International Energy Agency
Energy Technology Initiative on
Demand Side Management Technologies and Programmes

From 'I think I know' to 'I understand what you did and why you did it'

Task 24 – Phase I Subtask 3, Deliverable 3B

Closing the Loop – Behaviour Change in DSM:
From Theory to Practice

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Single- and double-loop learning on behaviour change in DSM interventions (Building Retrofits)

This report is Deliverable 3B for Subtask 3 of Task 24 of the IEA DSM Implementing Agreement. Deliverable 3 is a Methodological Review on 'Beyond kWh'. Deliverable 3A is a positioning paper, providing an inventory and critical account of current monitoring and evaluation practices in DSM, which, if it is done at all, mostly entails **single-loop learning**. This single-loop learning is instrumental and mainly focussed on short-term learning about ***efficiency and effectiveness*** in meeting pre-set goals and outcomes. **Double-loop learning**, in contrast, is process-oriented and is focused on the how, when, where, how, how long, for whom and is about questioning goals and the prevailing norms and rules underlying these goals (Breukers et al., 2009). Both types of learning are relevant (Mourik et al., 2014). Single-loop learning is especially relevant for assessing *whether or not pre-set goals are reached within the available time and budget.* Double-loop is relevant for learning *why an intervention is (in)effective in a specific context*. The combination of both single- and double-loop learning may provide valuable information that can be used to improve future DSM programmes.

Mourik et al. (2014) in the positioning paper (Deliverable 3A) concluded that that more double- loop learning is needed in DSM interventions and that the next step in this field is to develop a good overview of available and necessary single- and double-loop learning indicators and methodologies to assess the success of DSM interventions, tailored to the four domains of Task 24 (building retrofits, transport, SMEs and smart meters/feedback) and the types of behaviour being targeted: ranging from one-off investment in e.g. renovation to more habitual behaviour which can range from maintenance behaviour such as purchasing light bulbs to daily routines such as showering[1].

In this third deliverable (3B) the focus is thus on the identification and development of context-sensitive indicators, metrics and ways to monitor and evaluate both short- and long-term, identifiable and/or measurable (one-off investment- and more frequent habitual) behaviour change outcomes of DSM tools (being elements of larger interventions) within one of the four domains of Task 24: building retrofits. We start with a brief recap of the main points made by Mourik et al. (2014)[2], after which we will continue with providing answers to the question of how to monitor and evaluate single- and double-loop learning in more systemic interventions in the built environment domain aimed at different types of behaviour, with specific attention to different tools that can be used in interventions and their behavioural targets. We have chosen to focus on individual tools because different interventions may (and should!) consist of numerous combinations of various tools. It is not possible to provide general guidelines and indicators that will be valuable for whatever type of interventions that consist of a multitude of or combinations of different tools.

The need for a more comprehensive monitoring and evaluation of DSM interventions

The positioning paper (Deliverable 3A) showed that DSM programmes are mostly evaluated by making use of single-loop learning- and output indicators. Insufficient attention is awarded to long-term, ongoing outcomes. The current monitoring and evaluation (M&E) practices mainly follow on (or 'flow from') the economic and psychological underpinnings that characterise most current DSM interventions. This, in combination with the fact that DSM interventions are often top-down exercises with policymakers and/or other institutional actors as funders, results in an emphasis on effectiveness and efficiency (read cost-effectiveness) as the most important indicators of success. In many cases, the energy savings are calculated or modelled instead of being measured in order to assess the efficiency or effectiveness of the intervention. These models or calculations are based on assumptions regarding end-user behaviours, without actually verifying whether these are right or not. And even when effectiveness and efficiency are actually measured, this does not tell us much about the successfulness in terms of realising *lasting* long-term behavioural change and potential

[1] Investment behaviour or one-shot decisions are performed rarely and consciously, e.g. investing in energy efficiency improvements. Habitual behaviour is more frequent and in most cases less conscious, e.g. turing off the lights, showering, etc. (Mourik et al., 2014)

[2] See the positioning paper (Deliverable 3A) of Mourik et al. (2014) for a more detailed discussion.

other outcomes or success indicators which are relevant to various stakeholders (Mourik et al., 2014).

In recent years, there has been more attention on systemic, sociologically-underpinned types of interventions in DSM programmes (Mourik and Rotmann, 2013). The underlying idea is that behaviours are embedded in broader socio-technical systems and in order to support lasting behavioural change, these interventions aim to also realise changes in and to this system, such as physical infrastructures, build environment, social norms and conventions, frames of thinking, social and political-institutional structures etc. To properly monitor and evaluate these more systematic interventions we have to include important aspects of the broader socio-technical system in the monitoring and evaluation practices (Mourik et al., 2014). The positioning paper (Deliverable 3A) described several challenges and shortcomings of monitoring and evaluating behavioural change in DSM interventions, which are briefly listed below:

- A lack of benchmarking, which is an adequate tool to measure improvements against a set base-line
- Focus is often mostly at the implementation stage (supply side) instead of the in-use phase (end users), which means that the occurrence and evolution of behavioural change is not addressed
- In cases where behavioural change is addressed, there is often a lack of longitudinal M&E, which makes it impossible to assess the long-term outcome of behavioural change
- The M&E team is often only involved after the intervention is concluded. Consequently, requirements for monitoring and evaluation are often not included in the fine-tuning of an intervention
- Monitoring is often based on modelling and irrelevant proxies of behaviour, like for instance energy savings, cost savings, number of homes retrofitted and the floor area insulated etc
- The distribution of costs and benefits between different stakeholder is often not monitored and evaluated, while this is crucial to understand why end-users have responded the ways they did
- Different stakeholders may have different definitions of success, which are often not made explicit. In addition to this, e.g. end-users' success definitions are often not identified, monitored or evaluated at all
- Focus is often on individuals and not on practices or socially-shared ways-of-doing among social groups
- In traditional M&E there are no participatory elements or feedback loops
- Conventional measurements of success may not capture many of the potential additional or multiple benefits of an intervention (e.g. health, comfort, convenience).

