CHANGING BEHAVIOUR – Glossary

Compiled by the glossary task force, including Eva Heiskanen and Mikko Rask (NCRC), Dierk Bauknecht (OEKO Institut), Mike Hodson (SURF) and Sylvia Breukers (ECN), with the input and help from project partners from CEU, ECN, NRCR and SURF.

The current glossary is published on 19 December 2008. It may later be updated with new concepts and corrections.

Background and Purpose of the Glossary

The focus of analysis of the CHANGING BEHAVIOUR project is on demand side management (DSM) programmes. Such programmes aim at increasing energy saving and efficiency by various means of *energy demand management*. The aim of this glossary is to help understand the nature and extent of activities that go under the notion of energy demand management, and provide definitions for the key concepts.

The terms included in this glossary define the concepts of DSM projects and programmes as well as related actors, (e.g., intermediaries), contexts (e.g., macro, meso and micro levels of contexts), instruments (e.g., audits), objectives (e.g., types of behavioural changes) and outcomes (e.g. energy efficiency). Included are also some other central terms that are often used in the study of energy saving and demand management (e.g., rebound effect).

The current version of the glossary originates from the project internal need to reach a common understanding of the scope of issues and concepts that are relevant in the study of energy saving and demand management. Many of the terms that are defined here include references to published literature, for which reason the glossary may also serve a more general, though limited, function as a source book of DSM terms.

Structure of the Glossary

The terms in this glossary are organized by adopting DSM programmes as the focus and by identifying the elements that are linked with them. *Figure 1* indicates the main categories of terms included.
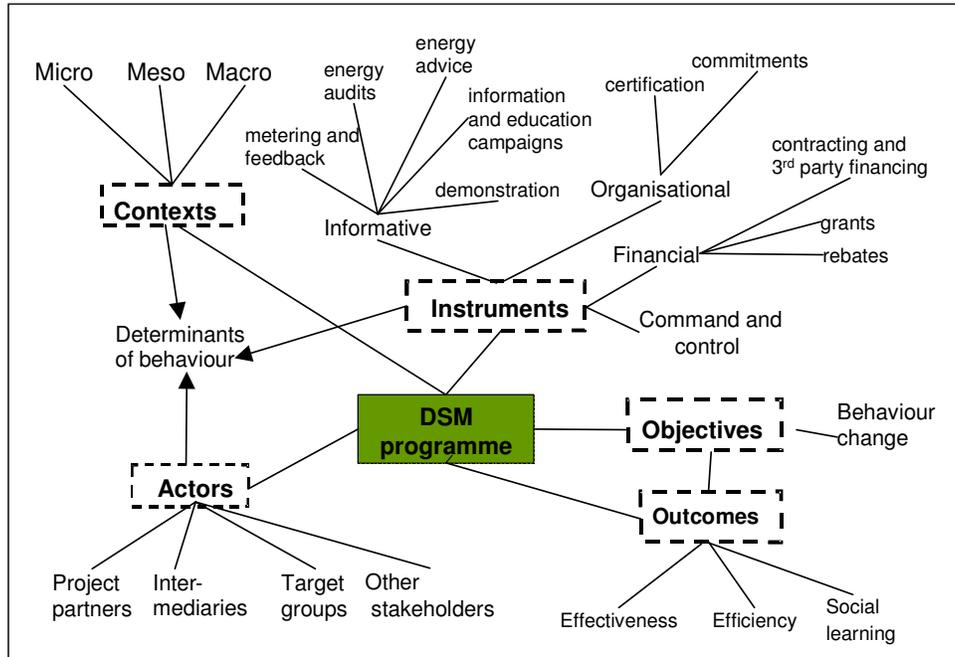

Figure 1 Map of DSM concepts

In the following sections, the terms are organized and defined under the headings presented in boxes in the map of DSM concepts (Figure 1): DSM programmes, actors, contexts, instruments, objectives and outcome success, and other terms. Under each heading, additional concepts are presented and defined as relevant.

DSM Programmes

Demand side management (DSM) – involves the policies, programmes, and projects employed to alter the quantity and patterns of energy consumption, and therefore necessary production, by focusing on customer (or end-user) oriented energy reduction plans.

