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

Guidelines and recommendations for Belgium

Task 24 – Phase I
Closing the Loop – Behaviour Change in DSM:
From Theory to Practice

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Contents

Do's and Don'ts for Belgian Behaviour Changers

Intervention Phase	DO	DON'T
DESIGN PHASE	– use models of understanding behaviour and theories of change to design interventions – spend some time pre-intervention researching your audience, its motivations, needs and heterogeneity – collaborate with other Behaviour Changers, especially researchers and intermediaries to design your interventions – segment your audience where you can as it will help tailor the intervention – design evaluation into the intervention up front, including the evaluation team (if different) – learn from mistakes and (re)iterate your intervention – put a lot of thought into dissemination and don't be afraid to use unusual means like social media, group learning and storytelling	– believe that there is one silver bullet model for behaviour change – always use the same model, neoclassical economics is a valid model that fits our socio-economic and political reality but it does not explain peoples' mostly habitual energy-using behaviour well enough – be afraid to mix models and create a toolbox of interventions – think you can design, implement, evaluate and disseminate a (national) behaviour change programme all by yourself – think all people are rational, utility-maximising automatons, even in each household you will find very different attitudes, behaviours and motivations – think you can leave evaluation til after the programme is finished – just think in kWh and cost savings, most people don't think of energy in this way but of the services they derive from it
IMPLEMENTATION PHASE	– collaborate with other behaviour changers in rolling out the intervention – use trusted intermediaries and messengers – target your audience with tailored information and feedback that makes sense to them – keep learning during the implementation by evaluating ex durante – listen to peoples' stories and especially the nay-sayers and laggards – not underestimate the power of moments of change, use them wisely	– operate in a silo, you need help – stop looking in unusal places for allies – let your (conflicting) mandates stop you from working with other Behaviour Changers – let technology overwhelm the intervention, it is a means to an end – ever forget that you are dealing with people and their homes are their castles and their cars their steeds – think you know better than your audience how they should use energy – keep a successful intervention to yourself, share it widely
EVALUATION PHASE	– evaluate ex ante, ex durante and ex post – put 10-15% of your resources into evaluation, it's worth it – benchmark! – think of the most relevant metrics and indicators, not just for you but for your target audience and the other Behaviour Changers – use double-loop learning methods – provide strong, ongoing, targeted feedback to your audience	– think it's just about kWh, evaluate beyond it (eg health, comfort, safety...) – think you need to do all evaluation yourself, use your collaborators to evaluate the bits they know best – leave evaluation til the end or ignore its importance in showing that your intervention worked – just model, measure as well – ignore the pathway of behaviour change that led to a kWh change – ask people
(RE)-ITERATION PHASE	– (re)iterate your intervention often – learn from your mistakes – listen to your collaborators and end users	– ignore your evaluation – hide your mistakes and horror stories, they are often the ones we can learn the most from
DISSEMINATION PHASE	– understand your audience, collaborators and stakeholders, tailor your dissemination accordingly – tell stories, use social media and word of mouth – use trusted intermediaries to tell your story	– spend all your money on (social) marketing campaigns – keep doing the same thing, peoples' willingness or brand awareness doesn't usually translate to behaviour change – tell a boring story about kWh – think you know better, ever

A summary of Task 24

Human behaviour is 'the way that people act socially and in the environment and spans a number of scientific disciplines including psychology, sociology, (behavioural) economics and neuroscience[1]'. It is estimated that there is about 30% energy efficiency potential in the so-called 'behavioural wedge', a lot of which is relatively cheap to access (e.g. changes in habits and/or purchasing behaviours), with some of the potential locked in more expensive, one-off investment behaviours. There are several different models of understanding behaviour (i.e. how human behaviour works) and theories of change (i.e. how to design interventions to change it)[2]. However, there is no behaviour change 'silver bullet', like there is no technological silver bullet that will ensure energy efficient practices. Designing the right programmes and policies that can be measured and evaluated to have achieved lasting behavioural and social norm change is difficult.

We believe that this Task, and its extension, helps to address these difficulties and has a multitude of guidelines, recommendations and examples of best (and good) practice and learnings from various cultures and contexts. We relied on sector-specific experts (researchers, implementers and policymakers) from participating and interested countries to engage in an interactive, online and face-to-face expert platform and contribute to a comprehensive database of different behaviour change models, frameworks and disciplines; various context factors affecting behaviour; best (and good) practice examples, pilots and case studies; and examples of evaluation metrics. The Task has several deliverables, including the expert network for continued exchange of knowledge and the large-scale analysis of the helicopter overview and case studies. We also tailor these country-specific reports with recommendations, outcomes and guidelines specifically to our funders' needs.

Some numbers of Task 24

- **July 2012 - March 2015:** Official start and end dates
- **8 participating countries:** the Netherlands, Norway, Sweden, New Zealand, Switzerland, Belgium, Italy, Austria
- **9 countries gave in-kind (expert) support:** the UK, Spain, Portugal, UAE, France, Australia, South Africa (which was meant to join but didn't do so in time), Canada and the US.
- **227 behaviour change** and DSM experts from **21 countries** participate in Subtask 5, the invite-only Task 24 Expert Platform (www.ieadsmtask24.ning.com).
- 15 successful expert workshops/webinars have been held to date[3]
- **137 videos and presentations** of these events on the Expert Platform
- 1000s of experts in 28 conferences and seminars have heard about Task 24
- **Over 30 publications** have been created and disseminated[4]
- **Almost 60 case studies** showing the successful (or not so successful) use of diverse models of understanding behaviour in the areas of transport, SMEs, smart meters and building retrofits have been collected to date from **16 countries** in a Wiki.

Belgium's Involvement in Task 24

Belgium joined Task 24 at the start in 2012. Frédéric Klopfert of ULB (Université Libre de Bruxelles) was appointed official National Expert, though due to various reasons was not able to fully contribute throughout the Task, hence Belgium was often represented at Task workshops by Matt Batey, independent energy consultant based in Flanders. The Belgian contribution was funded by the Federal Ministry of the Economy, with the contact person François Brasseur.

Several Belgian research institutes, technology developers, policymakers and practitioners were considered to be the audience for Belgium. See Table 1 below for an overview. Belgium, through

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[1] UK The Parliamentary Office of Science & Technology (2012). Energy Use Behaviour. Number 417.

[2] Described in detail in Darnton, Andrew (2008). *GSR Behaviour Change Knowledge Review*. Reference Report. 83pp.

[3] See Appendix 1 for all workshops, conferences and seminars that Task 24 organised and partook in

[4] See Appendix 2 for a list of all reports and publications

Frédéric Klopfert, Hélène Joachim (ULB) and Matt Batey (Independent), participated in workshops in the UK, Norway, Switzerland, Belgium, and the IEPPEC Conference in Berlin in September 2014.

Belgium contributed with the following case studies:
- SMEs: The project *'Build4Good'*
- Transport: *Slimme kilometerheffing*
- Smart Grid: *Linear*
- Retrofitting: *Living Green – Ecohuis*
- Stad Gent *'E-bike subsidy'*

Experts and organisations that participated in the several workshops we held in Belgium and/or in workshops and conferences abroad:

Private companies	Research organisations	Non profit and administrations
Bopro nv Matt Batey (Independent) ELIA (electricity distribution) VITO	Université Libre de Bruxelles VITO Vrije Universiteit Brussel CORE - University of Louvain-la-Neuve	FOD Economie Stad Gent FOD Environment Brussels Environment (BIM/IGBE) APERe (Association pour la Promotion des Energies Renouvelables)

Table 1. Experts and organisations in Belgium involved in Task 24

Belgium's Energy story (wider energy culture and contexts)

1. *Geography:* Belgium is small country made up of two distinct geographical regions: mostly flat Flanders and the more undulating hills of Wallonia. It has a small coast but is otherwise surrounded by the Netherlands, France and Germany.
2. *Socio-economics[5]:* Belgium is a small densely populated country. The population almost reaches 11 million.
3. *Energy supply:* The IEA DSM Annual report 2014 states that the Belgian Energy System is built mainly on nuclear (55%, IEA, 2009) and fossil fuels.
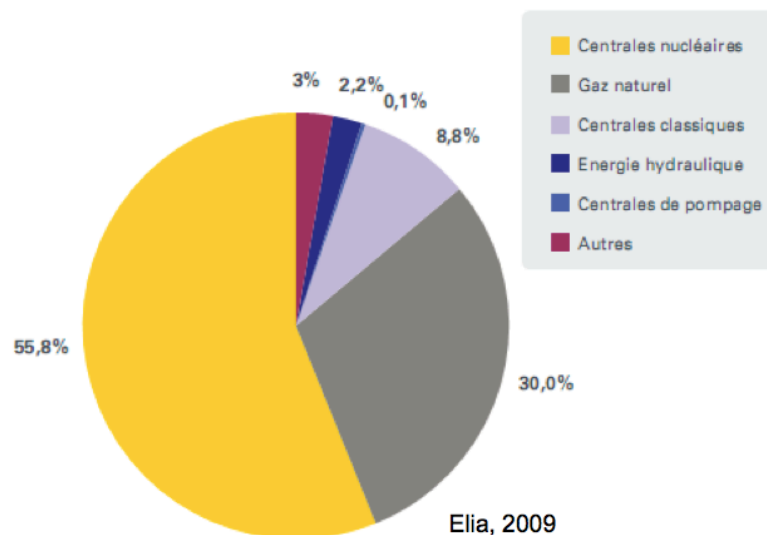
The IEA review of the Belgian energy policy (2009[6]) mentions that energy policy in Belgium is shaped by the European Union targets for 2020 on greenhouse gas (GHG) mitigation, renewable energy and energy efficiency. The country will have to cut GHG emissions from the sectors outside of the EU Emissions Trading Scheme (EU-ETS) by 15% below their 2005 levels by 2020. It will also have to increase the share of renewable energy sources in final

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[5] http://en.wikipedia.org/wiki/Belgium

[6] http://www.iea.org/publications/freepublications/publication/belgium2009.pdf

energy consumption from 2.2% in 2005 to 13% in 2020. Belgium's efforts to improve energy efficiency will also support the EU's target of cutting energy demand by 20%, although there are no binding targets for energy efficiency. The IEA[7] states that the closure of nuclear plants has led to a loss of 2 000 megawatts (MW) of electricity, making Belgium structurally dependent on imports in Winter 2013, leading to the implementation of a load-shedding policy to manage any emergency shortfalls. Though the nuclear plants were restarted in June 2014, the load-shedding plan remains active, theoretically representing a key opportunity for industrial scale DSM.

4. *Institutional:* The IEA energy review states that Belgium has already adopted — at both regional and federal levels — many mechanisms to promote energy efficiency and renewables along with other measures to reduce GHG emissions. However, there is still need for a comprehensive long-term strategy bringing together climate and energy policies.

5. *Energy policy and politics:* The Government wishes to support the transition to more renewables in the energy system by promoting investment, among other things through the renewable energy incentive schemes (Green certificates for electricity in all three regions, Energy subsidies towards investing in building-integrated renewable energy). The Belgian situation is complicated by its multi-layered federal, regional and provincial government structure. The IEA DSM Annual report 2014 also discusses the need to integrate a growing share of renewables, combined with a stable demand and an external dependence for energy supply that has become structural, with an ageing park of production and a lack of investment in new capacities, are the driving forces of a necessary market transformation. In this context, promoting and developing DSM (and demand flexibility) has become an absolute necessity.

6. *Energy Culture:* Historically one of the poorer performing EU nations in terms of energy-efficiency in buildings and other end-uses, Belgium has recently embraced the culture of renewable energy and energy-efficiency (thermal insulation, high performance glazing, low-energy lighting), particularly at the high-end with a proliferation of passive-house constructions and rooftop solar installations. A strong culture of house-building and renovation continues to improve performance, along with the stringent application of the EPBD, though energy use levels per person, relative to other nations, is hampered by the Belgian preference for large houses, with the floor area per person second only to Luxembourg within the EU.

7. *Energy Use:* Residential electricity consumption by final uses (lighting, cooking, heating etc.) in Belgium, relative to other EU nations, is illustrated in the graph below.

Graph sourced in presentation on the Belgian Energy Story, Frédéric Klopfert at the Task 24 Brussels workshop

Based on the ratio: energy consumption by end uses divided by the number of permanently occupied dwelling.

