Introducing a new behavioural toolkit for energy policy

Users TCP Behavioural Insights Platform
New toolkit for practitioners

- Helps improve the efficacy of demand-side energy policies
- Developed over the past year by the Users TCP
- Based on collaboration with 20+ behavioural science experts from 6 countries (NL, IR, UK, CH, CA, AU)

Freely accessible online at bitoolkit.userstcp.org
New toolkit for practitioners

What does the toolkit do?

■ Helps policymakers identify behavioural factors that might affect the success of their policy
■ Offers guidance how these factors can be addressed

What does it not do?

■ Directly tell the policymaker that they should pursue a particular policy (or that policy A is better than policy B)
Access the toolkit

bitoolkit.userstcp.org

Applying behavioural insights to energy policy

A toolkit for practitioners

This toolkit is intended for policymakers, civil servants, and professionals who design programmes to reduce emissions of citizens and businesses.

Energy programmes can fail because citizens and businesses might respond to them in unexpected ways. This toolkit will help you consider how people could respond to your programme and increase the likelihood that it will achieve its intended outcome.

To begin, please select the path that best matches your needs and answer the 3 questions that will follow. You will then be presented with personalised recommendations.

I am developing a new programme
You are designing a new programme to reduce emissions of citizens and businesses. Choosing this path will help you consider different types of interventions.

Start

I am improving an existing programme
You are either implementing or refining a programme that already exists. Choosing this path will help you consider the underlying factors that might be affecting the programme’s success.

Start

→ I don’t want personalised recommendations, take me directly to the behavioural checklists
Motivating reduction of heating consumption: Results and Policy Recommendations

Peter Conradie, Senior Researcher, imec-mict-ugent
Filippos Anagnostopoulos, NUDGE project Coordinator, IEECP
28 September 2022
NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Survey performed among 3129 Europeans

Questioned about their consumption, saving behaviours, but also tested a behavioural model with the aim of better understanding what drives them to reduce heating related consumption.

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Survey Structure

1. General information on the **physical characteristics** of people’s main residence, its energy efficiency and or production of energy

2. The second module assessed the stated “actual” **energy-saving behaviour** of respondents

3. The third module had a series (15) of **attitudinal, motivational** and **behavioural** constructs measuring the underlying theoretical model, with each construct comprising between 3 and 5 items.

4. Module four explored the **potential of energy platforms** that provide real-time energy monitoring but also control and automate energy flows.

5. A fifth and last module included **socio-demographic** indicators such as gender, age, household type, household composition, educational attainment, career status, and income.

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Saving behaviour: heating and cooling

- Turning heating off while airconditioning is on
- Closing windows when heating is on
- Keeping the doors closed to unheated areas in winter
- Closing curtains and/or blinds to prevent heat loss in winter and heat gain in summer
- Wearing more clothes instead of turning the heating up
- Lowering daytime/nighttime thermostat setting
- Turning off heating when absent
- Turning down temperature in unused rooms

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Behavioural Model

Novel given that we explored three pathways towards behaviour change:
1 - Rational, deliberate process of decision making
2 - Moral reactive path
3 - Social reactive path

All three has a positive impact on intention to reduce consumption.
Attitudes towards reducing consumption

Can be associated with bill consciousness, being aware of energy saving measures, but also with environmental concern.

The fear of losing comfort, by contrast, has a negative impact on this attitude.
What best predicts intent and (previous) behaviour?

The intent to reduce consumption is significantly impacted by subjective norms (do other people approve or disapprove of the behaviour) related to energy consumption, but also the degree to which people feel they have perceived behavioural control (the degree to which a person believes that he or she can perform a given behavior) over doing so.
What best predicts intent and (previous) behaviour?

Positive images of other people reducing their consumption furthermore significantly impacts both the intent to reduce consumption, but also having done so in the past.

