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HOW TO CREATE A 'MAGIC CARPET' FOR BEHAVIOUR CHANGE

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Abstract

The International Energy Agency's Demand Side Management Programme's Task 24 engages a large number of behaviour change global experts from many different disciplines and sectors. The Task's target audience of so-called 'Behaviour Changers' is segmented into 5 sectors: Government ('the Decisionmaker'), Industry ('the Provider'), Research ('the Expert'), Middle Actors ('the Doers') and the Third Sector ('the Conscience'). It also acknowledges the importance other Behaviour Changers outside the energy system play ('the Media', 'the Investor', 'Family & Friends' and 'Other Behaviour Changers'). Each one of the Behaviour Changers has important tools at their disposal, but each also faces restrictions due to their specific mandates and stakeholders. The center piece of the Task revolves around a new framework of how to view the energy system from the 'human', rather than a technocratic perspective, using a collective impact approach. At the 2015 BECC conference, this framework was christened a 'magic carpet' for behaviour change. It draws on various sociological and psychological models but adds its own unique flavour which is explored in field research settings on specific issues in each participating country. 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. In each participating country, workshops on top behaviour change issues are run with the relevant Behaviour Changers from each sector, where we co-design, implement, evaluate (via an internationally-validated standardised tool) and disseminate real-life interventions. This Task is a truly collaborative effort, where co-creation, including from the End User perspective, is key. The Task's overarching 'language' uses narratives and is developing behaviour change evaluation methods that go beyond kWh and beyond energy.

1. INTRODUCTION

Background of Task 24

The Demand-Side Management (DSM) Programme is one of more than 40 Co-operative Energy Technology Initiatives within the framework of the International Energy Agency (IEA). The DSM Programme, which was initiated in 1993, deals with a variety of strategies to reduce and manage energy demand. To date, 26 research Tasks have been initiated to look at DSM issues from a variety of technological, political and behavioural perspectives. Task 24 is called *Behaviour Change in DSM* (Rotmann and Mourik 2013) and was initiated in January 2012. It was the first IEA Task focusing solely on behaviour change. Now there is also Annex 66 in the Energy in Buildings and Community Programme, which focuses on the *Definition and Simulation of Occupant Behavior in Buildings*. It takes a very different, more quantitative and engineering-focused approach yet is complementary to Task 24, with similar goals and large number of international experts supporting it. The two IEA research projects are collaborating. Task 24 is financially supported by 9 countries (Netherlands, New Zealand, Sweden, Norway, Switzerland, Belgium, Italy, Ireland and Austria) and also receives strong in-kind (expert) support from 10 other countries. The overarching goal of this Task is to *provide a helicopter overview of best practice approaches to behaviour change interventions and practical, tailored guidelines and tools of how to best design, implement, evaluate and disseminate them in real life*.

There are two Phases (Phase 1: January 2012 to April 2015, called "*Closing the Loop: From theory to practice*" and Phase 2: April 2015 to April 2018, called "*Helping the Behaviour Changers*") and ten Subtasks (the first 4 were completed in Phase 1) in Task 24, which follow a logical flow:

Phase 1:
Subtask 1 – Helicopter overview of behaviour change models and frameworks;
Subtask 2 – In-depth case study analyses;
Subtask 3 – Evaluation tool;
Subtask 4 – Country-specific recommendations;
Subtask 5 – Expert platform (overarching in both Phases);
Phase 2:
Subtask 6 – Why? (Identifying top DSM issues);
Subtask 7 – Who? (Identifying relevant Behaviour Changers);
Subtask 8 – How? (Toolbox of interventions);
Subtask 9 – What? (Beyond kWh evaluation standard);
Subtask 10 – So What? (Overarching international story).

