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

International Energy Agency

Committee for Energy Research & Technology (CERT)

Oversees 40 int'l implementing agreements

15 Participating Countries

Each country has ExCo member

24 Tasks - each task has Operating Agent/s (OA)

DSM Implementing Agreement (www.ieadsm.org)

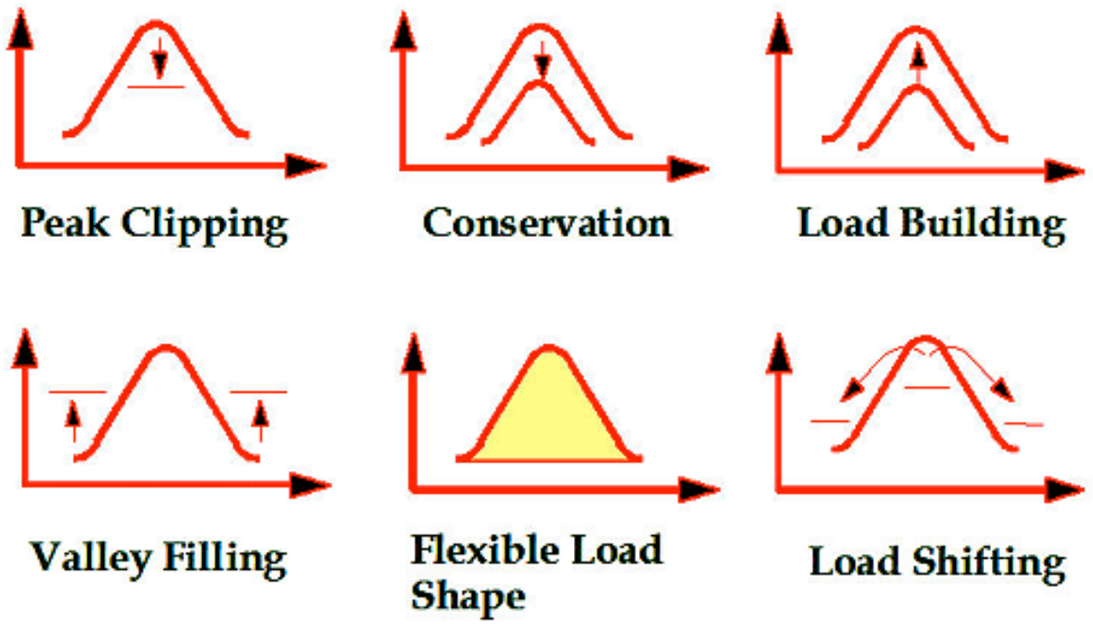
Task 24: Behaviour Change in DSM (OAs: Ruth and Sea)

Countries participating

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

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).



Pics via: tatapower.com, jcwinnie.biz, Guardian.co.uk, Treehugger.com,

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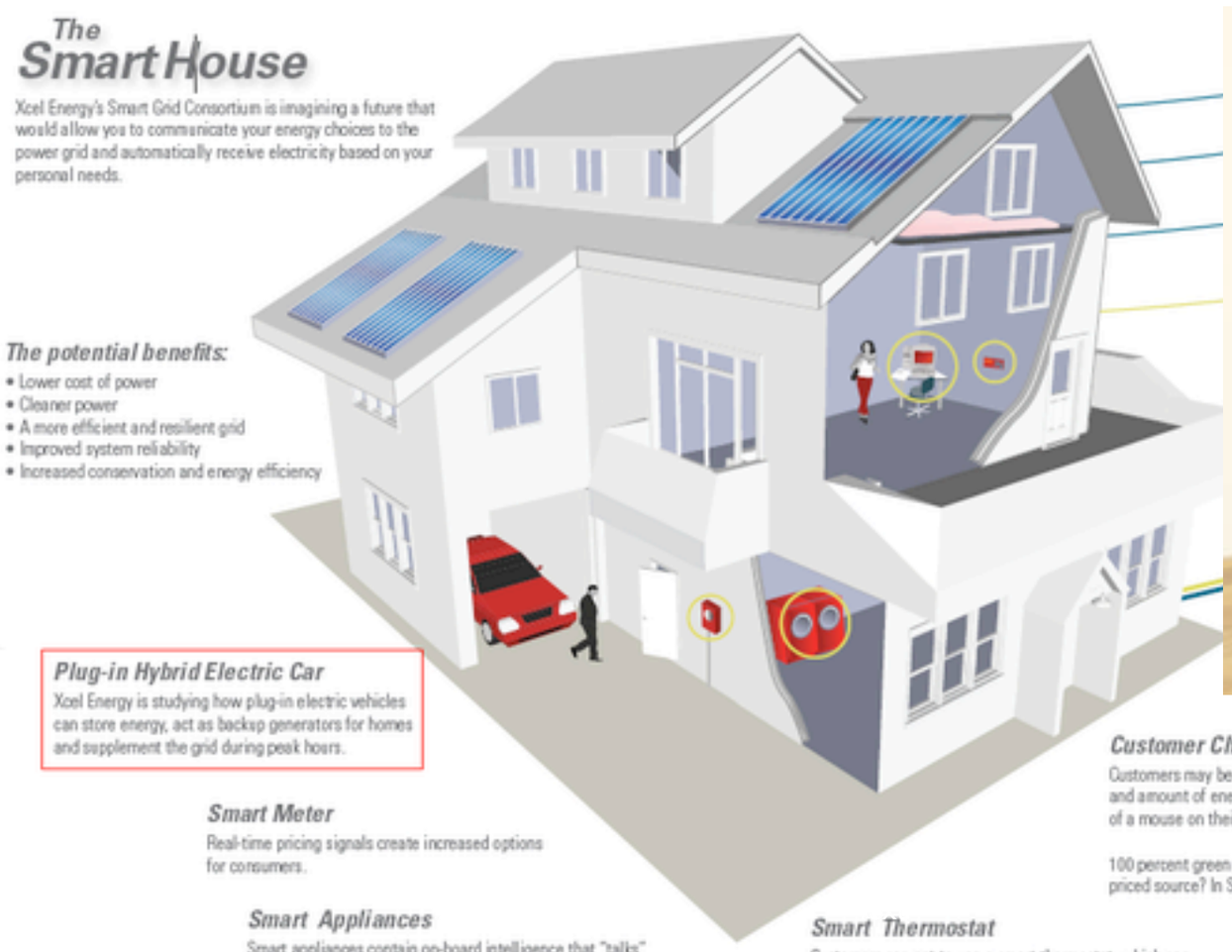


Pics via: tatapower.com, jcwinnie.biz, Guardian.co.uk, Treehugger.com,

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?

30% of energy demand is locked in behavioural wedge

Includes: technology uptake, use and maintenance

purchasing and investment behaviour

habits and routine behaviour

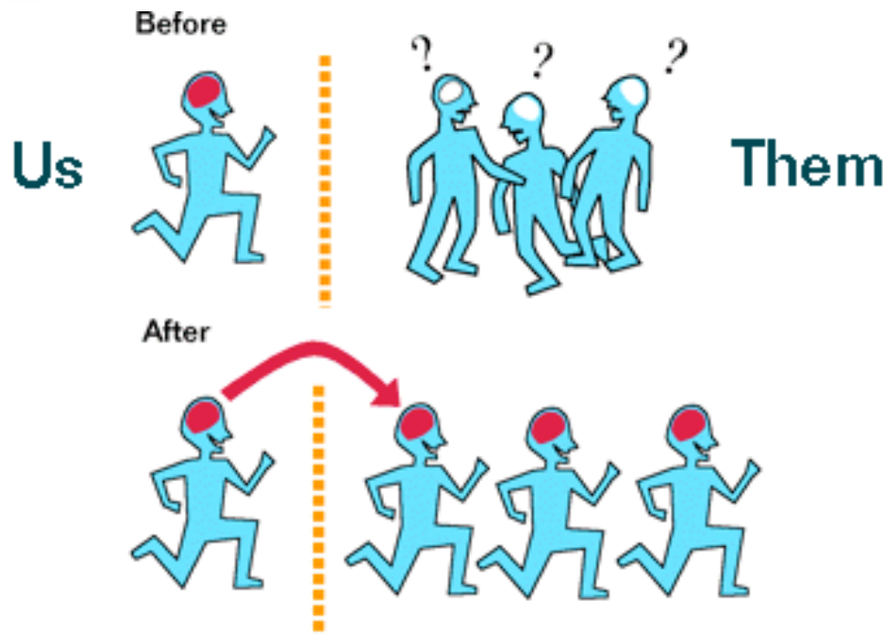
social acceptability

premise of Task 24

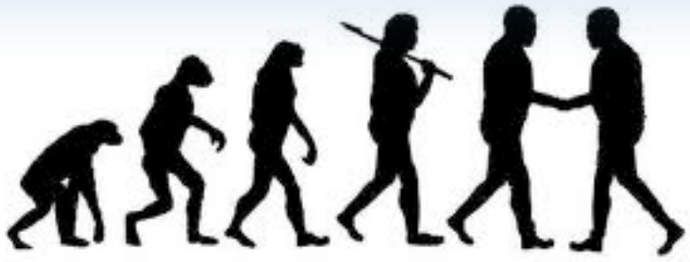
That the current energy efficiency gap results from:

- ✓ *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



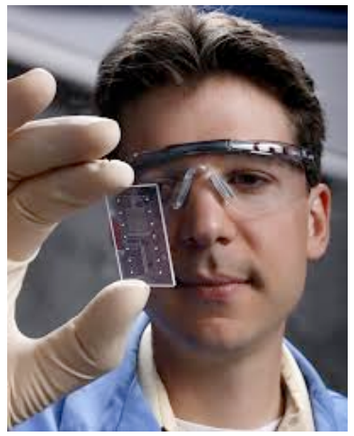
special features of Task 24



target audience of Task 24

1. **Intermediaries**

2. **Policymakers**



3. **Researchers**

4. **Industry**

5. **The Third Sector**

Pics via: theinnovativeeducator.blogspot.com, dreamstime.com, agu.org, lifesupplemented.org, rassutassu.com, change.comminit.com

target audience of Task 24

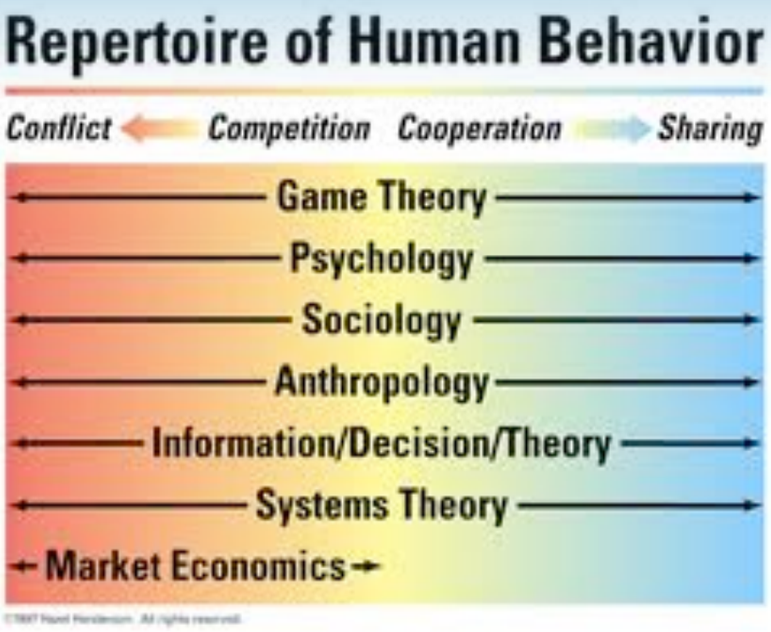
CHANGING THE BEHAVIOUR OF THE BEHAVIOUR CHANGERS

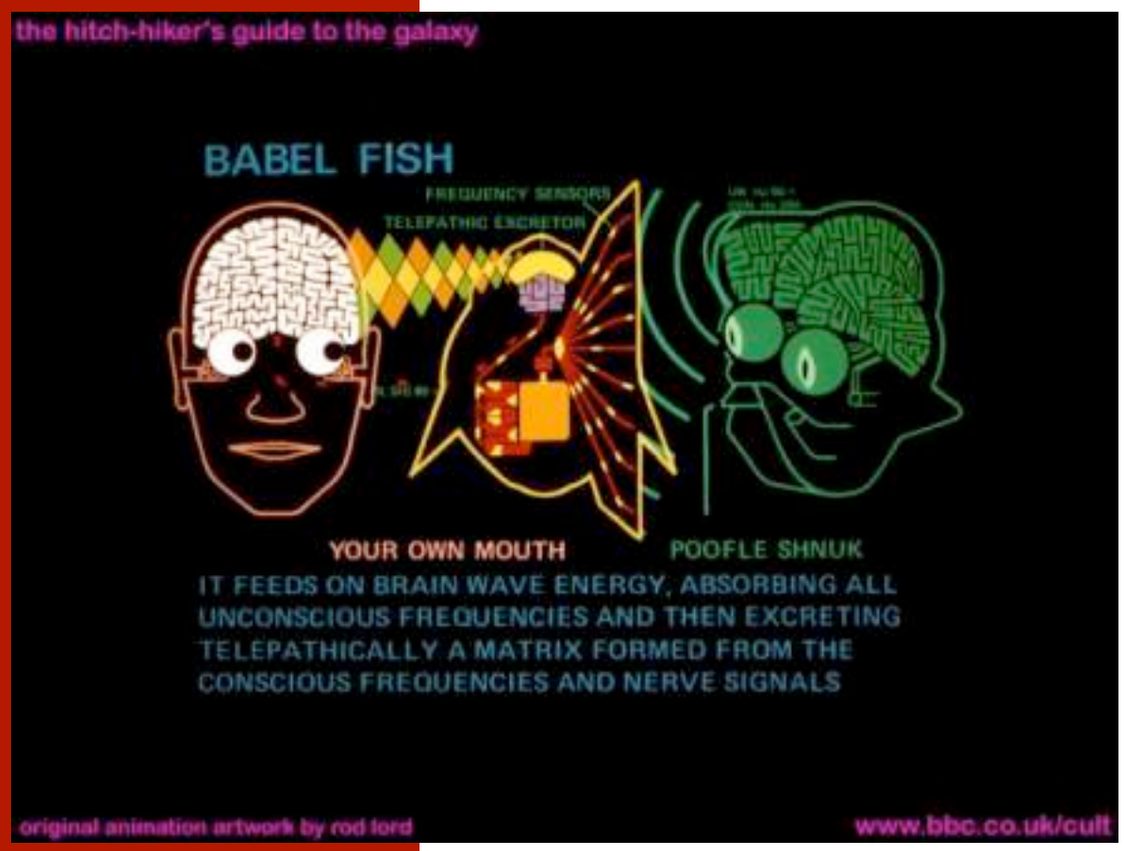
subtasks (deliverables)

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





- 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 story of: Behavioural economics

enayetkabir.blogspot.com
greenbookblog.com

subtask II -
specific case studies

smart metering

building retrofits

transport

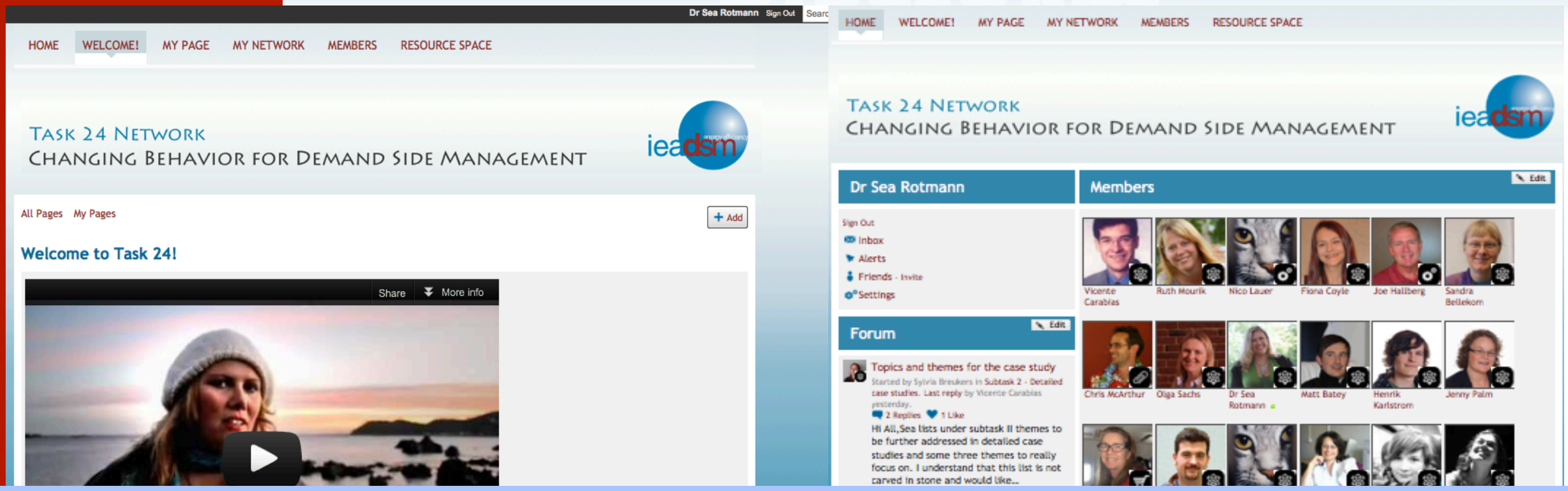
SMEs

subtask III - evaluation

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

subtask IV -
country-specific recommendations

subtask V - expert platform



JOIN US?