The positioning paper (Deliverable 3A) discusses why there is a need for an alternative M&E approach particularly in the area of energy DSM and behavioural change. This alternative should not only focus on effectiveness and efficiency but also on learning about how to achieve durable long-term behaviour (and habit) change; it should allow for different definitions of success and create a more participatory approach that focuses on both process and outcome. In short, this alternative approach should include both single- and double-loop learning. In addition, as discussed in the positioning paper (Deliverable 3A), when monitoring and evaluating a more systemic intervention, it is important to acknowledge that individual tools can aim to influence one, or more, of the following elements of behaviour change: individual behaviour, social norms, policy- and institutional context, and the physical environment (Breukers et al., 2013). Therefore, in the alternative M&E approach these four elements and how they are affected will be included so that it is possible to assess the systemic effects of specific tools.

Ideally, policymakers, funders, researchers, end-users, technology developers and other stakeholders that are involved in systemic DSM interventions should be involved in this collective and collaborative learning process and it is important to assess their role in monitoring and evaluation of different tools and interventions (Mourik et al., 2014). This is an important aspect of the Task 24 Extension, where we will co-develop, test and standardise various tools of designing, implementing and evaluating behaviour change interventions. Finally, a combination of qualitative and quantitative indicators and clear tools on how to collect what data (Beyond kWh modules, ST9) should be used in this new approach to evaluate a multitude of definitions for success that are relevant to different stakeholders.

With this in mind the remainder of the report will continue with discussing how this alternative monitoring and evaluation approach could look like for DSM programmes in Building Retrofits (Task

24 also looks at SMEs, transport and smart meter/feedback). Table 1 provides an overview of the types of tools we will discuss in each of the four domains (where relevant).

Focus	Instrument	Aim	Behaviour Targeted	System element targeted	Underlying discipline
Information and communication	Energy performance certificate / energy or product labelling	Driving demand for energy efficient products. Creation of a new social norm (implicitly).	Investment behaviour	Individual behaviour, social norms, policy- and institutional envt, physical environment	Economics
	Tailored advice	Reducing barriers caused by lack of information	Investment behaviour	Individual behaviour, physical environment	Psychology
	Mass media campaign	Reducing barriers caused by lack of information	Investment- and/or habitual behaviour	Individual behaviour, social norms	Social marketing
	Energy ambassadors	Reducing barriers; driving demand for energy efficient products. Creation of a new social norm (implicitly). Providing direct support and empowerment	Investment- and/or habitual behaviour	Individual behaviour, social norms	Social psychology
Financial	Subsidies & loans	Incentivising (additional) energy saving measures, reducing financial barriers for energy efficient products or measures, and/or stimulating the diffusion of innovative technologies	Investment behaviour	Individual behaviour, social norms	Economics
	Fiscal instruments	Incentivising energy saving behaviour by 'the polluter pays principle'.	Investment- and/or habitual behaviour	Individual behaviour, social norms	Economics
Covenants	Covenants: Formal voluntary agreement between stakeholders to work together towards achieving common goals	Sharing responsibility among stakeholders for achieving common (policy) goals.	Investment- and/or habitual behaviour	Social norms, policy- and institutional environment	Multidisciplinary
Regulation	Regulations	Making the use of certain instruments mandatory, e.g. energy labels when selling a product	Investment behaviour	Individual behaviour, social norms, policy- and institutional environment, physical environment	Economics
	Standards	Legal standards for energy performances of products. Non compliance usually results in a penalty (legal action, fines)	Investment behaviour	Individual behaviour, social norms, policy- and institutional environment, physical environment	Economics

Table 1: adapted from Murphy, Meijer & Visscher (2012).

We will start with briefly discussing how both investment- and habitual behaviour are generally being monitored and evaluated in building retrofits[3]. Then we will present fact sheets that show what M&E should look like for specific tools when attempting both single- and double-loop learning on a systemic level. These fact sheets contain indicators which could be used to allow for both single- and double-loop learning and a broader set of success definitions.

The aim at present is not to give an exhaustive overview of all tools, indicators and evaluation metrics available. It is a first attempt at developing a useful guideline for monitoring and evaluation of DSM interventions, translated into fact sheets. Time constraints and the fact that we aim to further develop this during the extension of Task 24 (Subtasks 8 and 9) has led us to treat this document and its fact sheets as a living document. Therefore, not all fact sheets of all tools are included here, the rest will be added during the extension of Task 24. Fact sheets for the other domains (Transport, SMEs, and Smart Meters/Feedback) will be added too. The metrics and indicators discussed here will hopefully see a lot of use and learning in the years to come, and with the Task 24 extension we will be able to update this document over the next three years.

[3] Based on a literature review of evaluations of DSM programmes in the specific themes (Deliverable 3).

Building Retrofits

Most tools commonly used in building retrofits aim to influence mainly investment behaviour geared at retrofitting or renovating existing buildings. These tools are often based upon economic theories and the information deficit model, which entails that financial considerations and information deficits are usually seen as the main barriers for investing in energy saving measures.

M&E aimed at influencing investment behaviour

Many DSM programmes tend to use quantitative evaluation metrics focused on e.g. the floor area of installed measures or insulation; the amount of subsidies paid for measures; the number of houses insulated; the insulation area and calculated reductions of CO2 emissions or energy consumption. Information about investment behaviour is often derived from self-reported documentation in the form of subsidy applications. The energy savings are usually estimated or modelled instead of being measured (Mourik et al., 2014; Mourik & Rotmann, 2013; Rosenow & Galvin, 2013). Effectiveness and efficiency are regarded as the main measurements of success[4].

M&E aimed at influencing habitual behaviour

If monitoring and evaluation of habitual behaviour takes place, it is usually focused on the house and addresses proxies of behaviour such as quantitative data related to space heating (e.g. thermal comfort on a seven-point scale, external and indoor temperatures, thermostat settings, patterns of use of electrical appliances). These evaluation methods remain mainly quantitative (Chiu et al., 2014); while, as argued by Mourik et al. (2014) and Karlin, Ford et al (2015) using both qualitative and quantitative indicators may provide valuable insights about outcomes beyond the duration of an intervention and beyond kWh (or other energy proxies).