Over 235 behaviour change and DSM experts from around the globe are participating in an invite-only Task 24 Expert Platform (Subtask 5). 60+ case studies in the areas of transport, SMEs, smart technology/feedback and building retrofits have been collected from 15 countries (Subtask 1). They were analysed with regards to their various disciplinary backgrounds, use of different models of understanding behaviour and their real-life applicability in behaviour change policies, programmes and pilots [1],[2]. In-depth case studies have been collected and analysed from the financially-participating countries (Subtask

2). Several of these looked at building retrofits and feedback/smart technology applications in the residential sector [3],[4],[5],[6].

Task 24 also addresses the all-important question of how to best evaluate successful long-term behaviour change outcomes (Subtask 3) from the perspective of the various 'Behaviour Changers' who are our target audience. Karlin et al. [7] and Karlin, Ford and McPherson Frantz [8] are developing a toolkit to evaluate behaviour change programmes 'beyond kWh' for Task 24 (Subtask 9). This toolkit will be tested in participating Task 24 countries to assess cultural idiosyncrasies and attempt to create a validated, international behavioural evaluation standard. An in-depth positioning paper [9],[10], looks at the various disciplinary approaches to evaluating behaviour change interventions and discusses the many issues Behaviour Changers face when assessing successful outcomes for different stakeholders and end users. Factsheets of how to employ the recommended method to better evaluate behavioural interventions utilising *double-loop learning* approaches were developed for three specific intervention tools from the building retrofit area - insulation subsidies, mass marketing campaigns and energy performance certificates [11]. In addition, Batey and Mourik [12] proposed a methodology to engage energy users in Do-It-Yourself (DIY) data monitoring, suggesting that it offers a number of benefits for evaluation, participation and wider, long-term impacts.

On finalising Phase 1 of the Task, we have provided country-specific recommendations for the different phases of behaviour change interventions (design, implementation, evaluation, re-iteration, dissemination). We also re-envisaged all country case studies that were collected in light of the main recommendations and findings of the Task, e.g. [13]. The Task's findings and recommendations are feeding into each participating country's policy but also the IEA Secretariat's policy goals and reports, e.g. [14].

The language of Task 24

During the first international Task 24 workshop at Oxford University in October 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. For example, long and often difficult discussions were had at this workshop around the meaning of the terms 'behaviour', 'behavioural models' or 'demand side management', see [15]. 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 [16],[10].

Storytelling

Another important outcome of this first Task 24 workshop was the realisation that not only did we need to be very careful in clearly defining our Task jargon and terminology, we also needed to find an overarching 'language' in order to bridge the many different disciplines, sectors and Behaviour Changers we were dealing with. It became clear that there

was only one overarching 'language' that was easily understood by all sectors and disciplines: the use of narratives and 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 [17] and some will be detailed in a special edition on "Narratives and storytelling in Energy and Climate Change" in *Energy Research and Social Science* (to be published in 2017). Examples of how storytelling was used in the Behaviour Changer Framework will be given below.

The Moral of the Story of Task 24

To summarise the many learnings of taking such a high-level 'helicopter overview' of global best practice and cutting-edge theory of behaviour change interventions [13]:

- There is no behavioural silver bullet, no model that fits all circumstances
- All models are wrong, but some of them are useful!
- *Homo economicus* basically doesn't exist in humans (only in chimpanzees[i])
- There is no such thing as purely individual energy use, as it is informed by social factors, traditions, learnings and contexts
- Most energy use is habitual and routine, thus not part of rational thought processes
- Most models and behaviour change interventions are based on the idea that humans think rationally and individualistically about their energy use
- Habits are the most difficult thing to break, and we need to better utilise moments of change and middle actors to do so
- We are at a crossroads and delving into new ways of designing behavioural interventions, so we shouldn't simply continue with the old, technocratic ways of doing things
- However, individualistic, technocratic and rational approaches to behaviour change fit well into our current socio-economic and political models and are also easier to measure and evaluate
- We do need to look at affecting whole-system, societal change including changing practices and lifestyles, not just individual behaviours
- This cannot be done in isolation by one sector - collaboration is key
- It is difficult to identify the right Behaviour Changers and break down the silos their different mandates, stakeholders and restrictions impose
- Every Behaviour Changer has a different piece of the puzzle but we haven't fit it together yet as a holistic picture
- So, we need a shared learning and collaboration framework that works in practice with different Behaviour Changers who all have different goals and approaches
- We also need a shared language based on narratives and clear definitions.

