



Closing the Loop – Behaviour Change in Demand Side Management

Workshop Report

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This document is a report by the organiser of a technical meeting set up as part of UKERC's research programme. It is believed to be an objective record of the meeting but has not been separately reviewed by the participants

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Workshop report

The purpose of this workshop report is to provide a summary of the discussions held between the participants at the workshop. For more information about the workshop including links to the presentations where the permissions have been given, and the workshop video please [click here](#)

Workshop context

This workshop was conducted to provide the International Energy Agency (IEA) Demand Side Management Programme's Task 24 with a UK-based cross and interdisciplinary expert discussion on behaviour change in energy use. The workshop focused on existing behavioural models of understanding to translate the theory behind the models into practice. This was done by examining case studies and distilling the contexts that enabled or hindered them, and how they can be applied in demand side management policy, programmes and practice.

There were three main questions that were the central focus of the workshop:

1. What can research end users (policy makers, DSM programme designers, research funders, intermediaries in industry, NGOs and technology etc) do with this theoretical knowledge on models of understanding behaviour, and how can they translate it into practice? What are the main barriers and drivers when translating the theoretical knowledge into practice?
2. What models of understanding work best for each theme (smart metering, building retrofits, transport, SMEs) and under which contexts (political, geographical, technological, legislative, cultural etc)?
3. How can we best monitor and evaluate improved energy use outcomes if these models are used in practice?

Scene Setting: What is Demand Side Management and Behavioural Change in the Context of the Task?

There are communication issues and confusions between DSM (which refers to electricity) and demand reductions – here we are dealing with a broader picture e.g. transportation, fuels etc. as well as electricity. There are language issues which create misunderstandings between these domains, so for the purpose of this agreement the terminology is generated from a whole systems perspective.

Within the wider IEA context Task 24 is the first to deal with behaviour, whilst other programmes are 'pure' DSM Tasks. There are many aspects to this Task, looking into social norms, why we want to use energy, why we use energy in the first place etc. It looks into understanding how we can make something invisible and intangible, recognisable to those who use it – and translate advice from policy to the people. Issues to address within the Task include, as mentioned; a common language needs to be introduced, when models are used they need to be simple, concise and usable information particularly for policymakers, and we need to understand where theory is needed, what type of theory and whether it is required.

Adam Cooper (DECC) Policy Perspective (Head of Social Science Engagement)

There is a continuous struggle between models which look at action and those which look at behaviour and how to change behaviour. The usage and purpose needs to be much clearer to the end user. The winter fuel payments example demonstrates the complexity of energy. There are many incorrect assumptions on economics and behavioural drivers e.g. pre-payment meters – pensioners, for example, do not have these so there needs to be a generalised perspective, with general theories and live data in order to better understand this.

Examples from the UK Government:

- Nudge, behaviour insights team, MINDSPACE – social practices
- Do we actually use behaviour models and theory? Models used are broadly economic – much naïve theorising
- What is theory, a model and policy?
- DECC uses many models – numerical real data models with some theory
- Need general knowledge about certain groups – what are the cultural pressures on them?
- What is happening with these people here and now?
- Doing policy – have to negotiate with other departments

The Business Perspective, Michela Beltracchi, OPower

Social media programmes (Facebook) to aid energy practices are not used in Europe yet, only in USA and at present it is too soon to say how successful this is. At present it is not the predominant means for reaching out to consumers but is becoming more and more important.

OPower have achieved savings of 2% in absolute energy across Europe and USA, this is significant but how can this be further improved? Basic engagement is important (with smart meters etc. more substantial savings could be achieved) as at the moment a broad engagement is undertaken and this is not sufficient. There are also assumptions that people are following tips provided by OPower, but these are only assumptions, there is a need to understand how the behavioural science actually works. We do not know how and why people save energy but it is known that the main prompt is neighbouring social norms. A greater understanding is needed of in-home dynamics to generate larger savings. Surveys are issued to support in-home monitoring; asking residents to start with turning off appliances and lights, then move towards switching to energy efficient appliances, then to installing insulation etc. Questions however arise such as 'is the money saving aspect the incentive?' 'Does this work better with different types of people?'

- OPower: Delivering Energy Savings with Certainty at Scale
- USA based - Behavioural science and data analytics is at the core of OPower

- Provide consumers with actionable insights – raw energy data doesn't make much sense to the average consumer
- Reach consumers through as many platforms as possible – utility letters/emails, web/mobile/alerts, customer service tools etc.
- Social norm data comparisons between neighbours – provides absolute benchmarks
- After time the tips offered to consumers have greater uptake from the easy to the more dedicated
- Helps consumers adopt other technologies – smart metering, time/use tariffs etc.
- Savings at scale across all segments of society and sustained over time (but only at 2-4% average).

Technical engineering/and industry Linda Hull (EA Technology)

With in-home displays, if they are personally delivered, installed and shown as part of smart energy delivery then there is a greater uptake. Within this study residents preferred a 'traffic light display' where they do not consciously have to think about what the numbers mean as they are instantly displayed and so residents can directly engage with their energy consumption.

Cultural and societal changes are happening all over the world for example with lower car ownership in cities etc. and changes in aspirations (status symbols are changing). In terms of energy it may be cheaper to ask people to shift their energy use, rather than changing the grid, through Time of Use tariffs for example. Additionally, energy savings are not constant across household dynamics; rich houses are saving as much as low income households as they can afford the smart appliances.

- Decarbonisation of electricity supply
- The pattern of demand is more important than the usage
- Interaction between smart grids and customers? – metering, micro-generation, controllable thermostats etc.
- The conventional grid – how much does it cost? Is the technology ready? What is the benefit? Smart grid – how much, is the technology/market ready? What are the benefits?
- 22% of homes given in-home displays didn't install it, 22% didn't use it – requires a flexible approach rather than one-size-fits-all
- Time of Use tariffs rewards for non-peak hours
- Can behavioural models help define the benefits?

Models of Understanding

Elizabeth Shove - Social Practice Theory

We need to think about the process of “Closing the Loop” more, with both ends needing investigation – there’s too much from the research side and there is also a mismatch between research and policy. There might be ways to better articulate the differences and be more explicit about the different starting points; this needs exploring.

We are tasked with moving towards a low carbon sector, so it would be useful to understand why and how we are doing this work. In achieving this 2% energy reduction we need to ask, what are the changes, what are the practices and what is the demand? Recording and evaluating skills, data and analysis is important for the process as there are many kinds of data collection going on, a variety of questions being asked and we need to enquire about reframed questions as it would be a new way of conceptualising the problem.