Until now, very few programmes have attempted to understand residents' experiences in the process of deep retrofitting and how they interact with, or adapt to their changing environment (their home) (Van Summeren, 2014; Chiu et al., 2014). Chiu et al. (2014) argue that there are multiple mechanisms that can lead to the unintended result of residents actually setting the temperature higher in their retrofitted houses. They involve complex interactions between building fabric, heating systems, household dynamics, and the supply chain. Residents adapt to their retrofitted houses in many different ways; very often their 'old' pre-retrofit behaviours persist, only the intensity of these behaviours change. Little effort is put into exploring the mechanisms that can result in higher temperature settings. Statistical work on quantitative data is often used to investigate causal relationships between for example certain (self-reported) behaviour and energy usage; but it is largely unable to reveal the relevant interactions between social and physical systems that result in this behaviour. In the absence of qualitative data from occupants about their behaviour and how this interacts with the building physics, it is hard to disentangle the relative contributions of buildings and people to energy consumption. Chiu et al. (2014) argued that building performance evaluations should be based upon a more systematic perspective that includes both the physical and social elements of a retrofit based on a wide range of contextual data. In addition, learning about the interactions between the project group, residents and technologies is essential to improve retrofit programmes so that the number of glitches and malfunctions and underperformance can be reduced in the current intervention and future programmes.

In the factsheets below we will discuss several tools (EPCs, mass media campaigns, and subsidies and loans) that are being used in interventions aimed at Building Retrofits. These tools are commonly used and have accompanying frequently-used monitoring and evaluation methods and indicators/proxies. For these tools we will provide recommendations for additional proxies and M&E methods, focused on identifying the impact of the DSM tool on the four system elements (individual behaviour, social norms, policy and institutional context, and the physical environment) and on both one-off and more frequent/habitual behaviour. In addition, we will identify why different indicators are relevant for different stakeholders.

References

[4] See Mourik et al. (2014) for a more detailed discussion about the use of efficiency and effectiveness as measurements of success.

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Factsheet: Energy Performance Certificates (EPCs)

Description	Communication tools that display information about the energy efficiency and energy performance of buildings. These labels can be used by consumers to compare and assess energy performance of buildings[a]. An energy label is usually part of an EPC; this label shows the energy indicator in a comprehensible (graphic) manner[b].
Aim	-To increase market demand for energy-efficient dwellings[c] -To increase awareness of the energy performance of a house and therefore increasing house owner motivation to invest in energy improvements[d,e] -EPCs implicitly also work towards the creation of a new social norm: a valuable house is an energy efficient house[f].
Behaviour targeted	Investment behaviour
Discipline	Economics
Possible combination with other instruments	In attempts to make this instrument more effective in terms of influencing investment behaviour it is often combined with a tailored energy advice report[g]. EPCs can also be combined with fiscal instruments and regulations (making EPCs mandatory).
Conventional M&E	M&E practices often follow the two underlying economic theories of EPCs: they investigate whether EPCs lead to increased market demand for energy-efficient dwellings and whether it is effective in increasing investment behaviour in energy efficiency improvements[h].
Pitfalls	An EPC is an indirect instrument that aims to provide information which should lead to increased awareness of energy performances of buildings. Eventually, this should lead to behaviour changes in the form of increased investments in energy performance improvements[i] or choices by tenants to prefer to rent homes with higher performance ratings. Thus, this instrument only influences the investment behaviour indirectly, therefore it is hard to accurately monitor and evaluate the exact impact of EPCs on investment behaviour. Some evaluations also consider why EPCs are (in)effective in realising behaviour change by investigating why end-users do (not) use EPCs in their decisions. The classical 'Principal Agent' issue of landlords not buying into energy efficiency improvements and rating systems, unless they are mandatory, is also a major pitfall.
Role of EPC in systemic interventions	EPCs only indirectly influence investment behaviour and it does not influence habitual behaviour at all. In order to achieve systematic changes in the built environment this instrument should be combined with instruments that directly influence investment behaviour and instruments that aim for influencing habitual behaviour.

System Element targeted: Individual Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent did the EPCs lead to higher awareness about energy efficiency (EE)?	Policymakers: they need to know if the EPC contributed to increased awareness of EE, which should eventually lead to more investments in EE Industry& Intermediaries: they want to know whether adding information about EPC's in their marketing activities is effective in influencing investment behaviour	Awareness of energy performance of houses, awareness of having an EPC	Before and after	Surveys	How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	Which factors influence investment decisions of house owners? [j]	Policymakers: with this information the EPCs can be better tailored to the needs and preferences of house owners Housing corporations: with this information the EPCs can be better tailored to the needs and preferences of house owners Retailers: they can use this information to improve their energy saving advice	Condition/quality and age of the dwelling The extent to which building owners believe that EPC improvements lead to increased property values	After	Surveys and interviews
Are the goals reached?	To what extent are the EPCs effective in influencing investment behaviour? [k,l,m]	Policymakers: they need to know if the EPC indeed contributed to EE improvements or if it was mainly used to label already EE homes Retailers: they can use information of EPCs to tailor their energy-saving advice to specific houses	Number of people with (and without) an EPC that carried out energy efficiency improvements	After	Surveys	Which lessons learned during the intervention are translated into (re)designs?	Why are private house owners (not) using EPCs in their decisions? [n,o,p]	Policymakers: this information can be used to improve the EPC schemes in the future Intermediaries (doing the certificates): any information changing the implementation is of importance to them as they may need to be re-trained	The perceived quality, reliability, availability, complexity, trustworthiness, clarity, meaningfulness, and relevancy of information. Awareness of the certificates The extent to which building owners believe that EPC improvements lead to increased property values	During	Surveys, interviews and end-user feedback

