

PECHA KUCHA

Task 24

Closing the Loop -

Behaviour Change in DSM: From Theory to Practice



Dr Sea Rotmann & Dr Ruth Mourik

Operating Agents

who are we ?



THEORY

PRACTICE

Ruth: Science and Technology Studies, Cross-EU Behaviour Change research projects, DSM consulting

Sea: Animal behaviour studies, research funding & evaluation, sustainable energy policy, sustainability implementation



IEA DSM Task 24 participating countries

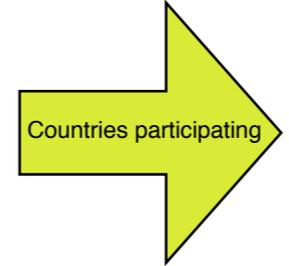


15 Participating Countries
Each country has ExCo member
24 Tasks - each task has Operating Agent/s (OA)

ieadsm
DSM Implementing Agreement
(www.ieadsm.org)

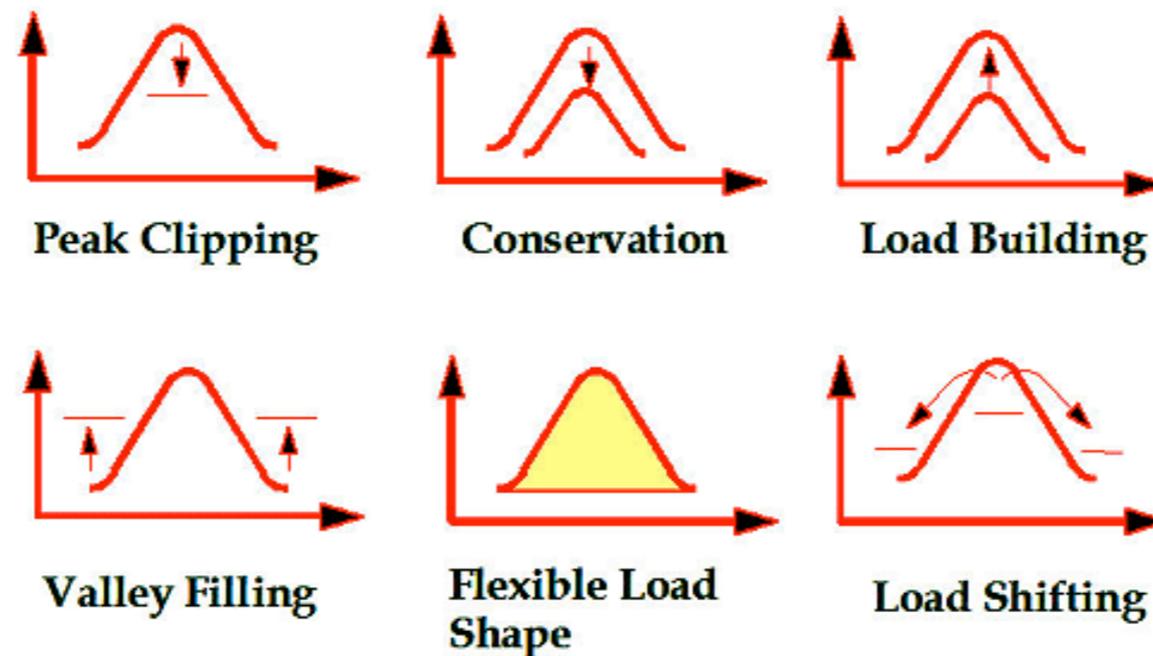
- Netherlands
- Switzerland
- New Zealand
- Belgium
- Norway
- Sweden
- Italy
- South Africa
- UK
- Austria
- Australia
- US
- Portugal
- Spain (in kind)

Task 24:
Behaviour Change in DSM
(OAs: Ruth and Sea)



what is DSM?

- Demand Side Management (DSM) generally refers to **changes that originate from the demand (energy user) side**.
- Reduce the total demand for energy (**conservation**), whilst providing the same service (**energy efficiency**) and shift demand from peak periods to off-peak periods (**load-management**).



what is DSM?

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The Smart House

Xcel Energy's Smart Grid Consortium is imagining a future that would allow you to communicate your energy choices to the power grid and automatically receive electricity based on your personal needs.

The potential benefits:

- Lower cost of power
- Cleaner power
- A more efficient and resilient grid
- Improved system reliability
- Increased conservation and energy efficiency

Plug-in Hybrid Electric Car

Xcel Energy is studying how plug-in electric vehicles can store energy, act as backup generators for homes and supplement the grid during peak hours.

Smart Meter

Real-time pricing signals create increased options for consumers.

Smart Appliances

Smart appliances contain on-board intelligence that "talks" to the grid, senses grid conditions and automatically turns devices on and off as needed.

Smart Thermostat

Customers can opt to use a smart thermostat, which can communicate with the grid and adjust device settings to help optimize load management. Other "smart devices" could control your air conditioner or pool pump.

Customer Choice

Customers may be offered an opportunity to and amount of energy they'd like to receive via a mouse on their computer.

100 percent green power? A mix of sources? priced source? In Smart Grid City, it could be



What is DSM and Behaviour Change in Task 24? (in a tweet)

What is DSM and Behaviour Change in Task 24? (in a tweet)



Dr Sea Rotmann @DrSeaRotmann

3s

#DSM definition in **#Task24**: Interventions developed and performed by intermediaries that seek to influence the ways end users consume energy

Expand



Dr Sea Rotmann @DrSeaRotmann

now

#behaviourchange in **#Task24**: Changes in human actions which were directly or indirectly influenced by various intermediaries' interventions

Collapse Reply Delete Favorite Buffer More

an important caveat

In this Task, a *successful behaviour change outcome* results in **improved energy use** by households and businesses. This does not necessarily focus solely on an immediate **reduction in total energy use**, but on **the most efficient and environmentally friendly use of energy** to derive the services that underpin societal and economic wellbeing.



WHY, OH WHY BEHAVIOUR?

BEHAVIOUR!

THE BEHAVIORAL WEDGE



30% of energy demand is locked in behavioural wedge

Includes: **technology** uptake, use and maintenance

purchasing and investment behaviour

habits and routine behaviour

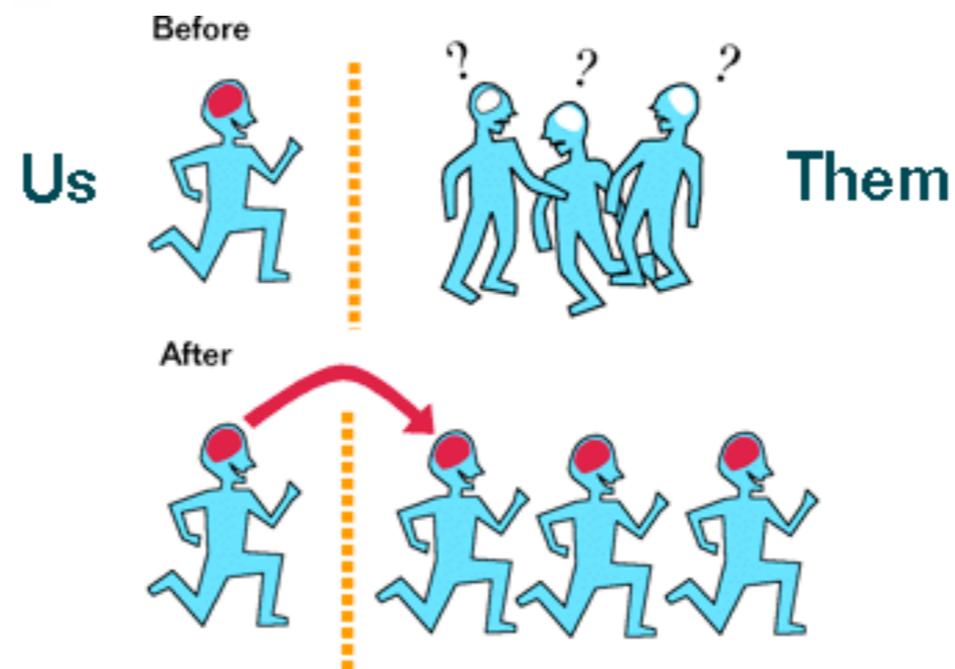
social acceptability

premise of Task 24

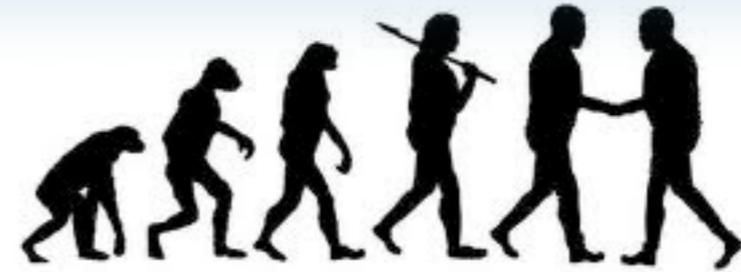
That the current energy efficiency gap results from:

- ✓ *Homo sapiens sapiens* ≠ *Homo economicus*
- ✓ overly **technocratic** approaches
- ✓ the **limited transfer** of best practice and good research to the **policy domain**
- ✓ the lack of meaningful **monitoring and evaluation tools**

objective of Task 24



special features of Task 24



The Story of Change

$$\text{Lightbulb} + \text{WE} + \text{Customer} = \text{CHANGE}$$



target audience of Task 24

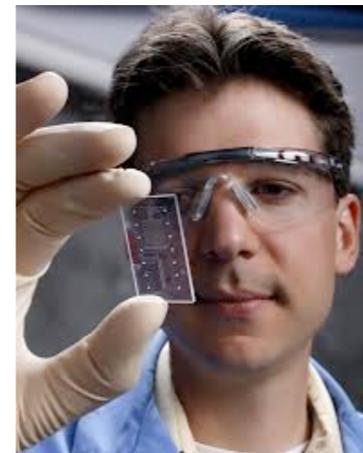
1. Intermediaries



2. Policymakers



3. Researchers



4. Industry



5. The Third Sector



CHANGING THE BEHAVIOUR OF THE BEHAVIOUR CHANGERS

subtasks (deliverables)

5-
Expert platform

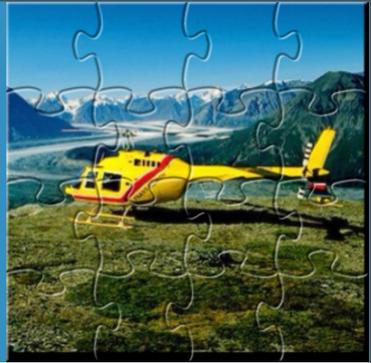
1- Helicopter overview of models, theories, contexts, case studies and evaluation metrics

2- In depth analysis in areas of greatest need

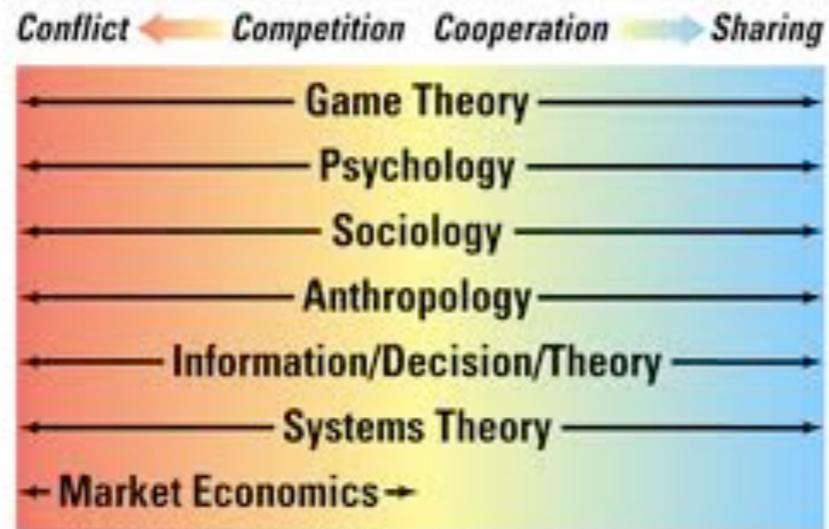
3- Evaluation tool for stakeholders

4- Country-specific project ideas, action plans and pilot projects

subtask I

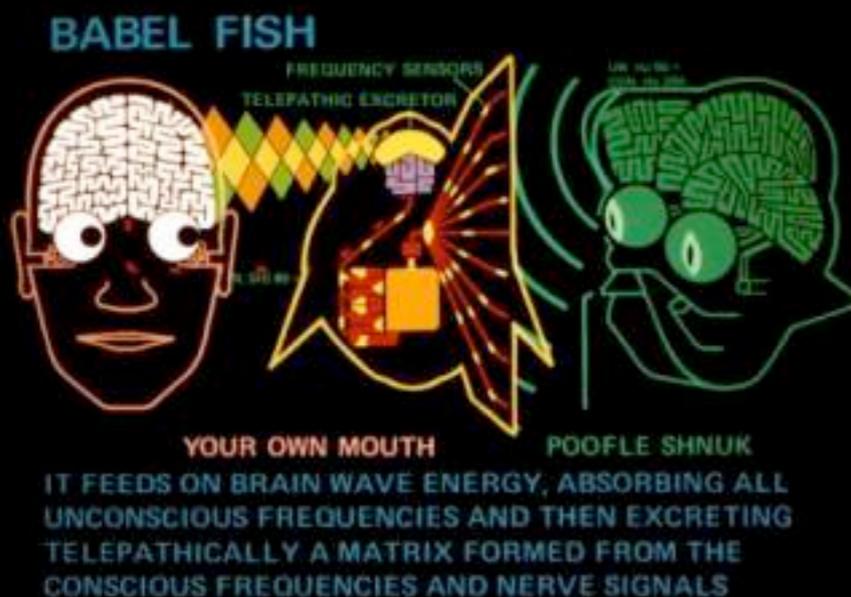


Repertoire of Human Behavior



- Overview of models and theories of change used in case studies
- Overview of definitions
- Inventory of experts
- Navigation tool to translate theory to be useful by practitioners

the hitch-hiker's guide to the galaxy



The story of: Behavioural economics



subtask II - specific case studies



specific case studies



smart metering



building retrofits



transport



SMEs

subtask III - evaluation

- Excellent
- Very good
- Good
- Average
- Poor

QUESTION

✓ WHAT IS A SUCCESSFUL LONG-TERM BEHAVIOUR CHANGE OUTCOME TO YOU?



subtask IV - country-specific recommendations



country-specific recommendations





subtask V - expert platform

bigelow

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CHANGING BEHAVIOR FOR DEMAND SIDE MANAGEMENT

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CHANGING BEHAVIOR FOR DEMAND SIDE MANAGEMENT

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Forum Edit

Topics and themes for the case study
Started by Sylvia Breukers in Subtask 2 - Detailed case studies. Last reply by Vicente Carabias yesterday.
2 Replies 1 Like
Hi All, Sea lists under subtask II themes to be further addressed in detailed case studies and some three themes to really focus on. I understand that this list is not carved in stone and would like...

Vicente Carabias Ruth Mourik Nico Lauer Fiona Coyle Joe Hallberg Sandra Bellekom
Chris McArthur Olga Sachs Dr Sea Rotmann Matt Batey Henrik Karlstrom Jenny Palm

JOIN US?

drsea@orcon.net.nz



What is Behaviour Change... To YOU?
Started by Dr Sea Rotmann in Uncategorized discussions. Last reply by Dr Sea Rotmann Jul 18.
7 Replies 0 Likes
Today I talked to my friend Nick Potter, an amazing behaviour change and storytelling expert from New Zealand. We were trying to figure out what software or online tools to use to best collect and...
Continue
Tags: definition, change, behaviour

Household behaviour change
Started by Janet Stephenson in Uncategorized

3 CLASS 5 Energy
Added by Joe Hallberg on July 30, 2012

4 CLASS 5 Energy: Engage People
Added by Joe Hallberg on July 30, 2012

5 CLASS 5 Energy
Added by Joe Hallberg on July 30, 2012

View All

Latest Activity Edit

subtasks

5 – Expert platform

1 – Helicopter view of models, frameworks, contexts, case studies and evaluation metrics

2 – In depth analysis in areas of greatest need (buildings, transport, SMEs, smart metering)

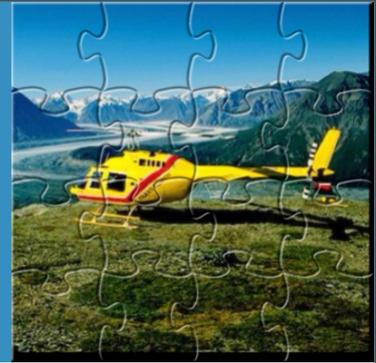
3 – Evaluation tool for stakeholders

4 – Country-specific project ideas, action plans and pilot projects

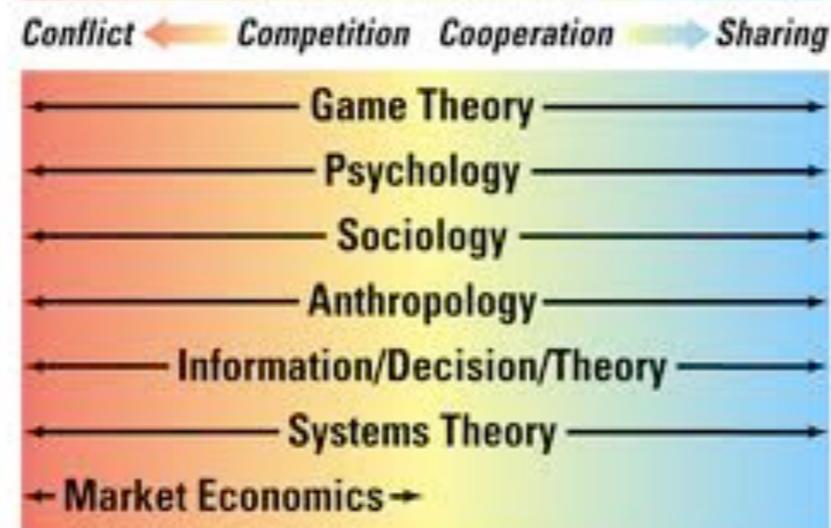
subtasks

1– Helicopter view of models, frameworks, contexts, case studies and evaluation metrics