In one sentence, the moral of this Task can be summed up as:
"It's all about the people!"

[i] http://www.monbiot.com/2015/10/14/human-kind/

Phase 2 of Task 24: Helping the Behaviour Changers

Phase 2 of Task 24 started in April 2015 and was based on the main learnings of Phase 1, which are summarised above. The main goal of Phase 2 is to take the theory that was analysed and explored in Phase 1 and turn it into actionable, practical solutions in Phase 2. In the work plan for Phase 2 [18] it is suggested that both storytelling and a collective impact approach [19] which is fostering collaboration among a variety of stakeholders, can be useful tools to overcome the abovementioned challenges and barriers and meet the many complexities imposed on our Behaviour Changers.

The difference and added value to having an International Energy Agency Expert Platform (Subtask 5) is that we identify the top DSM issues in participating countries (Subtask 6) and create much more in-depth relationships with and between the Behaviour Changers (Subtask 7) in each country using this collective impact approach. The Behaviour Changers will assess the effectiveness of the collective impact approach and narratives as a common language by conducting continual stakeholder analyses and interviews before, during and after the Subtasks finish. 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 improving the uptake of behavioural DSM interventions (Subtask 8). The overarching, international 'story of Task 24' will finally be told in Subtask 10. The Task is expected to finish by mid-2018.

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.*

Below we will elaborate on a different 'model of understanding' of the energy system and its actors that 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[ii].

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*, Figure 1).

[ii] For a short explanatory video, go here: https://youtu.be/VAxbT3lqP6E?list=PLoZ9-YO7tGnoDbnOLmu-cLGC9geztJ0F9