DSM programme – has a specific goal and target group. It can be initiated by governmental or other organisations. DSM programme is **distinguished from a DSM policy**, which has a broader target group and goal. DSM Programmes are often implemented through projects. DSM Programme is **distinguished from DSM projects**, since programmes are usually more long term and strategic than projects. CHANGING BEHAVIOUR studies both DSM programmes and individual projects that are implemented within or in anticipation of a broader programme.

This is in line with definitions by IEA-DSM (International Energy Agency's Demand-Side Management Programme[1]) and the EU Energy services directive[2], both of which take the view that "policy measure" is (in the DSM context) a specific type of political action or market intervention designed to persuade energy consumers to reduce energy use and encourage market parties to promote energy-efficient goods and services, whereas "programme" is an organised set of projects targeted towards defined market parties over a specific time period to achieve increased end-use efficiency or reduced use of energy services.

Aims of DSM programmes – are related to increasing energy efficiency or promoting energy conservation, including:
-   programmes promoting changing end-user behaviour
-   programmes promoting the use of energy-efficient products
-   programmes for load management that mainly aim at changing the pattern of energy use provided there is a clear link to energy conservation
-   programmes for end-user generation and energy self-sufficiency provided there is a clear link to energy conservation
-   broader low-carbon, environmental or sustainable lifestyle/business/region programmes provided there is a clear link to energy conservation

Targets of DSM programmes – include households, schools, the building sector, municipalities and SMEs, for example:
-   energy audits for SMEs, households or buildings
-   programmes promoting energy efficient building design, renovation and usage
-   training and capacity development programmes
-   campaigns and competitions for consumers, schools, office personnel, and other target groups

---

[1] See, http://www.managenergy.net/actors/A1648.htm.
[2] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.

Actors

Actors – individual agents or social groups both within and outside of the scope of DSM programmes. Actors within the scope of DSM programmes include project partners, target groups, and intermediaries.

Intermediaries – organisations that mediate, make connections, enable a relationship between different persons or issues. Intermediaries play an active role negotiating the relationship between other actors. Intermediaries are not simply arbitrators; they play a role in ordering and defining relationships.[3]

> **Energy service company (ESCO)** – a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.

> **Project intermediaries**[4] – can be consultants offering 'shared savings' energy conservation, facility managers operating heating/power appliances for industrial users and managers of grid and distribution networks, or energy trading associations of end-users and consumer associations informing private households on ways of cutting bills by using less energy.

> **Systemic intermediaries**[5] **–** manage transitions in energy systems in particular places and actively seek to re-shape energy infrastructures. Intermediaries build this capacity through multi-level networks of "relevant" social interests including political support, economic leverage, technology suppliers, etc. and "appropriate" resources such as forms of local knowledge, local political support, corporate investment, national political and financial support, etc.

Project partners – actors that are part of a project team working on a DSM programme. Project partners can include target group members, e.g., when coaches are recruited from the target group.

Target groups – particular groups of actors that an invention aims at (e.g. households, schools, the building sector, municipalities and SMEs).

Stakeholders – persons or groups that hold legitimate interest in the scope of the project or programme.[6]

> **Network of stakeholders** – actors and stakeholders, which have relevant relations among each other, not only with the programme or project. These relations can be social, or relate to value chains or supply chains, or other co-operative or competitive relations.[7]

---

[3] Marvin, S. and Medd, W. (2004) 'Sustainable Infrastructures by Proxy? Intermediation beyond the Production–Consumption Nexus'. Southerton, D., Chappells, H. and van Vliet, B. (Eds). *Sustainable consumption: the implications of changing infrastructures of provision*, Edward Elgar.

[4] Hodson, M. and Marvin, S. (2008) 'How can more "effective" intermediation build urban ecological security'? Forthcoming in *Regions.*

[5] Hodson, M. and Marvin, S. (2008) 'How can more "effective" intermediation build urban ecological security'? Forthcoming in *Regions.*

[6] Adapted from Freeman 1984 and Donaldson and Preston 1995: Freeman, R.E. 1984. Strategic management: A stakeholder approach. Boston: Pitman; Donaldson, T. and Preston, L.E. 1995. The stakeholder theory of the corporation: Concepts, evidence and implications. Academy of Management Review, 20: 65–91.

