



Third meeting of the project
“Monitoring of EU and national energy
efficiency targets” (ODYSSEE-MURE 2010)
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Overview of energy efficiency policies for buildings

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Definition of the building sector

By final energy consumption sector:

Residential + Tertiary sector

(residential and non-residential buildings)

By targeted end-uses:

- Space heating
- Hot water
- Space cooling
- Lighting



Today's presentation on policies for buildings

-
- Cooking
 - Electrical Appliances



Topic of the last Workshop in Slovenia
But: will be part of the building brochure

Important role of the building sector in EU energy and climate policy

EU Low Carbon Road Map from 8 March 2011

| GHG reductions compared to 1990 | 2005 | 2030 | 2050 |
|--|------|-------------|-------------|
| Total | -7% | -40 to -44% | -79 to -82% |
| Sectors | | | |
| Power (CO ₂) | -7% | -54 to -68% | -93 to -99% |
| Industry (CO ₂) | -20% | -34 to -40% | -83 to -87% |
| Transport (incl. CO ₂ aviation, excl. maritime) | +30% | +20 to -9% | -54 to -67% |
| Residential and services (CO ₂) | -12% | -37 to -53% | -88 to -91% |
| Agriculture (non-CO ₂) | -20% | -36 to -37% | -42 to -49% |
| Other non-CO ₂ emissions | -30% | -72 to -73% | -70 to -78% |

EU Energy Efficiency Plan 2011 from 8 March 2011

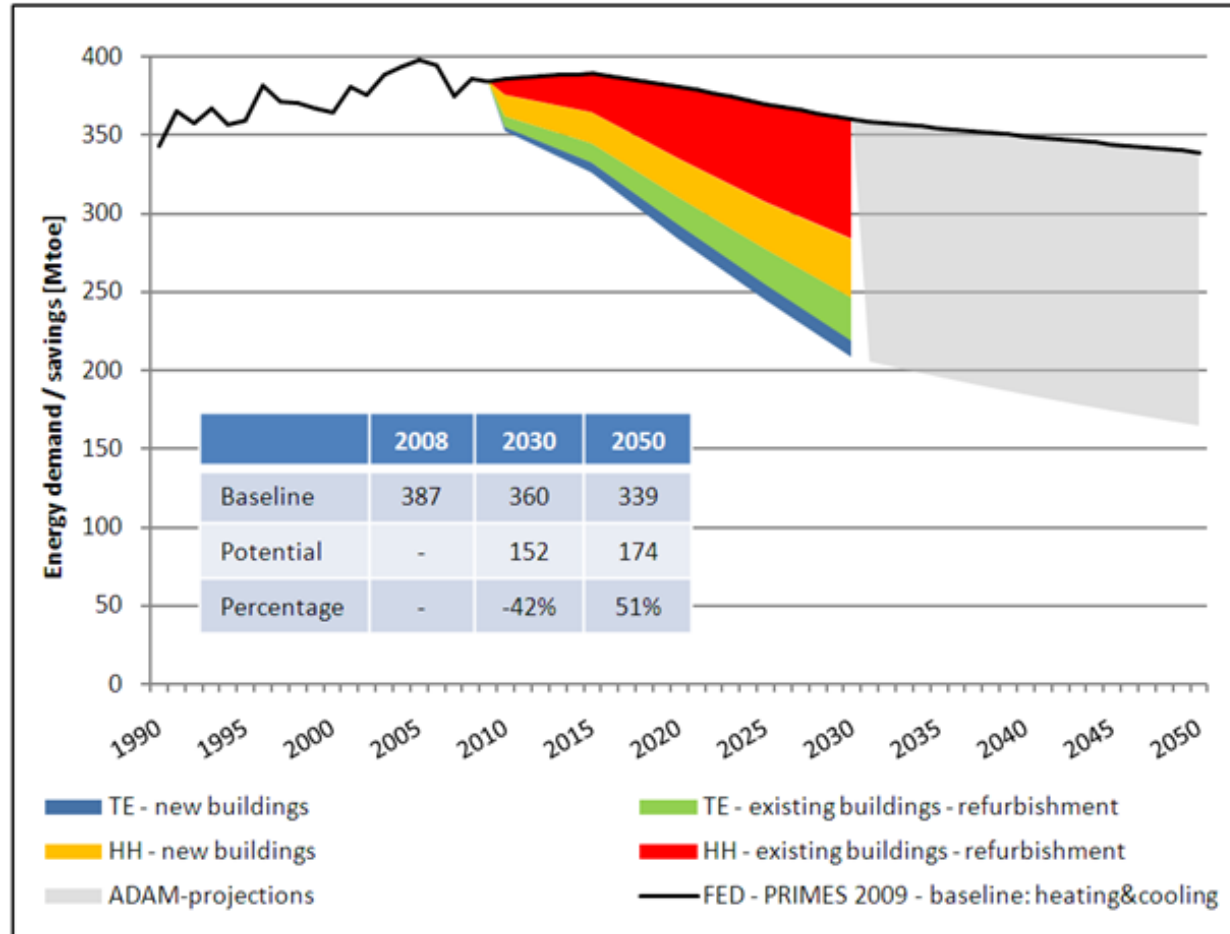
The greatest energy saving potential is stated for building →