drsea@orcon.net.nz

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

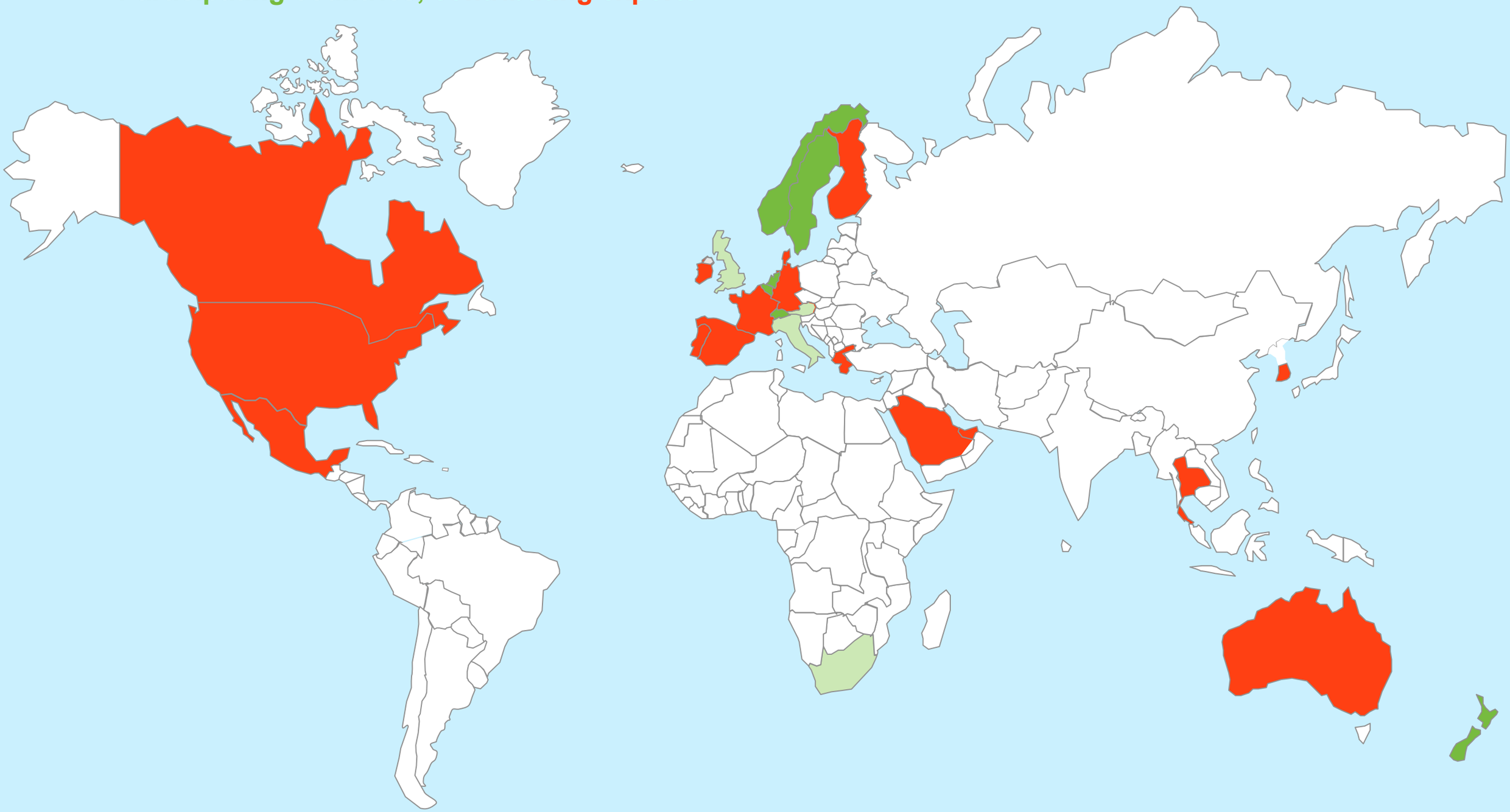
1- Helicopter view of models, frameworks, contexts, case studies and evaluation metrics

Subtask I

- 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

World Map of

Participating countries, contributing experts

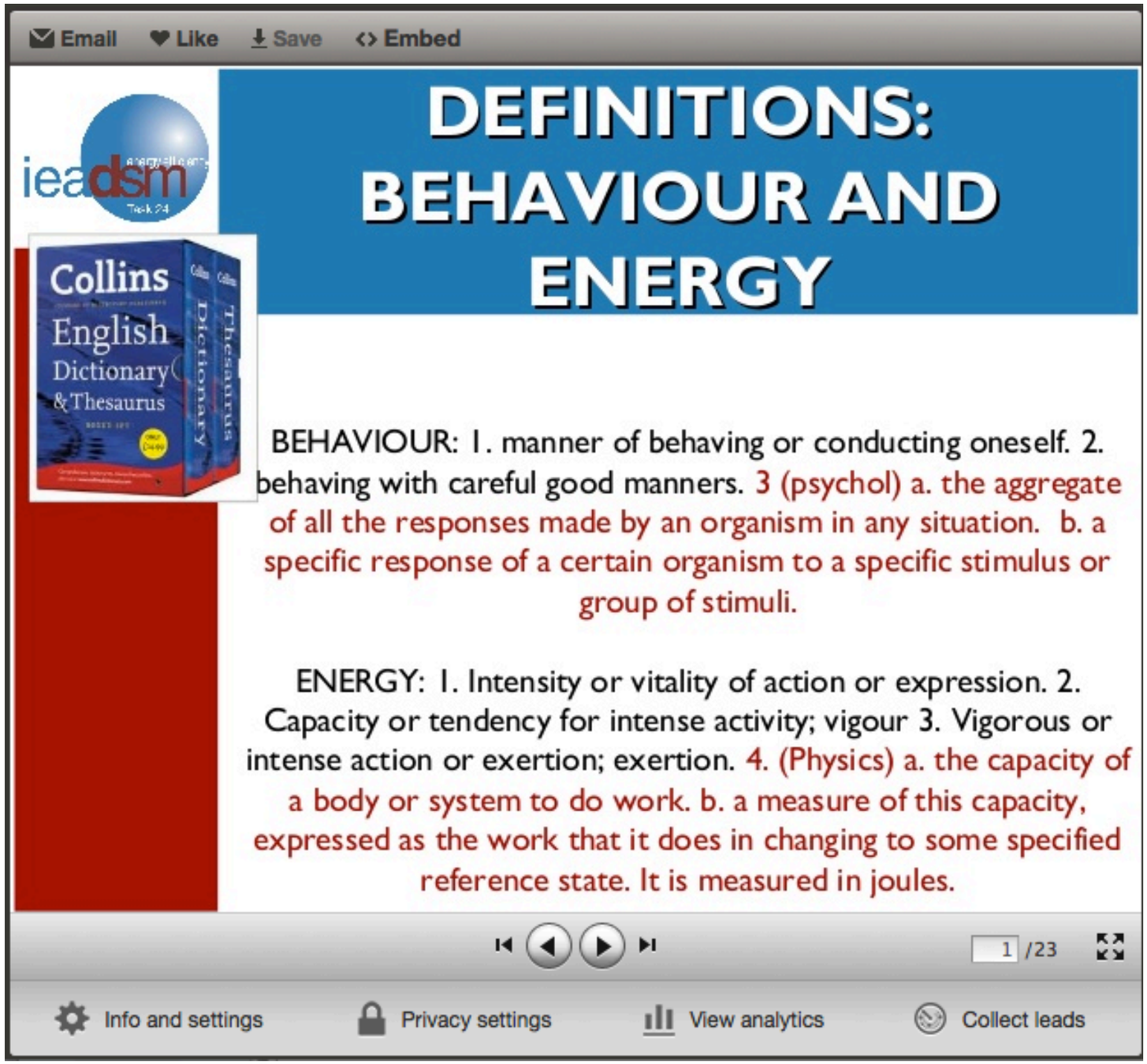


Expert platform currently has over 180 experts from 21 countries and 7 main sectors.