- Relations between theory and policy
- Closing the loop? Feeding in good policies into good theories
- Better mapping of models of energy behaviour and understanding what influences these (social norms, economics, technologies etc.)
- Selling theories of practice to policymakers but give shortcuts to policymakers – practice consists of elements, exist across time/space etc.
- Behaviour and context are reinstanced within one another
- What are the pros and cons? But how do they reframe the question – where do you start? Think about different paradigms
- Dynamics of infrastructure and daily life needs greater understanding
- Reviewing theories and evaluating the relevance to policy – we already have an understanding of behaviour change, so loops need to be kept open and more loops need to be created.

Interdisciplinary Modelling Janet Stephenson University of Otago - Energy Cultures

The ‘Energy Cultures’ work is not entirely policy directed and provides useful data for research; analysis involved 2 step cluster analysis to understand variation – some clusters showed poor energy efficiency (e.g. younger age groups in rented accommodation), some with poor material culture and some where energy practices were not important. From this, the questions focused on understanding what an energy practice is and on identifying the scale and levels in application of the model to differentiate material cultures. The interdisciplinarity of the work means that different or new questions are asked from different disciplines, this provides a more suitable way to understand what approaches would be useful for investigating certain questions. Thus it

can be seen that collaborating with other research institutes to combine existing data to understand discrepancies and differences is vital to this type of projects success.

- Interdisciplinary research network – established energy cultures framework 1. Material cultures, 2. Energy practices, 3. Norms – continuous interaction
- Internal and external influences on change or habit – (branding, family influences etc.) highly self reinforcing
- Different experts within the research network look at different aspects of the framework
- Energy behaviour at different scales – appliance, activity, household/business, sector, national level
- Adaptability of the EC framework – works at different scales and contexts, characterises heterogeneity, supports interdisciplinarity

Multiple Dimensions of Pro-Environmental Behaviour Tim Chatterton UWE

The framework provides a structure to go beyond identifying behaviours and gives researchers the liberty to understand what needs to be done. It helps open up thinking around the different characteristics and how they relate to different theoretical concerns. Questions can be asked such as ‘should we be nudging or reformulating how society works?’ for example and ‘which is the most useful model for doing this?’

It examines the relationships between the individual and community and tries to understand the influences that a norm has on an individual and how it varies. There are many elements to each behaviour (switching off lights in home vs. lights in office block). There are issues with the framework as there are no clear definitions, it needs to be more accessible and there needs to be an understanding as to what the impact of each model is; this is currently being tested and is under development.

- Wide range of approaches but dominated by psychology, economics and behaviour economics
- Are they looking at the same thing? No but what are they looking for?
- Nudging people to change behaviours but every behaviour is different
- Multiple models approach – optimise the problem so we understand what we are dealing with
- It is important to understand who the actors are, the domains, durability and scope – actors for example from individuals to populations to understand who or what is enacting the behaviour
- Framework helps to characterise the problems that may be faced
- Workshop to understand different models – pros and cons and reflections on learning techniques

Models within the context of Smart Metering

This section contains brief bullet points relating to the speaker presentations

Malcolm McCullough (Human Interfaces)

- Understanding how you assess feedback devices
- 150 methods of feedback – soft approach to feedback
- Information – feedback – control
- End user decision cycle – Happiness, needs (keep warm), mode (electric heater), product (2kw fan), usage (8 hours a day), personal (capital running) and system costs (capital running)
- Human interface – best design but it depends on how, who, what, why, when and where

Tom Hargreaves - Qualitative perspective (University of East Anglia)

- Research on energy feedback – wide range of data and results from different studies
- Identical households have vastly different energy usages so important question – what is going on in these households?
- Visible energy trial – 15 households in-depth cohort interviews t0 +t1 (12 months)
- Trajectories of engagement – not every household went through the same process – ‘nag factor’ from the device – new and shiny so want to use it – ‘dominant users’ of device – education/surveillance – ‘cooperation and/or conflict’ of device – resistance to use of devices – reaching limits – ‘plateau-ing out’ – developing detailed understanding – hardening against further demands
- Social dynamics of energy use – education, surveillance, cooperate, resist – who or what uses energy? – long-term perspective(meaning and use of monitors changes over time) – broader context – social and political context embroiled in domestic lives ‘I won’t because you haven’t’

Deployment, Sarah Darby, University of Oxford

- System efficiencies – plural as there are many ways to configure it
- In what sequence will smart metering be introduced?
- Smart grid – old grids with a new additions introduced
- Predict and provide – overall demand reduction or static peak shifting or dynamic peak shifting – examined from both the supply and demand side

- Regulatory preparations for smart grid deployment across various EU countries – introduced into models – scenarios for feasible and expected estimated impacts for smart grid introduction
- Practices of utilities, government etc. must be analysed together

Breakout Sessions: From theory to practice: how to implement these models of understanding in DSM Strategies (focus: smart metering/ feedback)

This section includes summaries from participant breakout sessions. The detailed reporting templates can be viewed in the appendix

Policy

Role of social science and research; what are major issues?

1. There are issues around the goals of smart meters and how we communicate these goals – there needs to be better communication around the new infrastructure to decarbonise, and the finding of new ways to obtain new energy (engage in energy).
2. In-home displays are linked to practices so there needs to be less about how much meters are telling us in kwh usage but rather how much energy it takes to wash clothes for example.
3. Social sciences – technologists for integrated working
4. Aspirational energy savings; smart meters indicate good things are happening not just social norms but also curtailment technologies and improving quality of life.
5. Smart meters are useful tools – price is too low – get away from over using by getting cost of energy increased whilst addressing equalities

Are any of these new ideas that DECC haven't already thought about? Information to practices is a new idea.

Economics

Three themes:

1. Economic models tend to be the most used model to change behaviour but there is a need to understand where its limits are – price incentives are one way to have affects on behaviour – valuing different options – behavioural economics – good framework for removing subsidies and internalising external costs.

2. Often vilified because its often misunderstood or misused – economic analysis rarely translates into policy – summarises messages but the answers are more often than not more complex but gets lost in translation.
3. Limits of economics to learn from other disciplines, the move to behavioural economics is good as it shows where interdisciplinarity can happen.

Social scientists have a lot to learn from economists – ways to simplify thinking to focus on the important things as economists view the same problem from different angles.

Social acceptability

1. Changing social norms and past successes (seatbelts, smoking) have to appeal to pre-existing deep seated values – ethics of changing norms, fairness as a driver of change – what support and level is needed?
2. Why just talking about policymaker? Involves everybody so building support for change is a cooperative process, we also have to deal with the many assumptions we tend to make “do not inconvenience the customer”
3. Too many assumptions so this discussion needs opening up further – how do we break this loop?

