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Energy Technology Initiative on

Demand Side Management Technologies and Programmes

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Task 24 – Phase II

Behaviour Change in DSM: Helping the Behaviour Changers

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Contents

Introduction

The IEA Demand-Side Management Task 24 aims at sharing knowledge between multiple stakeholder sectors and developing policy recommendations about the influence of behaviour change on effective implementation of energy-efficiency policies[1]. After a period of building the scientific framework and collecting practical cases (Phase I), Task 24 is now in the phase (Phase II) of engaging actual "Behaviour Changers" in real live interventions, supporting them with evidence-based scientific approaches and practical case study comparisons from various countries along the way.

Task 24 and Sweden

Sweden has participated in Task 24 since its inception in 2012. Sweden is one of the participating countries in Phase II of Task 24, together with New Zealand, the Netherlands, Austria, Ireland and, in Subtasks 9 and 11 and Year 3, the United States. The Swedish contribution is funded by a grant from the Swedish Energy Agency, which also supported the Task with national experts from the organisation. This report will concentrate on the Sweden-specific interventions related to all Subtasks of Task 24. For in-depth discussion of the second phase of Task 24, the approach, and the detailed overview on Subtasks, please refer to the Work Plan.

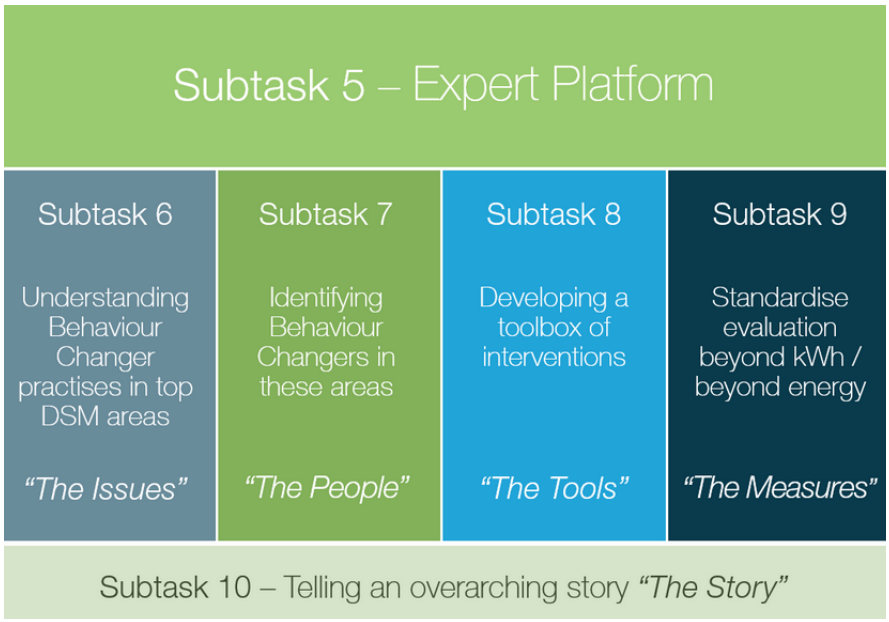

Fig 1. Task 24 Phase II Subtask overview

Background and Overview

Task 24 is aimed at improving demand-side management and sustainable energy use by influencing human behaviour. During Phase I (2012 - 2015), the teams in the different participating countries focussed on translating behavioural theory into practice. They built a network of >250 behaviour change experts who made an inventory of available theories, models and approaches, gathering over 60 practical examples and case studies from 20+ countries (for more details, see Rotmann 2016a).

Main lessons learned from Phase I (see Mourik and Rotmann, 2013):

- There are a variety of applicable theories and models that are currently underutilised when designing behavioural interventions (especially from sociology and multi-disciplinary studies);
- There is much to be gained by using combinations of approaches, and moving from the current, overwhelmingly technocratic approaches to consider more the 'human' perspectives. This includes fostering and facilitating multi-stakeholder collaborations;

[1] See Task 24 Policy Brief: http://www.ieadsm.org/wp/files/task24policybrief.pdf

- Many of the collected stories and case studies showed a lack of in-depth understanding turning behavioural theory into practice and a clear need of further field research and validated tools;

- Most countries had not clearly prioritised their top behavioural DSM issues for further research, or failed to include all relevant stakeholders ('Behaviour Changers') in the selection process;

- There were some top behavioural DSM issues in each country where the theory from Phase I could be turned into best practice in Phase II, using *Participatory Action Research* (PAR) approaches (e.g. see Bergold, 2012).

In 2015, Task 24 continued with a new Phase II based on these insights. First, the national teams selected their countries' top-priority areas in behaviour change in DSM (**Subtask 6** – "The Issues"). This selection of top areas was performed with the IEA DSM Executive Committee (*ExCo*) member of each participating country, the appointed *National Experts* and other country experts (*Behaviour Changers*). The DSM priorities differed between countries, as did their (technical, economic, political and societal) potentials and risks due to different national contexts. We will ascertain and highlight these country differences in **Subtask 10** ("Overarching story").

After having identified the top priority areas for energy efficiency within a country, one area was selected for further research in detail. Once the top areas were chosen in each country, the national teams brought the relevant *Behaviour Changers* together to explore the key issues supporting and hindering the uptake of DSM in the current system (**Subtask 7** – "The People"). The key systemic issues were then explored in facilitated multi-stakeholder workshops. Finally, in some countries, we could then engage the relevant *Behaviour Changers* in designing a "real-life intervention" (**Subtask 11**). We also developed more focused intervention approaches and a "Toolbox for behaviour change" (**Subtask 8**) as well as "Beyond kWh" evaluation tools (**Subtask 9**). The latter are discussed in depth elsewhere but will be mentioned here in their application in Subtasks 6 and 7.

The major hypothesis of the Task 24 Phase II approach is that *a Collective Impact Approach* (Kania and Kramer, 2011) *which fosters collaboration among a variety of stakeholders - together with whole-system visualisation exercises in participatory action research settings, and using storytelling as overarching 'language' - will lead to more successful behavioural interventions where multiple benefits to the end users and each* Behaviour Changer *can be clearly evaluated*.

Benefits of an IEA research collaboration

Most analyses of behavioural interventions do not explicitly focus on cultural differences between countries. This is a major reason why IEA research contracts between different countries were established. In Subtask 2 (Phase I), we focused explicitly on such cultural idiosyncrasies. For example, in Norway there is a strong 'do it yourself' retrofitting movement. In addition, there is almost no rental model for housing stock in Norway, whilst there is a strong rental model in the Netherlands, or in Sweden. In New Zealand, people are used to living in un(der) insulated, cold and draughty houses and "just put on another jumper", rather than heating them to the temperatures their Northern counterparts are used to. These cultural differences and their origins (cultural traits or a particular cultural characteristic) do impact on the meaningfulness of generic policy recommendations for *Behaviour Changers*. Identifying various cultural contexts, and designing and testing a toolbox of behavioural interventions that works in many different countries, sectors, and DSM issues, was a major objective of this Task. Policy briefings specific to the participating countries' policy makers will be developed including for Sweden. On the Swedish top issue of *Green Leasing in commercial office buildings* we were provided by international experts with cross-country comparisons for Norway, the UK, Ireland and Australia.

The added value to having an International Energy Agency Expert Platform (**ST 5**) is a highly experienced global network of *Behaviour* Changers in many different countries, sectors, disciplines and industries. They all bring different insights, learnings and perspectives, many of them do so in-kind. We facilitated their collaboration with national *Behaviour Changers* by using and testing the *Collective Impact Approach,* for the first time in the energy system. The *Behaviour Changers*

participating in this Task have assessed the effectiveness of this approach and the Task 24 toolbox of behaviour change interventions. This approach allows them to take an integral part in the development of the methodologies, guidelines and overarching 'language' to aid whole-system, societal change by proving, and improving the impact and uptake of behavioural DSM interventions.

Task definitions

During the first international Task 24 workshop at Oxford University in October 2012 (Churchhouse, Mahoney & Rotmann 2012), it became apparent that we had to be very careful with language and the jargon that was used in this Task. Seeing that the Task does not follow any specific research discipline or sectoral approach to behaviour change, it is easy to confuse meanings and terminology. Long, and often difficult discussions were had at this workshop around the meaning of e.g. 'behaviour', 'behavioural models' or 'demand-side management'. In order to clarify up front what 'language' the Task was using, we had to create our own definitions for the main terms *energy behaviour, behaviour change, Behaviour Changer, behavioural models, demand-side management, evaluation, monitoring, effectiveness, efficiency, investment vs habitual behaviours, outputs vs outcomes, single- and double-loop learning and DSM tools and benchmarks* (found in Mourik et al, 2015). The most important definitions used here are replicated below.

Energy behaviour refers to all human actions that affect the way that fuels (electricity, gas, petroleum, coal, etc.) are used to achieve desired services, including the acquisition or disposal of energy-related technologies and materials, the ways in which these are used, and the mental processes that relate to these actions.

Behaviour Change in the context of this Task thus refers to any changes in said human actions which were directly or indirectly influenced by a variety of interventions (e.g. legislation, regulation, incentives, subsidies, information campaigns, word-of-mouth etc.) aimed at fulfilling specific behaviour change outcomes. These outcomes can include any changes in energy efficiency, total energy consumption, energy technology uptake or demand-side management but should be identified and specified by the *Behaviour Changer* designing the intervention for the purpose of outcome evaluation.

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

Definitions specific to Green Leases in Commercial Office Buildings

Green Lease is an addition to the standard legal contract between landlord and tenant. It places these parties under mutual obligation to improve the environmental performance of a building, with a primary focus on energy management, through cooperation (Sayce et al 2009). Green leases do not only benefit the environment, but may also create mutual financial benefits for both the tenant and the landlord.

Green Leasing has been conceptualized as a form of 'middle-out' inter-organisational environmental governance that operates between organisations, alongside other drivers (Janda et al 2017). Where the term "green leases" usually reflects a change to the wording of a formal lease document; "green leasing" reflects a change to the relationship between the landlord and the tenant, which may be through the mechanism of the lease or through other channels.

Objective of Task 24

The main objective of Phase II is to take good theory into practice to allow *Behaviour Changers* to:

- Engage in an international expert network (**Subtask (ST) 5** 'THE EXPERTS')
- Identify the most appropriate DSM themes to focus on (**ST 6** 'THE ISSUES')

- Identify and engage countries' networks for at least one of the top 3 DSM themes (**ST 7** 'THE PEOPLE')
- Use and test a *Collective Impact Approach* to develop shared methodologies, guidelines and a common 'language' based on narratives to aid *Behaviour Changers* (**ST 8** 'THE TOOLS')
- Standardise how to evaluate behaviour change programmes 'Beyond kWh' and 'Beyond Energy' including multiple benefits analysis (**ST 9** 'THE MEASURE')
- Collate national learnings into an overarching (international) story to understand, compare and contrast the different behaviour change approaches, risks and opportunities and which recommendations can be universally applied (**ST 10** 'THE STORY').

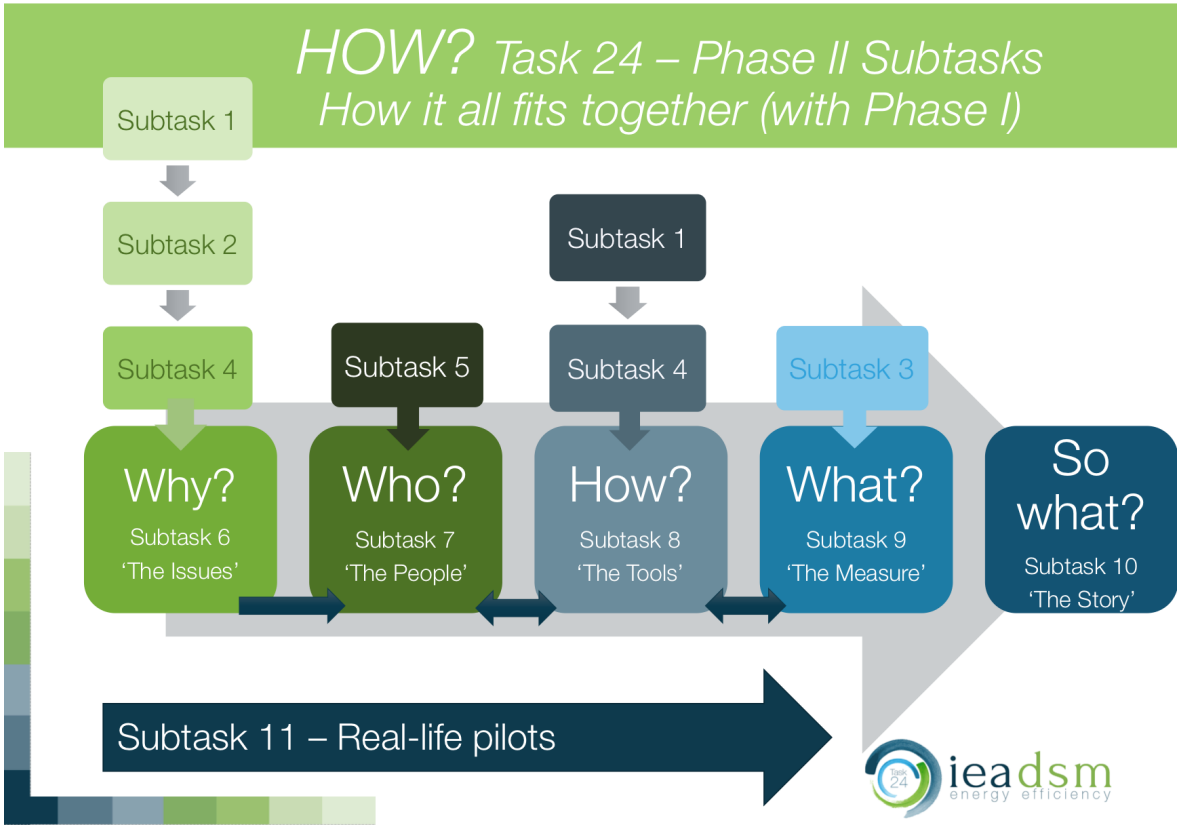

Fig 2. Overview of how Subtasks fit together (In Phases I & II)

Methodology of Task 24

We describe the individual approaches used in **Subtasks 6 & 7** in more detail below. The overarching tools that were developed and tested in Task 24 Phase 2 (**ST 8 & 9**) are summarised first.

Subtask 8 - The main tools in the Task 24 toolbox

The toolbox has a strong focus on tools that support the appropriate context for the *Behaviour Changers* and which are more conducive to developing systemic interventions, with stories and case studies illustrating their application. The workshop sessions with the *Behaviour Changers* focused on testing the tools on a variety of countries, sectors, contexts and behavioural issues.

Objectives

- Use the *Collective Impact Approach* to unite *Behaviour Changers* from five sectors on a specific DSM issue (both chosen in ST 6 & 7). Evaluate this approach via stakeholder analyses.
- Collect information for a Decision-making Tree to pick the most appropriate case studies and models of understanding analysed by Task 24 (ST 1, 2 & 6).
- Develop the common language of storytelling further and provide different examples of using storytelling and narratives in practice and how to best do it in the specific areas of focus and each of the *Behaviour Changers'* sectors.

- Identify the tools in each *Behaviour Changer's* Toolbox of Interventions, analyse their pros and cons, risks and opportunities, where they fall short and how another tool from another *Behaviour Changer* could overcome this deficit.
- Continued testing and development of the Evaluation Tools (ST 3 & 9) that can prove if a (toolbox of) intervention/s leads to actual, ongoing behaviour changes in practice. The *Behaviour Changers* will feed back on its potential applicability, risks and additional needs by working through (hypothetical or real life) examples chosen in ST 6 and using double-loop learning approaches to assess multiple benefits of interventions.
- Collaborative development of a testable Toolbox of Interventions for each top DSM focus area, where each *Behaviour Changer* sector has clearly identified and measurable roles and responsibilities. This intervention may then be taken into a real-life setting and trialed in practice (either as ST 11 or outside of Task 24).
- The toolbox is built on national and sectoral context specificities but will be synthesised and tested (e.g. in international conferences - ST5) for the general aspects that are of international validity (ST10 - the overarching story).

Deliverables

D 12: Testable toolbox of interventions of each country and their top areas of DSM focus This includes:

- A description and evaluation of the validity and effectiveness of the *Collective Impact Approach* in the energy arena, as a peer-reviewed paper (Rotmann, 2016a and b).
- A Decision-making Tree that enables *Behaviour Changers* to better utilise the findings of ST1 & 2 (de Zeeuw, 2018).
- A peer-reviewed paper on the impact of storytelling in energy research (Rotmann, 2017; Moezzi, Janda and Rotmann, 2017).
- A collection of sector stories from each *Behaviour Changer* (Swedish stories in Appendix 1).
- This includes a list of behavioural intervention tools each *Behaviour Changer* has at their disposal in each of their national and sectoral contexts (see Swedish workshop minutes).
- Continued testing and development of evaluation tools created in ST 3 and 9 (Rotmann and Chapman, 2018a).
- Testable toolbox for national *Behaviour Changers* (when choosing to take part in ST11, see Cowan et al 2018) and/or synthesis of internationally-valid tools to feed into the Overarching Story (ST10, to be published).