Subtask I



Repertoire of Human Behavior



- Inventory of experts
- Overview of definitions
- Overview of models, disciplines, frameworks
- Inventory of DSM case studies
- Inventory of evaluation metrics and contexts
- Navigation tool to translate theory to be useful by practitioners

subtask 1 - Overview of definitions

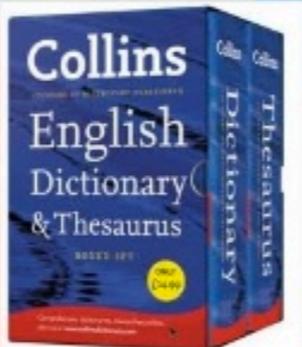
<http://www.slideshare.net/drsea/definitions-for-task-24>



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DEFINITIONS: BEHAVIOUR AND ENERGY



BEHAVIOUR: 1. manner of behaving or conducting oneself. 2. behaving with careful good manners. 3 (psychol) a. the aggregate of all the responses made by an organism in any situation. b. a specific response of a certain organism to a specific stimulus or group of stimuli.

ENERGY: 1. Intensity or vitality of action or expression. 2. Capacity or tendency for intense activity; vigour 3. Vigorous or intense action or exertion; exertion. 4. (Physics) a. the capacity of a body or system to do work. b. a measure of this capacity, expressed as the work that it does in changing to some specified reference state. It is measured in joules.

⏪
⏩

1 / 23

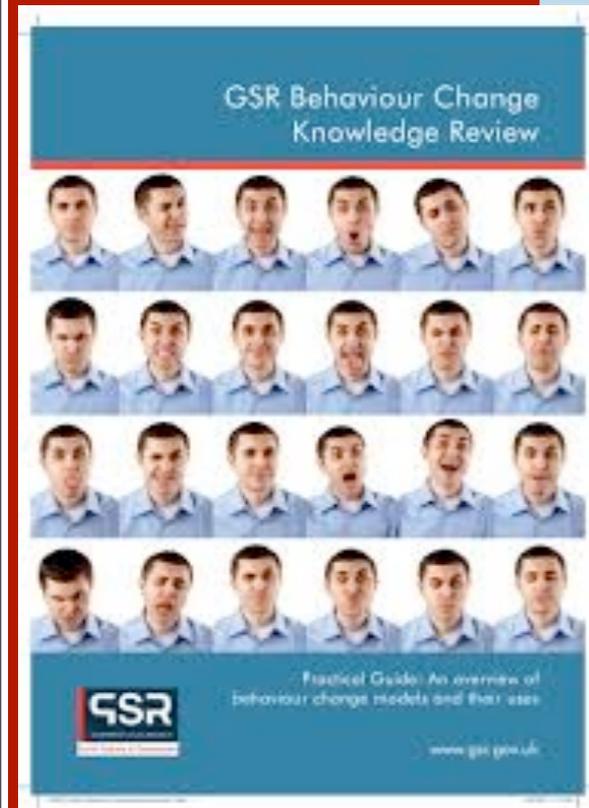
⏏

⚙ Info and settings
🔒 Privacy settings
📊 View analytics
👤 Collect leads

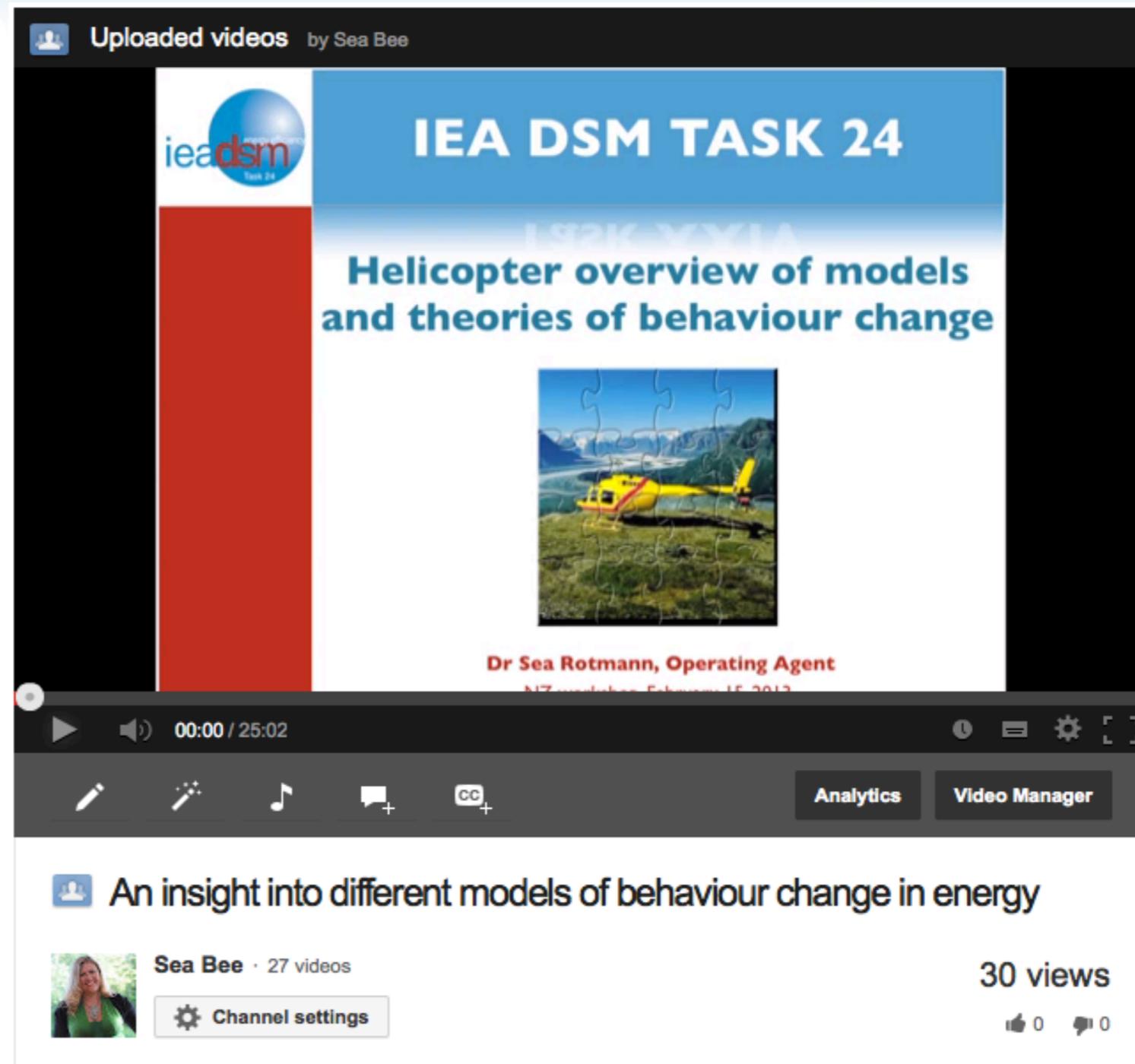
subtask I -

Overview of models, disciplines and frameworks

↑↓↔↻↷↸↹↺↻↷↸↹↺



Uploaded videos by Sea Bee



IEA DSM TASK 24

Helicopter overview of models and theories of behaviour change

Dr Sea Rotmann, Operating Agent

00:00 / 25:02

An insight into different models of behaviour change in energy

Sea Bee · 27 videos

30 views

Channel settings

https://www.youtube.com/watch?v=DOTkdA97Woo&feature=c4-overview&list=UU_p3PIWDpLyDBh8TwUBmVHQ

subtask 1 - some definitions



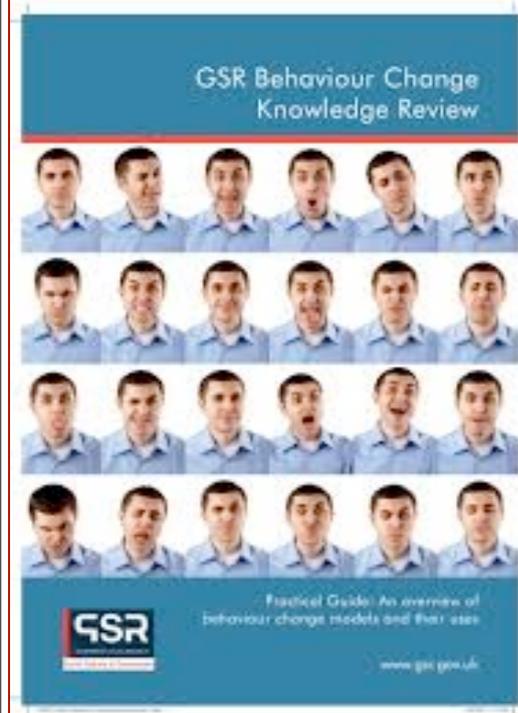
Models of behaviour help us to understand specific behaviours, by identifying the underlying factors which influence them.

