MURE policy measure interaction facility – Implementation and Guidelines

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1. Introduction

Interaction analysis

In the previous Odyssee/MURE project the concept of interaction analysis for policy measures in MURE has been developed and reported[1]. .

In the MURE database the impact of policy measures is provided, for each policy measure apart, in the form of a qualitative impact (High, Medium of Low). When more policy measures have influence on the same targeted end-use, the combined effect may not fit with the sum of the individually specified impacts. The report describes how mutually consistent impacts for packages as well as individual policy measures can be determined in the MURE database.

Implementation of interaction facility

The actual implementation of the interaction approach in the MURE database, and the testing by pilot countries, has been part of the Odyssee/MURE 2013-2015 project. Implementation issues regard the selection of policy measures from the database, the possibility to adapt available standardized interaction factors (if needed), the calculation of combined impacts figures and the presentation of the results. Moreover, some adaptations in the MURE database were needed in order to select the relevant policy measures and enable the right interaction analysis.

Guidelines

The application of the new interaction facility by users of the MURE database asks for guidelines. These regard the choice of targeted end-uses, the selection of policy measures, the adjustment of interaction factors and the interpretation of the results. Part of the guidelines will be available while applying the MURE facility.

Set-up of report

The second chapter provides a short overview of the concept of interaction analysis. Then follows a chapter 3 on the implementation of the interaction facility, including the adaptations to MURE. Chapter 4 provides guidelines how to use the interaction facility. In Annex IX results are presented of an application of the interaction facility for all EU countries.

[1] Interaction between policy measures – Analysis tool in the MURE database, Piet G.M. Boonekamp (ECN) & Stefano Faberi (ISIS), Odyssee/MURE, October 2012

2. MURE interaction analysis

2.1. MURE database

The MURE database (www.measures-odyssee-mure.eu) provides an overview of energy efficiency policy measures in EU countries, for the end-use sectors Households, Services, Industry and Transport. Information about these measures is collected by national energy agencies or institutes, according to harmonised guidelines which have been established centrally.

Categories of policy measures

The policy measures are characterised as to type at three levels. The most detailed characterisation (level c3) regards up to 45 types, differing sometimes between the end-use sectors. At the most aggregated level (c1) only seven main types exist (see Table 2-1 for the Household sector). The table shows also examples of measure types at c2 and c3 level.

Table 2-1: Policy measure types defined at different levels in the MURE database

Level c1	**Level c2/c3 (examples)**
Legislative/Normative	Mandatory Standards for Buildings
	Regulation for Heating Systems
	Other Regulation in the Field of Buildings
	Mandatory Standards for Appliances
Legislative/Informative	Mandatory labelling
	Mandatory energy efficiency certificates
	Mandatory audits
Financial	Grants / Subsidies for investments
	Grants / Subsidies for audits
	Loans/Others
Fiscal/Tariffs	VAT Reduction
	Income tax reduction
	Linear electricity tariffs
Information/Education	Voluntary labelling
	Information campaigns
	Detailed energy/electrical bill
	Regional and local information centres
Co-operative Measures	Voluntary/Negotiated agreements
	Voluntary DSM measures of suppliers
	Technology procurement
Cross-cutting	Eco-tax on electricity/energy
	Eco-tax on CO2 - emissions

Impact of policy measures

The effect of the policy measure, i.e. the impact or energy savings, is registered in the database in the form of Low, Medium or High. These categories represent a given amount of savings as fraction of the relevant energy consumption (Low < 0.1%, Medium 0.1% to 0.5% and High > 0.5%).

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2.2. Rating of policy interaction

Types of interaction

When two measures focus on the same targeted end-use, e.g. space heating in existing dwellings, the combined impact may take different forms:

- Neutral
- Mitigating
- Reinforcing.

If there is no interaction the combined impact is equal to the sum of the impacts for both policy measures (neutral). If there is overlap between the impact of the measures, the combined impact is lower than the sum (mitigating). An example of a mitigating combination is a minimum efficiency standard and a subsidy for an energy using device. Finally, policy measures can reinforce each other's impact, e.g. a combination of obligatory labels and a subsidy for A-label appliances.

Policy measures and implementation of saving measures

Energy savings are attained by implementing saving measures, where the implementation is dependent on the following conditions:

1. The saving option must be available for application.
2. The option must be sufficiently known to the appliers.
3. Restrictions that prevent a choice for the saving option must be lifted.
4. The decision maker must become motivated to take a positive investment decision.

The various policy measure types, mentioned earlier, influence the conditions for implementation and thereby stimulate energy savings. In Annex I it is explained in detail how the different policy measure types influence the conditions.

A combination of policy measures appears necessary to comply with all conditions. The following general criteria for an optimal set of policy measures are:

- Should cover all (relevant) conditions;
- Measure types should complement each other, not overlap;
- A measure type should influence more than one condition;
- Measures should be introduced in the right order.

Targeted end-uses

Energy consumption per sector can be divided into targeted end-uses, such as space heating for households, traveling by rail for transport or electric drives in industry. Very often policy measures focus on one targeted end-use, and their effect does not interact with that of many other policy measures focusing on different targeted end-uses. Therefore, the interaction analysis is performed per targeted end-use, to keep the analysis manageable.

Rating method

For each targeted end-use the set of relevant policy measures is defined. The possible interaction effect for each combination of two policy measures is rated by taking into account the relevant conditions for successful implementation or proper utilization, the influence of

both policy measures on these conditions, and the overlap or synergy. Next to the ratings "mitigating", "reinforcing" and "neutral" the case "non-existing" is present.

2.3. Interaction matrix

Presentation of possible interactions

The rating results for all possible combinations of two policy measure types are presented in a standard matrix, with all types both in the rows and the columns. **Figure 2-1** shows an example matrix of possible interaction effects for policy measure types in general.

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	Legislation on:			Taxes	Support via:		Information:		Agree-	Procu-	R&D	Tra-
Measure	applicat.	use	inform.		finan.	audits	options	use	ments	rement		ding
Legislation application												
Legislation use	-											
Legislation information	- - -	0										
Regulatory taxes	- -	- -	+									
Support (financial)	- - -	-	+++	- -								
Support (audits)	- - -	- -	- -	+	+							
Information (options)	- - -	0	- - -	+	+	- - -						
Information (use)	-	- - -	0	+++	0	-	0					
Agreements	- - -	-	-	-	+	-	-	-				
Procurement	- - -	0	+	+	+	+	-	0	-			
R & D-promotion	-	0	0	++	+++	0	+	0	0	++		
Emission trading	- -	- -	0	- - -	- -	-	+	++	-	0	+	

mitigating: - - - strong/- - modest/ - marginal, reinforcing: +++ strong/++ modest/+ marginal, 0 = no interaction.

Figure 2-1: Matrix of possible interaction effects for policy measure types

Interaction matrices in practice

In practice interaction is analysed for separate targeted end-uses per sector, e.g. new dwellings in the households sector. Not all policy measure types are applicable here (see **Figure 2-2**). For new dwellings mostly energy performance standards are applied, and sometimes financial support, agreements with builders and R&D stimulation. Not relevant are prescribed temperature levels (legislation use), subsidized audits, information on daily energy use and procurement or emission trading. Regulatory taxes influence all targeted end-uses, including (in principle) savings in new dwellings. Therefore, in practice the matrix of interaction is often much smaller in terms of rows and columns.

	Standard	Taxes	Subsidy	Agree-	R&D
Measure	(epc)		(invest)	ments	prom.
Standard (epc)					
Regulatory taxes	- -				
Subsidy (invest)	- - -	- -			
Agreement	- - -	-	+		
R & D-promotion	-	++	+++	0	

mitigating: - - - strong/- - modest/ - marginal, reinforcing: +++ strong/++ modest/+ marginal, 0 = no interaction

Figure 2-2: Practical matrix of interaction per targeted end-use (new dwellings)

3. Implementation of interaction facility in MURE

3.1. Overview of approach

The implementation regards the following preparatory steps:

- Definition of the targeted end-uses per sector
- Definition of the interaction types (extension of main policy measures types)
- Specification of relevant interaction types per targeted end-use
- Set-up of standard interaction matrices per targeted end-use (with specification of interaction strength for all combinations of measure types).

The actual implementation regards the steps:

- Selection of MURE policy measures for each targeted end-use
- Generation of the actual interaction matrix
- Calculation of the combined impact and sum of individual impacts.

The preparatory steps are described in the following sections 3.2 to 3.5 and the implementation of the approach in the MURE database in sections 3.6 to 3.8.

Figure 3-1 provides the general set-up, which starts from a set of policy measures (PM) with their impact, and finally delivering the overlapping/reinforcing effect due to interaction. Other inputs regard the targeted end-use (TU) per sector, targeted end-uses for specific policy measure types, the aggregation of specific types (c3 level) to interaction types (c1 level) and the standard interaction matrix (for all interaction types). The various steps are explained in the following sections.

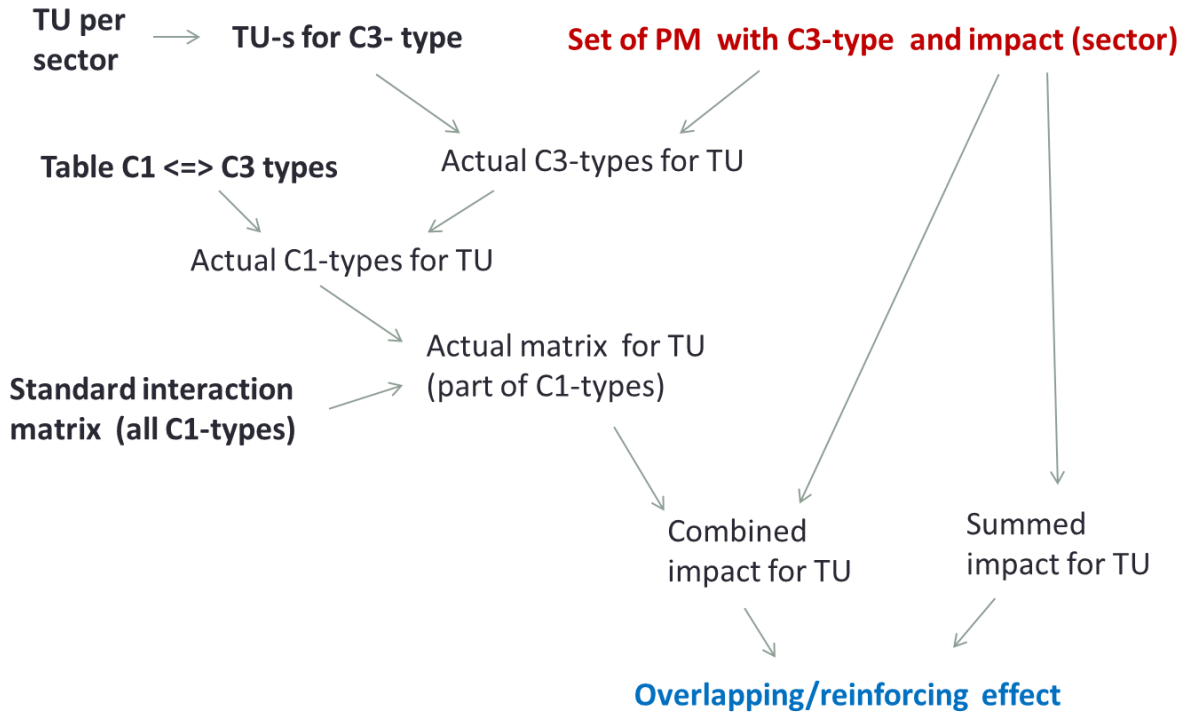

Figure 3-1: General structure of the set-up of the interaction facility

3.2. Definition of targeted end-uses per sector

The targeted end-uses in MURE (see Annex II) have been aggregated for interaction analysis.
Households:

- New dwellings
- Space heating - existing dwellings
- Hot water preparation
- Appliances and Lighting
- Renewable contribution

Services (Tertiary):

- New buildings
- Space heating existing buildings
- VAC
- Appliances/Lighting
- Other (agriculture)

Industry:

- Process heat
- Electric drives
- Other electricity
- CHP
- Buildings

Transport:

- Passengers / road (cars)
- Goods / road (truck, lorries)
- Persons – modal shift (train, bus, bicycle, walking)
- Goods – modal shift (train, ship)
- Persons – mobility
- Other goods transport (rail, planes, motor)

More than one targeted end-use can be valid. In case all uses are valid, e.g. for energy taxes, the set can be denoted by Total final energy as targeted end-use (or total fuel or total electricity).

3.3. Policy measures types used for interaction analysis

The interaction analysis starts from the most aggregated policy measure types (see **Erreur ! Source du renvoi introuvable.**, left column).

For analysis of interaction some of the main types have been expanded in order to make a distinction between measures focusing on investment decisions, measures on providing information and measures focusing on daily use.

Further on, for some policy measure types a split is made between focused measures and broad measures. For focused measures it is possible to restrict interaction to other measures that have the same focus. For broad measures the interaction can regard many other policy measures; therefore it is treated differently.

The two adaptation result in 11 or 12 policy measure types for interaction analysis, depending on the end-use sector (see Table 3-2). In Annex III the interaction types per sector are shown.

Table 3-1: Policy measure types for interaction analysis

Main types (level c1)	Extension for interaction
Legislative/Normative	Invest (standard for new buildings)
	Use (mandatory maintenance of boilers)
Legislative/Informative	Focused (mandatory labelling)
	Broad (Mandatory audits)
Financial-Fiscal	Invest (Subsidies for investments)
	Info (Subsidies for audits)
	Use (tariffs)
Information/Education	Focused (Voluntary labelling)
	Broad (Information campaigns)
Co-operative Measures	Broad (VA sector)
	Focused (VA manufacturers)
Cross-cutting/taxes	X

3.4. Interaction types per targeted energy-use

3.4.1. MURE policy measures types per targeted energy-use

Policy measures in the MURE database are characterized as to 30-45 specific types (depending on the sector, at the detailed level c3). Often these specific types are by nature only valid for one or few targeted end-uses (e.g. the type "appliance standards" regards only the targeted use "electricity use by appliances"). Therefore, the detailed specification of the policy measure types enables to connect them to one or more targeted end-uses specified in section 3.2.

Annex X provides tables per sector, with the policy measure types connected to targeted uses.

3.4.2. MURE policy measures types and interaction types

In MURE the specific policy measure types at c3 level are aggregated to the 7 main types (c1 level), which have been extended to the 11-12 interaction types. This structure enables to convert the targeted end-uses per specific type (see section 3.4.1) to targeted end-uses for the interaction types.

Annex IV provides tables per sector, with the specific policy measure types connected to the interaction types and the targeted end-uses.