subtask I -

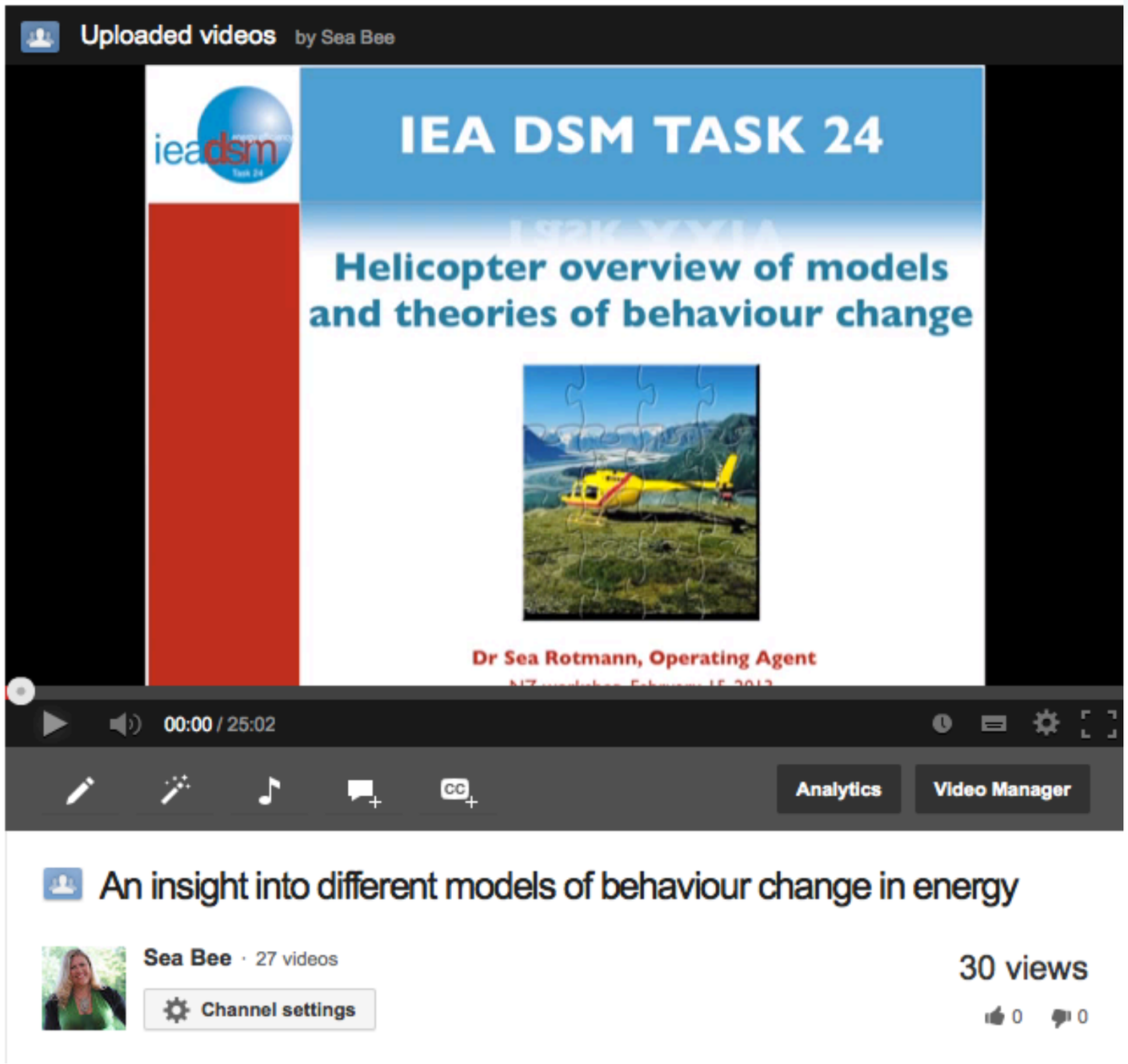
Overview of definitions

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



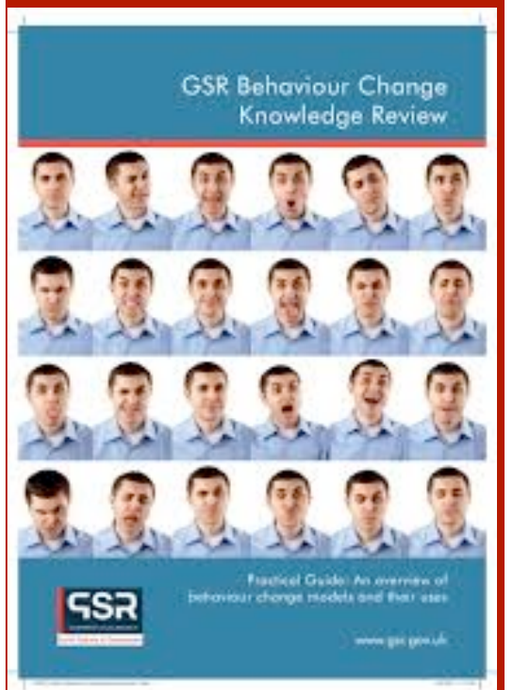
subtask I -

Overview of models, disciplines and frameworks



https://www.youtube.com/watch?v=DOTkdA97Woo&feature=c4-overview&list=UU_p3PlWDpLyDBh8TwUBmVHQ

subtask I - 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.

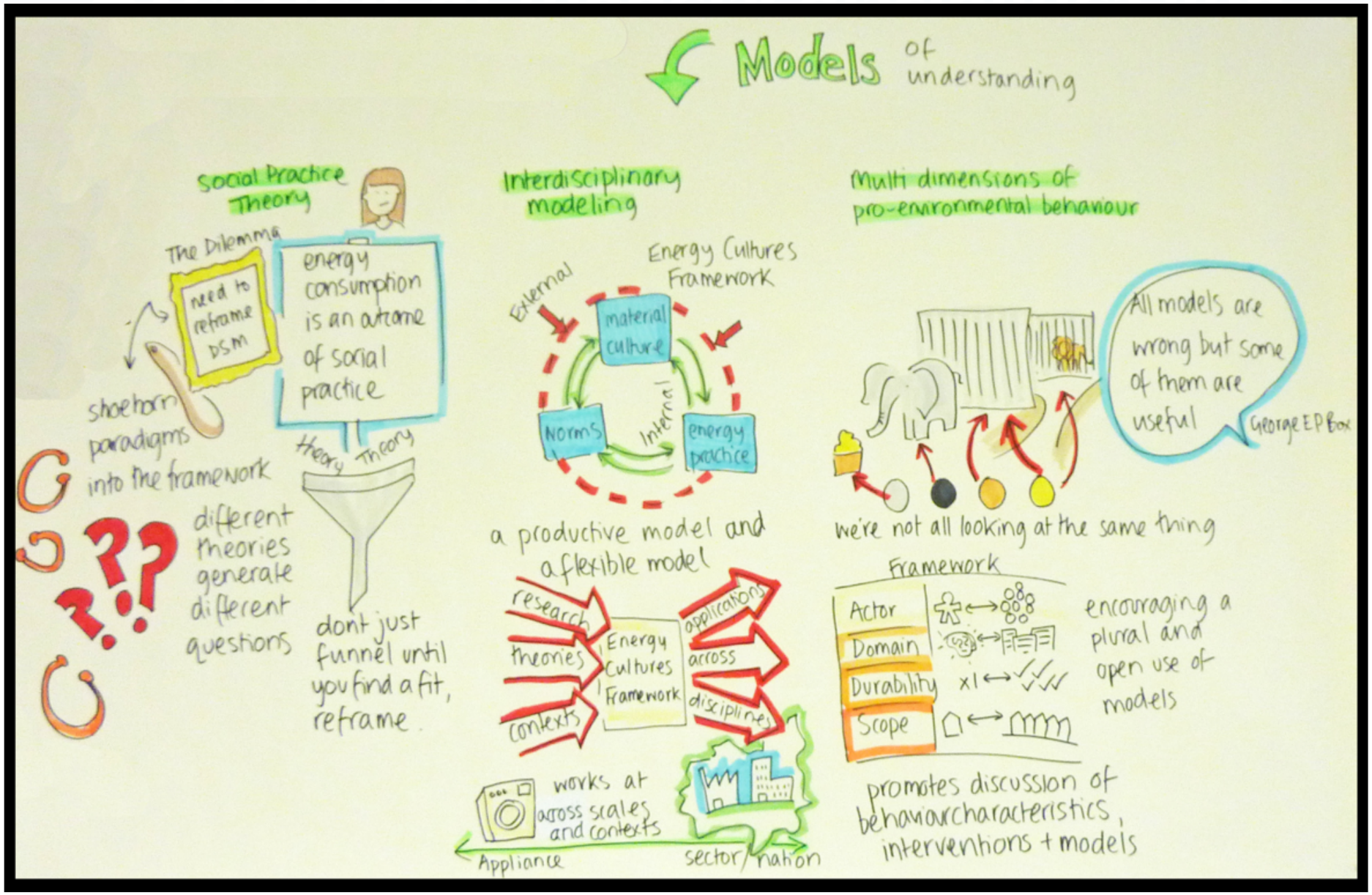
By contrast, theories of change show how behaviours change over time, and how they can be changed.

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

Both are important to understand when designing interventions.

subtask I -

Overview of models, disciplines and frameworks



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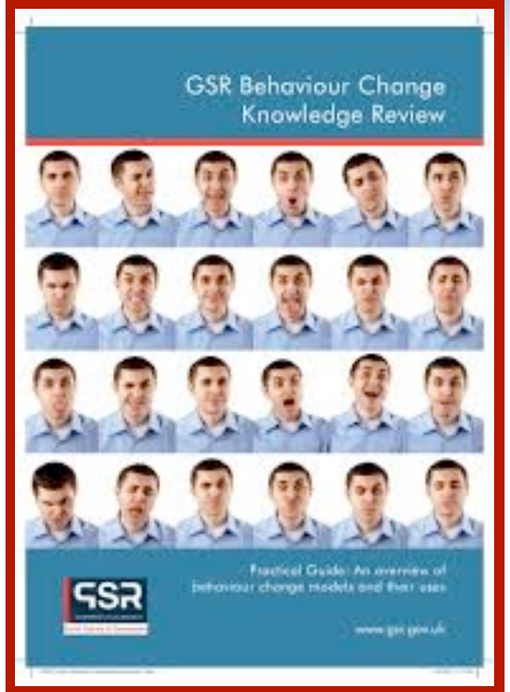