- Increase the renovation of buildings (private and public)
- Improvement of components and appliances used in buildings
- Outstanding role of public buildings (again stressed in new ESD proposal)
- Energy Efficiency Obligations for utilities as an important instrument

Most important policy instrument for buildings at the level of EU:

EPBD 2002 (2002/91/EC) and EPBD recast 2010 (2010/31/EC)

Energy saving potentials of efficient building envelope in the household and tertiary sector, compared to PRIMES 2009 baseline for heating and cooling energy demand



Sources: Odyssee (hist. Data); PRIMES 2009 projections (EC 2010); ADAM projections; Energy Saving potential study (Fraunhofer ISI, Enerdata, ISI, WI 2009)

The EPBD 2002 and the EPBD recast 2010 in the MURE database

| Code | Title | Status |
|-----------------------|---|---------------------|
| CY9 | EU-related: Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) - Information, awareness policies for energy savings | Ongoing |
| DK32 | EU-related: Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) - Energy Labeling Buildings | Ongoing |
| EST1 | EU-related: Performance of Heat Generators for Space Heating/Hot Water (Directive 92/42/EEC) - Efficiency requirements for boilers | Ongoing |
| EST16 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy performance of buildings | Ongoing |
| EU58 | Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) | Ongoing |
| FRA48 | EU-related: Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) - RT 2012 | Ongoing |
| GER68 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Savings Ordinance - revised version (EnEV revised) | Ongoing |
| GER67 | EU-related: Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) - Energy Savings Ordinance - revision 2012 | Proposed (advanced) |
| HUN27 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy review of heat producing sets and air conditioning systems | Ongoing |
| ITA24 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Performance of Buildings | Ongoing |
| RO25 | EU-related: Energy Performance of Buildings (2002/91/EC) - Energy Performance of New Buildings-building code | Ongoing |
| RO30 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Performance of existing Buildings-obligatory energy efficiency certificates | Ongoing |
| SPA36 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Technical Building Code (CTE) | Ongoing |
| SPA34 | EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Action Plan 2008-2012: Revision of the energy demands in the building regulations | Ongoing |

Search criteria:

All countries
EU measure

Type:

legislative-normative

Targeted end-use:

Space heating

Ideal result:

(>)2 measures for each country + EU

Possible reasons for non-ideal result:

- Measure not incl.
- Measure not linked as EU measure
- „Targeted end-use“ not filled-in

