



Ministerio de Energía
Presidencia de la Nación

BEHAVIOUR CHANGE FOR ENERGY EFFICIENCY: OPPORTUNITIES FOR INTERNATIONAL COOPERATION IN THE G20 AND BEYOND

SCOPING WORKSHOP

MEETING OUTCOMES

HOSTED BY
THE ARGENTINIAN MINISTRY
OF ENERGY (MEN),
THE INTERNATIONAL
PARTNERSHIP FOR ENERGY
EFFICIENCY COOPERATION
(IPEEC) AND
THE INTERNATIONAL ENERGY
AGENCY (IEA)

12 September 2018

1. Introduction and objectives

The Argentinian Ministry of Energy (MEN), the International Partnership for Energy Efficiency Cooperation (IPEEC) and the International Energy Agency (IEA) convened a one-day scoping workshop on ‘Behaviour Change for Energy Efficiency: Opportunities for International Cooperation in the G20 and beyond’ on 12 September 2018 in Paris, France. This event invited participants from IPEEC, IEA and G20 economies – as well as other international organisations (IOs), research organisations, and advocacy bodies working in this field, to discuss how behavioural science can strengthen energy efficiency policies and to share country-specific experiences in addressing the related challenges and solutions across economic sectors. The objectives of the workshop were to:

- Introduce behaviour change for energy efficiency, covering: i) how behaviour change theory can be used to strengthen traditional energy efficiency policies (typically but not exclusively standards and labelling schemes); and ii) new policy interventions to encourage energy efficient behaviour.
- Explore the particular opportunities and challenges faced in encouraging behaviour change across sectors and in different country contexts; and
- Identify possible topics for future collaboration as well as potential mechanisms and resources for collaboration, including the Task Groups under the G20 Energy Efficiency Leading Programme.

2. Overview

In the introductory session, delegates were reminded of the commitment made by G20 Energy Ministers to integrate behaviour change into the work conducted under the [G20 Energy Efficiency Leading Programme \(EELP\)](#) – the G20’s long-term framework for energy efficiency cooperation (see G20 Energy Ministers’ Communique [here](#)).

The morning session of the workshop focused on introducing concepts of behaviour change and showcasing examples of public and private sector programmes aimed at triggering behaviour change among energy consumers. Presenters included the governments of Japan, Ireland and Saudi Arabia, as well as research organisations and private companies including UCL, National Renewable Energy Laboratory (NREL), Oracle and Advizzo.

The afternoon session consisted of three sectoral break out discussions on buildings/appliances, industry and transport. Participants heard policy examples from each sector from the UK, Mexico and Argentina respectively. Among the topics discussed were key challenges and solutions to enhance energy efficiency through behaviour change, as well as opportunities for international cooperation activities to address countries’ needs in taking these issues forward in each sector.

In the concluding session, participants were encouraged to identify concrete activities to further explore the application of behavioural insights to energy efficiency policymaking.

3. Energy efficiency and behaviour change: Key messages from the workshop

(1) Human behaviour is crucial for scaling up energy efficiency

Humans use energy through technologies to fulfil social functions. All technologies, business models and energy policies contain a model of human behaviour. All energy programmes contain a theory of behaviour change. Addressing these implicit models of behaviour can enable policies and programmes deliver better outcomes and lower social, economic, environmental and political cost¹. Sometimes small behaviour changes can lead to large changes in energy use.

For example in Japan, the Cool Biz programme has improved energy efficiency by encouraging casual business attire, allowing workers to feel comfortable even when the room temperature is set to 28 degrees Celsius². In the transport sector, shared mobility has enabled increases in mobility while reducing energy costs, especially in developing countries.³

(2) There are myriad ways to influence human behaviour underpinned by various theoretical approaches

Broadly speaking, human behaviour can be influenced at both the individual or societal levels. Theoretical frameworks for changing the behaviour of individuals include behavioural economics and psychology. Changing individuals' behaviour requires providing them with the opportunity for change (e.g. by removing barriers to action), the motivation for change (e.g. by providing incentives or disincentives), and the capability to change (e.g. by improving individuals' access to information, knowledge and skills). Changing the social structures within which individuals are situated is the second way of changing behaviour.

Theoretical frameworks applied to achieving societal change include sociology, pedagogy and various design disciplines, amongst others. Approaches tend to be large-scale and require time, focussing on changes to an organisation or community group through education, rules and regulations or modifying the physical environment.⁴

(3) Behavioural insights can complement conventional policy instruments and approaches to improve energy efficiency

Drawing on behavioural insights to design conventional policy instruments and approaches can improve the effectiveness of interventions.

