International Energy Agency

Energy Technology Initiative on

Demand Side Management Technologies and Programmes

Final Status Report: Austria

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 Austria

Austria has participated in Task 24 since its inception in 2012. Austria is one of the participating countries in Phase II of Task 24, together with New Zealand, the Netherlands, Sweden, Ireland and, in Subtasks 9 and 11, the United States. This involves performing Subtasks 6 and 7 on Austria-specific issues and providing input into Subtasks 8 and 10. Austria will not test the evaluation tool developed in Subtask 9 as it is only participating in 2 (out of 3) years of Phase II. This report will concentrate on the Austria-specific interventions related to Subtasks 6 ("The Issues") and Subtask 7 ("The People"). 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.

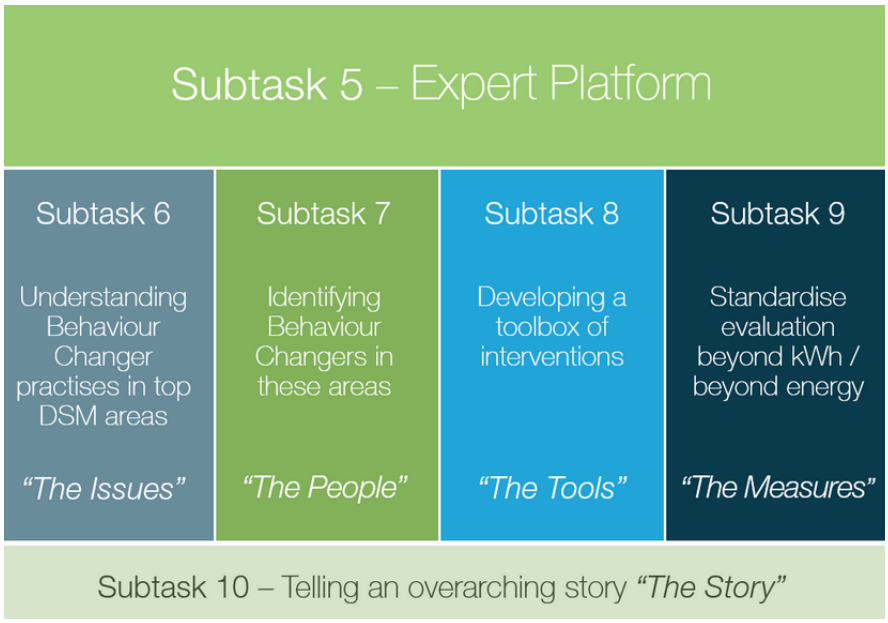

Fig 1. Task 24 Phase II Subtask overview

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 2016).

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;
- There is much to be gained by using combinations of approaches, and moving from the current, mostly technocratic approaches to more 'human' perspectives, which include 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 tools;

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

- There were some top 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 (but not Austria, due to the shorter 2-year participation), 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 (see Kallsperger & Rotmann, 2018 for the Austrian policy brief).

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 facilitate 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. The Task is expected to finish by mid-2018.

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 the language and 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 Decisionmaker' (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' (the intermediaries selling energy-using goods and services who are directly in contact with the End Users).

Methodology of Task 24

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

The main tools in the Task 24 toolbox

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.

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, 2016). The *Collective Impact Approach* (CIA) was first developed to aid social entrepreneurs. This approach, aimed at long-term social change, proposes a collective, rather than an individual approach for solving social 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:

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

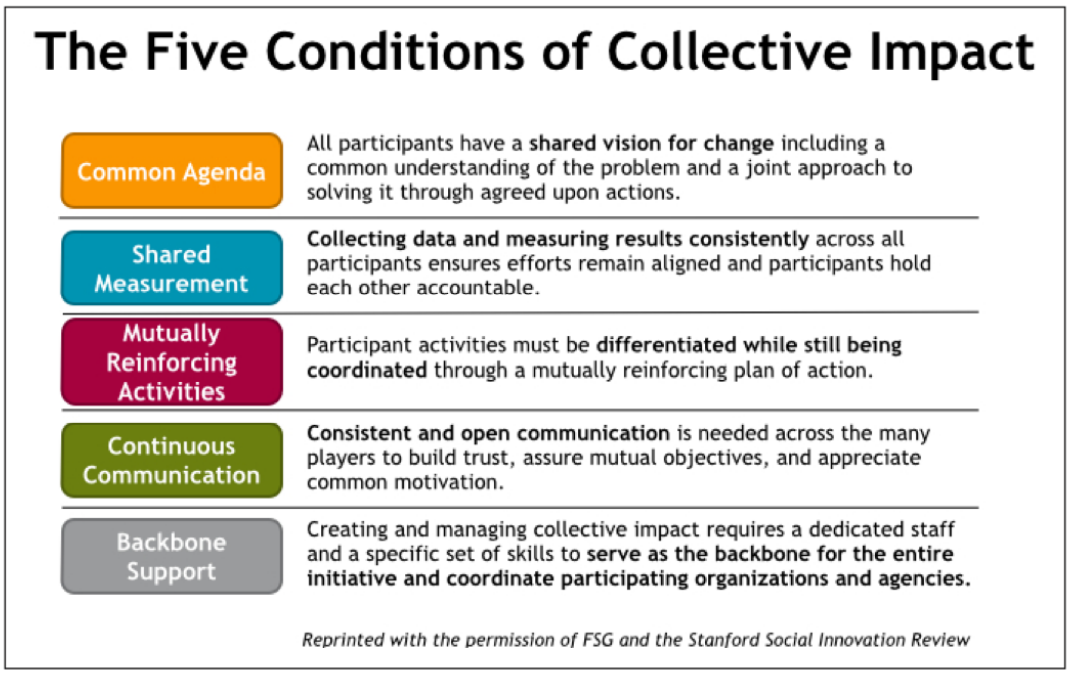

Fig 2. The 5 conditions of the Collective Impact Approach

A **common agenda** is important to create a common understanding of the problem and the solution in order 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 in order to share and learn from each other. In order to 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 have to be fulfilled for creating collective impact: In the first stage, **action has to be initiated**. In order to do so, the landscape of the social problem has to be understood first and a **champion** has to 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 have to be arranged. In the third and last phase **action has to 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 '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 have an 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, and their context in terms of technology, social aspects, infrastructure and environment. 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 2016).

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 also 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 3).