Source: odyssee

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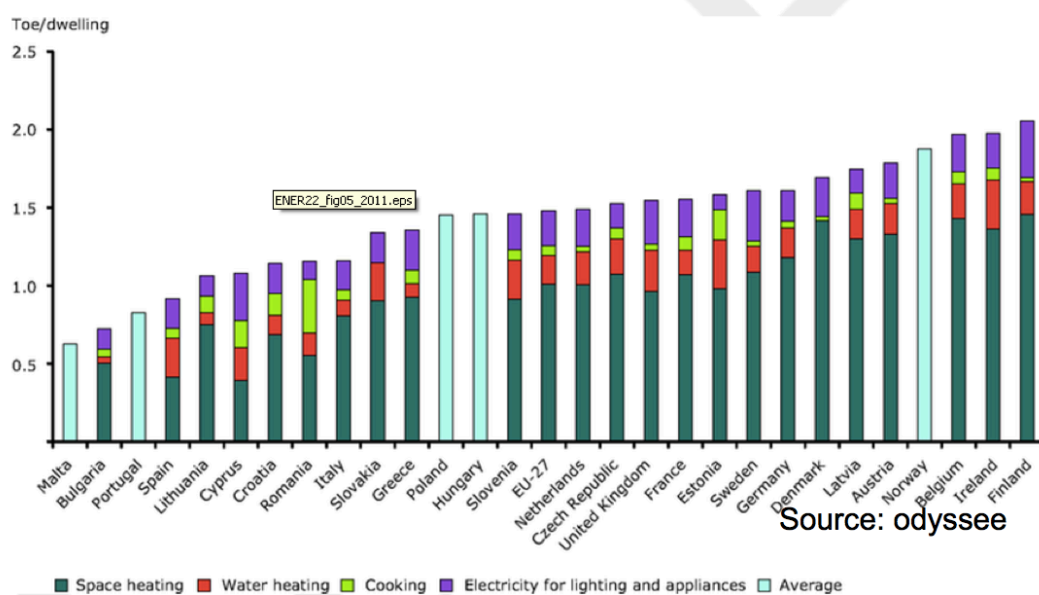
7 http://www.iea.org/publications/freepublications/publication/Energy_Policy_Highlights_2013.pdf

The phases of Task 24 and behaviour change interventions

THE DESIGN PHASE

One of the most important phases to ensure successful behaviour change interventions is the design phase. This is where Behaviour Changers chose a model of understanding behaviour (usually based on the disciplines of economics, psychology or sociology), one or more theories of changing it and, hopefully, think about what to evaluate to measure success, and how. Our first Subtask looked at this phase in particular, by analysing best (and not so great practice) from over 40 case studies from 16 countries.

The main advantages of a "helicopter overview" like the one provided in Subtask 1 are:

- ✓ the easy general understanding and overview it provides, together with
- ✓ a good representation of the different models of understanding behaviour that various disciplines bring to the topic of energy efficiency
- ✓ a snapshot of the current international best and substandard practices in the field
- ✓ a good platform to do some quality storytelling around what works and what doesn't.

It does not, however:

- ☒ represent an in-depth review of all available literature
- ☒ give a strict disciplinary or sectoral approach in any way
- ☒ present in a very usable format, which is why the Wiki was created.

Subtask I - 'The Monster'

45 case studies have now been analysed (with another 12 to be added) and a 160pp 'Monster' report and Wiki (www.ieadsmtask24wiki.info) have been developed. A short storybook version of the 'Monster' report is also available. The different models of understanding behaviour and theories of change, as well as some examples for intervention design can be found in Appendix 4. In summary, the case studies in the 'Monster' show:

- That conventional approaches (providing information and financial incentives) towards energy behavioural change often fail to achieve a strong, lasting impact but are still widely used.
- That there are many promising experiments with end-user and context-tailored approaches that move beyond changing the individual into more societal, lifestyle and practice changes.
- That current experiences are very scattered and there is no overarching method to evaluate success (nor are there commonly agreed-upon metrics) and that this makes it difficult to replicate success elsewhere, which is why we need to investigate a more coordinated approach.
- That we need more empirical and in-depth case studies (including field research) in order to investigate how such a coordinated, whole-system approach could work in practice, in different (national) contexts.
- That there are still gaps in social science knowledge, for example, the use of narratives is being promoted, especially by marketers, but has not been researched in depth in the energy field.
- That there is still limited interaction between different relevant stakeholders and disciplinary and sector silos, due to their different mandates and system-imposed restrictions, which keep them from collaborating effectively.

These general findings directly led to the development of the Task 24 extension work plan which addresses many, if not most of these issues.

In the (RE)ITERATION PHASE section of this report we will look at the Belgian case studies from the 'Monster' and assess the recommendations from each of the domains, and how the individual cases may be 'redesigned' to lead to potentially more effective behaviour change outcomes with these learnings.

THE IMPLEMENTATION PHASE

This is where theory turns into practice, and where it usually becomes quite apparent if an intervention has been designed well and based on the right model of understanding the particular audience and their particular behaviour that is meant to change and the right theory/ies of changing it. By looking at each country's in-depth case study (different for each country report), we can provide some '20/20 vision in hindsight'.

Subtask II – In-depth case studies

Several case studies for Subtask 2 have been collected, and more are on their way. These offer a way to:

- ✓ drill deeper into specific cases that are of particular interest to the Task
- ✓ focusing on the importance and impact of country-specific contexts in the design of programmes and initiatives
- ✓ offering some insights into cross-national potential
- ✓ standardising the analysis across countries and contexts.
- ✓ collect different points of view.

However, the case study analysis is not:

- ☒ in-depth, as it focuses on only one issue per country
- ☒ a literature review, as it is built on interviews and points of views of several stakeholders
- ☒ available to countries that provided in-kind expertise only.

The proposed Subtask 6 of the Task extension will offer more of these case studies as well as expanding on already existing ones.

Unfortunately, due to not having a dedicated National Expert for a long time, we could not complete a Subtask 2 analysis of an in-depth Belgian case study. The key lessons and recommendations from individual case studies (ST 1) can be summarised as follows:

How to start and keep going: Communities matter
- When you start with an existing community, make sure your proposition fits their goals and ambitions
- Make sure your technology can keep up with needs of the community members
- When people already meet in the street they need an online community that provides what the street encounters do not

Scalability starts with making it more than me and my machine
- Green minded community minded people need physical interaction, me and my system is not enough
- Belonging to a community creates more connection to the technology everyone is using
- communities offer scalability

Trust is key, make it a non-issue
- Knowing the team creates trust: make it personal

- Commercial interests and trust do not get along well
- Participants in a pilot have more patience towards the technology, as long as they are not blamed for failures
- Be transparent about the assumptions designed into the system: make participants as knowledgeable as they want to be
- Building up trust is also about demonstrating you understand the WIFM of participants

Residents are humans too...
- People usually do not use energy just to be able to waste it
- Propositions need to match what motivates to get people to behave accordingly
- To change behaviour technology needs to fit real life
- Do not ask people to accept a higher energy bill for the sake of the project
- Even the most willing participant has a family...
- Comfort is not only non negotiable, the need for comfort can even grow...
- Even greens place home or ' me' first, society second

Engage and share control: what you want is partnering, not engagement: partner not consumer
- People want to be a partner, not a passive consumer
- Shared decision making also creates a bigger potential to create a system that actually fits in the daily life and existing home installations
- Partnering entails accepting that participants are experts on their own homes and behaviour
- Investigate the potential of creating a sense of partnering during mass-rollout using open innovation
- Engagement is time consuming and can hurt (spouses): acknowledge this investment
- Beware you make as efficient use of participants' time as possible
- Don't push too hard for engagement: it might pollute your results
- Lasting engagement is key to changing behavioural routines

The Right Team and Methods
- Build-up a personal relationship: know your participants
- Create a one-stop shop contact person
- Different phases, different project team competencies
- Different phases require different methods
- Engage the silent voices, spouses or children. These are the next best thing to mass-market representatives.
- Being technical about it is OK
- Monitor, or your participants will and be frustrated about it
- Allowing feedback creates engagement
- Direct response to concerns strengthens the feeling of being in a partnership

THE EVALUATION PHASE

Surely one of the most important, yet often most neglected phases of a successful behaviour change intervention. In best practice, about 10-15% of the total cost of an intervention should be spent on evaluation and it should be undertaken ex ante, ex durante and ex post. In real life, these numbers hardly ever add up and there is no standard way or data collection in the literature of evaluating how a behaviour change has led to a change in eg kWh before and after an intervention[8]. To complicate things even more, different stakeholders (and the end user) have different perceptions of what should be a successful behaviour change outcome and there are many different metrics of how these can be measured[9]. We address all these issues in our Subtask

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[8]   See Karlin et al's Methodological Review 'What do we know about what we know?' for Subtask 3

[9]   See the different evaluation metrics in the 'Monster'

3 reports and factsheets and will go much further into an actual, standardised tool design in ST 8 and 9 of the extension.

Belgium expert Matt Batey, together with the Dutch national expert and task 24 Operating Agent Ruth Mourik, conducted a brief qualitative analysis of relevant task 24 case-studies in a paper for the IEPPEC conference in Berlin in September 2014.

Subtask III - Evaluation 'Tool'

Task 24 recognises evaluation as one of the most important parts of any type of behavioural intervention, and it is regarded in this Task to be:

- ✓ in great demand from decisionmakers and those funding behavioural interventions
- ✓ very important as it is the only way to truly show that an intervention has had actual impact on behaviour changes that last
- ✓ one of the most difficult issues to evaluate
- ✓ largely dependent on models, approximations and estimates rather than actual measurements
- ✓ a collection of different metrics beyond kWh and even beyond energy
- ✓ a methodological review of behavioural interventions in the residential building and feedback sectors
- ✓ an overview of how different disciplines monitor and evaluate behaviioural interventions
- ✓ an overview of definitions used in monitoring and evaluation in this Task
- ✓ an in-depth discussion of the many challenges facing Behaviour Changers
- ✓ a recommendation of switching from single- to double-loop learning and providing
- ✓ examples of how to do so in the building retrofit domain.

However, it is not:

- ☒ fully possible in the scope of Phase I of Task 24
- ☒ an easy thing to do, as there is no good existing or standard methodology for doing it, especially once different needs and expectations of various Behaviour Changers and end users are taken into account.

Developing a behavioural evaluation tool with concurrent methodology will be part of the focus of the Phase II of Task 24 (Subtasks 8 and 9).

Even though we have not yet a fully completed evaluation 'tool' that can be applied to all possible combinations of intervention tools in different domains, we have developed some fact sheets based on the insight that, instead of only undertaking 'single-loop learning', we also need to delve more deeply into the 'double-loop learning' process (see Figure 2 below for explanation). This is especially the case in more systemic, collaborative interventions, as promoted by this Task (after analysis of the case studies in Subtasks 1 and 2 showed how successful such interventions were, compared with siloed, individual, top-down approaches).
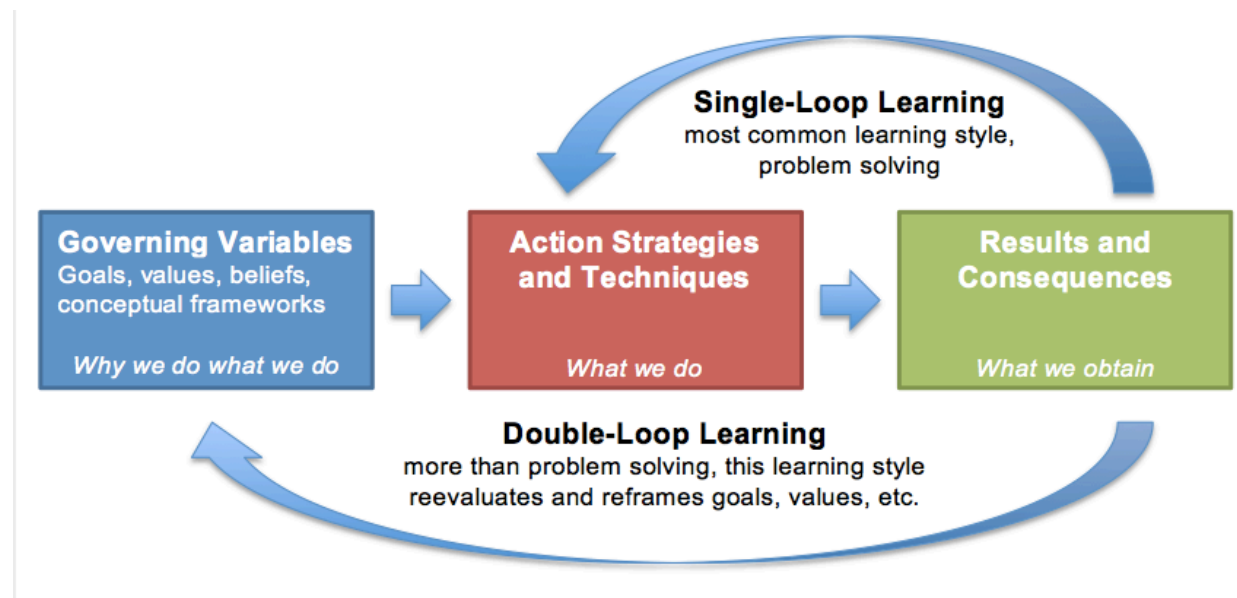
Figure 2: double vs single loop learning. Retrieved from http://www.afs.org/blog/icl/?p=2653

The template of questions that need to be addressed in both single- and double-loop learning (and which the individual fact sheets examining specific tools are based on) can be seen here:

Table 3. Different learning types, indicators, questions and metrics for monitoring & evaluating behaviour change programmes

Learning type	Indicators	Questions for M&E	Metrics (examples)
Single-loop learning	Efficiency indicators: • Cost-effectiveness • Lowering the total energy consumption	• Was the intervention cost effective? • Are the goals reached within the time and within the allocated budget?	• Costs and benefits (eg RoI or NPV) • Pre-set goals • Available time and time needed • Budget and costs
	Effectiveness indicators: • Reaching the intended goals • Lowering the total energy consumption	• Are the goals reached? • Is the total energy consumption lowered (per household? by sector?)	• Energy savings • Energy consumption before and after intervention

| Double-loop learning | Process indicators:
• Realising a network of a heterogeneous set of actors with different definitions of success
• Interaction and participation by the target group (so that they can learn about their own behaviour and consequences for energy consumption)
• Interaction and participation with a diverse set of stakeholders since the design phase
• Learning as an explicit aim of the intervention
• Record new lessons for future interventions
• Making use of lessons that are learned during previous interventions
• Perspectives of intermediaries before and after a intervention
• Changes in assumptions, norms and beliefs | • To what extent 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 was interaction and participation by the target group allowed in the programme? And to what extent did end-users learn about their own behaviour and consequences for their energy consumption?
• How was learning during and after the intervention ensured?
• How did the perspectives, assumptions, norms and beliefs of intermediaries and other stakeholders change during the programme? | • Diversity of actors that are involved in the design and implementation of the intervention
• Definitions of success that were co-created and used

• The way end-users were involved in the design and implementation of the intervention
• Perceived self-efficacy
• Perceived impact and benefit of the intervention

• Learning strategy

• Perspectives, assumptions, norms and beliefs of stakeholders before, during and after the intervention |
| | Content indicators:
• Alignment of the expectations of the stakeholders
• Reflection upon the function of evaluation/monitoring together with stakeholders
• Learned lessons during the intervention are translated into (re)designs
• Improving the capacity of own or similar organisations to perform successful DSM interventions
• Creation of new networks and institutions that support the newly formed behaviour and its outcomes

• Lasting changes (behavioural or practice change) | • To what extent were the expectations of stakeholders aligned? How is this done?
• How did reflection upon the function of M&E with stakeholders take place?
• Which lessons learned during the intervention are translated into (re)designs?
• Is the capacity of own- or similar organisations improved to perform successful DSM interventions?
• Are new networks and institutions created that support the newly formed behaviour and its outcomes?
• Did lasting changes take place? | • Collective impact approach to co-develop metrics to measure this

• Main lessons learned by different stakeholders

• Perceived success of collaboration and intervention design and implementation

• Short- and long-term effects |

THE (RE)ITERATION PHASE

During this phase, after we have designed, implemented and evaluated a behavioural intervention, we sometimes get the chance to reiterate current policies, programmes or projects with the results of our analyses. Often, evaluation happens only after a programme has been completed and the results can get lost (also an issue when e.g. losing corporate knowledge). This phase is hugely important in order to ensure that previous learnings and lessons have not been lost, but been used to improve future behaviour change interventions.