Policy measures for buildings in the MURE database

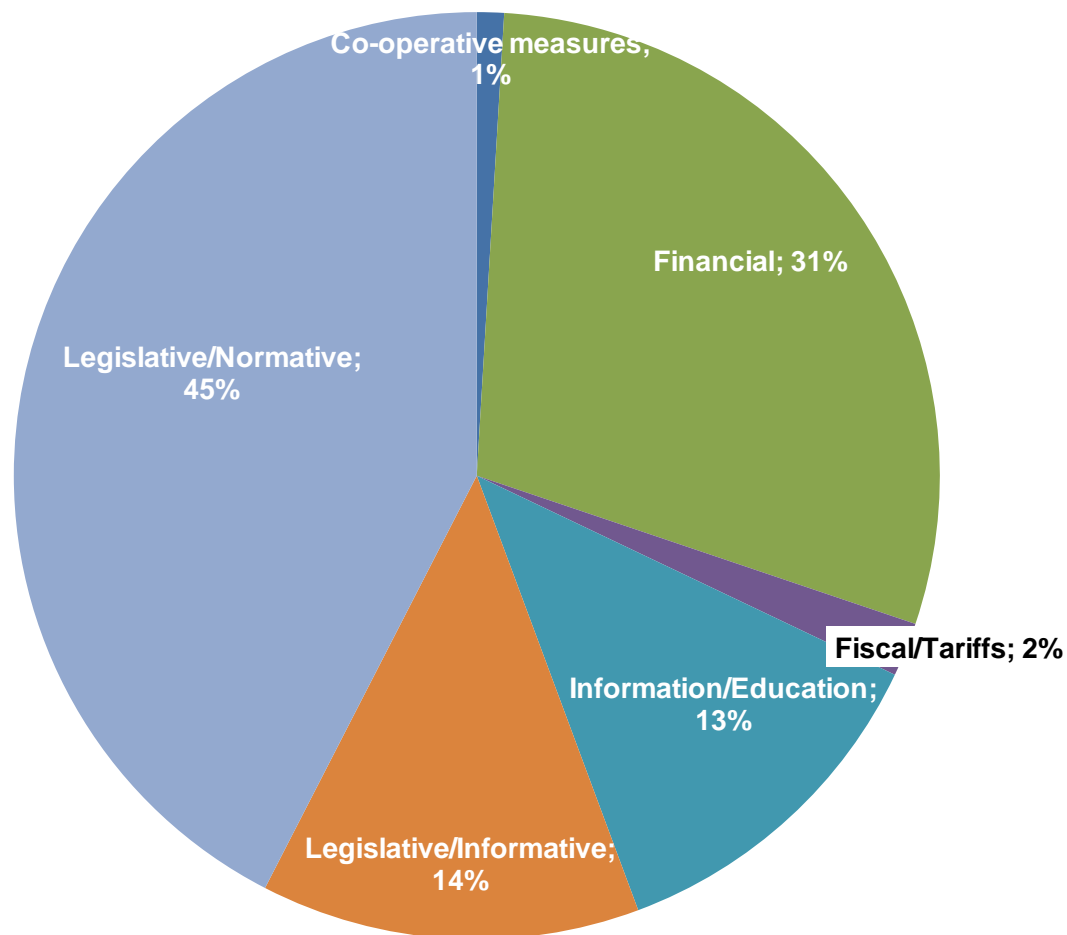
- Status: end of September 2010, i.e. after first update
- Measures from NEEAP1 are included, but not measures from NEEAP2
- New features have been added to MURE soon before the 1st update and **all** measures have to be adapted to the new features → this should be finalized with the 2nd update.
- Definition of the building sector in the following slides:
Electrical appliances could not always be excluded since the targeted end-uses were not fully updated. Main focus on households.
- No results from the new quantitative evaluation table since the 1st NEEAP did not include enough information → but for the building brochure this information is necessary (from 2nd NEEAP?).



MURE offers a lot of possibilities for the quantitative and qualitative analysis of policy measures, but only if all relevant measures are included, categorized correctly and described comprehensively.

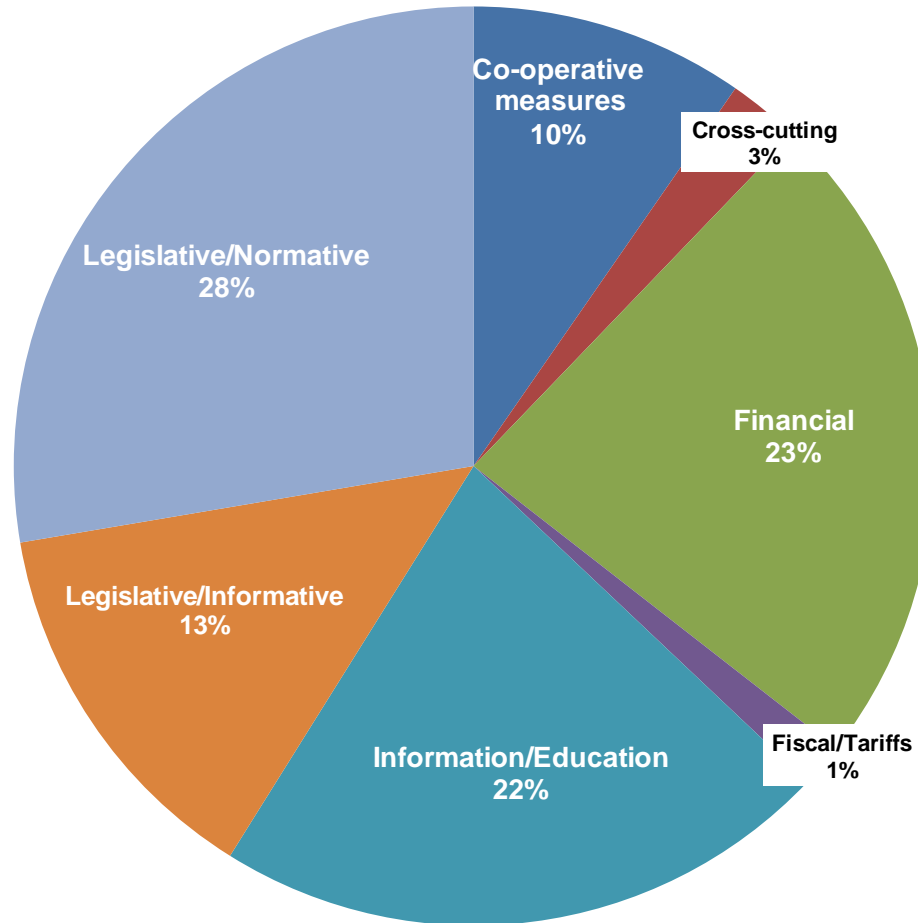
Measures in the household sector by type – all countries