3.4.3. Relevant interaction types per targeted end-use

Using both connections, described in preceding subsections, relevant interaction types per targeted end-use can be defined. Results for Households are presented in Table 3-2. The table shows that almost all interaction types are valid for space heating in existing dwellings; on the other hand only half are relevant for electricity use (appliances and lighting) and renewable energy production. An overview of interaction types per targeted end-use for all sectors is presented in Annex V.

Table 3-2: Interaction types per targeted end-use (Example Households)

Policy measure type (c1- adapted)	Space heating	New dwelling	Hot water	Appli-ances	Renewa-ble energy
Legislative/normative – invest	x	x	x	x	x
Legislative/normative – use	x		x		
Legislative/informative –focused	x	x	x	x	
Legislative/informative – broad	x		x		x
Financial/fiscal – invest	x	x	x	x	x
Financial/fiscal – use	(x)				
Financial/fiscal – info	x		x		x
Information/education – focused	x		x	x	x
Information/education – broad	x	x	x	x	
Co-operative – focused					
Co-operative – broad	x	x	x	x	
Cross-cutting/taxes	x	x	x	x	x

3.5. Standard matrices per targeted end-use

3.5.1. Qualitative interaction matrix

For each sector and targeted end-use an interaction matrix has been constructed, according to the method described in chapter 2. This standard matrix per targeted end-use if often smaller than the overall standard matrix presented in Figure 2.1, because not all possible interaction-types are valid for each targeted end-use. Thus the standard matrix per targeted end-use only contains rated interactions between relevant policy measure types. The matrix is called "standard" because it regards all policy measure types that can be present for a targeted end-use. In reality this will often not be the case (see actual matrices in section 3.7).

Results for space heating in existing households are shown in Figure 3-2. The matrix only regards 10 interaction types, one less than the 11 types in Table 3-2, because policy measure type "Financial/fiscal – use" is not relevant here.

The standard matrices per targeted end-use are provided in Annex VI'

		Legislation on:		Leg-inform		Support via:		Information:		Coop	Taxes
Measure		invest	use	label	audit	invest	audits	invest	use	VA	
Leg-norm-invest											
Leg-norm-use		-									
Leg-inform-focus (label)		- - -	0								
Leg-inform-broad(audit)		- - -	0	- - -							
Fin/fiscal-invest		- - -	-	+++	++						
Fin/fiscal-info (audits)		- - -	- -	- -	- - -	+					
Inform-focused-invest		- - -	0	- - -	- - -	+	- - -				
Inform-broad-use		-	- - -	0	-	0	-	0			
Coop-broad (VA)		- - -	-	-	0	+	-	-	-		
Taxes		- -	- -	+	+	- -	+	+	+++	-	

Figure 3-2: Standard interaction matrix for space heating in existing dwellings

3.5.2. Quantitative interaction matrix

The qualitative interaction ratings are converted to quantitative figures in order to determine mutually consistent individual and combined impacts. The following values apply:
+++ = strong reinforcing => 2.0
++ = reinforcing => 1.4
+ = some reinforcing => 1.1
0 = not interacting => 1.0
- = some overlap => 0.9
- - = overlap => 0.5
- - - = strong overlap => 0.1

The preliminary figures in the standard matrix are only default values in case no other information is available. The figures can be adapted for concrete sets of policy measures, to take account of the situation in the various countries. Figure 3-3 provides the quantitative interaction figures for the qualitative standard matrix (for space heating, households).

	Legislation on:		Leg-inform		Support via:		Information:		Coop	Taxes
Measure	invest	use	label	audit	invest	audits	invest	use	VA-DSM	
Leg-norm-invest										
Leg-norm-use	0.9									
Leg-inform-focus (la	0.1	1								
Leg-inform-broad(au	0.1	1	0.1							
Fin/fiscal-invest	0.1	0.9	2.0	1.4						
Fin/fiscal-info (audit	0.1	0.5	0.5	0.1	1.1					
Inform-focused-inve	0.1	1	0.1	0.1	1.1	0.1				
Inform-broad-use	0.9	0.1	1	0.9	1	0.9	1			
Coop (VA-DSM)	0.1	0.9	0.9	1	1.1	0.9	0.9	0.9		
Taxes	0.5	0.5	1.1	1.1	0.5	1.1	1.1	2.0	0.9	

Figure 3-3: Standard matrix on quantitative interaction (space heating in households)

3.6. Selection of MURE policy measures for interaction analysis

3.6.1. Categories of MURE measures

From the MURE database the following policy measures are selected:
- Ongoing policy measures per chosen sector
- Ongoing cross-sector policy measures (relevant for the chosen sector)

Completed policy measures are not selected, although their savings impact might be relevant when analysing interaction over a period. However, for the moment the analysis is only done for a recent year, where completed measures are not relevant.

3.6.2. Cross-sector policy measures

Cross-sector policy measures are measures that regard more than one sector, e.g. an energy tax. Often they have a broad scope as to policy measure types, e.g. a savings program consisting of audits, a subsidy scheme and information centres. In principle, the cross-sector measures must be converted into concrete policy measures per sector, e.g. the specific level of taxes for households, or the specific policy measure types in a savings programme

In case cross-sector measures are not split into sectoral policy measures, they should also be selected for the interaction analysis. In case they encompass various policy measure types, the most relevant type must be defined in order to deal with the cross-sector measure in interaction analysis.

To enable this, for each cross-sector measure is specified:

- The relevant sector(s)
- The targeted end-uses
- Per sector the possible interaction types.

In MURE the cross-sector measures have already been connected to one or more sectors. The targeted end-uses per cross-sector measure are given in Annex VII.. Broad measures generally regard (almost) all targeted end-uses.

The possible interaction types, per sector, are defined in the table in Annex VIII. Some cross-sector measures are rather specific, e.g. special tariffs for energy consumption, which leads to only one possible interaction type. But for broad measures, such as savings programmes, much more types are possible. Here a limited set of interaction types has been defined, based on assumptions about the general set-up of these broad measures.

Because for the interaction analysis only one interaction type can be chosen for a broad cross-sector measure, the approach is not optimal. Therefore, it is always better to convert the cross-sector measure into various sectoral measures. .

3.6.3. Selection of policy measures

For each targeted end-use in a sector the relevant sectoral "ongoing" policy measures are selected, based on tables with the connection between c3-types and targeted end-uses (see Annex X).

The relevant cross-sector measures for each targeted end-use are selected using the table in Annex VII.

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3.6.4. Attribution of interaction type to selected policy measures

The selected sectoral policy measures have been characterised as to type at c3 level. The interaction type is attributed to each selected policy measure, using the table with the connection between c3-types and interaction types (see Annex IV)..

For cross-sector measures the most appropriate interaction type can be chosen from a set of possible types (see Guidelines). With the chosen type for the cross-sector measure the interaction analysis is performed.

3.6.5. Adaptation of the selection of policy measures

Before the interaction analysis is performed the user can adapt the list of selected policy measures. One reason for the adaptation can be that the impact of the measure is too uncertain to take account of the impact. For cross-cutting measures the reason can be that it has already

been converted into specific sectoral policy measures. By removing the cross-cutting policy measure a double representation of the same policy measure is prevented.

The removal of policy measures is performed through a specific action (see Guidelines).

3.7. Generation of the actual matrices per targeted end-use

3.7.1. From standard matrix to actual matrix

The standard matrix for each targeted end-use is defined for a situation where all interaction types are present (see Figure 3-1 for space heating in existing dwellings). However, in reality this is often not the case. Generally countries deploy a set of policy measures that covers only 10-50% of the possible measure types.

Figure 3-4 shows that the actual matrix (for space heating in existing dwellings in the Netherlands) is much smaller. Because several policy measures types are absent, only a 5 x 5 matrix remains compared to the 10 x 10 standard matrix.

		Support via:		Information	Coop-broad	Taxes
Measure		invest	audits	use	VA	
Fin/fiscal-invest						
Fin/fiscal-info (audits)		+				
Inform-broad-use		0	-			
Coop-broad (VA)		+	-	-		
Taxes		- -	+	+++	-	

Figure 3-4: Actual interaction matrix for space heating existing dwellings (Netherlands)

Sometimes very few policy measures types are valid for a targeted end-use. In that case the actual matrix can shrink to a 2 x 2 matrix, with only one interaction, or even an empty 1 x 1 matrix (no interaction at all).

3.7.2. Adaptation of the matrix of interaction factors

For each standard interaction matrix the interaction factors have been pre-defined for each combination of interaction types (relevant for the targeted use). The interaction factors are values for situations in general. However, in practice with different countries and sectors the interaction may be different. Therefore, the user can adapt the interaction values if needed.

After adaptations the facility recalculates the impacts automatically, enabling to check the effect of adaptations directly

3.8. Determination of separate and combined impacts

Given the selected policy measures, for a targeted end-use and sector, the interaction facility provides both the sum of impacts per individual measure and the combined impact, taking account of interaction.

The calculation of impacts goes as follows.

Impact quantities used:
- Impact of individual policy measure x = IPMx
- Total calculated impact = ICAL
- Sum of impacts for set of policy measures = ISUM

ISUM = IPM1 + IPM2 + ... IPMn

ICAL = [(IPM1+IPM2) * factor PM1/PM2 + (IPM1+IPM3) * factor PM1/PM3 + ... + (IPM1+ IPMn) * factor PM1/PMn
+ (IPM2+IPM3) * factor PM2/PM3 + ... + (IPM2+IPMn) * factor PM2/PMn
+ (IPM3+IPM4) * factor PM3/PM4 + ……... . . + (IPM3+IPMn) * factor PM3/PMn
+ . . . . . .
+ (IPMn-1+IPMn)* factor PMn-1/PMn.] / (n-1)

All impacts IPM are present (n-1) times. If all factors PMi/PMj are equal to 1 this equation will deliver the sum of all IPM, which is consistent with a situation without interactions. .

In case of overlapping impacts the combined impact will be lower than the sum of impacts. The difference between the values for combined and sum can be regarded as a measure for the effectiveness of the set of policy measures.

3.9. Other issues

3.9.1. Interaction matrix needed or not

In reality matrices are not always needed. Depending on the number of policy measures (per country, sector and targeted end-use) the following cases are possible:
A. One policy measure > no interaction possible > no matrix
B. Two policy measures > only one interaction factor > no matrix needed
C. Three or more policy measures, but only one or two types > no matrix
D. Three or more policy measures of three or more types > matrix to be used.

Thus for case D only matrices are to be used.

3.9.2. Matrix defined per year or period

For most countries and sectors the set of policy measures changes every year due to the introduction of new measures or ending existing measures. Thus, every year the interaction regards different policy measures. In principle the interaction matrices should be set up for each separate year. However, this should lead to a very complicated analysis.

In reality the changes for concrete policy measures do not influence the situation for each sector and targeted end-use. Some changes regard a more stringent version of an existing policy measure, where the type does not change. Moreover, the interaction approach is in it's initial phase and has to prove its usefulness first. Therefore, the interaction analysis is restricted to a chosen period, e.g. 2000-2011, and the matrices represent interaction for all

policy measures active in the period. The consequence is that all resulting impacts regard the chosen period.

3.9.3. EU policy measures

In the MURE database the policy measures at EU level are specified under the "country" label "EU". These encompass a number of directives, such as Labelling and Ecodesign for appliances, EPBD for buildings and ESD or EED for overall energy savings.

EU policy measures are transposed into national legislation; therefore, they are part of the set of policy measures per country. Normally they are specified as national policy measures for the relevant sectors. E.g. the EPBD for the sectors Households and Tertiary and the car standards for the sector Transport. Therefore, EU policy measures as such can be disregarded in the interaction analysis for countries. .

3.9.4. Available impact figures

The following cases are possible:

1. only qualitative impacts per individual policy measure
2. qualitative impacts per measure / quantitative combined impact for a set
3. qualitative impacts per measure / quantitative impact for the major measure in set
4. only combined quantitative impact for the set of measures.

The current approach is based on case 1, assuming that always individual qualitative impacts are available (therefore case 4 is not relevant). For case 2 and 3 the results of the interaction analysis can be checked with the quantitative figures. However, for the moment this is not performed until more experience has been gained with the current approach.

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4. Guidelines for using the interaction facility

4.1. Status, aim and requirements of the tool

The interaction facility regards the first applicable version which is meant to be used by the country experts that participate in the Odyssee/MURE project.

The aim of the interaction application is to support the user of the MURE database to take account of policy measure interaction, and thereby better evaluate savings policy of countries.

The results of the interaction analysis will depend for a large part on the quality of the following inputs to the MURE database:

- completeness of the set of policy measures in the MURE database
- conversion of cross-sector measures to various types of sectoral policy measures
- characterization of policy measures as to type
- rating of the qualitative impact of each policy measure..

The database should contain all policy measures that are currently influencing the implementation of energy savings measures in different end-use sectors. In this respect it is also important to convert cross-sector measures to specific sectoral policy measures.

The specified type defines whether the right interaction type is connected to the policy measure. However, in some cases the MURE database does not offer an appropriate type to characterize the policy measure.

The rating of the qualitative impact (High, Medium of Low) should be based on the impact in isolation of other policy measures that focus on the same targeted end-use. The reason being, if the impact should already take account of interaction, this effect is counted twice when applying the interaction approach.

4.2. Role of the user of the tool

The tool interface is totally transparent and allows the user to:

- Select sectors and targeted end-uses for which the interaction analysis is to be performed
- Remove selected policy measures if these are not useful for the interaction analysis
- Replace the default savings per measure, based on the qualitative impact, by an own value (based on quantitative evaluations)
- Adapt the value of the interaction factor between any combination of two policy measures
- Compare calculated results for targeted end-use (or aggregated at sector level) with available quantitative impact figures available.

Moreover, the user can improve the quality of the results of interaction analysis by:

- Provide a complete set of policy measures, relevant for the targeted end-use at stake, especially measures that may interact with the other measures
- Check whether policy measures have been given the right type in MURE
- Rate the qualitative impact rightly, i.e. with High = > 0.5% savings, Medium = 0.1 – 0.5% savings and Low = < 0.1% savings.

4.3. Guidelines for using the tool

The operational sequences follow by close the methodology outlined in sections 3.6 to 3.8 and shown in **Figure 3-1.** The following figures show the interaction analysis procedure as it has been currently developed.

In the first step the user is asked, after selecting a sector, to select the country and the targeted end-use for which he wants to evaluate the measures impact. As example Figure 4-1 shows "Germany" as country and "Space heating new dwellings" as targeted end-use for the household sector.