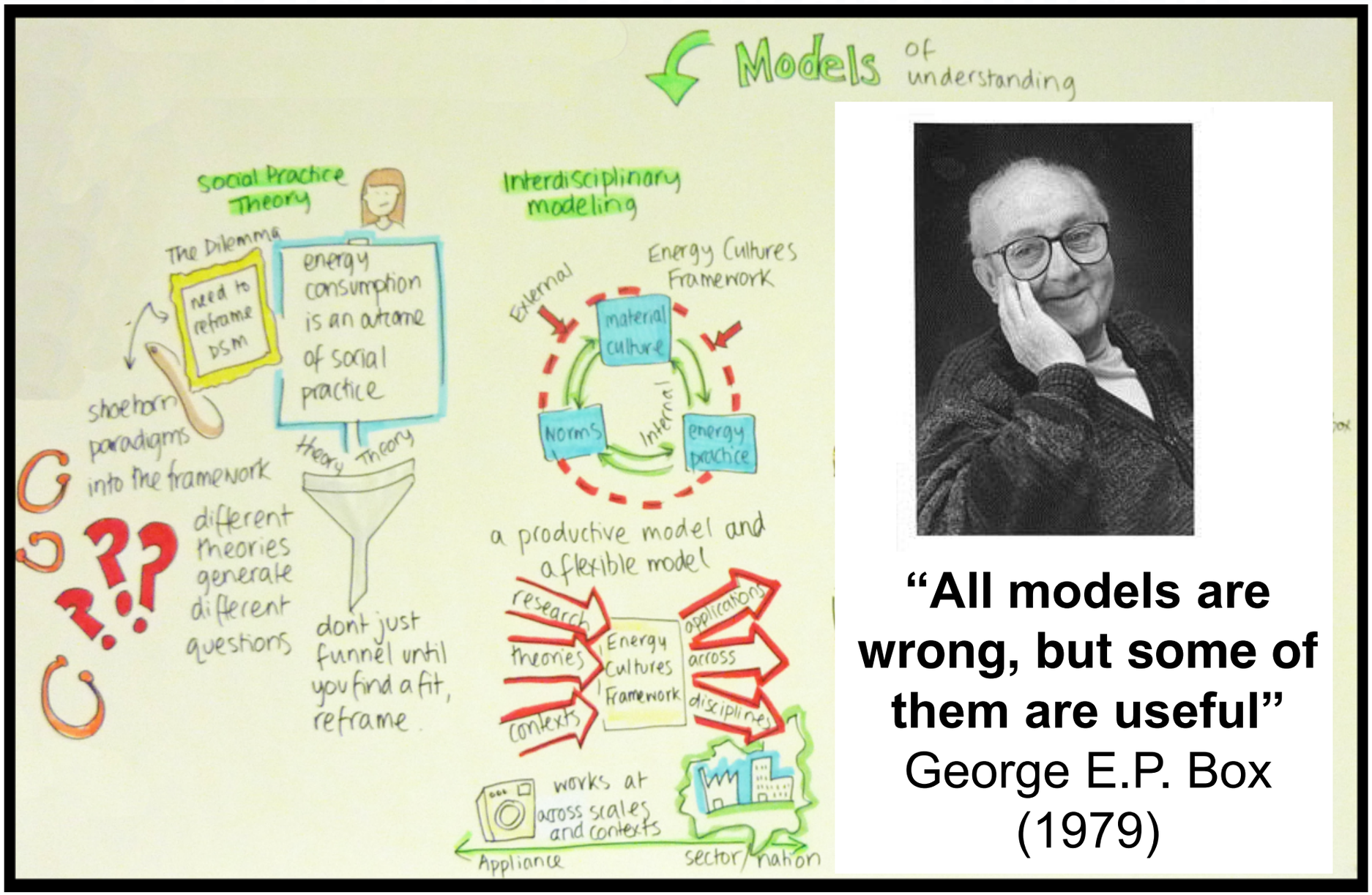

Babel to Babelfish?

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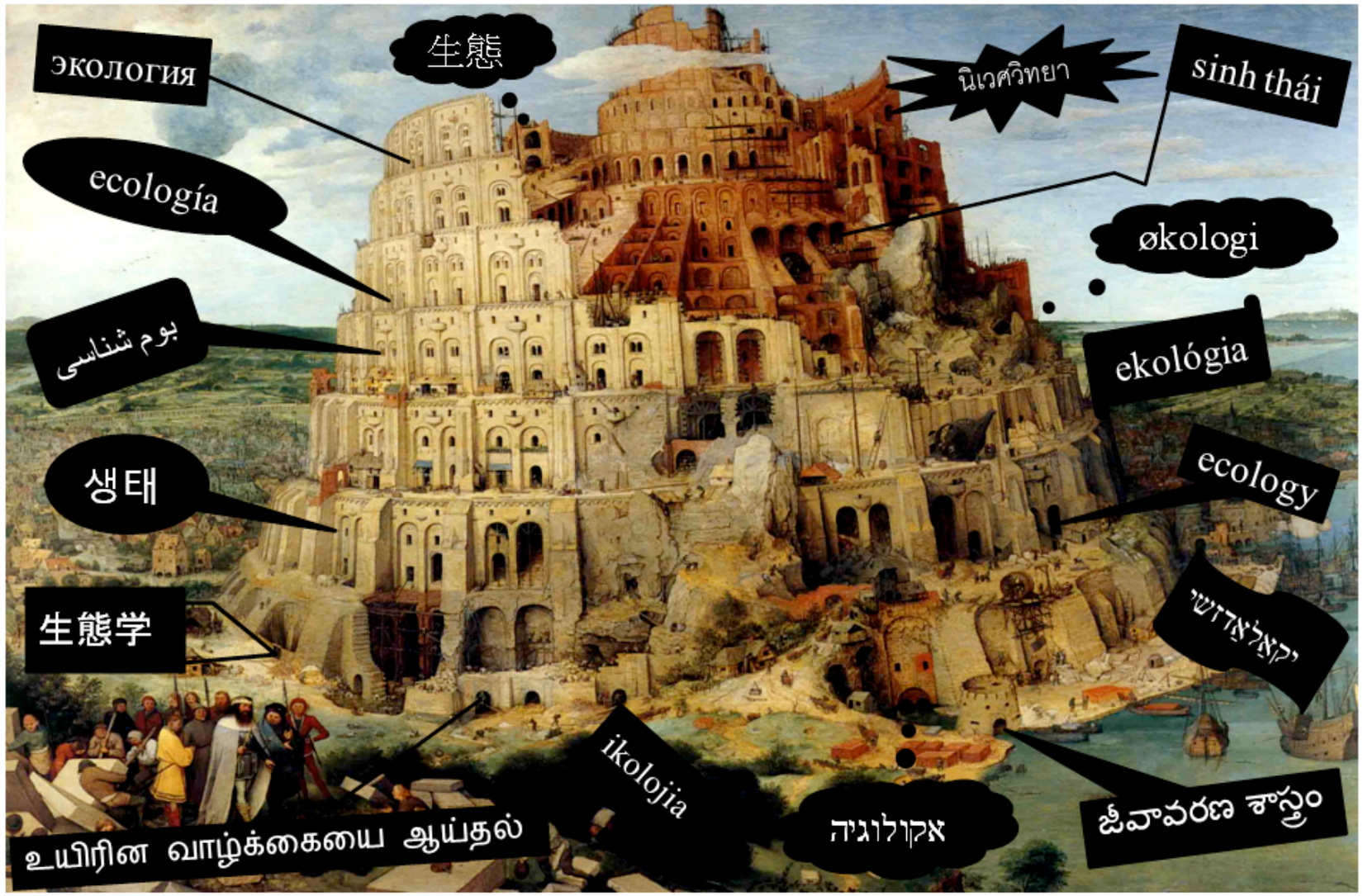

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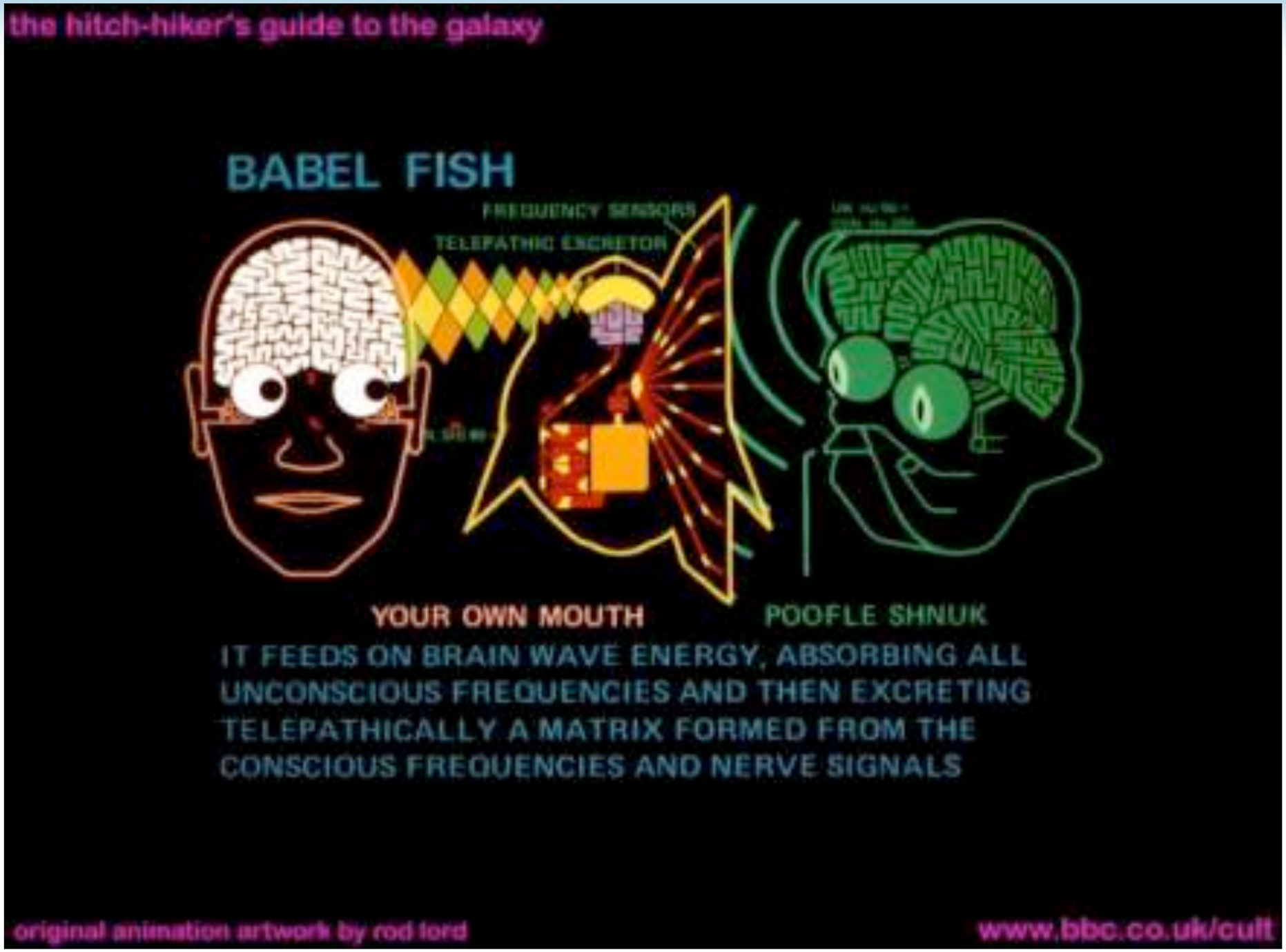