System Element targeted: Individual Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent are EPCs being used in purchasing decisions and negotiations of potential house buyers? [q,r]	Policymakers: they need to know if the EPC indeed influenced purchasing decisions and negotiations Realtors/landlords: they can use high EPC ratings for marketing and sales Intermediaries (doing the certificates): more awareness means more jobs for them doing the certifications	Number of house buyers, realtors, landlords etc. that used EPCs in their purchasing decisions and negotiations	After	Surveys analysis of the housing market, real estate and landlord associations, intermediaries providing the certifications	How did the perspectives, assumptions, norms and beliefs of intermediaries and other stakeholders change during the programme?	What are possible costs and benefits for private house owners? [s,t]	Policymakers: learning about the motives of house owners may contribute to a better embedding of the current- or future rounds or editions of an intervention Private house owners: taking these costs and benefits into account could lead to EPC schemes which divide the costs and benefits between stakeholders in a fairer way	Costs: e.g. money, time, hassle Benefits: e.g. increasing property value, useful information	During and after	Surveys and interviews http://mechanisms.energychange.info/tools/48
Have the goals been reached?	To what extent did EPC improvements lead to increased property values? [u,v,w]	Policymakers: this provides information about whether or not EPCs are being used for determining property values which should eventually influence investment decisions Realtors/Landlords: want to know whether EPCs are being used in the housing market to determine property values. High ratings could improve sales. Private house owners: they want to know whether EPC improvements lead to increased property values	Changes in sale prices Changes in rents EPC jumps	After	Statistical analysis of sale prices, rents and EE improvements leading to higher EPC ratings (or more ratings undertaken)	How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How does the house owners' context influence their behaviour?	Private house owners: with this information more context-sensitive EPC schemes can be designed that are more useful for house owners Policymakers: with this information more context-sensitive EPC schemes can be designed	People (practices and behaviour of direct peers, public awareness, demographic measures) Norms & values (social norms, values, culture (local, regional, national)) Demographics Infrastructure Technology	Before, during and after	Surveys and interviews http://mechanisms.energychange.info/tools/48

System Element targeted: Social Norms
Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Are the goals reached?	To what extent is the social norm to have an EPC shared among the target group? [x]	Policymakers: want to know whether or not this social norm is created/evolved Retailers: they can use information about the existing social norm in their marketing activities	Number of houses that have an energy performance certificate (at the time it is being sold)	Before and after	Analysis of housing market data	How did the perspectives, assumptions, norms and beliefs of intermediaries and other stakeholders change during the programme?	How did the social norm to have an EPC evolve? [y]	Policymakers: this gives information about how and why (not) the social norms have evolved. This can be used to improve current/future EPC schemes, e.g. making them mandatory.	Do house owners, brokers, etc. think it is normal to have an EPC? Why (not)? Would they get one if it was voluntary?	Before and after	Surveys and/or interviews

System Element targeted: Policy and Institutional Context
Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	Are EPCs institutionally anchored?	Policymakers: This gives information about whether or not EPCs have become an important tool for home owners and brokers or whether they need to be mandatory	Are energy labels an important factor in refurbishment and/or purchase decisions after they are implemented?	After	Surveys or interviews Number of EPCs awarded	How was learning during and after the intervention ensured and which new lessons for future interventions were recorded?	What are important characteristics of the EPC schemes and how could they be improved? [z]	Policymakers: they need to know how the EPC scheme could be improved Intermediaries (doing the certificates): they need to know how the quality of the EPC's can be improved	EPC characteristics: information and promotion strategies, other interventions, required expert capacity, calculation methodology, certification procedure, costs and time needed for certification	Before, during and after	Comparison between countries, analysis of programme and policy documents, and stakeholder and expert interviews

System Element targeted: Policy and Institutional Context Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How did the political- and institutional context influence the effects and outcomes of EPCs?	Policymakers: they want to know how the political and institutional context influenced the EPC scheme because then they can redesign the instrument so that it will better fit Intermediaries (doing the certificates): any changes to the scheme will affect them but they may have important insights	Political factors: stability, political culture and traditions, regulation and legislation, state support, existing standards	Before, during and after	Interviews http://mechanisms.energychange.info/tools/48
						Which lessons learned during the intervention are translated into (re)designs?	How flexible are the EPC schemes? [aa]	Policymakers: flexibility can be conducive to success, assessing the flexibility can help to improve the instrument Intermediaries (doing the certificates): involve them in any re-design	Goal changes Instrument changes Continuous monitoring	Before and during	Interviews and analysis of programme documents http://mechanisms.energychange.info/tools/2
						Which lessons learned during the intervention are translated into (re)designs?	How is the quality of the EPCs ensured? [bb]	Policymakers: they want to know which methods for quality assurance are effective to improve the EPC scheme. Intermediaries (doing the certificates): involve them in any quality assurance design	Quality assurance measures (e.g. training, national examinations, validations, audits)	Before, during and after	Programme/ policy documents Interviews Workshops eg collective impact approach (Task 24 extension)

System Element targeted: Physical Context Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	Did this instrument led to a market increase of EE technologies?	Policymakers: this gives information about whether or not the instrument led to more EE improvements in houses Retailers: they want to know if there is more demand for EE improvements	Number of houses renovated/ insulated/ etc.	Before and after implementation	Market research						

Best practices / exemplary projects

DSM programme	Tools used	M&E
The Dutch Energy labelling programme	Energy label / EPC; information campaign	Property values; percentage of houses that have an EPC;
The European IDEAL-EPBD project	Energy label	Investigating the response of households towards the energy label; in-depth interviews and questionnaires