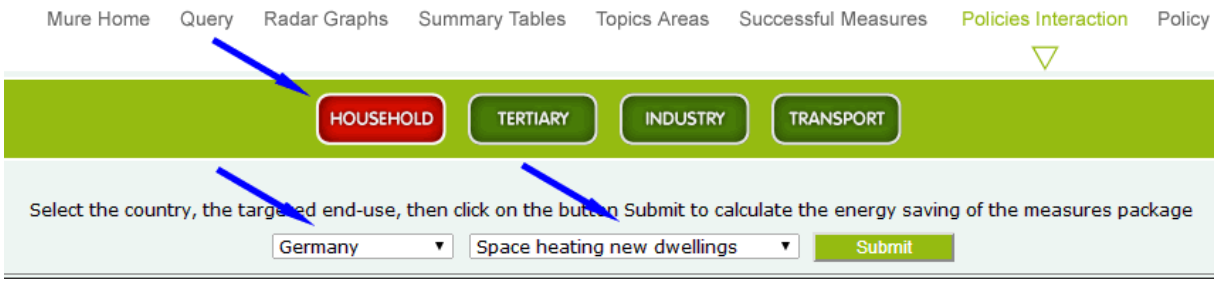

Figure 4-1: Step 1 - Selection of Country and Targeted end-use

Given the selection, clicking on the "Submit" button provides the calculation table shown in Figure 4-2. The first and second column provides the policy measures for the selected targeted end-use (in this case "space heating new dwellings"). The third column shows the measure type for each policy measure. The fourth column shows the qualitative impact, the fifth column the savings (in PJ) and the sixth column the percentage of savings.

The impact figure is converted into a percentage of the electric and/or thermal energy consumption of the analysed sector. Multiplying the percentage with sectoral energy consumption (derived from Odyssee) provides the savings.

The "Simple Sum" shows the arithmetic sum of the savings per policy measure. The "Combined Impact" is the sum corrected for the effect of interaction. The difference between these two is called "Overlap/reinforcing"..

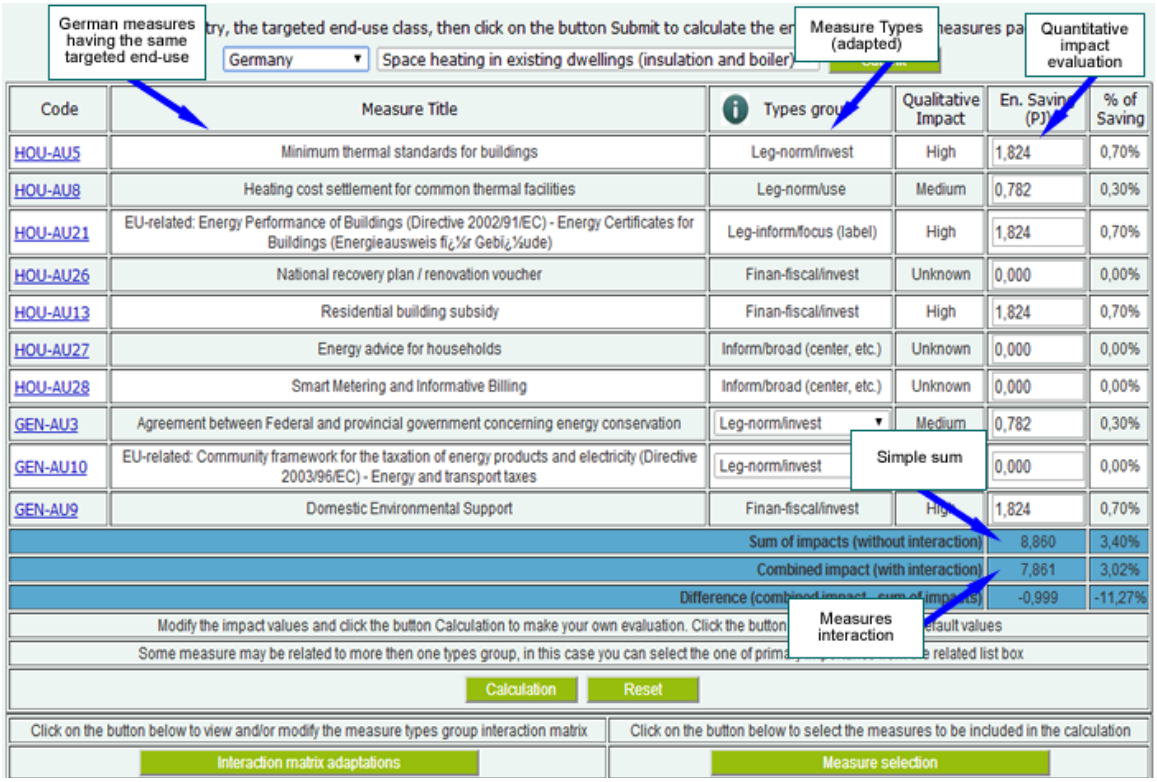

Figure 4-2: Step 2 – Impact calculation for Country and Targeted end-use

As outlined before, it is possible to analyse and even change this interaction matrix. By clicking on the "Interaction matrix adaptation" button, the tool provides the table shown in Figure 4-3.

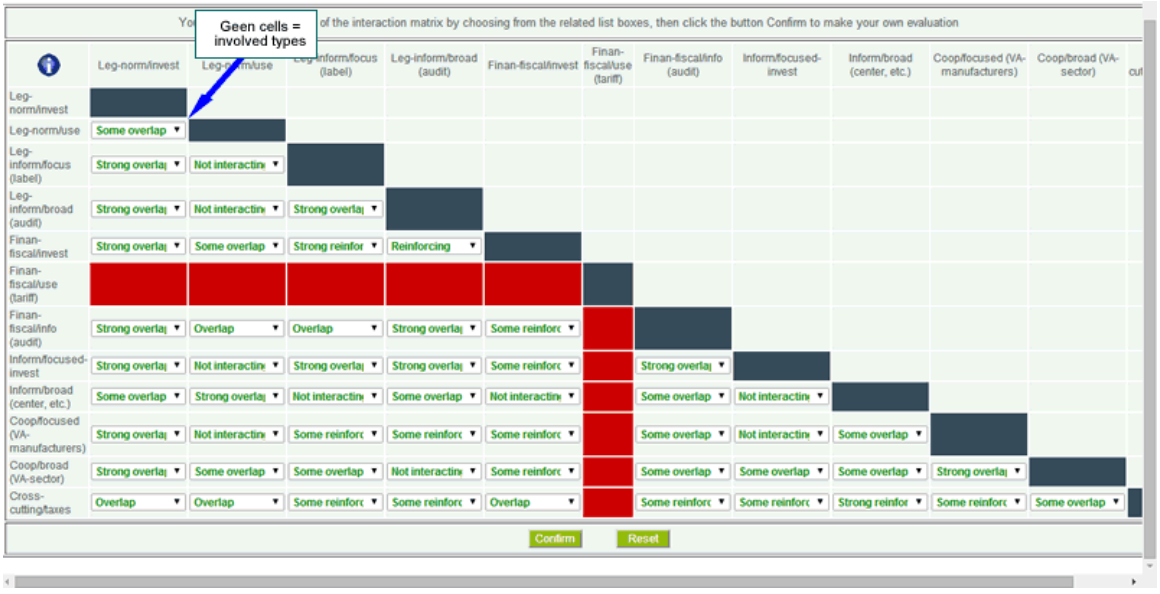

Figure 4-3: Step 3 – Checking the interaction matrix

This matrix is exactly that described in paragraph 3.5 and the "green" cells show which are the measures types involved by the measures shown in Figure 4-2.

By clicking on each of the green cells the user can change the interaction level of the involved measure types and in this way change the entire interaction scheme suggested by the tool (see Figure 4-4).

Once having set the interaction matrix, the user can confirm the changes (or reset everything and thus come back to the initial setting), and return to the calculation table to see the new interaction calculation. In the private area of the MURE website it is also possible to change and customize the quantitative interaction parameters (see section 3.5.2).

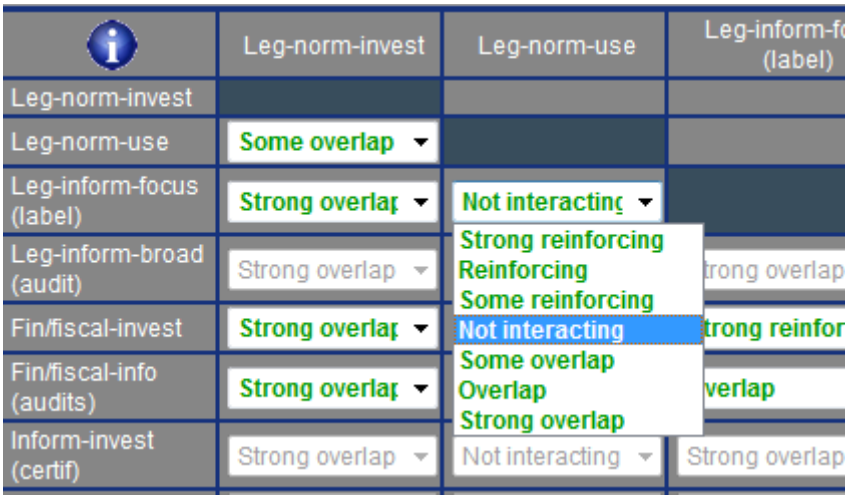

Figure 4-4: Step 3 – Modifying the interaction matrix settings

The user can decide which of the policy measures generated from the MURE database must be involved in the interaction package. By clicking on the accompanying "flag" the policy measure is removed or re-selected again (see Figure 4-5)..

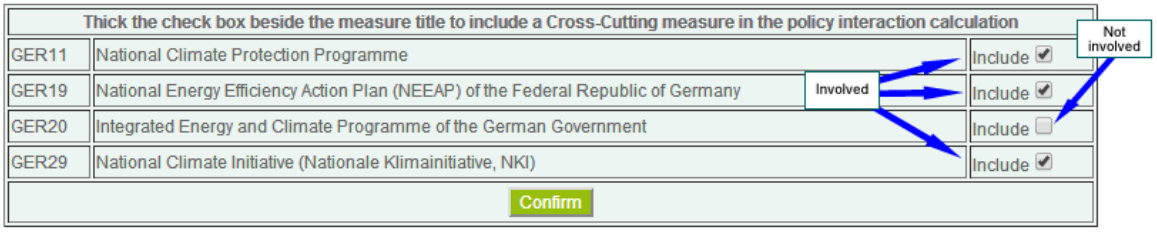

Figure 4-5: Step 4 – Removing policy measures from MURE selection

This is especially useful for cases where both cross-cutting policy measures and their related sectoral measures are present. Cross-sector policy measures are often broadly defined and encompass various measure types. Because interaction analysis can only deal with one measure type for each policy measure, one should make a choice between the different types for cross-sector policy measures. This is shown in Figure 4-6 where, after clicking on the types group cell, a type can be chosen from a menu.

The policies interaction tool also allows the user to replace the default qualitative impact for a specific measure by an own value (e.g. from a quantitative impact evaluation). Figure 4-7 shows how the provided value can be replaced by typing an own value.

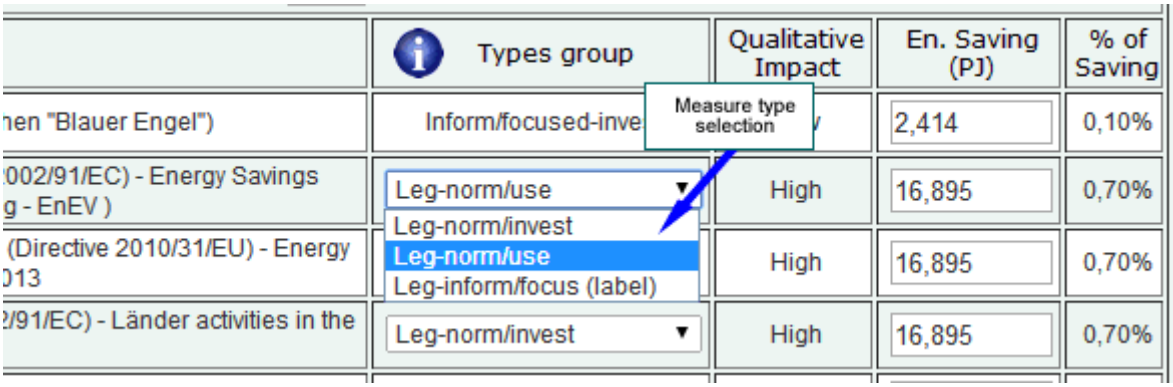

Figure 4-6: Step 5 – Choice of 1 out of N types for cross-sector policy measures

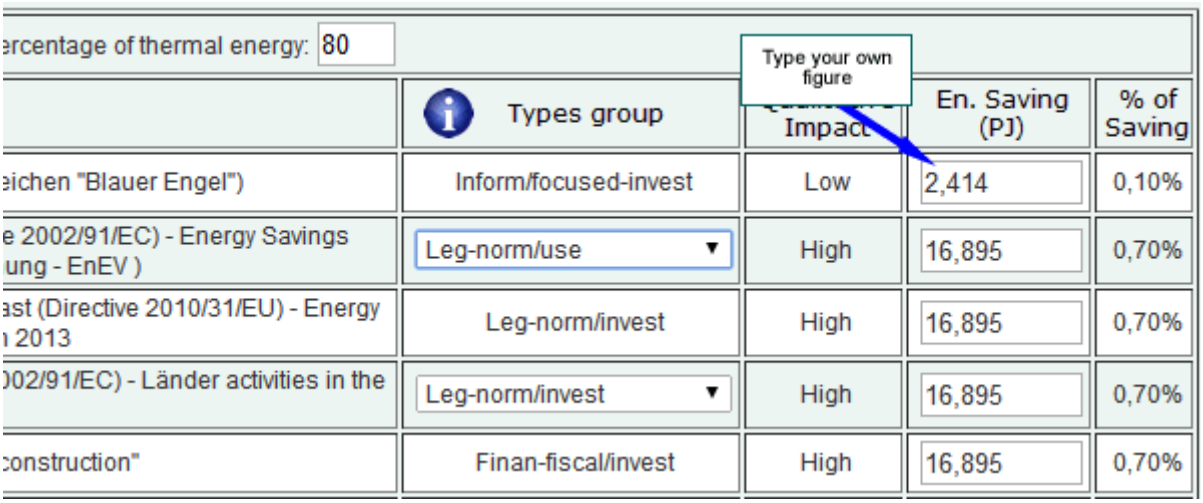

Figure 4-7: Step 6 – Adaptation of specific measure impact values

Finally, in the case the selected targeted end-use refers to thermal and electric consumption, a different percentage of thermal energy can be inserted in the top row (see Figure 4-7) where the default value is 80%.

After the modifications click on the button “Calculation”. Click on the button “Reset” to restore the original figures.