For example, integrating behavioural insights such as social norming (e.g. peer comparisons), loss aversion (people dislike losing more than they like winning) and choice architecture (help consumers make decisions by designing choices) in home energy reports, can effectively reduce residential energy consumption, as exemplified in the work of Japan's Ministry of the Environment and Ireland's Sustainable Energy Authority.⁵ Taking another example, behavioural insights indicate that people do not believe everything they are told by 'authorities'. The delivery of information could therefore be made more effective by using trusted local intermediaries and social role models instead of conventional "official channels".

(4) Digitalisation provides an opportunity to facilitate behaviour change

The “digitalisation” of everyday life, facilitated by the increasing ownership of information technology, smart phones and other smart devices, brings new opportunities to scale up behaviour change interventions. For instance, the Metropia mobility app developed by the Advanced Research Projects Agency – Energy (ARPA-E) of the U.S. Department of Energy, helps travellers to optimise the efficiency of their travel by providing information on changes in departure time, routes, vehicle passenger load, and ways to avoid unnecessary trips. Oracle Japan has utilised digital engagement, leveraging Japanese consumers’ affinity for digital communications and wide adoption of smartphones and SNS mobile apps, to send behavioural pointers to consumers through the messaging platform ‘Line’. Saudi Arabia has conducted behaviour change campaigns via various social media platforms ranging from paper mediums to online channels, among which the most effective has been mobile applications, which have reached over 169 million users.⁶

(5) There are several opportunities for international collaboration

The key opportunities for international collaboration centre on information sharing and data collection. In terms of information and experience exchange, international partnerships could facilitate cooperative studies to capture best practices and case studies on successful business models, policies and programmes. Open discussions at the international level on the failures of interventions would also be valuable, providing opportunities for reflection and learning. Regarding data collection, international collaboration could help improve the comparability of end use data gathered through trials and evaluations, allowing for better comparisons of consumers’ behaviours across different jurisdictions. Moreover, international surveys could help to understand how different contexts (socio-cultural, economic, technological, etc.) influence behaviour change for energy efficiency in different regions, which could help inform the design of replicable behaviour change policies and programmes.





Buildings and appliances

In the buildings and appliances sector, efficiency improvements could be realised through changes to energy users' behaviour in relation to **purchasing and investment decisions** (e.g. buying more energy efficient appliances, investing in building retrofits), **efficient use of products** and **switching to off-peak electricity tariffs** to curb peak demand.

The table below summarises the workshop discussion from the three perspectives.

Behaviour	Approaches to influence behaviour
Purchasing and investment decisions	<ul style="list-style-type: none"> • Simplify the design of labels. For product appliance, equipment labelling and building energy performance certificates (EPCs), rationalising the information contained in labels and certificates could help to reduce complexity and information overload. • Tailor the message to the audience - market the end product/service, not energy efficiency (e.g. there are several non-energy benefits of energy efficiency, such as health and comfort that could be focussed on). • Change framing is important. (e.g. The uptake of building efficiency grants is more successful when framed as renovation grants that increase property values rather than funding for efficiency). • Efficiently-set price incentives. Set the price at the precise point to influence purchasing decisions while minimising government expenditure. This requires in-depth understanding of target groups' responses to price. • Use trusted messengers and explore intersections with other issues to exploit energy efficiency's "multiple benefits" (e.g. banks are more trusted by consumers for delivering loans for building upgrades, so investment for energy efficiency may have a higher adoption rate if delivered by banks; The community trusts doctors to provide advice on health, therefore energy efficiency improvements may be more valued by patients as a means to achieve health if delivered by doctors).
Efficient use of products	<ul style="list-style-type: none"> • Initiate competitions (e.g. competitions among households and schools to reduce energy use through efficiency including "subversive" approaches such as competitions to find the "worse" performing appliance, etc.). • Combine policy mechanisms for increased efficacy. (e.g. combining EPCs with incentives such as financial incentives might encourage people to get EPCs).
Tariff choices	<ul style="list-style-type: none"> • Simplify the process for tariff switching. E.g., the remove arduous data entry requirements for consumers who want to switch to time of use tariffs. • Test novel ways to encourage consumers to switch tariffs. E.g., Ofgem has trialled auctions for tariffs, whereby consumers bid to pay the lowest tariff possible. This method achieved a 7-8% increase in consumers switching tariffs (vs 2% in the control group), by tapping into the "competition motive".