Stakeholder interaction – involves an exchange of knowledge between the project or programme and its stakeholders; can also be a way for the parties to influence each other. Interaction can occur via the media or surveys, in formal participation processes, or in naturally occurring face-to-face situations.[8]

---

[7] Adapted from Bunn, M.D., Savage, G.T. & Holloway, B.B. (2002). Stakeholder analysis for multi-sector innovations. *Journal of Business and Industrial Marketing* 17 (2/3): 181-203.

[8] E. Heiskanen, M. Hodson, R.P.J.M. Raven, C.F.J. Feenstra, A. Alcantud, B. Brohmann, A. Daniels, M. Di Fiore, B. Farkas, U. Fritsche, J. Fucsko, K. Hünecke, E. Jolivet, M. Maack, K. Matschoss, A. Oniszk-Poplawska, B. Poti, G. Prasad, B. Schaefer, R. Willemse (2007). *Factors influencing the societal acceptance of new energy technologies : meta-analysis of recent European projects. Create Acceptance.* FP6-2004-Energy-3, SUSTDEV-1.2.8. Proposal/Contract no.: 518351. Petten: ECN Policy Studies.

Context

Context – the interrelated conditions and institutional, cultural, political, social and economic processes at multiple levels or scales that influence or are influenced by a particular situation, actor or process.

Dimensions of context – in terms of the different actors, factors and issues these may consist of various dimensions, including: **social context** (social norms, values, relations and patterns of interaction), **cultural context** (ideas, customs and rules of behaviour), **institutional context** (formal rules, responsibilities and governance systems), **political context** (current political agendas) and **economic context** (patterns and institutions of financial transactions).[9]

Macro, meso and micro levels of context - for analytical purposes, we can examine context at various levels: macro (national and international), meso (regional, urban and district) and micro (the immediate social and physical context of the target group). We can also analyse the ways in which complex dynamics between these different levels influence or are influenced by a particular situation, actor or process. That is to say, the ways in which multi-level actors, factors and issues contribute to the shaping of a particular situation, actor or process or vice versa.

Context-tailored – where a demand-side management programme or an instrument or a technology is adapted to or configured to match with the conditions of the user's or target group's context.

---

[9] Adapted from: Kuper, A. & Kuper, J. (1985). *The Social Science Encyclopedia.* Routledge & Kegan Paul.

Determinants of behaviour

How individuals and organisations behave, and make energy related choices and decisions, depends on multiple interconnected behavioural determinants. These determinants consist of i.e. preferences, psychological issues, lifestyle, economic situation, political culture, capacities amongst others. These behavioural determinants can be categorised in several ways. A specific model of the determinants of enery related behaviour will be elaborated during the CHANGING BEHAVIOUR project, and later be included in this glossary.

Instruments

Command-and-control instruments – laws and regulations that set energy efficiency requirements for devices, practices or systems design. Typical regulations relating to energy efficiency are building codes and minimum energy performance standards.[10]

Financial instruments – are made available by public or private bodies in order to cover partly or totally the initial project cost for implementing energy efficiency improvement measures.[11] Financial instruments provide economic incentives to promote energy efficiency. They aim to encourage investment in energy efficient equipment and processes by reducing the investment cost; they thus mainly apply to investment (efficiency) behaviour rather than to curtailment behaviour.

> **Energy Service Contracting, performance contracting and 3rd party financing –** aim at overcoming or alleviating some of the barriers to energy efficiency by providing a new way to organise and finance energy efficiency investments. A contractual arrangement involving a third party – in addition to the energy supplier and the beneficiary of the energy efficiency improvement measure – that provides the capital for that measure and charges the beneficiary a fee equivalent to a part of the energy savings achieved as a result of the energy efficiency improvement measure. That third party may or may not be an ESCO.**[12]**

> **Grants** – amount of money given to an individual or an organisation for a particular purpose.[13]

> **Rebates** – are offered for the documented use of specific products or construction techniques. Rebates are generally gauged according to the efficiency level or quantity of equipment installed.[14]