Storytelling

We discussed the importance of language, definitions and jargon, and need to clearly define it, above. We also needed to find an overarching 'language' in order to bridge the many different disciplines, sectors and *Behaviour Changers* we were dealing with: this language was *storytelling*.

The Task thus embarked on a journey of using various narratives and storytelling tools to simplify learnings, bridge silos and 'translate' between different *Behaviour Changers*. Some of the approaches are discussed in Rotmann, Goodchild and Mourik (2015). The main Task 24 approach of using a fairy tale story spine to elicit stories from 100s of *Behaviour Changers* in over 20 countries was detailed in a Special Issue on "Narratives and Storytelling in Energy and Climate Change Research" in *Energy Research and Social Science* (Rotmann, 2017). Task 24 Operating Agent Dr Sea Rotmann co-edited this Special Issue with Drs. Mithra Moezzi and Kathryn Janda (see Moezzi, Janda & Rotmann, 2017 for an introduction and summary). 35 excellent papers are showcased in this Special Issue, which forms the ultimate collection on storytelling in energy and climate change research to date. Our introduction to the Special Issue became the Number 1 most downloaded article in ERSS in 2018.

The "Collective Impact Approach"

Task 24 uses two different, yet complimentary, approaches to facilitate multi-stakeholder collaboration in the more practice-oriented Phase II: *The Collective Impact Approach* (Kania and Kramer, 2011) and the *Behaviour Changer Framework* (Rotmann, 2016a). The *Collective Impact Approach* (CIA) was first developed to aid social entrepreneurs deal with complex social problems. This approach, aimed at long-term social change, proposes a collective, rather than an individual approach for solving difficult problems. Walzer et al. (2016) argue that complex situations which would normally be difficult to solve, can be solved using the CIA. This CIA is described by Collaboration for Impact as: *"…an innovative*

and structured approach to making collaboration work across government, business, philanthropy, non-profit organisations and citizens to achieve significant and lasting social change."

Five conditions are listed that are needed to create such a collective impact (Fig. 3):

1. A common agenda,
2. Mutually-reinforcing activities,
3. A shared measurement system,
4. Continuous communication and
5. A backbone support organisation.

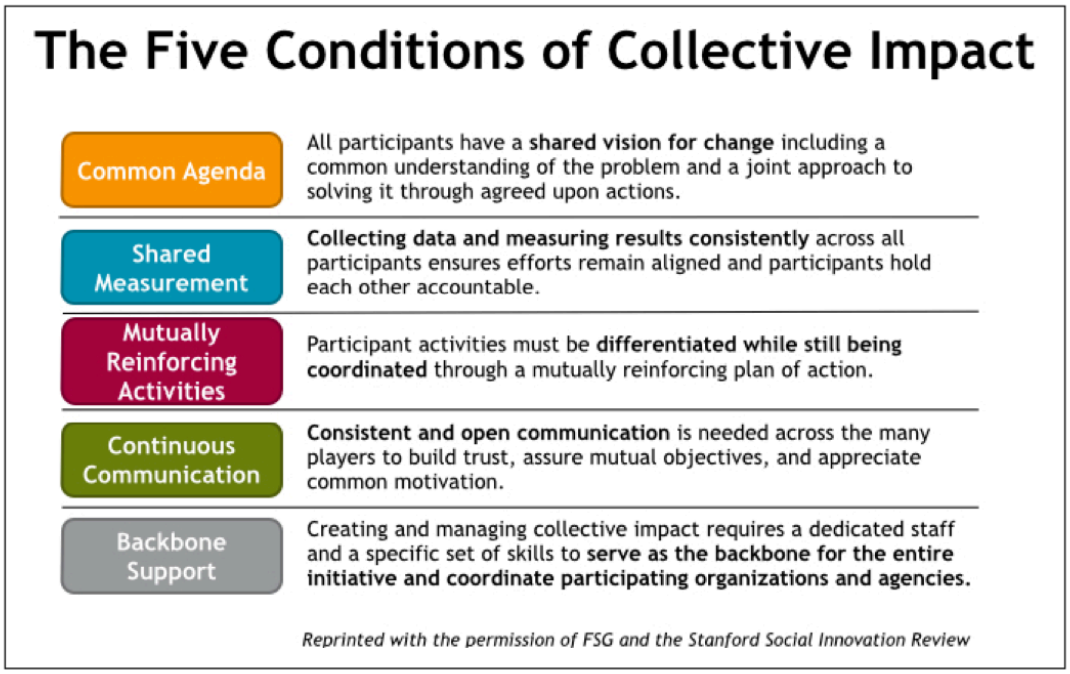

Figure 3. The 5 conditions of the Collective Impact Approach (from Kania and Kramer 2011)

A **common agenda** is important to create a common understanding of the problem and the solution to make sure all *Behaviour Changers* agree on taking the same road to the common goal. Secondly, it is also important that the relevant *Behaviour Changers* perform **mutually-reinforcing activities**, making sure that they do not impede other *Behaviour Changers* or their stakeholders. Thirdly, it is also important that there is a **shared measurement system** so that outcomes of all *Behaviour Changer's* actions are measured and reported in the same way, so as to share and learn from each other. To help create trust and a common vocabulary, it is of high importance that actors **communicate continuously**. Lastly, a separate **backbone support organisation** needs to be created that facilitates a change of mind set, creates publicity and mobilises resources. Kania and Kramer (2011) explain that **backbone organisations** are especially important for providing direction, facilitation of the dialogue, mobilising funding and handling all the different layers of linked collaboration. *Behaviour Changers* are interdependent on each other, on other stakeholders, and they also operate in different and sometimes very complex contexts confronted with various political, financial and social pressures. Their mandates may be insufficient to affect large-scale behaviour change, or in direct conflict to it. Hence, complex problems that include technical, organisational, social and behavioural dimensions ask for collectively addressing the challenges. In order to do so successfully and to enable shared learning, a trusted *Facilitator* and 'translator' is crucial (e.g. Measham, 2009). In Phase II, Task 24 took on these important roles.

CIA offers a way to implement change via a top-down/bottom-up mixed approach. Most research on this approach focuses on situations in which a collective impact is created by organisations that are independent units. The first version of the CIA did mention the five principles on which successful collective impact should be based. However, nothing was said on further steps that should be taken or what institutions could function as backbone organisations. In 2012, they wrote a second article in which they remedied both shortcomings. Hanleybrown, Kania and Kramer (2012) state that there are three phases that should be fulfilled for creating collective impact: In the first stage, **action should be**

initiated. To do so, the landscape of the social problem should be understood first and a **champion** must stand up. The importance of **champions** is to take care of attracting financial resources and creating a sense of urgency, striving for collaboration. It is also important to **organise for impact**. This means that common goals, a shared measurement system and backbone organisation should be arranged. In the third and last phase **action must be sustained** and impact should arise. **Active learning and coordination** is described to be essential for success (ibid).

For more detail on how the *Collective Impact Approach* is utilised in Task 24 and how it can be assessed in real-life applications, see e.g. Cobben (2017) and Cowan et al (2017).

The Task 24 Behaviour Changer Framework

To create a more hands-on tool to identify and work on the five conditions of the CIA, Task 24 developed the so-called "Behaviour Changer Framework", which was later dubbed "the magic carpet of behaviour change" by a major US utility during a Task 24 workshop. This framework was created to provide a visual overview of the social ecosystem, focusing on all relevant stakeholders, i.e. the *Behaviour Changers* from the different sectors and their relationships with one another, and the *End User*. This framework focuses on a chosen issue (**ST 6**) from the perspective of the *End Users* and their behaviour, as well as their context in terms of technology, social aspects, infrastructure and the wider environment (including political and regulatory). It also focuses on each of the *Behaviour Changers* in the system, what their main mandates, stakeholders, restrictions and tools are and how they interact with one another and with the *End User* (for detailed description of the process and actor types, see Rotmann 2016a).

An alternative view of our Energy System

An important point of departure from the current technocratic view of the Energy System is that in Task 24, we pose that *our energy system begins and ends with the human need for the services derived from energy (warmth, comfort, entertainment, mobility, hygiene, safety, etc.) and that behavioural interventions using technology, market and business models and changes to supply and delivery of energy are the all-important means to that end*.

The *Behaviour Changer Framework* operates on a different 'model of understanding' of the energy system, one based on *behavioural socio-ecology* (e.g. Moore, de Silva Sanigorski & Moore, 2013). The socio-ecological framework encourages both whole-system interventions, and the explicit understanding of how more-focused interventions might depend on factors at other levels (including the various human actors in a given system) for their effectiveness, acceptability or sustainability to be achieved (ibid, p1002). Here, this means first exploring the views, values and experiences of the various experts and decision-makers engaged in a given 'energy socio-ecosystem' (often also including the energy *End User* whose behaviour they are ultimately trying to change), before deciding upon, collectively, which (technological) approach or solution for change to focus on in a pilot intervention. It offers a pragmatic approach for how we propose to further improve the co-creation of knowledge, learning, sharing and translation into practice among practitioners in the energy field. The way the energy system is currently established in a very top-down manner does not easily permit such a whole-system view which puts human needs, behaviours and (ir)rationalities at the center of interventions geared at system change. Instead, if we look at the energy system through the human lens, we can see that it isn't necessarily a linear relationship starting with supply and ending with the *End User*, but rather a circular relationship which actually starts with the *End User's* need for an energy service. Amongst (rather than sitting above as is usually the way) this view of the system sit the 5 *Behaviour Changers* (the *Decisionmaker, Provider, Expert, Middle Actor* and *the Conscience*, Fig 4).

What is the Behaviour Changer Framework?

The *Behaviour Changer Framework* (BCF) is meant to be used as a 'heuristic' to make the mandates and relationships of the *Behaviour Changers* and their interaction with the *End User* more clear. It also enables storytelling for each of the *Behaviour Changers* who are working on a specific behavioural intervention in different domains, contexts and countries.

The "magic carpet", an actual 1.4m^2 piece of cloth, was used in intensive workshops to explore the stories of different *Behaviour Changers* who are working towards a very specific common intervention goal - for the Swedish example, how to promote green leasing between commercial office landlords and their tenants – see Janda, Rotmann et al (2017). The framework was used to explore and visually

describe the current situation, different mandates, drivers, barriers, conflicts and intervention tools each *Behaviour Changer* has and their relationships with each other, their primary stakeholders and the *End User*. It is then used to explore what the system should look like and collectively develop a roadmap towards a best practice, real-life intervention. Each additional country workshop (up to two workshops per year, per country) explored the changes between BAU and best practice and used the framework to evaluate, re-iterate and test completion towards the collectively agreed-upon roadmap.

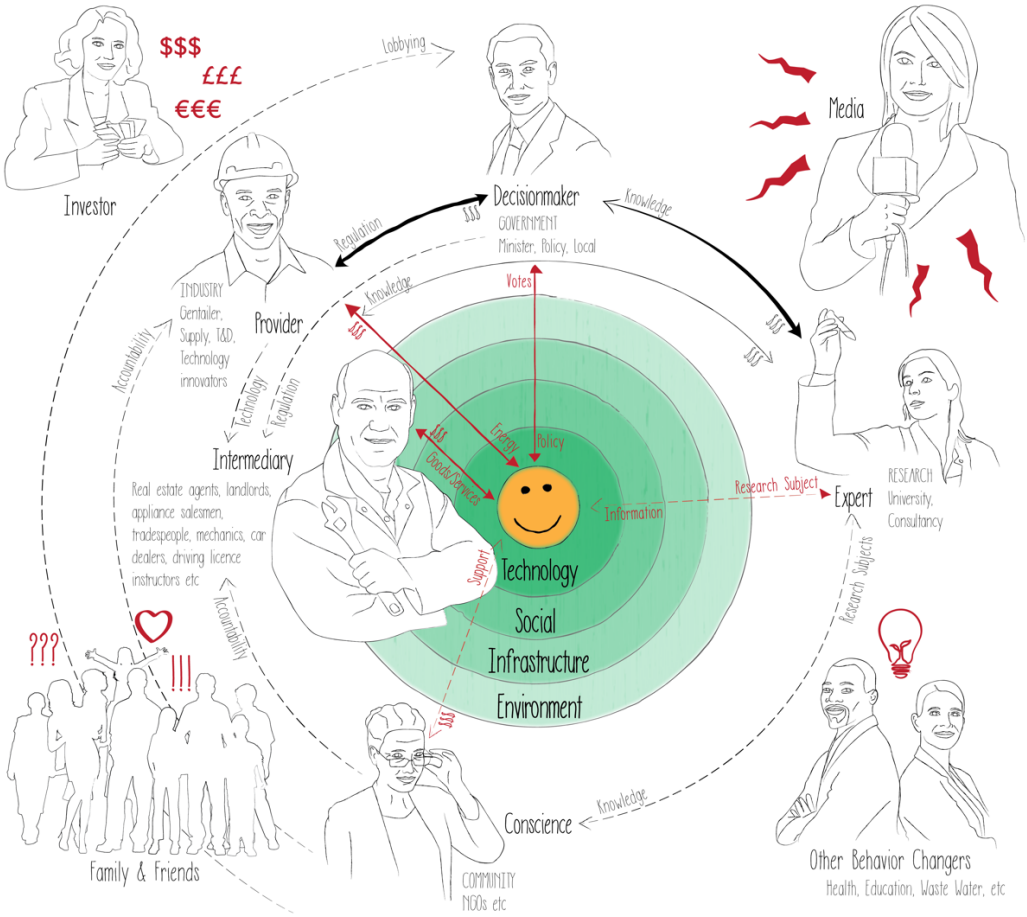

Figure 4. Diagram of the Behaviour Changer Framework *that works on behavioural interventions on the Energy* End User *in a generalised Energy System*[2].

The *Behaviour Changer Framework* thus:

- Acts as a collective impact tool (the process comes before the outcome)
- Helps visualise the energy system through the human lens, showing the status and barriers, and what is needed to achieve a common goal/best practice
- Helps different stakeholders agree on the best possible scenario and then collectively work on solving problems and co-create the right intervention to change the chosen behaviour/s
- Helps to evaluate and measure agreed best practice outcomes and how to iterate, if necessary
- Helps identify multiple benefits and how to measure them
- Helps us appreciate each other's world, the lock-ins, restrictions, and relationships both good and bad which the system throws up.

The human actors in the energy system

To be able to change the behaviour of *End Users*, an overview of the social playing field including conflicts and barriers is invaluable knowledge for *Behaviour Changers*. This *Behaviour Changer Framework* allows an end-user perspective with a focus on their behaviour and on the technological and social aspects, infrastructure and wider environment (including political pressures) that need to be

[2] For a short explanatory video, go here: https://youtu.be/E3A92eFyvNw?list=PLoZ9-YO7tGnoDbnOLmu-cLGC9geztJ0F9

changed when solving a complex social problem (Rotmann, 2016a). Next to this end-user perspective, a strong focus is given to the *Behaviour Changers* themselves - and their mandates, tools or instruments, restrictions, and stakeholders they need or depend on to perform their role.

The *Behaviour Changers* with often the most 'powerful' impact, the *Decision-makers*, have tools like **policies, taxes and incentives and legislation** to influence behaviour. The second actor-type is the *Provider*, usually focused on providing energy or energy-using technologies. They have different tools, e.g., **marketing campaigns or changes to billing systems**, with which they can influence *End Users*. The third group, the *Experts*, can develop, validate and criticise technologies and their impact on consumers. Their tools range from **scientific papers, to (big) data collection and analysis, undertaking interviews, surveys and focus groups** in real life or experimental settings. The fourth group is the *Conscience*, usually consisting of non-profit organisations mandated to reduce the social and environmental impacts of the energy system. They use tools like the **media, mass marketing and activist campaigns** to change behaviour. The last group are the *Middle Actors*, often from a service sector in direct contact with the *End User*. They have behaviour change tools like **direct access to consumers, trusted advice, technological information and labels**. In addition to various relationships and resource flows (e.g. money for energy or services) between the *End Users* and *Behaviour Changers*, the *Behaviour Changers* also have various relationships of various strengths with one another. Indirect influencers are the *Media, Investors, Family and Friends* and *Other Behaviour Changers*.

Why have two collaboration tools?

The *Collective Impact Approach* is mostly a top-down approach working on the higher levels of social change, whereas the *Behaviour Changer Framework* can be used complementarily as a way to directly focus on changing the behaviour of *End Users* via a bottom-up approach in collaboration with the relevant *Behaviour Changers,* also enabling a middle-out approach. The *Behaviour Changer Framework* thus offers important additional aspects that should be taken into consideration when creating a collective impact, namely the end-user perspective and a clear visualisation of the current energy system, as viewed through the human lens. This includes different conflicts and mandates and different flows of goods and services leading to different strengths in relationships and different tools that each *Behaviour Changer* brings to the table. The *Behaviour Changer Framework* also includes those who often do not have a direct say in decision-making processes. Incorporating the knowledge about problems that *End Users* experience, the additional bottom-up and middle-out approach and collaboration among *Behaviour Changers*, a "collective" is created which stimulates a feeling of cohesion and empathy. This is a good start for successful communication. Thus, the *Behaviour Changer Framework* and *Collective Impact Approach* are able to create a stronger collective impact when combined.