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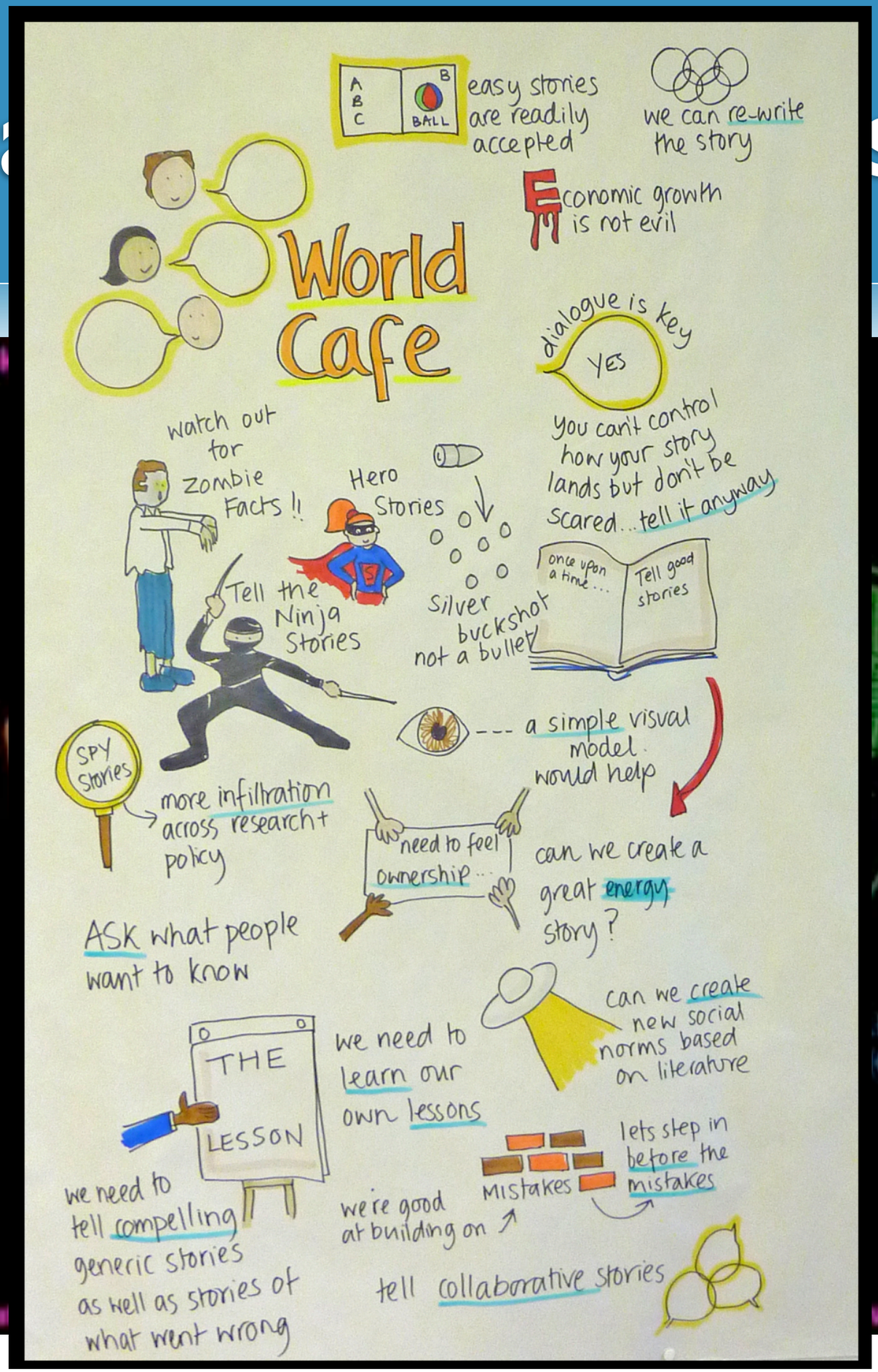
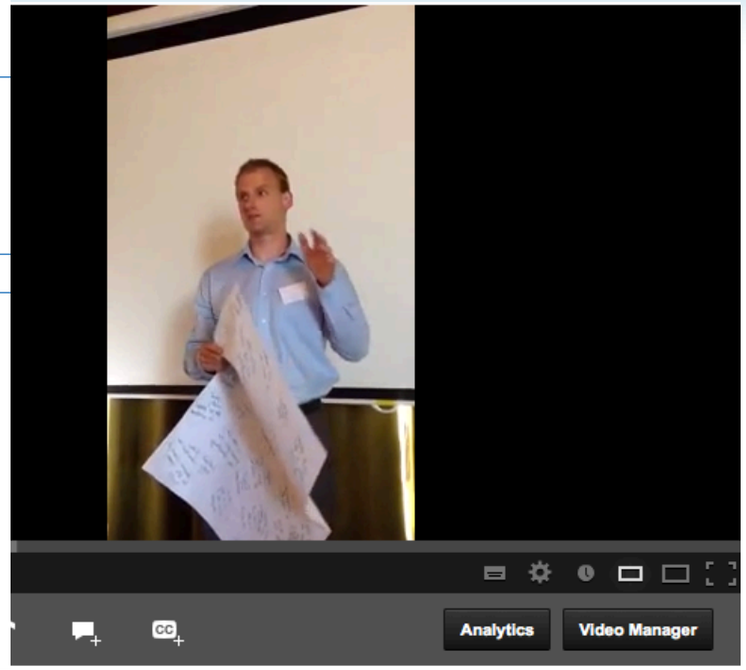

A B C
B BALL
easy stories are readily accepted
we can re-write the story
Economic growth is not evil
World Cafe
dialogue is key
YES
watch out for Zombie Facts !!
Hero Stories
you can't control how your story lands but don't be scared... tell it anyway
Tell the Ninja Stories
Silver buckshot not a bullet
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
THE LESSON
we need to learn our own lessons
can we create new social norms based on literature
we need to tell compelling generic stories as well as stories of what went wrong
we're good at building on
Mistakes
lets step in before the mistakes
tell collaborative stories