Subtask IV: Country-specific recommendations

The function of this part is to demonstrate some country-specific recommendations based on the country contexts and stories detailing interventions that worked (or did not). Each country will have

a set of recommendations tailored to its specific context – though there will be similarities and cross-country transferability. A country-specific list of recommendations is:

- ✓ a main drawcard of Task 24, providing specific recommendations to countries depending on their contexts
- ✓ a collection of country-specific contexts, based on the country stories
- ✓ different for each of the countries
- ✓ but with some similarities and overal, global conclusions (eg the do's and dont's)
- ✓ based on input from the country experts and their specific knowledge

However, it is not:

- ☒ Conclusive
- ☒ Entirely objective, some sector or disciplinary views may be missed
- ☒ Available to countries that are not financially participating.

Belgian case studies – guidelines and recommendations

On finalising the Task, we are providing country-specific recommendations and to do's/not to do's from in-depth stakeholder analyses collected during workshops, from our National Experts and during case study analyses. This report forms part of the Belgian summary and recommendations. Here we provide examples of how the case studies we looked at in Subtask 1 could be improved or changed following our learnings and recommendations:

Building retrofits

The abbreviated headline recommendations (for detailed recommendations see Appendix 6) from our Subtask 1 analysis of building retrofit case studies are described through the lens of the *Living Green Ecohuis* project below.

Programme: *Living Green Ecohuis*

Living Green is a programme initiated by a consortium of eight Northwest-European partners, settled in The Netherlands, Belgium, Great-Britain, France and Germany. It is co-financed by INTERREG North-West Europe (NWE), a "Programme of the European Union to promote the economic, environmental, social and territorial future of the North-West Europe area." Living Green aims at the sustainable renovation of buildings, keeping the cultural heritage of a building/region intact (thus omitting the building of new dwellings). Living Green started in 2008 and ended in 2013.

Living Green realises sustainable renovations within a region through 'Livinggreen centres' such as the EcoHuis in Antwerp. The EcoHuis Antwerp used to be a department store (De Wolmolen) which was sustainably renovated in 2003 as a demonstration and information centre for sustainability. Since 2008, the EcoHuis extended its scope by adopting the Living Green methodology. The EcoHuis now supports renovators by sharing knowledge, providing tailored advice ('EcoDoctor') and providing financial constructions. It also demonstrates examples of renovation measures and organises so-called 'Livinggreen-labs'. These labs focus on the participation and living experience of end-users instead of merely information supply. The EcoHuis also offers tools for mapping the energy saving potential of a building (e.g. via heat scans). Finally, the EcoHuis initiates and broadens networks to create public support for sustainable rentrofits. In total, 58 methods were used in Living Green (some in the EcoHuis) to change habitual and investment behaviour. Lessons of all Living Green partners were bundled and analysed, resulting in a toolkit targeting residents.

The toolkit is a step-by-step plan to provide tailored information about sustainable renovation to individual households. The toolkit is adaptable to the individual preferences, living situation and environment. It provides different tools in different phases, looking at multiple contextual factors. This requires a lot of information from the renovator, which is structured by four stories: a story about the history of the building, a story about the potential for sustainability, a story about the needs of the residents and a story about the limitations. The methodology aids in telling these stories, finding all the necessary information and making the right choices. The executed projects such as the EcoHuis are used as examples and are used to clarify successful steps in different situations.

LIVING GREEN ECOHUIS RETROFITTING PROGRAMME Domain: Building Retrofits Target: Individual Investment Behaviours		
Recommendations	**What the programme did**	**What the programme could do better**
1. Don't forget context: the will to change does not always result in the act of change	A main question to be answered with the monitoring and evaluation through the MoU was whether the methods actually engaged people in energy saving behaviour and sustainable renovation investments? The answer was: probably, but the methods were only analysed on their behavioural change potential, based on their theoretical background. There is some general data about activities regarding sustainable renovation for the EcoHuis, but there is no data on the actual investment and continuation of behaviour as a result of the Living Green methodology.	It would have been useful to see the effects of the activities by the EcoHuis in Antwerp on sustainable renovations and energy behaviour (both before and after the Living Green methodology was implemented). The evaluation focused on the relevance and likely success of the methods, based on two theories: Innovation-Decision Process (Rogers, 2003)[.] and Motivation-Opportunity-Abilities (MOA) (Ölander and Thøgersen, 1995)[..]. However, quantitative measures of actual implementations, plus feedback would enable understanding of whether the methods were sufficient to effect change or if more contextual barriers need to be tackled.
2. Practical data needed to confirm theory has become practice	The evaluation team concluded that the Living Green methodology addresses the first three phases in the innovation-decision process: knowledge, persuasion and decision. However, none of the methods used were addressing the implementation and confirmation phase. Rogers however stresses the importance of all phases due to the potential rejection even after the first three phases.	The evaluation team suggested that EcoHuis could support in the implementation phase by comparing offers from installation companies, assistance in detailed decisions (e.g. type of heat pump), or checking if an installation is installed correctly. (You could wonder whether these suggestions address indeed the implementation phase or rather the decision phase). For the confirmation phase, residents could be visited after installation of sustainable measures to support residents in their new situation
3. I'll do it if you will	In the theory of Rogers (as well as in the resilience theory) the importance of diffusion and (social) networks is underlined. Some method do focus on diffusion of energy saving behaviour and sustainable investments. Moreover, the EcoHuis itself as a physical centre in the city of Antwerp seems to contribute to the public support and further diffusion. But again, the concrete data is missing	Again, though theoretically sound, the programme would have benefitted from facilitating and monitoring the extent to which planned or desired renovations were carried out, which in turn would generate further evidence for or against this theory – and by communicating success potentially also extended both the diffusion and its wider impact.
4. Use the community to create new desired social norms	The theories state that peer-to-peer interaction and social norms influence behaviour. However, few of the methods focus on these motivators.	More focus should be on devising methods to include peer interaction and social norms. The evaluation team recommended the community based social marketing approach by McKenzie-Mohr (2011) and strategies in the MECHanisms toolkit.[.]
5. Finance plays a big part in creating the opportunity for change but it's not the whole story	MOA describes two important external factors that positively influence the chance of changing behaviour: social norm (covered in the previous point) and Opportunity. An opportunity can be a pre-condition or facilitating/motivating conditions. In the methods applied in general, little attention was paid to opportunity as a motivator. Financial constructions were the only type of measure employed.	Other Task 24 case-studies – e.g. Italian Time-of-Use scheme; Kirklees Warmzone – question the value of financial measures as motivator for change. However having the financial means is a key facilitator of the opportunity for change. Other 'Opportunity' facilitors include the necessary time to organize the renovation, availability of skills and/or a viable solution and allowance of the disruption caused by home improvements.

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[10] E. Rogers (2003). Diffusion of innovations. Fifth edition, The Free Press.

[11] Ölander, Thøgersen (1995). Understanding of consumer behaviour as a prerequisite for environmental protection. Journal of Consumer Policy, Springer.

[12] www.cbsm.org, www.*mechanisms.energychange.info*

Recommendations	What the programme did	What the programme could do better
6. Mixed-method approaches need monitoring sophisticated enough to weed out ineffective measures	A combination of 58 methods were used in the Living Green methodology. These were all build around a number of assumptions and premises about behaviour and change, however their impact was not evaluated separately. Considering the resources and mandate from Livinggreen Centres such as the EcoHuis are not unlimited, it is not possible to be able to implement all the suggestions.	In order to optimize financial efficiency of such a programme, funding should focus on methods that are effective. Quantitative analysis of the individual methods that successfully lead to actual behavior change would inform future programmes where their focus should lie. While the broad brush approach employed here may have succeeded in its educational and demonstration objectives, to be truly valuable, as the analysis showed, requires completing the change process through implementation.

Transport

Pilot: *Slimme Kilometerheffing (Smart Road-pricing)*

Smart Road pricing is a pilot aiming to test possibilities of smart kilometre charges in and around the city of Leuven. The pilot was set up by a consortium led by T!nc (Telematics Incubator) with support of the municipality of Leuven. The pilot started mid-2009 and by mid-2012 the final report was delivered.

The goals of the pilot were to:
- Decreasing the traffic on secondary roads through a shift from secondary roads to motorways.
- Decreasing congestion and peaks in traffic through a shift from peak to off-peak periods.
- Making sure participants would not pay more than their annual mobility taxes.

Secondary aims were also identified:
To reduce or internalise 'external costs' (costs to society). Such as costs due to time loss; environmental costs (climate change, air pollution); accidents, noise pollution and infrastructural costs.

SLIMME KILOMETERHEFFING TRIAL Domain: Transport Target: Individual Habitual Behaviours		
Recommendations	**What the programme assumes to do**	**What the programme could do better**
1. Don't just count the change, look at the real changes	The small pilot project aimed to test possibilities of smart kilometre charges in and around the city of Leuven, with the targeted changes of: -Decreasing the traffic on secondary roads through a shift from secondary roads to motorways. -Decreasing congestion and peaks in traffic through a shift from peak to off-peak periods. -Making sure participants would not pay more than their annual mobility taxes. Insufficient data was collected to test whether further behaviour changes in terms of using other lower impact transport or working from home increased the overall reduction.	The project had was only a pilot with a fairly narrow focus, leading it only to test whether the particular desired impact – shift from small roads to motorways, ToU shifts – occurred. Paying more attention to the wider context in which travel decisions are made and habits are developed, would provide a fuller picture of how change can best be achieved to the benefit of both the transport system and its users.

2. Rewards can work when other barriers to change are low	To change the mobility behaviour the following measures were designed: -Participants were rewarded for changing their behaviour from driving during peak periods to off-peak periods -Participants were rewarded for changing their behaviour from driving on secondary roads to motorways. The intervention resulted in 5% less drives during rush hours on secondary roads. More than half of the participants benefited financially from the intervention. However, or some of the participants the financial situation was comparable with the situation before the intervention, and for others participating was more expensive due to longer travel distance. 9 (of 34) participants that filled out the questionnaire said that they had insufficient freedom to adapt their behaviour due to several reasons (children to school, insufficient alternative routes).	Again, the very specific targeted change did not factor in the contexts to individual decision-making. Though the societal benefits of the desired change are clear, the full impact of change will not be palatable to all individuals. A more participatory approach, allowing individuals some role in proposing how they could change their behaviour in a way which still suits them might deliver better across the board results.
3. Gamification is unlikely to engage people performing daily chores	The pilot was a contest. The 'best adapted behaviour' was rewarded (for the first and second best participant) with gift cards. Almost all participants that filled out the questionnaire said that the effect of competition and the reward did not influence their behaviour.	Gamification works best for those with the freedom to join in the game – i.e. allow themselves to be led by it. A daily commute where participants are stressed, just trying to get to work on time, is not the ideal scenario for playful disruptive influences. In this case that this aspect was ignored by most is unsurprising. As the theoretical research showed: People need to be informed beforehand about the effectivity of an incentive system; the alternatives should be known, reasonable and easy to take; and the period between the behaviour change and the visible consequences should be short. Applying this in full would likely deliver better results.
4. What difference does it make?	Only money and kilometers were used as indicators. The 5% shift in driving behaviour might seem small at first, but it is unclear how for example this 5% will effect safety or air pollution. In addition, the societal value of a fairer mobility tax system (the driver pays) is not reflected in this 5%. The questionnaire points out that the competition element and the accompanying reward did not add value to the project in terms of motivation	More external factors were mentioned as necessary to be measured. Particularly in the case of assessing system level impact of something as non-linear as peak hour traffic impacts. Potentially a small reduction in volume could improve efficiency of all users resulting in a significant fuel and emissions reduction.
5. Time passes	The project measured that 65%-74% of the participants relapsed to old behaviour after the intervention.	The impact on long-term behaviour was limited due to the programme not implementing all aspects of the theory, or having a long-term strategy to cement change. Further measures are required, as laid out in the theory, to ensure behaviour change is continued – and further developed – i.e. ensuring financial benefits continue, further visible rewards are received and that users are continually informed of better options.
6. Self-assessment of behaviour not always reliable	The project employed a questionnaire to assess whether participants relapsed. Interestingly enough this was not perceived as such by some of the participants, since 11 (of 16) answered positive to the question if they changed their behaviour).	More understanding of the contextual influences which force participants to relapse, particularly while thinking they have not, e.g. through a long-term, looping feedback process, would help increase visible positive impact and hence the likelihood of long-term change.