Informative instruments – provide information and energy saving techniques to consumers with the aim of influencing energy savings/efficiency behaviour. Often referred to as a 'soft' DSM measure.[15]

> **Demonstration -** refers to the phase during which a new product or technique is tested in practice. This serves to generate information on the usefulness and energy savings during real use or to demonstrate this product or technique to potential users or decision makers.[16]

> **Energy advice** – refers to the provision of specialized information and support on particular energy conservation issues or for a particular target group. Advice involves some level of interaction with the client (media: phone, visits to the customer's home/business premises, specific recommendations in written material, workshops, training days, social groups as well as via internet platforms, virtual groups or expert systems).

---

[10] IEA DSM 2005 Evaluating Energy Efficiency Policy Measures and DSM Programmes.

[11] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.

[12] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.

[13] IEA DSM 2005 *Evaluating Energy Efficiency Policy Measures and DSM Programmes.*

[14] IEA DSM 2005 *Evaluating Energy Efficiency Policy Measures and DSM Programmes.*

[15] Adapted from Nadal, S. 1992. Utility demand-side management experience and potential: A critical review. Annual Review of Energy and the Environment 17: 507 – 535.

[16] IEA DSM 2005 *Evaluating Energy Efficiency Policy Measures and DSM Programmes.*

Energy audit: a systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, of an industrial operation and/or installation or of a private or public service, identify and quantify cost-effective energy savings opportunities, and report the findings.[17]

General information and education campaign – advertising and public relations campaigns designed to make consumers aware of the need to save energy, the means at their disposal to achieve this, and the consequences of doing so.[18]

Metering and feedback – the aim is to provide target groups with more detailed, comparable and comprehensible information on their energy use, including techniques to give users daily, weekly or monthly feedback, comparative feedback, direct displays and smart meters.[19]

Organisational or commitment based instruments

Certification – third-party endorsement that a product, service or organisation meets certain standards or employs certain processes.

Commitments by households and individuals – are only now emerging

Negotiated agreements – commitments for energy saving through bargaining between a public authority and industry.

Unilateral commitments – depends on the organisations themselves how they choose to enforce the commitment and monitor results.

Voluntary programmes – target individual organizations, which voluntarily make a commitment to join the programme.

---

[17] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.
[18] IEA DSM 2005 *Evaluating Energy Efficiency Policy Measures and DSM Programmes.*
[19] Darby, S, (2006). *The Effectiveness of Feedback on Energy Consumption – A Review for Defra of the Literature on Metering, Billing and Direct Displays.* Environmental Change Institute, Oxford University.

Objectives

Aims of DSM programmes

We examine programmes with **aims** of increasing energy efficiency or promoting energy conservation, including:

- programmes promoting changing end-user behaviour
- programmes promoting the use of energy-efficient products
- programmes for load management that mainly aim at changing the pattern of energy use provided there is a clear link to energy conservation
- programmes for end-user generation and energy self-sufficiency provided there is a clear link to energy conservation
- broader low-carbon, environmental or sustainable lifestyle/business/region programmes provided there is a clear link to energy conservation

Outcomes

Effectiveness – refers to the impacts of the programme by reaching the intended goals and realizing benefits in a broader energy context and in a way that is lasting. High effectiveness leads to a programme being successful and low effectiveness as unsuccessful. A DSM programme that has high effectiveness:

1. Has an effect in the broader energy context, a positive (reducing) effect on total energy consumption. In other words, the effectiveness of a DSM program is measured by means of the share of energy saved / total energy consumption or energy conservation potential (not always a relevant criterion). This measure should help us identify the relevance of the programme for overall energy conservation goals.
2. Has reached the desired effect (behavioural change and energy savings) aimed for in the target group, in other words the goals as set out in the programme were achieved. Whether or not these goals have been achieved is judged by means of evaluation of the programme. This evaluation can either be done internally by the implementers of the programme, or if that is not available, by external partners conducting an analysis of the match between the initial objectives of the programme and its final results.

With the above indicators in mind, a 'totally successful' effectiveness would consist of a programme that has achieved durable energy savings and behavioural changes.