Personal moral norms, however, has a slightly stronger impact.
Policy recommendation 1
Visualise energy consumption behaviour
Perceived behavioural control / subjective norms

Means

• Provide access to anonymized data for analytics
• Advance smart meter rollout
• Enable data sharing through IoT, smart meters, etc

Nudging features

• A) Visualisation of in-depth information about real time consumption
• B) Relevant social comparison

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Policy recommendation 2 (Part 1)
Extend the use of existing policies & measures
Perceived behavioural control / subjective norms

Means
• Energy Efficiency Obligation Schemes could be strengthened in their implementation and monitoring
• Push messages by retail companies or public actors

Nudging features
• Top: Timely and targeted energy saving tips
• Bottom: General energy saving suggestions for thermostats

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Means
• Energy Efficiency Obligation Schemes could be strengthened in their implementation and monitoring
• Push messages by retail companies or public actors

Nudging features
• A) Automation of energy saving procedures
• B) Tailored and in-person recommendations

Policy recommendation 2 (Part 2)
Extend the use of existing policies & measures
Perceived behavioural control, fear of losing comfort, energy knowledge

NUDGE has received funding from the European Union’s Horizon 2020 Research and innovation programme under grant agreement No 957012.
Policy recommendation 3
Targeted campaigns to reduce energy consumption
Perceived behavioural control, moral norms, subjective norms, environmental concern, bill consciousness

Means
• Public awareness multi-level campaigns, including TV, press and various social media

Nudging features
• Emphasize saving behaviour of role models
• A) Goal Setting / doing one's own part
• B) Stress environmental impact
• C) Estimate financial Impact

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NUDGE has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 957012.
RUN@24

Steering user behaviour towards higher RAC setpoint temperature settings

Simrat Kaur | 28 September 2022
Behaviour changes CAN and DO happen

Polio Immunization Programme in India

Simple messaging
- “Two drops of life”
- “Every child, every time”
- “My child, each time”

Messenger
- Amitabh Bachchan, a popular Bollywood star in India was the face of the campaign
- Cricketers endorsing the message

Timing
- Posters put up in huge numbers right before each polio round
- Strategic display of posters

Exhibit A: Communication material from Polio Immunization campaign in India
Behaviour changes CAN and DO happen

Polio Immunization Programme in India

Eradicating polio: Cases in India since 1980

The last polio case was reported in January, 2011.

India received the ‘Polio-free’ certification from the World Health Organization in 2014.

Figure 1: Polio cases in India since 1980 (Source: World Health Organization)
Citizen centric approach to behaviour change

India’s updated NDCs to the United Nations Framework Convention on Climate Change (UNFCCC) highlight the need for a citizen-centric approach to combat climate change.
Making sense of energy saving behaviour

Reducing  Switching  Shifting  Upgrading

Being fully informed is not enough

Framing of messages:

- Simple
- Appealing
- Resonance
- Timely
**Aim**: Encourage Room Air Conditioner (RAC) users in India to use their RACs at 24°C or above.

Adaptive thermal comfort

AC setpoint at which desired comfort level can be achieved as per the India Model for Adaptive Thermal Comfort (IMAC)

~6% savings²

Per °C increase in setpoint temperature

Source 1: Ozone Cell. India Cooling Action Plan, 2019
Source 2: AEEE. Projecting National Energy Saving Estimate from the Adoption of Adaptive Thermal Comfort Standards in 2030

Figure 2: AC Setpoint temperature settings during summers (AEEE findings)
Default Setting
Default setting of 24°C in all new ACs from 2020

Guidelines for commercial buildings
Large premises such as airports, hotels, shopping malls, offices and government buildings advised to maintain a temperature of 24°C - 25°C

AC@24 Digital Campaign
Key messaging of BEE’s campaigning has elements of **monetary** and **environmental** motivations for running AC at 24°C
Comfortable – neither too hot nor cold

Fewer chances of catching cough/cold

Suits most members of the family (including elderly and children)

Frequent change in temperature not required

30% of the respondents use RACs at 24°C or above
Reasons for using AC at 24°C or above
Role of digital technologies

Dynamic display of power consumption in RACs

- Empower RAC users to take action
- Participation in DR programs
- Spill over effects
RUN@24: Intended policy impacts

• The campaign contributes to the adoption of ATC standards in India and achieve energy and emission savings while ensuring higher productivity and comfort for households.

• The learnings from the Run@24 campaign can support BEE in formulating/refurbishing its ongoing and future awareness and outreach campaigns to promote a culture of energy efficiency in India.