Transport

Programme: The E-Bike Subsidy Programme

E-BIKE SUBSIDY PROGRAMME Domain: Transport Target: Individual Investment Behaviours		
What the programme did		**What the programme could do better**
1. Don't just count the change, look at the real changes	The relatively simple subsidy scheme encouraged people to buy electric bikes – up to 50% of a significant cost of 2-3000€ - in the hope that e-bikes enable journeys that would otherwise be made by car because they are too far or that the users do not feel fit enough to cycle (e.g. uphill). Though the programme recorded a great success in demand for the subsidy, it did not evaluate the behaviour change impacts	As with many subsidy programmes, getting through the budget is used as a clear sign of success, when a deeper investigation into who took the subsidy, why and what changes they made, would enable the mechanics of the approach to be better analysed for use in other programmes
2. Subsidies can work when other barriers to entry are low	In this case, the purchase is relatively simple, so cost is the main barrier, overcome with the subsidy. The behavioural barriers of remembering to charge the battery, dangers of busy roads and weather impacts on transport decisions were not evaluated. More significantly, neither were usage changes or user profiles recorded	In theory, the target markets are older people, who may otherwise have given up cycling and perhaps commuters who are put off by a challenging route to work. It would have been valuable to assess whether these were the dominant profiles taking up the subsidy or if not, to understand if and why targets were missed.
3. What difference does it make?	Behaviour change based on adoption of and adaption to new technology may simply result in the creation of new behaviours – in this case extra journeys – rather than substituting existing ones to deliver environmental savings. The subsidy programme did not assess how buyers used their e-bikes.	It is accepted that the monitoring required to obtain the desired usage and user data is a costly and administrative extra burden on a programme, which can be prohibitive. But if the aim (and the claim) is behaviour change, then it would be very useful to try to demonstrate this with data and if the data is not as expected, to then try to rectify it, perhaps with some ex-post nudging (see below). A potential solution would be to set-up a social network or online forum of buyers to encourage them to share stories. While this might not provide robust quantitative evidence of change it should certainly give a picture of the 'how' and 'why' of behaviour change and more importantly 'why not'.
4. Time passes	Behaviours can be changed but also be changed back – simply providing the means, as the subsidy did, even if it leads to initial 'trying something new' without infrastructural or social support, small factors – e.g. a flat battery – can be enough to re-introduce the old behaviours, meaning the change process has to happen all over again.	The network approach to monitoring may also improve continuity and sustainability of behaviour change, by providing a social context to make individual changes more visible, socially rewarding and more deeply entrenched.

Smart Meter/Feedback

Project: *Linear*
The less predictable and fluctuating pattern of renewable energy sources asks for a new way of balancing energy supply and energy demand. *Linear* (May 2009 – end of 2014/ beginning of 2015) aims at 1) developing and testing demand response technology and 2) implementing demand response technology in 240 households in Flanders. Smart appliances (dish washer, washing machine, and dryer) were installed in the participating households enabling users to shift demand. Displays showed feedback on energy savings, money gained and number of hours shifted.

Practices of lighting, cooking and anything related to multimedia appliances were not taken into account. Convenience and comfort were deemed important requirements for a successful intervention, and it was expected that including these appliances would be asking too much (behavioural change) from participants.

Two types of reward systems were used to induce energy shifting behaviour. A quarter (55) of the participating families are offered dynamic prices – time of use - to shift energy demand. 6 or 7 different pricing blocks were established, divided over the day. Higher tariffs reflected unfavourable use periods, lower tariffs reflected favourable system conditions, and the tariffs were e.g. dependent on the energy output of renewable sources. (But Linear looked at more conditions in different 'business cases', explained in more detail below.) The tariffs were changed daily, based on predictions about the system conditions.

Automated systems were installed at the remaining three quarters (185) of families. These families received price incentives for 'flexibility', which meant they got rewarded when they would allow the project team to switch the smart appliances on or off during preset time frames. Households received 1€ per 40 hours of flexibility. The system automatically activated the appliances during the most convenient time frames, bounded by the given flexibility. (See the part below on business cases for an explanation of what is meant with 'most convenient'.)

The Energy AWARE Clock Domain: Smart Meters/Feedback Target: Individual Habitual Behaviours		
Recommendations	**What the programme assumes to do**	**What the programme could do better**
1. Understand the limitation of 'homo economicus' and rational behaviour	The behavioural model used here seems a purely neoclassical economic theory or rational choice theory. Rational choice theory states that people make calculated decisions to maximise their utility. The means to gain utility and utility itself are often represented in terms of money. However, utility could be interpreted as happiness, tastes and preferences as well. Having a limited amount of means (money), people are expected to use these means as efficient as possible to gain the highest possible utility.	These assumptions might not always be accurate. Rational choice theory describes a model of the human being, the 'homo economicus', which overlooks or simplifies some features. Although this model makes it easier to estimate and calculate behaviour for larger groups of people, the conclusions are not always accurate when put into practice.
2. Quantitative data needed to confirm theory has become practice.	No difference is made between one-off actions and routine behaviour: the consumer is expected to act rationally and maximise utility in either case. Behaviour is assumed to last in the future as long as the price incentive is present and the utility of other products and services remains the same (otherwise utility might shift). However no quantitative measures were employed to test these assumptions.	There is significant evidence elsewhere in the Task 24 case-studies to suggest these assumptions are doubtful. At the very least, some ex-post analysis against quantitative targets would demonstrate the extent to which behaviour is actually changed, and whether the change is sustained.
3. Money not the only incentive for all	Both the automated reward system, as well as the price tariffs only encouraged demand shift through financial motivation (e.g. no social or environmental incentives). Feedback was not displayed in terms of other motivations (in hours shifted, energy saved, and money gained/saved). The 10 to 15% potential for demand shifting (15% for automated-systems- and 10% for price-tariff-households) might result in only limited financial gains.	Though the focus on price incentives as sole incentive allowed for an interesting analysis: with money as the only driver, it enough to change behaviour, and if so, how much? The reported limited financial gains may reduced the sustained impact of behavior change. Moreover, while the fact that segmentation was not used to find out and tailor incentives/intervention to different target groups, allowed testing of the widespread effectiveness of financial incentives, a segmented, tailored approach should be explored in future projects to potentially increase impact.

Recommendations	What the programme assumes to do	What the programme could do better
4. Targeting minimal behavior change is good for meeting targets, but may not be optimal.	Minimising the infringement on comfort and convenience was an important requirement of the project (which could be seen as maximizing utility). This was realised by asking for minimal behaviour change, e.g. by entering the desired flexibility in a system and then press start instead of immediately pressing start. This might be one of the reasons explaining why households with automated systems expressed to likely continue their energy shifting behaviour compared to households using price tariffs.	The clear benefit to the project's success of minimising disruption and required change accepted, it is worth exploring a participatory approach, employed on other projects such as the Swedish Energy Clock, to see if this offers greater potential for DSM and overall energy use reduction.
5. Positive trial results may not be reflected in a wider rollout if participants were volunteers.	The project did not need to be tailored to residents, only residents in favour of the project were chosen. It seems that there is (unintentionally) a strong focus on innovators. This positive attitude toward the project will have affected the outcomes of the project. It not only affects the choice of strategies for shifting energy demand (changing routine behaviour), but also of strategies for engagement.	Unfortunately, if only those households with a positive attitude towards the project are selected (through convenience sampling), the opinions of skeptics remain hidden and lessons relevant for mass roll-out are insufficiently targeted. This could be improved by randomly selecting participants and by first, allowing non-participation to be recorded in the results and second collecting feedback to understand and mitigate non-participation.
6. DSM Load shifting is valuable, but savings benefit both sides too.	No attention was paid to load reduction, only load shifting.	While load shifting might be an easier sell to energy users, future programmes should target load reduction where it could be feasible. This both maximizes user saving possibilities and increases overall network efficiency. Giving users the choice may also increase engagement by empowering them to decide, while also enabling inclusion of social and environmental incentives.
7. We are not all the same – tailor approaches to reach a wider audience.	The absence of quantitative goals, the focus on automated systems, the use of convenience sampling and focus on innovators, the mere use of financial incentives, the elaborated technology scenario's ('business cases'), the lack of different types of feedback all suggest a strong focus on technical feasibility and less on behavioural change and diffusion of DSM in households.	The assumptions of rational choice theory might have resulted in an oversimplification of human conduct, limiting the usefulness of the lessons learnt to the early movers. As already touched upon above, future programmes should aim to involve participants more to engage with a broader range of households and allow for differing motivations and contexts.

SMEs

Project: *Build4Good*

The Belgian project, here referenced as *Build4Good*, was a private initiative by the CEO of an important SME active in project management in the construction industry in Belgium. Although not specifically inspired by ideas from **Nudge**, it certainly applied some of the principles in attempting to convert the behaviour of employees and hence, its clients. In this Nudge-based intervention, the company relocated from an out-of-town industrial estate, ideal for access to motorways for travelling by car to sites around the country, to an inner-city site with limited parking.

The company rebranded itself into a dark green image, focusing much of its work on increasing the sustainability of its projects. It introduced flexible working, encouraging employees to travel only when necessary, and reducing the amount of floor space required in its office. Employees were further encouraged to use the train wherever possible to attend meetings and commute to the office. As a 'Nudge' style incentive, each employee was provided with a branded folding bike. The CEO used his influence over the rest of the staff to encourage even the less enthusiastic to at least try using the bike to work from a park-and-ride site on the city edge. The result of this nudging was the employees made the often difficult step to start cycling and soon appreciated the extra benefits of 'slow travel': fitness, open air and being more connected to the places through which you travel. Arriving at building sites on a bike also generated curiosity from the clients and partner firms.

'BUILD4GOOD' PROJECT **Domain: Small to Medium Enterprises** **Target: Individual Habitual Behaviours**		
Recommendations	**What the programme did**	**What the programme could do better**
1. It can't all come from the top or the bottom	The headline goal of the initiative was to reduce the carbon footprint of the company, in line with its green rebranding, including the activities of staff outside of the office – commuting, living and working within the city. The combination of top-down initiative requesting bottom-up support and follow-up action was successful here, with the minor caveat that the potential behavior changes may have been limited by fulfilling the boss' requests being enough, rather than taking it further on individual initiative.	This was not a programme as such, so its success reflects the particular culture of the company and people involved, and is not necessarily transferable. A more widespread initiative would need to understand the feasibility of similar impacts being achieved if a number of SMEs started similar initiatives. Plus, is it necessary to first become successful and generate a cash reserve before being able to invest in such an exercise?
2. It's all about the people	The relocation to the city centre coupled with flexible working actually reduced contact between employees and the opportunity to develop new collective behaviours. In this sense, the limit of change to those new approaches instructed by the boss' was risked further because other choices were mainly based on external influences.	It should be recognized that this social element to sustaining and enhancing change is critical. Continuously relying on the champion to lead new changes is risky, as they might run out of ideas, time or motivation, or just leave. So a culture of change needs to be created and maintained, allowing ideas to be exchanged between trusted intermediaries in a 'safe' setting but for changes to be socially supported and 'policed' without it becoming a management or discipline issue. Such organization changes might have contributed to a long term success of the project, certainly given the fact that behaviour changes need to be sustained for a period of several months before becoming embedded. Behaviour change programmes almost universally need to develop approaches that are open-ended, to enable changes to grow into norms. A strong social network (online or otherwise) within an SME is crucial for such an approach to be possible.
3. I want what you want, so let's do it	Though the company claimed to want to influence its clients, no strategic approach was devised to do this – understandable in a relatively conservative industry such as construction – though some have undoubtedly been influenced to follow (or be led).	Shared goals, including for reforms or industry-wide changes need to be identified (collaborative shared learning workshops are great vehicles for this). The Collective Impact Approach, which will be trialed in the Task 24 extension could provide the right framework to ensure this is managed well.
4. Don't be afraid to lose the nay-sayers	The project included consultation with employees on the relocation in order to achieve consensus, though a small number of employees left as they didn't feel they fitted the culture being created	Change can be scary and it is important to listen to people in the organisation or organisations who are against it, they may have good reasons. It is also important not to get disheartened by losing some of them as it may entrench social norms in the businesses that stay and the Diffusion of Innovation curve will mean the laggards will ultimately be engaged. It is in the early and late majority that most of the potential lies.
5. They lead - others follow	The company assessed impact on its own carbon footprint but not any impact on staff personal lives or client companies	While both external impacts are not the responsibility of the company, it would be very useful to understand the flow of influence on changing behavior in external contexts. This is a key element of achieving widespread behavior change through bottom-up initiatives.