Efficiency – refers to the way in which the programme achieves its goals and effects. A DSM programme that has high efficiency uses resources cost-effectively. Cost effectiveness can be measured by identifying the ratio of resources used to energy saved/other desired outcome achieved: programme funding/energy saved. For example, a programme that achieves about 5% energy savings can look quite modest (unsuccessful), but if it is achieved at low cost with high citizen involvement it is still very effective. An efficient programme meets its goals within the intended time-scale and budget.

Social learning – an emphasis on effectiveness and efficiency in outcomes tells us little about the processes of embedding a DSM programme and achieving 'acceptance' amongst the multiplicity of social interests involved, including target groups. Social learning in DSM programmes, thus, focuses on the process of embedding DSM programmes with target groups and users. A commitment to process requires not post hoc evaluations but formative engagement with the embedding of DSM processes in 'real time'. Social learning addresses the often different motivations for involvement in DSM programmes of different institutions, organisations and actors. In particular it necessitates a focus on interactions, which may be in conflict, and the processes through which these may be effectively aligned through the learning by doing, and the reflexive development of mutual and shared understanding.

Success or failure of a programme – within CHANGING BEHAVIOUR the success and failure of a DSM are identified on the basis of efficiency, effectiveness and social learning criteria, and additional selection criteria identified by the project partners in an interactive workshop.

Other related terms

Configuration of technology and user behaviour – configuration refers to more or less unique assemblies of material, organisational and procedural components, some standardly available, others specially developed, built up to meet the particular requirements of users.[20]

End-user needs – end-users needs concerning a certain solution can relate to usability, utility, user satisfaction, or acceptability of the solution on the individual, community or societal level.

Energy efficiency – a ratio between an output of performance, service, goods or energy, and an input of energy[21]

Energy efficiency potential – is usually divided into technical, economic and achievable potential. Technical potential refers to the theoretical maximum amount of energy use that could be displaced by energy efficiency disregarding all non-engineering constraints such as cost-effectiveness and the willingness of end-users to adopt the efficiency measures. Economic potential refers to the subset of the technical potential that is economocially cost-effective as compared to conventional supply-side energy resources. Achievable potential refers to the amount of energy use that efficiency can realistically be expected to displace assuming the most aggressive programme scenario possible.[22]

Energy service – the physical benefit, utility or good derived from a combination of energy with energy efficient technology and/or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings.[23]

Discount rate – The interest rate at which an agent discounts future events. A present-oriented agent discounts the future heavily and so has a high discount rate. The discount rate is related to the time value of money: an investor prefers to receive a payment of a fixed amount of money today, rather than an equal amount in the future.

Innovative technologies – refers to technologies that are new, not yet commonly in use, but hold large commercial or social potential for energy efficiency.

Rebound effect – an undesired consequence of an energy efficiency where energy savings are not attained due to efficiency improvements being offset by increased usage. The increase in consumption is fueled by the reduced unit cost of energy services.[24]

---

[20] Source: S Russell & R Williams, 'Social Shaping of Technology: Frameworks, Findings and Implications for Policy', in K Sørensen & R Williams (eds.), Shaping Technology, Guiding Policy (Edward Elgar, Cheltenham, 2002), Adapted from Fleck 1988).

[21] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.

[22] US EPA (2007) Guide for Conducting Energy Efficiency Potential Studies.

[23] Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.

[24] Adapted from Bertoldi et al, 2005Bertoldi, P., Rezessy, S and Vorsatz. 2005. Tradable certificates for energy savings: opportunities, challenges, and prospects for integration with other market instruments in the energy sector. Energy and the Environment 16(6): 959–992.

Social marketing - social marketing draws on insights from social and behavioural science and marketing research to promote public policy goals.

Technology appropriation – processes in which technologies are adopted and incorporated by users into particular social and technical settings, including local practices and culture.[25]

Timing – activity which brings together multiple elements at a particular point in time. In the context of energy saving programmes, timing includes processes and strategies whereby the programme interacts with changes in its context.

---

[25] Source: S Russell & R Williams, 'Social Shaping of Technology: Frameworks, Findings and Implications for Policy', in K Sørensen & R Williams (eds.), Shaping Technology, Guiding Policy (Edward Elgar, Cheltenham, 2002).