Subtask 9 – Evaluating behaviour change interventions

Beyond kWh, double-loop learning and multiple benefit evaluation tools

When we developed the work plan for Task 24 one of the starting points was the appreciation that DSM projects demonstrate great diversity in goals, scope, participants, resources etc. to match the diversity of *Behaviour Changers'* contexts and needs and their wider environment. As a consequence, developing a generic evaluation and monitoring framework that is widely applicable, yet does justice to this diversity, is very difficult indeed. We realised that finding more appropriate, effective and possibly, validated standardised ways of monitoring, evaluating and learning about successful behavioural DSM implementations was a real and urgent need. Currently, DSM policymakers and other relevant *Behaviour Changers* usually fund and/or support DSM programmes on a rather ad-hoc basis because they lack these means of assessing their impact on contributing towards a more sustainable energy system.

Beyond kWh evaluation tool

We undertook a review of state of the art research findings and current best practice and potential standardised ways of monitoring and evaluating could identify what roles and actions policymakers, investors and other *Behaviour Changers* might play to make behaviour change successful. This review of over 350 residential behaviour change studies published from 2003-2013 was undertaken under the umbrella of the Task by Karlin et al, 2015a ("Methodological Review"). They found that there is no standardised way of monitoring the impact of behavioural change DSM interventions beyond kWh

type of indicators (and often even they are not measured in a standardised way): 85% of studies did collect some data "beyond kWh", but there was little consistency in the way that these variables were collected or measured. Data on demographics (64%), behaviour (62%), user experience (58%), attitudes (27%), and knowledge (21%) were collected, but there was significant variation in the questions used within each category. No standard tool currently exists to conduct such assessment comprehensively and consistently. Such consistency would improve our overall ability to account for variation in treatment effects and verify savings. One of the consequences of not having a bank of standardised and psychometrically-validated survey questions is that research funders lack clear evaluation frameworks to decide on funding practical behaviour change research efforts and thus continue relying on the 'easier', technological fixes to our energy problems and the more common economic or psychological theory-underpinned type of interventions (see also Kallsperger and Rotmann, 2017 for a discussion of the difficulties in measuring and claiming energy savings from behaviour change interventions under the new Austrian Energy Efficiency Law).

The more complex systemic type of interventions that go beyond mere kWh type of outputs thus face severe start-up issues. For such a tool to be of maximum usefulness, it will need to be further developed in collaboration across a variety of *Behaviour Changers*, countries/cultures and with input from different research disciplines. This tool was first proposed by Karlin et al and called the "Beyond kWh evaluation tool" (2015). The *Beyond kWh* tool was further developed in **Subtask 9** and framed around the NZ-led *Energy Cultures*[3] framework. Karlin et al, 2016 state that "*Energy behaviour is embedded within the physical and social contexts of daily life; the interplay between behaviour and its contextual influences can be thought of as an "energy culture". Behaviour-based energy interventions aim to impact demand through influencing some aspect of energy culture - what people have, think, and/or do. Understanding how a programme does (or doesn't) work requires an understanding of changes in these elements of energy culture.*" The paper presented and tested a set of instruments that evaluate household energy culture before and after an intervention. The tool then underwent further psychometric testing with >600 Californian utility consumers (Southern California Edison, 2016).

The tool was then being tested in Ireland for a real-life pilot using public libraries in Dublin as *Middle Actors* to loan out "Energy Saving Kits"[4] (Rotmann and Chapman, 2018b). These kits are meant to improve energy literacy and education about people's own household energy consumption and potential infrastructural issues (such as thermal leakage). We also hope to test this tool on similar pilots in New Zealand and California to show that it is highly adaptable to different cultural contexts, and thus universally applicable. So far, the tool has only been developed for the residential sector. We hope that future iterations will allow us to create modules for e.g. the hospital, commercial office or transport sectors as well. In BELOK (2018), a form of the pre- and post- "beyond kWh" survey was adapted for the commercial office sector. It was meant to be trialed with the Swedish Energy Agency when it moved offices and entered a collaborate Green Leasing Agreement with its new landlord. However, we did not have the resources to implement it at that time.

Objectives

- The goal of this research is to develop and validate a set of tools and metrics that can be used consistently for the evaluation of behaviour-based energy programmes including but not limited to eco-feedback, home audits, information and rebate programmes, and social games.
- An in-depth assessment of current (best) practice, cultural and disciplinary idiosyncrasies, country drivers and needs and the best possible international standard (along the lines of psychometric tools like the IQ test - arguably not a perfect indicator of intelligence, but valuable in terms of enabling measurement and comparison).

Deliverables

D 13: An internationally validated set of tools and metrics for evaluating behaviour-based energy programmes 'beyond kWh'

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[3] http://energycultures.org/

[4] http://www.codema.ie/think-energy-home-hub/what-is-the-home-energy-saving-kit/

Double-loop learning

We initiated an expert discussion in 2014 on how a more standardised, practical, robust, generic evaluation and monitoring framework to evaluate both kWh-type of outputs as well as longer-term behavioural outcomes contributing to a more energy-efficient DSM system would look like. We provided a first attempt at initiating and contributing to such a discussion with our second ST3 deliverable, a "Positioning Paper" (Mourik et al, 2015). In this paper we briefly explain what monitoring and evaluation (M&E) mean, current M&E practice and how different disciplinary underpinnings of behaviour change interventions influence this. We also discussed the many challenges *Behaviour Changers* currently face when attempting to monitor and evaluate behavioural change in DSM interventions. These challenges led us to conclude that the traditional quantitative proxies used at present (which are often collected ad hoc and in a non-standard way, see Karlin et al, 2015) do not correctly reflect if real behavioural changes actually occur. Solely quantitative assessments often miss the details of what exactly is going on, for different people (*End Users* and *Behaviour Changers*) and in different contexts. This is problematic for multiple reasons, and we concluded with proposing an alternative to the current mainstream approach. This alternative includes a focus on *double-loop learning*, allowing for different definitions of success and creating a more participatory approach focused on both process and outcome that makes use of a combination of qualitative and quantitative metrics to evaluate a multitude of parameters for success.

Even though we have not completed a full evaluation 'tool' that can be applied to all possible combinations of interventions in different sectors and 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 5 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 **ST 1 & 2** showed how successful such interventions were, compared with siloed, individually-focused, top-down approaches).

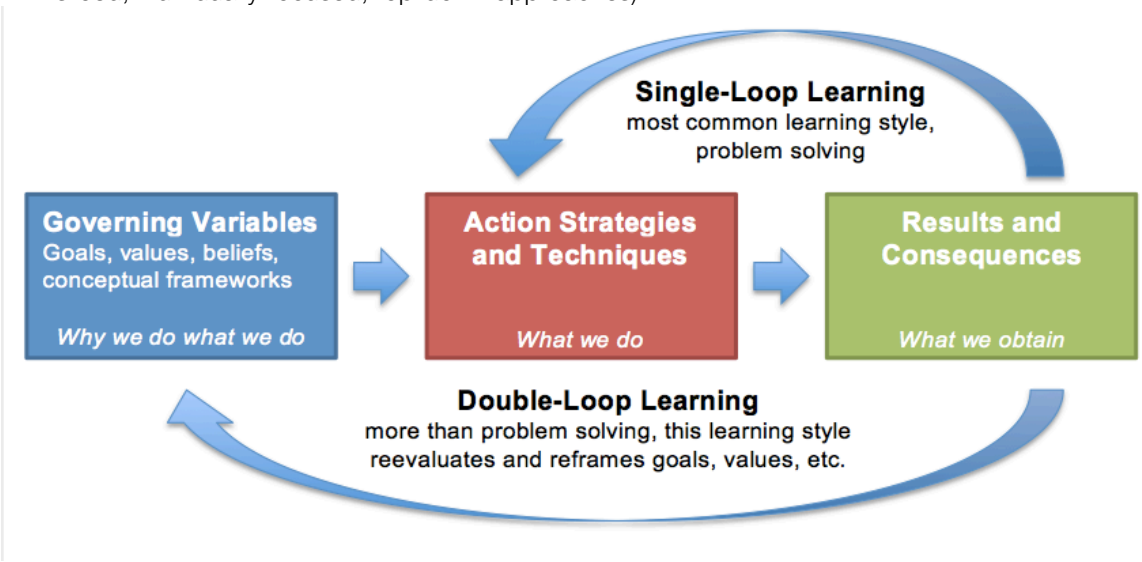


Figure 5. Double- vs single-loop learning. Retrieved from http://www.afs.org/blog/icl/?p=2653

In our third **ST3** Deliverable (Van Summeren et al, 2015), the factsheet document, we attempted to develop a practical, context-specific monitoring and evaluation template for various DSM tools (which can be used alone or in combination in behavioural interventions), with the specific aim to meet various *Behaviour Changers'* needs for outcome evaluation. This template is developed to match the monitoring and evaluation analysis in **ST 1 & 2** of Task 24. The factsheets are a template (completed for 3 types of intervention tools in the **Building Retrofit** domain: *Energy Performance Certificates, mass marketing campaigns and subsidy schemes*) which aims at providing indicators, metrics and ways to monitor and evaluate long-term, identifiable and/or measurable behaviour change outcomes of DSM programmes. These indicators aim to be context-sensitive and contingent on the sector/ goals/target groups of behaviour change interventions.

Multiple benefit evaluation

In order to prove ongoing success of behaviour change outcomes leading not only to energy savings, but also health, societal and environmental benefits such as e.g. community engagement or increased

species diversity, we also need to look at the additional benefits of behavioural DSM interventions. The multiple benefits of energy efficiency are outlined, with examples, in IEA (2014).

Figure 6. The multiple benefits of energy efficiency improvements. From IEA (2014).

The success of an intervention is usually evaluated on the basis of its cost-effectiveness or its kWh savings (which are often modelled, not measured). However, this does not provide insights about whether or not long-term behavioural change is achieved. Cost-effectiveness and kWh reduction may also fail to capture many of the potential social welfare outcomes and/or impacts such as job creation, positive health effects, reduced environmental externalities etc. Moreover, interventions may have positive spill-over effects that not only influence the target *End User* group (e.g. neighbouring effect) but have larger systemic impact, and longer-term effects.
Two different types of spill-over might be of particular interest, namely spill-over to:

i) Other people, e.g., peers, neighbours, family and friends; and
ii) Other types of energy-related behaviour.

In addition, energy end users often value other features beside cost reductions which are not included in these cost-benefit calculations (e.g. health or safety improvements). This demonstrates that evaluating success of an intervention should allow the identification of multiple definitions of success – by the *End User* the intervention is targeted at, and the *Behaviour Changers* who helped co-create it. It is thus considered valuable in large national programmes such as insulation subsidy schemes, to do some pre-testing of what outcomes would mean a successful programme and to whom (e.g. NZ's *Warm Up New Zealand: Heat Smart* programme, see Mourik and Rotmann, 2013; IEA, 2014).

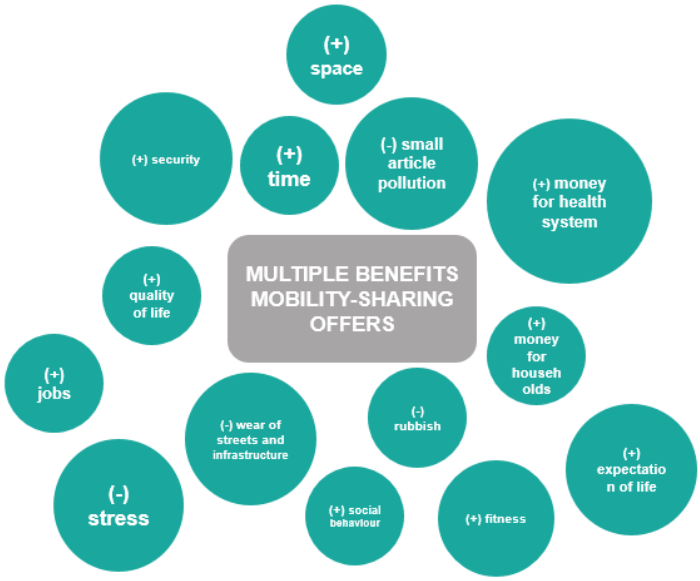


Figure 7. Example of multiple benefits in the transport sector (Austrian case study, see Kallsperger and Rotmann, 2017).

Of course, a problem with focusing on multiple benefits for different *Behaviour Changers* also leads to the question of weighing up the different (perceived) outcomes. In interventions that take a more comprehensive or systemic approach from the onset, with participation of multiple stakeholders, the whole process of aligning all these interests and needs becomes a challenge in itself. A solid understanding of where the different *Behaviour Changers* in such a systemic intervention sit in terms of their perceptions of successful outcomes and the intervention meeting their needs, will help design interventions and their M&E regimes better from the outset. A *Collective Impact Approach*, as used here, can go a long way to aid collecting and analysing these different mandates, drivers, needs and perceptions from the outset. We have thus collected the multiple benefits each *Behaviour Changer* perceived as part of the *Behaviour Changer Framework* exercise in Task 24 workshops (see e.g. Fig 7 above for multiple benefits from mobility-sharing platforms, Workshop 2 in Graz, September 2017).

Subtask 6 – Understanding the main DSM issues

Background

As part of **ST 2 & 4** of Task 24[5], many DSM stories and issues were being identified that lack in-depth understanding and are in need of further research to account for context specificities. Most countries have not clearly identified these top questions with the input from the whole range of *Behaviour Changers*. We acknowledge that the priorities differ between countries, due to different national contexts. We have ascertained and will highlight these country differences (in **ST 10**). The focus in each country is on three overall priority areas which is then further narrowed down to the top DSM priority that the relevant *Behaviour Changers* (**ST 7**) will be selected for. This decision-making process of focusing onto top DSM priority areas, collaboratively, is already an important step to foster engagement, empathy with multiple stakeholders and builds on the *Collective Impact Approach* (see above). Collating the relevant group of *Behaviour Changers* from all five Sectors for at the top priority area in each country enables shared learnings and the co-creation of more focused intervention approaches and case studies according to each of their insights (**ST 8 & 11**).

Objectives

- Develop lists of top 3 DSM implementable issues and their potentials in each country
- Use the *Collective Impact Approach* and the Task 24 Expert Platform to research and review current approaches and practices, nationally and internationally, on these top issues and provide feedback from the different disciplinary perspectives (**ST 7**)
  Feed these cases, and the ones analysed in **ST 1 & 2** into a Toolbox of Interventions (**ST 8**).

Deliverables

- D 8: List of top 3 DSM issues, including analysis of case studies elsewhere and their approximate contribution to each participating country's load management (economic, technological, political and societal potentials)
- D 9: Continued collection of case studies and stories to add to the "Monster" Wiki (**ST 1 & 8**).

Subtask 7 – Who are the relevant *Behaviour Changers*?

Background

In addition to the **ST5** expert platform, we have developed more focused networks in the participating countries. The *National Experts* are coordinating this second layer of country experts. In Sweden, we have focused on one main DSM topic, namely **green leases in commercial buildings.**

Objectives

- Identify, with help of the ExCo and National Experts the most appropriate *Behaviour Changers* focusing on at least one of the top 3 DSM issues chosen by each participating country.
- Collect detailed information on their specific interests, organisations and roles.
- Use the *Collective Impact Approach* to initiate discussions between different disciplinary perspectives and sectoral contexts. An explicit focus will be on deepening the understanding

[5] www.ieadsm.org/task/task-24-phase-1/

of the political-institutional context *Behaviour Changers* are operating in and what it means for their capacity to take a more systemic approach to behavioral change.

- Develop national *Behaviour Changer* dialogues in each participating country by holding (bi) annual workshops (**ST 6 & 8**) to foster mutual engagement, collaboration and shared learning and enable them to build relationships on neutral, trusted ground.
- Backbone support to set a common agenda, measurement systems, mutually reinforcing activities and ongoing communication between the *Behaviour Changers*
- Evaluate *Behaviour Changers'* impressions on the effectiveness of the *Collective Impact Approach* and use of narratives as a common language to overcome barriers
- Collect examples of successful matchmaking stories.