Factsheet: Mass media campaigns

Description	A mass media campaign can be used to expose a community to a message. This can be done by using media such as a television, the radio and/or the internet. Three main categories of knowledge which can be spread by mass media campaigns can be distinguished, namely[cc]: - **Impact knowledge**: information about a general problem or the consequences of certain behaviours - **Procedural knowledge**: information the audience can act on (instructions) - **Normative knowledge**: information about what others are doing (norms)
Aim	- Improve knowledge and awareness - Change energy behaviour
Behaviour targeted	Investment behaviour and/or habitual behaviour
Discipline	Social marketing
Possible combination with other instruments	Awareness raising and information programmes are often used as catalys to reinforce the impact of other policies or tools[dd]. Thus, this instrument can be used in combination with most other tools.
Conventional M&E	M&E practices focus mainly on outputs, outcomes and/or impacts. However, in most cases just outputs are monitored and evaluated[ee].
Pitfalls	- Outputs only provide information about the supply side and they do not say anything about the audience or target group, and it does not say anything about actual behaviour change[ff] - Awareness raising and information programmes are often used as catalysts to reinforce the impact of other policies, which makes it hard to separate the effects from other tools [gg] - The success of information and awareness programmes is significantly influenced by similar programmes carried out previously [hh]
Role of mass media campaigns in systemic interventions	Mass media campaigns are often being used as catalysts to reinforce the impact of other policies or instruments that aim for investment- and/or habitual behaviour. On its own it has often little impact on energy behaviour, but it can be used effectively to expose the target group to a message to increase their knowledge, to provide instructions and to provide normative information. In order to achieve systemic changes this instrument should be combined with instruments that target both investment- and habitual behaviour and all system elements (individual behaviour, social norms, policy and institutional context and the physical environment).

System Element targeted: Individual Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Was the intervention cost-effective?	What are the campaign outputs?	Policymakers: they need to know how many people they have reached during the intervention	Airtime of the spots, reach, frequency, impressions, gross ratings points, cost per targeted person etc.	After	Can be obtained from media vendors, market research	**Double:** How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How did the campaign influence investment behaviour?	Policymakers: how did behaviours change in order to improve current and future interventions Retailers: this information can be used to improve their marketing strategies	Behaviour changes related to the campaign (knowledge, awareness) Factors that influenced the decision making process	Before, during and after	Interviews, market research
Have the goals been reached?	To what extent did the campaign lead to the desired outcomes such as higher awareness and saliency? [ii,jj]	Policymakers: they need to know which behavioural determinants are effectively being affected by the intervention Industry: they can use this information to improve their marketing strategies	Ad recall, audience (brand) awareness, salience, behaviour intention, perceived behavioural control, attitude	Before and after	Surveys	**Double:** Which lessons learned during the intervention are translated into (re)designs? How are lessons learnt and shared?	Which (contextual) factors influence investment behaviour? And how?	Policymakers: how did the effectiveness of a campaign differ in different contexts to improve current and future interventions Local stakeholders: how did the intervention effect people in their region to adapt other policies and projects to it Industry: Did the campaign help them improve their market share?	The abilities, culture and opinions of individual audiences	Before, during and after	Interviews http://mechanisms.energychange.info/tools/48
						Double: Which lessons learned during the intervention are translated into (re)designs?	Which characteristics made the campaign more/less effective in terms of influencing behaviour? [kk]	Policymakers: they need to know how the campaign and future campaigns can be improved	Whether or not the source is seen as credible, competent, knowledgeable, reliable, expert and trustworthy Whether or not the message is perceived as memorable, understandable and clear Whether or not the campaign is targeted (e.g. motivation, ability)	Before (pre-testing) and after	Surveys, interviews

System Element targeted: Individual Habitual Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent did the campaign lead to the desired behaviour change?	Policymakers: they need to know whether the instrument is effective in changing behaviour	Behaviour inside the house (e.g. behaviours regarding ventilation, heating, lightning, appliances on stand-by vs. shutting down)	Before and after	Self-reported behaviour, interviews	How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How did the campaign influence habitual behaviour?	Policymakers: they need to understand how the behaviour is changed in order to improve current and future interventions	Behaviour Factors that influence behaviour inside the house Differences between household members etc.	Before, during and after	Interviews, home visits (walkthrough) and observations
						Which lessons learned during the intervention are translated into (re)designs?	Which characteristics made the campaign more/less effective in terms of influencing habitual behaviour? [II]	Policymakers: they need to know how the campaign and future campaigns can be improved	Whether or not the source is seen as credible, competent, knowledgeable, reliable, expert and trustworthy Whether or not the message is perceived as memorable, understandable and clear Whether or not the campaign is targeted (e.g. motivation, ability)	Before (pre-testing) and after	Surveys, interviews
						Did lasting changes take place?	Is the new behaviour sustained over a long time?	Policymakers: they need to know if the intervention led to lasting behaviour changes	Behaviour	Before, during and after	Self-reported behaviour, interviews, home visits and observations
						Which lessons learned during the intervention are translated into (re)designs?	Which contextual factors influence the behaviour? And how?	Policymakers: how and why did the effectiveness of a campaign differ in different contexts Local stakeholders (e.g. policymakers): they need to know how the intervention affects people in their region to adapt other policies and projects to it.	The abilities, culture and opinions of individual audiences	Before, during and after	Surveys, interviews http://mechanisms.energychange.info/tools/48 workshops, collective impact approach (Task 24 extension)

System Element targeted: Social Norms Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent did the social norm evolve or was a new social norm created?	Policymakers: Did the instrument only influence individual behaviour or also social norms which may then influence the investment behaviour of more people Industry & Intermediaries: they can use information about the existing social norms in their marketing activities	Involvement and ability to process	Before, during and after	Interviews and surveys	Which lessons learned during the intervention are translated into (re)designs?	Which factors helped to create a new social norm? mm	Policymakers: they need to know how to make the current- and future programmes more effective in creating a new sustainable social norm The Third Sector: Can repeat the lessons learnt in their own bottom-up community programmes	Feelings of relevance (of the information) or sense of involvement of the target group Ability to process information	During and after	Interviews and surveys workshops, collective impact approach (Task 24 extension)

System Element targeted: Social Norms Habitual Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent did the social norm evolve?	Policymakers: Did the instrument only influence individual behaviour or also social norms which may then influence the behaviour of more people	Involvement and ability to process	Before, during and after	Interviews and surveys	How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How did the social norm evolve?	Policymakers: they want to know how the instrument influenced social norms because they may continually influence habitual behaviour in the future The Third Sector: Can repeat the lessons learnt in their own bottom-up community programmes	Social norms	Before and after	Interviews and surveys

