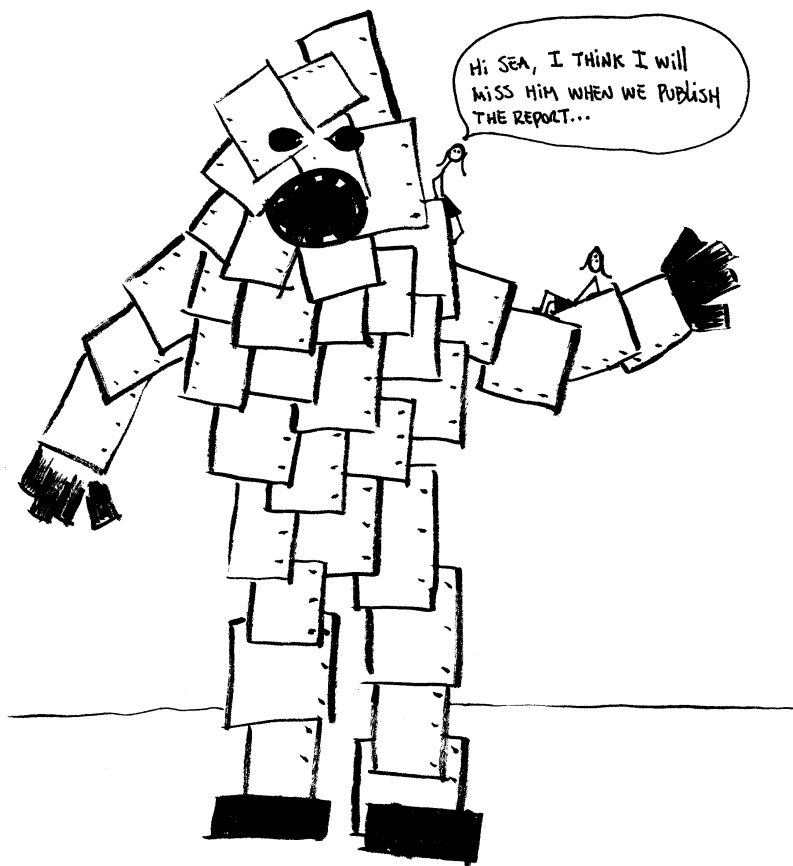


## International Energy Agency

### Energy Technology Initiative on Demand Side Management Technologies and Programmes



## Subtask 8: Decision-making Tree

### *Task 24 – Phase II*

#### Behaviour Change in DSM: Helping the Behaviour Changers

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## Reading guide and background

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This decision-making tree is part of [IEA DSM Task 24](#) Subtask 8 **Deliverable 12: Testable toolbox of interventions**. It should be read in conjunction with the Subtask 1 [“Monster Report”](#) (Mourik & Rotmann, 2013), a case study analysis of over 40 case studies from 15 countries. As this report is over 150 pages long, it was decided to create this decision-making tree to provide ease of access.

### How to use this decision-making tree

Firstly, the “Behaviour Changer”<sup>1</sup> has to choose in which sector he or she is operating in and what kind of Behaviour Changer he or she is, because these are the most important categories for sorting the information. However, the decision-making tree will mainly focus on “Decisionmakers” (from policy and government), because this is the most important target group of Task 24. Then one has to choose which kind of problem one is planning to solve, because that is the most important question to be answered to be able to give advice. After one has clicked on the problem, several case studies for solving the problem will be listed. The decision-making tree does not have a clear preference for one solution. For example, if you are a policy maker in retrofitting and you would like to solve the problem of unhealthy and uncomfortable homes, you can choose from four possible solutions to that issue. The Behaviour Changer can choose his or her preferred option or read all of the options and then make a decision. After choosing one kind of solution, the Behaviour Changer was meant to be redirected to a page with advice, including a short description of the case that has been researched and a short description of the theory applicable to the policy measure, what the influence of the theory on the measure is and the pros and cons of applying that theory, and some recommendations regarding monitoring and evaluation tailored to the specific policy measure. However, as Duneworks did not complete its deliverable to Task 24, and the case studies are over 5 years old, only the page numbers to the “Monster” are referred to here.