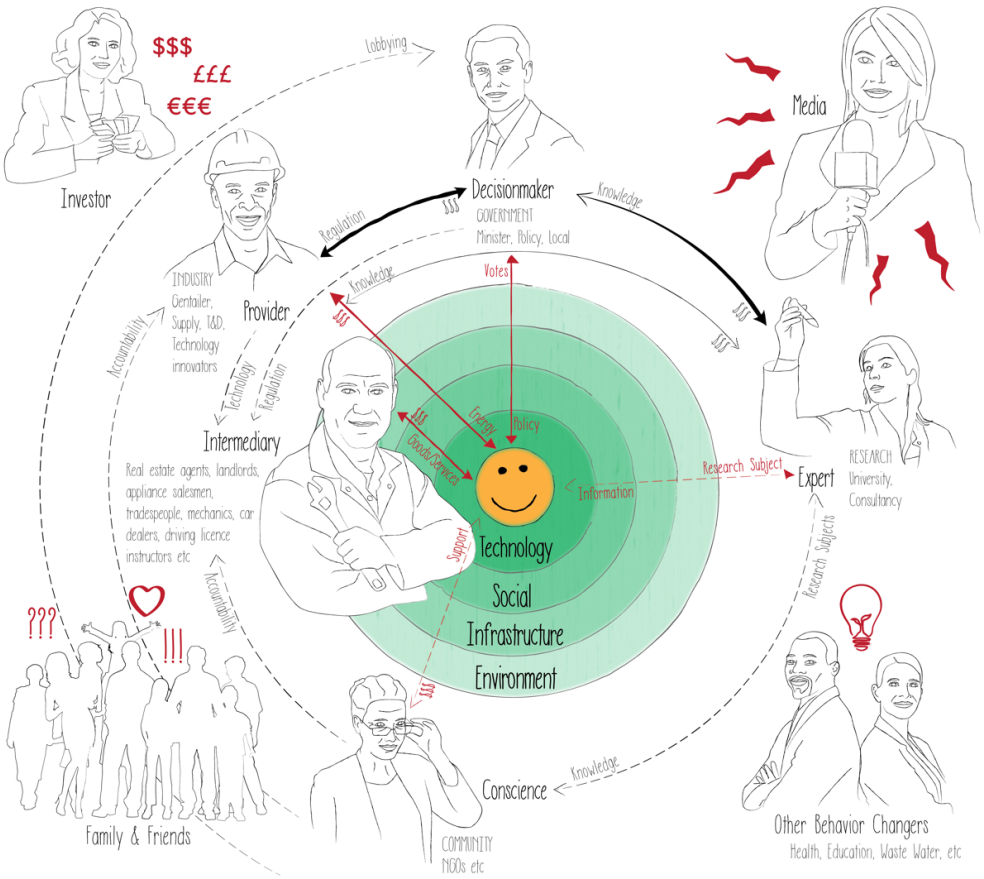

Fig 3. Diagram of the Behaviour Changer Framework[2]

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, is used in intensive workshops to explore the stories of different *Behaviour Changers* who are working towards a very specific common intervention goal - for example, how to promote green leasing between commercial office landlords and their tenants, in Sweden – see Janda, Rotmann et al (2017). The framework is 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) explores the changes between BAU and best practice and uses the framework to evaluate, re-iterate and test completion towards the collectively agreed-upon roadmap.

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 current status and barriers, and what is needed in order 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, often without the *Behaviour Changers'* choice.

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

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 changed when solving a social problem (Rotmann, 2016). 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 *Decisionmakers*, 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 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 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) 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.

Beyond kWh, double-loop learning and multiple benefit evaluation tools[3]

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 maybe also standard ways of monitoring, evaluation and learning about successful 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.
We felt that 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 was undertaken of over 350 studies over a ten year period under the umbrella of the Task by Karlin et al, 2015 (a) ("Methodological Review"). They found that there is no standardised way of monitoring the

[3] For more detail, see Mourik et al, 2015; Karlin et al, 2015a and 2015b

impact of behavioural change DSM interventions beyond kWh type of indicators (and often even they are not measured in a standardised way). One of the consequences 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. The more complex systemic type of interventions that go beyond mere kWh type of outputs thus face severe start-up issues.

Beyond kWh evaluation tool

Building on a large database, the conclusion of this *Methodological Review* was that there was a dire need for a wider discussion about these complex issues. Task 24 also promised it would create an internationally-validated monitoring and evaluation template that would provide a standardised way of measuring if, when and why an actual behavioural change has occurred following an intervention. This tool was first proposed by Karlin et al in 2015 (b) and called the "Beyond kWh evaluation tool".

The *Beyond kWh* tool was further developed in **Subtask 9** and framed around the NZ-led *Energy Cultures 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 is now being tested in Ireland for our pilot using public libraries in Dublin as *Middle Actors* to loan out "Energy Saving Kits"[4]. 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.

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 lead 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, 2015a) 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 4 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).

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

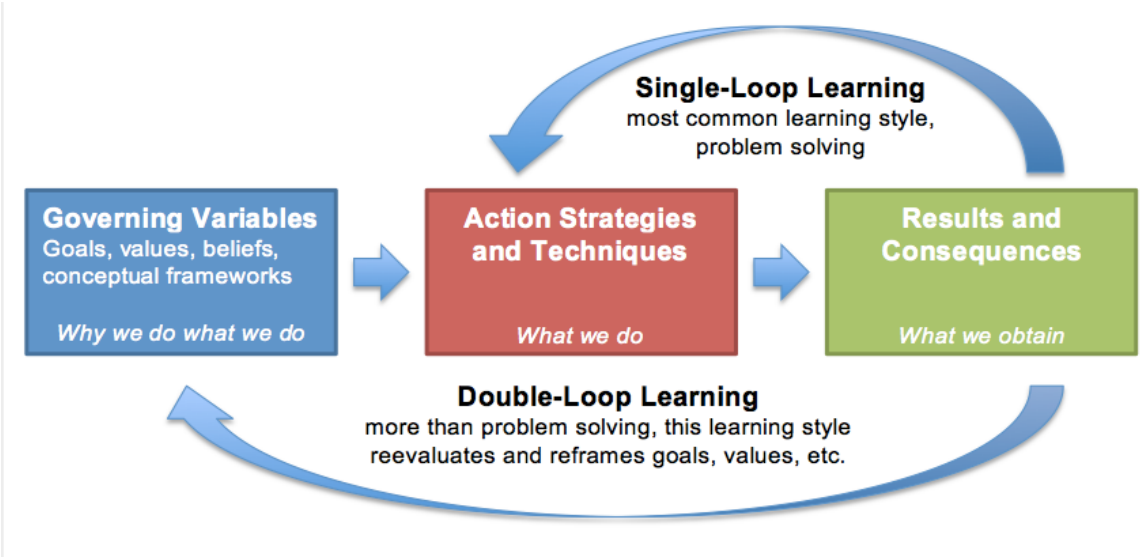

Fig 4. Double- vs single-loop learning. Retrieved from http://www.afs.org/blog/icl/?p=2653

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).

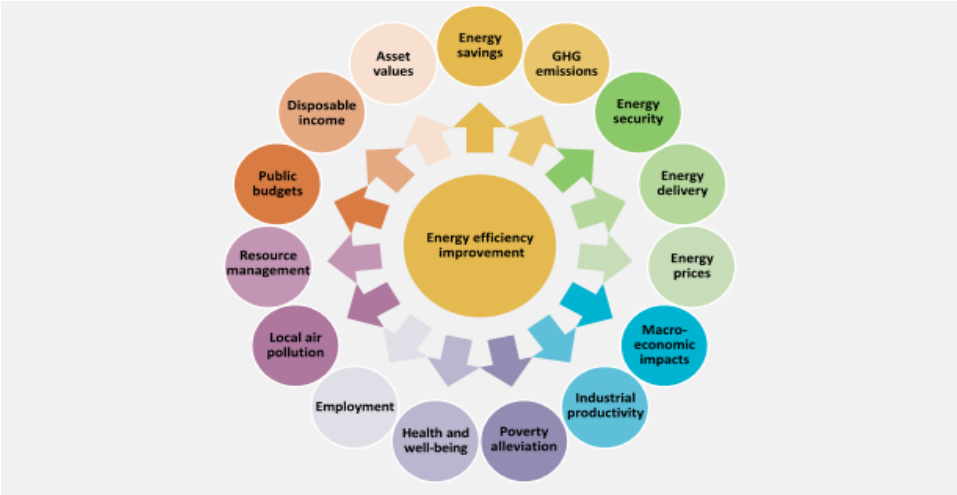

Fig 5. The multiple benefits of energy efficiency improvements. From IEA (2014).

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).

Of course a problem with focusing on multiple benefits for different *Behaviour Changers* also leads to the question of weighing 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 6 below for multiple benefits from mobility-sharing platforms, Workshop 2 in Graz, September 2017).

Fig 6. Multiple benefits of mobility-sharing offers (discussed in 2nd Task 24 workshop in Graz).