Social acceptance of renewables – difference between acceptance (imposed on end users) and acceptability (onus is on organisation that is imposing to ensure acceptability)

Systems perspective

1. Systems approach – no particular behaviour change model but a realistic analysis (pragmatic theory for changing behaviour rather than a model of understanding behaviour)
2. Adoption of various smart grids across the world at different rates – emergence of different functions and actors coming into the system so getting more complicated – all actors need attention not just the end user – analyse relations between all involved
3. Determine the boundaries of the system and identify the most important components to focus on

Open space

1. Will DSM save us? No but it is essential – various DSM approaches help buy us time to achieve targets

Does DSM buy us time or lock us into a trajectory that makes it more difficult to achieve? If DSM methods are used we can start to fundamentally ensure we don't end up undertaking unsustainable behaviours. Lock-in practices refers to changing behaviours first then applying the technology e.g. central heating behaviours (put on heating rather than a jumper...) but could technology follow needs rather than vice versa?

Session Discussion

At the end of the feedback session, the plenary session was opened up to all participants. The following is a summary of the key points raised during the discussion.

Ambitious air pollution standards – meet standards by 2010 and do not need to drastically change peoples' transport behaviour but the spirit of emissions regulation is not followed by industry. This has created a society that believes that technology will sort out the energy issue but this will create a more difficult problem when things fail.

This leads on to keeping up with new technologies where behaviour change can add to the demand, therefore the real problem is that it is a long-term problem and people are resistant to change systems. Additionally, there is no competitive edge as private sector drivers try to compete as effectively as long as there is a problem, from this, the policymakers will need to set the long term objectives.

There is a need to bring in creativity; the low equality of service is accepted in the mobile home industry, will this be the same in the energy sector and how can this happen? There are restrictions and controls on usage and in some areas there is no noticeable difference due to the low level of service already present.

The technology must be driven alongside behaviours – physical objects are used everyday so must always be considered together as a way to understand both sides of the coin; technology has too often been used as the end goal rather than the means.

Energy behaviour is not about energy behaviour change but energy use change in timing, quality etc. the uptake of something, wellbeing consequences, economic gains from energy suppliers – these outcomes then may affect drivers and different players; those who are off-grid for example? Can they ever achieve independence?

Conclusions

These discussions have not mentioned models as much as expected, is this a symptom of how useful models may be? This could show that there is a need to understand what is going on now and how it works now, rather than forecasts.

DSM – is this thinking too small? Changing practices is good but there is a need to change values so that if in 5 years time after all these behavioural changes have only reduced demand by 5% - we know what to do... DSM is the angle but the task now is to understand DSM better and the role of behaviour, as mentioned it is a means to an end and there is a need to take a systemic view on how these issues are related. As the discussions have shown, there is also a need to learn from economists on how to keep things simple but also how not to over-simplify things.

In terms of values, one key message is that it's not about changing values in people but stopping having a society that encourages the wrong values. This would make the task an easier one as it stops the accelerator on extrinsic values and would hopefully ensure the right values would come out in people.

How do we evaluate success and what are the types of indicators? There is a need to learn how to deal with this complexity and make it workable in practice. First discussions this morning were on theories but looking at practices and case materials needs to be done first, we can then return to theories as it is difficult to have this discussion if one can't relate it to what's happening on the ground. Greater interdisciplinarity is therefore critical as it throws up opportunities for social science and questions what people are doing to make it more relevant.

Where should the balance be between evaluating things and getting on and making things happen? What is the proof that policymakers require from us to see what works? Should there be a higher burden of truth? What about broader change? There are tensions between robustness of evidence and the type of evidence that can be collected.

DAY TWO

Case studies breakout feedback

Participants were able to self select groups based on their own interest.

Communities

The role local level activity has on DSM and sustainable energy management is important to understand; within the UKERC project 'Understanding Energy Governments', local is assumed to be a good thing but is this right? Some local governments have taken a top down approach for infrastructure change for example but has this served to reduce local engagement, where the community looks and sees that the work has already been done for them. When community groups are faced with a vast amount of aggregate information, it is sometimes difficult to obtain and provide the best advice for them through skills deficits and a lack of knowledge and skills to turn good intentions into practice.

There needs to be a new Closing of the Loop as there is a disparity between government and community, more intermediaries are needed to bridge the gap and establish new groups getting them to link in with existing groups. The drivers of this include; practice knowledge and capacity development, barriers include funding, time scales, workable solutions, same-people-syndromes in community groups. Failures include skill deficit and the fact that the aims of these groups may not fit with DSM policies.

What has created this social glue and how do we translate these lessons of cohesion to communities that have a bigger role in DSM?

Smart meters

The energy demand research project, a large project over 2 years, involved the introduction of different meters in households. The trials were supplier-led and not academically robust and so lacked clarity from the beginning. It is examined from a policymaker's and practitioner's point of view, policy: interpret research so they make sense to policymakers, practitioners; test out technology and assess costings etc. The drivers included helping to deliver behaviour change through implementers and by adapting technology to work for different users. Barriers involved questions such as; what do you do with the results from such large studies? These can have a large significance, but smaller focused studies are required to answer specific questions, and better understanding is required of the questions we want to ask, as how the intervention is carried out has a significant impact on results.

Transport

Transport and everyday life cannot be separated so we have to ensure both are addressed in these forums. There are both drivers and barriers to this at the individual and societal level; infrastructure, urban morphology, architecture etc. Policy however, is not always helpful as transport planners and environmental policymakers talk different languages. Jillian Anable's models of understanding in case studies for example, the psychology (individual) is dominant in many cases; smart measures implemented in three UK towns was a successful scheme in changing some behaviours with increased walking and cycling and reduced car use. This however, after examination, raised discussions such as is it just a few people doing a lot, or is it lots of people doing a little

bit? Thus, further evaluation and design improvements are needed to understand the personal motivations of people.

With the Smarter Choices project, how can practice theory for example, help improve understanding of what transport practices mean to people? There are three main suggestions for the project; 1. Transport and mobility as a part of everyday life and need to be addressed 2. Do not choose one or another model but use them to get a better idea of which aspects have been addressed sufficiently in a project and vice versa 3. Change of name from 'Soft' to 'Smart' measures.

Building Retrofits

A range of case studies from the UK and other countries were presented; one investigated innovative technology in social housing through innovative heating systems. It examined the roles of tenants and landlords in installation and usage. Focus groups and interviews were used to understand the barriers for adoption. Results presented issues such as hidden costs, breakages, status quo, apathy, lack of information etc. Drivers included; understanding what had made people adopt it, particularly post introduction. Technology in the home and reactions to new technologies, how do they understand how the technologies work? This is important as if this is misunderstood it could take more time to change behaviours. Models were used to understand how the system works, rather than behaviours.