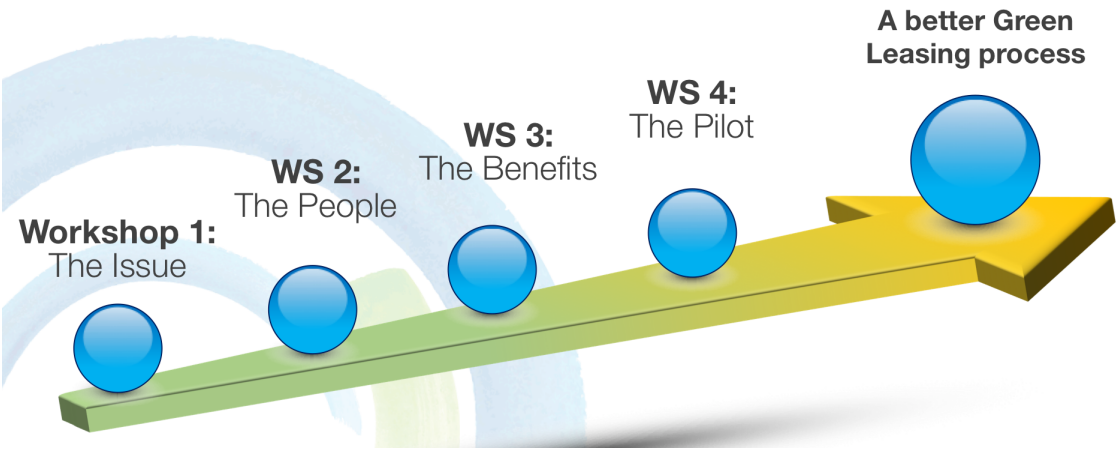
Deliverables

D 10: National networks of *Behaviour Changers* from all 5 sectors (government, industry, research, the third and service sectors) in at least one of the top 3 DSM focus areas (chosen in **ST 6**); including workshop reports, videos, presentations, stories, blogs, Wiki etc.
D 11: Evaluation Report based on stakeholder analyses on the effectiveness of the *Collective Impact Approach* and use of narratives as a common language to overcome barriers.

In summary, the Swedish contribution to Task 24 was shaped in accordance with the following methodology:

Step	Procedure	Method
1	Identification of the top 3 DSM issues in Sweden ("The Issues")	Workshop 1, informal talks, networking
2	Identification of the *Behaviour Changers* in Sweden; national & international expert network ("The People")	Workshop 2, Swedish Energy Agency partners, eceee summer studies 2015 and 2017, Task 24 expert network
3	Application and testing of Task 24 tools ("The Tools and Stories")	Four Task 24 Workshops Stockholm, BEHAVE conference 2016
4	Input for the pilot of green leasing in the commercial office sector ("The Case Study")	Workshop 3 & 4 Engagement of experts (workshops + BELOK), stakeholder interviews

Task 24 milestones in Sweden



Outcomes

The main outcomes from Sweden are structured into four parts: 1) Main DSM-issues, 2) Top Issue on Green Leasing, 3) Cross-Country Comparisons and 4) A Pilot with the Swedish Energy Agency.

Overview of Main DSM Issues in Sweden

National potential for Energy Efficiency and Demand Side Management

During the first workshop held in June 2015 (see combined Swedish workshop minutes for details), several barriers and market failures were discussed. Questions were raised if the Swedish Energy Agency is doing enough and if the policy instruments work as they should. It became clear that the Swedish building code standards and building stock is far above average, compared to most other OECD countries. One of the major initiatives, the "1 million homes" social housing building retrofit programmes was already discussed in the *Hållbara Järva* case study (Mourik and Rotmann, 2013). Other Swedish case studies focused on Design Thinking ("The Energy Aware Clock") and a collaborative approach to promote energy saving in SMEs in Eskilstuna. The main Subtask 2 case study focused on a top area of interest – Transport, analysing the Stockholm congestion pilot (see Nyström, 2014).

Transport and SMEs were still regarded as top DSM issues that could benefit from more behavioural interventions, but the discussion focused in on commercial building retrofits. Below is a short overview of the top Energy Efficiency policy instruments aimed at building owners and tenants in Sweden (for background see Swedish Energy Agency (STEM) 2015). They are not ranked by priority or efficiency.

Energy-Efficient retrofit measures

Cost-effective measures: Which retrofit measures are cost-effective for a building owner or for a tenant to undertake vary due to different parameters such as the economic situation of the company i.e. their required rate of return, their purchasing competence, the need of a renovation and supply and demand etc. Regardless of these parameters, it is important that the property owner has the necessary understanding of its building stock in order to make the right decisions regarding energy efficient renovations. As for the tenants, it is important that they have the right knowledge in order to understand how their business affects their energy use and how they can make it run more efficiently. Part of entering a Green Leasing arrangement can be towards ensuring the most appropriate retrofit measures (for landlords and tenants) are taken (cf. the Swedish Energy Agency case study, BELOK 2016 and 2018).

Using Total Concept as a day-to-day working tool

In order to obtain the necessary information and knowledge of its stock building owners can use the *Total Concept*[6] as a day-to-day working tool. The *Total Concept* was developed by *BELOK* in the mid-2000 and is a refined method for improving energy efficiency when renovating a building. The first pilot study was conducted in 2007 and the concept has so far been applied in more than 200 buildings. The method is based on a package of energy-efficient retrofit measures being formed as a package that together fulfils the building owner's profitability requirement. By using the method when renovating, building owners can decrease the energy use by as much as 50 percent, sometimes even more when it comes to commercial buildings. The method consists of three steps. Step 1 involves creating a package of energy-efficient retrofit measures. This involves collecting different kinds of data such as energy use. In order to do so, an energy audit for the building is conducted. In Step 2, the measures are carried out and in Step 3 the retrofit is evaluated. The evaluation involves additional data collection in order to compare and analyse the building energy use before and after the retrofit.

Energy-efficient policy instruments aiming to make the energy use more efficient in commercial buildings

In Sweden, there are a number of different policy instruments aiming to make the energy use in the building sector more efficient. The instruments are mostly directed to the entire building stock and therefore not specified to the commercial building sector. Below is a list of different policy instruments and a description of how commercial building owners are affected by the instruments. The list is not complete, but gives an overview of different types of instruments:

[6] http://belok.se/totalmetodiken/

- Building regulations: Planning and building law; the purpose with the building regulations is that the buildings should fulfil essential technical requirements. The purpose is also to support the Swedish environmental targets, such as "Good built environment". When it comes to energy use, the regulation states that the building is to be constructed in order to limit energy use through low heat losses, low need for cooling, an efficient heat and cool use and an efficient electricity use.
- EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - EE certificates.
- Green leases: By using a green lease, both the building owner and the tenant are involved in the process of make the energy use more efficient. A green lease exposes the distribution of responsibilities between the parties (see BELOK, 2016).
- Demonstration projects: The Swedish Energy Agency (STEM) is funding demonstration projects that allow property owners to test new, more energy efficient methods. Building owners can apply for doing a demonstration project i.e. when testing the *Total Concept* method for the first time or likewise.
- Technology procurements: STEM is also funding different technology procurements to more rapidly get new energy-efficient technology on the market. A building owner can participate in the process as a purchaser of the new technology.
- Apply for financial support when conducting an energy efficiency audit: SMEs can apply for financial support from STEM when conducting an energy audit. The financial support covers a maximum of 50 percent of the total cost of conducting an energy audit.

Decision-making process leading to the Swedish Top two DSM Themes

In Sweden, there are several barriers that prevent cost-effective/profitable energy efficient retrofit measures. Some of them can be classified as market failures. The top market failures are classified as knowledge barriers and split incentives[7]. At the time being, Sweden has various ongoing policy instruments in place in order to correct for these perceived market failures[8].

The first issue we discussed in Workshop 1 (June 5, 2015) was **tariffs and incentives to improve load shifting**, especially with hot water. Other than being cheaper it would also reduce CO_2 emissions, it can be visualised and be made competitive. Addressing the energy behaviour of end-users has become increasingly important in Sweden and there have been several initiatives that target behaviour change through a number of methods, such as energy use visualisation. We undertook a Task 24 "issues analysis" as a quick dive into the practicability of such an intervention (see Fig 8). The *Behaviour Changers* estimated what the various technological, economic, societal and political potentials and risks (in %) would be should this project be implemented as a national programme.

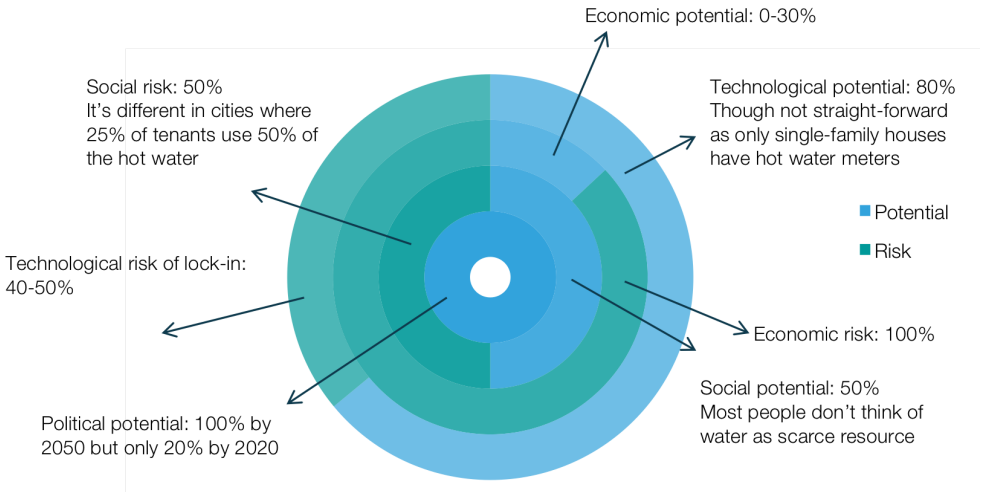


Fig 8. Issues definition to visualise the potential opportunities and risks if designing tariffs for load shifting hot water.

[7] Based on 2013 Analysis of barriers and market failures connected to energy efficient renovations conducted by Swedish Energy Agency and National Board of Housing, Building and Planning.

[8] Policy measures aiming to correct for the market failures as mentioned are procurement networks, demonstration projects, energy certificates, eco design labelling etc.

The second issue that was discussed focussed on **split incentives between commercial building owners and their tenants and the usage of green leases in the commercial building sector.** Green leases were chosen since they are used in order to correct for split incentives and because the participants clearly saw, during the issues definition exercise (see Figure 9 below), that there are some improvements that can be made in order to increase the usability of green leases.

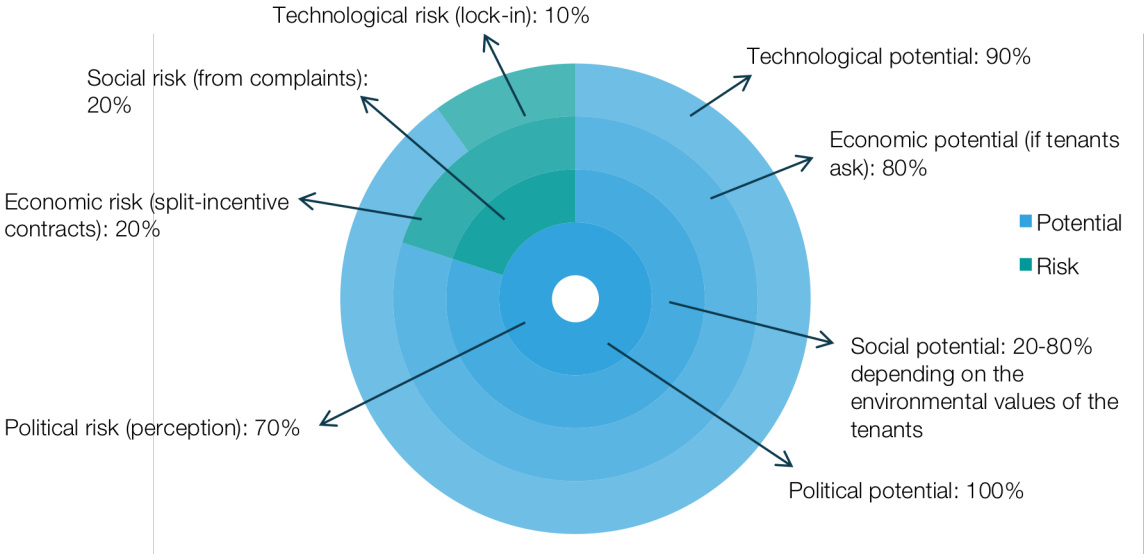


Figure 9. Issues definition exercise to visualise the potential opportunities and risks for improving green leasing between commercial office landlords and tenants.

The decision to focus on this as Sweden's top issue was taken in close cooperation with members from the procurement network *BELOK* (a network with 19 large Swedish non-residential real estate owners) that is organised and financed by the Swedish Energy Agency, with National Experts for Sweden (Maria Alm, Svetlana Gross, Tomas Berggren, Sandra Lennander (all Swedish Energy Agency) and Agneta Persson, WSP) and the international Task 24 expert Dr Sea Rotmann[9]. Once this topic was chosen, other international experts on green leases, under the lead of Dr. Kathryn Janda from Oxford University (now University College London), became involved.

Swedish Top Issue: Green Leasing in Commercial Office Buildings

Background

In 2014, the building sector in Sweden used 76.1 TWh 27% was used by the commercial building sector. The total energy use in buildings for heating and warm water has decreased by 30% from 1985 to 2014. The average energy use in commercial buildings in 2014 was 121 kWh per square meter. The Swedish building code states that new commercial buildings or buildings that undergo major renovation should use 70 kWh per square meter at the most if the commercial building is located in the third climate zone[10]. So, even though the energy use in the building sector has decreased during the last 30 years, there is an opportunity to decrease it even more, especially when existing buildings undergo a renovation[11].

However, there are barriers that prevent the full potential to be realised. The impact of these barriers can vary depending on type of building, size of the building owner, the economic situation on the market and the economic situation for the company etc. As for the commercial building sector, there are at least two barriers of importance when it comes to decreasing the total energy use of a commercial building. The barriers are **lack of knowledge about energy efficient measures** when

[9] See workshop minutes

[10] Sweden has four different climate zones.

[11] It is important to note is that these numbers only show us the energy use for heating and warm water, meaning that the energy used to run a business is not included in the numbers.

undergoing a major renovation and **split incentives** between the building owner and the tenant. Sweden already has different kind of policy instruments in place that are aiming to correct for lack of knowledge about energy efficient measures when undergoing a major renovation and how to deal with split incentives. However, some of them might need some improvements in order to work as efficiently as they could.

One such policy instrument that corrects for split incentives is **green leases** between building owners and tenants. The national Association of private property owners *Fastighetsägarna* designed their "Grönt Hyresavtal" (*Green Lease*) template in 2010-11. A significant number of building owners have started using their *Green Lease* in Sweden (around 2500, BELOK 2016). However, from our workshop conversations and the market review and interviews our Swedish expert Bosse Wikensten from BELOK undertook in 2016, it became clear that improvements can still be made: a) to make more building owners and tenants willing to use green leases more frequently, b) to avoid "green washing" and address c) a perceived imbalance in benefits between tenants and landlords. If the **green leasing process** (see definitions above) can be improved it could lead to building owners undertaking energy-efficient measures that they wouldn't do without the involvement and closer relationship with the tenants, including a better understanding of their specific needs. If green leasing was used more frequently and appropriately, this could lead to a significantly more efficient use of energy in the entire commercial building sector, and a better relationship between landlords and tenants, leading to a reduction in split incentives.

Main Issues regarding Green Leases

Task 24, in collaboration with the Swedish expert team has formulated two further areas of attention:

1. *The need to elaborate our empirical knowledge base (elaborate on who, why, how?)*

This is based on the fact that when building owners conduct energy-efficient renovations they only focus on the energy use connected to the building itself. By doing so they do not include the energy use needed for the business/es which are housed in the building and therefore they know nothing, or very little of the building's total energy need. As the technology and the different systems in a building become more energy efficient, building users' behaviour connected to their businesses' energy use becomes more important to reduce the total energy need of commercial buildings.

There are several different stakeholders involved in the work of a commercial building energy needs. Even if they do work within the same area they face different incentives, challenges, future expectations and motivations. They may face similar practices, norms, organisational structures and physical characteristics but still respond differently based on their position in that chain, ownership structure or regulatory model. In order to understand what kind of different incentives and challenges they face and how it might affect their work and the total energy use of a building, we need to broaden our empirical knowledge base by exploring their different roles when implementing a green lease.

2. *The need to understand the roles of the different Behaviour Changers when using green leases to co-create improved interventions, using a collective impact approach as process tools to overcome language/jargon barriers, inherent systemic barriers and silos*

Working in silos is a common phenomenon, not only in the building sector. Social norms and jargon barriers and aversion to change ("we do as we always have") are examples of challenges that are ubiquitous but can be hard to correct for. Below are some examples of challenges/barriers that might give rise to other challenges and barriers. By correcting these issues, it could lead to other challenges and barriers also being corrected for.

- **Split incentives** causing silos between tenants and landlords (or spreading of the value stack across many participants such that none is motivated to act). Also differ between cold vs warm rents, net or gross leases, if there are sub meters or split rents.
- **Imbalance in benefits** with current Green Leases being more advantageous to building owners.
- Benefits or constraints from the **regulatory environment** (such as EDB regulation or access to smart meter data).
- Role **of tradition, social norms** and room for **radical change** in challenge to these characteristics of Landlords and Tenants (both *End Users* in this topic).
  Core knowledge is lacking (e.g. research and education on behaviour change)
- **Evaluation of impact** of programmes like Green Leases (lack of data or audits)
- **Lack of consequences** if Green Lease agreement is breached ("green washing").

Types of behaviour and the role of *Green Leases* in commercial buildings

The primary motivation ultimately is to affect more sustainable energy behaviour of *End Users* – commercial building owners and tenants.