System Element targeted: Social Norms Habitual Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						Which lessons learned during the intervention are translated into (re)designs?	Which factors helped to create a new social norm? [nn]	All Behaviour Changers: need to know how to make the current- and future programmes more effective in creating a new sustainable social norm	Feelings of relevance or sense of involvement of the target group and other Behaviour Changers Ability to process information	During and after	Interviews and surveys workshops, collective impact approach (Task 24 extension)

System Element targeted: Policy and Institutional Context Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						How did the perspectives, assumptions, norms and beliefs of end users change during the programme?	How did the social norm to improve the house EE evolve?	Policymakers: has the intervention just influenced individual behaviour or also social norms The Third Sector: Can repeat the lessons learnt in their own bottom-up community programmes	Shared social norms among a neighbourhood to improve the EE of their houses	Before, during and after	Interviews in a neighbourhood/ among participants

System Element targeted: Policy and Institutional Context Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						How was learning during and after the intervention ensured and which new lessons for future interventions were recorded?	What do key stakeholders think about the effectiveness of the instrument? [oo]	Policymakers: how can the intervention be adjusted to make it more effective in influencing behaviour Other Behaviour Changers: how were they involved in design and roll-out	Is the instrument effective? Why (not)? Who else may need to be involved to make it more effective?	During and after	Feedback of personnel, interviews, workshops, collective impact approach (Task 24 extension)
						Which lessons learned during the intervention are translated into (re)designs?	How flexible is the instrument?	All Behaviour Changers: flexibility can be conducive to success, assessing the flexibility can help to improve the instrument	Goal changes Instrument changes Continuous monitoring	Before and during	Interviews and analysis of programme documents http://mechanisms.energychange.info/tools/2 workshops, collective impact approach (Task 24 extension)

System Element targeted: Policy and Institutional Context
Habitual Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						How was learning during and after the intervention ensured and which new lessons for future interventions were recorded?	What do key stakeholders think about the effectiveness of the instrument? [pp]	All Behaviour Changers: they need to know how the instrument can be adjusted to make it more effective in influencing behaviour	Is the instrument effective? Why (not)? Who else may need to be involved to make it more effective?	During and after	Feedback of personnel, interviews workshops, collective impact approach (Task 24 extension)
						Which lessons learned during the intervention are translated into (re)designs?	How flexible is the instrument?	All Behaviour Changers: flexibility can be conducive to success, assessing the flexibility can help to improve the instrument	Goal changes Instrument changes Continuous monitoring	Before and during	Interviews and analysis of programme documents http://mechanisms.energychange.info/tools/2

System Element targeted: Physical Environment
Investment Behaviour

SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Was the intervention cost-effective?	What are the campaign outputs?	Policymakers: they need to know how many persons they have reached during the intervention. It also provides information about the effectiveness of the medium	Airtime of the spots, reach, frequency, impressions, gross ratings points, cost per targeted person, etc.	After	Can be obtained from media vendors						

System Element targeted: Physical Environment Habitual Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Single: Was the intervention cost-effective?	What are the campaign outputs?	Policymakers: they need to know how many persons they have reached during the intervention. It also provides information about the effectiveness of the medium	Airtime of the spots, reach, frequency, impressions, gross ratings points, cost per targeted person, etc.	After	Can be obtained from media vendors						

Best practices / exemplary projects

DSM programme	Tools used	M&E
The Warm Up New Zealand: Heat Smart programme	Subsidies, quality standards, building codes; Mass media campaign	Annual monitoring regime; non-energy indicators of success; external evaluation which provided means to improve the programme ex durante
The Dutch Energy Labelling Programm	Energy label/EPC/information campaign	Property values; percentage of houses that have an EPC

Subsidies and Loans

Description	A subsidy is a form of financial (or in kind) support that can be extended to people who improve the energy efficiency of their house or who buy an energy efficient technology. In most cases the level of subsidy is fixed as a percentage of the total cost of the investment, with a set maximum amount of money. Low/no-interest loans are a form of indirect subsidies[qq].
Aim	- To reduce the financial barriers for carrying out energy performance improvements on houses[rr] - To incentivise households to carry out additional energy performance improvements during normal renovation activities[ss] - To support the diffusion of energy saving or micro-generation technologies[tt]
Behaviour targeted	Investment behaviour
Discipline	Economics
Possible combination with other instruments	- Energy performance certificates (amount of money for each EPC jump) - Tailored advice certificate (paid by the subsidiser) - Social marketing information campaigns
Conventional M&E	In many cases subsidy and loan programmes are not monitored and evaluated at all, or just at a user satisfaction level[uu].
Pitfalls	Just counting the number of houses renovated or number of technologies sold does not tell much about the reasons for (not) participating or the behavioural or energy changes made
Role of subsidies and loans in systemic interventions	Subsidies and loans only influence investment behaviour and mostly by targeting individual behaviour by removing financial barriers. This instrument should be combined with instruments that target the other elements of investment behaviour and with instruments that aim for influencing habitual behaviour.