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*. There will be some high priority DSM issues that *the Decisionmakers* have (either politically motivated or informed by (inter)national obligations), *the Experts* may have published some papers with (national) lists of behaviour change actions and their (technological or economical) potential impacts, and *the Providers* will have (confidential or commercially-sensitive) priorities of their planned DSM spending. However, it is highly unlikely that *the Conscience* and *the Middle Actors,* both of

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

whom are imperative for any bottom-up engagement and roll-out of behaviour change programmes, were engaged in developing national DSM priorities.

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 Austria, we have focused on one main DSM topic, namely **acceptance of behavioural DSM-interventions into the Austrian energy efficiency (EE) law** but have also invited *Behaviour Changers* from the 2nd most high-ranking DSM topic to discuss **e-mobility and mobility-sharing platforms**.

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 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 Austrian contribution to Task 24 was shaped in accordance with the following methodology:

Step	Procedure	Method
1	Identification of the top 3 DSM issues in Austria ("The Issues")	Events, Workshops, informal talks, networking
2	Identification of the *Behaviour Changers* in Austria; Strengthening of national and international network ("The People")	Workshops, GEA network, social media, webinars, partners, eceee summer study 2017
3	Application and testing of Task 24 tools ("The Tools and Stories")	Task 24 Workshops Graz, eceee Summer Study 2017
4	Input for the acceptance of DSM-interventions into the Austrian law on energy efficiency ("The Measure")	Engagement of experts (workshops + evaluation), exchange with the Monitoring-Institution

Results

The main results from Austria are structured into four main parts, which are 1) national Top DSM-issues, 2) national DSM-examples, 3) the approval of DSM-interventions into the Austrian EE Act and 4) DSM interventions to trigger e-mobility and innovative sharing offers.

Top DSM-issues in Austria

Based on the experiences of the first Phase of Task 24 and the GEA network and know-how, the top DSM-issues were identified with the help of the existing expert network, informal talks and exchange during workshops and events.

The top 3 chosen DSM issues are:

1. *Acceptance of behavioural DSM interventions into the Austrian energy efficiency (EE) Act*[6]
   - Reason: It turned out that DSM interventions are only interesting for *Behaviour Changers* when those lead to significant energy savings. The Austrian EE Act[7] plays a central role in this. Current methods of assessing EE turned out to have no motivation for the implementation of behavioural interventions, as there are no methods or prompts provided in the official methods document. This is why Task 24 in Austria focussed on the elaboration of a method for approval of such interventions into this law.
   - Implementing institutions: Public authorities (municipalities, cities, etc.); industry, energy supply companies and SMEs.
   - Target group: Employees in public and private institutions.
   - Example: Online Tool *Green Clicks*[8] (user motivation online tool to engage employees in office buildings in sustainable energy behaviour). The saving potential depends on the size of the organisation and the participation of the employees.

2. *DSM-interventions in office buildings*
   - Reason: Office buildings have big potential to implement DSM-interventions. A big number of end users can be reached. DSM interventions address employees of various backgrounds (technicians, marketing, facility management, management etc.).
   - Implementing institutions: Public and private organisations in commercial office buildings.
   - Target groups: Employees in public and private office buildings.

[6] For a more detailed description see the Final Update Report to the Austrian Government [in German]

[7] Österreichische Energieagentur, 2013 & Bundesgesetz über die Steigerung der Energieeffizienz bei Unternehmen und dem Bund, in der Fassung vom August 2014

[8] Tool Green Clicks ("Klick fürs Klima"), 2016: www.klickfuersklima.at

- Example: Behaviour change campaign *ENERGIES@WORK*[9], which was conducted from February 2016 until March 2017 in 31 office buildings in the municipality of Graz as a competition for the greatest energy savings. In Graz, 264,752 kWh could be saved in total in the one-year competition period.

3. DSM-interventions to accelerate e-mobility

- Reason: In order to provide a strengthened market penetration of electric vehicles, diverse incentives are required. A lack of knowledge and some common misconceptions (e.g. around range) lead to many e-vehicle-offers not being used by end users. Possible interventions can range from information to innovative sharing-offers or multimodal systems, campaigns, events on the topic, driver training, city tolls or financial incentives when purchasing e-vehicles.
- Potential implementing institutions of DSM interventions to accelerate e-mobility are political, administrative and governmental institutions; companies offering e-vehicles; science and research agencies; and eco-social institutions.
- Among the target groups are all people with a need for transport such as inhabitants in a certain region/city, or tourists.
- One example of a DSM-intervention in the field of e-mobility is the financial support for purchasing a vehicle. Within the funding "eCP-Pendeln" (i.e. "eco-commuting") private citizens who commute to work, education or free time activities in the city and surrounding Graz were supported with €5,000 for their new e-car. 33 e-cars were funded so far.

National DSM-examples

Phase I of Task 24 already showed that there is a wide range of (inter)national examples for DSM-interventions, which are already implemented. In the second phase, the original list was extended and more examples were added. The examples stem from the sectors of:

1. Mobility: Among those are projects and interventions, which support the usage of e-mobility via information campaigns, financial incentives etc. The focus is not only on e-vehicles, but also on innovative sharing-offers or multimodal systems. A reduction in greenhouse gases and air pollution is the ultimate goal.

2. Smart metering/feedback systems: These focus on DSM-interventions which analyse the effects of smart meters and feedback instruments on human behaviour.

3. SMEs and public entities: SMEs and public entities have a wide range of options how to implement DSM-interventions. They can directly affect their employees and reach a big number of end users, who can then implement the positive learnings into their private life and daily routines.

The DSM-examples are categorised by sectors (see listing above). The long list of examples is in German will be available in the German results report[10].

Approval of DSM-interventions into Austrian energy efficiency law

Background

In 2014, Austria introduced a law on energy efficiency[11]. In particular, large companies and governmental institutions are obliged to fulfil certain energy savings. Institutions, which implement energy-saving measures can evaluate those measures (in kWh) and those savings can be submitted to a national "monitoring agency". When approved, the savings can be used for fulfilling the obligations or can be sold on the national market.

Accepting behavioural DSM-interventions into this Act has big weight for several stakeholders in Austria. Potential implementers of such interventions like big companies or public authorities need better incentives to do something positive for their employees and the environment. That is why the Austrian Task 24 team focussed on the elaboration of an evaluation method in order to make

[9] Project ENERGIES@WORK, 2017: https://energiesatwork.at/

[10] see Final Report to FFG, 2017 [in German]

[11] Bundesgesetz über die Steigerung der Energieeffizienz bei Unternehmen und dem Bund, in der Fassung vom August 2014

behavioural DSM-interventions accountable into the Austrian EE Act. The Ministry established an institution for the handling of all concerned topics and proceedings as well as a document, which describes the methodology of how to assess certain measures ("methods-document")[12]. This document mainly comprises technical measures. Currently, there are only five measures in the category of awareness-raising measures. Those are:

- Energy consultation for private households
- Energy consultation for SMEs
- Intelligent meters (smart meters) and informative accounting in households
- Stand-by reduction in households
- Fuel-efficient driving training.

With those measures, only a fractional part of behavioural interventions is represented in the methods documents. Many more behavioural interventions currently find no application in the existing law. From Task 24 and other relevant projects, we know about the effects and importance of such interventions in our energy system. When implementing Task 24 in Austria it turned out that most organisations are only interested in implementing behavioural measures if they gain direct financial value. Social responsibility and a green image are (at least for most) organisations not yet trigger enough. In order to generate a further push for such interventions, potential implementers need clear guidance how these measures are accounted for. That is why we focussed on the development of further calculation methods for behavioural change measured within the Austrian EE Act. The overall aim was to improve submissions and acceptance of such measures by the national monitoring agency. A workshop was held in Graz with the relevant *Behaviour Changers* participating. With their input, a calculation method was tested for a recently implemented campaign in the form of an energy-saving contest.