The roles of Green Leases as a supporter

- Green Leases expose the distribution of responsibilities between a building owner and a tenant.
- Green Leases increase collaboration between landlord and tenant, which increases the ability to create well-functioning premises with good indoor environment.
- Since the Swedish version of Green Leases also includes other environmental aspects it helps to compare the environmental- and energy-related performance of different buildings and facilities, both within and between individual actors' property portfolio.
- In addition, the agreement will contribute to lower costs, when the use of energy and other resources is reduced, which can be shared between the landlord and tenant.
- Increase property value.

Users and their dealings with the building

- Ability to understand the whole picture. How each building user's behaviour affects the total energy use and where their role fits in the chain.
- Part of the projected energy savings will be achieved through a better understanding of the building and better use of its systems and through changes in daily routines.

Fastighetsägarna's Green Lease ("Grönt Hyresavtal")

From BELOK's 2016 market review:

- Many stakeholders are happy that there is a market standard.
- The standard (basic) version of the green lease is easy to accept, whereas the enlarged version meets more resistance. The enlarged version is mainly used when the tenants have their own sustainability agenda/demands.
- Some consider the standard version being just common practice, and therefore intend to include the most important parts in their standard lease instead of using the *Green Lease* Appendix.
- The paragraphs in the *Green Lease* – mainly the standard version - are not always followed by the stakeholders. One example is that not even the compulsory annual meeting takes place, in many cases. This is causing questions as to what consequences should follow if these Agreements are breached. Right now, that there are no repercussions, which leads to "green washing".

There are between 16 and 41 potential requirements to consider on the Swedish *Green Lease*. The 16 basic ones are mostly about exchanging information and buying green appliances. The enlarged version requirements provide larger energy savings potentials.

Table 1. Overview of Green Lease requirements (from Workshop 2)

	Landlord	Tenant	Together	Total
OBLIGATORY	6	3	6	16
VOLUNTARY	14	5	7	25
Total	**20**	**8**	**13**	**41**

Using the Task 24 *Behaviour Changer Framework* on this Top Issue

After doing the initial *Behaviour Changer Framework* ("magic carpet") exercise and collecting stakeholder feedback at the first workshop in 2015, we delved more deeply into the specific issue at the second workshop on March 21, 2016.

Behaviour Changers on Green Leasing in Sweden

Various *Behaviour Changers* were invited to the four workshops. We had the Swedish Energy Agency as *Decisionmaker*, various major commercial landlords as both *Providers and End Users*, the Real Estate Owners Association *Fastighetsägarna* as *Middle Actor*, national and international research *Experts* from academia and consulting, and the Swedish Green Building Council as *Conscience.* For the final workshop, we also had the new STEM landlord and STEM facility manager. Their relationships and systemic conflicts were explored in the "magic carpet" exercise (see workshop notes and Fig 10).

Figure 10. Magic carpet exercise, Workshop 2, March 2016.

The Behaviour Changers' main mandates, stakeholders, restrictions and tools

Detailed descriptions can be found in the workshop minutes. There is also an animated walk-through.

The End User (tenants in commercial office buildings) context

BEHAVIOUR	Goal: Co-create a Green Leasing process between commercial office landlords and tenants that works
TECHNOLOGY	• Feedback, smart meter, sub meters • Lighting • Appliances and labels • Thermostats • ICT • Coffee Machines
SOCIAL	• Utility • Landlord • Co-workers • Management • HR/Unions • Lawyers • Installers/Tradespeople • Procurement officers • Staff • PR and marketing department
INFRASTRUCTURE	• Building Management System • Security system • HVAC and District Heating/Cooling system • Water and energy supply • Waste/recyling • (Public) transport and EV charging system • Servers
WIDER ENVIRONMENT (geographic, political, regulatory etc.)	• 4 climate zones • Cold and dark in winter • Political system • Green Lease Agreement brand • Paris Accord • Swedish climate targets

Multiple Benefits of Green Leases

We undertook a quick definition of co- or multiple benefits of green leasing in Sweden (see Table 2).

Table 2. Overview of multiple benefits, metrics, methods and benefits

Co-Benefit	Measure or metric	How to measure?	Who
Indoor Environmental Quality	Perception by building users	Surveys/interviews	Building users
Improved productivity	Company output	HR data, profit	Employers/ees
Improved health	Reduction of sick days	HR data	Employers/ees
Staff wellbeing and happiness	Better staff satisfaction	HR surveys	Employers/ees
Increased thermal comfort	Fewer complaints	HR/facilities	Building users,
Marketing, brand, reputation	Positive brand recognition, increased revenue/contracts	Marketing research	Employers
Staff loyalty and engagement	Staff satisfaction	Surveys	Employers
Greater influence	Performance feedback	Management 360s	Employers/ees
Facility Managers empowered	Greater job satisfaction	HR surveys	Facility Managers
More skills & training	Training days, kWh savings	HR data, energy data	Facility Managers
Triple bottom line reporting	CRS measures, awards	Various data	Employers
Use learnings outside of work	Staff habits at home	Surveys	Employees
A more valuable building	Higher market value	Real estate data	Landlord
Lower maintenance & running	Operational costs	Accounting data	Landlord
More educated tenants	Lower energy costs	Energy data	Landlord/Tenants
Improved relationships	Green leasing process	Green Lease/surveys	Landlord/Tenants
Longer tenant agreements	Length of lease contracts	Lease Agreement	Landlord
Good PR	Positive brand recognition,	Marketing Research	Landlord
Attractiveness to tenants	Ease of getting new tenants	Real estate data	Landlord
Profitability	Increased rent	Real estate data	Landlord
Competitive advantage	More profitability	Real estate data	Landlord
Traffic reduction	Reduced parking space needs/vehicle days	HR surveys/parking space surveys	Landlord/City Planners
Influence on urban planning	Engagement with city	Surveys	Landlord/City
Reduced greenwash	Green Lease audits	Legal data	All
Sustainable energy system	Reduced carbon liability	Fewer GHGs	Government
Increased energy knowledge in	Greater EE knowledge	Surveys, energy data	Government/
International leadership	Awards, best practice	OECD statistics	Politicians
Good examples	Case studies	Reports, mentions	Government
Greater government support	Increased votes	Voting data/polls	Politicians
Increased relevance	Acceptance by peers	Invitations to keynotes,	Researchers
Greater expertise	Acceptance by publishers	Number of papers,	Researchers
Impact in the real world	Acceptance by policy	Consulting contracts	Researchers/
Greater networks	Researchers in network	Co-authors	Researchers
More funding	Amount of research	Financial data	Researchers
Save the world	Take-up of research	GHG reductions	All
Help members	Memberships	Number of members	Fastighetsägarna
Prove Green Lease works	Improved uptake of GL	Number of leases	Fastighetsägarna
Benchmarking	Prove impact	Data collection, audits	Fastighetsägarna
Meet legal requirements	No contractual issues	Reduced legal costs	Fastighetsägarna
International best practice	Improve PR, awards	(Marketing) Research	Fastighetsägarna
Increase profile	Brand recognition	New contracts	Fastighetsägarna

Our common goal

We discussed the common goal in Workshop 3, October 3, 2016:

> *We aim to co-create a working Green Leasing process for Swedish office buildings. We aim to help office building owners and their tenants to contribute to managing Sweden's resources better. We aim to create real change by empowering tenants and changing Green Leases from a product to a process that improves relationships and has many co-benefits. We aim to identify and measure the multiple benefits to each of the parties involved in the process.*

What is "in it" for every Behaviour Changer involved?

In general:

- Understand the difference between viewing your energy system through the human, rather than the technocratic lens
- Map out the energy system from a human perspective and identify where you fit within it
- Identify the best ways to interact with other stakeholders of your system and develop strategies and roadmaps for better partnering with them
- Practice using energy narratives as a common language and develop your energy story that can be used in real life
- Learn about monitoring and evaluating behaviour change interventions beyond kWh and beyond energy.

For Task 24:

Garner learning about the Swedish situation and fulfil our action research goal by testing our "Task 24 toolbox for Behaviour Changers" in real-life situations

For the Swedish Energy Agency (the 'Decisionmakers'):

Improve the uptake and development of green leases in commercial office buildings and fund a pilot that involves all actors needed to co-create a better green leasing process.

For the Researchers (the 'Experts'):

Provide expertise (which will be funded in the pilot) on the use of green leases here and overseas, and collect data before, during and after the process. Aid evaluation of the pilot and disseminate the outcomes, including in scientific literature.

For Landlords or Property Owners (the 'Providers'):

Ensure your meets as property owners are met and included in the design of a better practice in green leasing. Be able to announce yourself as a leader in the field and establish closer relationships with current and future tenants which will improve both the quality of your property stock and the longevity of your tenant relationships.

For the Swedish Building Council (the 'Conscience'):

Develop your understanding on green lease agreements which will lead to strong PR potential for taking a leadership role at the World Building Council.

For the Real Estate Owners Association (the 'Middle Actor'):

Improve your Green Lease standard and improve your value proposition to your members and increase your membership.

For the Tenants (the 'End User'):

Ensure your needs are met and that you and your staff will get the best leasing arrangement to become a leader in green office buildings and work behaviours. Have a better relationship with your landlord and improve your staff performance, loyalty and pride in your organisation.

Storytelling

All Swedish stories can be found in Appendix 1. Here is a collection of the most relevant ones.

The Swedish Energy Agency's story (told in Workshop 2)

Once upon a time… There was an energy agency in Sweden than wanted everyone to use energy and resources in a sustainable and equitable way. It was also what the government wanted the agency to do, just as long as the free market didn't get disturbed too much and the citizens didn't feel deprived of their freedom of choice.

Every day… The agency was thinking of ways of how to improve the situation, trying out different measures, research and development that could influence the market without influencing and disturbing too much. It was sometimes successful and sometimes not so much, and it was difficult to know why some things work and others don't.

But one day… Dr Sea came along and offered a way of getting into peoples' heads without impacting on the marketplace much. The people themselves will realise that more sustainable energy use will benefit them all and that people can change behaviours through understanding each other's needs and situations and collaborating on solutions.

Because of that… The most burning issues (green leases) that the marketplace wasn't able to solve were brought up to the table and the relevant stakeholders gathered around it. They were at first a little careful when telling what problems they met in their daily work life but slowly they got more comfortable and exchanged their stories around this burning issue more freely. The agency realised that it can't do much on its own to solve this issue without others seeing the (multiple) benefits of the improvement, but it was eager to support the change financially.

But then! After having talked a couple of times the stakeholders went home to their businesses and decided that the potential gains are too small for them, their bosses didn't see how spending time on green lease improvement will earn them more money, and their lawyers weren't interested in changing their lease contracts. So the collaboration was on the brink of breaking down. And the agency's financial support was too little to play a role.

Because of that… Next time Dr Sea was in town she invited many more people to the table – from Sweden and from overseas. Then the conversation became even more interesting and started focusing on the bigger picture of what a good work place and a good tenant/landlord relationship might look like if more actors cooperate and share the benefits.

Until finally… All the Behaviour Changers could agree on a long-term plan of how their neighbourhood would become more attractive and how many more benefits they all could achieve through offering services to each other's businesses. Suddenly, the main Green Lease opponents realised what a good and profitable idea it was.

And, ever since then… Most commercial landlords have started to offer the improved green leases to their tenants all over the country and the tenants are happy to participate. Now the energy agency is proudly promoting this outcome and supports constant improvement of the green leasing practices. The agency is also spreading this magic method to other difficult issues that the marketplace has failed to solve so far. **The end**.

AFM (the Provider)

Once upon a time… There was a landlord that wanted to get *Green Lease* agreements out to its tenants because it wanted to take responsibility for the environment and sustainability issues.

Every day… He tried to engage tenants into his climate work with the help of dialogue and various tools he had at his disposal.

But one day… He realised he needed to visualise the climate impact more clearly and develop tools such as energy audits and better training of his building users.

Because of that… He decided to have a dialogue and information/education training between the parties to understand each other and the bigger challenges they each faced.

But then! It was clear that not everyone followed his agenda and the green leases weren't implemented the way they were intended.

Because of that… He had to go back to the drawing board with his other Behaviour Changer colleagues and try to understand the model of the Green Lease better, and share the responsibility of making it work among the wider community.

Until, finally… they all realised that together they could participate and contribute to a sustainable future.

And, ever since then…Green Leases have been implemented much more strongly and the whole exercise has led to a better understanding and trust between the different Behaviour Changers.

Real Estate Owners Association (Middle Actors)

Once upon a time… The Real Estate Owners Association tried to get more landlords to use the *Green Lease* appendix and help improve it. They knew that even though the physical improvements in buildings are important, tenants' buy-in and behaviours are ultimately responsible for the result to be great.

Every day… They worried that even though "saving the environment" makes good economic sense they knew they had to find solutions for both the landlord and the tenant to have these benefits also show up in their profits.

But one day… They realised it *was* profitable and they only had to find the right standard for the whole industry that works for many (types of) real estate, landlords, tenants etc.

Because of that… They set out to prove that a happy tenant also means a more valuable property for landlords. To that end, they started collaborating with others and working on their data collection and evaluation of surveys.

But then! It was clear that not everyone could follow their ideas and that knowledge simply often was lacking on the tenants' side. They realised that the more knowledge there was, the more interest there would be and that they had to create simple tools in order to help tenants save time and be greener.

Because of that… They co-created an industry standard involving the tenants and other Behaviour Changers.

Until, finally… they all realised that together they could spread the knowledge, change the law and create a more sustainable future.

And, ever since then…They keep going, as the option of not saving the environment with all their tools was too dire to imagine. **The end**.

The following story was highlighted in the Task 24 publication on using the fairy tale story spine (Rotmann, 2017).

"Two Swedish girls" – as told by the '*Conscience*' during a workshop.

Once upon a time… there was a girl who had two friends: one who had a really cool, super-green house who needed a roommate and one who loved eco issues and needed a place to live.

Every day… the girl in the super-green house longed for someone who loved green houses as much as she did, to come live with her, and the other girl dreamt of living in a super green home. So, their common friend introduced them to each other and they moved in together.

But, one day… the girl who owned the super-green house turned the temperature down to 19C and gave her new roommate a bill for green electricity, which was much more costly than conventional fuels. They also got into an argument over which cleaning chemicals to use. So, their common friend suggested that they should come up with some house rules and made a contract they could both agree on.
Because of that… the two girls found that they were both much happier and lived quite well together because they both knew the rules and stuck to them. Many of their friends saw how happy and green they were and asked them for their contract.

Until, finally… they started an instagram account (#happygreenlease) showing all of the happy moments in the house. The contract and hashtag was copied all the around the world.
And, ever since then… they lived happily ever after. **The End.**

Main issues of discussion in Task 24 Workshops

Identifying the right Behaviour Changers is hard

Several discussions were held regarding who the most appropriate Behaviour Changers from each sector would be and it proved to be one of the more difficult aspects of utilising this tool in Sweden. A proper commercial (Green) Lease Agreement involves lawyers, who are often not engaged in the design process. Normally, lawyers just want to de-risk a situation, not cause any potential issues for tenants (thus pro forma acting as the tenants' *Conscience*). It is always preferable an agreement manages to get the lawyers on board as support system, rather than brake system (this discussion was extended in Workshop 3 with Irish lawyers focusing on green leasing). It could also be pointed out that many lawyers in Sweden are probably not familiar with green leasing arrangements, which may result in them being extra risk-averse.

How can we avoid green washing?

For now, *Green Leases* in Sweden are voluntary though there is a legally-enforceable aspect to them but only if landlords and tenants are interested in them will they work. It is important to check if a lease clause strong enough the way it is written to be used in a court of law. If landlords and tenants do not cooperate with the *Green Lease* Agreement in Sweden, it simply won't work. The duty to cooperate is an issue, more like a memorandum of understanding rather than a new, agreed lease which is intentional but not legally enforceable.

What are we actually trying to change and can we compare it internationally?

One point of a green lease is how the tenant wants to use energy, another point is how the building delivers energy. In Australia, it is called the 'Landlords and tenants guide to happiness'. In Sweden it is about operational ratings (in all buildings). In the UK, it is about operational and design ratings. One major issue is that often, the energy performance of a building before and after a *Green Lease* has been put in is not adequately assessed (in Sweden).

How could behavioural economics support better understanding?

The behavioural economics expert from IVL talked about many factors being more important than the monetary drivers alone. Especially emotions do have a big impact on behaviour. Classical economics thinking means that landlords and tenants should be able to agree on a green lease. Despite having "rational choice" there are problems with split incentives and asymmetrical information (landlord risk, moral hazard, free-riders), which should be able to be solved by bargaining. In some cases, a commercial landlord cannot monitor how much energy a tenant is using (asymmetrical information), which the tenant may know. The tenants also know more about behavioural activities that go on in their building. This can lead to a further Principal Agent issue between management, who pay the bills, and staff, whose activities cause the high energy costs. Asymmetrical information can also be a driver, not just a barrier (e.g. knowing that a *Green Lease* will make a building perform better than a competitor's). But we need tools to create a model that divides tenants and property owners and they need to be simple.

It is hard to develop such tools due to:

1) Cognitive biases
2) Rights not being easily measured
3) Asymmetrical information
4) Transaction costs (including psychological costs that affect behaviour).

Who are the actual End Users for Green Leases in Sweden?