## Retrofitting case studies

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### Uncomfortable and unhealthy houses

1. *In which sector are you operating in?*
  - [Retrofitting](#)
  - Transport
  - Smart metering
  - SME's
2. *What kind of ‘Behavior Changer’ are you?*
  - [Policymaker](#)
  - Researcher
  - Third sector
  - Industry
3. *What is the problem?*
  - Energy waste (4 cases)
  - [Uncomfortable and unhealthy houses](#) (4 cases)
  - Both of the above (Dutch *Blok voor Blok* pp. 14)
  - Neighborhood with bad retrofitting and other (socio-economic) problems ([Swedish Sustainable Järva](#) pp. 26)
4. *How would you like to solve the problem?*
  - Free retrofitting (UK [Kirklees Warmzone](#) pp. 29)
  - Funding for retrofitting (NL *Blok voor Blok* pp. 14)
  - Discount on retrofitting (New Zealand [Warm up NZ](#) pp. 18)
  - Loan for retrofitting (UK [Kirklees](#) pp.29)
5. *Who is your target group?*

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<sup>1</sup> *Behaviour Changer* is a person or agency tasked with the goal of designing, implementing, evaluating and/or disseminating interventions geared at changing energy *End User* behaviours. In this Task, we differentiate between five *Behaviour Changer* sectors: “the Decision-maker” (usually government on all levels), “the Provider” (usually energy- and energy technology-providing industry on all levels), “the Expert” (researchers and consultants from a multitude of disciplines, especially economics, psychology, sociology and engineering), “the Conscience” (the Third sector including NGOs, community organisations, consumer groups etc.) and “the Middle Actor” (usually service providers in direct contact with the End Users).

- House owners (Blok Voor Blok pp.14)
  - Tenants (Norwegian Myhrenenga case pp. 24)
  - Both (Warm up NZ pp. 18, Kirklees pp. 29)
6. *What kind of behavior would you like to change?*
- Onetime investment (short-term) (Warm Up NZ pp. 18)
  - Habitual behavior (long-term) (Swiss 2000 Watt Society pp. 22)

## Energy waste

1. *In which sector are you operating in?*
  - [Retrofitting](#)
  - Transport
  - Smart metering
  - SME's
2. *What kind of 'Behavior Changer' are you?*
  - [Policymaker](#)
  - Researcher
  - Third sector
  - Industry
3. *What is the problem?*
  - [Energy waste \(4 cases\)](#)
  - Uncomfortable and unhealthy houses (4 cases)
  - Both of the above (Dutch [Blok voor Blok pp. 14](#))
  - Neighbourhood with bad retrofitting and other (socio-economic) problems (Swedish [Sustainable Järva pp. 26](#))
4. *How would you like to solve the problem?*
  - Energy label (Dutch [Energy labelling pp. 16](#))
  - Subsidy insulation old houses ([Blok voor Blok pp. 14](#))
  - Policy, subsidy retrofitting and renewable energy (Swiss [Building retrofit pp. 20](#))
  - Variety of measures for decreasing energy use (Swiss [2000 Watt Society pp. 22](#))
5. *Who is your target group?*
  - House owners ([Energy Labelling pp. 16](#), [Blok voor Blok pp.14](#), [Building retrofit pp. 20](#))
  - Every citizen ([2000 Watt Society pp. 22](#))
6. *What kind of behavior would you like to change?*
  - One-time investment ([Building retrofit pp. 20](#), [Blok voor Blok pp.14](#), [Dutch Energy Labelling pp. 16](#))
  - Habitual behavior (long term) ([2000 Watt Society pp. 22](#))

## Transport

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### Congestion

1. *Which sector are you operating in?*
  - Retrofitting
  - [Transport](#)
  - Smart metering
  - SME's
2. *What kind of Behaviour Changer are you?*
  - [Policymaker](#)
  - Researcher
  - Third sector
  - Industry
3. *What is the problem?*
  - [Congestion \(3 cases\)](#)
  - Purchase of polluting cars (Norwegian [Nobil EV programme pp. 55](#))
  - Bad driving behaviour (2 cases)
4. *How would you like to solve the problem?*
  - Personalised support to encourage people to cycle or walk (New Zealand [Active a2b programme pp. 53](#))
  - Congestion charge (Swedish [Stockholm congestion pilot pp. 60](#))

- Information supply, price incentive and personal avoidance plan (Dutch Congestion pricing programme pp. 63)
- 5. *Who is your target group?*
  - Employees large companies/working places (New Zealand active a2b programme pp. 53)
  - Drivers in the city (Swedish Congestion pilot pp. 60)
  - Car drivers, general (Dutch Congestion pricing programme pp. 63)
- 6. *What kind of behavior would you like to change?*
  - Choice of transport (New Zealand Active a2b programme pp. 53)
  - Time of travelling to and from the city center (Swedish Congestion pilot pp. 60)
  - Norm, habit: avoidance of rush hour (Dutch Congestion pricing programme pp. 63)

## Bad driving behavior

1. *What is the problem?*
  - Congestion (3 cases)
  - Purchase of polluting cars (Norwegian Nobil EV programme pp. 55)
  - [Bad driving behavior \(2\)](#)
2. *How would you like to solve the problem?*
  - Campaign to change norms (Dutch New driving programme pp. 56)
  - Training of drivers (New Zealand Post fuel efficient driver training programme pp. 58)
3. *Who is the target group?*
  - (Young) male drivers (Dutch New driving programme pp. 56)
  - Drivers postal service (New Zealand Post fuel efficient driver training programme pp. 58)
4. *What kind of behavior would you like to change?*
  - social norm, habitual behavior (Dutch New driving programme pp. 56, New Zealand Post fuel efficient driver training programme pp. 58)