First workshop Graz

On May 22nd 2017, a first workshop was held in Graz on the topic. Representatives from all five *Behaviour Changer* Groups (Municipality of Graz, universities, local energy supply companies, local associations, consulting agencies, research organisations etc.) discussed the topic "beyond kWh" in the frame of the Austrian EE Act.

The aim of the workshop was to find out:

- How can DSM-interventions be evaluated and measured?
- Who is in charge of doing so?
- Which multiple benefits are generated and how can those be measured?

In several discussion rounds, the participants discussed the questions above. The following outcomes were elaborated and discussed:

1. Known behavioural interventions:

Labels; penalties; financial: taxes and incentives; appliance exchange; 'car diets'; papers & research; life cycle analysis and regional programmes including films; energy advice; subsidies; advice; education; online tools; leadership ideal; walk the city/talk energy; help energy-poor households; individual energy advice; internet of things ("industry 4.0").

2. The most promising and effective interventions:

Real-time feedback monitors; competitions; information campaigns; getting rid of counterproductive subsidies ("Pendlerpauschale"); tax incentives; campaigns; labels; online tools.

3. Evaluation of the impact of the interventions:

Quantitative vs. qualitative methods; not all impacts can be measured quantitatively; qualitative evaluation is very intense in time and resources.

4. Multiple benefits generated by DSM-interventions:

[12] https://www.bmwfw.gv.at/EnergieUndBergbau/Energieeffizienz/Documents/Methodendokument_RK_AT_131015.pdf

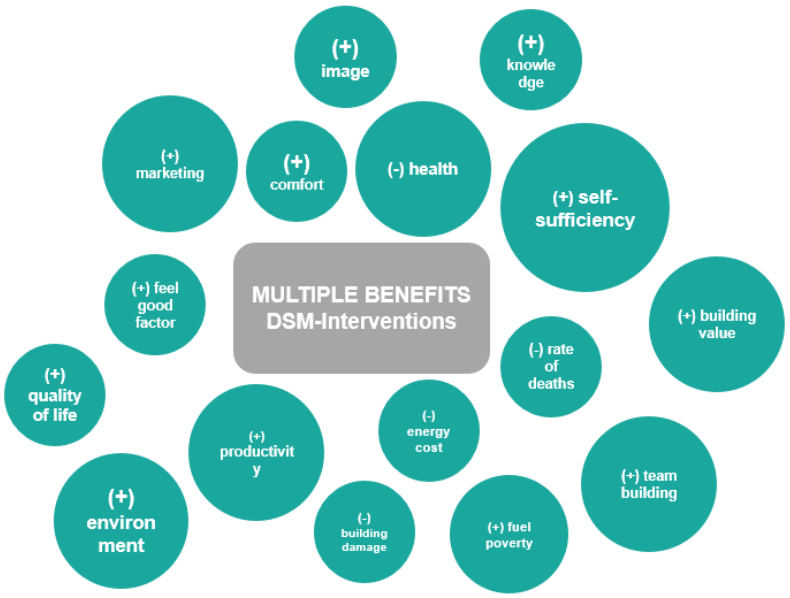

Fig 7. Multiple benefits of behavioural DSM interventions, especially if applied to the Austrian EE Act.

Example: Calculation of *ENERGIES@WORK* behaviour change campaign

Basic information campaign ENERGIES@WORK:

- Energy saving competition
- February 2016 – March 2017
- In Austria: 31 buildings, more than 2,000 employees affected
- Overall savings
  - 264,752 kwh (- 7% for the reference year)
  - 38,000 €
  - 286 t CO_2
- Detailed results in Austria can be found in the project's brochure.
- Conducted in 9 European countries

The workshop from May 22nd 2017 in Graz concluded that there is no single evaluation method for the many different behavioural interventions. Therefore, an evaluation template of an end-user motivation campaign was developed. For this evaluation template, the recently conducted campaign ENERGIES@WORK was taken as an example, as practical data was already available. Furthermore, the campaign consisted of a wide range of different measures, which can also be employed separately[13]. Many factors and potential activities of DSM-measures in office buildings are represented here as well. Among those are/were:

- *Formation of 21 energy teams*: In the beginning of the campaign energy teams were built. Those were in charge of the implementation of the campaign in each building and to inform and activate the employees.
- *Distribution of energy starter kits*: Each energy team received a starter-kit in the beginning of the campaign including helpful materials and energy-saving tips.
- *Energy-saving workshops*: In the beginning of the competition, starter-workshops were held in each building in order to inform employees about the campaign, to conduct a status-quo- and potential analysis and to analyse the first measures that could be implemented.
- *Development of action plans*: Each energy team summarised the measures to be implemented in an action plan (like a roadmap for the competition period).
- *Distribution of energy-saving tips*: Every two weeks, energy saving tips were provided for the energy teams.

[13] see Final Report to FFG, 2017 [in German]

- *Online tool on energy saving*: The user motivation tool *Green Clicks* supports employees with practical tips how to save energy.
- *Project website*: The website informs about the competition and was used to provide information to energy teams.
- *Energy monitoring*: Online tool for energy teams to analyse energy demand in each building.
- *Surveys*: At the beginning and at the end of the campaign surveys were conducted in order to examine the effects of the campaign.
- *Information events*: A start-event was organised to begin the campaign as well as finishing up with an award ceremony, where the winners of the campaign were celebrated.
- *Lotteries*: Each month a lottery was had in order to activate participants (employees) to engage in the campaign.

Approach and results:

First, it was checked which of the measures implemented during the campaign were covered by existing methods out of the methods-document. It turned out that only three measures (of the ones listed above) were covered by existing methods. For the rest of the measures, which are not part of the existing methods document and for which there is no distinctive calculation method yet, individual calculations were created. Various calculation approaches which are proposed for the measures covered in the document were examined and used to develop additional, suitable methods. We also analysed evidence in the form of invoices, participant's lists, workshop documentations etc. for each measure. An overview of the measures, savings and documentation can be found in the table below.

In summary, it can be stated that:

- *Methods according to methods-document*: According to the existing methods **174,346 kWh** can be submitted for the campaign.
- *Individual methods*: According to the individually-calculated savings, for which there is no standard method, **663,571 kWh** could be submitted additionally.
- *In total*: **774,917 kWh** could have been submitted for the campaign conducted.

This much more impressive result was submitted to the monitoring-agency. However, currently, only the savings calculated by the given methods from the methods-document (174,346 kWh) were allowed to be submitted once secure approval was provided. For our individual calculations a check-off is required from the monitoring-agency is and, unfortunately, the agency does not offer *ex ante*-evaluation of already-submitted inputs. Once a campaign has been officially submitted and the monitoring-agency has checked its plausibility, it decides if the calculation methods are approved or not. However, we hoped to show that with improved calculation methods, impressive results of 5-times greater potential savings could be found. The detailed calculation methods can be found in the German final report.[14]

In summary, it can be stated that the savings generated by the calculations applied here (methods-document and individual calculations) are not yet serious-enough incentives for institutions to implement large-scale behavioural campaigns. The effort for conducting campaigns of this dimension (one-year competition in 31 buildings, more than 2000 employees participating, 21 energy teams, 21 action plans etc.) far outweighs the savings calculated for the whole campaign. Our example shows that other incentives are required in order to make institutions implement behavioural DSM-interventions. The large variety of positive multiple benefits, which are generated as side effects of such interventions are so far entirely neglected. In order to make behavioural interventions more attractive it is necessary to make those side effects count officially, as well. We hope that our improved calculations, as well as prompting the need for more detailed multiple benefit analysis and calculations, will be taken up by the *Monitoringstelle* to prompt more investment in behaviour change interventions in Austria.