Share of legislative + financial measures: 90%

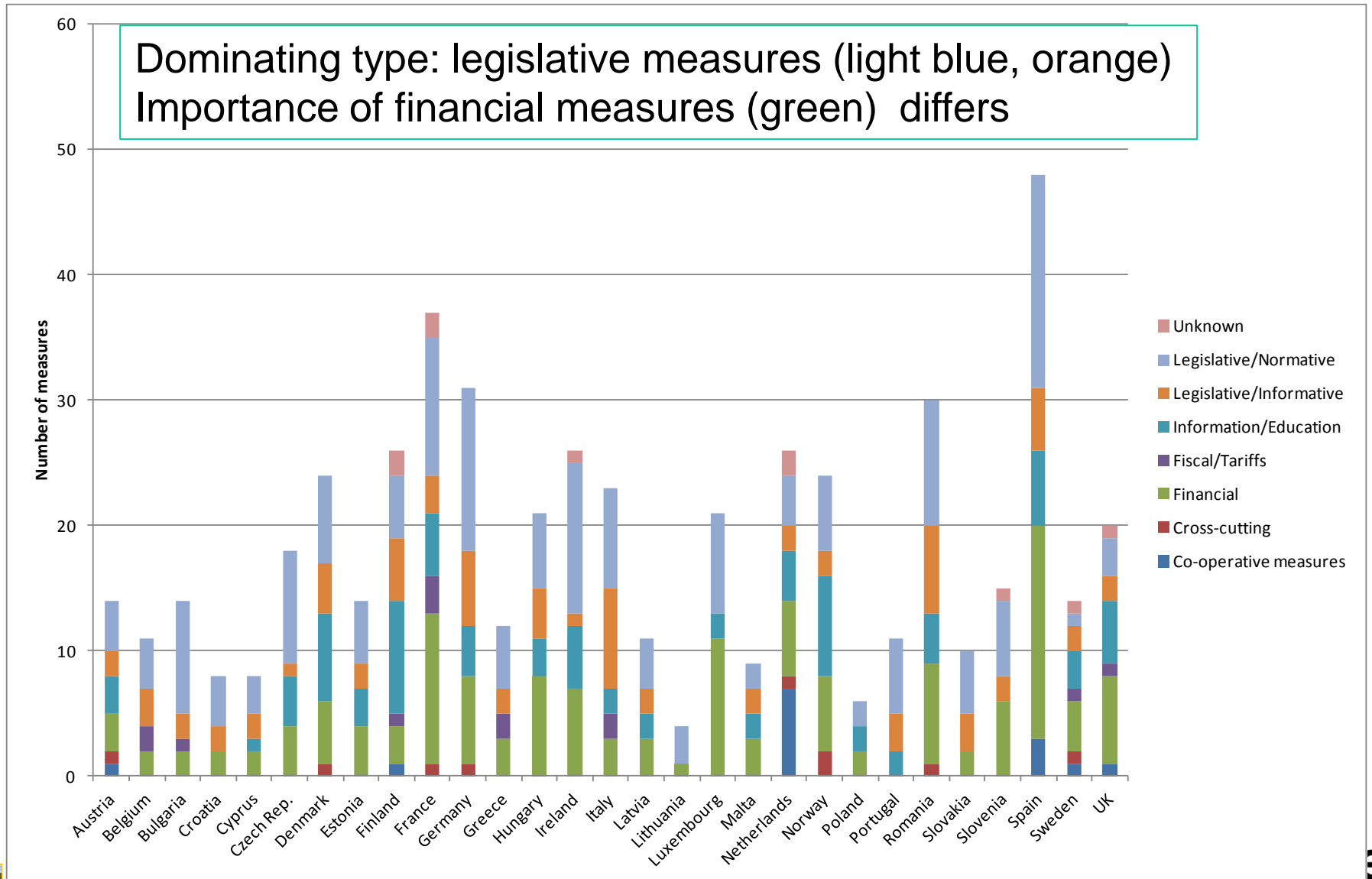


Measures in the tertiary sector by type – all countries

Share of legislative + financial measures: 64%

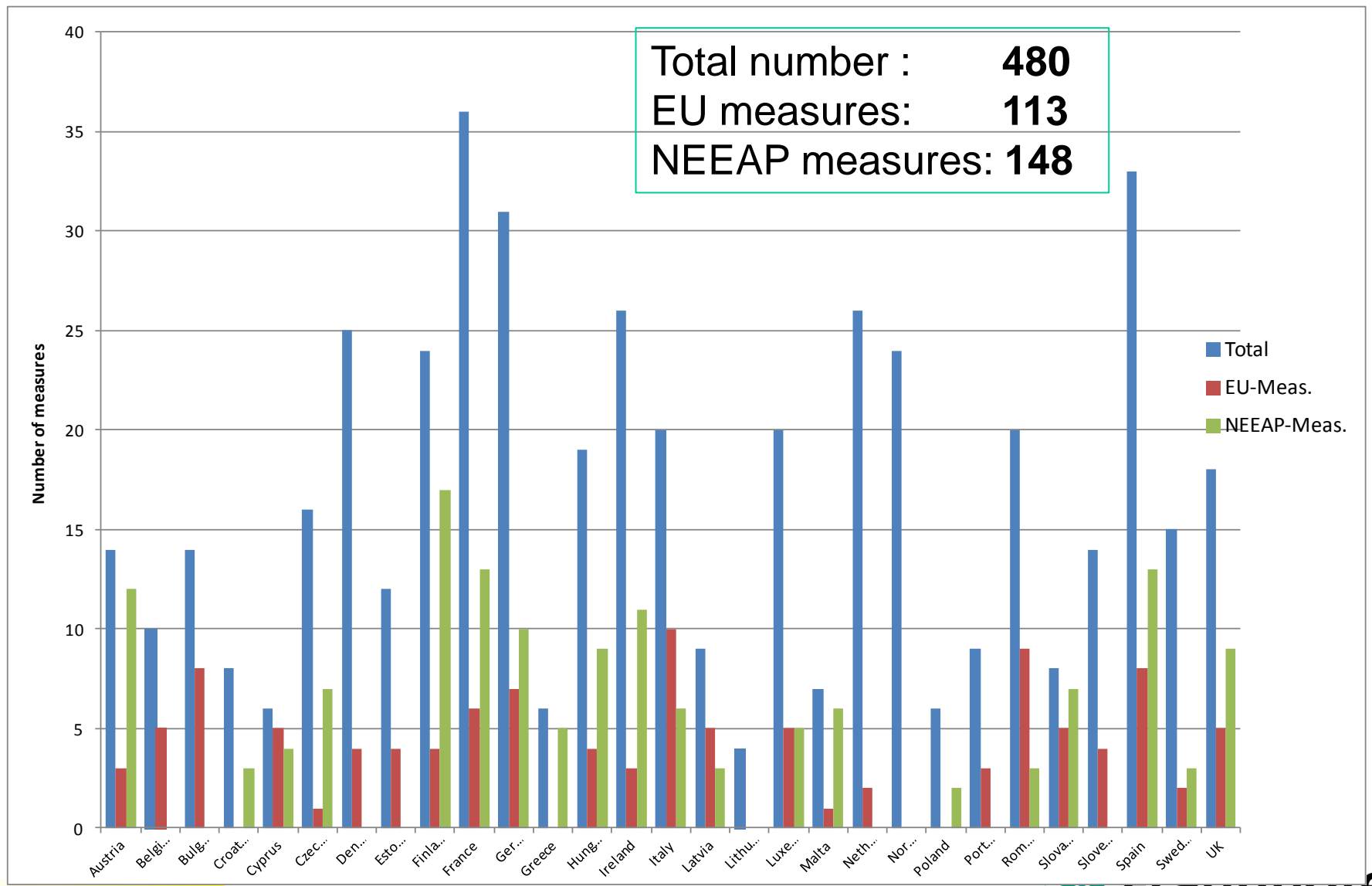


Measures in the household sector by type and country – all end-uses

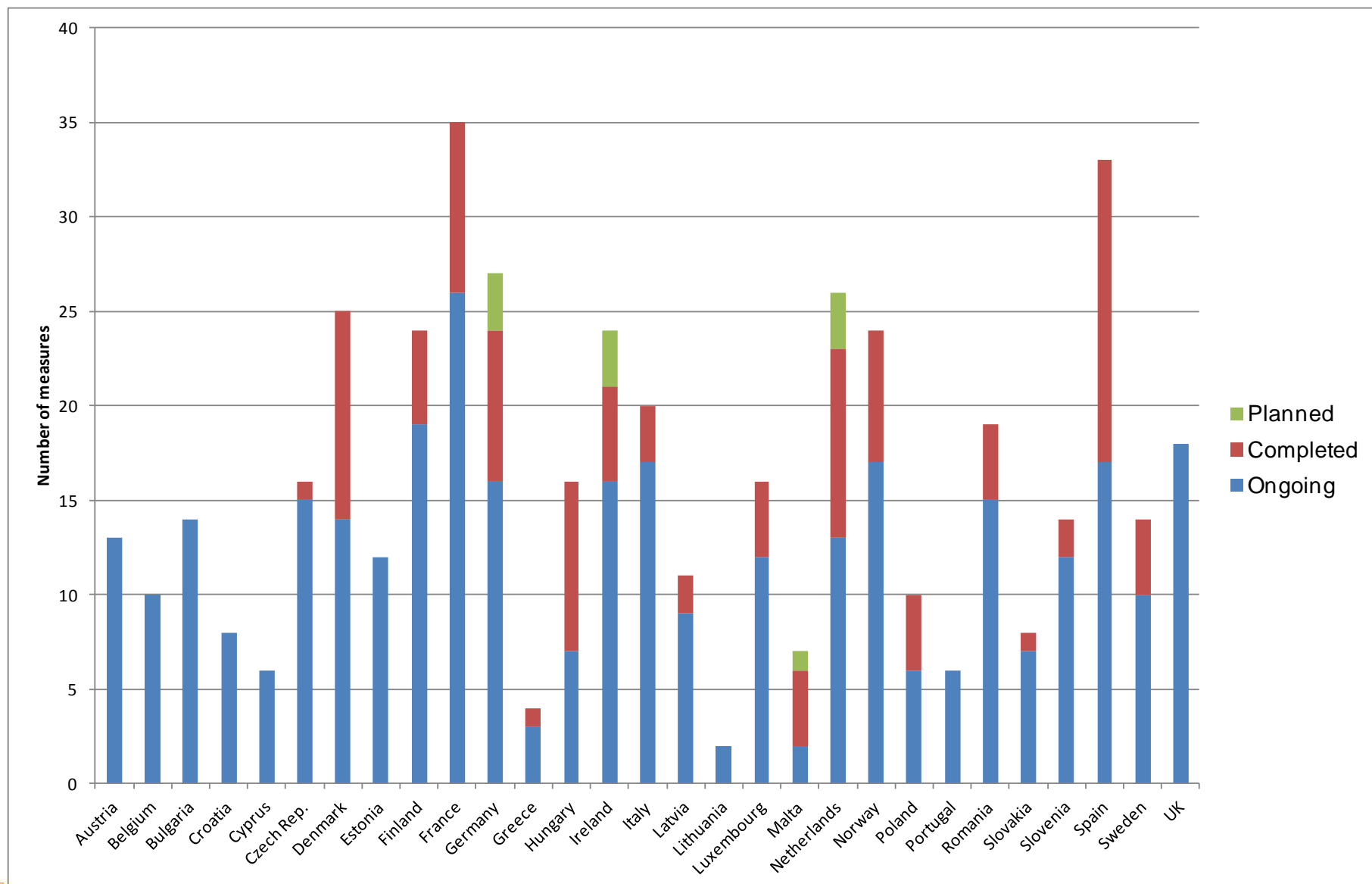


Measures in the household sector – total, EU measures, NEEAP measures

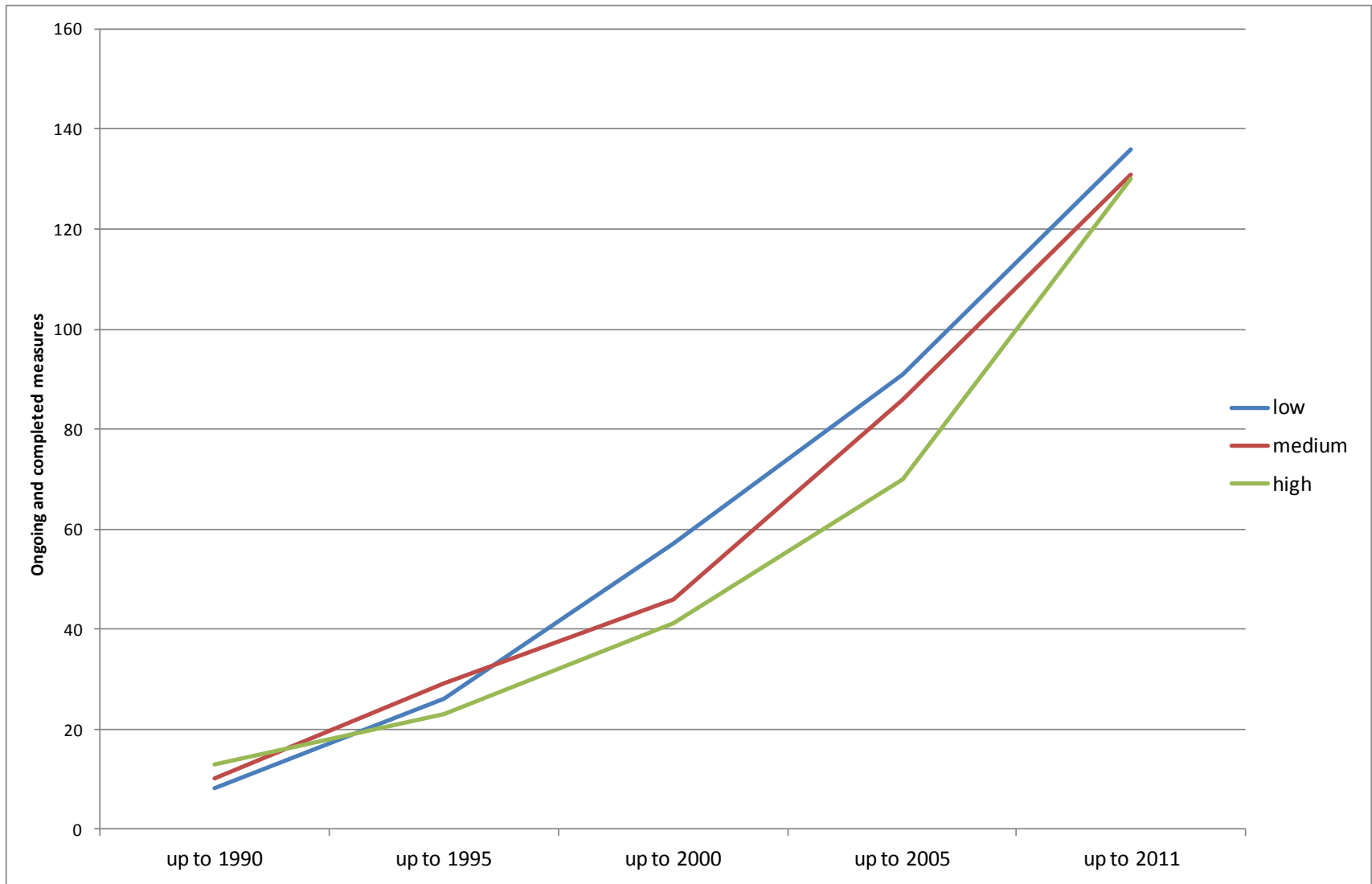
Total number : **480**
 EU measures: **113**
 NEEAP measures: **148**



Measures in the household sector by status



Increase of measures in the household sector in time and by measure impact



Policy packages for buildings

The impact evaluations in some NEEAPs (e.g. in Italy) are oriented at targeted end-uses and only the combined impact of all policy measures directed at this