The project only examined and discussed retrofitting in the domestic sector where moments for change can stimulate uptake. These include new children for standard renovations as it would be less costly and more amenable to renovation. General barriers include aspirations of households where people strive for new kitchens, bathrooms etc. but this can be energy intensive and there is a lack of advice available as to how to do this. Failures of this include the lack of connection between tenants, designers, landlords etc. the lack of control as some are not satisfied with work done which raises issues of trust. The processes of decision making/acceptance in adoption of these measures is difficult for tenants to articulate as there are different types of renovation; collective (housing blocks, collectively) and individual which fit in with normal homemaking practices so it needs to be decided whether we focus on individual or system.

SMEs

This case study involved learning change in an organisation. Remote sensors were attached to equipment with data normalised to ease greater understanding. This was to promote the fact that the process matters more and that engaging with people is more important which in turn generates change. The study examined pre and post installation of sensors and reviewed many models to understand what was important. – evaluating frameworks as valuable if not more than specific models of change – health and safety – possible obstacle to change – social norms significant in study – competition and comparison without incentives – feedback devices as important as process – talking to people more powerful but requires funding... one option could be to employ interns in companies who have gone through process but there are still resourcing issues. The differences in commercial environments matter as well as the size of the organisations as some are seen as more suitable than others. Barriers included; resources and engaging with SMEs with limited capacity; drivers were the cost savings of energy in large firms.

Linkages and synergies

Evaluation

The lack of evaluation across the case studies is a reoccurring issue, it also has to be acknowledged that these projects cannot deliver the perfect answer, but through a series of evaluations we can start to respond to the characteristics of companies, sectors etc. Effective policy and practice should also be based on evaluation so that it creates a persuasive story rather than a lot of numbers. Additionally, decisions need to be made from the best information whilst being opportunistic about the schemes and types of evaluations; these need to be direct and concise starting with a straightforward message and then elaborated. Practically we also need to think about how we enable others to evaluate as, for example, communities stories are important as they support evidence.

Not always about energy

New ways of questioning has started about the broader dynamics of everyday life including technologies and research design for example, are we trying to apply social science to natural science? What is possible for social scientists?

Across many sectors, including business, transport and energy there is huge heterogeneity and so there is a need to look beyond the energy use to make sense of the research; examine the multidisciplinary linkages across such sectors and understand the practices and norms and learn from them. With this, it will be easier to understand that one thing cannot cure the problem as it is about many, if not all sectors and actors joining up in their approaches. There is not just one theoretical approach; approaches need to be tailored for it to be successful and transferable across sectors and fields of expertise.

There is also a need for stronger drivers for local authorities and others to get the detail right and to understand the patterns of how things need to change across the board to identify whether projects etc. are heading in the wrong direction. The dedicated actors, who also attend meetings need to start bringing along new speakers and volunteers so that new thoughts and ideas are introduced into the discussion.

There is a mismatch about the thinking on end-users; SMEs managers can implement behaviour change in companies but also be part of the programmes, can we solely rely on policy? There is a significant amount of innovation already happening across sectors and there is a dilemma for academics about not to be left behind as innovation is happening and being developed fast. Storytelling from social scientists should be a gateway to providing the message to policymakers etc. A workshop is needed with end-users and intermediaries – provide them with value (all stakeholders) expert opinions on what is being done now – study what they are doing and then evaluate what works and why – solicited and unsolicited advice – then we can be more approachable to end-users if they want it. The right solution needs a balanced and mixed idea from a human and technological perspective, we need to face reality and understand why academics are taken seriously.

World Cafe Report Back

Keep stories as truthful as possible and introduce different stories for different audiences; hero/learning/ninja stories as this involves engagement and getting the right stories across and developed to the right people. In time, a dialogue between stakeholders is created helping in understandings of each others' positions and reframing languages. This process is needed as there is not one truth or right way of doing things; you are creating a common truth/dialogue and agreeing to disagree. This helps share best practices, lessons from the worst cases and allows more attention for multidisciplinary teams.

The stories that have been popular for a long time – stability, an event, aversion, struggle, happy ending – these can be used as elements to get people to listen and get the message across in a familiar way. In terms of the message, show alternatives and demonstrate the positive messages, hear from who you need to speak to and learn from their lessons as not doing this enough and not listening to ourselves and each other is fatal. Also, engaging earlier and providing free advice, for example, allows a more direct way to communicate our lessons and advice. We also need to learn from our own lessons, understand the co-benefits and understand the end-users.

Stories could include, for example; crises-coping stories such as Japan's energy issue allows people to see what is possible and expands thinking, this also relates to identity stories; Olympic London, this moment in time will remind people how we can be innovative and creative, which in turn links to future stories; compelling stories about stories that do and don't work and why and how.

Workshop Observations - Sylvie Douzou

The workshop identified many areas under discussion including the fact that a common language will not be approved by everybody with models, frameworks etc. all used in different ways, therefore we should not spend so much time trying to find the ideal definition. Academics should aim to concentrate on the content of the research in a multidisciplinary fashion, not forgetting that different disciplines can bring together mutual frameworks which are able to host several approaches or models. This would create a systemic view of the links between end-users and policy etc.

Researchers and their teams need to be decompartmentalised through developing gateways between domains, areas of research and the people behind them. Additionally, we need to take into account the cultural, local and historical contexts etc of other countries through comparativeness so as to better understand, what a society is and what a society wants. End-users need more discussion as to how you keep the dialogue between them and us open. There are no clear tools or magic solutions, policymakers do not have the time to be messed around, we need to bring the research to them which is usable, concise and easily communicated. Can we learn from economists, they are able to simplify their ideas and findings so they are easily understood?

We need to improve our understanding of models and understanding of what they are for, are we all talking about the same thing and are they challenging our ideas; what happens if the model is wrong? Within this field one thing models are useful for is little compartments to store ideas in and to see where our ideas fit. This can help overcome some aspects of complexity as there are many different models out there, with some useful for different timescales etc. From this we can examine whether the aims of the workshop have been achieved; 'identify useful models for behavioural interventions'; was the question too narrow and did this workshop want or go beyond this? Again, we have identified lessons to be learned; a narrow question is a good idea as a starting place and to get discussions going, but frameworks may be more interesting to explain who, what, why, when, how than a model as they may not fit the purpose or the question. A framework of different models is needed as this is a very complex area, this would help to create linkages which give a narrative, but go in-depth, to better explore the wealth the knowledge available.

Cost benefit analysis – problem to solve – what costs can bare it? Only way to solve problem is through people making lots of money – problem of CC rolling on – what costs to quality of life are we prepared to accept?