[14] see Final Report to FFG, 2017 [in German]

Measures campaign	Results	Documentation	Evaluation according to methods-document	Savings in kWh
Workshops	21 building inspections including status-quo- and potential-analysis	Building checklists (pdf) Action plans (pdf)	Energy consultation (level 3)	63,000
	100 employees trained about saving potentials and information distribution (to colleagues)	Workshop presentation participants list		
Support by the online-tool	205 active participants (36 concrete energy saving measures)	Evaluation online-tool	Internet based personal consultation (level 2)	43,050
Starter-kits	80 plug bars distributed	invoice	Stand-By power reduction in private households	5,296
	26 power meters distributed	invoice		
Energy teams in each building	21 energy teams	List of energy team members	Individual evaluation	663,571
	21 strategic handbooks distributed	Handbook(pdf)		
	100 info folder distributed to energy team members	Info folder employees (pdf)		
	800 information folders distributed to participants	Info folder team (pdf)		
	150 posters hanged	Poster (pdf)		
Information material	3000 stickers, 3000 hangers, mugs to inform about campaign and measures	invoice		
Action plans for energy teams	21 action plans and update	Action plans		
Energy saving tips every second week	25 energy saving tips (A4, two pages) sent to around 2000 employees	Energy saving tips (pdf) Email list, Emails		
Homepage	17.00 site views, more than 30 blog entries	Screenshots and evaluation Blog entries (pdf)		
Lotteries including prices	12 lotteries 12 winners 12 prices 3 main prices (value:1.500,- €)	List of lotteries List of winners signatures awards		
Online-tool to check energy demand	64 energy indicators of 18 buildings	Evaluation energy monitoring tool		
Evaluation of the effects of the campaign on employees	232 participants	Evaluation survey		
Starting event, awarding ceremony	2 events with 125 participants	participants lists		
Sum of measurable kWh				**774,917**

Table 1. Summary of additional savings calculated for ENERGIES@WORK

DSM interventions to trigger e-mobility & innovative sharing offers

Background

Improving the uptake of e-mobility and mobility-sharing platforms was chosen as another of the top 3 DSM issues in Austria. It was discussed in a Task 24 workshop setting at the ECEEE summer study 2017, together with the Clair City[15] H2020 project on air pollution (see Rotmann and Kallsperger, 2017). The main issue of focus for this informal workshop session was reducing fine air pollution in Graz. Due to the many interesting conversations that came up at ECEEE, we then decided to hold another Task 24 workshop in Graz, again using the "magic carpet" to delve deeper into this issue.

In 2016, 0.24% of all vehicles in Austria were e-vehicles, out of new registrations of 1.54%[16]. In order to accelerate the market penetration, to strengthen the EV-market and to raise awareness among the population, more diverse approaches are needed. Currently, interventions are largely based on financial incentives in forms of funding, financial support for the purchase etc. A lack of knowledge and common misconceptions (e.g. around range anxiety) mean that already existing offers of e-mobility and innovative sharing platforms are not yet utilised enough by end-users. Well-designed behavioural interventions are required in this field. These interventions can be implemented in various ways, including: driver training, information campaigns, environmental zones, city tolls, regulations such as CO_2 tax, prohibiting certain highly-polluting vehicles, funding and financial subsidies for environmental-friendly vehicles, innovative mobility offers and many more. The concept of "using instead of owning" does not only affect end users in the transport sector, but in many other situations of daily life. With regard to mobility, there are many innovative options of sharing:

1) *Vehicle-sharing*: e.g. also public transport (PT) and micro EVs, newer programmes provide the ability to share your private vehicle, like AirBnB. There are different systems: free-floating, stationary and a combination of them. Some are open to all users, some are partly open and some are private, where users are being chosen by certain criteria. Examples:

- UDO in Bremen ("Use it DOn't own it"). This highly-successful initiative reduced 8-10% of all public vehicles.
- Car to go: models that are supported by the public sector. Vienna is trialling this concept though there are concerns that it could be in competition with public transport.
- Carsharing 24/7: private and very active in Styria.
- Bikesharing: OVO System is a free-floating Chinese system, albeit one which also has recently run into controversy.

2) *Time-sharing:* this is where you e.g. carpool at the same time of day; Examples:

- ÖPNV – public transport, micro PT much more flexible – e.g. call your own bus, shared taxi or UberPool
- Carsharing e.g. "Mitfahrbörse": private car-sharing and pooling. In Germany, www.mitfahren.de has 1.1million users.

3) *Infrastructure-sharing:* this isn't new, but for example EV fuelling stations; Examples:

- Fuelling infrastructure, e.g. share and charge where you can offer your EV charging station.

4) Combined sharing models

- tim "Täglich Intelligent Mobil". A highly prestigious project of the city Graz, it has been running for 1 year and is a mobility offer at central stations. One card and payment system can be used for everything from PT, E-taxis, E-bikes etc. In the moment, the biggest issue is that are only 3 central multi-modal stations so far.

The goal is to reduce private vehicle traffic significantly, with fewer errands run by solo drivers in their own vehicles (especially car sharing/pooling). Instead, one can pay for each trip and time of use. This means that people have to think rationally when it suits them best to take various trips, and how which may be seen as less convenient than a personal vehicle. The main downside is having to share a vehicle and not always having access when it is needed on short notice. On the other hand, the user does not have to worry about e.g. car maintenance, insurance, registration etc. and has much greater flexibility, especially around choice of vehicle which can be tailored to current needs.

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15 www.claircity.eu

16 Austriatech, 2016: Elektromobilität in Österreich: https://www.bmvit.gv.at/verkehr/elektromobilitaet/downloads/oesterreich2016_de.pdf

Second Task 24 Workshop in Graz

On Sept 27th 2017, a second workshop was held to discuss the topic of "using instead of owning" with relevant *Behaviour Changers* in the mobility sector. In Graz, and Austria, there are already some innovative sharing offers in the transport sector. However, they have not experienced high market penetration yet. The Task 24 *Behaviour Changer Framework* was applied to the behavioural problem of getting car drivers to use their cars less and change to innovative sharing offers instead.
The ***End User*** was collectively defined as follows:

- Smart phone-using
- Currently owning a private vehicle whose usage they are willing to reduce
- Living/working in Graz City.

Fig 8. The End User *in the context of our "magic carpet" exercise*

END USER: Potential users of innovative mobility-sharing initiatives

MANDATE:

- Get to work/school/home
- Take shopping home
- Drive for entertainment

STAKEHOLDERS:

- Family
- Friends
- Employer
- Politicians

RESTRICTIONS:

- Convenience
- Lack of information/knowledge e.g. range anxiety
- Too expensive
- Not enough tailored solutions yet
- Sharing solutions still not regarded en par with private vehicle

- Smart-Phone users
- Work in Graz City
- Have a car, open to reducing its use
- Open to innovative mobility-sharing solutions

TOOLS:

- Votes
- Purchase Power
- Manpower (e.g. demonstrations)

Our behaviour change solution was flexible: **anything innovative that helped these *End Users* reduce the time spent driving on solo trips in their own vehicle**. Over time, we were also hoping that the experience of car-sharing would mean that these users would consider getting rid of their own vehicles, or at least be put off buying new or replacement ones.

Who are our Behaviour Changers?

We went around the table and each wrote down our main mandates, stakeholders, restrictions and tools we brought to this solution. Then we chose different *Behaviour Changers* to imagine each other's point of view. This exercise helps build empathy but also shows that everyone in the room was already well-acquainted with each other and their main roles and positions.

Decisionmakers – From politics and the public service (Magistrat Graz, Stmk Landesregierung).
Providers – EV manufacturers (*Nissan*) and PT & infrastructure providers (*Holding Graz*) as well as *Lastenrad* and *Family of Power* (providers of vehicle sharing platforms).
Experts – IEA DSM (behaviour change), DI THM, *Verkehrsplus*.
Middle Actors – *Grazer Energy Agency*, *FGM* (engineers), *Verkehrsplus* (planners).
Conscience – Umweltamt (Environment Ministry) & (roleplayed) "*Critical Mass*".