end-use is quantified → The same impact values have to be repeated for all single measures related to the respective end-use and a comment must be added in the comment column of the new quantification table.

Mure II Household - New Measure - Targeted End Use Attributes - Step 3 of 3

| Targeted End Use | Type of impact | Impacts in different years (in PJ / kt CO ₂ eq.) compared to a fixed year or a reference developpement | Starting year of impact | Evaluation method | Comment |
|----------------------------|----------------|---|-------------------------|---|---------|
| Total fuel consumption | Ex-post | Year of impact: 2016, 2020, [], [], [] Compared to: Fixed year, Fixed year, [], [], [] PJ: [], [], [], [], [] kt CO ₂ eq.: [], [], [], [], [] | [] | Direct measurement Billing analysis Enhanced engineering estimates Mixed deemed and ex-post estimate Deemed estimate unit savings Stock modelling Diffusion indicators Specific consumption indicators Econometric modelling Integrated BU/TD methods Other | |
| Total electric consumption | Ex-post | Year of impact: 2016, 2020, [], [], [] Compared to: Fixed year, Fixed year, [], [], [] PJ: [], [], [], [], [] kt CO ₂ eq.: [], [], [], [], [] | [] | | |
| Appliances and lighting | Ex-post | Year of impact: 2016, 2020, [], [], [] Compared to: Fixed year, Fixed year, [], [], [] PJ: [], [], [], [], [] kt CO ₂ eq.: [], [], [], [], [] | [] | | |

Alternative approach: quantification of single measure with correction factor for double counting

| Energy Savings | 2007 | 2010 | 2016 | Summe | Correction factor for double counting | Implementation factor |
|--|-------------------------------|-----------|-----------|-----------|---------------------------------------|-----------------------|
| Unit | PJ/a (electricity factor = 1) | | | | | |
| Bottom-up – quantifiziert | 1995-2007 | 2008-2010 | 2008-2016 | 1995-2016 | | |
| Sum Buildings | 247,8 | 75,5 | 250,9 | 498,7 | | |
| Building regulation (non-res. buildings) | 63,2 | 8,8 | 35,1 | 98,3 | 0.9 | 0.95 |
| Building regulation (residential. buildings) | 127,9 | 27,2 | 108,1 | 236,1 | 0.9 | 0.95 |
| Several financial promotion prgrams from KfW | 45,0 | 26,7 | 70,9 | 115,8 | 0.9 (0.7) | 1.0 |
| Advice program from BAFA | 0,5 | 0,6 | 1,8 | 2,3 | 0.45 | 1.0 |
| Financial subsidies for solar thermal | 9,9 | 10,4 | 30,1 | 40,0 | 0.7 | 1.0 |
| Measures by Federal States | 1,2 | 1,8 | 5 | 6,2 | 0.9 | 1.0 |

Source: NEEAP2 Germany, 31 August 2011

Innovative measures: White certificates to enhance energy savings in buildings?