APPENDIX

Day 1: Breakout Session: From theory to practice: how to implement these models of understanding in DSM Strategies (focus: smart metering)

Chair: Sea	From the models discussed so far today, how can they be implemented in demand side management strategies?
What is happening in the real world at the moment?	<ul style="list-style-type: none"> · Understanding innovation · Price incentives · Valuing different options · How can economics help? · Behavioural economics · Identifying subsidies · Internalising external costs · Framework for thinking about distinctions/barriers
In what context can this model be applied? And what would the desired behavioural change outcome be?	Focusing only on price is difficult
How could you evaluate the desired behavioural change using this model(s)?	Problem of unvalued benefits in CBA – answer is biased towards things you can value.
What steps are needed to transform this into practice?	Economic analysis rarely translates directly into policy. Answer is normally more complex than a single number
Barriers / drivers for policymakers/implementers who use these models.	
Top 3 themes from your discussion.	<ol style="list-style-type: none"> 1. Economics – most used model to change behaviour, therefore important 2. Vilified for being misused 3. Important to understand limits and learn from other disciplines

Chair: Sarah Darby	From the models discussed so far today, how can they be implemented in demand side management strategies?
What is happening in the real world at the moment?	Adaption of various smart grid elements at varying speeds, emergence of prosumers, demand aggregators, data managers – new functions and actors
In what context can this model be applied? And what would the desired behavioural change outcome be?	Our model was a systems approach, practice-theory related. Taking into account all actors in the system, not just end users

What steps are needed to transform this into practice? Barriers / drivers for policymakers/implementers who use these models.	Debate on where control should lie between different actors/ power relation between actors. What would the best outcomes from a smart grid be, for different participants/ actors/players? Analysing this is important.
Top 3 themes from your discussion	Determining the boundaries of the system under investigation, and which components are most interesting. If no clear benefits for end-user, communal or individual, then policymakers have an uphill struggle.
Tweet: could you summarise your key point in 1 sentence?	Bring more of the 'social' into analysis and planning of socio-technical systems.

Chair: Who was the chair? Malcolm?	From the models discussed so far today, how can they be implemented in demand side management strategies?
What is happening in the real world at the moment?	Mixed ideas about what they are for - missing opportunities re 2 way conversation. Current info is worst e.g Skwh kWh? Billing vs Shopping SM do nothing – but are computers – can be part of an ecosystem How to enable
In what context can this model be applied? And what would the desired behavioural change outcome be?	Social norm research Helping identify things may change <ul style="list-style-type: none"> · I do x and change what practices emerge · Help them spot how to increase practices · Other ideas
What steps are needed to transform this into practice? Barriers / drivers for policymakers/implementers who use these models.	SM as enablers Give info first and then help them identify solutions Create aspiration of low carbon lifestyles Use of incentives can lead to rebound following end of incentive Will you use SM – little kick to change habits
Top 3 themes from your discussion.	Define goals and be open. Info should be linked to practices Social Scientists getting stuck into technologists Make energy saving aspirational <ul style="list-style-type: none"> · Linking it to quality of life improvements
Tweet: could you summarise your key point in 1 sentence?	Social scientists! Work more with technologists to maximise potential of smart meters!

Day 2: Case Study breakouts

Transport Case Studies Chair: Jill Anabel	
<p>Key point from case study presentation</p> <p>Transport – everyday life So additional design and evaluation is needed addressing social and end user aspects</p>	<ul style="list-style-type: none"> · Social differences; cultures; trust; peer-context <ul style="list-style-type: none"> ○ Crucial + underresearched · Interesting transport case studies! – psych. Individual approaches · Interesting results in traffic; uptake walking; reduce car use but: Few people are doing a lot or Lasting? Potential? Many doing a bit? Limits?
<p>How can we ensure buy in from end users (policy makers, programme implementers and practitioners) to implement these models into real life.</p>	<ul style="list-style-type: none"> · Depending on aims of project: · Proper design and evaluation · Use models to structure ideas and making sense. Find out what is missing, in need of alteration e.g. gateway to models can help
<p>Drivers</p>	<ul style="list-style-type: none"> · Society: car ownership (cultures/expectation) · Infrastructure · Urban morphology and residency patterns · Silos – transport planners don't want to be seen as promoters of 'soft' measures (smart) · From individual to coll. level
<p>Barriers</p>	<p>From individual to coll. level</p>
<p>What are the failures in this area and why?</p>	<p>Addressing the personalised level:</p>
<p>Top 3 themes from your discussion.</p>	<ul style="list-style-type: none"> · Transport and mobility are part of everyday life and need to be addressed as such · Models to support – not as 'total basis' · Need more work on evaluation: straightforward outcomes and qualitative aspects (e.g. changes in meaning of car ownership for people)

Case Studies User-centered design in non domestic buildings (UCL Project) Chair: Marcela Ucci	
Key point from case study presentation	The study reviewed models and applied or adapted one. However frameworks seem more useful for understanding theme/models. Predictive Guidance on approaches that work best with particular types of company
How can we ensure buy in from end users (policy makers, programme implementers and practitioners) to implement these models into real life.	? Tap into free resources
Drivers	Substantial savings are possible, or may be possible. Varies – for some control matters, or cost, or type of work that attract certain
Barriers	Can be difficult to engage with SMEs with limited capacity? But same with all aspects of study. Cost of consultancy – type interventions and hardware SMEs are highly varied. Possibly more complex than households
What are the failures in this area and why?	Didn't discuss failures
Top 3 themes from your discussion.	Frames come before models. There are different types of frame.

Innovative technologies in social housing (Retrofit – domestic sector only) Chair: Phil Brown	
Key point from case study presentation	Project still underway – early funding only. Barriers to adoption of efficiency measures – disruption, personal liability, hidden costs, favouring status quo, apathy, lack of information Drivers – not clear that people understand why they had decided to adopt Lack of trust
How can we ensure buy in from end users (policy makers, programme implementers and practitioners) to implement these models into real life.	Centrality of trust – often in short supply What stories are being told Grounded theory. If there is a model it will be emergent from the research. Does practice theory relate to investment decisions?
Drivers	Windows of opportunity, moments of change. Norway focus on these points to increase investment in efficiency Non-energy related refurbishment
Barriers	Aspirational home improvements can be very energy intensive Lack of professional/ advice on work needed Different interests of owners/renters Lack of understanding of climate change imperative
What are the failures in this area and why?	Disconnect between tenants, landlords, installers, designers. Technical failures, lack of quality control
Top 3 themes from your discussion.	<ol style="list-style-type: none"> 1. Processes of decision making around adaption (or acceptance for social tenants). Complex and difficult to investigate 2. Different type of renovation – collective renovation (Norway), renovation over a longer time frame, individuals, landlords. Renovations at moments of opportunity 3. Energy renovation – how does it fit within normal home making, renovation processes. Individual and systems perspectives 4. Power of metaphor and stories around innovative systems.