The policies interaction tool allows the user to do some sensitivity analysis by:

- removing part of the set of policy measures
- choosing the type for cross-sector policy measures
- adapt the interaction factors in the matrix
- replace qualitative impact figures by own values

5. Annexes

I: Details on the rating of interaction effects

II: Targeted end-uses per sector

III: Interaction types (per sector)

IV: Policy measure types, interaction types and targeted uses

V: Interaction types per targeted end-use (per sector)

VI: Standard interaction matrices per targeted end-use/sector

VII: Cross-sector measures per targeted end-use (per sector)

VIII: Possible interaction types for cross-sector measures

IX: Interaction results for Space heating in Households (preliminary)

X: Targeted end-uses per measures types

ANNEX I: Details on the rating of interaction effects[2]

Conditions for implementation

For proven saving options **availability** is hardly an issue; however, when demand is growing very fast the supply of the efficient systems can pose a (temporally) problem. For new options 'availability' can have different meanings. The first one, the proof of the concept after fundamental research, is not what is meant here. The saving option should be technically grown up and provide the energy-function in (almost) the same manner as the reference system it replaces. However, it need not serve all applications from the start. Often it suffices to supply a niche market; for instance, in case of an electrical heat pump, only new dwellings which have no connection to the gas grid. Thus availability of new saving options regards market ready saving options, at least for some applications.

Sufficient **knowledge** of the existence and properties of a saving option normally is a prerequisite to make a choice for a more efficient energy system. Only when the choice is obligatory, because of legislation, this knowledge is not essential. In other cases an important issue concerns who must obtain the knowledge: the user of the more efficient system, the investor in the system, the decision maker, the fitter/installer of the system, the architect or all parties involved? Insulation of rented houses asks for a co-ordinated information process towards all parties involved. In small enterprises the technical staff and management have to be informed both. In large energy-intensive enterprises an organisational structure will be available to continuously obtain, disseminate and evaluate the information on saving options. The same holds for a well-functioning energy service market where experts decide on the options to choose.

An important **restriction** for current energy applications is the remaining lifetime of the existing energy using systems. Normally decisions on implementing a more energy efficient system are taken at the 'natural moment' only, when old equipment must be replaced. But retrofit-options can be installed at any time. Another restriction can be the split between ownership/investment and utilization/benefits. In the case with rented office buildings or shop malls this hinders costly investments in energy savings. Finally a number of specific restrictions can be present, such as lack of space for the system, scarcity of investment money or lack of personnel resources (see Velthuijsen[3]).

Unless legal pressure forces the implementation of saving options, the decision maker should become **motivated** to choose the more efficient system. The most cited motivation is the financial benefit resulting from the implementation of the saving option. This motivation can be enhanced by introducing a tax on energy consumption; the higher financial value of energy saved shortens the pay-back time. Another possibility is lowering the investment costs by providing investment subsidies. However, enhancing non-economic motivation to invest is possible too, for instance by increasing the general awareness of the greenhouse problem and its relation with energy use. Another way is the creation of social pressure by public campaigns. Hennicke and Ramesohl[4] mention the role of regional networks and the behaviour of the peer group. Sometimes a saving option creates its own investment motive, as is the case with the extra living comfort that is achieved by installing double-glazing.

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[2] Based on chapter 5 of the thesis "Improved methods to evaluate realised energy savings", P.G.M. Boonekamp, Utrecht: University, 2005, ISBN: 90-8672-000-5

[3] Velthuijsen JW. Determinants of investment in energy conservation, PhD thesis, report SEO-R-357. Amsterdam, The Netherlands: Stichting voor Economisch Onderzoek, 1995

[4] Hennicke P, Ramesohl S. Interdisciplinary analysis of successful implementation of energy efficiency in the industrial, commercial and service sector. JOULE III- JOS3-CT95-0009. Wuppertal, Germany: Wuppertal Institute, 1998.

Next to the four conditions for implementation, the **proper utilization** of installed energy systems forms a fifth condition for realising energy savings. This regards use as meant in the system design, without sacrificing the energy services needed. Meeting this condition is especially important in case of new saving options because it makes sure that the promised saving effect is realised. For instance, regular maintenance of heat recovery systems is needed to keep the savings at the original level. Proper utilization asks for continued action, from a yearly inspection to a weekly feedback on energy consumption. Actually this condition can be translated into the same conditions as used with implementation: knowledge, restrictions and motivation (availability is not relevant here). However, due to the limited importance of proper utilization in this interaction analysis, this has been omitted.

Influence of policy measures on the conditions

The availability of new market ready saving options often is dependent on additional R&D to deliver a marketable option. In the latter stages of development, legislation (e.g. standards) can speed up the development process too according to Newell[5]. Financial measures can stimulate the creation of marketable options too, provided that they are considered to last over a long period. With the exception of high taxes on transport fuels, sustained for decades in various countries, this has not been the case for energy taxes in general. As Newell shows, even the very high energy prices due to the oil crises were only partly responsible for increased energy efficiency. Finally procurement can speed up actual availability.

The knowledge as to saving options, not only about the concept but also about the actual performance, is most effectively increased by dedicated information, such as mandatory labels. Other possibilities are free information on specific saving options. Audits, agreements and procurement combine the search for saving opportunities with the provision of information on saving options. Blok[6] states that subsidies often focus attention of energy users to saving options and thus serve as an information source too. Regional and branch networks of entrepreneurs are a means to provide knowledge as well, as parties often imitate each other's decisions. The level of implementation already achieved contributes to knowledge of other users too. Actually all measures that stimulate the take-off of a new saving option contribute to it becoming more widely known. Finally, as stated earlier, legislation on the implementation of the saving option is an alternative because it cancels the need for information.

Restrictions that hamper the implementation of saving options often are of a non-economic nature; therefore they cannot be lifted easily by financial measures according to Vermeulen[7]. Restrictions on performance can be overcome partly by adaptations to the saving option with additional R&D. For instance the development of a high-efficiency boiler with 'closed air circulation' has diminished the problems of placement to a great extent. Restrictions with respect to the decision making process sometimes can be circumvented with tailored policy measures. For rented dwellings this can be an agreement between housing associations, representatives of occupants and the government on the division of costs and benefits. But hardly any measure is able to influence the replacement moment when there is an opportunity to realise energy savings. Even legislation on more efficient systems does not influence directly the actual lifetime of the old systems (see policy measure descriptions in MURE).

[5] Newell RG, Jaffe AB, Stavins RN. The induced innovation hypothesis and energy saving technological change, Discussion Paper 98-12. Washington, USA: Resources For the Future, 1998.

[6] Blok K., de Groot H, Luiten E, Rietbergen M. The effectiveness of policy instruments for energy efficiency improvement in firms, report E-NWS-2002-02. Dept. of Science, Technology and Society, Utrecht University, 2002.

[7] Vermeulen WJV, Das, BWJ, Meyer LA. Policy measures for energy savings in practice (in Dutch), report STB/94/006. Apeldoorn, The Netherlands: TNO-Beleidsstudies, 1994

Almost all measures can contribute to the motivation to invest in new saving options. Some provide an economic motivation, such as subsidies or taxes. Other measures, such as information campaigns and voluntary agreements, can create a social motivation. Legislation creates by definition the strongest "motivation". In the longer run this can be accomplished too in an indirect way, by some other measures mentioned that lead to the disappearance of less efficient options altogether.

Influencing the proper utilization of energy systems asks for continuous action, as opposed to the one-time investment decision. Moreover, the users of the systems are more difficult to reach. In practice relatively few measures are available to ensure a proper utilization, for instance legislation on maintenance and monitoring of performance. Regular feedback can lead to avoiding unnecessary energy use for space heating according to Jensen[8], but for practical applications feedback costs have to be low. Groot[9] states that energy taxes lead to limited energy savings on daily energy use given the rather low short term price elasticities.

As Sorrell[10] shows, it must be pointed out that the influence of policy measures does not only regard government and the energy users, but other actors in an implementation network as well. Shop owners that are pressed to sell more efficient appliances to their customers form an example of these other actors. The network of researchers, suppliers of technologies, energy advisers, user associations, public interest groups and subsidizing agencies, each with their own interests, defines the relationship between policy measures and implementation too. This means that the different conditions for realising saving options are not tied to the same actor. For instance the condition 'availability' often will be associated with the manufacturing of new appliances or systems, while the condition 'motivation' mostly regards the energy user. In this analysis the role of these other parties is taken into account when analysing possible interaction between policy measures.

Optimal combination of different measure types

The following general criteria for an optimal set follow:
- The optimal set should cover all (relevant) conditions;
- Measure types should complement each other, not overlap;
- A measure type should influence more than one condition;
- Measures should be introduced in the right order.

An optimal combination of different measure types meets all conditions for a successful implementation of saving options. Preferably it enhances the proper utilization of the energy systems as well. The policy measures in an optimal combination complement each other with respect to meeting the five conditions. Because the conditions often are coupled to different actors, an optimal set should regard all relevant actors as well. To limit the number of policy measure types deployed, it is important that the measures influence more conditions at the same time. The last criterion concerns the timing of various measures; it has obviously no use to increase the motivation to buy a saving option at a time when the option is not yet market ready. This last criterion is not elaborated on further as it does not play a role in the following analysis.

[8] Jensen OM. Visualisation turns down energy demand. Proceedings ECEEE Summer Study 2003. p. 451-454.
[9] Groot A et al. The price elasticity of energy demand – State of affairs 1998 (in Dutch), report no. 483. Amsterdam, The Netherlands: Stichting voor Economisch Onderzoek, 1998.
[10] Sorrell, S. Interaction in EU Climate Policy – Policy design and policy interaction: literature review and methodological issues. A report to DG Research. Brighton, UK: Science & Technology Policy Research, University of Sussex, 2001.

In practice the overall optimality of a combination of policy measures will depend on other factors too. Not all types of policy measures present are applicable to every saving option. In energy policy formulation many other factors play a role when choosing a policy measure type. For instance, legislation demands extensive ex-ante knowledge about the appropriateness of the regulated saving option; this knowledge is not always easy to provide. Subsidies often affect actors not belonging to the target group; too much free riders diminish the effectiveness of the measure (see Blok and Vermeulen)

Qualitative rating of the possible interaction effect

In this analysis the interaction effect regards the direct influence of one policy measure on the saving effect of another measure. Measures from an earlier period, such as R&D-programmes, can influence the effect of present policy measures but are not taken into account. Second order effects, such as the past agreement on industrial energy efficiency in the Netherlands which has provided for a structure that was beneficial to the new measure benchmarking, are not taken into account either.

The qualitative rating of the possible interaction effect proceeds as follows. The more two measures exert influence at the same condition(s) for implementation, the more they mitigate each other's effect. Depending on the specific situation this results in a relative rating: marginal-, modest- or strong mitigating ('-', '- -' or '- - - '). The last rating can be characterised as 'too much of the same kind'. An example is the combination 'standards and subsidies' which provides more motivation to invest into a saving option than is actually needed. Their combined effect is less than the sum of the separate effects of both measures apart. These cases are also called 'overlapping' or, as in Braathen and Serret[11], 'counterproductive'. In the extreme opposite case two measures complement each other in such a way that the combined effect is much greater than the total effect of both measures apart. This synergetic combination is rated as strong reinforcing ('+++'). A Dutch example is the label system for appliances and the energy premium scheme. The evaluation in Belastingdienst[12] shows that this combination has led, in a few years only, to people purchasing efficient or very efficient appliances only. If the mutual reinforcement of two measures is less optimal the rating is modest or marginally reinforcing ('++'or '+'). In cases where it can be reasoned that one measure does not affect the saving effect of the other the rating '0' is given.

It must be stressed that the interaction analysis regards the common scope of two measures, e.g. in case of appliance standards and subsidies only the part of the subsidy scheme that is devoted to appliances. Because the quantification of interaction effects in literature often gives rise to confusion, the outcomes of interaction analysis for two measures A and B are illustrated in **Erreur ! Source du renvoi introuvable.**. For the mitigating combination the total saving effect is less than the sum of both effects; for the reinforcing combination this is the other way around. A neutral combination provides (almost) the same total savings as the sum of both measures. The figure shows that an increase in total savings due to a second measure is valid for all combinations, even the mitigating one. The point is: how relates the combined effect to the sum of the effects of both measures on their own?

[11] Braathen NA, Serret Y. Instrument mixes used for environmental policy; Further analysis and additional case studies, report ENV/EPOC /WPNEP(2004). Paris, France: IEA, May 2005

[12] Belastingdienst. Report on research findings with respect to the evaluation of the Energy Premium Scheme (in Dutch), Den Haag, The Netherlands: Belastingdienst/Centrum voor proces- en produktontwikkeling, June 2002.

ANNEX II: Targeted end-uses per sector

Targeted end-uses are separate parts of sectoral energy consumption. These parts have been chosen because they are the target of specific policies (e.g. energy performance standards for new dwellings or buildings). The following targeted end-uses have been chosen.

Households

- Space heating in existing dwellings (insulation and boiler)
- Heating new dwellings
- (Space cooling, electric)
- Hot water preparation
- Appliances
- (Lighting)
- Renewable energy (behind the meter)

Tertiary

- Space heating in existing buildings
- New buildings
- Ventilation, Air-conditioning & Cooling (VAC)
- (Lighting)
- Appliances
- Other applications (Agriculture)

Industry

- Process heat (specific technologies)
- Electric drives
- Other electricity (electrochemical, lighting, ventilation,….)
- Buildings
- CHP

Transport

- Road – Passengers (cars)
- Road – Goods (truck, lorries)
- Modal shift - Persons (train, buses, bicycling, walking)
- Modal shift - Goods (train, ship)
- Mobility – Persons (management, ICT)
- Other goods transport

All sectors

- Total electricity
- Total fuels (non-electricity)
- Total final energy

If relevant, more than one targeted use can be chosen. In case of many targeted uses, e.g. for energy taxes, the full set of targeted uses can be denoted by the category Total final energy (or total electricity or total fuels).
For the analysis of interaction some targeted end-uses (between brackets) are only used when relevant for a country..

ANNEX III: Interaction types (per sector)

The interaction types are based on the 7 main MURE types (at c1 level):

- Legislation-normative (e.g. minimum efficiency standards)
- Legislative-informative (e.g. obligatory labels)
- Financial (e.g. subsidies)
- Fiscal/tariffs (e.g. tax rebates)
- Information (e.g. campaign, info centers)
- Cooperative actions (e.g. voluntary agreement)
- Energy taxes.