There are **individualistic** models and **social** models.

By contrast, **theories of change** show how behaviours change over time, and how they can be changed.

Behavioural theory is **diagnostic**, and change theory is more **pragmatic**.

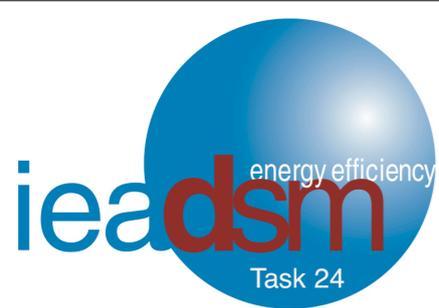
Both are important to understand when designing interventions.



subtask 1 -

Overview of models, disciplines and frameworks

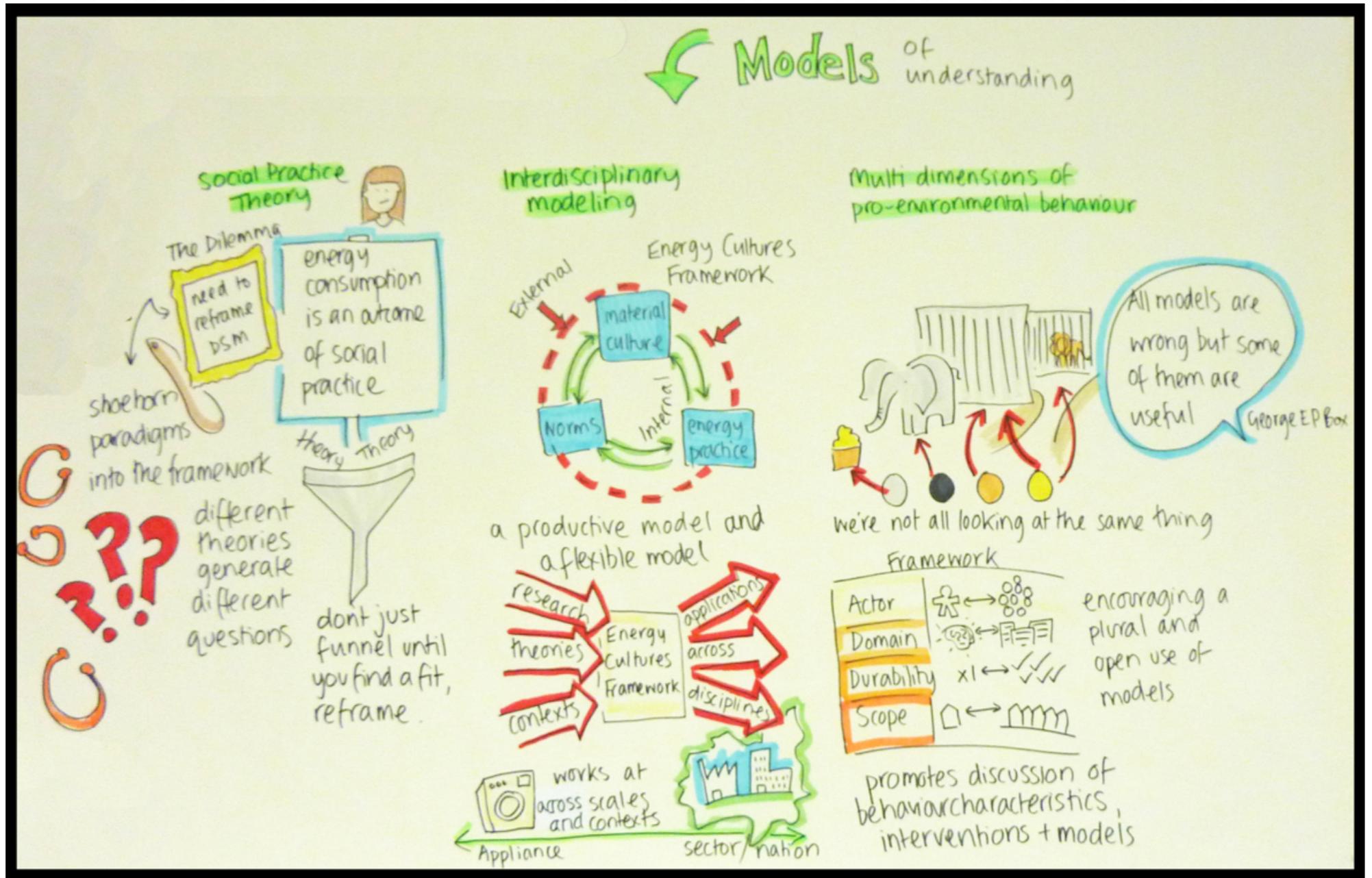
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GSR Behaviour Change Knowledge Review

Practical Guide: An overview of behaviour change models and their uses

www.gsr.gov.uk



subtask 1 -

Overview of models, disciplines and frameworks

¿NSWGMOLK?



GSR Behaviour Change Knowledge Review

Practical Guide: An overview of behaviour change models and their uses



Models of understanding

Social Practice Theory

The Dilemma: energy consumption is an outcome of social practice

need to reframe DSM

shoehorn paradigms into the framework

different theories generate different questions

Theory Theory: don't just funnel until you find a fit, reframe.

Interdisciplinary modeling

Energy Cultures Framework

External: material culture, Norms, energy practice

Internal: energy practice

a productive model and a flexible model

research theories contexts → Energy Cultures Framework → applications across disciplines

works at across scales and contexts

Appliance → sector/nation



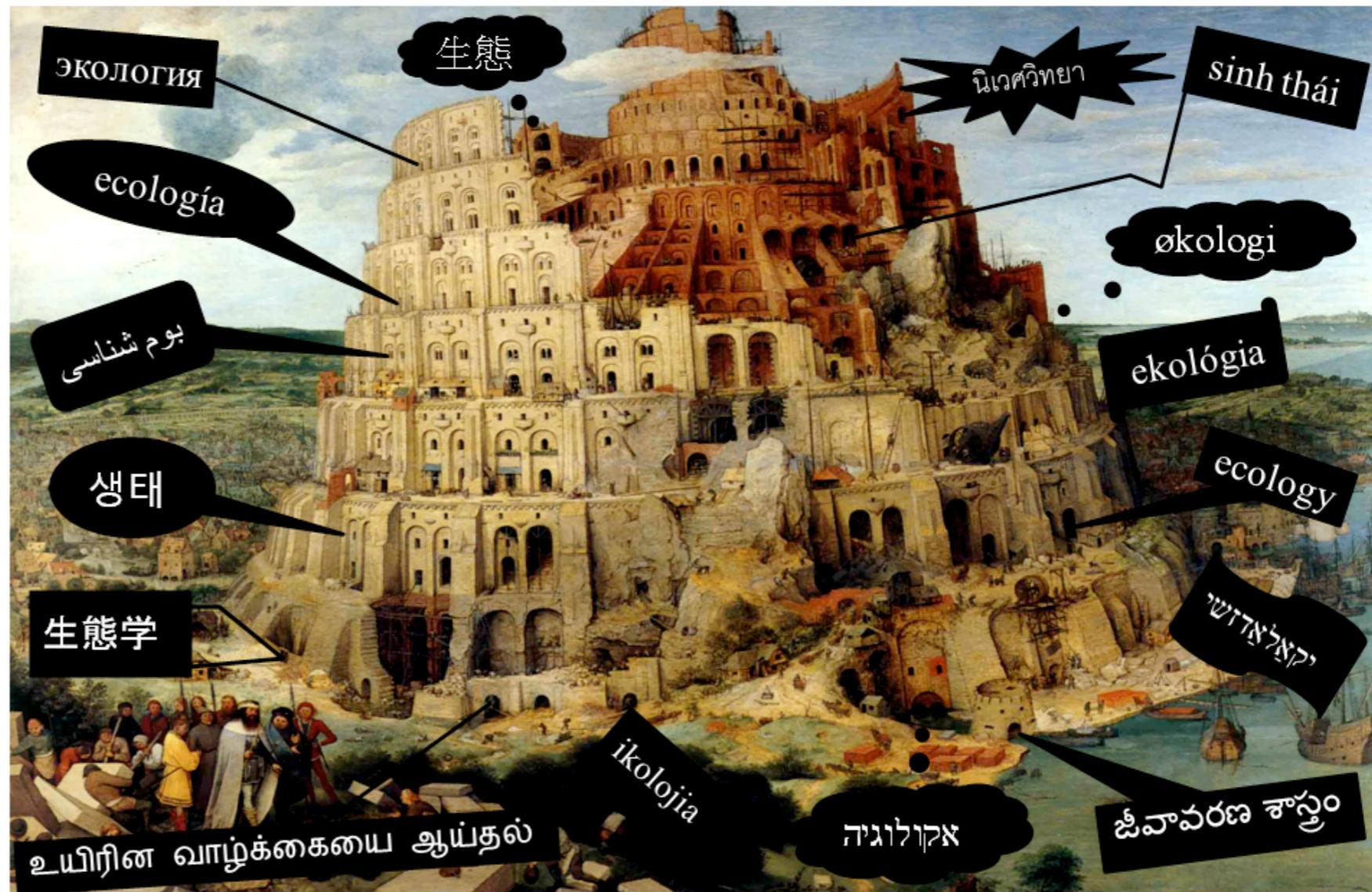
“All models are wrong, but some of them are useful”
George E.P. Box (1979)



Babel to Babelfish?