Case Studies Energy Demand Research Project/Smart Meters Chair: Gary Raw	
Key point from case study presentation	Complexity of programme and designed outcomes lack of clarity on the effectiveness of the results Project involved 60,000 households and costed £20m in total. 4 main suppliers. Gas and electricity meters. Supplier led trials not academically robust. Combination of interventions, H&Ds, SMs, ToU etc
How can we ensure buy in from end users (policy makers, programme implementers and practitioners) to implement these models into real life.	Policy makers – Interpret results in a meaningful way in relation to stated policy objectives. Programme implementers – buy in achieved through testing technology prior to wide scale roll-out (profit imperative) Practitioners
Drivers	Policy makers – need to support policy objective (cost, low carbon security) Deliver behaviour change and support energy policy objectives Programme implementers – Large, complex study. What do we do with these results and what do they tell us? Practitioners – utility behaviour, different types of buildings, synergy between interventions, installer behaviour
Barriers	Policy makers - more beneficial to suppliers who learned more from trials than policy makers Programme implementers – large complex study. What do we do with these results and what do they tell us? Practitioners How much interest is there in robust evidence – if it delivers the “wrong” answer
What are the failures in this area and why?	Complexity can lead to “policy based evidence” rather than “evidence based policy” Results are difficult to interpret – reducing credibility Survey data could not be linked to consumption data
Top 3 themes from your discussion.	Importance of clarity in research design prior to commencement of study Understanding what the question is before undertaking full research. Useful to have a clear theoretical framework – means, motive, opportunity (esp. Time) from analysis of data. How the intervention is carried out has a significant impact on results.

Social acceptability breakout session notes Chair: Joanne Wade	
Key point from case study presentation	Initial discussion of the term social acceptability and the group's discomfort with it, and the suggestion it embodies that we as energy actors are introducing something to society from the outside. Followed by broader discussion of acceptability of efforts to change behaviour.
Points discussed	<ul style="list-style-type: none"> · The way to change norms is to appeal to stronger and much deeper rooted values (such as the primal need to provide for children). This has been the case with successful initiatives such as seatbelts and smoking – and there has been significant political support; · The ethics of attempting to change norms; · The concept of fairness as a driver for change (linked to resource scarcity) and how to overcome the barrier of 'I won't because he isn't', and the potential role of regulation in this; · The need for a certain level of public support before legislation can be implemented (but to what extent should the policymakers develop this support – is the 'policy window' model, where the policymaker follows the will of the public, really acceptable?) · The fact that the level of acceptance of government intervention in our lives is much lower now than it has been in the past; · The roles of different actors in delivering changes in behaviour, and the fact that this has to be a cooperative effort, without too much focus on any one actor; · The assumptions we make about 'givens', such as 'we must not inconvenience the consumer' (electricity industry perspective) or 'supply reliability has to be maintained at its current level'; · We need to understand what the 'non-negotiables' are · The potential of the education of the next generation.
Top 3 themes from your discussion.	<ol style="list-style-type: none"> 1. Significant behaviour changes appeal to pre-existing deep-seated values and have political drivers 2. We make too many assumptions about what are the non-negotiables and we constantly reinforce these assumptions with a whole range of other things that we do. How do we break this loop? 3. Building support for change is a cooperative process; we should not focus too much on one actor as the driver of change.

Linkages and Synergies summary

<p>What are the cross theme/ case study opportunities and what would the benefits be?</p>	<ul style="list-style-type: none"> · Use of models. Where is clarity important? Clear objectives or clear model. Reviewing models as checklist- at beginning or at end. Use them all with clear understanding of what for · Gary's model – means, mode, opportunity · Do they capture process of change – who, sequence, timing · How important is it to know why? Potential for change, elsewhere · Imperative to act and not to act · Lack of evaluation of case studies – need a framework that could be deployed to account for and work within set complex constraints. · Evaluating things can be counted not what counts · Evaluation is key · Interactive and advice · Systems – different tool that we can apply · Personal – Use what we have – use both. Choose which elements work
<p>Where are the major gaps between themes/case studies?</p>	<ul style="list-style-type: none"> · Apparent lack of linkages between members. Need to decompartmentalise areas · Technology – mal adoption days. On its own not enough · Review choices that people make · EDRP trial. On average people save 3%. Can't link evaluation. Other things happen
<p>Top 3 themes from your discussion</p>	<ul style="list-style-type: none"> · Managing expectations – can't count everything · Different within frameworks · Fuzzy-ness should be captured and communicated · Need to open ways to link together – models are diverse · Full tailoring package – be tailored enough – what is the gap · Motive · Engagement · Technologies

World Café reporting templates

In this session the notes refer to the three following questions:

1. **What stories would end users ((policy makers, DSM programme designers, research funders, intermediaries in industry, NGOs and technology etc like to hear?**
2. **What stories would they listen too?**
3. **And what stories (case studies) should we tell?**

MESSO

- It happens in a dialogue. Understand somebody's frame. Understand the context and reframe and rephrase it

- Same project – who is responsible for implementation? Understanding the knowledge level. Economics is dominant. We can bring a new view to add. Importance of context. Too many stories?
- Message to be told: system innovation.
 - Behavioural
 - Institutional
 - Technical
- Share experiences
- Evaluation is important (Italian Example). Beyond figures and statistics, the value of multi methods.
- We are the ones to adapt to our target groups
- Get in the right direction
- Media wants soundbite. Why don't we use USP's. We get stuck in nuances. How do you sell the benefits?
- Interfacing - stakeholders must understand each other. Improve cooperation and even switch. Inconsistency is difficult. Nature of research and the "real world" differs, because the nature of research is to allow an open end
- Focus of researchers on policy makers.
- Trust the person to get each other to listen. Where does the time come from to build relationships?
- Help redefine the problem not just give the answer. Ask the right questions. Not only answering the question but share knowledge.
- MINDSPACE was oversold. Overpromised
- Nudge. How do you manage right use of message? Make tools useful?
- Premature ideas
- Who is responsible for good use?
- Use vehicles around people.
- Translation plans?
- Media has to be involved for positive information
- Interpretation is not to influence
- Need for a communication expert
- Get on with it. Don't be scared for negative stories. Have a dialogue. Dissemination is part of your research. Engage. Enable

- We are stuck on enabling ourselves? We are critiques? And there not popular.
- Local governments give a shit and they will feed up to national government.
- GOOD EXAMPLES!!
- Empowerment
- Cost saving in messages helps.