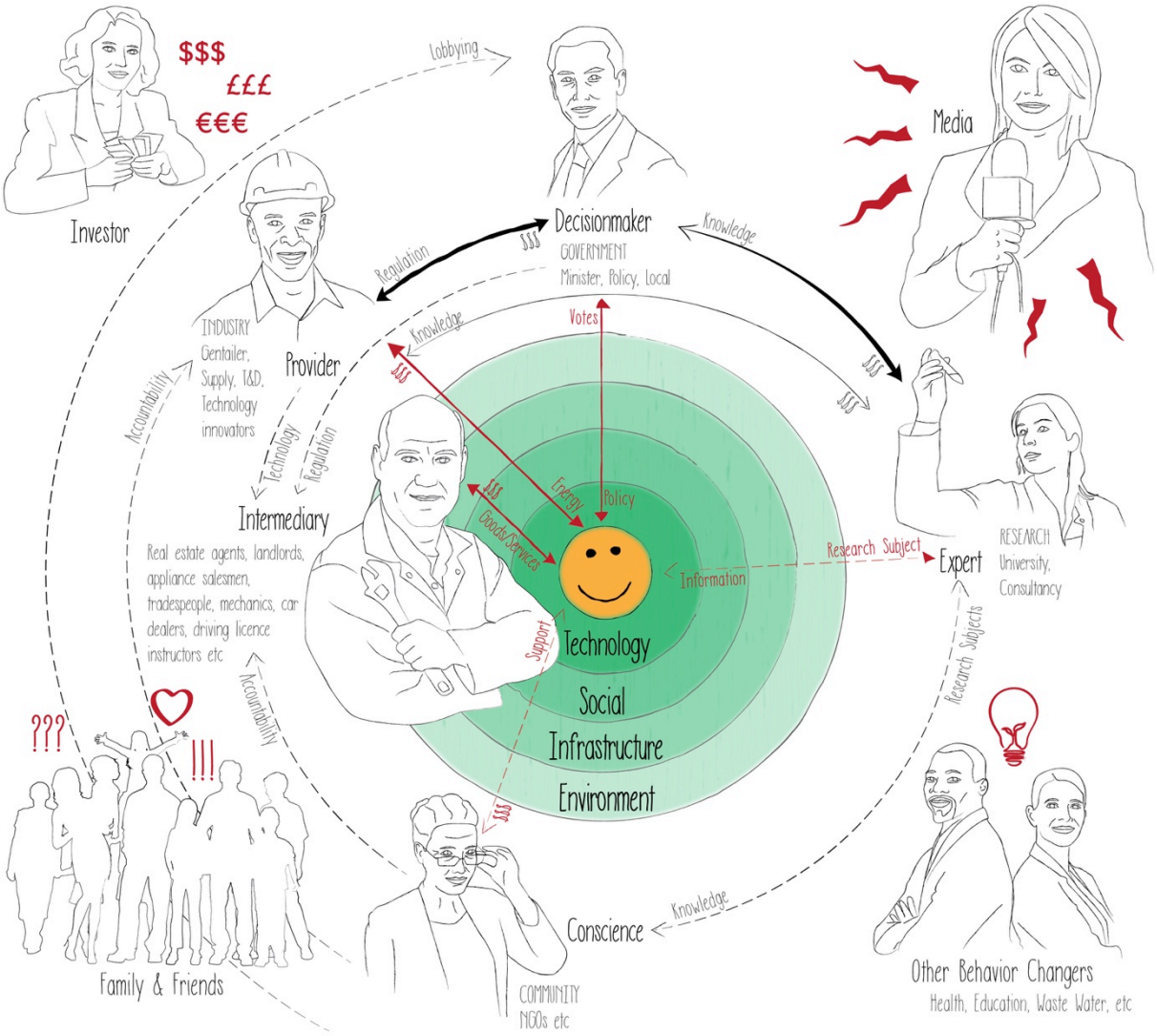

Figure 1. Diagram of the Behaviour Changer Framework that works on behavioural interventions on the Energy End User in a generalised Energy System[iii].

An important note to Figure 1: This is only a 'model' of the system (remember: *"All models are bad, but some of them are useful."* George E.P. Box) and has thus been simplified, concentrating on the main mandate/s of each Behaviour Changer. However, each Behaviour Changer may have multiple roles. For example, *Experts* in knowledge institutes sometimes lobby, as do energy *Providers* who often influence energy policy in many countries; and NGOs (the *Conscience*) may very well also act as *Middle Actors*, depending on their role and aims. *End Users* can also lobby (locally), intermediate (energy coaches), investigate (mobilise local knowledge) and provide energy (home PV), rather than being just passive agents that

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

most models in the current system assume them to be. However, even though this is slowly changing (notice the rise of the 'prosumers' and the increased interest in energy security, energy emissions and energy poverty in many countries), the (individual) End User is still the main target that behaviour change interventions are geared at (hence they are in the center of this diagram). The End User here also means his/her energy behaviours, norms and practices. What needs to be remembered, is that each of the Behaviour Changers is also an End User.

We introduce these actor-types who are the main behaviour change agents (of course their roles may overlap and are not set in stone) in order to highlight their individual and collective importance to achieving behaviour change. Each of these actors play an important role, but none of them can create systemic change in isolation. They depend on each other, on end users and on the conditions set by the particular social, institutional, physical and political context in which they work.

Other groups are also highly influential as potential Behaviour Changers but not directly involved in a specific aspect of the energy system and the End User. One of these other groups are the *Media*, a group that can have enormous impact on end user understanding of aspects of the energy system, both good and bad. The *Conscience*, on the other hand, usually benefits from media interest, e.g. holding other Behaviour Changers in the system accountable for social or environmental impacts from their practices. Other important Behaviour Changer groups outside of the Energy System are the *Investor, Family and Friends* (probably the most influential group on the End User) and *Other Behaviour Changers* from areas such as health, education, waste, water, etc. Of course, the energy End User is the real, final Behaviour Changer so it is crucially important that the other Behaviour Changers learn more about diverse end user groups and their needs.