Usually, only the lawyers and negotiating agents are involved – can they be nudged by behavioural economics? Can the lease become more of an active, real document that does create change? How? Usually people only refer to their lease agreement when there is a problem. The process of *Green Leasing* and establishing a strong collaborative relationship between tenants and landlords may be more important what than what is written in the document, which is the main issue lawyers concentrate on. How it is formulated and explained is important. We settled on **commercial office tenants**, though the exact end users may be a smaller, more focused sector which may come out of the cluster that the Swedish Energy Agency wants to initiate.

Which Behaviour Changers are missing?

Decisionmakers – Municipalities? Or Government departments like STEM? Residential property companies in municipalities have office buildings as part of their stock. A region that has a declared goal, like Gothenburg to be fossil fuel-free by 2040, GHG emissions per person etc. Public-private dimension with municipalities being property owners, tenants and landlords. Building Code – **BOVERKET**

Providers – **large and small office property owners** of different locations, preferably national.

Experts – We are doing well with the range of experts we have invited.

Conscience – **Lawyers?** For tenants and landlords?

Middle Actors – Commercial realtors? May be value of involving and training them. They know about Green Leases but don't really understand them and wouldn't sell them to tenants. Pity as it is an important 'moment of change' that is lost by not having a trusted Middle Actor in this position teaching the tenants. **Facility Management Companies** too. Represent the owners and have access to the systems and tenants and continue being involved. Also have access to the data of the building in use and their mandate is to manage the building well. Once a lease is signed it's usually put in the cupboard because nobody wants to involve the lawyers.

Light or dark green lease?

Originally there were two versions: a standard one, and the extended one. The smaller version, performed in the right way, could lead to better outcomes than the larger one Lighter version with 'teeth' and more content work behind it. Wrong terminology because it doesn't relate to impact. Our case: STEM is big tenant, so quarterly meetings would be good idea to discuss green aspects but not feasible for larger number of tenants. Framework of e.g. checklists is more important than the GL. Shared measurements and continuous communication very important, need to be flexible and move forward.

Covenant or schedule or MoU or Appendix?

In Sweden, it's an Appendix which is good as it can be used as amendment to existing lease or new lease. Would need to include clauses related to original lease agreement. Our case: important to agree on collective impact conditions rather than the green lease. Need to draw the system boundaries not just around the properties but also the wider system e.g. commuting? Tenants may not complain about the real problem and instead use something in the lease to pick on. Annual meetings to discuss any issues, not just the lease, is important. Green leases are not what we have to do, it is a suggestion of how lease can be formed. It is the minimum and what you build on it and the relationship you have between tenant and landlord is more important. Important to understand the different positions in the market – e.g. size of landlords, how green tenants are already etc. Could be largely around time-frames of follow-ups but the green lease solution was almost universal. In AUS and UK, it was usually larger landlords and larger tenants in larger, better performing properties – what about the others?

Property lawyers – help or hindrance?

Property lawyers will de-risk situation for the client. What is the other place besides the lease where some of the collaborative agreements could go? Old buildings that don't have energy-efficient technology and envelope already, are a much bigger problem. That's where our Appendix idea could come in useful. It is important not to confuse the lease with the leasing process. A problem with property lawyers that they are not always interested in green leasing or know much about it. How can different types of professions get greener? When Katy worked with property lawyers, she realised that they are often looking for their ability to contribute positively. Can also work with front-runners. Some got very excited that they could serve their client not just by de-risking but the larger contribution to society by helping enforce bigger environmental outcomes. Need to have an evolution of property law as much as changing the building performance themselves.

Incentives for over-performance or penalties for under-performance

Carrot and stick approach? Framework should provide a value and have clear tools of how to implement it – may be better than dealing with consequences? Contract can be bigger issue in terms of legal implications e.g. what happens if you sell the business? In Sweden, successful cause a few big companies were role models but if you want to make it broader, you'll probably see same problems as in Norway. It would be good to create a checklist for landlords that can easily be followed and measured. There shouldn't be any consequences but a good tool, and voluntary approach instead of green leases – for smaller, less efficient properties and clients. The Australian slogan about

happiness conceptualises finding a love match with the right landlord and tenant. This is very different to adversarial relationship which would be about consequences. Penalties problematic, incentives are much more positive.

Cross-country comparison of green leasing

International Experts

Dr Kathryn Janda is one of the leading experts on energy use in organisations, included tenanted property (Axon et al 2012). She analysed green leases and green leasing, in Australia and the UK, as part of her WICKED ((Working with Infrastructure, Creation of Knowledge, and Energy strategy Development) UK Engineering and Physical Sciences Research Council project (see Janda et al 2016). She partook in the last 3 Task 24 workshops on the topic and connected the Swedish expert team with green lease experts in Ireland and Norway (who also partook in one workshop). In 2018, she also visited the new Swedish Energy Agency office in Eskilstuna which was the topic of the third workshop. Finally, she lead wrote a joint peer-reviewed conference paper contrasting Sweden, the UK and Australia's green lease developments and co-presented this work at the European Council for an Energy Efficiency Economy's biannual conference (Janda et al 2017).

The Task 24 work in Sweden created an important opportunity to discuss green leasing issues in a collaborative environment with diverse participants (across the industry and from different countries) in real time. Previous research (e.g., Janda et al 2016) relied on separate interviews rather than group discussions. The Task 24 workshops facilitated new insights into the topic because of the joint discussions with multiple perspectives. In one workshop, the Irish participants shared an English language green lease they had developed, which was valuable because leases in England and Ireland are legal documents rarely available for study. Lawyers or property companies may describe the contents but often do not share the documents. In Sweden and Australia, however, the lease content is held differently and is easier to access. In another workshop, the Task 24 discussions led from a focus on the concept of green leases (words in a legal document) to green leasing, the larger process of sharing a property between landlord and tenant. A green lease might specify that the landlord and tenant need to meet to discuss energy issues; a focus on green leasing expands this to recognise the social factors and ongoing work that would allow such meetings to foster further engagement and dialogue, rather than just being a tick box exercise. The Swedish expertise in green leasing was essential in providing new insights for a matrix comparing the strength and alignment of landlord and tenant environmental practices. This matrix shows that green leasing can be led by tenants, landlords, both parties, or neither group. Most research on green leases assumes that landlords lead the way, but the UK/Australia/Swedish work shows that other configurations exist in practice.

Dave Collins is a PhD candidate from the Norwegian University of Science and Technology. Dave's research investigates how users impact on the sustainability of non-residential buildings, with a particular focus on the rental sector in Norway and the United Kingdom. His doctoral work focuses primarily on sustainable facility management and green leasing practices. David presented the Norwegian case for green leases, which was followed by discussions about the similarities and

differences between Sweden and Norway when it comes to the green leasing market and the associated practices. *Norsk Eiendom*, the Federation of Norwegian Property, is an organisation for private owners of commercial and residential properties which has been driving the development of green leasing practices in Norway. Norsk Eiendom launched the standard green leasing agreement approximately two years ago, but has not received the expected response from the market. Norsk Eiendom argued that the stakeholder that receives the largest benefits from a green leasing agreement should be responsible for the larger part of the costs associated with energy performance improvements. Rigid agreements, not covering sufficient building types, along with unattractive clauses for the market were the reasons for the weak market uptake.

A failed attempt by *Statsbygg*, the Norwegian government agency that manages the real estate portfolio of the Government of Norway, led to the signing of only two green leasing agreements within two years due to the combination of relatively high investment costs, low electricity prices and lack of government directives. Collins identifies a number of other barriers to the uptake of green leases in Norway as:
- market actors being intimidated by green leases and the associated obligations,
- lack of knowledge,
- insufficient dialogue between landlord and tenant, and
- omitting possible green leasing clauses that may already exist in a rental agreement.

It could be argued that the barriers to the further adoption of green leases in Norway and Sweden are somehow similar with low energy prices, lack of standard practices and knowledge, and issues about cost sharing.

In the workshop discussions, it was mentioned that the term "leasing" could be the reason that market actors feel intimidated by green leases, as it could be interpreted as something leading to increased administration and risks, and therefore negative. *Vasakronan* gave the example that the company has stopped using the term green lease and instead included green leasing clauses in standard rental leases, making virtually all their leases green leases. The company meets annually with all its tenants to follow up on the energy and CO_2 emissions related to the operation of each of its buildings.

Roisin Bennet, Brian Meldon and Deirdre Nifhloinn- the Irish case

Three professionals from Ireland were invited to participate in one of the workshops through Skype in order to strengthen the international perspective of the work and find synergies with people working with green leasing issues outside of Sweden. Brian Meldon works with lease negotiations and tenant and landlord advise at Meldon Chartered Surveyors. Roisin Bennet and Deirdre Ni Fhloinn drafted the first Irish green leasing template and are construction and commercial property lawyers at Reddy Charlton Solicitors. The drafted green leasing template, which was shared with the workshop participants, was launched by Meldon Chartered Surveyors. They gave an overview of the Irish case and shared their experiences of green leasing practices and related issues in Ireland. This was followed by a discussion of the Swedish case and possible ways to establish cooperation to exchange experiences and knowledge.

The Irish participants mentioned that, since the concept of green leases is new to the Irish market, it is recommended that any draft lease that is proposed be on a "light green" basis, which encourages energy efficiency, rather than a "dark green" basis, which imposes requirements for energy efficiency. Even if there are stricter clauses in a green lease, there is an ongoing discussion on how conflicts, and possible penalties, should be handled in case there is a breach. The British approach is to include a Memorandum of Understanding that is independent from the lease, which is a resulting, and often voluntary rather than legally binding, written agreement of a collaborative process between the landlord and tenant. In Australia, the penalty for under performance is to begin with remedial notices, mediation, and arbitration, but there could also be cases where the non-defaulting party steps in and rectifies at the party's cost. Other aspects that are relevant to green leases that were discussed were the handling of the level of certification for a building, the establishment of the environmental targets, setting out an environmental management plan, rental levels – for example, in the case of an old building being retrofitted should there be lower rent for tenant to meet the set targets? -, among many others.

The follow-up discussions showed Sweden has had considerable achievements when it comes to improving the energy performance of its commercial buildings stock compared to Ireland. It was

identified, however, that there is stronger focus on the legal aspects of green leasing in Ireland, which is missing in Sweden. Green leases are not a particularly important focus area for Swedish property lawyers, and more efforts are needed to form local leases that meet the legal needs of both landlords and tenants. Possible ways to connect the Irish participants with property lawyers were discussed to strengthen the legal aspects of green leasing practices in Sweden.

A green leasing pilot with the Swedish Energy Agency

The Swedish Energy Agency (SEA) is subordinate to the Ministry of the Environment and Energy and has around 400 employees. The Agency's main office is located in Eskilstuna, with a smaller office and a test lab located in Stockholm. After spending nearly ten years in its previous offices and sharing the building with other tenants, the Agency moved to a new building in October 2017, where it is the sole occupant. The move was not only significant in the way that it allowed the Agency to have a greater control on its energy use, but it also marked a shift from the traditional workstyle to activity based working. One of the reasons behind the decision to switch to activity-based working was also to reduce the floor area used per employee. The primary goal was to cut down energy use, as not all employees are present at the office at all times, due to external meetings and flexible working opportunities.

After discussions with several landlords, an agreement was reached with **Ladingen**, which owned an old foundry building in the industrial part of Eskilstuna. The building, which was designed to expel heat instead of preserving it as it was used as a foundry, underwent major renovations, both to shift the energy performance and transform an old foundry into a modern office building. Expert views were taken into account to protect the historical value and the industrial character of the building in the renovation process. The lease between the two parties is a so-called complete cold rental agreement, where the Energy Agency pays for all purchased energy, which includes heat and electricity. Although the project could be considered a "prestige project" for the landlord given that the Energy Agency is the tenant, there was clear commitment from the both sides to reach as high energy performance standards as possible.

One of the important aspects that were agreed on was that there would be a *green leasing agreement* to ensure the energy efficient and sustainable operation of the building. This green leasing agreement would be an annex to the main rental agreement between the parties. A consultant from **BELOK** (Bosse Wikensten) was hired by the Agency to produce an ambitious green leasing agreement based on the commonly used green leasing agreement of **The Swedish Property Federation**. The idea was also to showcase a workable and ambitious green leasing agreement that could become the new industry standard. A draft of the agreement, including commitments that are not covered by the Swedish Property Federation's industry standard agreement, (see Appendix 2) was delivered to the Agency by the consultant. Although most of the energy efficiency improvements were made to the building before the Agency moved in, which may not be the case for the majority of the buildings, the future investments that have a longer pay-off time than the duration of the rental agreement are ensured in the proposal as long as they are financially feasible.

Recommendations

The table below summarises the recommendations for the top DSM issue, which we focussed on in the second phase of Task 24 in Sweden. In general, to solve any DSM-intervention all *Behaviour Changers* have to collaborate and communicate with each other and with the *End Users*.

Table 3: Recommendations for Sweden to improve uptake of green leasing arrangements

Behaviour Changers	Recommendations approval of behavioural interventions
 Decisionmakers	- Continue to show leadership and measure and communicate the benefits and learnings from the Swedish Energy Agency green leasing pilot. - Creation of a clear regulatory framework that would minimise the uncertainties surrounding the uptake of green leases and green leasing practices. - Introduction of policy tools that would increase the knowledge about green leases and encourage their use. - Providing clarity about the legal aspects of green leases to minimise the perceived risks associated with the signing of green leases. - Creation of stakeholder platforms to support the dialogue between related actors and contribute to the development of standard practices.
 Experts	- Identification of the most relevant and effective issues that could be included in green leases in a local context. - Strengthening the legal aspects of green leases to provide clarity and assurance to the actors involved, and thereby reducing the risks associated with green leases by the market actors. - Evaluating success and challenges of green leasing pilots and publishing case studies and cross-country comparisons.
 Providers	- *Fastighetsägarna*: Industry interest organisations play a key role in creating awareness regarding green leases and push for a change in the leasing practices on the market. - They can provide guidance for the market actors and even act as a mediator in cases of conflicts. - Providers can also lobby for policy changes that would create favourable conditions for the uptake of green leases.
 Middle Actors	- Facility Managers: Support of end users in implementing DSM-interventions (technology and consulting) - Ensuring that buildings are operated according to what is laid out in the green leasing agreement between the tenant and the landlord. - Efficient monitoring to inform the contracting parties in case of unexpected developments that may be conflicting with the terms of the green leasing agreement. (For example, if the demand-driven ventilation system is using much more energy than what is designed for or what was thought that it would use).
 Conscience	- Intensified communication of the topics climate change and energy efficiency and providing education to end users. - Increased lobbying, especially regarding best-practice-examples and positive side effects. - Creating awareness regarding the impacts of energy use in buildings and how green leasing can reduce environmental impacts and create benefits for the participating parties. - Communicating and showcasing successful examples of green leasing practices to increase the interest for green leasing among market actors.

Conclusions

Now that the Swedish participation in the second Phase of Task 24 concludes, the following main conclusions can be drawn:

1. *Make people the focus*

   The necessary transformation of our energy system can only work sustainably and effectively, if all concerned stakeholder groups are involved. Most systems do not consider *End Users* and most policy interventions do not include stakeholders from 'the Conscience' or 'Middle Actor' sectors. It is absolutely necessary to include these groups more consciously and to involve them to co-create behavioural interventions based on their needs and requirements, as well as the other *Behaviour Changers'*.

2. *Collaboratively identify and work on Top DSM-issues*

   Many of the DSM-issues in Sweden, similar to other countries, are related to the transport sector, increasing the energy efficiency of the SMEs, and conducting energy efficiency retrofits in buildings. The two specific issues that were discussed and highlighted in the workshops were: tariffs and incentives to improve load shifting; and split incentive issues between commercial building owners and their tenants and the use of green leases to solve this problem. It was ultimately decided that the top DSM-issue in Sweden is increasing the uptake of green leasing practices to minimise split incentive issues in commercial buildings.

   The takeaway message of this work is that having a sound, multi-stakeholder dialogue highlighting common ambitions are key to solve issues between stakeholders.

3. *Evaluation of multiple benefits is required*

   Although green leasing practices often target split incentive issues to increase the energy performance of buildings, financial gains or the saved kWh should not be the sole focus. For example, improvements to a building may result in better indoor climate, which positively impacts productivity and reduces the frequency of sick-days. It also increases the market value of the building, and often reduces maintenance costs. It is therefore critical for both parties to have a wide and long-term perspective to successfully assess the outcome of the green leasing collaboration and see beyond just financial and energy savings.

4. *It's about the (Green Leasing) process, not the product (Green Lease)*

   It is clear now that the sustainability challenges that we are facing today could not be solved efficiently by each Behaviour Changer acting alone and focusing solely on their own interests. It is crucial to increase the dialogue and collaboration between related stakeholders to ensure sustainable practices in all sectors, including the buildings sector, which represents roughly one third of the energy demand in most countries.