Chair: Sarah What stories would we like them to hear?	
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Key ideas collected

Policy makers

- Sign. Minority of people who drive cars and want to give them up
- One size fits all doesn't work
- Policymakers implementing instruments + relationship with people who fund them
- Unexpected outcomes, social science can help. Try see what they can be
- Acknowledge uncertainty
- Engagement Strategy
- What doesn't work important

Technology Developers

- Show how to make \$
- U stick to advertisers, social marketing
- Make business stronger, corp. response
- How to manage smart meter roll out well
- How world is changing and their business models can adapt
- Its important
- Open innovation

Intermediaries

- How to implement practice
- Be practical, translate theory very simply
- 'off the shelf'
- What's in it for them, why do they do it
- Laddering approach "why"?
- Green deal – intermediaries are providers, jump on bandwagon l/out understanding social acceptability issues
- Much better understanding how ? integrates in lifestyle
- Tradespeople, installers etc very important

Research funders

- Should get bonus points for inter-disciplinarity – but problems with that as well
- Social Scientists only included end of pipe, need to be included from start
- Criteria: knowledge transfer need to be more rigorously enforced
- Users to end users of research
- Appropriate place to publish esp for interdisciplinary research

General public

- For the wider context
- ? credentials reflect the interest of general public
- Energy is human story
- I can help you
- Careful with using the word 'practice' but explain why
- Shifts in thinking to simplify but still get message right
- Comms training?
- Often right results of tools more important than if tools if purist(ically applied)
- Simplicity as the other side of complexity – have researchers digested the complexity enough to make it simple?

Round 1

- Have listened to Nudge (great story – can be told easily; doesn't alienate; resonated; cheap) and Mindspace (understanding what makes people tick, power/control. Took over from economics narrative of practice theory, very challenging, involves reframing, can't be implemented by one department, long timescale (in terms of 4-5 year political cycle)) planning theories (locally)
- Tech developers look in disciplinary publications
- Coolbiz as successful story
- Icelandic ash cloud showed connectedness to everyday life. Led to change in business practices, e.g. employers want to know where employees are at any time. Rise in video conferencing.
- Crises as turning points.
- User led design has been listened to, to good effect (or is it tokenistic?)
- A difference between listening to a story and acting on it...but the rhetoric may change

Round 2

- Nudge – nothing actually changed much...it was only adapted because it fitted an ideology. But it could still be usefully applied in opening doors to related ideas
- Stories are listened to when they fit with the terms of reference/priorities of the listener
- Co benefits
- Carbon Trust talking to lorry drivers (to try to reduce carbon impact of transporting aggregates); discuss savings in diesel/£
- Why has WRAP (Waste Reduction Action Plan) survived while Carbon Trust and EST have been drastically cut? CT and EST about saving the planet; WRAP about avoiding waste. So narratives are different.
- 'Energy City' label in Switzerland – has been successful story though it's now a bit too easy to become one
- Invention stories (e.g car that does 10,000mpg)..can be very powerful, showing what's possible. You can then build on them by getting into discussions about supply chains, actor networks etc.

Round 3

- Important not just to say what doesn't work but to add a story or stories about what does work
- Tell wildly 'unrealistic/radical' (80% carbon reduction) stories to stretch mental boundaries
- Green deal has been a really interesting idea/story that has persisted in spite of all the mounting evidence that it won't work

- Policy makers have to listened to a great many stories/lobbyists. Academics/researchers as honest brokers and sense makers? (not always seen as neutral – shouldn't over emphasise this? Not quite honest?
- We want to tell stories that are generic (universality of powerful stories) not just project by project.

Round 4

We'd like to tell

- Evaluation stories – selection of categories, terms of reference
- Comparison stories – how did other countries/cities cope with similar challenges?
- Collective, interdisciplinary stories from teams....engineers are good ambassadors for these
- These stories/toolkits can be developed by sharing, discussing and building them with intermediaries. Story can be too complex at first. May need refining
- Stories that contain something that look like a solution
- Stories that build consensus among researchers
- Stories that are clear about what can be achieved
- 'Living lab' as a story – see IESD at DeMontfort University for details

Chair: Sea	Q: what stories were listened to by end users?
Key ideas collected	<ul style="list-style-type: none"> · We are humans, people use energy · nudge – heard what they wanted to hear. Cost nothing, no regulation · low emission focus based on LOG. Frame (logical framework) · Little stories come from it. Soil erosion # in BUROBE · WUNZ insulation scheme – health story · Hero stories vs learning stories · What works? Troubled families Prog. · There is no individual problem, need to phrase it in context need to pander to policy makers' problems and align to their policies · Many local policy makers not just central govt. · Need to find the person to tell the right story to ·
Mind space – oversold	
Horror story	
Zero carbon buses by 2016	
To be a hero you have to go through trials; overcome boundaries; obsolescence	

Top three themes from your discussions	<ul style="list-style-type: none"> · Zombie facts · Ninja Stories · Super Hero Stories · Practice Theory · “social scientists seek truth not necessarily how can it be approved” · Policy makers limited, go to other people · Get ideas into the heads clear · Change the context “ninja story” · Oz – no appetite for people matters – needed to go the right person, with right story at right time · Fun psychology stories eg. Line drying guys thought they were thought to be homosexuals! · Don’t change the story, change the end user of the story? · Norway: heatpumps – focused on increased comfort level · PV made neighbourhood groups (Austria) · Leadership vs. fast followers? NZ · Tony Blair re: George W Bush (no power to change his position) · Practice theory doesn’t have to be difficult expands opportunities and kinds of things that can be shaped and ? will be more and more people once research progresses · Global cool “turn up the style/Turn down the heat”
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Attendee List

First Name	Surname	Organisation
Jillian	Anable	University of Aberdeen
Laura	Barnfield	Oxford Brookes University
Matt	Batey	De Montfort University
Sara	Bell	Alectrona Grid Services Ltd
Michela	Beltracchi	Opower
Even	Bjornstad	ENOVA
Brenda	Boardman	University of Oxford
Yvonne	Boerakker	DNV KEMA
Sylvia	Breukers	Dunetworks
Philip	Brown	University of Salford
Tim	Chatterton	University of the West of England
Yeoungjin	Chae	Korea Power Exchange
Adam	Cooper	DECC
Sarah	Darby	University of Oxford
Sylvie	Douzou	EDF-R&D
Angela	Druckman	University of Surrey

First Name	Surname	Organisation
Brian	Drysdale	Cardiff University
Esther	Dudek	EA Technology
Tina	Fawcett	University of Oxford
Vicky	Haines	Loughborough University
Tom	Hargreaves	3S Research Group
Samantha	Heath	LSx
Sabine	Hielscher	Sussex University
Kersty	Hobson	University of Oxford
Gesche	Huebner	UCL Energy Institute
Linda	Hull	EA Technology
Taofeeq	Ibn-Mohammed	De Montfort University
Katy	Janda	University of Oxford
Helene	Joachain	Université Libre de Bruxelles
Aurore	Julien	UCL Energy Institute
Henrik	Karlstrom	Norwegian University of Science and Technology
Andrew	Karvonen	University of Manchester
Frederic	Klopfert	Université Libre de Bruxelles
Matt	Lipson	DECC
Evelyn	Lobsiger-Kägi	ZHAW Zürcher Hochschule für Angewandte Wissenschaften
Malcolm	Mcculloch	University of Oxford
Ruth	Mourik	Duneworks
Janine	Morley	Lancaster University
Charlie	Morris-Marsham	UCL
Michael	Peters	University of Reading
Bianca	Poti	CERIS
Gary	Raw	UCL Energy Institute
Ruth	Rettie	Kingston University
Sea	Rotmann	Sustainable Energy Advice (SEA)
Elizabeth	Shove	Lancaster University
Michelle	Shipworth	UCL Energy Institute
J Richard	Snape	De Montfort University
Janet	Stephenson	Otago University
Joseph	Szarka	Bath University
Claire	Thornhill	Frontier Economics
Marcella	Ucci	UCL
Paul	Upham	University of Leeds
Joanne	Wade	Joanne Wade