• The Run@24 campaign supports the Government of India's 'Lifestyle for Environment (LiFE)' movement.
THANK YOU
simrat@aeее.in

Connect with us
+91-11-4123 5600
info@aeее.in
www.aeee.in

Alliance for an Energy Efficient Economy
AEEE_India

37 Link Road, Ground Floor, Lajpat Nagar III, New Delhi, 110 024
Introduction to the Opower Platform

Influence action → save energy & reduce customer bills → drive energy security

Mary Sprayregen, Global Head of Regulatory Affairs
Oracle Energy and Water – Opower
Opower solves energy and engagement challenges for utilities worldwide

Since 2007, Opower has served 175+ utilities in 12 different countries

- Canada
- USA
- France
- Spain
- Italy
- Sweden
- United Kingdom
- India
- Japan
- Hong Kong
- Malaysia
- New Zealand
- Australia
Behavior-based utility programs: a measurable impact

- Saved with Behavioral Energy Efficiency: 33 TWh
- Lower Peak Demand Capacity Today: 418 MW
- Faster Product & Program Adoption: up to 5X
- Customer Bill Savings: +$2.7B
- Satisfied Customers: up to 95%
Behavior-based utility programs: a measurable impact

33 TWh

Saved with Behavioral Energy Efficiency

Equivalent to taking all of Denmark’s households off the grid for 1 year
Avoided CO₂ emissions equal to outputs from ~60 natural gas-fired power plants¹
Potential to save an additional 10 TWh annually in Europe

1) https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
Our success stems from the intersection of AI and behavioral science

**Artificial Intelligence**
- Simplifies complexity
- Trained on the world’s largest energy consumer data set
- Predicts and offers what each customer needs

**Behavioral Science**
- A variety of proven principles
- Makes price signals secondary
- Large experiments with leading scientists
- Gets customer attention and influences action
Behavioral change is a necessary tool to address the Russian gas crisis and to meet sustainability goals.

Despite its acknowledged importance to short and long-term energy efficiency programs, there is no mandated plan in Europe to drive behavior change.

Opower is the global leader in behavioral energy efficiency. Our impact in Europe can be tremendous.
The urgency of the current European energy crisis makes effective consumer engagement more important than ever.

**Case Study: Opower’s Original European Pilots**

*The urgency of the current European energy crisis makes effective consumer engagement more important than ever.*

Across five energy efficiency pilot programs in Europe, Opower reduced >113 GWH of electric and gas usage.*

Europe’s smart meter rollout enables new tools that drive additive energy efficiency savings.

The climate crisis has become increasingly urgent since Opower left the European market.

Fuel prices are taking an unprecedented toll on consumers, necessitating the relief Opower can provide.

*Measured through a series of randomized control trials.
Case Study: Electricité de France

Program Length: 2013-2016

Opower Efficiency Solutions:
- HER – Print and Email
- Web Portal
- Unusual Usage Alert

Electric Savings Rate: 1.35%

Total Electric Savings: 2.81 GWH

Impact on EDF Brand

- EDF helps you reduce your electricity consumption: +11%
  - ** 90% Significant Difference
- EDF is a reliable source of information about saving energy: +5%
  - *** 95% Significant Difference
- EDF helps you master your energy costs: +10%
  - *** 95% Significant Difference
- EDF is a company I can trust: +0%
  - 77% Control Group
  - 78% Recipient Group

Customer Satisfaction Surveys

Results taken from 2016 qualitative survey of EDF customers.
Why aren’t these programs in Europe today?

To enable a successful behaviour change programme, you need:

1. Access to meter data

2. The ability to proactively communicate with consumers in a personalized way

3. Retail supplier incentive
### Program design
- 2017-2021 programme
- 300,000 households
- Five retailers participated
- Behavioral energy efficiency Home Energy Reports

### Funding structure
- Ministry of Energy (MoE) provided funding
- Individual retailers shared data
- Opower delivered home energy report program via retailer

### Program results
- 2% average energy efficiency saving
- 2.8% max savings
- 47,000 tons of CO2
“Flip the switch”

Lessons learned in the Dutch information campaign on energy efficiency

Lucas Boehlé (The Netherlands)
Policy Advisor Energy Efficiency

28 september 2022
IEA behaviour workshop
Phase 1 (spring 2022)

- Energy crisis
- Raise awareness
- Broad campaign with quick actions
- First households, second companies
- Start with a bang!
Main actions

› Households
  1. Heating
  2. Showering
  3. Extra tips

› Companies
  1. Heating
  2. Lighting
  3. Ventilation
  4. Extra tips
How and where?