These main types have been extended for different situations, depending on the sector. Moreover, for transport specific extra types have been defined

	Household		Tertiary		Industry		Transport
1	**Leg-norm/invest**	**1**	**Leg-norm/invest**	**1**	**Leg-norm/invest**	**1**	**Leg-norm/invest**
2	**Leg-norm/use**	**2**	**Leg-norm/use**	**2**	**Leg-norm/use**	**2**	**Leg-norm/use**
3	**Leg-inform/focus (label)**	**3**	**Leg-inform/focus (label)**	**3**	**Leg-inform/broad (audit)**	**3**	**Leg-inform/focus (label)**
4	**Leg-inform/broad (audit)**	**4**	**Leg-inform/broad (audit)**	**4**	**Finan-fiscal/invest**	**4**	**Finan-fiscal/invest**
5	**Finan-fiscal/invest**	**5**	**Finan-fiscal/invest**	**5**	**Finan-fiscal/info (audit)**	**5**	**Finan-fiscal/use (tariff)**
6	**Finan-fiscal/use (tariff)**	**6**	**Finan-fiscal/info (audit)**	**6**	**Market-instrum /invest**	**6**	**Inform/broad (center, etc.)**
7	**Finan-fiscal/info (audit)**	**7**	**Inform/focused-invest**	**7**	**Inform/broad (center, etc.)**	**7**	**Coop/focused (VA-manuf)**
8	**Inform/focused-invest**	**8**	**Inform/broad (center, etc.)**	**8**	**Inform/focused-invest**	**8**	**Infra/focused (modal shift)**
9	**Inform/broad (info center, etc.)**	**9**	**Coop/focused (VA-manufacturers)**	**9**	**Coop/broad (VA-sector)**	**9**	**Infra/broad (mobility)**
10	**Coop/focused (VA-manufact)**	**10**	**Coop/broad (VA-sector)**	**10**	**Coop/focused (VA-manufac)**	**10**	**Soc-plan/use (mobility)**
11	**Coop/broad (VA-sector)**	**11**	**Cross-cutting/taxes**	**11**	**Cross-cutting/taxes**	**11**	**Cross-cutting/taxes**
12	**Cross-cutting/taxes**						

ANNEX IV: Policy measure types, interaction types and targeted uses

Definition of numbers for interaction types see Annex III

Table IV-1: Households

code	Policy measure types (c3)	Interaction type	Targeted uses		
1	Energy Performance Standards	1	SH-new	SH-existing	< only new ?
2	Minimum thermal insulation standards	1	SH-existing		
3	Minimum efficiency standards for boilers	1	SH-existing	Hot water	
4	Compulsory replacement of old boilers above a certain age	1	SH-existing		
5	Thermostatic zone control	2	SH-existing		
6	Control systems for heating (Regulation)	2	SH-existing		
7	Mandatory heating pipe insulation	1	SH-existing		
8	Periodic mandatory inspection of boilers	2	SH-existing	Hot water	
9	Periodic mandatory inspection of Heating/Ventilation/AC (HVAC)	2	Space-cooling	SH-existing	
10	Mandatory use of solar thermal energy in buildings	1	RES	Hot water	
11	Individual billing (multi-family houses)	2	All but new uses	(NOT New dwellings)	
12	Maximum indoor temperature limit(s)/limitation heating period	2	SH-existing		
13	Minimum efficiency standards for electrical appliances	1	Appliances		
14	Mandatory measures for efficient lighting	1	Lighting		
15	Mandatory labelling of heating equipment	3	SH-existing	Hot water	
16	Mandatory energy labelling of electrical appliances	3	Appliances		
17	Mandatory energy efficiency certificates for existing buildings	3	SH-existing	Hot water	
18	Mandatory energy efficiency certificates for new buildings	3	New dwellings		
19	Mandatory audits in large residential buildings	4	SH-existing	Hot water	
20	Mandatory audits in small residential buildings	4	SH-existing	hot water	
21	For investments in new buildings exceeding building regulation	5	New dwellings	hot water	
22	For investments in energy efficient building renovation	5	SH-existing		
23	For the purchase of more efficient boilers	5	SH-existing	Hot water	
24	For the purchase of highly efficient electrical appliances	5	Appliances		
25	For other energy efficiency investments	5	All but new uses	(NOT New dwellings)	
26	For investment in renewables	5	RES		
27	For CHP investments	5	SH-existing	New dwellings	DH
28	For energy audits	7	SH-existing	Hot water	
29	Reduced interest rates (soft loans)	5	All uses		
30	Leasing of energy efficient equipment	5	Hot water	Appliances	
31	VAT reduction on retrofitting investment	5	SH-existing		
32	VAT reduction on equipment	5	Hot water	Appliances	
33	Income tax reduction	5	SH-existing	Hot water	RES
34	Income tax credit	5	SH-existing	Hot water	RES
35	Linear electricity tariffs	6	SH-existing	Space-cooling	
36	Voluntary labelling of buildings/components (existent and new)	8	SH-existing	New dwellings	
37	etc)	9	All but new uses	(NOT New dwellings)	
38	Detailed energy/electrical bill aiming at EE improvement	9	All but new uses	(NOT New dwellings)	
39	Regional and local information centre on energy efficiency	9	All but new uses	(NOT New dwellings)	
40	Vol./Negot. agreements with producers of White / Brown Goods	10	Appliances		
41	Vol./Negot. agreements with producers of ICT (e.g. on stand-by)	10	Appliances		
42	Voluntary DSM measures of energy suppliers and distributors	11	All but new uses	(NOT New dwellings)	
43	Technology procurement for en. efficient appliances and buildings	10	Appliances	New dwellings	
44	Eco-tax on electricity/energy cons./CO2 - emissions	12	All uses		
45	Eco-tax with income (mainly) recycled to EE/RES	12	All uses		
46	Eco-tax with income recycled to indirect labour cost	12	All uses		
47	Eco-tax with reduced rates for the industrial sector	12	All uses		

Table IV-2: Tertiary sectors

code	Policy measure types (c3)	Interaction type	Targeted uses		
1	Energy Performance Standards	1	New(lighting)	SH-existing	VAC
2	Minimum thermal insulation standards	1	New(lighting)	SH-existing	
3	Minimum efficiency standards for boilers	1	SH-existing		
4	Periodic mandatory inspection of boilers	2	SH-existing		
5	Periodic mandatory inspection of HVAC	2	SH-existing	VAC	
6	Maximum indoor temperature limit(s)	2	SH-existing		
7	Energy efficiency regulation for public lighting	1	Special applications		
8	Mandatory energy efficiency certificates for buildings	3	SH-existing	New(lighting)	VAC
9	Mandatory audits in large tertiary sector buildings	4	SH-existing	VAC	
10	Mandatory audits in small tertiary sector buildings	4	SH-existing	VAC	
11	Mandatory appointment of an energy manager	4	All but new uses		
12	Mandatory Energy Action Plan for municipalities	4	All uses	DH	
13	Mandatory annual energy report for municipalities	4	All uses		
14	For energy efficiency investment	5	All uses		
15	For investment in renewables	5	RES		
16	For CHP investments	5	SH-existing	DH	Horticulture
17	For energy audits/training/benchmarking activities	6	All but new uses		
18	Financial incentives for architects who integrate EE measures	6	New(lighting)		
19	Reduced interest rates (soft loans)	5	All uses		
20	Preferential loan guarantee conditions	5	All uses		
21	Tax reduction / Tax credit	5	All but new uses		
22	Accelerated depreciation	5	All uses		
23	Voluntary labelling of office equipment	7	Office appliances		
24	Voluntary labelling of buildings	7	SH-existing	VAC	
25	Information campaigns (by energy agencies, energy suppliers etc)	8	All but new uses		
26	Regional and local information centre on energy efficiency	8	All but new uses		
27	Information/Training for top-level management / energy managers	8	All but new uses		
28	Governing by example	8	All uses		
29	Energy efficiency / renewables awards	8	New(lighting)		
30	Voluntary energy audits	8	All but new uses		
31	Voluntary agreements with actors of the building sector	9	New(lighting)	SH-existing	
32	Voluntary agreements with public or private services	10	SH-existing		Horticulture
33	Technology procurement for energy efficient buildings / components	9	New(lighting)	SH-existing	VAC
34	Technology procurement for energy efficient appliances	9	Office appliances		
35	Eco-tax on electricity/energy consumption or CO2 - emissions	11	All uses		
36	Eco-tax with income (mainly) recycled to en. eff. / renewables	11	All uses		
37	Eco-tax with income recycled to indirect labour cost	11	All uses		
38	Eco-tax with reduced rates for the industrial sector	11	All uses		

Table IV-3: Industry

code	Policy measure types (c3)	Interaction type	Targeted uses	
1	Mandatory DSM for energy suppliers / other actors in energy sector	1	All except CHP	
2	Mandatory standards for the efficiency of electric motors	2	Electric drives	
3	Mandatory standards for the efficiency of industrial boilers	2	Process heat	
4	Mandatory appointment of an energy manager	3	All uses	
5	Mandatory audits for industrial processes / buildings	3	All uses	Buildings
6	For energy efficiency investment	4	All uses	
7	For investment in clean fuels (renewables, waste, natural gas,…)	4	All uses	
8	For CHP investments	4	CHP	
9	For energy audits/training/benchmarking activities	5	All uses	
10	Reduced interest rates (soft loans)	4	All uses	
11	Preferential loan guarantee conditions	4	All uses	
12	Tax reduction / Tax credit	4	All uses	
13	Accelerated depreciation for energy eff. investm. / renewables / CHP	4	All uses	
14	Emission trading (ETS)	6	Process heat	CHP
15	JI / CDM	6	All uses	
16	Voluntary audits	7	All uses	
17	Voluntary labelling of cross-cutting technol. (e.g. industrial motors)	8	Electric drives	
18	Information campaigns (by energy agencies, energy suppliers etc)	7	All except CHP	
19	Regional and local information centres on energy efficiency	7	All except CHP	
20	Information/Training for top-level management / energy managers	7	All uses	
21	VA/NA to reduce energy cons./CO2 emiss. of industrial processes	9	Process heat	CHP
22	VA/NA for cross-cutting technologies (e.g. industrial motors)	9	Electric drives	Other electricity
23	Technology procurement for energy efficient equipment	10	Electric drives	Other electricity
24	Eco-tax on electricity/energy consumption or CO2 - emissions	11	All uses	
25	Eco-tax with income (mainly) recycled to en. eff. / renewables	11	All uses	
26	Eco-tax with income recycled to indirect labour cost	11	All uses	
27	Eco-tax with reduced rates for the industrial sector	11	All uses	

Table IV-4: Transport

code	Policy measure types (c3)	Interaction type	Targeted uses		
1	Mandatory fuel consumption standard (cars)	1	Road-passengers		
2	Mandatory speed limits	2	All uses	Road-pass	Road-good
3	Speed limiters for cars and motor cycles	1	Road-passengers		
4	Speed limiters for lorries	1	Road-goods		
5	Periodic mandatory inspection of vehicles / pollution control	2	Road-passengers		
6	substitution	1	All uses	Road-pass	Road-good
7	Mandatory labelling of vehicles (EU)	3	Road-passengers		
8	For energy efficient vehicles	4	Road-passengers		
9	For clean vehicles (bio-fuelled /electric / LPG / gas cars)	4	Road-passengers		
10	For the scrapping of old cars	4	Road-passengers		
11	City tolls	5	All uses	Mob-person	Shift-person
12	Highway tolls	5	All uses	Road-goods	Shift-goods
13	Tax on the purchase of cars (if linked to EE improvement)	4	Road-passengers		
14	Annual vehicle tax (if linked to efficiency improvement)	4	Road-passengers		
15	Mineral oil tax	4	All uses		
16	For energy efficient vehicles	4	Road-passengers		
17	For clean vehicles (bio-fuelled /electric / LPG / gas cars)	4	Road-passengers		
18	For clean fuels (bio-fuels / LPG / natural gas / low-sulphur	4	Road-passengers		
19	Tax deduction home/job travel favouring public transport	5	Modal shift persons		
20	Information / training on energy efficient driving behaviour	6	Road-passengers		
21	Information on public transport	6	Modal shift persons		
22	Promotion of cycling or walking	6	Modal shift persons		
23	VA/NA with car producers	7	Road-passengers		
24	VA/NA for trucks / light vehicles	7	Road-goods		
25	VA/NA for public transport companies	7	Modal shift persons		
26	Technology procurement for EE or green vehicles	7	Road-passengers		
27	Modal shift toward public passenger transport	8	Modal shift persons		
28	Modal shift toward public goods transport	8	Modal shift goods		
29	Improvement of intermodality / interconnection of transport	8	Modal shift goods		
30	Urban traffic management and optimisation	9	Mobility persons		Shift-person
31	Inter-urban traffic management and optimisation	9	Mobility persons		Shift-goods
32	Reduction in traffic volume	9	Mobility persons		
33	Car-sharing / increased occupancy of cars	10	Mobility persons		
34	Teleworking	10	Mobility persons		
35	Commuter plans for companies	10	Mobility persons		
36	Work and school hours scheduling	10	Mobility persons		
37	Better organisation of the goods distribution in the cities	10	Other goods transport		
38	Increased load factor for goods	10	Other goods transport		
39	Eco-tax on electricity/energy consumption or CO2 -	11	All uses		
40	Eco-tax with income (mainly) recycled to en. eff. /	11	All uses		
41	Eco-tax with income recycled to indirect labour cost	11	All uses		
42	Eco-tax with reduced rates for the industrial sector	11	All uses		

ANNEX V: Interaction types per targeted end-use (per sector)

HOUSEHOLDS

SH existing dwelling
Leg-norm/invest
Leg-norm/use
Leg-inform/focus(certif)
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/focused (invest)
Inform/broad (center, etc.)
Coop/broad (VA-sector)
Cross-cutting/taxes

New dwellings
Leg-norm/invest
Leg-inform/focus(certif)
Finan-fiscal/invest
Inform/focused(invest)
Coop/focused (manufact)
Coop/broad (VA-sector)
Cross-cutting/taxes

Hot water
Leg-norm/invest
Leg-norm/use
Leg-inform/focus(label)
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/focused (invest)
Inform/broad (center, etc.)
Coop/broad (VA-sector)
Cross-cutting/taxes

Appliances
Leg-norm/invest
Leg-inform/focus (label)
Finan-fiscal/invest
Inform/focused (invest)
Inform/broad (center)
Coop/focus (Manufac)
Cross-cutting/taxes

Renewables
Leg-norm/invest
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/broad (center)
Cross-cutting/taxes

TERTIARY

SH existing buildings
Leg-norm/invest
Leg-norm/use
Leg-inform/focus (label)
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/focus-invest(certif)
Inform/broad-use
Coop/focused (WBM)
Coop/broad (VA-sector)
Cross-cutting/taxes

New buildings
Leg-norm/invest
Leg-inform/focus (label)
Finan-fiscal/invest
Finan-fiscal/info
Inform/broad
Coop/focused (Manufact)
Cross-cutting/taxes

VAC
Leg-norm/invest
Leg-norm/use
Leg-inform/focus (label)
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/focus-invest(certif)
Inform-broad-use
Coop/focused (VA/DSM)
Cross-cutting/taxes

Appliances
Leg-norm/invest
Leg-inform/focus (label)
Finan-fiscal/invest
Inform/focus-invest(certif)
Inform/broad-use
Coop/focused (Manufac)
Cross-cutting/taxes