System Element targeted: Individual Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Was the intervention cost-effective?	How much of the budget available for subsidies/ loans has been spent (in the planned timeframe?)?	Policymakers: they need to know whether the available budget has been completely used (and at what time)	Amount of money spent on subsidies or loans Total number of approved subsidies/ loans Timeliness	During and after	Subsidy applications	How was interaction and participation by the target group fostered in the programme?	How (and why) is the instrument tailored to a specific target group? [vv]	Policymakers: in combination with information about the effectiveness of the instrument this tells them whether or not a certain type of tailoring and segmenting made the programme more effective	Tailored to: e.g. income levels, building characteristics Segmented to: e.g. different Energy Cultures, landlords vs. homeowners etc	Before, during and after	Analysis of policy/ programme documents, interviews with policy-makers http://mechanisms.energychange.info/tools/11
Have the goals been reached?	How many households decided to renovate or improve their house in terms of EE by using a subsidy/ loan? [ww]	Policymakers: they need to know to what extent the subsidies and loans indeed contributed to energy efficiency improvements and building retrofits	Number houses renovated or sold number of technologies Number of subsidy applications	After	Analysis of subsidy applications	To what extent were the expectations of end users aligned? How is this done?	What are possible costs and benefits for private house owners/ landlords? [xx,yy]	Policymakers: learning about the motives of- and barriers for house owners may contribute to a better embedding of the current- or future rounds or editions of an intervention Private house owners: taking these costs and benefits into account could lead to subsidy schemes which divide the costs and benefits between stakeholders in a fairer way	Costs: e.g. money, time, inconvenience, hassle, split incentives (if landlords) Benefits: e.g. energy savings, comfort improvement, health improvement, increased property value (if done in combination with EPCs)	Before, during and after	Surveys and interviews http://mechanisms.energychange.info/tools/48
Have the goals been reached?	To what extent were the subsidies and loans effective in influencing investment behaviour? [zz]	Policymakers: they need to know how much of the money actually gave rise to EE measures	Without a subsidy: - Postpone - No measures - Fewer measures - The same amount of measures (free riders)	During and after	Surveys	Which (and how are) lessons learned during the intervention are translated into (re)designs?	How does the house owners' context influence their behaviour?	Policymakers: with this information more context-sensitive subsidy schemes can be designed	People (practices and behaviour of direct peers, public awareness, demographic measures) Norms & values (social norms, values, culture (local, regional, national)) Demographics Infrastructure Technology	Before, during and after	Surveys and interviews http://mechanisms.energychange.info/tools/48

System Element targeted: Social Norms Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	To what extent did the neighbourhood effect occur?	Policymakers: they want to know whether a snowball effect occurs since this may have high impacts on the long-term effectiveness and a wider (national?) roll out	Subsidy applications (e.g. How did you come to know about the grant/loan?)	During and after	Surveys	How did the perspectives, assumptions, norms and beliefs of intermediaries and other stakeholders change during the programme?	How did the social norm to improve the house EE evolve?	Policymakers: they want to know if the instrument just influenced individual behaviour or also social norms which are likely to influence the investment behaviour of more people in the near future Industry & Intermediaries: they can use information about the existing social norms in their marketing activities The Third Sector: Can repeat the lessons learnt in their own bottom-up community programmes	Shared social norms among a neighbourhood to improve the EE of their houses, e.g. word of mouth communication	Before, during and after	Interviews and surveys in a neighbourhood/ among participants
Was the intervention cost-effective?	How effective was tailoring to a specific neighbourhood?	Policymakers: they want to know whether it was more effective to tailor the instrument to a specific neighbourhood	Percentage/number of residents from a given neighbourhood that participate	During and after	Analysis of subsidy applications						

System Element targeted: Policy and Institutional Context Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
						Is a network of a heterogeneous set of actors developed in which they all participated and interacted with each other since the design phase? Did this lead to different definitions of success?	How do other stakeholders perceive the quality of the subsidy scheme?	Policymakers: collaboration with other Behaviour Changers will improve the rollout & evaluation of an intervention Other Behaviour Changers: will get to be involved in co-design, rollout and evaluation which may help shape the market	Awareness among other Behaviour Changers, reaching lower income groups via 3rd Party Co-funding, reaching landlords via e.g. industry associations, use of trusted intermediaries (e.g. public health nurses, installers)	During and after	Stakeholder interviews, surveys, market indicators (eg increase in insulation installers), subsidy applications, workshops, collective impact approach (Task 24 extension)
						Which lessons learned during the intervention are translated into (re)designs? How are lessons learned and shared?	How flexible is the instrument?	All Behaviour Changers: flexibility is important, by assessing the flexibility can help to increase the flexibility	Fixed vs. flexible goals Intervention changes Continuous monitoring?	Before and during	Interviews and analysis of programme documents http://mechanisms.energychange.info/tools/2
						Did lasting changes take place?	How does the subsidy/ loan scheme incorporate long-term goals? [aaa,bbb]	Policymakers: they want to know whether the subsidy or loan scheme helped achieve ongoing behaviour changes Industry & Intermediaries: they want to know because they can adapt their marketing strategies to subsidy schemes	For how long is the subsidy/loan available? Is there a market that is meant to become self-sufficient after a certain time? Short- and long-term goals regarding behaviour change outcomes	During and after	Analysis of programme/ policy documents Survey of other Behaviour Changers (e.g. industry) workshops, collective impact approach (Task 24 extension), Survey of end users and any associated behaviour changes

System Element targeted: Physical Environment Investment Behaviour											
SINGLE-LOOP LEARNING						DOUBLE-LOOP LEARNING					
Questions	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**	**Questions**	**What to M&E**	**Relevant to whom and why?**	**Indicators**	**Timing**	**Methods, tips & tricks**
Have the goals been reached?	Did this instrument lead to a market increase of EE technologies?	Policymakers: this gives information about whether or not the instrument led to more EE improvements in houses Industry & Intermediaries: needs to know if a market is ready to become self-sufficient	Number of houses renovated/ insulated/ etc. Number of EE technologies sold	Before and after	Market research						

Best practices / exemplary projects

DSM programme	Tools used	M&E
The Warm Up New Zealand: Heat Smart programme	Subsidies, quality standards, building codes; Mass media campaign	Annual monitoring regime; non-energy indicators of success; external evaluation which provided means to improve the programme ex durante
The Dutch Blok voor Blok Programm	Subsidies and low interest loans; covenant between housing corporations, contractors, installers and municipalities	Social learning strategy; important stakeholders followed courses on knowledge exchange; looking for success factors that can be broadly applied; M&E at intermediate moments; ensuring social learning between programme implementers; tailoring to a specific neighbourhood; issues and outcomes relevant to end users such as the approach of residents, satisfaction of residents and the reason of their (decline of) participation; external evaluation which provided means to improve the programme ex-durante
Norwegian Myhrenenga Housing	Extraordinary project funding (subsidy); bottom-up initiative	Small and locally initiated; highly flexible; issues and outcomes relevant to end users
Swiss Retrofitting Programme	Subsidies; fiscal tools (fee on combustibles)	Randomly checking the realisation of the measure on site
UK My Kirklees Warmzone Project	Subsidised/free EE measures; interest-free loan	Involving decliners or opt-out households; environmental and health benefits; safety of homes; poverty reduction and job creation

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bbb Mourik, R., & Rotmann, S. (2013). Task 24: Closing the Loop - Behaviour Change in DSM: From Theory to Practice. Eindhoven, NL; Wellington, NZ: DuneWorks and SEA.