Opportunities for international collaboration

Information sharing is a key opportunity for international collaboration on behaviour change in buildings and appliances sector. This includes:

- Good-practices on energy performance certificate and product labelling design, particularly connecting experiences in Europe, US, Japan with emerging economies on topics such as:
 - behavioural insights for EPCs design
 - Barriers of obtaining/ renewing EPCs (e.g. transaction costs)
 - Behavioural insights to incentivise people to obtain and renew an EPC.
 Results of trials getting consumers to switch tariffs/competitions to save energy.
- Good-practices on finance/loan design for building retrofits.



Industry

Industrial energy efficiency could be improved through changes to behaviour in relation to **investment decisions** (e.g. organisations invest in cost-effective energy efficiency technologies and energy management systems)⁷ and **organisational culture** (e.g. integrating energy efficiency into corporate strategies).

The table below recaps the group discussion from these two perspectives.

Behaviour	Approaches to influence behaviour
Investment decisions	<ul style="list-style-type: none"> • Provide incentives and disincentives. Monetary incentives and disincentives mentioned including tax, subsidies and feed-in tariff rebates to companies that have implemented ISO 50001 and have demonstrated energy savings. Other non-monetary incentives included promoting commitment campaigns and award schemes (e.g. EP 100 ; CEM Energy Management Campaign and Energy Management Leadership Awards) to give high-level profile to energy efficiency within companies, including top management • Improve framing to increase interest among energy managers. Using “energy productivity” rather than “energy efficiency” as a paradigm could better link economic growth with energy consumption and be perceived more positively by top management and investors • Lead by example. Government could play a larger role to lead by example, for instance by improving procurement processes. In companies, the CEO could also lead by example by showing a commitment toward realising energy savings or improving energy productivity.
Organisational culture	<ul style="list-style-type: none"> • Sustain learning networks. The learning energy efficiency networks provide a complementary approach to the implementation of energy management systems by demonstrating the business case of energy efficiency and creating dialogue between energy managers and higher level management. Additionally, networks initiate peer reinforcement and friendly competition between energy managers and companies. • Activate the young generation. Energy efficiency could be made more exciting for young people. Younger generations could be encouraged to pursue energy management related careers by receiving greater support at the university level or within companies (e.g. Germany’s ‘Energy Scouts’ initiative). Efforts could be made to increase the number of women who are involved in energy efficiency-related professions.

Opportunities for international collaboration

Greater awareness and information sharing among key stakeholders on the benefits of energy savings and energy management systems is required in the industry sector, in particular to foster trust between different levels of management and among companies. The following activities could address these issues:

- **Improve communication and information availability by establishing an online platform.** Such a platform could provide information on additional or perceived costs of energy efficiency measures for a CEO, including perceived risk (e.g. delays in production) and payback periods as a way to assess investment risks. It could also provide information on additional or perceived benefits of energy efficiency measure, for instance ways to rethink production processes that lead to overall improvements, quality of products, and the advantages it brings for recruiting talent.
- **Encourage companies and government to join international campaigns and networks.** There are international campaigns such as Energy Management Campaign of Energy Management Working Group (EMWG) under IPEEC, Clean Energy Ministerial (CEM) and the G20. The Climate Group’s global EP100 initiative (EP100) can also drive visibility of energy smart companies.



Transport

In the transport sector, efficiency improvements could be achieved through changes in users' behaviours in relation to **using current vehicles more efficiently, purchasing more efficient vehicles, and choosing more efficient transportation modes (or traveling less)**. The table below summarises group discussion on these three perspectives among two transport domains: **frequent personal transportation** (e.g. personal car use, buses, walking) and **freight** (e.g. moving goods, rather than people). Behaviour change of infrequent personal transportation (e.g. airplanes, boats, trains) was not discussed due to time constraints.