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Newspapers

- Two ads
  - One for households
  - One for companies
- Both national and regional
TV and radio

› Minister himself
  – Interviews at the kick-off
  – Mention the campaign in talkshows to keep up momentum

› Commercials
  – Focus on one measure
  – More info on the website
Social media

› The usual suspects
› Targeted information, but not detailed
› Easily shareable and click-throughs to the website
## Return on investment

### Mediabudget (Netto)

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### Mediadruck

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How to quantify the effects?
Survey results

- Raised awareness
Survey results

- Raised awareness
- Increased efficiency
Survey results

› Raised awareness
› Increased efficiency
› Insights in motivation
Lessons learned

1. Exemplary role of government
2. Better early than late, but better late than never
3. Partners are important
4. Money can be a motivator
5. Companies need to do their part
Questions?

l.m.boehle@minezk.nl
+31 6 15 63 65 46

Lucas Boehlé
How to engage hard-to-reach energy users in awareness & behaviour campaigns?
Lessons & challenges

IEA EEWP, Sept 28, 2022

Dr. Sea Rotmann
(Task Leader & National Expert, Aotearoa)
UsersTCP and the International Energy Agency (IEA)

- The **International Energy Agency (IEA)** is an intergovernmental organisation that works to shape a secure and sustainable future for all, through a focus on all fuels and all technologies, and analysis and policy advice to governments and industry around the world.

- To facilitate global cooperation on energy technology, the IEA created the **Technology Collaboration Programme (TCP)**. Today, the UsersTCP is one of 38 TCPs each focused on a different topic. Together, they connect thousands of experts across government, academia and industry in 55 countries dedicated to advancing energy technology research and application.

- The UsersTCP is **functionally and legally autonomous** from the IEA. Views and findings of the UsersTCP do not necessarily reflect those of the IEA.
We studied, in-depth, who hard-to-reach (HTR) energy users in the residential & non-residential sectors were (see Rotmann et al., 2020)

We described their characteristics & estimated how many they were, in what sectors, and how to better motivate & engage them in interventions geared at changing their energy-using behaviours

(for extensive case studies, see our publications website)
The HTR Task has evolved from 10+ years of research

### IEADSM Task 24: Phase I
2012-15

First global behaviour change research collaboration on behaviour change & DSM. Phase I (8 countries) created a theoretical helicopter overview of behavioural models & theories of change, and how to evaluate behaviour change programmes. We realised there was no silver bullet.

⇒ Collective Impact Approach & socio-ecology

### Task 24: Phase II
2015-18

Phase II of Task 24 (6 countries) focused on the human aspect of the energy sector, the energy users but also the “Behaviour Changers” who tried to engage them via awareness and/or behaviour change campaigns. We developed & tested a multi-stakeholder facilitation framework, and did field research pilots.

⇒ Multi-stakeholder collab plus end user engagement

### Users TCP HTR Task
2019-23

The HTR Task (5 countries) was created “to identify, define & prioritise HTR audiences; and design, measure & share effective strategies to engage those audiences to achieve energy, demand response and climate targets while meeting access, equity & energy service needs.”

⇒ There are many sub-types of HTR audiences & big research gaps

### HTR Task: Phase II?
2023-26?

We propose to focus on those energy users in “hidden hardship” as they are extremely underserved, barely engaged with current strategies & interventions, and in dire, urgent need of support given the energy (poverty) crisis. These are marginalised, stigmatised & criminalised elements of society only trusted frontline & community middle actors can engage.
Our definition of HTR energy users

“In this Task, a hard-to-reach energy user is an energy user from the residential or commercial sectors who uses any type of energy or fuel, and who is typically either hard-to-reach physically, underserved, or hard to engage or motivate in behaviour change, energy efficiency & demand response interventions that are intended to serve our mutual needs.”