IEA Demand Side Management Energy Technology Initiative

The Demand-Side Management (DSM) Energy Technology Initiative is one of more than 40 Co-operative Energy Technology Initiatives within the framework of the International Energy Agency (IEA).The Demand-Side Management (DSM) Energy Technology Initiative, which was initiated in 1993, deals with a variety of strategies to reduce energy demand. The following member countries and sponsors have been working to identify and promote opportunities for DSM:

Austria	Norway
Belgium	Spain
Finland	Sweden
India	Switzerland
Italy	United Kingdom
Republic of Korea	United States
Netherlands	ECI (sponsor)
New Zealand	RAP (sponsor)

Programme Vision: Demand side activities should be active elements and the first choice in all energy policy decisions designed to create more reliable and more sustainable energy systems
Programme Mission: Deliver to its stakeholders, materials that are readily applicable for them in crafting and implementing policies and measures. The Programme should also deliver technology and applications that either facilitate operations of energy systems or facilitate necessary market transformations

The DSM Energy Technology Initiative's work is organized into two clusters:
The load shape cluster, and
The load level cluster.

The 'load shape" cluster will include Tasks that seek to impact the shape of the load curve over very short (minutes-hours-day) to longer (days-week-season) time periods. Work within this cluster primarily increases the reliability of systems. The "load level" will include Tasks that seek to shift the load curve to lower demand levels or shift between loads from one energy system to another. Work within this cluster primarily targets the reduction of emissions.

A total of 24 projects or "Tasks" have been initiated since the beginning of the DSM Programme. The overall program is monitored by an Executive Committee consisting of representatives from each contracting party to the DSM Energy Technology Initiative. The leadership and management of the individual Tasks are the responsibility of Operating Agents. These Tasks and their respective

Operating Agents are:
Task 1 International Database on Demand-Side Management & Evaluation Guidebook on the Impact of DSM and EE for Kyoto's GHG Targets – *Completed*
Harry Vreuls, NOVEM, the Netherlands

Task 2 Communications Technologies for Demand-Side Management – *Completed*
Richard Formby, EA Technology, United Kingdom

Task 3 Cooperative Procurement of Innovative Technologies for Demand-Side Management – *Completed*
Hans Westling, Promandat AB, Sweden

Task 4 Development of Improved Methods for Integrating Demand-Side Management into Resource Planning – *Completed*
Grayson Heffner, EPRI, United States

Task 5 Techniques for Implementation of Demand-Side Management Technology in the Marketplace – *Completed*
Juan Comas, FECSA, Spain

Task 6 DSM and Energy Efficiency in Changing Electricity Business Environments – *Completed*
David Crossley, Energy Futures, Australia Pty. Ltd., Australia

Task 7 International Collaboration on Market Transformation – *Completed*
Verney Ryan, BRE, United Kingdom

Task 8 Demand-Side Bidding in a Competitive Electricity Market – *Completed*
Linda Hull, EA Technology Ltd, United Kingdom

Task 9 The Role of Municipalities in a Liberalised System – *Completed*
Martin Cahn, Energie Cites, France

Task 10 Performance Contracting – *Completed*
Hans Westling, Promandat AB, Sweden

Task 11 Time of Use Pricing and Energy Use for Demand Management Delivery- *Completed*
Richard Formby, EA Technology Ltd, United Kingdom

Task 12 Energy Standards
To be determined

Task 13 Demand Response Resources - *Completed*
Ross Malme, RETX, United States

Task 14 White Certificates – *Completed*
Antonio Capozza, CESI, Italy

Task 15 Network-Driven DSM - *Completed*
David Crossley, Energy Futures Australia Pty. Ltd, Australia

Task 16 Competitive Energy Services
Jan W. Bleyl, Graz Energy Agency, Austria / Seppo Silvonen/Pertti Koski, Motiva, Finland

Task 17 Integration of Demand Side Management, Distributed Generation, Renewable Energy Sources and Energy Storages
Seppo Kärkkäinen, Elektraflex Oy, Finland

Task 18 Demand Side Management and Climate Change - *Completed*
David Crossley, Energy Futures Australia Pty. Ltd, Australia

Task 19 Micro Demand Response and Energy Saving - *Completed*
Linda Hull, EA Technology Ltd, United Kingdom

Task 20 Branding of Energy Efficiency - *Completed*
Balawant Joshi, ABPS Infrastructure Private Limited, India

Task 21 Standardisation of Energy Savings Calculations - *Completed*
Harry Vreuls, SenterNovem, Netherlands

Task 22 Energy Efficiency Portfolio Standards - *Completed*
Balawant Joshi, ABPS Infrastructure Private Limited, India

Task 23 The Role of Customers in Delivering Effective Smart Grids - *Completed*
Linda Hull. EA Technology Ltd, United Kingdom

Task 24 Closing the loop - Behaviour Change in DSM: From theory to policies and practice
Sea Rotmann, SEA, New Zealand and Ruth Mourik DuneWorks, Netherlands

Task 25 Business Models for a more Effective Market Uptake of DSM Energy Services
Ruth Mourik, DuneWorks, The Netherlands

For additional Information contact the DSM Executive Secretary, Anne Bengtson, Liljeholmstorget 18,11761 Stockholm, Sweden. Phone: +46707818501. E-mail: anne.bengtson@telia.com
Also, visit the IEA DSM website: http://www.ieadsm.org

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