Fig 9. The Decisionmaker in the context of our "magic carpet" exercise

DECISIONMAKERS: POLITICIANS & PUBLIC SERVANTS

- Stadt Graz: Gemeinderäte, Umweltamt, Abteilung für Verkehrsplanung
- Land Steiermark – Amt der Steiermärkischen Landesregierung, Fachabteilung Energie und Wohnbau , etc.

MANDATE:

- Get votes
- Motivate Graz citizens to embrace sustainable mobility
- Improve living quality (e.g. reduce air pollution)
- Show leadership and create opportunities

TOOLS:

- Information
- Subsidies and incentives
- Regulation/Tax/Law change
- Policy interventions
- Marketing

STAKEHOLDERS:

- Citizens
- Party and Ministry staffers
- Transport providers, experts and planners
- Lobbyists
- Media

RESTRICTIONS:

- Politics/re-election
- Tailoring to individual groups is hard, 1000 different interests pulling them in different directions, e.g. commuters
- Tasks and views of different parties are often incompatible and hard to unify, especially e.g. fossil fuel lobby
- Limited budget and many issues that need to be addressed in the city and regions

Fig 10. The Expert in the context of our "magic carpet" exercise

EXPERTS: TRANSPORT, MOBILITY SOLUTIONS, PLANNERS, ENERGY EFFICIENCY

- Consultancies
- Mobility research centers, Verkehrsplus
- Energy agencies etc.

MANDATE:

- Behaviour change
- Consulting
- Validate data, models and simulations
- Intermediary between different actors
- Publications and dissemination of know-how

TOOLS:

- Reports
- Data and practical knowledge
- Information platforms
- Research and Development
- Materials
- Leadership role
- Best-Practice Examples
- Case studies and testing
- Innovation

STAKEHOLDERS:

- Politicians, research funders
- Citizens
- Mobility providers
- Universities

RESTRICTIONS:

- Financial and resource restrictions
- Lack of knowledge or misinformation in public
- Resistence from end users („don't touch my car!")
- Unify trans- and multi-disciplinary research approaches
- Not enough courage from political and industry leaders to move away from fossil fuel infrastructure
- Difficult to recreate international best practice examples in Graz

Fig 11. The Provider in the context of our "magic carpet" exercise

PROVIDER: INNOVATIVE MOBILITY SOLUTIONS

- *Das Lastenrad*
- *Family of Power*
- *Tim*
- *EV manufacturers e.g.: Nissan Österreich*
- *Holding Graz*

MANDATE:

- Create and provide tailored mobility solutions (EVs, das Lastenrad, ÖV offers from Holding Graz)
- Offers are safe, environmentally friendly and cost-efficient
- Easy access (*Lastenrad* e.g. free of charge, flexible opening hours etc.)
- *Holding Graz*: infrastructure, keep politicians happy
- Nissan: R&D, provide new technology e.g. E-Lorries

TOOLS:

- Public transport
- Tailored mobility offers
- Provision of charging and EV infrastructure
- Innovation + Technology
- Apps, Platforms
- Marketing, Information
- R&D funding

STAKEHOLDERS:

- Citizens, visitors and tourists and customers
- Politicians
- Shareholders, R&D managers, planners
- Infrastructure providers

RESTRICTIONS:

- Financial and time restrictions
- Lack of knowledge and mis-information (e.g. range anxiety)
- Lack of political leadership and role modelling
- Lack of incentives, regulations and laws to stimulate innovation and system change
- Fossil fuel lobby and lack of right infrastructure

Fig 12. The Middle Actor in the context of our "magic carpet" exercise

MIDDLE ACTORS: ENERGY AGENCIES, MOBILITY PLATFORMS

- Grazer Energieagentur
- Verkehrplus, FGM

MANDATE:

- Secure jobs and staff employment
- Provide mobility solutions and information to the population
- Attract as many end users as possible
- Research and data management
- Modelling, simulations, conduct small-scale pilots
- Improve technical knowledge and public consciousness
- Partake in international research collaborations

TOOLS:

- Information
- Networks
- Concept of proof (theory to praxis)
- Models for citizen engagement
- Data, evaluation, metrics & measurements
- Systems (e.g. platforms, apps)

STAKEHOLDERS:

- City Graz
- Municipalities and regions
- End users
- Energy suppliers, economy, politicians
- EU, H2020, IEA DSM etc.

RESTRICTIONS:

- Financial restrictions
- Lack of knowledge/mis-information of end users
- Lack of cooperation and flexibility of mobility and infrastructure providers
- Fears of Innovation
- System change is very difficult to achieve

Fig 13. The Conscience in the context of our "magic carpet" exercise

CONSCIENCE: NGOs, CONSUMER GROUPS etc.

MANDATE:

- Make the world a better place
- Fight climate change and air pollution
- Social justice
- Engage, enrage, activise and lobby

- Critical Mass Graz
- NGOs
- Environment Ministry

STAKEHOLDERS:

- Citizens and wider public
- Other species & future generations
- Politicians/public service
- Media

TOOLS:

- Campaigns, demonstrations
- Events
- Studies
- Media releases, social media
- Donations

RESTRICTIONS:

- Not being listened to/taken seriously enough, also: tend to operate in echo chamber
- Politicians and police actions against them
- Financial limitations
- No public face
- Not enough activists

End user Context

BEHAVIOUR	• AIM: don't go by car, but use innovative sharing-offers
TECHNOLOGY	• Das Lastenrad, e-taxis, e-car-sharing, tim, bike-sharing • Company vehicles • Information systems, smart phones
SOCIAL	• Politics • Role models („celebrities") • Education (teachers, educators) • Oil lobby • Status • Media, employer • Family and friends, colleagues • Other traffic participants
INFRASTRUCTURE	• Public transport, waiting rooms, stations • Electricity grids • Service stations • Websites, apps • Bike lanes, pedestrian areas, streets, charging stations...
ENVIRONMENT	• Tourism and economy • Urban sprawl • Sport, lifestyle • Small article pollution, air, quality of life, hot and cold, clean and secure • Law on energy efficiency • Tradition, affordability • Program klimaaktiv

Table 2. The different layers of context for our End User

Relationships between Behaviour Changers:

Relationships between the different *Behaviour Changers* and the *End User* are relatively strong already: Decisionmakers (**DM**) influence End Users (**EU**) with infrastructure; laws and policies; regulation; information campaigns. **EU** influence **DM** via their voting behaviour, mostly. Experts (**E**)

influence **EU** with knowledge, information and new innovations. **EU** influence **E** by providing data and feedback, and uptake of new technologies and innovative solutions. Providers (**P**) influence **EU** with technology, infrastructure and platforms. **EU** influence **P** by paying for these services (and cookies, e.g. *Das Lastenrad*!). The Conscience (**C**) influences the **EU** with information, participation in activism and lobbying for them and **EU** are active participants and often funders of the **C**. Middle Actors (**MA**) influence the **EU** with information and **EU** often participate as research subjects, thus providing **MA** with data.

Conflicts vs strong relationships

We put hearts to symbolise strong relationships and bombs to symbolise inherent systemic conflicts, onto the magic carpet.

Clear conflicts were e.g. the car-free day that **DM** tried to put into action once a year; or general policies or regulations which seem to impact on freedom-of-choice. *Critical Mass* (**C**) has demonstrations which block traffic and are thus not seen as overly favourable by most **EU**. There is a lot of misinformation out about e.g. *Nissan* EVs (**P**) which the media is often responsible for, as well as mouth propaganda by family and friends (both "Other Behaviour Changers"). For the *Holding Graz* (**P**) it is difficult to do right by everybody especially if it means taking away parking or reducing car access. **Experts** are often attacked for providing too much, or conflicting information and studies. **Investors** regularly fund wrong initiatives and put their money into 'silver bullet technologies' like the "hydrogen economy" and are often in the hands of the fossil fuel lobby.