Babel to Babelfish?

THE ECOLOGICAL TOWER OF BABEL



Babel to Babelfish?



B

sh?

World Cafe

easy stories are readily accepted

we can re-write the story

Economic growth is not evil

dialogue is key

YES

You can't control how your story lands but don't be scared... tell it anyway

watch out for zombie facts!!

Hero Stories

Tell the Ninja Stories

Silver buckshot not a bullet

once upon a time... Tell good stories

SPY stories

more infiltration across research + policy

a simple visual model would help

need to feel ownership...

can we create a great energy story?

ASK what people want to know

can we create new social norms based on literature

we need to learn our own lessons

lets step in before the mistakes

Mistakes

we're good at building on

tell collaborative stories

we need to tell compelling generic stories as well as stories of what went wrong

the hitch-hik

original animal

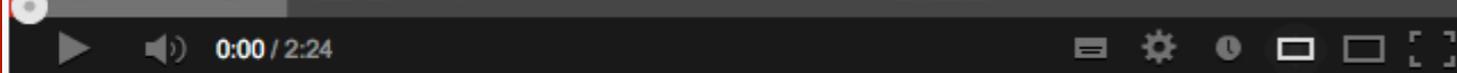
www.bbc.co.uk/cult



energy stories: personal



Janet Stephenson interview



IEA DSM Task 24 Energy Stories: Gerri

Sea Rotmann · 24 videos

Channel settings



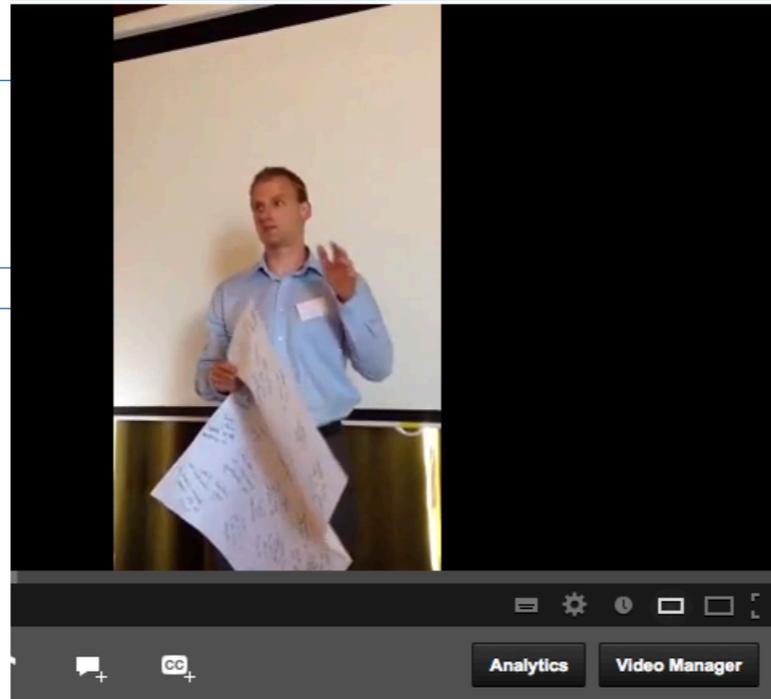
energy stories: sectoral

Energy Efficiency and Conservation Authority
Te Tari Tiaki Pūngao

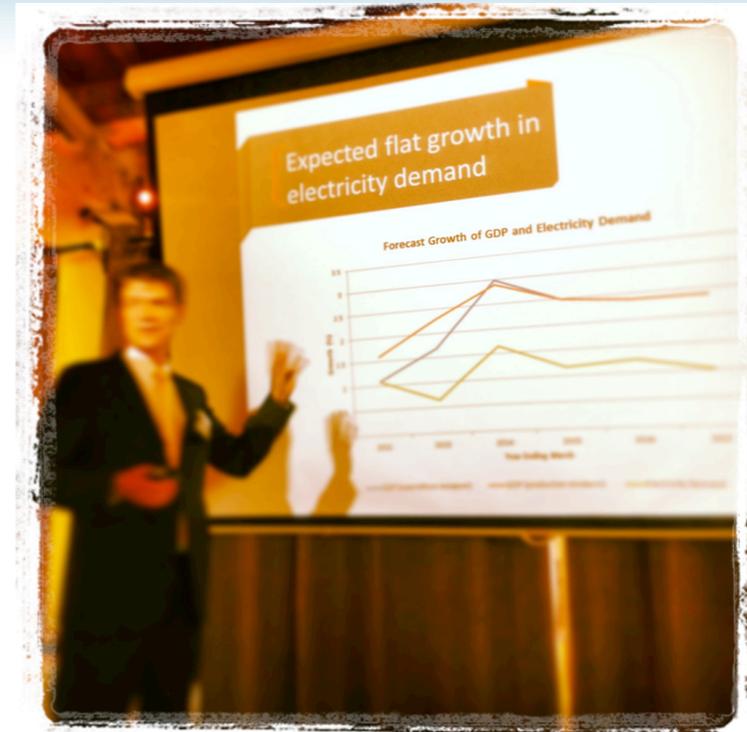
New Zealand Government

Fuel efficient driving behaviour in the light vehicle fleet

15 February 2013 | Jörn Scherzer | Transport Partnerships



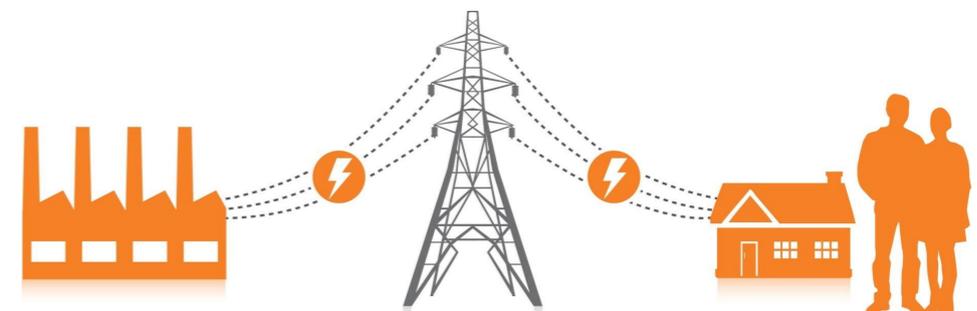
Jörn Scherzer on transport issues



Energy Behaviour Challenge 1

Changing household energy cultures
A research perspective

Re-orient OURSELVES



energy stories: national



IEA DSM – Task XXIV



Belgian Story



Brussels, September 7, 2012

Norwegian Energy Story



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE
Office fédéral de l'énergie OFEN
Ufficio federale dell'energia UFE
Swiss Federal Office of Energy SFOE

Swiss Energy Strategy and research projects concerning behavior change

Dr. Aurelio Fetz, Market Regulation, Swiss Federal Office of Energy



Workshop IEA DSM Task 24, 15.10.2013

The New Zealand energy story ^{demand-side}

Sea Rotmann and Janet Stephenson



Inventory of DSM case studies

Case studies collected for IEA DSM Task 24 in transport, building retrofits, SMEs and smart metering Note: Blue boxes denote government-led policies and programmes, green boxes denote business, research or community-led programmes and pilots