## Smart metering/feedback

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### For policymakers

1. *Which sector are you operating in?*
  - [Smart metering](#)
2. *What kind of Behaviour Changer are you?*
  - [Policymaker](#)
  - Researcher
  - Third sector
  - Industry
3. *What is the problem?*
  - High energy use (5 cases)
  - Energy use during peak hours (Dutch project Your Energy Moment pp. 96)
  - Mismatch energy demand and supply (Dutch PowerMatching City project pp. 98)
4. *How would you like to solve the problem?*
  - Smart meter (UK Charm project pp. 91, The Swedish project Clockwise pp. 94, Austrian € CO2-Management project pp. 101)
  - Research the impact of SM on behavior and the perception on SM (Swiss Smart Metering case study Uttwil (EKT) pp. 104)
  - Research effect of different information systems (Swiss EWZ smart metering project pp. 105)
5. *Who is your target group?*
  - Energy users, residential
6. *What kind of behavior would you like to change?*
  - Energy use (habitual)

### For industry

1. *Which sector are you operating in?*
  - [Smart metering](#)
2. *What kind of Behaviour Changer are you?*
  - Policy maker

- Researcher
  - Third sector
  - [Industry](#)
3. *What is the problem?*
    - High energy use (US [Opower Home energy reporting platform programme pp. 93](#))
    - Energy use during peak hours ([New Zealand Time of Use case pp. 86](#), [Italy's Time of Use case study pp. 100](#))
    - Customers have problems paying the bills ([Portuguese On Demand pp. 87](#))
    - Acceptance devices by customers ([Norwegian demo Steinkjer pp. 90](#))
  4. *How would you like to solve the problem?*
    - Smart meter ([Norwegian demo Steinkjer pp. 90](#), [Opower Home energy reporting platform programme pp. 93](#))
    - Time of use tariff ([New Zealand Time of Use case pp. 86](#))
    - Economic incentive ([Portuguese On Demand pp. 87](#))
  5. *Who is your target group?*
    - Energy users, residential
  6. *What kind of behavior would you like to change?*
    - Energy use (habitual)

## Small to medium enterprises

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1. *Which sector are you operating in?*
  - Retrofitting
  - Transport
  - Smart metering
  - [SMEs](#)
2. *What kind of Behaviour changer are you?*
  - [Policymaker](#)
  - Researcher
  - Third sector
  - [Industry](#)
3. *What is the problem?*
  - Energy use SMEs ([Swedish Eskilstuna project pp. 133](#), [New Zealand's EECA SME Crown Loans Scheme pp. 136](#))
  - Unsustainable commercial buildings ([Belgian Build4Change project pp. 126](#))
  - Unsustainable behavior ([Dutch Green Deed project pp. 128](#), [Swiss EnAW project pp. 131](#), [Swedish Energy Save Eskilstuna project pp. 131](#))
  - Energy use plant ([Norwegian Finnfiord AS project pp. 134](#))
  - Energy use computers ([Spanish Verdiem project in Barcelona City Council's computers pp. 129](#))
4. *How would you like to solve the problem?*
  - Software ([Spanish Verdiem project in Barcelona City Council's computers pp. 129](#))
  - Support scheme energy audits ([Swedish Eskilstuna project pp. 133](#))
  - Energy audits and shared learning ([New Zealand's EECA SME Crown Loans Scheme pp. 136](#))
  - Move to energy efficient building and motivate staff to save energy ([Belgian Build4Change project pp. 126](#))
  - Contest and social comparison ([Dutch Green Deed project pp. 128](#), [Swiss EnAW project pp. 131](#), [Swedish Energy Save Eskilstuna project pp. 131](#))
  - Steam turbine ([Norwegian Finnfiord AS project pp. 134](#))
5. *Who is your target group?*
  - Staff ([Belgian Build4Change project pp. 126](#), [Dutch Green Deed project pp. 128](#))
  - Other SMEs ([Swiss EnAW project pp. 131](#), [Swedish Energy Save Eskilstuna project pp. 131](#), [EECA Crown loans pp. 136](#))
  - Investors ([Norwegian Finnfiord AS project pp. 134](#))
6. *What kind of behaviour would you like to change?*
  - Habitual behavior ([Belgian Build4Change project pp. 126](#))
  - One-time investment ([Dutch Green Deed project pp. 128](#), [Norwegian Finnfiord AS project pp. 134](#))

## 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
Ireland	Canada
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, RVO, 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** Behaviour Change in DSM: Phase 1 - From theory to practice  
Phase 2 – Helping the Behaviour Changers  
Dr Sea Rotmann, SEA, New Zealand

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

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