Strong relationships were between *Holding Graz* (P) and GEA (MA); *Holding* (P) and the Magistrat Graz (DM); Experts and Middle Actors; and the *Lastenrad* with everybody. Experts, Providers and Decisionmakers often work together on providing good solutions. Media and DM can also have very symbiotic relationships, where one depends on the other.

Multiple Benefits discussion

We discussed several co-benefits which would accrue to the different actors (see Fig. 6 above). Some additional ones we discussed were climate goals; less € for oil dictatorships; that public spaces will be more accessible and friendly for everyone; new industries; less noise; more compact cities; conservation.

Specific co-benefits go to:
Conscience (Environment Ministry): better air quality, less noise pollution, achieve climate & conservation goals
Experts: more bike paths and more space to do other things but drive
Decisionmakers (politicians): happy voters
Providers (*Nissan*): increases value to get rid of old cars; more EVs purchased; but also less production which will increase production costs in the short term
Middle Actors (*GEA*): happy stakeholders, more funding.

Storytelling & Headlines

All the collected fairy tale stories [in German] can be found here. The stories were wonderful examples of how powerful the fairy tale story spine can be to collect very pithy and meaningful tales in a very short period of time (see Rotmann, 2017). We also went around the table and got everyone to call out headlines they would like to see in the local newspaper after 2 years of a successful intervention. Here are some of the best:

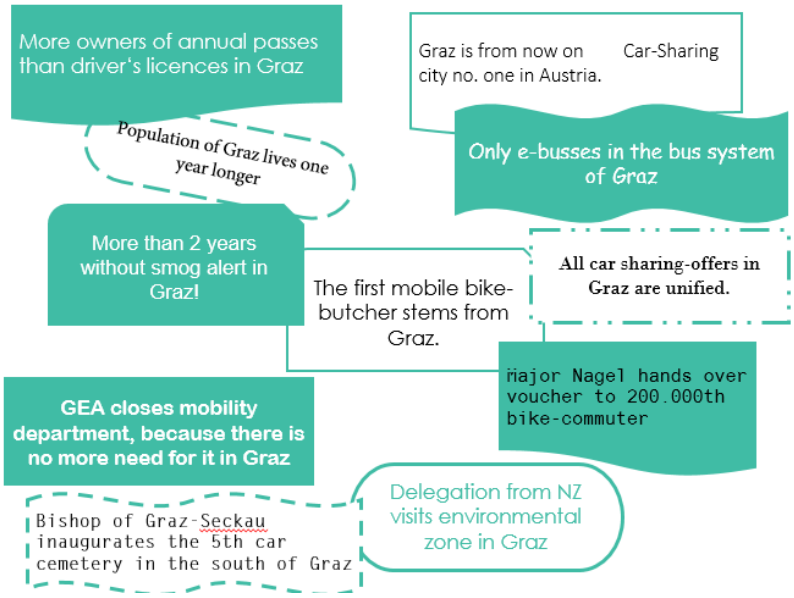

Fig 14. Fictional headlines for the "Kleine Zeitung" showing what would come from a successful pilot

Problem and Solution

Austria has long had car-sharing solutions but need a stronger strategy to really succeed. There are only three *tim* stations in Graz so far, with another two planned. We should really aim for 20-30, which is entirely realistic. Service vehicles and public procurement should be changed over to all-EVs, by policy. We also need car-sharing and EV-charging stations in e.g. big apartment complexes. The political will seems to be there, but not the money. It is also important to strengthen the electricity distribution system to cope with increased draw on power. There seems to be a chicken and egg problem: there are diverse *End Users* who want diverse solutions. Car-sharing is usually only small EVs though, not e.g. utility vehicles. Large families need more seats, for example. Zürich, which is only twice as big as Graz, has 140 car-sharing stations in comparison. We can do better and should pull together a randomised control trial/pilot that studies how to improve uptake in *tim*.

Recommendations

The two tables below summarise the recommendations for the top two DSM-problems, which we focussed on in the second phase of Task 24 in Austria. 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 approval of behavioural-interventions into Austrian EE Act

Behaviour Changers	Recommendations approval of behavioural interventions
 Decisionmakers	- Extension of the methods-document with behavioural change measures - Creation of incentives in order to make companies and public authorities implement more DSM-interventions (e.g. in approval and support/guidelines for the calculation of non-kWh) - Support of the issue “evaluation of positive side effects of DSM-interventions” - Role model function in terms of DSM-interventions, case studies and pilot projects
 Experts	- Development of further calculation methods for relevant DSM-interventions, especially non kWh-ones - Providing recommendations for politicians and decisionmakers and support for case studies and pilot projects - Scientific solution of the evaluation of positive side effects of DSM and energy efficiency - Publication of best-practice-examples and case studies
 Provider	- Development of further calculation methods for relevant DSM-interventions, especially non kWh-ones - Providing recommendations for politicians and decisionmakers and support for case studies and pilot projects - Role model function in terms of DSM-interventions, case studies and pilot projects
 Middle Actors	- Support of end users in implementing DSM-interventions (technology and consulting) - Solution of the evaluation of positive side effects of DSM and energy efficiency
 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

Table 5: Recommendations DSM to trigger innovative mobility

Behaviour Changers	Recommendations DSM to trigger innovative mobility
 Decision Makers	- Multi-channel information and funding of measures to trigger e-mobility and sharing-offers among end-users (financially and legally) - (Co)financing of case studies and pilot projects - Implementing regulations, to simplify the usage of e-mobility
 Experts	- Development of new mobility solutions (e.g. innovative offers for e-car sharing) - Increased evaluation of DSM to trigger e-mobility, including calculations of positive side effects (“Beyond kWh”) - Publication of best-practice examples and case studies
 Provider	- Development and test of new mobility solutions (e.g. innovative offers for e-car sharing) - Development of solutions for technology and infrastructure
 Middle Actors	- Support of end-users - Offer of innovative sharing solutions
 Conscience	- Educational work and lobbying on the issue e-mobility/sharing offers about life cycle assessment, cost, scope etc.

Conclusions

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

1. *Make people the main focus*

   The necessary transformation of our energy system can only work sustainably and effectively, if all concerned stakeholder groups are involved[17]. 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. *You need a variety of DSM- and behaviour change tools and examples*

   There is already a great variety of national and international DSM and behaviour change examples from diverse sectors and institutions. Within the second Phase of Task 24, the Austrian list of examples was extended. On the one hand, this list provides motivation and

[17] Kern, 2017: Die Transformation des Energiesystems als sozio-technischer Wandel

incentive for potential implementing institutions to do more, whilst on the other hand it provides a good overview of existing measures. A more in-depth evaluation of what works and what doesn't and why (not just based on the kWh calculations currently used by the "Monitoringstelle") would also be very useful in the Austrian context.

3. *Collaboratively identify Top DSM-issues*

The top DSM-issues in Austria are:

- Approval of behavioural DSM-interventions into the Austrian energy efficiency Act
- Behavioural interventions to trigger e-mobility and innovative sharing offers
- Behavioural interventions in office buildings

To some extent, we analysed all three of these topics, including with real-life Austrian examples. It was unfortunate that Austria only partook in two years of Task 24 Phase II, as the mobility example especially would have lent itself to a real-life pilot (e.g. co-designing how to increase uptake of *tim* in Graz).