Domain/Country Cases and used theories/models	Netherlands	New Zealand	Switzerland	Italy	Austria	Norway	Sweden	Belgium	UK	Other countries
Smart Metering/ Feedback	Jouw Energie Moment Theories/Models used: Expectancy Value Theory Design with Intent Interpretation for sustainable behaviour	Responses to Time Varying Prices for Electricity (Otago Uni) Theories/Model used: Classical Economics and marketing	Smart Metering Zurich Pilot EWZ and EKZ Theories/Model used: behavioural economics and social norms/comparisons	Time of Use Tariff Theories/Models: Classical Economics	Die Energiejagd Theories/Models: Shared learning, Social Norming, freezing/unfreezing	Demosteinkjer Theories/Models: Theory of Planned Behaviour	Clockwise Theories/Models: Constructivist Learning Theory Shared learning		Rettie, Ruth CHARM Theories/Models used: social norms approach practice theory	Spain (Juan Pablo García): VERDIEM Theories/Models: Classical Economics
			Smart Metering EKT Dietikon Theories/Model used: behavioural model of residential energy use by Raaij & Verhallen behavioural economics and social norms/comparisons		€CO2 Management Theories/Models: Classical Economics					Portugal (Joane Abreu): Smart meter feedback in North Theories: Nudge, classical economics, moments of change
			Munx Repower website Theories/Model used: behavioural economics, social norming							
Retrofitting	Blok voor Blok aanpak retrofitting programme Theories/models used: Behavioural economics	Warm Up New Zealand: Heat Smart Theories/Models used: social marketing; social norms; classical economic; TPB	Swiss Building Retrofit Program Models: Classical Economics			Retrofitting of Myhrenenga Housing Theories: TPB	Building retrofits Theories: Shared Learning			
			2000 Watts Society (housing) Models: Ethics, long-term visioning							
SMEs	De Groene Daad Theory/model used: Nudge	EECA SME Crown Loans Scheme Theory/model used: originally based on TPB; changed to social learning and social norm theories	Energy-Model and SME-Model from (EnAW) Theories/Models used: Classical Economics Social norm			Finnfjord Theories: Leadership		Build4Change Model: Nudge		
		Energy Cultures SMEs pilot Model used: Energy Cultures								
Mobility	Het Nieuwe Rijden (the New Driving) Theories and models used: Psychology: Henry A Murray (1938) and the acceptability/availability model of behaviour by Rose (1990).	Active a2b Theory/models used: Norm Activation Theory Elaboration Likelihood Model Stern's Principles for Intervening Triandis TIB Lewin's Unfreezing/Refreezing McKenzie-Mohr	2000 Watt on mobility Models: Ethics, long-term visioning			Electric vehicles Nobil Theories/Models used: TPB	Stockholm congestion tax Models: activity based models		Chatterton & Wilson Framework Combining individualistic (eg Triandis) and societal (Practice theory) approaches to help UK policymakers	Kevin Luten UrbanTrans (Australia) Transport behaviour change based on BJ Fogg
		NZ Post Transport Driver behaviour training Theory/models used: Value Action Gap Theory	Fuel consumption of newly purchased cars Theory of Planned Behaviour (TPB) and Norm-Activation Model (NAM)							

THE MONSTER

Most of the time what we do is what we do most of the time. And sometimes we do something new¹

Analysis of case studies IEA DSM Task 24 Closing the Loop - Behaviour Change in DSM: From Theory to Practice.

Deliverable 2 for IEA Implementing Agreement DSM Task 24

September 2013

Authors: Ruth Mourik (DuneWorks, Netherlands), Sea Rotmann (SEA, New Zealand)

With contributions from, in alphabetical order:

- ✦ Joana Abreu (MIT, USA)
- ✦ Matt Batey (& IESD, UK, Belgium)
- ✦ Michela Beltracci (OPower, USA)
- ✦ Sylvia Breukers (DuneWorks, Netherlands)
- ✦ Vicente Carabias-Hütter (ZHAW Zurich University of Applied Sciences, Switzerland)
- ✦ Tom Croskery (New Zealand Post)
- ✦ Juan Pablo Garcia (Leantricity, Spain)
- ✦ Tim Harries (Kingston University, UK)
- ✦ Cecilia Katzeff (Interactive Institute Swedish ICT, Sweden)
- ✦ Henrik Karlstrom (NTNU, Norway)
- ✦ Gerhard Lang (Grazer Energie Agentur, Austria)
- ✦ Evelyn Lobsiger-Kägi (ZHAW Zurich University of Applied Sciences, Switzerland)



Money makes the world go round

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

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

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

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

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

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

You will save money for a nice weekend to the Bahamas

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

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

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



¹ Townsend & Bever

worked examples: smart metering

Country	case	Theory or model used	Policy or Societally driven
Netherlands	Jouw Energie Moment	Expectancy Value Theory; Design with Intent, Interpretation for sustainable behaviour	societally
	PowerMatching City Hoogkerk	Value action gap theory	Mixed, subsidy from policy and part of larger policy programme
New Zealand	Responses to Time Varying Prices for Electricity (Otago Uni)	Classical Economics and marketing	societally
Switzerland	Smart Metering Zurich Pilot EWZ	behavioural economics and social norms/comparisons	societally
	Smart Metering EKT Dietikon	behavioural economics	societally
Norway	Demosteinkjer	Theory of Planned Behaviour	societally
Italy	Time of Use Tariff	Classical Economics	societally
Austria	€CO2-Management	Classical economics	policy
	Energy neighbourhoods 2	Shared learning	societally
Sweden	Clockwise	Constructivist Learning Theory, collaborative learning	societally
Portugal	CoopRoriz	Combination of participatory and sociological approaches	societally
USA	Opower	Cialdini's social psychology theory	societally
UK	CHARM	social norms approach, practice theory	societally

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

3 ways of telling the stories:

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

3 ways of telling the stories:

1. **The cases fall into story groupings:** hero stories, love stories, horror stories, learning stories...

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

3 ways of telling the stories:

1. **The cases fall into story groupings:** hero stories, love stories, horror stories, learning stories...

2. **The models and theories** used in the cases tell their own story from the implementer's or end user perspective

Storytelling



Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

3 ways of telling the stories:

1. **The cases fall into story groupings:** hero stories, love stories, horror stories, learning stories...

2. **The models and theories** used in the cases tell their own story from the implementer's or end user perspective

3. **Each case can be told as a short story**

Neoclassical economics smart metering

Several of our smart meter cases informed by neoclassical economics: deficit model



74,81	+1,78	460300	19,04	17,36	Abitibi-cons	15	+0	4
5,63	-4,25	329100	4,94	3,16	Air Canada	12,7	+0	3
33,94	+0,38	70000	22,48	14,5	Alberta Energy	65,55	+0	
45,81	+1,94	244700	20,18	17,69	Banque Natl. Canada	26,4	+0	2
45,06	-0,42	407600	12,31	10,99	Barrick Gold	25	+0	4
74,44	+0,94	1471100	23,19	20,7	Bell Canada	42,05	+0	14
49,88	+1,28	521100	15,74	13,3	BT Telus Comm	41,3	+0	5
96,81	-0,33	269500	34,7	31,1	Bk Of Montreal	79,2	+0	4
38,06	-0,18	263500			Bk Of Nova Scotia	42,2	+0	26
25	+0	1088100			Canadian Pacific	22,85	+0	10
27,38	-0,22	705200	9,3	12,45	Cameco	22,6	+0	7
24,2	+4,54	319800	28,14	14,2	Canadian Pacific	0,41	+0	3
5,81	-1,19	1470700			Cameco	24,85	+0	14
5,4	-4,42	63600			Canadian Pacific	41,7	+0	
2	-6,1	2096400	3,33	2,15	Cascades Inc.	6,4	+0	20
26,25	+0,23	260100			Con Occid Petroleum	34,95	+0	2
44,31	+4,73	557000	14,77	17,47	Con Tire Corp	39	+0	5
35,56	+2,89	527400	17,6	17,6	Con Interper. bk. comm.	45,95	+0	5
26,88	+6,46	899500		2,51	Dominion Inc.	19,9	+0	5
9,88	-1,79	972300			Domtar Inc.	13	+0	9
60,38	+1,91	1520600	29,89	23,31	Echo Bay Mines Ltd	0,54	+0	15
8,75	-0,68	132900	9,11	8,1	Falconbridge	16,45	+0	1
15,69	-2,73	86400	9,63	8,01	Fletcher Challenge	15,3	+0	
15,75	-3,43	435800	9,1	7,29	Gaz Metro Lp	15,75	+0	4
61,06	+1,97	1118200	32,65	27,75	Gulf Cda Res	6,95	+0	11



The story of neoclassical economics & smart meters



Money makes the world go round and we know your time is money

You need to consume less and we will help you by providing numbers, graphs and charts

By the way, you might need to stop drying your hair at peak time in the morning or using the television to be your kid's nanny when you prepare dinner

We can help you if you give us access to your private information

You only need to make a one-off decision to let us install this smart meter

If you do not understand the smart meter (and you probably won't) just **DON'T TOUCH THE BUTTONS!**

You might save money for a nice weekend to the Bahamas if you really make an effort

We will send you a bill every two months or so, the main thing is we now know exactly how much energy you actually saved

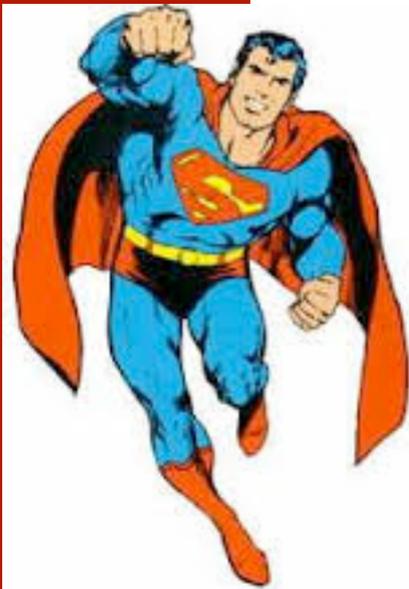
What counts for us is that you use electricity when we want you to so we do not need to invest in more grid capacity and get as much Big Data as possible. And, of course, that you save a few bucks!