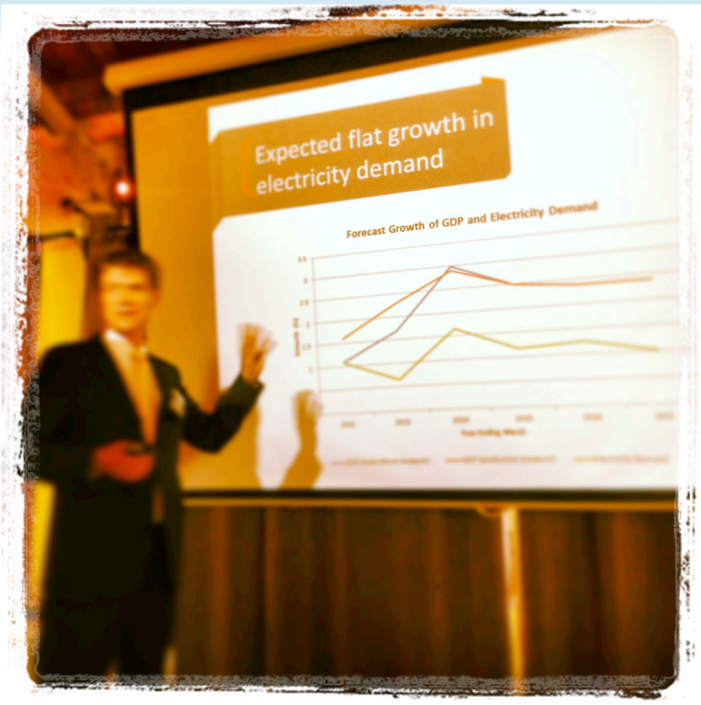
energy stories: personal

energy stories: sectoral

Fuel efficient driving behaviour in the light vehicle fleet

15 February 2013 | Jörn Scherzer | Transport Partnerships





Jörn Scherzer on transport issues

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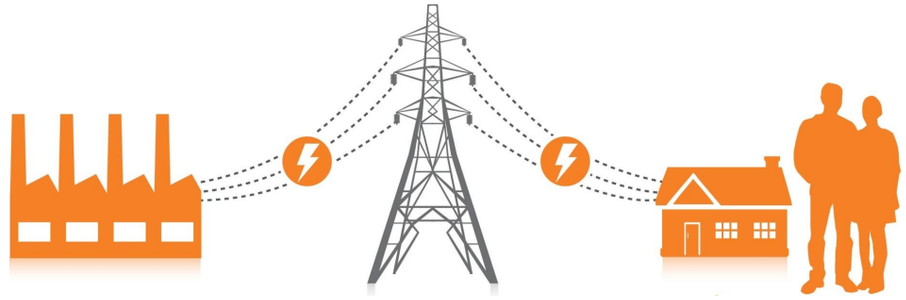
SAPERE AUDE

Re-orient OURSELVES

genesis ENERGY

Energy Behaviour Challenge 1

Changing household energy cultures
A research perspective



energy stories: national

IEA DSM – Task XXIV

Belgian Story

Brussels, September 7, 2012

Swiss Energy Strategy and research projects concerning behavior change

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

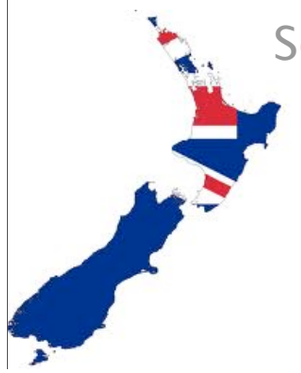
Workshop IEA DSM Task 24, 15.10.2013

Norwegian Energy Story

NTNU
Norwegian University of Science and Technology

demand-side The New Zealand energy story

Sea Rotmann and Janet Stephenson



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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 Garçia): **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							US (Michela Beltracchi): Opower feedback programme Models: Cialdini's 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 new[1]

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!

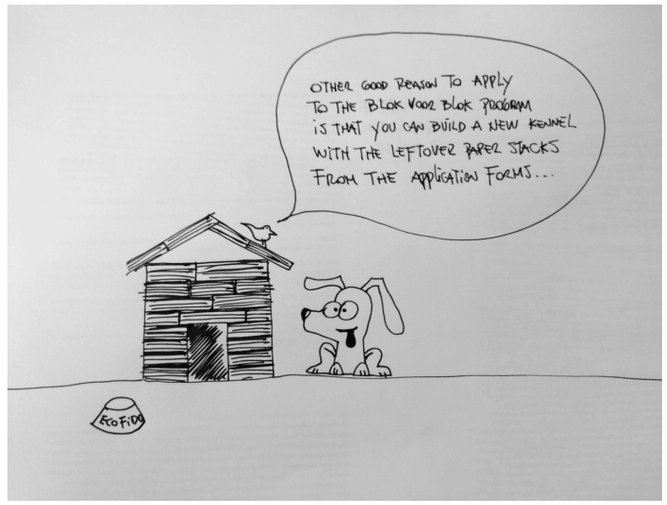
If you do not understand the technology, just don't touch the buttons…

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

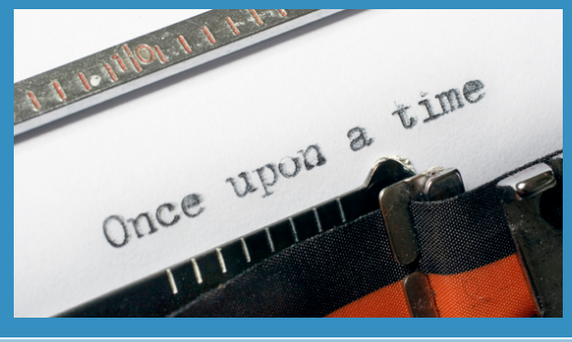


[1] Townsend & Bever

worked examples: smart metering

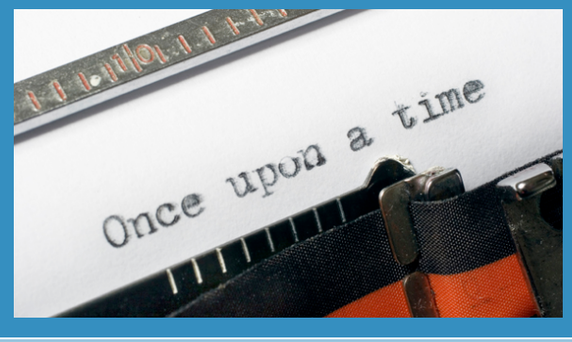
Country	case	Theory or model used	Policy or Societally driven
Netherlands	Jouw Energie Moment	Expectancy Value Theory; Design with Intent, Interpretation for sustainable behaviour	societally
	PowerMatching City Hoogkerk	Value action gap theory	Mixed, subsidy from policy and part of larger policy programme
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



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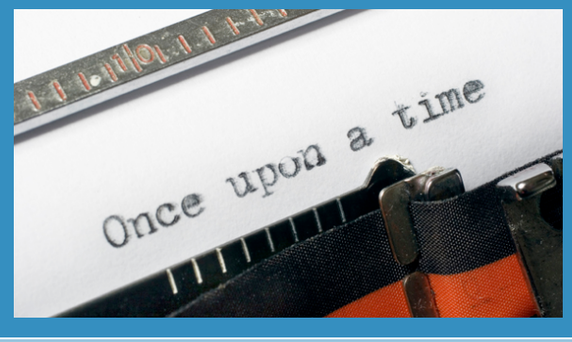
Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

Storytelling

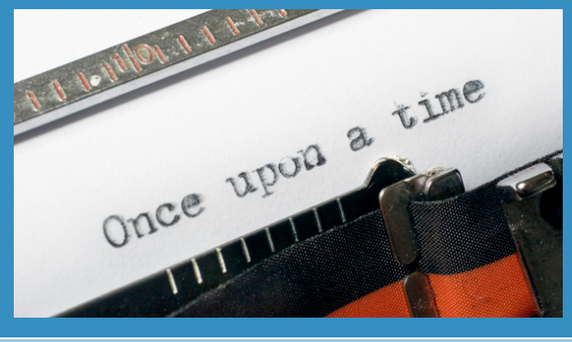


Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

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

3 ways of telling the stories:

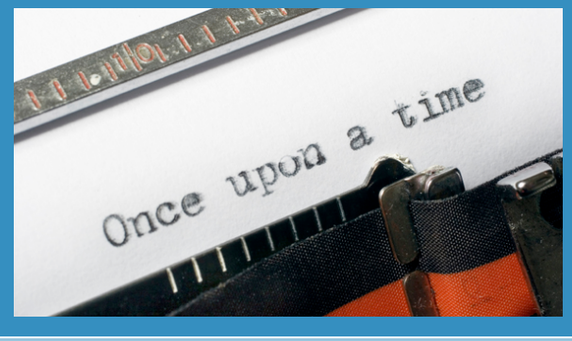
Storytelling



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



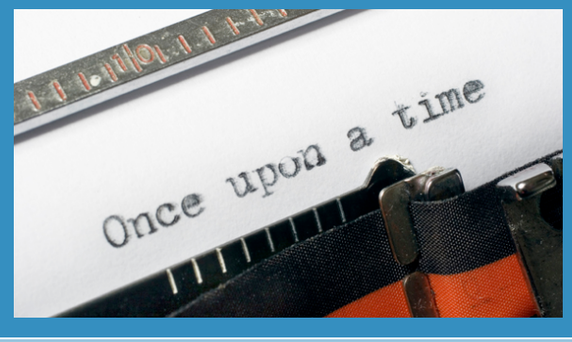
Narratives= social science tool aimed at providing way to explore how big events (policies) impact on small scale (individuals)