Other (agriculture)
Finan-fiscal/invest
Finan-fiscal/info
Inform/broad
Coop/focused (WMB)
Coop/broad (VA-sector)
Cross-cutting/taxes

INDUSTRY

Process heat
Leg-norm/invest
Leg-inform/broad(audit)
Finan-fiscal/invest
Market-instr/invest(ETS)
Finan-fiscal/info (audits)
Inform/broad-use
Coop/focused (WBM)
Coop/broad (VA-sector)
Cross-cutting/taxes

Electric drives
Leg-norm/invest
Leg-inform/broad(audit)
Finan-fiscal/invest
Finan-fiscal/info (audits)
Inform/focus-invest
Inform-broad-use
Coop/focused (WBM)
Coop/broad (VA-sector)
Cross-cutting/taxes

Other electricity
Leg-norm/use
Leg-inform/broad
Finan-fiscal/invest
Inform/broad-use
Coop/focused (WBM)
Coop/broad (VA-sector)
Cross-cutting/taxes

CHP
Leg-norm/invest
Finan-fiscal/invest
Market-instr/invest ETS)
Coop/focused (WBM)
Coop/broad (VA-sector)
Regulatory taxes

Buildings matrix
Leg-inform/broad
Finan-fiscal/invest
Finan-fiscal/info
Inform/broad
Cross-cutting/taxes

TRANSPORT

Road-passengers
Leg-norm/invest
Leg-norm/use
Leg-inform/focus (label)
Finan-fiscal/invest
Finan-fiscal/use (tariff)
Inform/broad (center)
Coop/focused (VA-man)
Cross-cutting/taxes

Road-goods
Leg-norm/invest
Leg-norm/use
Finan-fiscal/invest
Finan-fiscal/use (tariff)
Coop/focused (VA-man)
Cross-cutting/taxes

Modal shift persons
Finan-fiscal/use (tariff)
Inform/broad (center)
Infra/focused (mod.shift)
Cross-cutting/taxes

Modal shift goods
Finan-fiscal/use (tariff)
Infra/focused (mod.shift)
Cross-cutting/taxes

Mobility persons
Finan-fiscal/use (tariff)
Infra/broad (mobility)
Soc-plan/use (mobility)
Cross-cutting/taxes

Other goods transport
Finan-fiscal/use (tariff)
Infra/broad (mobility)
Soc-plan/use (mobility)
Cross-cutting/taxes

ANNEX VI: Standard interaction matrices per targeted end-use/sector

HOUSEHOLDS.

Space heating existing dwellings										
	Legislation on:		Leg-inform		Support via:		Information:		Coop	Taxes
Measure	invest	use	label	audit	invest	audits	invest	use	VA	
Leg-norm-invest										
Leg-norm-use	-									
Leg-inform-focus (label)	- - -	0								
Leg-inform-broad(audit)	- - -	0	- - -							
Fin/fiscal-invest	- - -	-	+++	++						
Fin/fiscal-info (audits)	- - -	- -	- -	- - -	+					
Inform-focused-invest	- - -	0	- - -	- - -	+	- - -				
Inform-broad-use	-	- - -	0	-	0	-	0			
Coop-broad (VA)	- - -	-	-	0	+	-	-	-		
Taxes	- -	- -	+	+	- -	+	+	+++	-	

New dwellings						
	Leg-norm	Leg-inform	Support	Inform	Coop	Taxes
Measure	invest	label	invest	certif.	VA-	
Leg-norm-invest						
Leg-inform-focus (label)	- - -					
Fin/fiscal-invest	- - -	+++				
Inform-invest(certif)	- - -	- - -	+			
Coop-broad (VA)	- - -	-	+	-		
Taxes	- -	+	- -	+	-	

Hot water										
	Legislation on:				Support via:		Information:		Coop	Taxes
Measure type	invest	use	label	audit	invest	audits	invest	use	VA-DSM	
Leg-norm-invest										
Leg-norm-use	-									
Leg-inform-focus (label)	- - -	0								
Leg-inform-broad(audit)	- - -	0	- -							
Fin/fiscal-invest	- - -	-	+++	++						
Fin/fiscal-info (audits)	- - -	- -	- -	- - -	+					
Inform-invest(certif)	- - -	0	- - -	- - -	+	- - -				
Inform-broad-use	-	- - -	0	-	0	-	0			
Coop-broad (VA)	- - -	-	-	0	+	-	-	-		
Taxes	- -	- -	+	+	- -	+	+	+++	-	

Appliances								
	Legislation on:		Support	Information:		Coop (VA)	Taxes	
Measure type	invest	label	invest	invest	use	Manuf.		
Leg-norm-invest								
Leg-inform-focus (label)	- - -							
Fin/fiscal-invest	- - -	+++						
Inform-invest	- - -	- - -	+					
Inform-broad-use	-	0	0	0				
Coop (VA manuf.)	- - -	- -	+	++	0			
Taxes	- -	+	- -	+	+++	+		

Renewables matrix							
		Leg-norm		Support		Inform	Taxes
Measure		invest	audit	invest	audits	invest	
Leg-norm/invest							
Leg-inform/broad(audit)		- - -					
Finan-fiscal/invest		- - -	+++				
Finan-fiscal/info (audits)		- - -	- -	+			
Inform/broad (center)		- - -	- - -	+	- - -		
Cross-cutting/taxes		- -	+	- -	+	+	

TERTIARY SECTORS

Space heating existing buildings (+lighting?)				4	5	6	7	8	8	10	11
	Leg-norm		Leg-inform		Support via:		Information:		Coop		Taxes
Measure	invest	use	label	audit	invest	audits	invest	broad	WBM	sector	
Leg-norm/invest											
Leg-norm/use	-										
Leg-inform/focus (label)	- - -	0									
Leg-inform/broad(audit)	- - -	0	- - -								
Finan-fiscal/invest	- - -	-	+++	++							
Finan-fiscal/info (audits)	- - -	- -	- -	- - -	+						
Inform/focus-invest(certif)	- - -	0	- - -	- - -	+	- - -					
Inform/broad-use	-	- - -	0	-	0	-	0				
Coop/focused (WBM)	- - -	0	+	0	+	-	0	-			
Coop/broad (VA-sector)	- - -	-	-	0	+	-	-	-	- - -		
Cross-cutting/taxes	- -	- -	+	+	- -	+	+	+++	+	-	

New buildings matrix							
	Leg-norr	Leg-inf	Support		Inform	Coop	Taxes
Measure	invest	label	invest	info	broad	manuf	
Leg-norm/invest							
Leg-inform/focus (label)	- - -						
Finan-fiscal/invest	- - -	+++					
Finan-fiscal/info	- - -	- -	+				
Inform/broad	-	0	0	-			
Coop/focused (Manufac)	- - -	+	+	-	-		
Cross-cutting/taxes	- -	+	- -	+	+++	+	

Ventilation/air-conditioning (VAC) matrix										
	Leg-norm		Leg-inform		Support via:		Information:		Coop	Taxes
Measure type	invest	use	label	audit	invest	audits	invest	use	VA/DSM	
Leg-norm/invest										
Leg-norm/use	-									
Leg-inform/focus (label)	- - -	0								
Leg-inform/broad(audit)	- - -	0	- -							
Finan-fiscal/invest	- - -	-	+++	++						
Finan-fiscal/info (audits)	- - -	- -	- -	- - -	+					
Inform/focus-invest(certif)	- - -	0	- - -	- - -	+	- - -				
Inform-broad-use	-	- - -	0	-	0	-	0			
Coop/focused (VA/DSM)	- - -	-	-	0	+	-	-	-		
Cross-cutting/taxes	- -	- -	+	+	- -	+	+	+++	-	

Office appliances matrix							
	Leg-norr	Leg-inf	Suppor	Information:		Coop	Taxes
Measure type	invest	label	invest	invest	use	Manuf.	
Leg-norm/invest							
Leg-inform/focus (label)	- - -						
Finan-fiscal/invest	- - -	+++					
Inform/focus-invest(certif)	- - -	- - -	+				
Inform/broad-use	-	0	0	0			
Coop/focused (Manufac)	- - -	- -	+	++	0		
Cross-cutting/taxes	- -	+	- -	+	+++	+	

Other (horiculture) matrix						
	Support		Inform	Coop-VA		Taxes
Measure	invest	info	broad	WBM	sector	
Finan-fiscal/invest						
Finan-fiscal/info	+					
Inform/broad	0	-				
Coop/focused (WMB)	+	-	-			
Coop/broad (VA-sector)	+	-	-	- - -		
Cross-cutting/taxes	- -	+	+++	+	-	

INDUSTRY

Process heat matrix	1	4	5	6	7	9	10	11	12
	Leg-norr	Leg-info	Support via:			Inform	Coop(VA)		Taxes
Measure	invest	audit	invest	ETS	audits	broad	WBM	sector	
Leg-norm/invest									
Leg-inform/broad(audit)	- - -								
Finan-fiscal/invest	- - -	++							
Market-instr/invest (ETS)	- - -	++	- -						
Finan-fiscal/info (audits)	- - -	- - -	+	++					
Inform/broad-use	-	-	0	+	-				
Coop/focused (WBM)	- - -	0	+	+	-	-			
Coop/broad (VA-sector)	- - -	0	- - -	+	+	- - -	- - -		
Cross-cutting/taxes	- -	+	- -	- -	+	+++	-	-	

Electric drives matrix	1	4	5	7	8	9	10	11	12
	Leg-norr	Leg-info	Support via:		Information:		Coop (VA)		Taxes
Measure type	invest	audit	invest	audits	invest	use	WBM	sector	
Leg-norm/invest									
Leg-inform/broad(audit)	- - -								
Finan-fiscal/invest	- - -	++							
Finan-fiscal/info (audits)	- - -	- - -	+						
Inform/focus-invest(certif)	- - -	- - -	+	- - -					
Inform-broad-use	-	-	0	-	0				
Coop/focused (WBM)	- - -	0	+	-	-	-			
Coop/broad (VA-sector)	- - -	0	- - -	+	-	-	- - -		
Cross-cutting/taxes	- -	+	- -	+	+	+++	-	-	

Other electricity matrix	2	4	5	9	10	11	12
	Legis-no	Leg-info	Suppor	Inform	Coop (VA)		Taxes
Measure type	DSM	audit	invest	use	WBM	sector	
Leg-norm/use							
Leg-inform/broad	- - -						
Finan-fiscal/invest	- - -	+++					
Inform/broad-use	-	0	0				
Coop/focused (WBM)	- - -	- -	+	0			
Coop/broad (VA-sector)	-	0	+	-	- - -		
Cross-cutting/taxes	- -	+	- -	+++	+	-	

CHP matrix	Leg-norr	Support		Coop (VA)		Taxes
Measure	invest	invest	ETS	WBM	sector	
Leg-norm/invest						
Finan-fiscal/invest	- - -					
Market-instr/invest (ETS)	- - -	- -				
Coop/focused (WBM)	- - -	+	+			
Coop/broad (VA-sector)	- - -	+	+	- - -		
Regulatory taxes	- -	- -	- -	-	-	

Buildings matrix	Leg-info	Support		Inform	Taxes
Measure	audit	invest	info	broad	
Leg-inform/broad					
Finan-fiscal/invest	+++				
Finan-fiscal/info	- -	+			
Inform/broad	0	0	-		
Cross-cutting/taxes	+	- -	+	+++	

TRANSPORT

Road-passengers	Legis-norm:		Leg-inf	Fin-fiscal		Informa	Co-operative	
Measure	invest	use	focus	invest	use	broad	focus	Taxes
Leg-norm/invest								
Leg-norm/use	-							
Leg-inform/focus (label)	- - -	0						
Finan-fiscal/invest	- - -	-	+++					
Finan-fiscal/use (tariff)	- - -	-	-	+				
Inform/broad (center, etc.)	-	- - -	0	0	-			
Coop/focused (VA-manuf)	- - -	0	+	+	0	-		
Cross-cutting/taxes	- -	- -	+	- -	- -	+++	+	

Road-goods	Legis-norm:		Fin-fiscal		Co-operative	
Measure	invest	use	invest	use	focus	Taxes
Leg-norm/invest						
Leg-norm/use	-					
Finan-fiscal/invest	- - -	-				
Finan-fiscal/use (tariff)	- - -	-	+			
Coop/focused (VA-manuf)	- - -	0	+	0		
Cross-cutting/taxes	- -	- -	- -	- -	+	

Modal shift persons		Fin-fisca	Inform	Infra	
Measure		use	broad	focus	Taxes
Finan-fiscal/use (tariff)					
Inform/broad (center, etc.)		-			
Infra/focused (modal shift)		+	+		
Cross-cutting/taxes		- -	+++	+	

Modal shift goods		Fin-fisca	Infra	
Measure		use	focus	Taxes
Finan-fiscal/use (tariff)				
Infra/focused (modal shift)		+		
Cross-cutting/taxes		- -	+	

Mobility persons		Fin-fisca	Infra	Soc-planning	
Measure		use	broad	use	Taxes
Finan-fiscal/use (tariff)					
Infra/broad (mobility)		+			
Soc-plan/use (mobility)		+	+		
Cross-cutting/taxes		- -	+	+	

Other goods transport		Fin-fisca	Infra	Soc-planning	
Measure		use	broad	use	Taxes
Finan-fiscal/use (tariff)					
Infra/broad (mobility)		+			
Soc-plan/use (mobility)		+	+		
Cross-cutting/taxes		- -	+	+	

ANNEX VII: Cross-sector measures per targeted end-use (per sector)

List of cross-sector policy measures

	c1	c2	c3
1	General Energy Efficiency / Climate Change / Renewable Programmes		General energy efficiency programme
2	General Energy Efficiency / Climate Change / Renewable Programmes		General climate change programme
4	Legislative/Normative Measures		Heating Planning (e.g. district heating, gas)
6	Legislative/Normative Measures		Priority access of CHP to the electricity grid
7	Legislative/Normative Measures		Obligations for distribution companies
9	Fiscal Measures/Tariffs		Preferential feed-in tariffs for CHP
10	Financial Measures		CO2 / energy efficiency /renewables funds
11	Co-operative Measures		Voluntary DSM measures of energy suppliers and distributors
12	Market-based Instruments		Incentives facilitating TPF / ESCOs
13	Market-based Instruments		White certificates
18	Market-based Instruments		Incentives producers innovative technologies
19	Market-based Instruments		Technology deployment schemes
20	Non-classified Measure Types		Non-classified Measure Types

Cross-sector measure types and targeted end-uses

Households

1 / 2	General energy efficiency programme		All uses		
4	Heating Planning (e.g. for district heating, gas)		SH-existing	New dwellings	DH
7	ESO, Energy Service Obligations for supply/distribution companies		All but new uses	(NOT New dwellings)	
10	CO2 / energy efficiency /renewables funds		All uses		
13	WCS (White Certificates System)		All but new uses	(NOT New dwellings)	
18/19	Incentives for the producers of innovative technologies		All uses		

Tertiary sectors

1 / 2	General energy efficiency programme		All uses		
4	Heating Planning (e.g. for district heating, gas)		SH-existing	New(lighting)	DH
7	ESO, Energy Service Obligations for supply/distribution companies		All uses		
10	CO2 / energy efficiency /renewables funds		All uses		
12	Incentives facilitating Third Party Financing / ESCOs		All uses		
13	WCS (White Certificates System)		All uses		
18/19	Incentives for the producers of innovative technologies		All uses		

Industry

1 / 2	General energy efficiency programme / climate change program		All uses		
6	Priority access of CHP to the electricity grid		CHP		
7	ESO, Energy Service Obligations for supply/distribution companies		All uses		
9	Preferential feed-in tariffs for CHP		CHP		
10	CO2 / energy efficiency /renewables funds		All uses		
11	Voluntary DSM measures of energy suppliers and distributors				
12	Incentives facilitating Third Party Financing / ESCOs		All uses		
13	WCS (White Certificates System)		All uses		
18/19	Incentives for the producers of innovative technologies		All uses		

Transport

1 / 2	General energy efficiency programme		All uses		
7	ESO, Energy Service Obligations for supply/distribution companies		All uses		
10	CO2 / energy efficiency /renewables funds		All uses		
13	WCS (White Certificates System)		All uses		
18/19	Incentives for the producers of innovative technologies				

ANNEX VIII: Possible interaction types for cross-sector measures

For definition of numbers for interaction types see Annex III.