EU proposal for a new Energy Efficiency Directive (rev. from 3/10/2011)

Article 6:

- Par. 1: Energy efficiency obligation scheme in all MS with a saving target of 1.5 % of energy sales in the previous year (transport excl.)
- Par. 8: Exemptions for small companies: limits were raised in the version from 3 October 2011
- Par. 9: Alternative measures to achieve the savings

Existing energy efficiency obligation schemes in some MS

- UK: only household sector
- IT: all sectors (incl. transformation)
- FR: all sectors (incl. transport); for buildings combination with tax reductions
- DK: all sectors except transport
- P: Planned (Slovenia?)

White certificates in the MURE database

MURE II Household 18 Measures Found

| Code | Title | Status | Type | Starting Year | Semiquantitative Impact | NEEAP Measure | Quantitative evaluation |
|------|---|---------|-----------|---------------|-------------------------|---------------|-------------------------|
| UK20 | Carbon Emissions Reduction Target & Suppliers obligation (Former EEC 3) | Ongoing | Financial | 2008 | High | Yes | Yes |

MURE II General cross-cutting 27 Measures Found

| | | | | | | | |
|------|--|---------------------|--|------|--------|-----|-----|
| BEL5 | Energy efficiency public services obligation | Ongoing | Market-based Instruments | 2002 | High | No | No |
| FRA1 | Energy savings certificates | Ongoing | Market-based Instruments | 2006 | High | Yes | Yes |
| ITA2 | White certificates: market based instruments promoting energy efficiency | Ongoing | Co-operative Measures, General Energy Efficiency / Climate Change / Renewable Programmes, Market-based Instruments | 2004 | Medium | Yes | Yes |
| PL12 | System of white certificates - Energy efficiency Act - draft | Proposed (advanced) | Market-based Instruments | | High | Yes | No |
| DK6 | The Energy Companies' saving effort | Ongoing | General Energy Efficiency / Climate Change / Renewable Programmes, Legislative/Normative Measures | 2006 | High | No | Yes |

White certificates for buildings – only instrument or part of a suitable measure package?

| Targeted end-use | Energy Efficiency Obligation Scheme | Financial grants / subsidies, Funds | Tax reduction / exemption | Regulation: improved compliance | New / tightened regulation | Information / Advice |
|---|-------------------------------------|-------------------------------------|---------------------------|---------------------------------|----------------------------|----------------------|
| Buildings (residential, non-residential) | | | | | | |
| Refurbishment of building envelope with BAT | - | ++ | + | o | ++ | - |
| Refurbishment of windows with BAT | + | + | ++ | o | ++ | - |
| Enhancement of the rate of building renovation | ++ | + | ++ | -- | ++ | - |
| New buildings with BAT | o | ++ | + | - | ++ | - |
| Replacement of boilers | ++ | + | ++ | -- | ++ | o |

Source: Assessment Fraunhofer ISI 2011

White certificates for buildings – some questions

Relationship of legislative measures and white certificates

If a country has ambitious energy efficiency standards in the building regulation also for the renovation of existing building (e.g. Germany): which savings should be credited in a obligation scheme?

→ Question of the baseline

Combination of White certificates with other financial measures

(e.g. tax exemptions in France)

To which measure is the impact ascribed to?

Availability of financial sources for building renovation

→ Can the volume be increased by white certificates
(independent from public budget)

Other questions → Discussion in the technical sessions?

Proposed contents of the building brochure / 1 (February 2012)

Part 1: Background

- Definition of the building sector
- ODYSSEE Indicators
- Energy saving targets and saving potentials
- Main obstacles

Part 2: Policies for residential buildings

- Dynamics of the implementation of measures
- Impact evaluation (EPBS, financial measures, WC)
- “Quality” of policy measures: good practices, innovative measures
- Suitable measure packages
- White certificates for buildings
- The role of behaviour
- Social aspects of measures

Proposed contents of the building brochure / 2

Part 3: Policies for tertiary buildings

- Similar topics as in part 2
- Specific aspects of non-residential buildings

Part 4: Policies for electrical appliances

- Electrical household appliances
- ICTs
- Cross-cutting technologies in the tertiary sector

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