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



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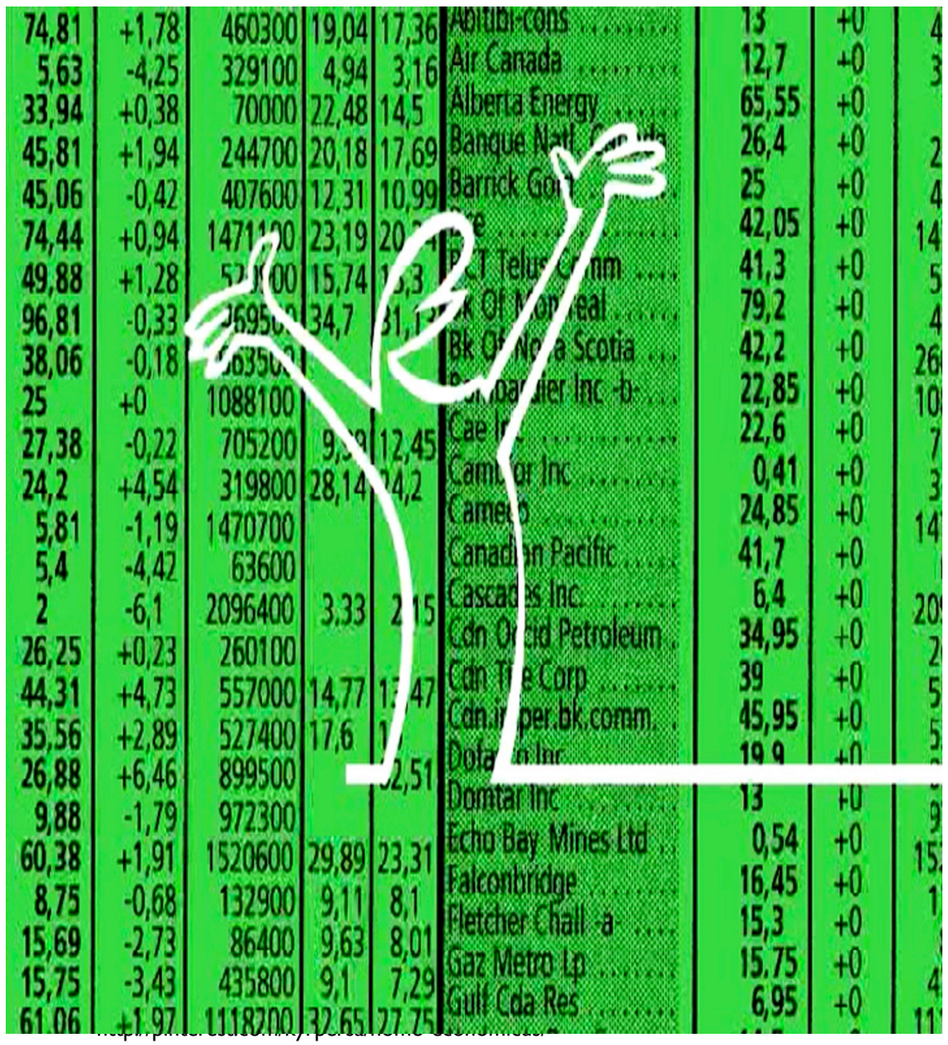
Allow for quick practical and useful understanding of complexity of interconnected factors in behaviour research

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



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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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.

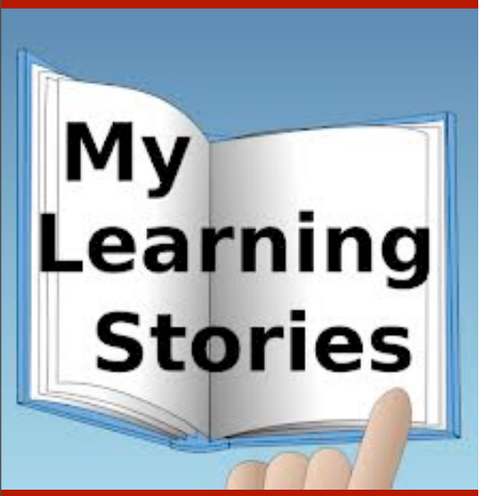
But then... the "Smart-Meter-Wave" finally hit Switzerland (it takes sometimes a bit longer in Switzerland, because we don't have a coast…)

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.

A story of economics theories & smart metering



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Smart meter fears

Smart meter fears

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

Unsere Energiejagd AUFSPÜREN - EINSPAREN - GEWINNEN	eco2-CUT
social approach	individualistic approach
social norm (MoU) social learning (ToC) Freezing/unfreezing (ToC)	classical economics (MoU)
Gamification, competition, feedback, tailored advice, champions	Feedback, Advice & Incentive (iPod!)
Goal: CO2 savings	
Huge success	Unexpected 'failure'

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Unsere Energiejagd
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social approach

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Huge success

Austria -
Die Energiejagd vs €CO2 Management

In-depth analysis:
Austria - SM

In-depth analysis:
Austria - SM

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

In-depth analysis:
Austria - SM

Beispiel			Meine Kosten	
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Unsere Energiejagd
AUFSPÜREN - EINSPAREN - GEWINNEN

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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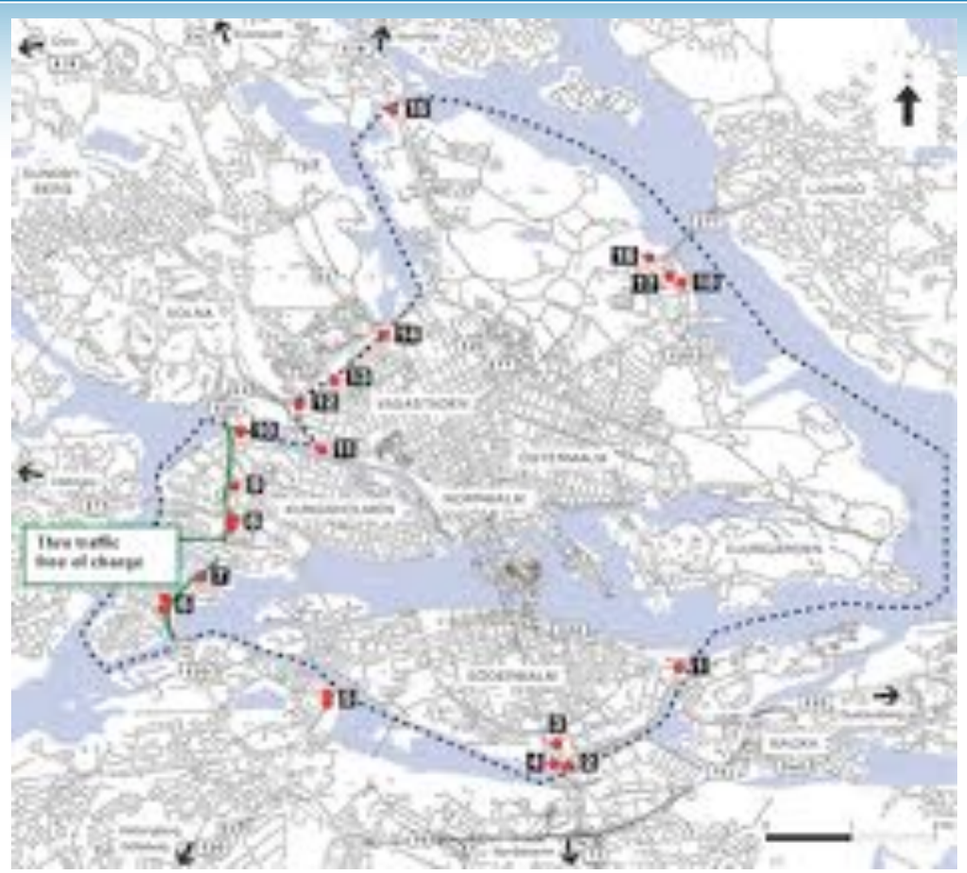
Norway - SMEs

Finnfjord

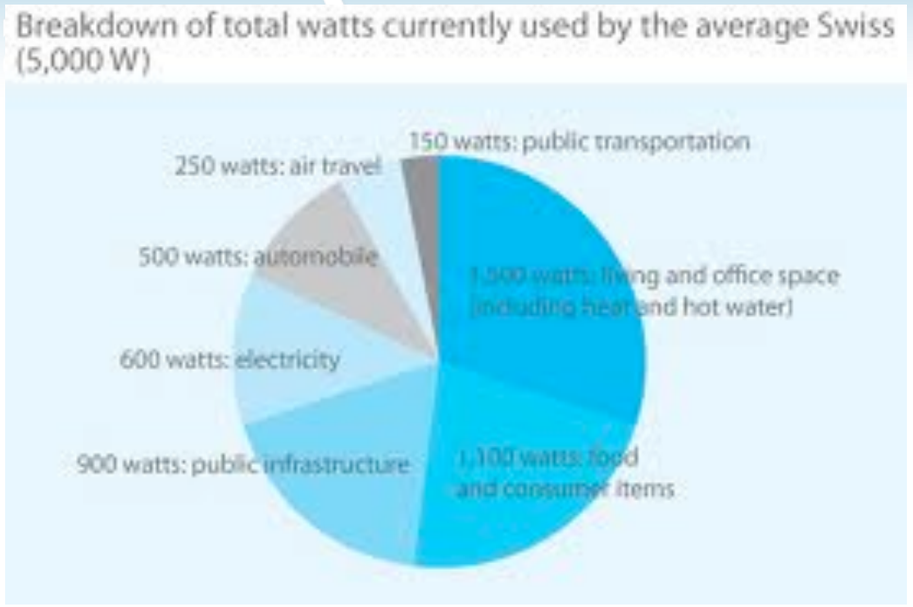
Sweden - Transport

Stockholm congestion charges



Switzerland - Buildings

2000 Watt Society



Subtasks

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Subtasks

3 – Evaluation tool for stakeholders

subtask III - evaluation metrics

Conventional monitoring of smart metering success	More systemic monitoring of smart metering success
• 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	• 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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