, age). Availability of cooking equipment along with types of fuels used for cooking in main and secondary cooking equipment. Age (in broad classes) of primary cooking equipment.
Air Conditioning	Information on air-conditioning equipment (type, age). Availability of air conditioning equipment (central system, number of individual units), its age as well as the availability of a thermostat for central system.
Electrical Appliances	Availability of electrical appliances (type, number, age). The age (in broad classes) may be limited to the main appliances
Energy Service Demand	Intensity of use of heating system and thermostat set-points during the heating period. Intensity of use of air-conditioning system and thermostat set-points during the cooling period.
Penetration of Renewable Energy Sources	Use of solar panels (surface / power, by type), biomass consumption (by type) and the penetration of heat pumps (type/power, electricity consumption).

Source: Eurostat 2008 Task Force and MESH team.

Methods of data collection *surveys*

- **Business surveys** [ask info from companies directly / indirectly involved in energy consumption in households]
  - Gas / electricity suppliers [aggregate consumption]
  - Sales of specific fuels
  - Sales of equipment [equipment manufacturers]
  - Maintenance companies [type of equipment that has been maintained during the year]
  - Knowledge of the consumer: companies may know if the final user is a private one or a SME, freelance,…
    - Fares, tax rates, meter identification
  - Data validation of household surveys
    - Use supplier information (gas meters)
- **Household survey**
  - Information on the patterns of use / equipment of the dwelling

Methods of data collection
use of administrative data

- ***Administrative data***
  - Data already available but not collected directly for statistical purposes *[derived from administrative sources before any processing or validation by the NSIs]*
  - Governmental (Energy tax, certificates, permits)
  - Energy supply companies (Bills)
  - Building registers, sales of specific equipment

Methods of data collection *modelling*

- Models serve *to make 'not available information' available*
  - Applying models help to reduce survey frequencies and in some cases to reduce sample size. This saves resources and helps to reduce respondents' burden
  - Due to the complexity of energy consumption, survey responses have to be validated
    - the survey is the first step and a model based data validation the necessary second step to get realistic consumption figures
- Risks
  - use unrealistic or outdated default values and/or assumptions
  - assumptions that appear quite reasonable but have not been tested may easily lead to an accumulation of errors
  - use default values from another country with different regional/national circumstances in case of unavailability of own data
  - No Stand-alone methodology — cannot be calculated without input data

Methods of data collection *in situ measurements*

- *In situ* measurement is a process by which very detailed measurements are taken in homes
  - ✓ Key instrument to improve the existing knowledge about actual energy use in the household sector
  - ✓ Detailed information on daily and hourly consumption of the household equipment, with distinction between seasons and types of days.
  - ✓ Determine a detailed understanding of a component of energy use, be it temperature, thermal efficiency or electricity [efficiency of insulation, of thermal equipment]
  - ✓ Better knowledge of the standby consumption
  - ✓ Better knowledge about the real electricity consumption by end uses
    - **types** of electronic appliances and lamps, **patterns of use** of electrical household appliances

Challenges (1)

- Representativity of data
  - Issue of regional supplier / dealer – no representative at national level
- Companies have sometimes better knowledge of the actual consumption than the customer himself
  - ✓ Need to validate the data
- Non-response rate (legal basis might be needed)
- Non-metered fuels (wood, coal): various suppliers for same customer
- Several entities holding similar information [who's the best 'client' for the survey?]
  - Risk of having duplication of answers

Challenges (2)

- Frequency vs. size of questionnaire
- Beware of the confidentiality of data
- Dependency on third parties, different definitions, legal barriers to the use of data
  - Efforts to set up the process (collaboration)

- Use of renewable energy sources in households (mainly fuel wood)
  - *Renewable Energies Directive* (2009/28/EC)
  - Complex field – non metered fuels, no 'cost', heterogenous
  - Guidelines providing methods to calculate the energy provided by renewable sources