Cross-sector measure	**Households**	**Tertiary sectors**	**Industry**	**Transport**
General energy efficiency programme	4,5,7,9,10,11	4,5,6,8,9,10	4,5,8,9,10	4,6,7,8,9,10
General climate change programme	see 1	see 1	see 1	see 1
Heating Planning (e.g. district heating, gas)	1,2,11	1,2.10	x	x
Priority access of CHP to the electricity grid	x	x	1,4	x
Obligations for distribution companies	4,5,7,8,10	4,5,6,7,9	3,4,5,8,10	x
Preferential feed-in tariffs for CHP	x	x	4	X
CO2 / energy efficiency /renewables funds	5	5	4	4
Voluntary DSM measures of energy suppliers and distributors	10,11	9,10	9,10	x
Incentives facilitating TPF / ESCOs	x	5,7	4,8	x
White certificates	4,5,7,8,10	4,5,6,7,9	3,4,5,8,10	4,6,8
Incentives producers innovative technologies	10	9	10	7
Technology deployment schemes	10	9	10	4 + 7
Non-classified Measure Types	X	X	6	X

ANNEX IX: Interaction results for Space heating in Households (preliminary)

The interaction facility has been applied for most EU countries, with all policy measures and their characteristics from the MURE data by September 2014, and as supplied by the country representatives.

The difference between the sum of impacts per policy measure (Summed) and de total combined impact including interaction (Combined) has been expressed as a percentage of the sum. This Fraction shows that in all cases there is an overlapping interaction effect (positive value). The lowest overlap is found for Austria, France and Germany, while an overlap above 40% is found for Italy, Latvia, Lithuania and Poland. On average 26% overlap is found.

Interaction results and explaining factors for EU countries (Spece heating Households)

	Number	No imp.	H-imp.	Taxes	Summed	Combinec	Difference	Fraction
Austria	8	3	4	0	8,078	7,364	714	9%
Belgium	21	7	10	0	31,961	20,565	11,396	36%
Bulgaria	16	0	7	0	9,194	6,890	2,304	25%
Croatia	13	4	6	0	4,363	2,747	1,616	37%
Czech Republic	15	8	1	0	3,793	2,467	1,326	35%
Denmark	7	2	2	1	3,576	2,535	1,041	29%
Estonia	15	0	3	0	1,428	1,013	415	29%
Finland	14	0	5	0	9,364	7,578	1,786	19%
France	27	4	7	0	150,885	132,160	18,725	12%
Germany	13	0	7	1	147,226	104,908	42,318	29%
Greece	11	1	2	0	7,464	6,718	746	10%
Hungary	6	0	0	0	2,593	1,642	951	37%
Ireland	14	0	7	0	8,186	6,732	1,454	18%
Italy	14	4	1	0	26,566	15,822	10,744	40%
Latvia	11	0	1	1	1,235	722	513	42%
Lithuania	7	2	2	0	1,028	579	449	44%
Netherlands	8	0	3	1	11,238	7,920	3,318	30%
Poland	5	2	3	0	13,743	7,559	6,184	45%
Portugal	6	0	6	0	6,963	5,013	1,950	28%
Romania	6	0	2	0	7,226	5,881	1,345	19%
Slovakia	13	1	2	0	1,345	928	417	31%
Slovenia	10	0	5	1	3,932	2,842	1,090	28%
Spain	15	0	8	0	62,862	39,855	23,007	37%
Sweden	6	3	1	1	1,915	1,422	493	26%
UK	16	0	4	0	89,364	64,503	24,861	28%
Average/total 25	11.9	1.6	4.0	0.24	615,528	456,365	159,163	26%

The fraction per country has been analysed as to the total number of policy measures per country, the lack of impact figures or the fraction of High impacts, and the presence of an energy tax measure.

This analysis shows that there is no relation between amount of overlap and number of policy measures. Thus, more and more policy measures need to lead to more overlap.

When countries rate the impact rather often as High there is a slightly higher overlap. This is probably due to the fact that overlap between policy measure with each a high impact adds rather much to the overlap.

For countries with energy taxes there is overall more overlap than for the countries without a tax. This is due the fact that the effect of taxes by nature has an interaction with that of almost all other policy measure types.

It must be stressed that this regards preliminary results, without any further selection of relevant policy measures or adaptation of the interaction matrix for specific circumstamces in countries.

ANNEX X: Targeted end-uses per measures types

HOUSEHOLD				
type code	type group C1	type subgroup C2	type detail C3	end-use
1	Legislative/Normative	Mandatory Standards for Buildings	Energy Performance Standards	Space heating existing dwellings
				Space heating new dwellings
2	Legislative/Normative	Mandatory Standards for Buildings	Minimum thermal insulation standards	Space heating existing dwellings
3	Legislative/Normative	Regulation for Heating Systems and hot water systems	Minimum efficiency standards for boilers	Space heating existing dwellings
				Hot water
4	Legislative/Normative	Regulation for Heating Systems and hot water systems	Compulsory replacement of old boilers above a certain age	Space heating existing dwellings
5	Legislative/Normative	Regulation for Heating Systems and hot water systems	Thermostatic zone control	Space heating existing dwellings
6	Legislative/Normative	Regulation for Heating Systems and hot water systems	Control systems for heating (Regulation)	Space heating existing dwellings
7	Legislative/Normative	Regulation for Heating Systems and hot water systems	Mandatory heating pipe insulation	Space heating existing dwellings
8	Legislative/Normative	Regulation for Heating Systems and hot water systems	Periodic mandatory inspection of boilers	Space heating existing dwellings
				Hot water
9	Legislative/Normative	Regulation for Heating Systems and hot water systems	Periodic mandatory inspection of Heating/Ventilation/AC (HVAC)	Space heating existing dwellings
10	Legislative/Normative	Regulation for Heating Systems and hot water systems	Mandatory use of solar thermal energy in buildings	Hot water
				Renewables
11	Legislative/Normative	Other Regulation in the Field of Buildings	Individual billing (multi-family houses)	Space heating existing dwellings
				Appliances
				Hot water

12	Legislative/Normative	Other Regulation in the Field of Buildings	Maximum indoor temperature limit(s)/limitation heating period	Space heating existing dwellings
13	Legislative/Normative	Mandatory Standards for Electrical Appliances	Minimum efficiency standards for electrical appliances	Appliances
14	Legislative/Normative	Mandatory Standards for Electrical Appliances	Mandatory measures for efficient lighting	Appliances
15	Legislative/Informative		Mandatory labelling of heating equipment	Hot water
				Space heating existing dwellings
16	Legislative/Informative		Mandatory energy labelling of electrical appliances	Appliances
17	Legislative/Informative		Mandatory energy efficiency certificates for existing buildings	Hot water
				Space heating existing dwellings
19	Legislative/Informative		Mandatory audits in large residential buildings	Hot water
				Space heating existing dwellings
20	Legislative/Informative		Mandatory audits in small residential buildings	Space heating existing dwellings
				Hot water
21	Financial	Grants / Subsidies	For investments in new buildings exceeding building regulation	Space heating new dwellings
				Hot water
22	Financial	Grants / Subsidies	For investments in energy efficient building renovation	Space heating existing dwellings
23	Financial	Grants / Subsidies	For the purchase of more efficient boilers	Hot water
				Space heating existing dwellings
24	Financial	Grants / Subsidies	For the purchase of highly efficient electrical appliances	Appliances
25	Financial	Grants / Subsidies	For other energy efficiency investments	Appliances
				Hot water
				Space heating existing dwellings
				Renewables
26	Financial	Grants / Subsidies	For investment in renewables	Renewables

28	Financial	Grants / Subsidies	For energy audits	Space heating existing dwellings
				Hot water
29	Financial	Loans/Others	Reduced interest rates (soft loans)	Hot water
				Appliances
				Space heating existing dwellings
				Renewables
				Space heating new dwellings
30	Financial	Loans/Others	Leasing of energy efficient equipment	Appliances
				Hot water
31	Fiscal/Tariffs	Tax Exemption / Reduction	VAT reduction on retrofitting investment	Space heating existing dwellings
32	Fiscal/Tariffs	Tax Exemption / Reduction	VAT reduction on equipment	Appliances
				Hot water
33	Fiscal/Tariffs	Tax Exemption / Reduction	Income tax reduction	Space heating existing dwellings
				Hot water
				Renewables
37	Information/Education		Information campaigns (by energy agencies, energy suppliers etc)	Hot water
				Renewables
				Appliances
				Space heating existing dwellings
38	Information/Education		Detailed energy/electrical bill aiming at EE improvement	Appliances
				Hot water
				Renewables
				Space heating existing dwellings
39	Information/Education		Regional and local information centre on energy efficiency	Space heating existing dwellings
				Renewables
				Hot water
				Appliances
40	Co-operative Measures		Vol./Negot. agreements with producers of White / Brown Goods	Appliances

41	Co-operative Measures		Vol./Negot. agreements with producers of ICT (e.g. on stand-by)	Appliances
42	Co-operative Measures		Voluntary DSM measures of energy suppliers and distributors	Space heating existing dwellings
				Appliances
				Renewables
				Hot water
43	Co-operative Measures		Technology procurement for en. efficient appliances and buildings	Appliances
				Space heating new dwellings
44	Cross-cutting with sector-specific characteristics		Eco-tax on electricity/energy consumption or CO2 - emissions	Renewables
				Appliances
				Space heating new dwellings
				Space heating existing dwellings
				Hot water
45	Cross-cutting with sector-specific characteristics		Eco-tax with income (mainly) recycled to en. eff. / renewables	Space heating new dwellings
				Space heating existing dwellings
				Renewables
				Hot water
				Appliances
46	Cross-cutting with sector-specific characteristics		Eco-tax with income recycled to indirect labour cost	Renewables
				Hot water
				Space heating new dwellings
				Appliances
				Space heating existing dwellings
47	Cross-cutting with sector-specific characteristics		Eco-tax with reduced rates for the industrial sector	Renewables
				Hot water
				Appliances
				Space heating existing dwellings
				Space heating new dwellings
TERTIARY				
type	type group C1	type subgroup C2	type detail C3	end-use

code				
1	Legislative/Normative	Mandatory Standards for Buildings	Energy Performance Standards	Space heating existing buildings
				Ventilation/air-conditioning
				Lightings
2	Legislative/Normative	Mandatory Standards for Buildings	Minimum thermal insulation standards	Lightings
				Space heating existing buildings
3	Legislative/Normative	Regulation for Building Equipment	Minimum efficiency standards for boilers	Space heating existing buildings
4	Legislative/Normative	Regulation for Building Equipment	Periodic mandatory inspection of boilers	Space heating existing buildings
5	Legislative/Normative	Regulation for Building Equipment	Periodic mandatory inspection of HVAC	Space heating existing buildings
				Ventilation/air-conditioning
6	Legislative/Normative	Other Regulation in the Field of Buildings	Maximum indoor temperature limit(s)	Space heating existing buildings
8	Legislative/Informative		Mandatory energy efficiency certificates for buildings	Ventilation/air-conditioning
				Lightings
				Space heating existing buildings
9	Legislative/Informative		Mandatory audits in large tertiary sector buildings	Space heating existing buildings
				Ventilation/air-conditioning
10	Legislative/Informative		Mandatory audits in small tertiary sector buildings	Space heating existing buildings
				Ventilation/air-conditioning)
11	Legislative/Informative		Mandatory appointment of an energy manager	Office appliances
				Space heating existing buildings
				Ventilation/air-conditioning
				Other (horticulture)
12	Legislative/Informative		Mandatory Energy Action Plan for municipalities	Other (horticulture)
				Space heating existing buildings
				Office appliances
				Space heating new buildings
				Ventilation/air-conditioning
				Lightings
13	Legislative/Informative		Mandatory annual energy report for	Lightings

			municipalities	Space heating existing buildings
				Other (horticulture)
				Space heating new buildings
				Ventilation/air-conditioning
				Office appliances
14	Financial	Grants / Subsidies	For energy efficiency investment	Office appliances
				Space heating existing buildings
				Lightings
				Ventilation/air-conditioning
				Other (horticulture)
				Space heating new buildings
15	Financial	Grants / Subsidies	For investment in renewables	Renewables
16	Financial	Grants / Subsidies	For CHP investments	Other (horticulture)
				Space heating existing buildings
18	Financial	Grants / Subsidies	Financial incentives for architects who integrate EE measures	Lightings
23	Information/Education/Training		Voluntary labelling of office equipment	Office appliances
24	Information/Education/Training		Voluntary labelling of buildings	Space heating existing buildings
				Ventilation/air-conditioning
25	Information/Education/Training		Information campaigns (by energy agencies, energy suppliers etc)	Other (horticulture)
				Lightings
				Space heating existing buildings
				Office appliances
				Ventilation/air-conditioning
26	Information/Education/Training		Regional and local information centre on energy efficiency	Other (horticulture)
				Ventilation/air-conditioning
				Office appliances
				Lightings
				Space heating existing buildings
27	Information/Education/Training		Information/Training for top-level	Lightings

			management / energy managers	Ventilation/air-conditioning
				Office appliances
				Other (horticulture)
				Space heating existing buildings
28	Information/Education/Training		Governing by example	Lightings
				Other (horticulture)
				Office appliances
				Ventilation/air-conditioning
				Space heating existing buildings
				Space heating new buildings
29	Information/Education/Training		Energy efficiency / renewables awards	Lightings
30	Information/Education/Training		Voluntary energy audits	Other (horticulture)
				Office appliances
				Space heating existing buildings
				Ventilation/air-conditioning
31	Co-operative Measures		Voluntary agreements with actors of the building sector	Lightings
				Space heating existing buildings
32	Co-operative Measures		Voluntary agreements with public or private services	Other (horticulture)
				Space heating existing buildings
33	Co-operative Measures		Technology procurement for energy efficient buildings / components	Space heating new buildings
				Ventilation/air-conditioning
				Lightings
34	Co-operative Measures		Technology procurement for energy efficient appliances	Office appliances
35	Cross-cutting with sector-specific characteristics		Eco-tax on electricity/energy consumption or CO2 - emissions	Space heating existing buildings
				Other (horticulture)
				Ventilation/air-conditioning
				Space heating new buildings
				Office appliances