Recommendations	What the programme did	What the programme could do better
6. Nudging is what it is: a nudge, not a life saver	In this case, most of the changes were infrastructural , with the nudging the final piece in the jigsaw to encourage employees to make the first steps in changing. For the effects to be truly long-lasting, external contexts need to be influenced and changed along a similar path, which is difficult for a single organization to achieve.	Nudges used as external stimuli to make it easier for SMEs or their employees to embed changes are a good idea but not too much importance should be put on their effectiveness on the long term. Strong interpersonal support from the top, staff champions and the implementer in an organisation, as well as continued mentoring and involvement with a trusted intermediary and other peer organisations will be more valuable to change norms and practices sustainably. Go-it-alone actions such as this can be highly valuable torch-bearers for change, but community, city and wider infrastructure needs to evaluated and appreciate impacts and facilitate other SME's to make the change, each time easier than the last, to aid the transformation of a change into a social norm.
7. Show who's a leader	In this case, the SME involved has won many prizes championing its green approach, helping it gain marketing benefits from its green investments.	Its important for wider programmes to recognize the sensitivities of singling out champions against the aim for widespread, general impact. Rewards should also include recognition for those facing higher barriers taking small steps in the right direction, not just those with the means to go further.

Possible Pilots and Research Questions for each Domain

All the research questions collected during workshops and from the Subtask I analysis of the case studies can be found in Appendix 7. In the last Task 24 workshop in Graz (October 2014) we discussed the main areas of focus the Task extension should drill into in each of the four domains. The national experts (and three ExCo members) came up with the following problems which are globally regarded as major behaviour change issues (see also NZ stakeholder feedback) that have not been successfully tackled as yet. We will propose possible pilots, based on our learnings collected so far, in each of these areas and will discuss this in more detail during workshops in our Task extension (Subtask 6).

Building Retrofits:
How to deal with the Split Incentives/Principal Agent issue in rental properties?

SMEs:
How to deal with the Split Incentives/Principal Agent issue in a chosen SME segment?

Smart Metering/Feedback:
How to link smart meters to better feedback, using ICT?

Transport:
How to get people out of their cars and into healthier and/or more environmentally friendly modes of transport?

Belgian Stakeholder Feedback
In addition the Belgian workshop stakeholders highlighted the following areas of research for our work in this Task:
- How can social media support Energy DSM?
- Are behavior changes quantifiable and permanent? (indicators and how to measure the proportion of savings related to behavior can efficiency be measured at the level of a city?
- How can human decisions (micro level) be used for global network regulation (macro level)?

- How can we arrive at quantifiable indicators to measure lasting behavioural change?
- Which DSM techniques can help in energy saving and shifting? (smart metering; new services and concepts (storage, V2G))
- Can technology be used to enable bottom up initiatives?
- What regulatory changes are required and effective?
  - Legal frameworks regarding behaviour measurement and privacy issue
- Connecting top-down (policy/market) initiatives and bottom-up(grassroot, community) initiatives. How to better enable the latter and anchor it into policy making and programme design?
- How to use the power of open innovation, action research, crowdsourcing and shared learning practices better?
- How do we define and describe DSM? How to factor in the different forms of load-shifting: energy fuel shifting, location (of activities) load-shifting, prosumption-based shifting and time-of-use shifting?
- Stress the importance of storytelling: why is it that our 'right' story on energy efficiency and the importance of understanding human behaviour is not being heard/understood by decision-makers? Why are the old and disproven stories on unlimited economic growth, technological silver bullets and Homo economicus still so powerful? What can we do to tell our story better?

THE DISSEMINATION PHASE

A huge part of an intervention's ongoing success lies in its dissemination - both of (tailored) feedback to its intended behaviour change targets (the end users) and a wider audience of Behaviour Changers who can benefit from the learnings. Storytelling as a methodology for both kinds of feedback is very, very powerful and will be discussed below. Social media and networking is also very powerful to foster relationships and shared learning but has its pitfalls.

The expert platform described below forms an important part of the dissemination phase of the task. It is:

- ✓ a good place to 'collect' experts and information on the Task
- ✓ a great broadcasting tool with all the news, reports and events, reaching many more people more directly than eg traditional academic publishing
- ✓ a good way of measuring Task impact (via Google Analytics)

However, it is not:

- ☒ a silver bullet to make people talk or engage online
- ☒ a way of making busy experts use social media or social networking
- ☒ a way of easily managing files, which is why we have created the Wiki.

Subtask V - The Expert Platform

The expert platform has been an invaluable tool to invite interested experts to the Task and provide them with a safe platform to share and discuss learnings. However, it has not been as successful as expected in terms of creating engagement, face-to-face workshops, conferences and meetings have been shown to be imperative to foster true engagement and trust. The social media aspects of the platform are mainly used by one of the Operating Agents and it provides a very good platform for broadcasting to its members. It is also a good way of collecting members' bio, interests and details and to ensure their privacy (eg when filming interviews with them or presentations at workshops). However, the platform will be assessed and potentially slightly changed when going forward with the extension. It is particularly important to enable easier file sharing, although the new IEA DSM website, plus the Task 24 Wiki may be sufficient to do so.

We currently have 17 members from Belgium on the expert platform (5 Government officials, 6 researchers, 3 industry members, 3 NGO representatives), thus showing a good spread among sectors.

Storytelling Methodology

One of the main outcomes of the task is the development of a form of storytelling methodology for task findings dissemination. Due to its simple structure and focus on the most important aspects of a theory or intervention, it is:

- ✓ a good wayto break down silos between disciplines or sectors and the every-present tendency towards jargon
- ✓ a valid social science tool, using narratives
- ✓ something inately human, we all understand and tell stories well
- ✓ fun, engaging, social and most importantly: memorable
- ✓ a way of removing 'bias' due to complexity?

However, it is not:

- ☒ a reason to bypass 'proper' analysis.

Storytelling is a very powerful social science methodology to ensure recall, engagement and interest. The initital impetus to use storytelling in Task 24 was created in our largest, Oxford workshop. The story of Task 24 is told here (at the March 2014 NERI Conference as Pecha Kucha) and here (at the last workshop in Graz, October 2014). There is also a presentation on the different ways we use storytelling as our main dissemination methodology here. We are telling:

- The stories of theTask and our workshops (ST1 & 5)
- Our participating countries' stories to get overview of country-specific contexts for ST4
- Sector stories to be able to workshop specific issues of specific sectors (ST 1 & 2)
- Different types of stories based on Janda and Moezzi's (2013) definition: hero, learning, love, horror stories (ST 1)
- Stories based on how the models of understanding behaviour would be perceived by the end users (ST 1)
- Personal energy stories of our experts (ST 5)
- Telling DSM stories in different genres (ST 5)
- Telling the 'human' story of the Energy System (Extension)

We will continue to flesh out and develop our storytelling methodology in the Task 24 extension. It will be important to start measuring and testing the impact of storytelling, which is rather difficult but will be an important part of our evaluation tool.

So… what's the story of Task 24 so far?

- ✓ There is no silver bullet, but the potential for behavioural interventions remains huge
- ✓ Homo economicus mostly doesn't exist (in energy)
- ✓ This is largely because energy use is invisible, not a high priority and largely habitual
- ✓ Habits are the most difficult thing to break
- ✓ This means we have to get even smarter and embracy the complexity we are facing
- ✓ We are at a crossroads and shouldn't turn back to the old ways
- ✓ We need to look at whole-system, societal change, not just the individual
- ✓ This can't be done just by one sector, collaboration between Behaviour Changers is key
- ✓ Social media and social networks are (theoretically) quite good for it
- ✓ But nothing beats face-to-face interactions and real, strong professional relationships built on trust
- ✓ It is hard to find the right people in the different sectors to build these relationships with
- ✓ Every one of them has an important piece of the puzzle, yet we need all of them to fit it together
- ✓ We need a shared learning and collaboration framework that works, everywhere
- ✓ That also means we need a shared language we all understand, based on narratives.

➔ The most important finding of Task 24? IT'S ALL ABOUT THE PEOPLE!

Appendix 1

Task 24 Expert Workshops, webinars and stakeholder meetings

Date	Place	# of Experts	# of Countries	Type of meeting	Government	Industry	Academic
10/4/12	Utrecht, NL	23	4	XM	4	9	10
10/4/12	Graz, AUT	5	2	SHM	4	1	1
11/4/12	online	13	6	XM	2	2	9
3/5/12	online	6	5	XM	1	1	4
30/8/12	Utrecht, NL	20	1	SHM	2	12	6
7/9/12	Brussels, BE	24	8	XM	3	8	13
9-10/10/12	Oxford, UK	65	9	XM	3	13	39
26/10/12	online	6	5	XM		2	4
12/11/12	online	6	5	XM		2	4
17/12/12	Wellington, NZ	10	1	SHM	8	1	1
20/12/12	Utrecht, NL	22	1	SHM	1	14	7
7/2/13	online	6	5	XM		2	4
15/2/13	Wellington, NZ	50	4	XM	15	15	20
22/5/13	Graz, AUT	10	2	SHM	9	1	
27-29/5	Trondheim, NO	20	8	XM	1	3	17
15/6/13	Milan, IT	15	2	SHM	14	1	
17/6/13	Dubai, UAE	30+	3	SHM	5	15	other (kids)
21/8/13	Wellington, NZ	6	1	SHM	4	1	1
10/10/13	Stockholm, SE	12	2	SHM	4	1	7
15/10/13	Luzern, CH	30	9	XM	3	12	15
17/10/13	Brisbane, AUS	12	2	SHM	10	2	
17/12/13	Wellington, NZ	40	1	SHM	30	4	6
17/03/14	Wellington, NZ	55		XM	25	15	15
05/09/14	Oxford, UK	18		XM	2	3	13
Feb & July 2014	Wellington, NZ	5		SHM	3	2	
12/5/14	Brisbane, AUS	12		SHM	10	2	
3/10/14	Milan, Italy	10		SHM	7	2	1
13-14/14	Graz, Austria	40		XM/SHM	20	5	15
24/10/14	London, UK	12		XM	5	2	5

XM = Experts meeting
SHM = Stakeholder meeting
In green = national expert workshops and webinars

Seminars and conferences Task 24 was presented at

Date	Place	Total # Experts	# of countries	Type of meeting
8/5/12	Linköping, SE	20	2	Presentation to University
29-31/8/12	Basel, CH	~300	15+	Task Presentation at 3rd Intl Sustainability Conference
19/9/12	Helsinki, FI	20	3	Task Presentation to Finnish Experts
20-21/9/12	Helsinki, FI	~250	15+	Task Presentation and session chairing at BEhavE conference
24-25/10/12	Berlin, GER	100s	10+	Attendance at EEIP 'Energy Recovery in Industry: Opportunity for energy efficiency' conference
13-14/2/13	Wellington, NZ	100+	6	National Energy Research Institute conference 'Energy at the Crossroads'
13/3/13	Paris, FR	30+	28	Presentation to IEA Secretariat Behaviour Workshop 'Choices, Decisions and Lifestyles Roundtable'
24/4/13	Utrecht, NL	50+	12	DSM Workshop 'The NL Polder Model', 2 presentations
7/6/13	Hyéres, FR	450+	45	eceee summer study, 1 presentation, 3 informal sessions
8/7/13	Nisyros, Greece	100+	10+	Task 24 presentation by Swiss expert at ELCAS
7/10/13	Copenhagen, DE	100+	15+	IEEE ISGT conference - also leading Consumer Behaviour panel
16/10/13	Luzern, CH	30+	10+	IEA DSM Workshop
8/10/13	Stockholm, SE	8	2	Presentation at Technical Institute Stockholm
11/10/13	Brisbane, AUS	25	2	Skype lecture to Qld University energy efficiency course
20/11/13	Sacramento, US	500+	15+	BECC Conference presentation
20/11/13	Sacramento, US	25+	6	Transport panel at BECC conference
2/12/13	Flanders, BE			Smart Grid conference
12/12/13	Bonn, DE			Expert Roundtable on Energy Efficiency & Behaviour in Developing Countries, German Development Institute
18/3/14	Wellington, NZ	>100	12	NERI conference
12/5/14	Brisbane, AUS	15	2	Lecture at International Energy Center
9/8/14	Washington DC, USA	<100/10000	>25	APA conference
4/9/14	Oxford, UK	<300	>20	BEHAVE conference
11/9/14	Berlin, GER	180	>15	IEPPEC conference
10/10/14	Brisbane, AUS	>10	2	IEC Skype Lecture
23/10/14	Sheffield, UK	>40	2	Seminar at Sheffield Hallam Uni
21-22/1/15	Milan, IT			ESCO lecture
14/1/15	DSM University (online)			Task 24 webinar