   It is often experienced that many stakeholders are willing to collaborate, but there are only a few who actually do. The reason behind this lack of collaboration is often due to strictly-defined roles, imposing different mandates and interests on each party, and the lack of dialogue between landlords and tenants. An open dialogue and the discussion of mutual benefits through the green leasing process can create a stronger relationship between the landlord and the tenant, which would have a potential to go beyond the requirements of a green leasing agreement. Such relationships may result in sustainable solutions that could be adapted by the both parties regardless of concerns over maximised benefits if there is an ambition to achieve a joint target, which is an environmentally-friendlier building. The green lease agreement should therefore not be considered as the ultimate goal, but rather a by-product of the green leasing practice between the landlord and the tenant.

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Appendix 1. Collected Swedish stories (Phases 1 and 2)

Sustainable Järva – as told in the "Monster" (Mourik and Rotmann 2013)
Once upon a time.... There were six neighborhoods around the field of Järva that were in urgent need of improvement. The area had been constructed during the 1960s and 70s as part of the one-million-home-programme, initiated by the Swedish government to tackle a growing housing deficit in the country's urban areas. The neighbourhoods contained housing units for more than 60 000 people, but the socio-cultural context had changed and the buildings were turning old and outdated.
Every day.... People in the area were experiencing economic as well as social challenges. Many of the foreign residents were unemployed, had difficulties learning the Swedish language, and the younger generations were lacking good opportunities for education. The houses they lived in were terribly inefficient, and the area in general did not work for the needs of its current residents. Several investments had been undertaken during the years to improve the situation, but nothing helped and the people felt no one was listening to them.
But, one day... The city of Stockholm decided that it would once again invest in the area, and to improve the living conditions for the people living there. But this time it would be different, this time they had realised that the circumstances were radically different to the 1960s and 70s. They realised that in order for the "upgrading" to be successful they needed to include the residents in the process - from the beginning.
Because of that... The Järva dialogue was initiated during the fall 2009 and for one week 10 000 residents contributed with more than 30 000 opinions and suggestions about how the area should be developed and improved. Based on these contributions the vision Järva 2030 was formulated and measures were planned to address the four areas of 1) improved housing and urban environment, 2) everyday security, 3) better education and language teaching, as well as 4) more jobs and entrepreneurship
But then... It was also realised that the area and the buildings had been constructed before the energy crisis without considering the environment, and thus the project Sustainable Järva was introduced to also bring about an environment-, climate- and energy- focus in the development.
Until, finally... The dialogue with the residents continued and together with all stakeholders many great measures were planned to promote sustainable lifestyles, satisfaction and well-being. The ultimate goal with the project is for Järva to serve as model and inspiration for sustainable development of similar areas both nationally and internationally.
And, ever since then... The neighbourhoods around the field of Järva have become a place where people want to live!

Stockholm congestion pricing – as told in the "Monster" (Mourik and Rotmann 2013)
Once upon a time....there was the City of Stockholm, which was gorgeous but had way too many traffic jams. Every day...more and more Volvos and Saabs tried to drive in the not-so-well-planned City (well, the Vikings didn't have cars!) and people got very frustrated.
But, one day...the national and local governments decided to try to kill the behemoth that was the traffic chaos in Stockholm.
Because of that...a comprehensive congestion charge pilot was introduced.
But then! Car commuters who travelled in from the outside and (felt that) they had no alternatives, turned sour, for several reasons.
Because of that...the policymakers realised that they should also improve public transport, park and ride schemes etc to make it easier to travel without car.
So, finally...the improved social acceptability thanks to the comprehensive toolbox of measures enabled the politicians to implement congestion charges on a permanent basis. And Stockholm's air is almost as fresh as when the Vikings lived.

Clockwise - as told in the "Monster" (Mourik and Rotmann 2013)
Once upon a time... There were nine families living in nine identical houses in Ursvik – a small, small suburb in a very cold and dark country called Sweden.
Every day... The families used their electrically heated bathroom floor, their electrical coffee maker, their dishwasher, their tumble dryer and their spotlights without reflecting about the amount of electricity they used.
But, one day... The families were contacted by the people who had built the houses the families lived in. They were asked if they would like to participate in an experiment organised by a creative research institute. The experiment would place a funny object called The Energy AWARE Clock in each house and after three months researchers from the creative research institute would interview the families about their experience with the clock. The clock was no ordinary clock. In fact, it was connected to the energy meter of the house and measured the household's electricity use. It displayed this in inspiring circular graphs so that the family could follow their own behavioural pattern on the level of one minute, one day and one week. Of course, the families said yes, they would love to participate in the experiment.
Because of that... The families learned about how much electricity their individual appliances used and reflected about what a kWh really is and started to discuss energy use with their neighbours. During the first three weeks they really learned a lot about their own household.
But then... They didn't use the clock for learning anymore. Rather, the clock was domesticised into the households and was subsequently used to check that everything was normal and that no unnecessary electricity use was going on. They clock became like a member of the family.
Because of that... The nine families in Ursvik got interested in energy use, reduced their use of some appliances and increased their use of others.
And, ever since then... The Energy AWARE Clock was developed into a product, which may now be bought off the shelf in the shop.

Eskilstuna - as told in the "Monster" (Mourik and Rotmann 2013)
Once upon a time... In the ancient kingdom of Sweden...
Every day... people went to work in SMEs not reflecting on their energy use.
But, one day... the Swedish Energy Agency introduced a support scheme for energy audits.

But then...still nothing much happened!
Because of that... the Swedish Energy Agency promoted demand for facilitators like procurement consultants that could help build collaborative networks.
So, finally...the SMEs started to make use of the audits and carry out corresponding measures based on their needs.
And, ever since then... many Swedish SMEs now have a successful energy management system.

Building Retrofits – as told collaboratively in a workshop 2014
Once upon a time... in Sweden, building owners retrofitted their buildings when something broke or got old. They often chose to do like they always have done, without taking any extra risks.
Every day... they built the same buildings with the same technology and tried to do this as energy efficiently as possible.
But, one day... the home owners kept getting sick and this called for political attention.
Because of that... something had to change about the systematic view on the built environment. But no one was willing to take that risk!
But then! A group of interested first movers, together with the Swedish Energy Agency started to take action and formed a networkin order to solve the problem with energy efficiency in building retrofits once and for all.
Because of that... new technology and new knowledge was invented and learned.
So, finally... the buildings can now be energy efficient without the home owners getting sick.
And, ever since then... the buildings don't have to be retrofitted before their longevity has run out.

Smart grid/feedback - as told collaboratively in a workshop 2014
Once Upon a time... there was a tiny provincial town called Sala-Heby in Sweden.
Every day... people used electricity in households without reflecting about when and how they used it.
But, one day... the local energy utility realised that the load was too heavy on the electricity grid and that they needed to manage it. Also, the costs for consumers were too high. Something had to be done.
Because of that... they introduced a demand-based time-of-use tariff. This was communicated to households through brochures.
But then! Winter came. And the householders saw their electricity prices rise and rise and were shocked.
Because of that... households became more concerned about their consumption and asked for real-time feedback from the utility.
So, finally... a clever research team started a project with consumers and the energy company to make that real-time use data available for households.
And, ever since then... the households in the provincial town have changed their behaviours and have changed when they used electricity during the day to the times when the load wasn't too heavy on the grid.
Transport - as told collaboratively in a workshop 2014

Once upon a time... was the city of Stockholm with too many traffic jams.
Every day, more and more cars tried to drive into the not-so-well-planned city and people got more and more frustrated over this state of affairs.
But, one day... the national and city governments decided to kill the behemoth that was traffic chaos.
Because of that... congestion charging was introduced.
But then! Car commuters who traveled from the outside and felt they had no alternative to cars, turned sour, for several reasons.
Because of that... the policymakers realised they should also improve public transport and do other things, like park and ride, to make it easier to travel without a car.
So, finally... the social acceptability from this combined toolbox of interventions enabled the politicians to implement congestion charging on a permanent basis in Stockholm.
And, ever since then... the monster Behemoth has dwelled only outside of Stockholm.
SMEs – as told collaboratively in a workshop 2014
Once upon a time... in the ancient kingdom of Sweden.
Every day... people went to work in SMEs never thinking about their energy use at work.
But, one day... the Swedish Energy Agency introduced a support scheme for energy audits.
Because of that... wasteful energy use became much more visible to SMEs.
But then! Nothing much happened!
Because of that... the Swedish Energy Agency promoted demand for facilitators like procurement consultants and energy auditors to talk to the SMEs.
So, finally... the SMEs started to make use of the audits and carried out corresponding measures based on their individual needs.
And, ever since then... many SMEs now have a successful energy management system in Sweden.

A love story – told by Kajsa Ellesgård at IEA DSM Storytelling workshop, Wellington 2014
Once upon a time... in Sweden there was a retirement home.
Every day... the staff took care of the elderly and used a lot of time dishing and washing up but had little time to talk.
But, one day... the manager wanted to make sure that the retirement home would function even during an electricity outage.
Because of that... she called the energy company and wanted to undertake a real case study with only reserve power.
But then! they needed to reorganise their electricity patterns so that they would not create a black-out while using reserve power (they needed to reduce their load peaks).
Because of that... they took in a consultant that taught the staff the electricity uses of different devices.
So, finally... they performed the test, by only using the washing machines when the elevator was not used and the dishwashers when everyone was asleep at night.

And, ever since then... the retirement home continued to only wash 2 days a week when the machines were full and the dishwashers were only used at night when they were full too. They saved a lot of energy but they also now had a lot more time chatting and laughing with their elderly patients. And everyone lived happily ever after.

Swedish Workshop 2, March 2016

The Swedish Energy Agency

Once upon a time… There was an energy agency than wanted everyone to use energy and resources in a sustainable and equitable way. It was also what the government wanted the agency to do, just as long as the free market didn't get disturbed too much and the citizens didn't feel deprived of their freedom of choice.

Every day… The agency was thinking of ways of how to improve the situation, trying out different measures, research and development that could influence the market without influencing and disturbing too much. It was sometimes successful and sometimes not so much, and it was difficult to know why some things work and others don't.

But one day… Dr Sea came along and offered a way of getting into peoples' heads without influencing the marketplace whatsoever. The people will themselves realise that more sustainable energy use will benefit them all and that people can change behaviours through understanding each other's needs and situations and collaborating on solutions.

Because of that… The most burning issues (green leases) that the marketplace wasn't able to solve were brought up to the table and the important stakeholders gathered around it. They were at first a little careful when telling what problems they met in their daily work life but slowly they got more comfortable and exchanged their stories around this burning issue more freely. The agency realised that it can't do much on its own to solve this issue without others seeing the (multiple) benefits of the improvement, but it was eager to support the change financially.

But then! After having talked a couple of times the stakeholders went home to their businesses and decided that the potential gains are too small for them, their bosses didn't see how spending time on green lease improvement will earn them more money. So the collaboration was on the brink of breaking down. And the agency's financial support was too little to play a role.

Because of that… Next time Dr Sea was in town she invited many more people to the table – the city council, the local kindergarten, the bike repair shop and the local grocer came along. Then the conversation became even more interesting and started focusing on the bigger picture of how a good work place and a good neighbourhood might look like if more actors cooperate and share the benefits.

Until finally… All the new stakeholders could agree on a long-term plan of how their neighbourhood would become more attractive and how many more benefits they all could achieve through offering services to each other's businesses. Suddenly, the main green lease stakeholders realised what a good and profitable idea it was.

And, ever since then… All landlords have started to offer the improved green leases to their tenants all over the country and the tenants are happy to participate. Now the energy agency is proudly promoting this outcome and supports constant improvement of the green lease practices. The agency is also spreading this magic method to other difficult issues that the marketplace has failed to solve so far. The end.

AFM (the Provider)

Once upon a time… There was a landlord that wanted to get the green leases out to its tenants because it wanted to take responsibility for the environment and sustainability issues.

Every day… He tried to)engage tenants into his climate work with the help of dialogue and different tools he had at his disposal.

But one day… He realised he needed to visualise the climate impact more clearly and develop tools such as energy audits and better training of building users.

Because of that… He came to have a dialogue and information/education (training) between the parties to understand each other and the bigger challenges they each faced.

But then! It was clear that not everyone followed the agenda and the green leases weren't implemented the way they were intended.
Because of that… He had to go back to the drawing board with his other Behaviour Changer colleagues and try to understand the model of the green lease better, and share the responsibility of making it work among the wider community.
Until, finally… they all realised that together they could participate and contribute to a sustainable future.
And, ever since then…Green leases have been implemented much more strongly and the whole exercise has led to a better understanding and trust between the different Behaviour Changers.
Real Estate Owners Association (Middle Actors)
Once upon a time… The real estate owners association tried to get more landlords to use the green lease appendix and help improve it. They knew that even though the physical improvements in buildings are important, tenants' buy-in and behaviours are ultimately responsible for the result to be really good.
Every day… They worried that even though "saving the environment" makes good economic sense they knew they had to find solutions for both the landlord and the tenant to have these benefits show in their profits.
But one day… They realised it should be profitable and they only had to find a standard for the whole industry that works for many (types of) real estate, landlords, tenants etc…
Because of that… They set out to prove that a happy tenant also means a more valuable property. To that end, they started collaborating with others and working on their data collection and evaluation of surveys.
But then! It was clear that not everyone could follow their ideas and that knowledge simply often was lacking on the tenants' side. They realised that the more knowledge there was, the more interest there would be and that they had to create simple tools in order to help tenants save time and be greener.
Because of that… They co-created an industry standard involving the tenants and other Behaviour Changers.
Until, finally… they all realised that together they could spread the knowledge, change the law and create a more sustainable future.
And, ever since then…They keep going, as the option of not saving the environment with all their tools was too dire to imagine. The end.
Katy Janda (the Expert)
Note from Katy: "I intentionally made the landlords the 'villain' in this story although I don't at all think that Michael is evil! Was just trying to be provocative in my story"…
Once upon a time…There were many split incentives that prevented landlords & tenants from cooperating well.
Every day… Tenants worked in a space where they were disconnected from the environmental aspects of their building.
But one day… The landlords introduced green leases as the solution.
Because of that… Tenants and landlords suddenly shared responsibility and knowledge, to help the world become a better place.
But then! The landlords didn't do what they agreed to do to help the tenants and turned their backs on them.
Because of that… The tenants formed an association to hold the landlords accountable. They created their own 'conscience'.
Until, finally… The Swedish Energy Agency worked with the tenant associations to make the landlords greener and more accountable.
And, ever since then…Tenants, landlords and energy agencies lived happily ever after in a land full of green and healthy buildings. The end.

Swedish workshop 3, October 2016

The Decisionmakers' story

Once upon a time… there was an energy agency working on the governmental level. They mainly used a top-down approach even if there was some cooperation with end users.

Every day… we were thinking of creating a sustainable energy system but we never reach all the actors that we want to reach.

But, one day… we found magical tools that will be able to create better interactions in face-to-face meetings discussing how we can all improve green leases, with many different actors.

Because of that… we have decided to increase our efforts on promoting collaboration between actors where end users are included from the beginning.

Until, finally… green leases have transformed to 'green leasing' which is now an ongoing, collaborative process based on increasing dialogues between end users and landlords.

And, ever since then… all actors know their benefits with green leasing and everyone was aware of the benefits of improving energy efficiency in our office building stock.

The Experts' story

Once upon a time… there were people who believed that green leases were a great idea.

Every day… or twice a year, they held a workshop at the Swedish Energy Agency office.

But, one day… they started talking to the experts who admitted having limited knowledge.

Because of that… some experts decided to build and create more knowledge.

Until, finally… they constructed a model.

And, ever since then… they applied that model to every conceivable problem, regardless if it fit or not.

The Providers' story

Once upon a time… we had no problems renting out our office areas.

Every day… our tenants went to work and we were there to help with any indoor climate problems that would arise.

But, one day… our tenant asked us to engage in cooperating on a green lease. They had just certified their organisation to iSO 14001 and thought it was the logical next step.

Because of that… we contacted Fastighetsägarna asking to help us with a green lease. They did, and the green lease was signed.

Until, finally… it was an additional effort to have to meet with the tenants more often now.

And, ever since then… these meetings ended up making us work together much better with our tenants on many different issues.

The Middle Actor's story

Once upon a time… there were people in a cold country that was very long. This country had a Middle Actor who kept trying to bring the people closer together.