You want to know how much energy you saved today? You can take a look at the smart meter every 15 minutes or so, or get your wife to stand near the meter when you are turning something off....

Too difficult? Well, buy a nice feedback translating device, there are 100s out there already.



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**HORROR
STORY**



A story of economics theories & smart metering



Once upon a time...electricity was just coming out of the socket, nobody had to think about it, because it was cheap and the negative effects of electricity production were not yet discussed at the “Stammtisch” in Switzerland nor in the pubs of London.

Every day...people were using electricity, paying their invoices for power, water and gas supply without even looking at the amount, neither the kWh nor the Swiss francs.

But, one day...people began to think about future energy supply, the negative effects of conventional energy supply and renewable forms of energy and how to integrate them into the energy system.

Because of that... the local energy utilities began to rethink their role in the energy economy. Some of them jumped onto the opportunity of helping their customers to reduce electricity demand and increase their efficiency.

But then... the “Smart-Meter-Wave” finally hit Switzerland (it takes sometimes a bit longer in Switzerland, because we don’t have a coast...)

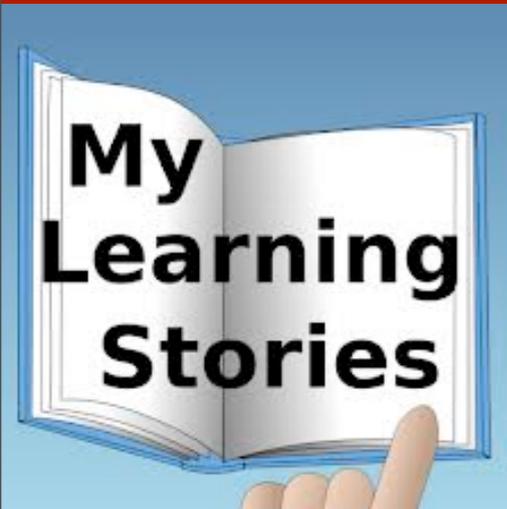
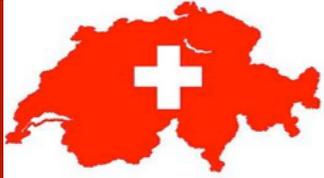
Because of that... the regional energy utility EKT started a smart meter programme with 200 participants, who can monitor their electricity demand via a smartphone app or a normal homepage. They also answered questions about their opinions (risks and benefits) about smart meters

So, finally...EKT saw how large the impacts of smart meters were on energy demand (on average minus 1.7%) and what concerns their customers had about them (data security and economic advantages for utilities)

And ever since then...customer concerns and the realistic potential of demand side management are taken into account more appropriately by EKT when designing smart meter programmes.



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Smart meter fears



Smart meter fears



HORROR STORY™

subtasks

5 – Expert platform

1 – Helicopter view of models, frameworks, contexts, case studies and evaluation metrics

2 – In depth analysis in areas of greatest need (buildings, transport, SMEs, smart metering)

3 – Evaluation tool for stakeholders

4 – Country-specific project ideas, action plans and pilot projects

subtasks

2-

In depth analysis in areas of
greatest need
(buildings, transport, SMEs, smart
metering)

Austria - Die Energiejagd vs €CO2 Management

Die Energiejagd vs €CO2 Management



	
<p>social approach</p>	<p>individualistic approach</p>
<p>social norm (MoU) social learning (ToC) Freezing/unfreezing (ToC)</p>	<p>classical economics (MoU)</p>
<p>Gamification, competition, feedback, tailored advice, champions</p>	<p>Feedback, Advice & Incentive (iPod!)</p>
<p>Goal: CO2 savings</p>	
<p>Huge success</p>	<p>Unexpected 'failure'</p>

Austria - Die Energiejagd vs €CO2 Management

DIΕ ΕΝΕΡΓΕΙΕΙΣ ΛΣ €CO2 ΜΕΝΕΣ





In-depth analysis: Austria - SM



W02019 - 2W



In-depth analysis: Austria - SM



Beispiel		Meine Kosten	
		Leistung	Betriebsstunden
$100\text{ W} \times 400\text{ h} = 40.000\text{ W}$ $40.000\text{ W} = 40\text{ kWh}$			
<p>Die Berechnung der jährlichen Stromkosten erfolgt mittels Multiplikation des Stromverbrauchs mit dem Strompreis (z. B. 18 Cent/kWh).</p>		x	=
$40\text{ kWh} \times 18\text{ Cent/kWh} = 720\text{ Cent}$		Verbrauch:	x
Dies entspricht:		Strompreis:	=
$7,20\text{ €}$		Kosten:	



In-depth analysis: Austria - SM



Beispiel

$$100 \text{ W} \times 400 \text{ h} = 40.000 \text{ W}$$

$$40.000 \text{ W} = 40 \text{ kWh}$$

Die Berechnung der jährlichen Stromkosten erfolgt mittels Multiplikation des Stromverbrauchs mit dem Strompreis (z. B. 18 Cent/kWh).

$$40 \text{ kWh} \times 18 \text{ Cent/kWh} = 720 \text{ Cent}$$

Dies entspricht:

7,20 €

Meine Kosten

Leistung	Betriebsstunden	
		×
		=
Verbrauch:		×
Strompreis:		=
Kosten:		



The story of neoclassical economics and SM



Once upon a time

Many people in Austria lived beside each other and didn't care much about energy. And they paid their energy bills without thinking, no matter how high they were.

Every day

They behaved like the day before, because they didn't see any difference on their annual bill if they tried to save some energy in their household.

But one day

They got a smart meter installed and wise men came to their house and gave them advice how to save energy and the wise men showed them how to use the smart meter to see the impact of their changed behaviour. They even gave them an ipod with a feedback App installed. The wise men also gave them brochures about energy efficiency and told them that there are different tariffs for their electricity and then the wise men left.

Because of that

The people were quite motivated to save energy and made many plans about changing their behaviour.

But then

After a while they forgot about their plans. They also forgot about the smart meter and the wise men and even about the intelligent ipod with the feedback App, which could be used to check their energy consumption.

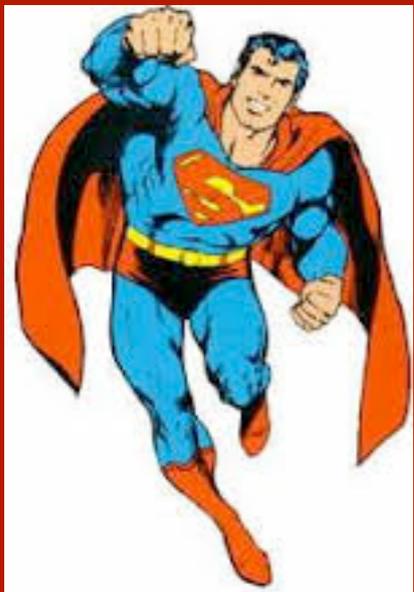
Because of that

The savings went down and only increased again when the wise men announced that they would return and ask them how it was going. So overall, the savings were around 6%, which was better than changing nothing, but the effort was huge compared to the savings.

So finally

The wise men realised that only giving technical advice and providing the technical devices is not enough to be successful, but keeping the attention level high over a long period is one of the real challenges. **The end.**