				Lightings
36	Cross-cutting with sector-specific characteristics		Eco-tax with income (mainly) recycled to en. eff. / renewables	Ventilation/air-conditioning
				Office appliances
				Space heating existing buildings
				Space heating new buildings
				Other (horticulture)
				Lightings
37	Cross-cutting with sector-specific characteristics		Eco-tax with income recycled to indirect labour cost	Other (horticulture)
				Space heating existing buildings
				Ventilation/air-conditioning
				Office appliances
				Space heating new buildings
				Lightings
38	Cross-cutting with sector-specific characteristics		Eco-tax with reduced rates for the industrial sector	Space heating existing buildings
				Ventilation/air-conditioning
				Space heating new buildings
				Other (horticulture)
				Office appliances
				Lightings
INDUSTRY				
type code	type group C1	type subgroup C2	type detail C3	end-use

1	Legislative/Normative	Mandatory Demand Side Management	Mandatory DSM for energy suppliers / other actors in energy sector	Other electricity
				Buildings
				Electric drives
				Process heat
2	Legislative/Normative	Other Mandatory Standards	Mandatory standards for the efficiency of electric motors	Electric drives
3	Legislative/Normative	Other Mandatory Standards	Mandatory standards for the efficiency of industrial boilers	Process heat
4	Legislative/Informative		Mandatory appointment of an energy manager	Process heat
				Buildings
				Other electricity
				CHP
				Electric drives
5	Legislative/Informative		Mandatory audits for industrial processes / buildings	CHP
				Process heat
				Electric drives
				Buildings
				Other electricity
6	Financial	Grants / Subsidies	For energy efficiency investment	Process heat
				Electric drives
				CHP
				Other electricity
				CHP
				Buildings
7	Financial	Grants / Subsidies	For investment in clean fuels (renewables, waste, natural gas,…)	Process heat
				CHP
				Other electricity
				Buildings

				Electric drives
8	Financial	Grants / Subsidies	For CHP investments	CHP
9	Financial	Grants / Subsidies	For energy audits/training/benchmarking activities	CHP
				Buildings
				Electric drives
				CHP
				Process heat
				Other electricity
10	Financial	Soft Loans for Energy Efficiency, Renewables and CHP	Reduced interest rates (soft loans)	CHP
				Process heat
				Other electricity
				Electric drives
				Buildings
11	Financial	Soft Loans for Energy Efficiency, Renewables and CHP	Preferential loan guarantee conditions	Process heat
				CHP
				Other electricity
				Electric drives
				Buildings
12	Fiscal/Tariffs	Tax Exemption / Reduction / Accelerated Depreciation	Tax reduction / Tax credit	Other electricity
				Electric drives
				Process heat
				Buildings
				CHP
13	Fiscal/Tariffs	Tax Exemption / Reduction / Accelerated Depreciation	Accelerated depreciation for energy eff. investm. / renewables / CHP	Process heat
				CHP
				Buildings
				Other electricity
				Electric drives
14	New Market-based Instruments		Emission trading	CHP
				Process heat
15	New Market-based Instruments		JI / CDM	Electric drives

				CHP
				Other electricity
				Buildings
				Process heat
16	Information/Education/Training		Voluntary audits	Other electricity
				Electric drives
				Process heat
				Buildings
				CHP
17	Information/Education/Training		Voluntary labelling of cross-cutting technol. (e.g. industrial motors)	Electric drives
18	Information/Education/Training		Information campaigns (by energy agencies, energy suppliers etc)	Electric drives
				Buildings
				Process heat
				Other electricity
19	Information/Education/Training		Regional and local information centres on energy efficiency	Electric drives
				Other electricity
				Process heat
				Buildings
20	Information/Education/Training		Information/Training for top-level management / energy managers	Buildings
				Electric drives
				Process heat
				CHP
				Other electricity
21	Co-operative Measures		VA/NA to reduce energy cons./CO2 emiss. of industrial processes	CHP
				Process heat
22	Co-operative Measures		VA/NA for cross-cutting technologies (e.g. industrial motors)	Electric drives
				Other electricity
23	Co-operative Measures		Technology procurement for energy efficient	Other electricity

			equipment	Electric drives
24	Cross-cutting with sector-specific characteristics		Eco-tax on electricity/energy consumption or CO2 - emissions	Process heat
				Buildings
				Other electricity
				Electric drives
				CHP
25	Cross-cutting with sector-specific characteristics		Eco-tax with income (mainly) recycled to en. eff. / renewables	Electric drives
				CHP
				Other electricity
				Process heat
				Buildings
26	Cross-cutting with sector-specific characteristics		Eco-tax with income recycled to indirect labour cost	Buildings
				Electric drives
				CHP
				Other electricity
				Process heat
27	Cross-cutting with sector-specific characteristics		Eco-tax with reduced rates for the industrial sector	Process heat
				Other electricity
				Buildings
				CHP
				Electric drives
TRANSPORT				
type code	type group C1	type subgroup C2	type detail C3	end-use
1	Legislative/Normative	Mandatory Standards for Vehicles	Mandatory fuel consumption standard	Road-passengers
2	Legislative/Normative	Mandatory Standards for Vehicles	Mandatory speed limits	Modal shift goods-train/ship
				Road-goods
				Modal shift persons- public trsp
				Road-passengers

				Other goods transport
				Mobility persons
3	Legislative/Normative	Mandatory Standards for Vehicles	Speed limiters for cars and motor cycles	Road-passengers
4	Legislative/Normative	Mandatory Standards for Vehicles	Speed limiters for lorries	Road-goods
5	Legislative/Normative	Mandatory Standards for Vehicles	Periodic mandatory inspection of vehicles / pollution control	Road-passengers
6	Legislative/Normative	Mandatory Standards for Vehicles	Mandatory fuel substitution / Removal of barriers to fuel substitution	Road-passengers
				Mobility persons
				Modal shift goods-train/ship
				Other goods transport
				Road-goods
				Modal shift persons- public trsp
7	Legislative/Informative		Mandatory labelling of vehicles (EU)	Road-passengers
8	Financial	Grants / Subsidies	For energy efficient vehicles	Road-passengers
9	Financial	Grants / Subsidies	For clean vehicles (bio-fuelled /electric / LPG / natural gas cars)	Road-passengers
10	Financial	Grants / Subsidies	For the scrapping of old cars	Road-passengers
11	Financial	Tolls	City tolls	Mobility persons
				Modal shift goods-train/ship
				Road-goods
				Other goods transport
				Modal shift persons- public trsp
				Road-passengers
12	Financial	Tolls	Highway tolls	Road-goods
				Other goods transport
				Mobility persons
				Road-passengers
				Modal shift persons- public trsp
				Modal shift goods-train/ship

13	Fiscal	Taxation (other than eco-tax)	Tax on the purchase of cars (if linked to efficiency improvement)	Road-passengers
14	Fiscal	Taxation (other than eco-tax)	Annual vehicle tax (if linked to efficiency improvement)	Road-passengers
15	Fiscal	Taxation (other than eco-tax)	Mineral oil tax	Other goods transport
				Modal shift goods-train/ship
				Road-goods
				Modal shift persons- public trsp
				Road-passengers
				Mobility persons
16	Fiscal	Tax Exemption / Reduction / Accelerated Depreciation	For energy efficient vehicles	Road-passengers
17	Fiscal	Tax Exemption / Reduction / Accelerated Depreciation	For clean vehicles (bio-fuelled /electric / LPG / natural gas cars)	Road-passengers
18	Fiscal	Tax Exemption / Reduction / Accelerated Depreciation	For clean fuels (bio-fuels / LPG / natural gas / low-sulphur fuels)	Road-passengers
19	Fiscal	Tax Exemption / Reduction / Accelerated Depreciation	Tax deduction home/job travel favouring public transport	Modal shift persons- public trsp
20	Information/Education/Training		Information / training on energy efficient driving behaviour	Road-passengers
21	Information/Education/Training		Information on public transport	Modal shift persons- public trsp
22	Information/Education/Training		Promotion of cycling or walking	Modal shift persons- public trsp
23	Co-operative Measures		VA/NA with car producers	Road-passengers
24	Co-operative Measures		VA/NA for trucks / light vehicles	Road-goods
26	Co-operative Measures		Technology procurement for energy efficient or green vehicles	Road-passengers
27	Infrastructure		Modal shift toward public passenger transport	Modal shift persons- public trsp
28	Infrastructure		Modal shift toward public goods transport	Modal shift goods-train/ship

				Other goods transport
29	Infrastructure		Improvement of intermodality / interconnection of transport modes	Modal shift goods-train/ship
29	Infrastructure		Improvement of intermodality / interconnection of transport modes	Other goods transport
30	Infrastructure		Urban traffic management and optimisation	Mobility persons
31	Infrastructure		Inter-urban traffic management and optimisation	Mobility persons
32	Infrastructure		Reduction in traffic volume	Mobility persons
33	SocialPlanning/Organisational		Car-sharing / increased occupancy of cars	Mobility persons
34	SocialPlanning/Organisational		Teleworking	Mobility persons
35	SocialPlanning/Organisational		Commuter plans for companies	Mobility persons
36	SocialPlanning/Organisational		Work and school hours scheduling	Mobility persons
37	SocialPlanning/Organisational		Better organisation of the goods distribution in the cities	Modal shift goods-train/ship
38	SocialPlanning/Organisational		Increased load factor for goods	Modal shift goods-train/ship
39	Cross-cutting with sector-specific characteristics		Eco-tax on electricity/energy consumption or CO2 - emissions	Road-goods
				Mobility persons
				Road-passengers
				Modal shift goods-train/ship
				Other goods transport
				Modal shift persons- public trsp
40	Cross-cutting with sector-specific characteristics		Eco-tax with income (mainly) recycled to en. eff. / renewables	Mobility persons
				Modal shift persons- public trsp
				Other goods transport
				Road-goods
				Road-passengers
				Modal shift goods-train/ship
41	Cross-cutting with sector-		Eco-tax with income recycled to indirect	Mobility persons

	specific characteristics		labour cost	Other goods transport
				Modal shift goods-train/ship
				Modal shift persons- public trsp
				Road-goods
				Road-passengers
42	Cross-cutting with sector-specific characteristics		Eco-tax with reduced rates for the industrial sector	Road-passengers
				Modal shift goods-train/ship
				Mobility persons
				Other goods transport
				Modal shift persons- public trsp
				Road-goods

GENERAL CROSS-CUTTING				
type code	type group C1	type detail C3	sector	end-use
1	General Energy Efficiency / Climate Change / Renewable Programmes	General energy efficiency programme	household	Renewables
				Hot water
				Appliances
				Space heating existing dwellings
				Space heating new dwellings
			industry	Process heat
				Other electricity
				Buildings
				Electric drives
				CHP
			tertiary	Lightings
				Office appliances
				Other (horticulture)
				Space heating new buildings
				Ventilation/air-conditioning (VAC)

				Space heating existing buildings
			transport	Road-passengers
				Road-goods
				Modal shift goods-train/ship
				Modal shift persons- public trsp
				Mobility persons
				Other goods transport
2	General Energy Efficiency / Climate Change / Renewable Programmes	General climate change programme	household	Hot water
				Appliances
				Renewables
				Space heating existing dwellings
				Space heating new dwellings
			industry	CHP
				Electric drives
				Buildings
				Other electricity
				Process heat
			tertiary	Space heating new buildings
				Lightings
				Ventilation/air-conditioning (VAC)
				Other (horticulture)
				Office appliances
				Space heating existing buildings
			transport	Mobility persons
				Road-passengers
				Modal shift persons- public trsp
				Road-goods
				Modal shift goods-train/ship
				Other goods transport

4	Legislative/Normative Measures	Heating Planning (e.g. for district heating, gas)	household	Space heating existing dwellings
				Space heating new dwellings
			tertiary	Lightings
				Space heating new buildings
6	Legislative/Normative Measures	Priority access of CHP to the electricity grid	industry	CHP
7	Legislative/Normative Measures	Service obligations for supply distribution companies	household	Appliances
				Hot water
				Space heating existing dwellings
				Renewables
			industry	Buildings
				Process heat
				CHP
				Other electricity
				Electric drives
			tertiary	Lightings
				Other (horticulture)
				Space heating new buildings
				Ventilation/air-conditioning (VAC)
				Space heating existing buildings
				Office appliances
			transport	Mobility persons
				Road-passengers
				Modal shift goods-train/ship
				Modal shift persons- public trsp
				Other goods transport
				Road-goods
9	Fiscal Measures/Tariffs	Preferential feed-in tariffs for CHP	industry	CHP
10	Financial Measures	CO2 / energy efficiency /renewables funds	household	Space heating new dwellings
				Space heating existing dwellings

				Hot water
				Renewables
				Appliances
			industry	Buildings
				Other electricity
				Process heat
				Electric drives
				CHP
			tertiary	Ventilation/air-conditioning (VAC)
				Lightings
				Office appliances
				Other (horticulture)
				Space heating new buildings
				Space heating existing buildings
			transport	Other goods transport
				Modal shift goods-train/ship
				Road-goods
				Road-passengers
				Mobility persons
				Modal shift persons- public trsp
12	Market-based Instruments	Incentives facilitating Third Party Financing / ESCOs	industry	Electric drives
				Other electricity
				CHP
				Process heat
				Buildings
			tertiary	Office appliances
				Other (horticulture)
				Space heating existing buildings
				Space heating new buildings

				Lightings
				Ventilation/air-conditioning (VAC)
13	Market-based Instruments	White certificates	household	Appliances
				Hot water
				Space heating existing dwellings
				Renewables
			industry	Other electricity
				Buildings
				CHP
				Electric drives
				Process heat
			tertiary	Ventilation/air-conditioning (VAC)
				Lightings
				Office appliances
				Space heating new buildings
				Space heating existing buildings
				Other (horticulture)
			transport	Modal shift goods-train/ship
				Mobility persons
				Other goods transport
				Road-passengers
				Modal shift persons- public trsp
				Road-goods