Usually, behaviour change interventions target the individual behaviours of energy end users. However, addressing end-use also entails attention for behaviours, social norms and practices which shape and are shaped by the environment in which these are embedded. For example, in the New Zealand pilot study [20] on sharing PV-generated energy across neighbourhoods, we can think of *social culture* at a neighbourhood level. This includes the many varied social norms that different individual households in a neighbourhood bring. And we can think of *practices* as ways of doing when it comes to the management of households, building infrastructure and appliances. Changes in the End User's behaviours – e.g. towards using less energy – are strongly influenced by all these contextual characteristics.

We use the term Behaviour Changers to denote those that can affect the conditions for energy saving and efficiency behaviours in end users. They may have expert knowledge needed for saving energy; or have information about the occupancy and energy use of residences throughout the year; or have knowledge about the heating and cooling systems or other appliances; or have influence on decision-making that affects current practices; etc.

Every one of these Behaviour Changers holds an important piece of the puzzle and has the power/tools needed to affect changes within their organisation (or cluster of organisations, or sector). However, none of them are in the position to affect systematic change on their own. The Behaviour Changers are interdependent on each other, on other stakeholders and they also operate in different and sometimes very complex contexts confronted with political, financial and social pressures. Their mandates may be insufficient to affect change or in direct

conflict to it. Hence, complex problems that include technical, organisational, social and behavioural dimensions, ask for collectively addressing the challenges. Since involved stakeholders have different perspectives, preferences and interests, the first step is to arrive at a shared understanding of what the main challenges are when attempting energy saving and improving efficiency. Such an understanding then provides a starting point for developing ways to address these challenges – always with due attention to End User needs.

The Behaviour Changer Framework, or how we created a 'magic carpet'

The Task 24 *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 first step (Subtask 6) is an in-depth issue definition where we assess the potential risks and opportunities in terms of their technological, economic, societal and political impacts. We also discuss the multiple benefits, see [14], for each of the Behaviour Changers, and how to measure them.

The BCF 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 train Middle Actors to deliver neighbourhood energy efficiency interventions, in Ireland). 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 (using normative modelling, see [21]) 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
- Is a backcasting tool as it helps us imagine best practice (in the real world) and describes the current status and what is needed in order to achieve 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 from current status to best practice (i.e. a common goal)
- Helps to evaluate and measure the path towards the best practice (via the specific intervention that was chosen, and the specific indices to measure success for each Behaviour Changer) and helps us re-iterate, where necessary
- Helps identify multiple benefits and decide how to measure them
- Helps us appreciate each others' world, the lock-ins, restrictions, relationships both good and bad which the system throws up, often without the Behaviour Changers' choice.

The Behaviour Changer Framework is a physical cloth ('the magic carpet') of 1.4m by 1.4m where each of the Behaviour Changers' images are placed around the End User circle and liquid chalk is used to write on a vinyl overlay. The **first step** is to let the End User tell their *story regarding the issue* that is being discussed and then work through their behavioural, technological, social, infrastructure and environmental contexts. The **second step** is to collect each Behaviour Changer's *main mandates, stakeholders and restrictions* in relation to the issue we are addressing. We then let each Behaviour Changer assume the role of another and try to imagine what their main mandates etc. are. The reason for this approach is to foster empathy for each others', often conflicting positions but also to show the depth of understanding already in the room regarding each others' roles (this will only be done in the first of the workshops). Each Behaviour Changer has a *toolbox* in which we write the main tools available at their disposal for the specific issue that we are addressing (e.g. policy instruments, taxation, legislation, regulation, national information campaigns, etc. for the Decisionmaker). This is the **third step**. In the **fourth step**, we draw the *relationship arrows*, first between each Behaviour Changer and the End User and then between all the Behaviour Changers. The **fifth step** is to discuss and mark *conflict*s (in the form of cartoon bombs) and *strong existing relationships* (in the form of cartoon love hearts) between each Behaviour Changer and the End User. These steps are used to *visualise the existing BAU energy system* in relation to a specific behavioural issue (for example, how to change hospital building management operators' behaviour to improve energy-related communication and documentation, in Canada, see Figure 2).