Appendix 2

Task 24 Publications, films and reports

- IEA DSM Initial Positioning Paper on Behaviour Change*
- IEA DSM Task 24 Final Workplan*
- IEA DSM Spotlight Issues (6 stories so far)*
- IEA DSM Task Flyer 24 (updated)*
- IEA DSM website Task 24*
- Positioning paper and minutes from Brussels workshop*
- Positioning and definitions paper and UKERC report from Oxford 2012 workshop*
- 25 minute professional film summarising Oxford workshop
- Template for Models of Understanding Behaviour via Case studies in 4 domains
- IEA DSM Task 24 Pecha Kucha presentation (powerpoint/film)^
- 6 participating countries' Pecha Kucha presentations (powerpoint/film)^
- Interviews of experts' own energy stories (film, over 30 so far)^
- NZ World Café report-back (film/presentations/documents)^
- ECEEE summer study (2013) paper on Task 24 by Rotmann and Mourik*
- ELCAS (2013) paper by Carabias-Hütter, Lobsiger-Kagi, Mourik and Rotmann (2013)*
- BECC (2013) presentations on Task 24 and transport behaviour^
- Overview of definitions and how they were derived (powerpoint)*
- Overview of models of understanding behaviour (powerpoint/film)^
- NL, Swiss and NZ stakeholder analyses (Excel)^
- Implemention bloopers (powerpoint/film)^
- 10 presentations on various aspects of behaviour change models (powerpoint/film)^
- Interview with www.energynet.de (podcast)
- Analysis of Subtask I (160pp report, wiki)*
- The Little Monster storybook (booklet)*
- Green Growth Article (2013)*
- Presentation to Energy Savers Dubai, UAE June 2013
- Presentation and 3 informal workshops at eceee June 2013
- Task 24 presentations at RSE (Milan, Italy); Leeds University (UK); Linköping University (Sweden); Stockholm Technical Institute (Sweden); Grazer Energy Agency (Austria); Energy Efficiency and Conservation Authority and Ministry of Business, Employment and Innovation (both New Zealand); UCLI (USA); International Energy Center (Australia); Queensland Government (Australia); Sheffield Hallam University (UK)^
- Conference and workshop presentations at Utrecht DSM workshop (NL); eceee (France); ELCAS (Greece); IEEE ISGT (Denmark); Luzern DSM Workshop (CH); BECC conference (US); BEHAVE conferences (Finland and UK); Espoo DSM Workshop (Finland)^
- Energy Expert Stories short film
- Filmed presentations from Storytelling workshop in Wellington (youtube)
- ESCo Facilitators report and 5 page summary for Task 16*
- Articles for Energy Efficiency in Industrial Processes Magazine (http://www.ee-ip.org/)
- Evaluation Paper for IEPPEC*
- Six ST2 country case study reports (NL, NZ, SE, NO, AT, CH)*

* indicates reports that are on the IEA DSM Task 24 website
^ indicates presentations and films etc found on the invite online expert platform

Online sharing and administration of Task 24

- Widely disseminated via @IEADSM on twitter (also @DrSeaRotmann and @RuthMourik), IEADSM linkedIn and facebook groups; ECEEE and EEIP columns and various energy and behaviour linkedIn groups

- Weekly publication of <u>Behaviour Change & Energy News</u> by Dr Sea Rotmann
- Expert platform <u>www.ieadsmtask24.ning.com</u>
- Task 24 dropbox (<u>www.dropbox.com</u>) to share templates and collected models etc
- Task 24 wikipedia (<u>www.ieadsmtask24wiki.info</u>)
- Task 24 youtube channel (<u>http://www.youtube.com/user/DrSeaMonsta/videos?flow=grid&view=0</u>)
- Task 24 slideshare (<u>http://www.slideshare.net/drsea</u>)

Appendix 3

Belgian DSM interventions (from 2014 IEA DSM Annual Report)

DSM Developments and Priorities in Belgium

The need to integrate a growing share of renewables, combined with a stable demand and an external dependence for energy supply that has become structural, with an ageing park of production and a lack of investment in new capacities, are the driving forces of a necessary market transformation. In this context, promoting and developing DSM (and demand flexibility) has become an absolute necessity.

Transmission/Distribution network

The Belgian transmission network, confronted with a comparable situation (increase of needs, driven by the development of renewable production, and decrease of classic flexible resources), efficient stream balancing can be achieved through 3 streams of action:

- incentives and tools for market parties to self-balance until as close as possible to real-time (e.g. specific supply and BRP contracts, imbalance price) cross-border synergies (e.g. by netting imbalances with other countries or by pooling the least used volumes), and
- diversification of resources (e.g. thanks to new contracting parties and new balanc- ing services, including participation of demand). In this regards, new products have been developed. For example:
- interruptibility contracts have been adapted in order to allow aggregation
- primary reserves have been adapted to allow a combination of symmetric and asym- metric products and allow access to the market to (single or aggregated) grid users ;
- flexibility resources located on the distribution network can now participate to the balancing market (« R3 Dynamic Profile »);
- a strategic demand reserve has been introduced (starting 1st November 2014) serving a different purpose (adequacy) but targeting new flexibility.

But the real challenge is at the distribution level, where the DR potential is very high, and demand flexibility can be considered as an opportunity to limit grid investments. And it goes hand-in-hand with the growth of renewables. But the DSO should there- fore have the right to activate flexibility of grid users directly when network security is at stake. Projects and discussions are ongoing with all stakeholders in order to allow such flexibility and unleash the DSM potential at the distribution level (e.g. through sub-metering, specific contracts, ...)

Smart metering and smart grids

Regarding smart metering devices, Belgium is now fully busy with regional test-phase programmes and won't proceed with a full roll-out any time soon. For example, a large-scale pilot project is on-going in the Flemish Region, with the deployment of 50.000 smart meters. It consists of a logistical and technical test for smart meters but also for DSO's internal procedures, market procedures and com- munication protocols. The Flemish Region is also working on a « smart conversion » of networks, aimed at a better coordination between distribution network development and decentralised production units development. This project has multiple aspects: definition of indica-tors, study, action plan set up in close coordination with the different stakeholders.

Appendix 4

Examples of different models and interventions

'Models of behaviour help us to understand specific behaviours, by identifying the underlying factors, which influence them. By contrast, theories of change show how behaviours change over time, and can be changed. While behavioural theory is diagnostic, designed to explain the determinant factors underlying behaviour, change theory is more pragmatic, developed in order to support interventions for changing current behaviours or encouraging the adoption of new behaviours. While the two bodies of theory have distinct purposes, they are highly complementary; understanding both is essential in order to develop effective interventions.'[13]

In the Subtask I analysis we added a short narrative demonstrating what approaches based on various theories and models actually tell the end-user. The storyline from an end-user's perspective is based on the following questions that an end-user would ask when confronted with an intervention:
o   How am I motivated or approached or seduced to respond or change my behaviour?
o   Why should I do this?
o   What do I need to do and what will others do?
o   What will it take or what will it 'cost' me?
o   Will I get help?
o   What behaviour needs to change and how much will I need to change?
o   Will it be difficult?
o   What will I gain? What is in it for me?
o   Will I get feedback that I understand/ trust and that tells me what the result of my actions was?

Influence of economic theories on building retrofit intervention design

The programmes based (explicitly and implicitly) on economic theories usually translate into approaches that:
- focus mainly or even solely on individuals
- focus (indirectly but mainly) on generating biggest benefits for the supply side when based on subsidies and technological innovations
- regard individuals as instrumentally/economically rational creatures ('Homo economicus') that aim at maximising financial benefits and act largely in a self-interested manner
- regard information deficits as an important cause of 'non-rational' behaviours (and consequently view information provision, along with financial incentives, as imperative to enable economically rational choices by individuals)
- focus often on short and one-off financial incentives
- focus on extrinsic motivations mainly
- do not tailor their approach to the individual characteristics, except for (sometimes) some financial or technological tailoring
- lack flexibility and room for engagement, co-creation and participation
- monitor mainly quantitative aspects and work with calculated or modeled savings
- Behavioural economics-based approaches also include insights from social psychology, and for instance focus on the power of nudging people into different behaviours through their infrastructural, institutional or design environment.

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[13] Darnton, Andrew (2008). GSR Behaviour Change Knowledge Review. Reference Report: An overview of behavioural models and their uses. 83pp.

A Story on an economic theory-based approach in retrofitting

Money makes the world go round

You need to change your home's energy use and we will help you by paying (part of) its retrofitting

By the way, you need to pay up first and it might take a while before we pay you back

The info we need from you will teach you all you need to know

You only need to make a one-off decision to invest

We have the technology you need, contractors or installers (you need to find/choose) will put it in and that's it!

If you do not understand the technology, just don't touch the buttons...

You will save money for a nice weekend to the Bahamas

You only need to give us a bill from your installer, we probably won't check how much energy you actually saved

What counts for us is how many m2 are insulated, how many homes are retrofitted or how much money is spent. Oh yes, and how many kWh are saved of course!

We will do the number crunching, don't worry, we do not need to know what you actually saved, we will use models to calculate all energy savings

But if you want to know how much energy you saved, buy a metering device.

A Story on an behavioural economics (Nudge) approach in retrofitting

Money **still** makes the world go round

By the way, you **still** need to pay up first and it might take a while before we pay you back

The info we need from you will teach you all you need to know

You have many choices **but we will design choice architecture to ensure you make the right one** to retrofit your home

You only need, not only for yourself but for the sake of everyone, to make a one-off decision to invest

And to do so, we have the money and technology you need and **we will design rules, regulations, institutions, or infrastructure that will nudge you in the right direction**

You will save money, **or the environment or whatever matters to you**

You only need to give us a bill from your installer, we won't check how much actual energy was saved

What counts for us is how many m2 are insulated, how many homes are retrofitted or how much money is spent. Oh yes, and how many kWh are saved of course!

We will do the number crunching, don't worry, we do not need to know what you actually saved, we will use models to calculate all energy savings

But if you want to know how much energy, **CO2, trees or polar bears** you saved, buy a metering device.

Even though we have made some strong criticism of the most-commonly used economic approach here, they obviously have some positives as well:
- They do well within what they intend to do and fit well within the current economic and political system and way of thinking
- The programmes are relatively easy to evaluate in quantitative terms and often show good results
- The retrofitting market can grow
- Subsidies are often used up to the max
- Many homes do get insulated
- Behavioural economics does manage to nudge a certain percentage
- Free riders upgrade their plans and retrofit more comprehensively
- Sometimes even a new norm seems to be emerging.

Influence of other theories (psychology and sociology) on building retrofits design

They:
- focus on collaboration and institutional capacity building
- focus on building trust in market parties and information sources
- target end user needs and multiple benefits
- use multiple definitions of success
- perform pre-scoping
- allow for engagement and participation
- allow for flexibility and iteration of programmes
- focus on institutional change
- focus on lifestyles
- use the power of social norms

A Story on a more system-based approach in retrofitting

Together we will make the world go round

You embody what we need to know and change: do, feel, learn

We will help you understand and use the technology, and train those that install and sell it to you

We will create a supportive material, institutional and social environment

Your needs are important so we need to do this together, as if this were your kitchen or bathroom

Your life will change

It's all about us now, and our grandchildren and their future

Quality matters and we will keep learning and sharing

If we need to be flexible we will

This is only the start of a long way and your home is the first step

We will monitor, calculate and report on energy, money, health, welfare, comfort, wellbeing

And learnings based on qualitative and quantitative inputs will be shared (with you)

We will help you figure out what your impact is to be able to make sure you get where we collectively want to!

What are the downsides to this more whole-system approach?

This approach' storyline sounds more appealing to most and its systematic approach makes inherent sense. Also, the participants of such programmes often report more satisfaction with being engaged in this way.

However, as there is no silver bullet, if we want to tell a learning story:
- These types of interventions are very complex with many partners who have different mandates, needs and restrictions
- They cannot be driven by policy alone, need all levels collaborating
- Not everyone wants to change everything or their lifestyle
- Not everyone wants to engage but it is important to ensure that the naysayers are not becoming the over- riding voice
- The flexibility of changing goals, aims and interrelatedness of issues etc makes it difficult to evaluate

Influence of psychological theories and models on the design of transport interventions

Many of the psychological theories underpinning (explicitly or implicitly) transport interventions can be described to result in the below listed design characteristics of interventions. We have made one list for all psychological theory-underpinned interventions because the theories more or less contain these elements with differences in emphasis.
- focus on needs and the meaning attribution of the car (use)
- prescoping = essential
- focus on concrete actions, capacity building, not sustainability guidelines
- targeting and visualising the information deficit
- leveraging moments of change
- Nudging: creating supportive institutional and infrastructural environments
- focus on lifestyles
- use social norms and commitment

A Story on value Action Gap informed transport interventions

You can make the wheels of your car go round more efficiently

You are good driver and should be proud, but you can become the best!

You only need the right attitude and the motivation to act, we know you will want to act as soon as you see what you can do

We will pull down the barriers you experience, may they be social, individual or institutional

We know you also experience constraints such as lack of time, money, information, encouragement, facilities or whatever

We will help you take responsibility and do away with your laziness or lack of interest, or lack of trust and the feeling that you cannot be efficient at changing your behaviour

So we will make sure a peer you respect and trust will show you how to drive more efficiently

Don't worry, only your driving will change, you and your car will still be cool

It's all about you and your car and your driving and of course your money

We will monitor your driving, we got really cool gadgets to do that

You will see how easy you can save money, fuel and become an even better driver!

A Story on Theory of Planned Behaviour informed transport interventions

You can make the wheels of your car go round more efficiently

You can become the proud owner of a fuel efficient or even electric vehicle, you only need to intend to do it, want to join the others already ahead and feel that you can do it!

We know you will act as soon as we remove whatever makes you feel you cannot do the right thing

And of course what makes you feel you cannot do is due to money, lack of information or lack of availability of the fuel or car, so we will tackle that for you!

We know you also experience constraints such as lack of time,, encouragement, facilities or whatever

As soon as we give you and your peers more information you will of course all want to go get a green car! Right?

Don't worry, only your car will change, nothing else needs to change

It's all about you and your car and of course your money and what you know

We will only monitor the sales figures, we do not need to know if your driving is ok, or if you use the car right or even if you need a car at all....

You will see you can save money, fuel and nothing else changes!

A Story on Murray & Sachs descriptive theory informed transport interventions

We know your car makes your world go round

And it still can, but slightly differently, and guess what, you will be even more in control than before!

You just need to rethink if the way you drive really is the best way to treat your car...

We know you will act as soon as we train you and show you how to take even better care of your beloved car

Do not worry about those other drivers, they form the 99.9% that are really bad at driving, do not compare yourself to them..

You know, there are really cool ways to find out how good this new driving is for your car, its engine and your wallet too!

 Don't worry, only your driving will change, the car stays the same, you might even pimp it with the savings you yield!

It's all about you and your car and of course your money

The environment and road safety? Oh well, you will contribute to that as well, sorry about that...