4. *Evaluation of multiple benefits is required*

In the frame of elaborating a calculation method for the approval of DSM-interventions into the EE Act it turned out that the calculated savings do not offer enough incentives to implement DSM-interventions. Though the interventions generate € and kWh savings, they seem not really relevant in comparison to technological solutions. Currently, the Austrian EE Act only allows the approval of kWh, with only the most standard of calculation methods, thus further reducing the impact of claimable kWh. However, the implementation of behavioural DSM-interventions comes along with a great variety of multiple benefits, which cannot be evaluated by the current methods as they are entirely geared towards a kWh value. Consequently, the evaluation of multiple benefits is required in order to make the implementation of DSM-interventions more attractive and show other avenues to convince stakeholders and end users of their value.

5. *Behavioural interventions to trigger e-mobility and innovative sharing offers*

Innovative sharing offers in the mobility sector in Graz need more financial and communication resources, more involvement of end users and participants and a pilot project in order to analyse how to improve the uptake in existing offers.

References

Austriatech, 2016: Elektromobilität in Österreich Zahlen & Daten. https://www.bmvit.gv.at/verkehr/elektromobilitaet/downloads/oesterreich2016_de.pdf

Bergold J. and Thomas S., 2012: Participatory Research Methods: A Methodological Approach in Motion. *Forum Qualitative Social Research* ***Volume 13, No. 1***.

Bundesgesetz über die Steigerung der Energieeffizienz bei Unternehmen und dem Bund, in der Fassung vom August 2014.

Cobben, D., (2017). Subtask 6&7: Case Studies NL Higher Education and ICT. IEA DSM Task 24.

Cowan, K., Sussman, R., Rotmann, S. & R. Cox (2017). Subtask 11: Real-life case studies Designing a Behaviour Change Programme for Hospital Facilities Staff. IEA DSM Task 24.

Churchouse, T., Mahoney, L., & Rotmann, S., (2015). *Closing the Loop – Behaviour Change in Demand Side Management*. Workshop report, London: UKERC The Meeting Place. 37pp.

ENERGIES@WORK, 2017: https://energiesatwork.at/

Hanleybrown, F., Kania, J. & M. Kramer (2012). Channeling Change: Making Collective Impact Work. Stanford Innovation Review Jan 26, 2012.

International Energy Agency (IEA), (2014). *Capturing the Multiple Benefits of Energy Efficiency.* Paris, France: IEA.

IEA DSM Task 24 Phase I: Closing the Loop: Behaviour Change in DSM – From Theory to Practice
http://www.ieadsm.org/task/task-24-phase-1/#section-8

IEA DSM Task 24 Phase II: Behaviour Change in DSM – Helping the Behaviour Changers
http://www.ieadsm.org/task/task-24-phase-2/#section-8

K. Janda, S. Rotmann, M. Bulut and S. Lennander (2017), Advances in green leases and green leasing: Evidence from Sweden, Australia, and the UK, ECEEE Summer Study Proceedings, Hyéres, France.

Kania, J., & Kramer, M., (2011). *Collective Impact*, Stanford Social Innovation Review, Winter 2011. ssir.org/articles/entry/collective_impact.

Kallsperger, T. & S., Rotmann (2018). *Policy Brief Austria*. Graz, Austria: IEA DSM Task 24.

Karlin, B., Ford, R., Wu, A., Nasser, V., and Frantz, C., (2015a). *IEA DSM Task 24 Subtask 3 Deliverable 3A. How do we know what we know: A Review of Behaviour-Based Energy Efficiency Data Collection Methodology*, Los Angeles, USA: IEA DSM.

Karlin, B., Ford, R., and C. McPherson-Frantz, (2015b). Exploring Deep Savings: A Toolkit for Assessing Behavior-Based Energy Interventions*, IEPEC Proceedings*, International Energy Program Evaluation Conference, Long Beach, USA: IEPEC.

Karlin, B., Ford, R., and C. McPhearson Frantz (2016), Evaluating Energy Culture: Identifying and validating measures for behaviour-based energy interventions, IEPEC Conference, Amsterdam, Netherlands.

Kern F., 2017: Die Transformation des Energiesystems als sozio-technischer Wandel (Präsentation vom 12.10.2017: https://nachhaltigwirtschaften.at/resources/iea_pdf/events/20171012_iea-vernetzungstreffen/kern_transformation-energiesysteme.pdf?m=1507794773)

Klick fürs Klima, 2016: https://klickfuersklima.at/

Measham, T.G., (2009). Social learning through evaluation: a case study of overcoming constraints for management of dryland salinity, *Environmental Management* 43: 1096-1107.

Monitoringstelle: Rechtliche Grundlagen für Energieeffizienz in Österreich. https://www.monitoringstelle.at/index.php?id=589

Moezzi, M., Janda, K. & Rotmann, S., (2017). Using stories, narratives, and storytelling in energy and climate change research. *Energy Research and Social Science*, Special Issue on Storytelling in Energy and Climate Change Research, Volume 31, September 2017, Pages 1-10.

Moore, L., de Silva-Sanigorski, A. and S. N. Moore, (2013). A socio-ecological perspective on behavioural interventions to influence food choice in schools: alternative, complementary or synergistic? Public Health Nutr. (2013) 16(6): 1000–1005.

Mourik, R.M. & Rotmann, S., (2013). *IEA DSM Task 24 Subtask 1. Most of the Time what we do is what we do most of the time. And sometimes we do something new. Analysis of case studies,* Eindhoven, NL and Wellington, New Zealand: IEA DSM.

Mourik, R.M., van Summeren, L.F.M., Rotmann., S., & Breukers, S. (2015). Did you behave as we designed you to? Monitoring and evaluating behavioural change in demand-side management: from what to why*, ECEEE Summer Study Proceedings*, Hyéres, France: ECEEE.

Österreichische Energieagentur, 2013: *Methoden zur richtlinienkonformen Bewertung der Zielerreichung gemäß Energieeffizienz- und Energiedienstleistungsrichtlinie 2006/32/EG* („Methodendokument“)

Rotmann, S., & Mourik, R.M., (2014). *Workplan for Phase 2. IEA DSM Task 24 Behaviour Change in DSM – Helping the Behaviour Changers,* Wellington, New Zealand: IEA DSM.

Rotmann, S., Goodchild, B., & Mourik, R.M. (2015). Once upon a time… telling a good energy efficiency story that ‘sticks’, *ECEEE summer study proceedings*, Hyéres, France: ECEEE.

Rotmann, S., (2016). How to Create a ‘Magic Carpet’ for Behaviour Change, *ACEEE Summer Study on Energy Efficiency in Buildings*, Monterey Bay, USA: ACEEE.

Rotmann S., 2017a: “Once upon a time…” Eliciting energy and behaviour change stories using a fairy tale story spine, *Energy Research and Social Science*, Special Issue on Storytelling in Energy and Climate Change Research. Volume 31, September 2017, Pages 303-310.

Rotmann, S. and T., Kallsperger, (2017). ECEEE Workshop minutes. IEA DSM Task 24.

Southern California Edison (SCE), (2015). Dimensions of Energy Behavior: Psychometric Testing of Scales for Evaluating Behavioral Interventions in Demand Side Management Programs. California, USA: SCE

Van Summeren, L.F.M., Mourik, R.M., & Rotmann, S., (2015). *IEA DSM Task 24, Subtask 3 Deliverable 3B. From “I think I know” to “I understand what you did and why you did it”*, Eindhoven, NL: IEA DSM.

Walzer,N., Weaver, L. & McGuire, C. (2016). Collective impact approaches and community guideline developments. Journal of Community Development 47(2).

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 by Grayson Heffner, EPRI, United States

Task 5 Techniques for Implementation of Demand-Side Management Technology in the Marketplace – Completed by 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 by 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 - Completed
Phase 2 – Helping the Behaviour Changers: Dr Sea Rotmann, SEA, New Zealand

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

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