First Name	Surname	Organisation
Judith	Ward	Sustainability First
Jennifer	White	University of Nottingham
Charlie	Wilson	Tyndall Centre

Programme

This workshop will provide the International Energy Agency Demand Side Management Programme's Task XXIV with a UK based cross and interdisciplinary expert discussion on behaviour change in energy use. The workshop will focus on existing behavioural models of understanding to translate the theory behind the models into practice. This will be done by examining case studies and distilling the contexts that enabled or hindered them, and how they can be applied in demand side management policy, programmes and practice.

We have 3 main questions that we aim to get answered by this workshop:

4. What can research end users (policy makers, DSM programme designers, research funders, intermediaries in industry, NGOs and technology etc) do with this theoretical knowledge on models of understanding behaviour, and how can they translate it into practice? What are the main barriers and drivers when translating the theoretical knowledge into practice?
5. What models of understanding work best for each theme (smart metering, building retrofits, transport, SMEs) and under which contexts (political, geographical, technological, legislative, cultural etc)?
6. How can we best monitor and evaluate improved energy use outcomes if these models are used in practice?

Day 1, 9th October

09:00 Registration and refreshments

09:30 **Welcome and Introduction** *Chair: Sea Rotmann Sustainable Energy Advice*

09:50 **Scene setting: What is Demand Side Management and Behavioural Change in the context of this Task?** *Chair: Sea Rotmann, Sustainable Energy Advice*

- Overall goal of the task reminder: to *aid the users of behaviour change research (ie policymakers, DSM businesses, community groups and other intermediaries) to find the most appropriate models of understanding, approaches and evaluation methods to measure their desired behaviour change outcomes (in their specific contexts).*

10:20 **Subtask I Helicopter Overview - Research end user perspectives:** three 15 minute presentations

The following session will present some of main practical/policy approaches of behavior change

research users: *Chair: Michelle Shipworth UCL Energy Institute*

- Policy perspective (Adam Cooper, DECC)

- Business perspective (Michela Beltracchi, Opower)
- Technical engineering/ and industry (Linda Hull, EA Technology)

11:40 Refreshments

11:50 **Models of Understanding:** three 15 minute presentations *Chair: Paul Upham, University of Leeds*

- Social Practice Theory (Elizabeth Shove, Lancaster University)
- Interdisciplinary modeling (Janet Stephenson, Centre for Sustainability, Otago University)
- Multiple dimensions of pro-environmental behaviour (Tim Chatterton and Charlie Wilson, University of East Anglia)

13:15 *Lunch* & short participant interviews of own energy 'stories'

14:15 **Scene setting for breakout sessions** *Chair: Ruth Mourik, Duneworks*

1. Model in a tweet

2. Implementation 'bloopers' from over the world

3. Models used within the context of Smart Metering

- Human interfaces, (Malcolm McCullough, University of Oxford)
- Qualitative perspective (Tom Hargreaves, University of East Anglia)
- Deployment (Sarah Darby, University of Oxford)

15:00 **Breakout Sessions: From theory to practice: how to implement these models of understanding in DSM Strategies (focus: smart metering)**

- **Economics** (Sea Rotmann, Sustainable Energy Advice) **Dobbs Room 1**
- **Policy** (Adam Cooper, DECC) **Dobbs Room 2**
- **Social acceptability** (Michael Peters, University of Reading) **Hamlin Room 1**
- **Systems perspective** (Sarah Darby, University of Oxford) **Hamlin Room 2**
- **Open space** (Michelle Shipworth UCL Energy Institute) **Morden Hall**

Discussions are to be from the perspective of the policymakers/implementers who may have to use these models. This includes a short discussion on what the behaviour change outcome would be and how that could best be evaluated using this model.

16:00 *Refreshments*

16:15 **Challenges of implementation feedback session** *Chair: Ruth Mourik, Duneworks*

17:00 **Day 1 conclusions** *Chair: Sea Rotmann, Sustainable Energy Advice*

17:30 Close

18:30 Drinks reception & dinner Cotsworld Lodge

Day 2, 10th October

Focus: case studies and practical experiences in the areas of smart metering, transport, SMEs and building retrofits. These will feed into the helicopter overview, and offer critique via case studies including actual, practical implementation barriers and drivers

08:45 Welcome refreshments

09:15 Welcome and introduction to day 2 *Chair: Sea Rotmann, Sustainable Energy Advice*

09:30 Case study breakouts

- **Communities** (Joanne Wade, Independent) **Dobbs Room1**
Chair: Michael Peters, University of Reading
- **Smart Meters** (Gary Raw, UCL Energy Institute) **Dobbs Room 2**
Chair: Brian Drysdale, University of Cardiff
- **Transport** (Jillian Anable, University of Aberdeen) **Morden Hall**
Chair Sylvia Breukers, Duneworks
- **Building Retrofits** (Phil Brown, The University of Salford) **Hamlin Room 1**
Chair: Tina Fawcett, ECI
- **SMEs discussion** **Hamlin Room 2**
Chair Paul Upham, University of Leeds

A contextual analysis of case studies of what works when, where, and why, including an intercultural political analysis

10:45 Refreshments

11:00 **Case study feedback** *Chair: Sea Rotmann, Sustainable Energy Advice*

11:30 **Linkages and synergies** *Chair: Ruth Mourik, Duneworks*

12:30 **World Café introduction** (*Meeting Place*)

12:45 Lunch

13:45 **World Café recommendations** *Chair: Sea Rotmann, Sustainable Energy Advice*
Focused discussions on optimal design recommendations for new DSM policies, pilots and programmes in different contexts from a mix of different stakeholder perspectives.

15:15 Refreshments

15:30 **World Café report back** *Chair: Sea Rotmann, Sustainable Energy Advice*

16:00 **Workshop observations** (Sylvie Douzou, EDF)

16:25 **Workshop conclusions** *Chair: Sea Rotmann, Sustainable Energy Advice and Ruth Mourik, Duneworks*

16:45 *Drinks reception*

Steering Committee:

Ruth Mourik; DuneWorks,
Sea Rotmann; Sustainable Energy Advice,
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