You can do all the monitoring, and even compete with yourself or pals on the road. Do not worry we will not touch your car, we know what it means to you!

If we want to know what your impact is we will use boring stats such as traffic accidents (not saying you caused them before) or emission reductions (that is good for the kids with asthma)

A Story on Norm Activation Theory informed transport interventions

We know you care about your wheels, but you also care about the planet/other drivers/your boss/your kids...

You like to help, even if there isn't any money in it for you

You like to feel that you are doing the right thing, and some of that you may have learned from others in society

You may even feel guilty if you don't do the right thing

We can activate your altruistic nature by making you aware of the consequences of your own actions for others

But you will weigh up the personal costs of acting, which may stop you from taking responsibility

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A Story on Cialdini's Social Psychology informed transport interventions

We know you care about your wheels, but you also care about the planet/other drivers/your boss/your kids...

You like to help, even if there isn't any money in it for you

You like to feel that you are doing the right thing, and some of that you may have learned from others in society. Some of that is what you feel ought to be done.

If other drivers around you are speeding, you may do the same. If you see a police car up ahead, he will probably reduce your speed.

If we tell you how much the 'average' driver consumes in fuel, it should make you want to change. However, if you use a lot less fuel you may be inclined to increase your use!

Norms can mediate between your own identity and that of a group. But your car as a status symbol may over-rule social motives and instead make you feel more powerful and better than others

Influence of economic theories on smart metering interventions design

Several of the analysed interventions were informed by economic theories such as neoclassical economics and or behavioural economics. The design characteristics of such programmes were already mostly discussed under the theme of retrofitting. Specific smart meter issues were:
- Time is money
- Strong technology push focus
- distributional issues

Influence of psychological theories on smart metering interventions design

The design characteristics of programmes based on psychological theories such as value action gap theory were already discussed under the theme of transport. Smart metering specific design characteristics of interventions based on psychological theories are as follows:
- visualising behaviour and information deficits
- targetting the behaviour in context from smart metering to meaning attribution of living in one's home
- social norms are key
- segment, tailor, motivate, act!

Influence of design theories on smart metering interventions design

Design with Intent (DwI) is a theory by Dan Lockton which states that through the design of products or services, behaviour is designed as well. Lockton created a toolkit for designers to adapt the design in order to influence and steer behaviour. It is a composition of various findings from several (psychological) disciplines. The combination resulted in 101 suggestions in the form of questions ('did you take ... into account?') to steer behaviour. Suggestions vary from strategic positioning of the design to decoying alternatives. According to Design with Intent, technology and architecture can contain scripts; it has the ability to steer users towards a certain behaviour. And the use of norms and values to influence behaviour is proposed, for example motivators as 'guilt', 'expert's choice' and 'social proof' can be used to change behaviour. The (implicit or explicit) use of design theories result in several design characteristics for smart metering interventions:

- electricity meters and home displays need to visualise energy and thus make energy use more understandable to the common person
- Feedback should be delivered in the household's central locations, to create an awareness of electricity consuming household activities
- keep engaging your end users, feedback often gets boring quickly

---

A Story on Design Theories informed smart metering interventions

We will design a product or technology which will also design your behaviour

Don't worry, in most cases this doesn't mean we will blatantly manipulate you in order to get data or other valuable information for utilities or to push a technology on you that's pretty useless to you!

Trust us, we know what is best for you and the economy. Oh, and the planet of course!

So, we may need to stop thinking like engineers cause then we only design for other engineers - you may not be as interested in graphs or kWh as we are

We know you like design that is clean, easy to understand, engaging and fun

The more fun it is, the more you will engage with it and the more energy you will save

Energy doesn't need to be boring or invisible anymore, a key goal is to show you when you are using energy and how (much)

Feedback needs to be in a prominent position, so the design of the feedback system will impact on where it is located in the house - we need to design something you want to have hanging on your best wall

And we need to make sure you will want to keep checking it automatically and alter your behaviour, even after its initial fun factor has worn off

If we could only design something as clever and engaging as Apple products - everyone would love saving energy then, right?

Influence of collaborative learning theories on smart metering interventions design

Projects using elements of collaborative learning theories have the following distinct characteristics:
-        piloting and building on previous experiences
-        participation matters

> **A Story on collaborative learning approaches in smart metering interventions**
>
> This will only work if you actively participate and engage with us on the project
>
> We want to make sure that we build on your learnings, so we're trying to keep you open-minded so you can see the learnings and past mistakes and don't repeat them
>
> It is important that you trust us and the other people you are learning with so you are happy to share the good and maybe not-so-good stories
>
> The 'horror stories' are often the ones we can all learn the most from but no one likes to look like a fool... especially not public servants!
>
> Trust us - we're not trying to patronise you, we are really interested in hearing what you say, think, feel
>
> We can make you change your habits easier in a group setting - by freezing and unfreezing them
>
> Learning from your peers can be both good and bad, competition with your neighbours can be healthy... or really annoying!
>
> We don't need all the fancy technology to create learning opportunities - it is much more important that we involve your whole household, your kids and your neighbours
>
> You'll be a significantly tougher nut for us to crack if you are not already motivated to save energy or the environment. But we'd be smart to make sure we at least learn from your misgivings or issues with our project
>
> We understand that you have too much other important stuff to deal with than to have time to learn about energy efficiency, which is why it's up to us to design it so it's fun for the whole family

The influence of Nudge on SME interventions

SME-specific design characteristics of interventions based on behavioural economics, nudge theories and approaches:
- from nudging to nudgers: get high level involvement
- losing some, winning some
- Intervening in the specific decision-making context
- Energy or the environment might not be the magic words to nudge people...
- Nudging needs continuity
- Nudging is what it is: it is a nudge, not a life changer

Influence of using social norms approach on SME interventions

SME-specific design characteristics of interventions based on social norms theories and approaches:
- Institutionalising social norms
- Even social norms need to take account of specific implementation context
- Distributional issues and social norms
- Competition and social comparison creates committed communities, at the start

Influence of the Energy Cultures approach on SME interventions

SME specific design characteristics of interventions based on the energy cultures approach:
- Energy cultures differ from company to company

> ## A Story on Energy Cultures in SMEs
>
> We know that there are different Energy Cultures in each SME and that someone coming from the outside, telling you what to do according to some generalist scheme, is not going to go down well
>
> You may like the way you do things and think you are doing them in a rather capable manner already
>
> Or you may be stuck in a way of doing things because that's how all other SMEs in your sector are doing it
>
> So, it is important that you help us understand how your business works by listening to you and your staff
>
> We can then use a framework to explain the different elements that need to work together
>
> There are external drivers including commercial pressures, technology networks and supply firm interventions which you can't do anything about
>
> But there are also internal drivers, how you use energy ("practices"), your physical technologies and infrastructure ("material culture"), and mental models of what is normal or appropriate ("norms"), which tend to become self-reinforcing
>
> The best way to break through these locked-in Energy Cultures is to bring in trusted outside expertise and to find a CEO who is willing to take a risk and be an innovator
>
> Then we also need someone capable who can introduce the new technology or process into the business
>
> There may need to be some money in it for you in order to nudge you to do it
>
> Or there may be some competitive element, that you simply want to be the first or the best

Influence of using Collaborative learning approaches on SME interventions

SME-specific design characteristics of interventions based on a collaborative learning approach:

- Building collective capability
- Getting the right intermediary in place to lead the group learning
- Shared learning needs time
- Shared learning requires connected goals
- Anchoring and owning the learnings
- Shared learning is only really successful once sharing takes place again

Table 1. Example of interventions (both regulatory and non-regulatory) available to policymakers when trying to change light bulb purchasing behaviours[14].

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[14] From the UK's Parliamentary Office of Science & Technology (2012). Energy Use Behaviour. Number 417.

Box 2. Ladder of Interventions [1,6]

		Interventions	Illustrative examples to encourage energy saving light bulbs
Regulation		Eliminate choice	Prevent the use of conventional, inefficient light bulbs
		Restrict choice	Stop selling conventional light bulbs (current policy[7])
Fiscal measures		Guide through financial disincentives	Increase tax on conventional light bulbs
		Guide choice through financial incentives	Reduce tax or subsidise energy saving light bulbs
Non-regulatory and non-fiscal measures		Guide choice through non-financial incentives or coerce through non-financial disincentives	Offer a reward, e.g. entry into a prize draw, for buying energy saving light bulbs
		Persuade individuals using argument and coercion	Persuade people that improving energy efficiency is important and that energy saving light bulbs help save energy whilst reducing bills
	Nudges	Guide choices through changing the default policy	Supply energy saving light bulbs in new light fittings and lamps
		Enable choice by designing or controlling the physical or social environment	Make energy saving light bulbs the most prominent type at the point of sale
		Use social norms and salience, provide information about what others are doing	Use adverts to show how many people are buying energy saving light bulbs
		Provide information to educate and increase knowledge and understanding	Explain how energy saving light bulbs work and how they save energy
		Do nothing or monitor the current situation	Track sales in different types of light bulb

Appendix 5

Belgian Stakeholder Feedback

The stakeholder feedback received from Belgian stakeholders was discussed on pages 22-23.

Appendix 6

Detailed recommendations for each domain (from the 'Monster')

Building Retrofit Recommendations

Key DSM retrofitting interventions lessons and questions for further research. The lessons below are tailored to policymakers, intermediaries or other initiators of DSM retrofitting interventions.

1. Focusing retrofitting interventions on the level of individuals and individual households ignores the need of individuals to be part of a social group or society. Addressing the collective level of e.g. home owner associations can upscale the impact and create more lasting changes. Rather than thinking in terms of technology (which is a means) think about and inquire into end-user needs and their way of life so that these form the point of departure and make use of peer to peer education or the neighbour effect. It's not only about the houses, but first and foremost about the people who live there. Involve, engage and target multiple members of a social group, at the collective level, not only at the level of the individual. FOCUS ON THE SOCIAL SIDE.

2. Subsidies and incentives focus mainly on investment behaviour and alter the home but do not address the use of the building and its installations or appliances. Focus on both investment and habitual behaviour to avoid bad and unnecessary rebound effects. IT'S NOT JUST WHAT WE BUY, IT'S WHAT WE DO.

3. Programmes that have a more systemic perspective as starting point acknowledge that retrofitting can be a 'gateway' into other more habitual behaviour changes around for example lighting and appliance use and even domains beyond the energy domain such as waste and transportation behaviour. Use insulation as a gateway, not a one-off. CHANGE LIFESTYLES NOT LIGHTBULBS

4. An approach focused on incentivising and subsidising individuals to invest in technologies and measures actually benefits mainly and mostly the supply side (economically and on the short term). Beware if only the supply side or the implementer of the intervention seems to benefit. THINK OF THE BENEFITS FOR THE END USER AS WELL

5. Providing information only works if relevant stakeholders agree on the truthfulness of the information e.g. through a trusted consortium of societal and policy stakeholders. Trusted messengers are everything. FOCUS YOUR MESSAGING.

6. When a project aims to solve an information deficit, it should not request this information from the end-users, but arrange for training or intermediaries to help the end-users find this information. And when targeting the individual need for money and financial support, do not ask for prefinancing. PAY THE SUBSIDY UPFRONT.

7. Targeting the individual need for maximising financial benefit ignores that comfort and other benefits often rank higher on the priority list. Focusing first on financial rewards might create serious barriers for (follow-up) interventions also aiming at getting the bigger message why it is an important social or a global issue will likely fail. Cooperation between multiple parties - from governmental agencies to landlords and NGOs such as district health boards - can result in more tailored and context-sensitive programmes. Cooperation between multiple parties can also result in a more diverse set of instruments being deployed, from more segmented financial incentives to certifying contractors, enhance building codes quality, installer trainings, and TV marketing campaigns, and including instruments targeting outcomes that are not directly related to energy efficiency, e.g. health improvements. Tailor to your end users' needs which may not be about kWh savings. Cooperate widely and make it about more than money. USE A TOOLBOX OF INTERVENTIONS AND GO BEYOND kWh TARGETS.

8. Pre-scoping to analyse the problem to be solved can allow for a more broad or integral approach focusing also on other, e.g. health, comfort and social benefits. However. performing research to find out about homeowners' needs and preferences prior to implementation is only conducive to success when the needs that were identified are also targeted in the intervention.

Pre-scope to find out what is most important to end users. IF YOU KNOW WHAT THEY WANT, MAKE SURE YOU TRY AND GET IT FOR THEM.

9. Programmes that focus on lifestyle implicitly or explicitly acknowledge that end-users do not live according to sectoral divisions, even when governmental agencies do. They allow for an approach that focuses on the function of the use of energy in the life of end-users instead of on the use of energy. DON'T BOX PEOPLE IN TOO MUCH

10. Metered instead of modelled saving calculations are necessary to assess the real impact of the measures on energy consumption. Benchmarking and monitoring of the actual impact of the measures on the energy use, living quality, reduced costs, improved health etc should be part of the programme. It should not be left to the individual to buy and install metering devices to meter the actual impact of retrofitting. BENCHMARK YOUR HEART OUT, MEASURE, NOT MODEL

11. 'Decliners' or opt-out households are potentially as valuable to survey as those engaged. LEARN FROM THE UNWILLING

Transport Recommendations

The key lessons below are tailored to policymakers, intermediaries or other initiators of DSM transport interventions.

1. Creating new meanings for the car might allow for more sustainable driving behaviour and purchasing behaviour. Focus on what is meaningful to drivers, and that probably will not be the environment or traffic accidents, but their health, wellbeing, comfort, health of their car, their status, feelings of power. Cars mean everything to many people, be careful how you approach them. DON'T TAKE AWAY THEIR WHEELS.