Every day… the people were cold and they needed to drink a lot of coffee. But the coffee machines caused a real energy problem. The people from the two ends of the country each struggled with their coffee machine issues but they never talked with each other about it.
But, one day… the Middle Actor put them together and showed that they were struggling with the same task – to fight the energy problem of constantly-heated coffee machines in office buildings.
Because of that… they got closer together and became friends instead of enemies and they could identify what each of them needed to work better.
Until, finally… they could measure and have time to identify new ways to walk forward and found better solutions to provide coffee in more energy efficient ways.
And, ever since then… this had been a good example for other countries which followed this model and also made changes to their working ways.
The Conscience' story
Once upon a time… there was a girl who had 2 friends: one who had a really cool, super green house who needed a room mate and one who loved eco issues and needed a place to live.
Every day… the girl in the super green house longed for someone who loved green houses as much as she did, to come live with her, and the other girl dreamt of living in a super green home. So, their common friend introduced them to each other and they moved in together.
But, one day… the girl who owned the super green house turned the temperature down to 19C and gave her new room mate a bill for green electricity, which was much more costly than convential fuels. They also got into an argument over cleaning chemicals. Their common friend suggested that they should come up with some house rules and made a contract they could both agree on.
Because of that… the two girls found that they were both much happier and lived quite well together because they both knew the rules and stuck to them. Many of their friends saw how happy and green they were and asked them for the contract.
Until, finally… they started an instagram account (#happygreenlease) showing all of the happy moments in the house. The contract was copied all the around the world.
And, ever since then… they lived happily ever after.
The End User's story
Once upon a time… there was a juvenile detention facility with units all over Sweden. Different residences in different parts of the country had different issues, due to different weather and climate conditions and infrastructure.
Every day… the tenants opened the windows for fresh air, then increased the heating and even used the oven for extra heat! All lights were always left on even when they left the room. The landlords complained about high energy usage and the tenants about cold rooms.
But, one day… they both signed a green lease. The tenants got protected, transparent data quarterly which showed how their energy use was developing over time. So the units started competing with each other on seeing who could have the lowest energy use. The landlord helped out with thinking more energy efficiently in all areas of their business.
Because of that… the energy use was lowered by 25% in just 3 years.
Until, finally… the relationship between tenants and landlords is now great.
And, ever since then… all are happy and prospering.

BEHAVE conference 2016, the Swedish case study exercise

THE SWEDISH CASE STUDY STORY OF GREEN LEASES IN COMMERCIAL BUILDINGS

Once upon a time… There was beautiful country that was already a world-leader in sustainable building and energy initiatives. Its government wanted the Swedish Energy Agency to continue improving on this, just as long as the free market didn't get disturbed too much and the citizens didn't feel deprived of their freedom of choice.

Every day… The Agency, and its collaborators in business and research, were thinking of ways of how to improve the situation, trying out different measures, research and development that could influence the market without influencing and disturbing too much. They were sometimes successful and sometimes not so much, and it was difficult to know why some things worked and others didn't.

But one day… Task 24 came along and offered a way of getting into peoples' heads without impacting the marketplace whatsoever. The Behaviour Changers and End Users will themselves realise that more sustainable energy use will benefit them all and that people can change behaviours through understanding each others' needs and collaborating on solutions.

Because of that… The most burning issues (Green Leases in commercial buildings) that the marketplace wasn't able to solve were brought up to the table and the important Behaviour Changers gathered around it. They were at first a little careful when telling what problems they met in their daily work life but slowly they got more comfortable and exchanged their stories around this burning issue more freely. When they talked to the Middle Actors from the Green Lease organisation, it was clear that the current Green Lease system didn't work and amounted to little more than greenwash. The Agency and the Landlords and the Experts all realised that they couldn't do much on their own to solve this issue without others seeing the (multiple) benefits of the improvement.

But then! After having talked a couple of times the Behaviour Changers went home to their businesses and decided that the potential gains are too small for them, their bosses didn't see how spending time on Green Lease improvement will earn them more money. And the tenants' laywers were very conservative and looking out for the tenants' best interests, so they didn't want them to be locked into anything that wasn't clearly helping them. So the collaboration was on the brink of breaking down. And the Agency's financial support was too little to play a role.

Because of that… They realised that the conversation needed to start focusing on the bigger picture of how a good work place and a good neighbourhood might look like if more Behaviour Changers would cooperate and share the benefits. They also realised they really needed to include the End Users (tenants) and their lawyers to co-create the Green Leases so that everyone got all the (multiple) benefits they offered.

Until finally… They met again to try and co-design a better way forward.

And, ever since then… The future goal is that all landlords have started to offer the improved green leases to their commercial tenants all over the country and the tenants are happy to participate. The end.

The Swedish before/after stories

The Decisionmaker (Swedish Energy Agency) – Before the exercise

Once upon a time… Energy efficiency of buildings was good but tenants were poorly behaved.

Every day… Energy was wasted because building occupants saw no or insufficient benefit in changing their ways.

But, one day… it was suggested that landlords get tenants to sign Green Leases. But no one understood the benefits to anyone or what the role of the landlord was in controlling the behaviour of their tenants!

Because of that… The full benefits of ‘good behaviour’ were explained to the tenants (and possibly some regulatory or other controls/drivers were plaed on them to improve) and therefore landlords didn’t need to force them to do it right.
And, ever since then… Tenants wanted (or had to) improve their behaviour and they thus valued landlords who supported them in behaving better (including monitoring their multiple benefits). Thus, landlords would charge higher rents and they helped occupants improve their behaviour. The End.
After the exercise
Once upon a time… Energy efficiency of buildings was good (but could be better) and tenants were poorly behaved.
Every day… There was little or no data on Green Lease compliance and benefits and no one understood the benefits for the other people/Behaviour Changers involved.
But, one day… We all worked together in a multi-disciplinary/sectoral environment to better understand the perspectives/benefits of each of the audiences involved.
Because of that… We designed a new Green Lease and the supporting policy/guidance tht everyone was happy with. We also funded R&D to gather data and monitoring and evaluation devices to identify what relies on technology vs behaviour and created jobs with the ‘Green Lease monitor’.
And, ever since then… We all decided to co-create a Green Lease system that benefits everyone, where the multiple benefits to all can be clearly shown and will contribute to Sweden’s office buildings becoming carbon neutral. The End.
The Provider (Landlords) – before the exercise
Once upon a time… There was a beautiful country which was already a world leader in sustainable commercial buildings and energy initiatives.
Every day… My tenants seem happy and pay their rent on time and my life as landlord was very easy and simple!
But, one day… The Swedish government introduced Green Leases which complicated my easy situation. I can now charge more rent and the buildings are even more energy efficient. However, I may have problems selling this concept and the higher rents to my tenants first.
Because of that… My office tenants might feel that they have to impose changes on their staff, but we would like to support them in it. So we asked the Landlord Association to support and guide us in this process.
And, ever since then… We have been able to exploit the process and tailored it for individual buildings to encourage our tenants to take part in the Green Lease programme. The End.
After the exercise
Once upon a time… There was a beautiful country which was already a world leader in sustainable commercial buildings and energy initiatives.
Every day… My tenants seem happy and pay their rent on time and my life as landlord was very easy and simple!
But, one day… The Swedish government introduced Green Leases after a stakeholder consultant and they were easy to implement because it was clear who was responsible for what, and the associated many benefits were assessed and clear for all.

Because of that… The Landlord Association established an excellent approach and we were able to justify and tailor the details with the End Users (tenants) so that we all benefited.
And, ever since then… We co-created a Green Lease system that benefits everyone, where the multiple benefits to all can be clearly shown and will contribute to Sweden's office buildings becoming carbon neutral. The End.
The Experts (Academics and Consultants) – before the exercise
Once upon a time… The Swedish Energy Agency wanted to promote the use of Green Leases in office buildings.
Every day… They faced problems to get tenants and landlords committed to GL, mainly leading to 'green wash'.
But, one day… The Agency invited us experts to identify and operationalise the benefits for the different players.
Because of that… The promotion of GL was focused on the economic, social and environmental benefits for everyone and it led to the creation of sustainable work place culture with good examples showing benefits only 6 months after introduction.
And, ever since then… The number of GL exploded and the leases fulfil their real purpose: profound behaviour change was achieved. The End.
After the exercise
Once upon a time… The Swedish Energy Agency wanted to promote the use of Green Leases in office buildings.
Every day… They faced problems to get tenants and landlords committed to GL, mainly leading to 'green wash'.
But, one day… The Agency invited the expert group, together with all the other stakeholders, to co-create improved GL contracts. The experts were funded by the Agency and the Landlord Association and its member Landlords. The main task for the experts was to identify and operationalise multiple benefits for stakeholders.
Because of that… The promotion of GL was focused on multiple benefits and how to measure them, for everyone. As a neutral member, we identified the multiple benefits in collaboration with the other stakeholders. We ensured the multiple benefits were measurable, provided the right kind of data to the stakeholders and started some pilot projects which we all co-designed.
And, ever since then… We co-created a Green Lease system that benefits everyone, where the multiple benefits to all can be clearly shown and will contribute to Sweden's office buildings becoming carbon neutral. The End.
The Middle Actors (Landlord Association) – before the exercise
Once upon a time… We were promoting the use of Green Leases in office buildings to landlords and tenants.
Every day… We would tell Landlords that they should use GL. They told us that this was too risky an investment and not working for them in the form that they were in.
But, one day… The Swedish Energy Agency invited us work together on this.
Because of that… We worked with other member landlords to identify how benefits and risks could be shared differently, and identified ways that costs could be subsidised (e.g with tax rebates).

And, ever since then… We have had more GL with more impacts on energy savings and reputational and other benefits for our members, the Landlords. The End.
After the exercise
Once upon a time… We were promoting the use of Green Leases in office buildings to landlords and tenants.
Every day… We would tell Landlords that they should use GL. They told us that this was too risky an investment and not working for them in the form that they were in.
But, one day… We realised they needed more data, information and tools to show the real and multiple benefits that entering into these contracts would deliver them, like better reputation, financial benefits, increased value of real estate, healthier working environments and more productivity and higher retention of staff and tenants.
Because of that… We decided to work together with all the other stakeholders to provide the necessary missing data and information that would allow them to make a more informed decision.
And, ever since then… We co-created a Green Lease system that benefits everyone, where the multiple benefits to all can be clearly shown and will contribute to Sweden's office buildings becoming carbon neutral. The End.
The Conscience (Lawyers) – before the exercise
Once upon a time… The Swedish government wanted to cut emissions, introduce energy efficiency and sustainable practices. They developed a policy whereby GL would be introduced into the commercial rental sector.
Every day… Tenants were choosing the most simple, low-hanging fruit offers and landlords were happy with this 'green wash' too, as it didn't cause them any problems. However, it didn't do much in terms of sustainable development.
But, one day… The Swedish Energy Agency stepped into stop the green washing and they directed that the Landlords and Tenants work together to come up with a more effective plan. The lawyers were called in to ensure that the agreement was fair and that both parties stuck to their contracts.
Because of that… The lawyers promoted a strong agreement in line with Swedish law which was practical and possible for both sides.
And, ever since then… Both sides were happy to introduce the measures and a third party was set up to monitor the implementation and development of the plan. A mediation process was set up, so tht if conflict arose each case didn't necessarily have to go to court. The End.
After the exercise
Once upon a time… The Swedish government wanted to cut emissions, introduce energy efficiency and sustainable practices. They developed a policy whereby GL would be introduced into the commercial rental sector.
Every day… Tenants were choosing the most simple, low-hanging fruit offers and landlords were happy with this 'green wash' too, as it didn't cause them any problems. However, it didn't do much in terms of sustainable development.
But, one day… The lawyers intervened and worked with the landlords and tenants to put in place a list of actions tht neeeded to be carved out. They also delved into the implications and pitfalls of each action to ensure nobody went in blindly.

Because of that… Government and experts set up the necessary monitoring and evaluation mechanisms for the lawyers to be able to create the most effective GL contracts that benefited everyone.
And, ever since then… We co-created a Green Lease system that benefits everyone, where the multiple benefits to all can be clearly shown and will contribute to Sweden's office buildings becoming carbon neutral. The End.
The End User (Office tenant) – before the exercise
Once upon a time… I moved my company office into a building with a Green Lease because being more green was important to our image.
Every day… I struggled trying to get my lawyers to agree to more stringent clauses and my employees to follow my good lead.
But, one day… The Swedish Energy Agency and Landlord Association approached me via my Landlord and said they wanted to help me be a leader by listening to my issues and co-create a GL that would work for my employees and keep my risk-averse lawyers happy.
Because of that… We all sat down and started discussing our main issues, complexities, inherent conflicts and relationships.
And, ever since then… I have now a GL that benefits both me and my Landlord, that my employees love so much that they are taking their new found knowledge and use it at home. My lawyers started a company solely concentrated on green leases! And the Swedish Energy Agency can yet again be proud to have made Sweden the envy of the world. The End.

Appendix 2. The proposed green leasing agreement template for the Swedish Energy Agency

The following agreement is a proposal for an adapted green lease for the Swedish Energy Agency according to their request, developed by the author of the report with inspiration from Belok's previous models from 2010, various green leasing agreements and Fastighetsägarna's "Grönt Hyresavtal".

Common agreements for tenant and landlord

§1 Energy monitoring should be done monthly via an appropriate system with normal year-adjusted values for heat utilisation. The outcome shall be reported to both parties on a monthly basis, and reviewing the follow-up shall be a standing point at quarterly meetings. Follow-up is being made to detect deviations and to follow-up the outcome of any measures taken. An appropriate system can be the landlord's existing system, provided that the tenant's electricity usage is also included. Another suitable system could be handled by the tenant. Appointed officers are listed in Appendix 1c.

Choice made in this case study:

- The landlord's existing system including the tenant's electricity use.

§2 Trimming of systems shall be conducted on a continuous basis with particular focus over the next 1.5 years. The responsibility is the responsibility of the landlord's representative. Reconciliation shall be made in connection with the agreed quarterly meetings. Representatives of the property owner as well as the tenant shall be appointed (see Appendix 1c).

§3 One night walk (after the closure of the office, but before the alarm has been activated) per year must be done to identify any "energy thieves". According to the author's recommendation, the timing is to be changed for when the night walk is carried out, based on season. The parties jointly designate (during the quarterly meeting) who will do the night walk and when to do it.

§4 The landlord ensures that an energy survey according to Belok's **Total Concept Method** (including cost-effective measures) is implemented by end of 2019. The energy survey shall include heating, cooling and electricity (both, real estate and office).
____% of the cost of the survey will be paid by the landlord, and the remaining share will be paid by the tenant.

§5 All cost-effective/profitable[12] investments for increased energy efficiency shall be implemented, provided feasibility[13]. Profitability means that both the landlord and the tenant earn the investment. Measures for lower energy costs are financed by an agreement between the parties on a supplement to the rent over the agreed period. A prerequisite for such additions is that these are lower than energy cost savings. The tenant has the opportunity to carry out energy-saving measures in his own premises by agreement with the landlord. Proposal for calculation model can be found in Appendix 1d.

§6 The landlord and tenant shall, at least every three years (starting with a quarterly meeting) **collaboratively verify current tariffs** for heating, power grids and water to identify the most cost-effective tariff. In this connection, special attention is paid to the power (kW) of heat and electricity, and an hourly value analysis of these must be made.

In addition to the above-mentioned points, the following points are part of the lease:

The tenant agrees through the agreement that they:

[12] The definition of cost-effective / profitable is based on the property owner's perspective, taking into account the district's "yield", cost of interest, life cycle cost and the tenant's willingness to contribute to investments provided that the investments provide a lower total cost for the tenant.

[13] Feasibility means amongst other things that the measures should not affect day-to-day operations too negatively. Landlord and tenant decide together feasibility, but convenience is not an obstacle to implementation.

- Immediately inform property owners & their operating staff of changed utilisation times of the premises.
- Obtain agreement from the property owner prior to the permanent installation of electrical equipment (> 1 kW).
- Allocate an energy-responsible person who acts as a contact between the employees and the property owner. This energy-responsible person ensures that ideas from the “Energy Champions” and reach the property owner and vice versa (see Appendix 1c).
- Implement identified electricity-efficiency measures with short repayment time (3 years) within their own premises.
- Approve that the landlord collects consumption data from the tenant's electricity meter.
- Use only eco-labelled electricity.

The landlord is bound by the agreement to:

- Follow the tenant's business to propose further improvements.
- Actively monitor all energy types continuously per property on a monthly basis. If the use of energy suddenly increases for a tenant, the tenant will quickly be alerted.
- Support and encourage operational staff in their work and continuously present energy usage statistics in the premises.
  Be ready to invest in cost-efficient measures for further reducing energy use.

Date:……

For the tenant:	For the landlord:
……	……
Signature	Signature
……	……
Name in print	Name in print

Appendix 2b: Responsible people

In order for the work on energy efficiency and sustainability to proceed during the existing contract period, commitment, staff and resources are important factors. This Appendix specifies current names of „energy-responsible people“ with property owners and tenants. In case of personnel changes, Appendix 1c will be permanently updated. The persons mentioned in the cooperation so far are, for the renter, Kerstin Jansson and Evastina Hagen and for the landlord, Robert Johansson (facilities manager) and Mikael Fransson (property manager).

1. Responsible contact people for this Green Lease and for quarterly meetings:

Tenant: ……

Landlord: ……...

2. Responsible people, energy monitoring:

Tenant: Kerstin Jansson
Landlord: Robert Johansson

3. Energy responsible person in the tenant’s staff group: ……..

4. Responsible people, negotiations regarding profitable energy efficiency measures

IEA Demand Side Management Energy Technology Initiative

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

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

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

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

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

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

These Tasks and their respective Operating Agents are:

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

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

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

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

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

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

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

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

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

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

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

Task 12 Energy Standards - to be determined

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

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

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

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

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

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

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

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

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

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

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

Task 24 Behaviour Change in DSM: Phase 1 - From theory to practice
Phase 2 – Helping the Behaviour Changers Dr Sea Rotmann, SEA, New Zealand

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

For additional Information contact the DSM Executive Secretary, Anne Bengtson, E-mail: anne.bengtson@telia.com and visit the IEA DSM website: http://www.ieadsm.org