Figure 2. Completed Behaviour Changer Framework (in Toronto, October 2015).

In addition, we use a *stakeholder interview and case study template* to collect more in-depth information about each Behaviour Changer and country issue. Both templates follow the logic of the BCF using similar prompts for each step (e.g. exploring the End User contexts first, then asking specific questions about the Behaviour Changer's mandate, stakeholders and restrictions, etc). During workshops, we use the Task 24 '*storytelling spine*' (see [17] and box below) to tease out each Behaviour Changer's story, imagining their 'perfect' future based on the perspective of their organisation or sector. They then each tell a different 'chapter' of the story which helps us to collectively discuss how much overlap there already is, where there are obvious systemic conflicts between Behaviour Changers (e.g. due to different mandates) and ultimately compromise on a *collective story* (or ultimate goal for the intervention) that the behavioural intervention will then be co-designed for.

The storytelling spine

Once Upon a Time… [the background, where you outline the setting and who you are – including your mandate, your main stakeholder/s and your main restrictions]

Every Day… [where you outline the problem and the End Users' behaviours you/we are trying to change. It may include some of the End Users' technological, social, environmental, etc. context/s – the ones that are most important to this issue]

But One Day… [where you outline the idea/solution and how it is meant to change the End Users' behaviours – concentrate on your specific tools you will bring to the table]

Because of That… [where you outline the implementation of the intervention and the opportunities for success – think of the love hearts/good relationships in the Behaviour Changer Framework here, especially between you and the other Behaviour Changers or you and the End User]

But Then! [where you outline what can/will/has gone wrong and why – think of the bombs/conflicts in the Behaviour Changer Framework here, especially between you and the other Behaviour Changers or you and the End User]

Because of That… [where you outline how you have reiterated the intervention because of what you have learned – which new/different tools are you using to diffuse some bombs and strengthen some of the love hearts]

Until, finally… [where you outline how you have measured the multiple benefits that accrued to you/r organisation/sector and what the main results are]

And, Ever Since Then… [where you outline the wider (e.g. national) change that has occurred because of this intervention and any possible lessons going forward or future research that needs to follow]

The Behaviour Changer Story Spine, as it is used during Task 24 workshops.

Conclusions

The BCF has so far been used in 10 workshops in 7 countries with over 100 Behaviour Changers, including at the 2015 BECC and ECEEE summer study conferences. The feedback received during the initial workshops strongly influenced its final design. Each one of the workshops was a great success (as measured by participants' feedback), every Behaviour Changer (and even the sometimes potentially 'difficult' End Users) was highly engaged in both the issues definition, the visualisation of the current situation and the storytelling exercise of their collective future goals. The framework was recently described by Taylor and Janda [22] as "one of two of the leading frameworks for structuring behavioural research in energy." The Task 24 Behaviour Changer Framework organically evolved from the findings of the meta-analysis of Phase 1. Even though it seems to clearly 'borrow' from theoretical models and approaches, such as Actor Network or Social Practice Theory, it was developed not by a social scientists, but an energy efficiency practitioner. It is clear that no intervention idea is truly unique anymore, and that these social science approaches still have a lot to offer to practitioners. The difficulty usually lies in translating complex academic theory into actionable practice, so being somewhat unencumbered by theory may have been helpful here in creating a practical tool. The greatest success of this framework is to offer a simple, easy-to-understand tool of incorporating the complexities of our current energy system by using narratives to foster collaboration and visualise the energy system in a circular, end user-driven, rather than a technocratically-driven, linear way. It is already clear, however that the 'magic' does not lie in the actual carpet, but in the Behaviour Changers that engage with it, and each other, to co-design a better vision for the future.

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