2. Focusing on lifestyle and the role of the car is key but do not forget that life is also very much about the technological thing called car. Allow for the same meaningfulness but in a more energy-efficient manner by producing and providing things from which people derive meaningfulness in an energy- efficient manner. An energy efficient car can be sexy (see the Tesla!). CARS REFLECT LIFESTYLES.

3. Focusing on lifestyles also implies that multiple interventions are necessary to address behaviour in its many complex interrelated contexts. Use a toolbox of interventions that work together. YOU NEED MORE THAN ONE TOOL TO FIX A CAR.

4. Used trusted and respected peers to deliver the message and show the alternative. Active coaching by trusted peers is key. TRUST IS EVERYTHING.There is not much as habitual as driving and traveling patterns. It is truly embodied in seasoned drivers and very often we shift gear or take a look in the mirror on a very unconscious level. Training is essential. Prescope to understand where the drivers behaviour comes from. Set goals and visualise the gap between the actual and the goal behaviour and confirm when the gap is closed. Focus on concrete actions, capacity building, not sustainability guidelines to change the behavioural routine. PRE- SCOPE AND TRAIN, VISUALISE THE GAP BETWEEN ACTUAL AND GOAL BEHAVIOUR.

5. Driving is an individual but also a very social activity, so it is important to demonstrate how normal the desired behaviour is and get people to commit to it and become proponents. Reward good behaviour with a diploma or license, or making them driver of the week, to reaffirm the new behaviour. Make smart driving the social norm. BE SMART, DRIVE SMART.

6. Leverage change moments to normalise the desired behaviour. The New Year/new car/new licence is great place to start! SOMETHING CHANGED, SO I THINK ABOUT HOW I TRAVEL.

7. Urban design and decadal infrastructural decisions such as roading and town planning can be a real obstruction or a big opportunity. The creation and in particular the sustaining of a new behaviour and a new norm need the accompanying institutionalisation of this new norm and associated changes in the infrastructure and technologies. Change the institutional and infrastructural environment! IT'S ABOUT SO MUCH MORE THAN JUST THE CAR.

8. When you use the social norm as a lever, do not forget to also involve the social environment of your target (family, friends, coworkers). Create a sense of community amongst drivers in

an intervention and use social based marketing. YOU'RE NEVER ALONE WHEN YOU'RE DRIVING.

9. Beware that the use of risk messages is a very difficult matter with many potential unexpected impacts, e.g. people can feel that cycling is life threatening when you require them to wear a helmet for safety reasons. Beware of perverse outcomes. RISK MESSAGES CAN BE RISKY.

10. Money might not do the trick or create lasting change, but economic incentives can play a strong role play in starting and emphasising the social desirability of a new social norm and accompanying behaviour. Money is a good start but not enough in the long run. MONEY AIN'T EVERYTHING.

Smart meter/feedback recommendations

The lessons below are tailored to policymakers, intermediaries or other initiators of DSM retrofitting interventions.

1. Projects based on neoclassical or behavioural economics assume that people react 'rationally' when stimulated with the right triggers, and financial benefits or threats are such triggers. However, in many instances it is clear that economic gains or losses are not necessarily the only trigger necessary. TIME ISN'T ALWAYS MONEY

2. Smart metering projects are, by definition, projects that push a technology. But, a smart meter is not necessarily a meaningful device for household members. Often households do not (feel they) need it. Usually the only two challenges identified for smart metering projects are its adoption, and the education of people of its economic benefits. The successful implementation of smart metering is dependent on the creation of an intervention that goes beyond acceptance and aims at creating multiple benefits through the introduction of a smart meter. TECHNOLOGY ISN'T EVERYTHING

3. The issue of distribution of costs, risk and rewards and benefits is key but not very often addressed. End-users can start to feel that the distribution of costs and benefits actually benefit the utilities and DSOs more (in terms of customer loyalty, avoided investments in the grid, more information on customers) than the end-users themselves. Who benefits and who pays (eg with assumed loss of privacy)? MAKE SURE THERE IS CLEAR VALUE FOR THE CUSTOMER

4. Automated feedback on actual energy use and potential for changing one's energy consumption behaviour is at the core of most smart metering projects. This stems from the assumption present in almost all economic and psychological theories or models that increased knowledge and know-how about energy and energy consuming behaviour will lead to a reduction of energy. It is mainly when information provision is coupled to active learning, coaching and shared learning through peers, that this approach can indeed be effective. Information isn't everything - it needs to be coupled to active or shared learning. AUTOMATONS SHOWING kWh DON'T TEACH NEARLY AS WELL AS REAL PEOPLE AND THEIR OWN STORIES

5. Beware the self-selecting participants, they cloud results on acceptance and acceptability of smart meters. If they want it, they're already convinced it's a good idea and not your main target. FIND AND CONVINCE THE 'LUDDITES' THAT YOUR TECHNOLOGY IS GOOD FOR THEM

6. Smart metering targets the home, its inhabitants and their electricity and gas, and sometimes water consumption. The behaviours that should therefore target habitual actions AND investment behaviour (including retrofitting actions). Smart metering projects, however, usually target the behaviour of people, not of the home. The home and its technologies are left untouched. Tailored advice should also take into account the impact of the house on the capabilities and capacities of households to change the use patterns and its impact on the energy bill. Don't just tackle the behaviour of people, but also of their home. HOUSEHOLD DYNAMICS HOLD YOUR KEY.

7. The devil is in the detail: the personalities of installers can have an influence on the understanding of clients about the technology, and on their "happiness" regarding the technology. Small differences are found to be key explanatory variables. Beware of the

strong effect of personalities when using intermediaries, champions or advisors. SOCIAL CUES ARE MORE POWERFUL THAN TECHNOLOGY - FOR GOOD AND BAD.

8. People do not invest in their home but live in them, and the home means different things for different people and means different things at different times. One fairly constant meaning the home often has is comfort. A home is not where energy is used, it is where people live (comfortably, thanks to energy). MY HOME IS MY CASTLE.

9. Seeing is doing. Specially trained "Energy Masters", volunteers within the groups that motivate, supervise monitoring and provide material, such as 'DIY energy audits' can be a key to success. Use trusted champions and advisors. SEEING IS DOING.

10. Technological maturity of a region or target group needs to be matched to the ambitions of a project. The technology solution needs to match the technology literacy/maturity of the target. DON'T SELL IPHONES TO PEOPLE WITH NO POWER

11. Providing feedback on particular behaviours or practices rather than on the more abstract level of overall electricity consumption facilitates the identification of particular behaviours that are 'wasteful'. Focus not on individuals but on their practices. IT WILL TAKE A LONG TIME TO CHANGE 7 BILLION PEOPLE INDIVIDUALLY

12. Participation can be a key success factor. Co-development can have a strong impact on satisfaction levels. Engage your customers through multiple channels. PARTICIPATION IS KEY

13. Talking about "wastefulness" in interventions may be more effective than talking about saving money. Being wasteful can be worse than spending money. NO ONE LIKES WASTE

14. Social norming information about the consumption of others is engaging and interesting. Potentially disaggregated social norming information could encourage energy reduction. It is important to provide detailed feedback in hourly or half-hourly consumption, and in graphs which display peaks and troughs to enable users to identify high–consuming energy practices. Regular emails displaying users' own recent consumption over time, and access to personalised websites are a useful complements to real-time energy monitors. I wanna know what others are up to and where I stand. TELL ME IF I'M DOING BETTER THAN MY NEIGHBOUR

SME recommendations

The lessons below are tailored to policymakers, intermediaries or other initiators of DSM SME interventions.

1. Interventions focused on changing employee behaviour need a very active support or even involvement of the management level, implementation level, staff and even from clients. Top-Down, middle and bottom-up is needed, plus some external validation. IT CAN'T ALL COME FROM THE TOP OR THE BOTTOM.

2. For a better evaluation comparing successes between SMEs a more detailed analysis of different enterprises and their future plans need to be undertaken, and the data comparability with all enterprises has to be up to date. Compare and celebrate successful companies and interventions. BENCHMARK YOUR HEART OUT.

3. Target the key staff or champions or champion nudgers in an organisation and work with them. Economics as an approach is not sufficient to deal with the often implicit power plays and personal relationships in an office and between different layers of staff. Creating ownership amongst relevant staff is therefore key. Find your champions in your organisation and work with them. IT'S ALL ABOUT THE PEOPLE.

4. Mobilising towards shared goals can help increase internal support for reforms or organizational changes. If you have shared goals, you're halfway there. I WANT WHAT YOU WANT, SO LET'S DO IT.

5. In SMEs a multitude of people work, in different roles, and not everyone will feel comfortable with changes in the company, or with required changes. It is natural to 'lose' some along the road, and potentially this self-selection will strengthen the new social norms emerging amongst those that stay. The 'laggards' can have a powerful negative effect on your staff. DON'T BE AFRAID TO LOSE THE NAY-SAYERS.

6. Nudges do not necessarily act on the internal motivations, the attitudes or the intention to change behaviour. They are external stimuli to facilitate or discourage certain behaviour. Nudges can thus support people as reminders about their motivations and attitudes but more (e.g. changing social norms, institutionalisation of norms)   is needed to change attitudes and motivations. NUDGING IS WHAT IT IS: A NUDGE, NOT A LIFE SAVER.

7. The creation of a dedicated institution or intermediary por label/certification such as the Ecolabel (EU) and the New Zealand 'MKB prestatieladder' (SME performance ladder) can be key to successful implementation in a certain branch of SMEs. Validate where possible. SHOW WHO'S A LEADER.

8. There are many competing demands when addressing SME energy consumption behaviour. individual visits and tailoring leads to actionable goals and recommendations. Tailor to each SME, they are not all the same. TAILORING IS ESSENTIAL.

9. The equitable distribution of burdens and costs and the continued use of the same subsidy rules is key to creating movement amongst SMEs. Be fair, support innovators. THEY LEAD SO OTHERS CAN FOLLOW.

10.   Whereas energy efficiency efforts are often a matter of external consultants coming and going (along with the knowledge) equipping companies with the capability, methods and tools to themselves take control of and reduce their energy use through a collaborative learning approach might be more effective. Build your own capability if you want to share learnings. CONSULTANTS DON'T CARE AS MUCH ABOUT YOUR COMPANY AS YOUR STAFF DO.

11.   Getting the right intermediary in place to lead the group learning is key. Industry associations, e.g. provide a more homogenous group of SMEs that can more easily benchmark each other against their progress. Go to trusted intermediairies. TRUST IS EVERYTHING.

Appendix 7

Future research questions collected in Task 24

Building Retrofits
1. Can ambitiously set programmes create technological innovations and even professionalise a market, including the accompanying job growth? And do interventions aimed at retrofitting at the comprehensive level of the house generate more impact on the market, than e.g. simple insulation measures?
2. Does institutionalised longer-term support help to foster new markets and provide clarity and security/certainty for both end users and market parties? (e.g. setting quality standards for contracting service providers, building codes, training schemes for installers, performance contracting schemes, energy label for homes or low interest bank loans)
3. Is involving all relevant stakeholders in the form of diverse partnerships conducive to the creation of a new social norm? Has their interaction, and their often diverging needs and key performance indicators demanded alignment of interests with the potential for social learning?
4. Has social learning through building on previous programmes resulted in more effective programmes? And is this key to successful mainstreaming of retrofitting initiatives?
5. Should 'free riders' (people who would have taken measures without the subsidy) be welcome too? Can incentives actually motivate towards even better or more comprehensive retrofitting than planned without the incentive?
6. What is the potential of un-orchestrated collective learning? What could be the impact of seeing your neighbours retrofitting their home with the aid of a financial incentive?
7. With overly extrinsically motivated interventions, will the bigger message why it is an important social or a global issue, get lost and ignored, thus enhancing the changes of rebound? One could also ask whether programmes potentially veer towards appealing to self-interest because otherwise they drown in a sea of marketing encouraging consumption practices that work against altruistic motivations?

Transport
1. Many of the intended outcomes, e.g. changes in the symbolic meaning attributed to a car or a bike, or increased positive perceptions of urban traffic, can only be assessed by qualitative inquiries making use of e.g. surveys or interviews. Changing the meaning attribution can, however, be a very effective way to change driver behaviour. What methods are best to assess the changes in meaning attribution of the car?
2. It is very difficult to monitor the actual change in driving behaviour on the individual level. Mobility DSM is not deployed in a laboratory situation, or in the confined space of a home, so other (changing) conditions always interfere with the intervention. How could a comprehensive monitoring regime look like that focuses on both the individual and societal level and on quantitative and qualitative changes?
3. The costs of transport campaigns are most likely not the only costs of interventions. Generally, only costs on the supply side are calculated. But the individual drivers themselves potentially have additional costs in terms of lost time, problems with getting negative comments or social stigma, but these costs can hardly be calculated. How can the costs of transport interventions incurred on the end-user side be calculated and weighted?

Smart Metering/Feedback
A key design challenge is to create a smart metering system that keeps engaging with the household members. Changing the messages and feedback in the course of time following energy literacy can be key. Information should thus be dynamic over time. What designs work well for whom?

SMEs

1. How to evaluate the savings (energy, CO_2, cost) or increased productivity of the earlier (due to the intervention) implementation of already-planned measures?

2. Concerning the application of Nudge it would be interesting to see if a specific approach applied to the specific context of a single SME is more effective rather than a general policy measure aimed at all SMEs.

3. Are competitions potentially most effective as an early incentive to familiarise the public with a (social) innovation and start up initial behaviour?

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