Methods of data collection: *summary*

- Always be transparent
  - Inform the stakeholders on the objectives, the process and how the data will be used
  - Questions asked should be clear and precise
- Prepare the process
  - Train the participants, organize a pilot survey / test operation
- Validation of data
  - Involve experts, check the consistency, use several data sources or data collection methods
- Good data needs time
  - **Start asap!**

MESH:
some good practices and examples

EXAMPLE

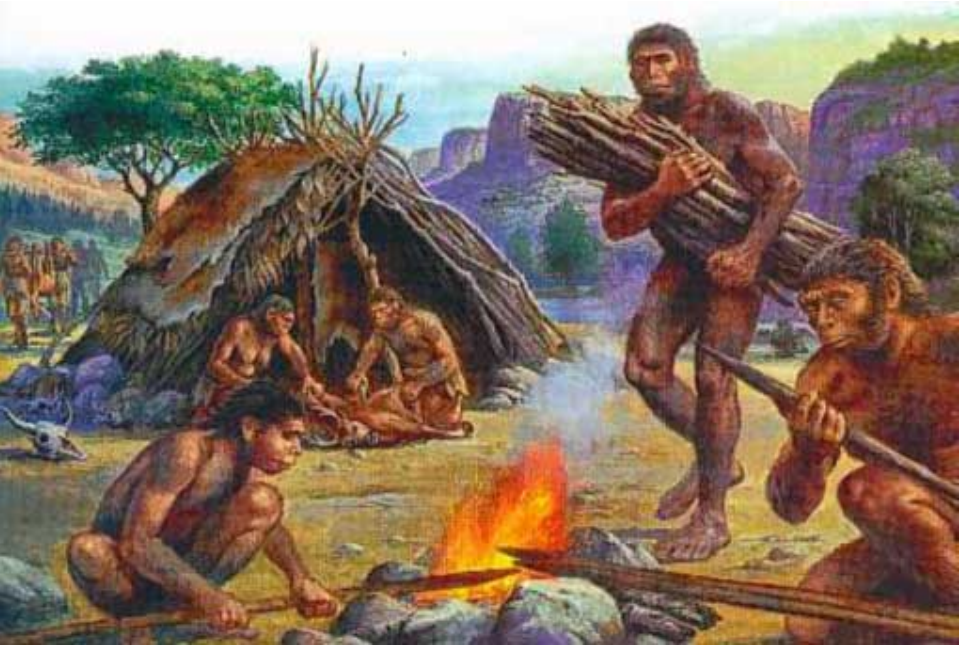
Data Collection Method	Good Practice
Business surveys	• Compilation of electricity data though use of surveys of suppliers (UK)
Households surveys	• Face to face Survey in the frame of the SECH-SPAHOUSECH project (Spain) • Mail survey: Electricity and natural gas consumption of households by purpose (Austria) • CATI/CAPI survey: Energy consumption of households (Slovenia) • Panel survey: Energy consumption of private households (Germany)
Use of administrative data	• Client registers of energy companies in the Netherlands • Administrative data of energy companies data: experience from other countries (United Kingdom, Spain) • Use of management information data from policies (United Kingdom)
Modelling	• The Cambridge Housing Model (UK) • Model based data validation procedure (Austria) • Model based estimation of energy consumption in second residences (Austria)
In situ measurements	• End Use Metering in 400 Households (Sweden) • Measurements of Electricity Consumption in the Household Sector (Spain) • Household Electricity Consumption by Purposes (Austria) • Best Practices' on *in situ* Thermal Measurements (UK) • Experiences with the collection of household temperatures • Experiences with *in situ* U-value measurements

Conclusion and further steps

- Use (all) data available before implementing new systems
  - ✓ Avoids duplication by using existing data
  - ✓ High level of accuracy and exhaustivity needs the use of several methods thus resources are important!

- Work has started on the further disaggregation of statistics on *Final Energy Consumption* in the *Industry* sector

Uses of energy in households



Thank you for your attention!

Questions?

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