Key Findings

• Most commonly-mentioned HTR audiences: Low-income households, renters, SMEs
• HTR audiences with great energy-saving potential: High-income, landlords, building operators
• Audience size estimates: >2/3 of energy users (e.g. >60% renters, 99% of all businesses)
• COVID-19 impact: Huge, particularly on most vulnerable households, renters and SMEs

⇒ These audiences are not only hard-to-reach, they are also underserved and under-researched by Behaviour Changers in industry, government and academia. **Energy justice, inequity, stigma** are key themes that need to be addressed more urgently & on these target audiences.
Even harder: those in “hidden” hardship
Even harder: the “hidden” users

‘Forgotten’ or overlooked (marginalised) groups:
- Those affected by mental illness & other disabilities
- Isolated elderly
- Isolated (Indigenous) rural communities
- Victims of crime & domestic violence

Socially-stigmatised and often discriminated-against groups:
- Beneficiaries & the unemployed
- Refugees & immigrants from developing countries
- LBGTQ+ community
- Single mothers
- Gambling & alcohol addicts

Illegalised or criminalised groups:
- Previously or recently-incarcerated
- Illegal overstayers
- Drug users & drug dealers
- Sex workers & their clients
- The homeless (including those who are couch surfing or staying in shelters)
- Perpetrators of (domestic) violence
- Those who disagree with laws set by the government (this includes conspiracy theorists, ‘sovereign citizens’ & anti-vaxxers)
- Gang members or gang affiliates
But not all “hidden” users are in hardship.
And not all are residential energy users
We know what works:
1. Follow a strong co-design process

We know what needs to be done:

2. Acknowledge bias in “professionalism” standards

https://ssir.org/articles/entry/the_bias_of_professionalism_standards
We know what works:
3. Engage trusted community middle actors

https://digital-health.blog/2019/05/20/the-importance-of-co-design-to-improve-clinical-systems/

https://www.slideshare.net/pennyhagen/hagen-rowlandcodesign-ux-australiaupload
We know what works:

4. Listen before you create top-down interventions
Thank you very much for your attention!

Any questions?

drsearotmann@gmail.com

Check out our research here: https://userstcp.org/task/hard-to-reach-energy-users/
Special Workshop on Behaviour and Awareness Campaigns for Energy Crisis Response
Empowering People to Act: Best practice in awareness and behaviour campaigns
28 September 2022
Energy Crisis is hurting households, industries and economies

Increasing wholesale energy prices have led to higher end-user costs worldwide, with largest impacts in Europe.
Governments take action to support its citizens

- Households are spending an ever-greater proportion of their budgets on home energy and fuel bills.

- Governments are committing to supporting consumers through price controls and income transfers, but are also asking people **change their behaviour**.

- Numerous campaigns have been launched asking citizens to cut their energy usage through measures like:
  - Turning down thermostats
  - Shortening showers
  - Line-drying clothes
  - Driving less…

---

**Budgeting for Winter's Energy Bill**

Estimated single-use costs for appliances from Oct. 2022 ~ Jan. 2023

- Electricity will cost nearly 2.5 times more than it did in winter 2021, when 1 hour of electric heating cost £0.42.

- Gas prices will be more than 3 times higher than last winter, when 6 hours of central heating cost £2.63.

Sources: Uswitch; Ofgem; The Heating Hub

Note: “Electric lights” is equivalent to 10 non-energy-saving bulbs. “Gas central heating” is for a typical home size according to Ofgem.
Demand reduction campaigns launched to motivate citizens to act

Multiple campaigns launched by the Netherlands, Germany, Austria, Denmark, Switzerland, Finland and others
Well-designed campaigns can change behaviour and reduce energy use

• Getting the message right
  - Make it targeted, relatable, actionable and hit the right tone

• Getting the message across
  - Find good partners and channels to amplify your messages using visuals, a dedicated website, media, social media, and track the impact

• Combining information with behavioural insights
  - Pair your campaign with real-time feedback, relevant nudges, demand response programmes, home energy reports, and more

• Campaigns in a crisis context
  - Times of crisis demand firmer messages and collective responses
Behavioural insights can lead to significant savings

- **Real-time feedback** via smart thermostats can reduce gas consumption by 4.5% to 5%, without loss of thermal comfort.

- **Energy-saving competitions and games** can achieve savings of around 14%.

- **Regular feedback** through home energy reports have been estimated to reduce household electricity consumption by as much as 2.2%.

- **Goal setting and prompts** for demand response programmes in Australia led to savings in the range of 25-42%.

- **Change of default settings** by manufacturers can result in substantial savings as demonstrated by example of India regulating the default temperature to be 24°C.