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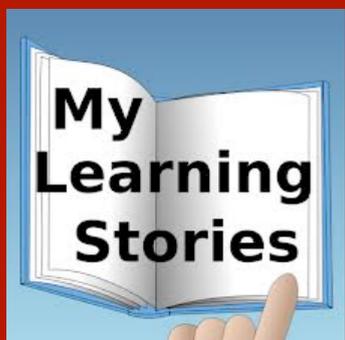
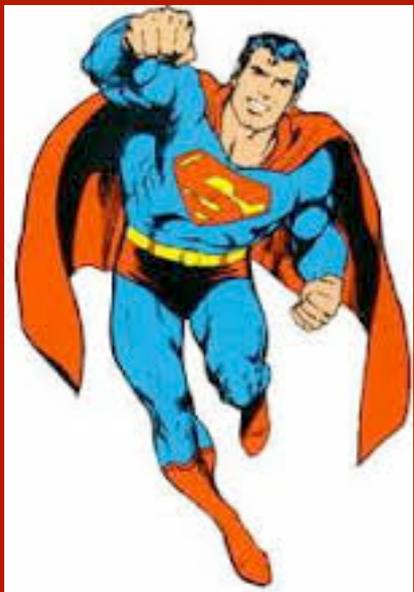
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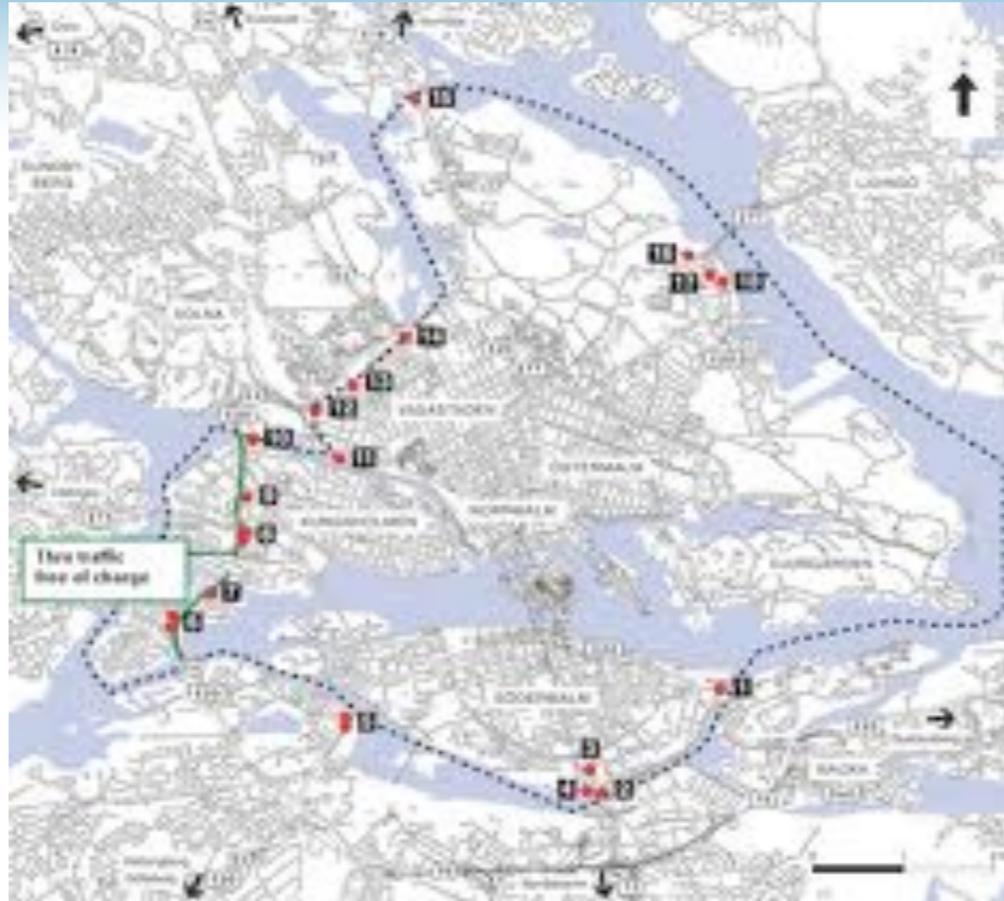
Norway - SMEs

Finnfjord

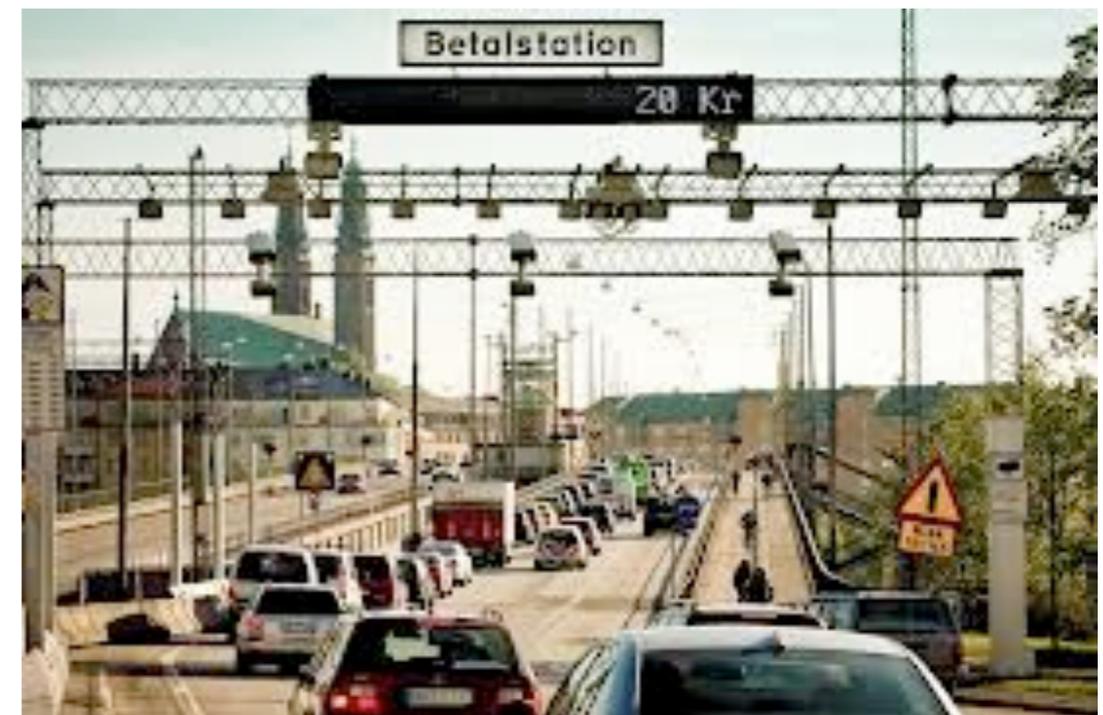


Sweden - Transport

Stockholm congestion charges



Stockholm congestion charges

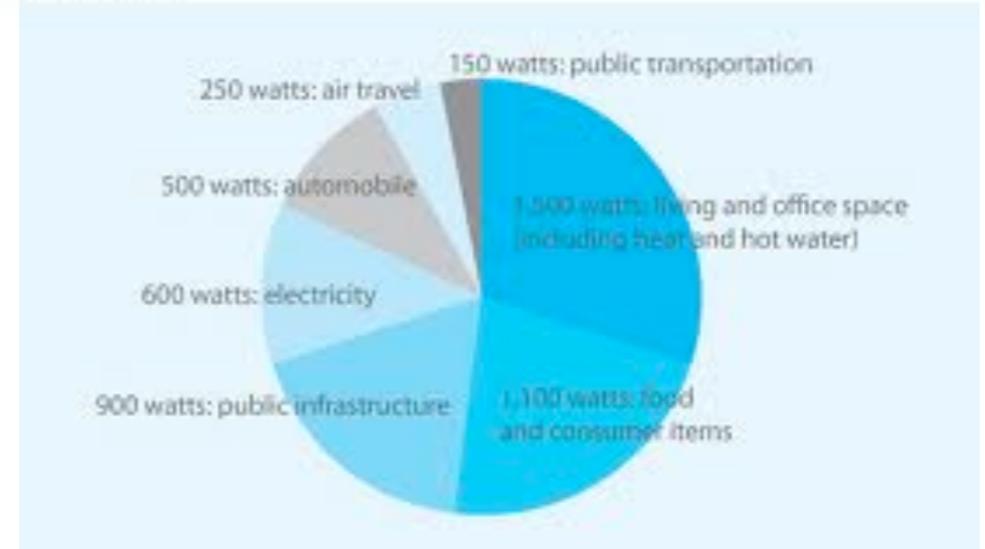


Switzerland - Buildings

2000 Watt Society



Breakdown of total watts currently used by the average Swiss (5,000 W)



Subtasks

5 – Expert platform

1 – Helicopter view of models, frameworks, contexts, case studies and evaluation metrics

2 – In depth analysis in areas of greatest need (buildings, transport, SMEs, smart metering)

3 – Evaluation tool for stakeholders

4 – Country-specific project ideas, action plans and pilot projects

Subtasks

3-

Evaluation tool for
stakeholders

subtask III - evaluation metrics



Conventional monitoring of smart metering success	More systemic monitoring of smart metering success
<ul style="list-style-type: none"> • number of smart meters and or feedback interfaces installed • load shift per client • number of times clients looked at the feedback provided • acceptance and attitudes towards smart meters • Electricity consumption over a year • level of technology affinity concerning the use of the technical feedback equipment 	<ul style="list-style-type: none"> • all of the issues listed left, and those mentioned under systemic retrofitting monitoring plus: • Personal motivation to participate in the competition • Actual energy-related behaviours • Recent purchases in energy technologies (like energy efficient boilers, new windows, tec.) • The information level on energy efficiency and renewable energy sources • Sources on information on energy issues • Attitudes on energy and climate protection issues • Estimation of the level of own energy costs • building of capacity, • creation of engagement • customer sentiment, • participation in other energy efficiency programs • feeling of control (over energy bills, the home, energy) • level of unemployment, • level of illiteracy • Internet penetration rate

questions?



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