Frequent personal transportation	
Using current vehicles more efficiently	<ul style="list-style-type: none"> • Provide Eco-driving programmes that teach efficient driving techniques and vehicle maintenance tips. These could be integrated into current drivers' license education programs or offered through employers. • Improve Information availability while driving (e.g. provide users with real-time feedback on the fuel consumption and GHG emissions on the vehicle dashboard).
Purchasing more efficient vehicles	<ul style="list-style-type: none"> • Provide appropriate incentives (e.g. Rebate/ Fee scheme in France, cheap parking for efficient vehicles, and supporting infrastructure). • Improve Information availability through labelling and improved metrics (e.g. France has a vehicle pollution sticker scheme to rate the pollution level, which is independent from the Energy Labels with different format and colour codes; or provide an online vehicle selection tool that include information on fuel spending projections). • Upgrade purchasing experience to provide vehicle buyers an emotional connection to fuel efficient vehicles (e.g. provide free trial service for EVs).
Choosing more efficient transportation modes	<ul style="list-style-type: none"> • Encourage car sharing by overcoming the barriers of pooling (e.g. creating an app that provides co-rider ratings and uses "safety" as a key message). • Link efficient transport use with employees' promotion (e.g. performance rating includes "energy efficiency" and employees lose points if they drive with their own cars; this could be added on to existing employee evaluation programs that are available in some countries). • Organise campaigns to promote events (e.g. "One day per week as alternative transportation mode day").
Freight	
Using current vehicles more efficiently	<ul style="list-style-type: none"> • Initiate intra/intercompany competition to award the most efficient driver. • Introduce eco-driver training coupled with incentives (e.g. driver gets the fuel savings as a bonus). • Encourage shipping sharing (e.g. Develop bidding platform to rent free space on trucks so that they are more likely to travel at optimal efficiency; create rating function on the platform to reward drivers for being reliable). • Enforce regulatory frameworks (e.g. Minimum Energy Performance Standards (MEPS) and emission standards for fuel content). • Introduce changes to shopping websites to reduce next-day shipping (e.g. avoid one-day shipping from being default setting; use prompts to inform consumers about emissions associated with shipping times; use yellow button for one-day shipping/ green button for multiday shipping).
Purchasing more efficient vehicles	<ul style="list-style-type: none"> • Provide incentives (e.g. subsidies and tax) to freight companies to adopt fuel efficiency vehicle upgrades.
Choosing more efficient transportation modes	<ul style="list-style-type: none"> • Encourage new shipping methods (e.g. DHL uses human electric hybrid delivery vehicles in cities to reduce traffic/parking congestion).

Opportunities for international collaboration

- **Develop common standards and international network.** For example, promoting regional standardised charging infrastructure for electric vehicles to allow users to charge their vehicles in neighbouring countries could encourage purchases of electric vehicles.
- **Information sharing. Sharing successful business models** (e.g. car sharing system) can help companies to innovate. In addition, technology sharing (e.g. share the technology of in-car feedback system) could trigger larger scale behaviour change in the transport sector by allowing for wider deployment of such technologies and market transformation.

Next steps

Workshop participants widely recognised the need to address the human dimension in policy design and implementation and to encourage behaviour change to enhance energy efficiency. There was broad agreement that more action is required at the national and international levels to take this topic further.

As next steps, the G20, [IPEEC](#) and the IEA will explore how to continue exploring the themes and issues highlighted during the workshop. IPEEC with the support of the **Argentinian G20 Presidency** will explore how to integrate behaviour change into the existing G20 Task Groups, such as [Improving Policies through Energy Efficiency Indicators Task Group \(IPEEI\)](#) [Transport Task Group \(TTG\)](#) , and [Energy Management Action Network for Industrial Efficiency \(EMAK\)](#) to improve energy efficiency monitoring methods, freight efficiency and energy efficiency in industry. The **IPEEC Secretariat** will continue to support the current and upcoming G20 presidencies in maintaining the visibility of behaviour change in the field of energy efficiency, including under Japan's G20 presidency in 2019.

Building on the workshop, the [IEA Demand Side Management Technology Collaboration Program \(DSM TCP\)](#) is developing a new task, led by Ireland, bringing together behavioural insights teams from around the world to share information on a range of topics. The DSM TCP would welcome other countries' participation and a workshop will be held soon (late 2018 or early 2019) to develop the task further. The IEA Secretariat is also supporting the development of the task by exploring the potential for capacity building on behavioural insights in emerging economies.

Endnotes

¹ Presentation by Prof. David Shipworth, [Behaviour and Energy Efficiency: Systems tell people how to act - people tell systems how to change](#)

² Presentation of Mr Masaomi Koyama and presentation of Mr Yoshihiro Mizutani and Mr Ken Haig, [Behavioural Insights & Climate Change Countermeasures](#)

³ Presentation of Mr Andrew Duvall, [Behaviour Change and Transportation Research](#)

⁴ Ibid

⁵ Presentation of Mr Karl Purcell, [Applying Behavioural Science at SEAI: What We've Learnt so Far...](#)

⁶ Presentation of Mr Mohammed Alkulaib, [Saudi Energy Efficiency Program](#)

⁷ The energy management systems (EnMs) is a system that can enable users to discover, analyse, and share data about how energy is consumed, and the potential to become more efficient. It helps break the organization's cultural barrier, create a community of implementation that involves people and develop a growth and accomplishment mind set in terms of energy efficiency and best practices.

Annex 1: Workshop Agenda

08:30 – 09:00 Arrival and registration		
09:00 - 09:45	Introductions	<p>Ms Kaili Levesque, <i>Chair of the IPEEC Executive Committee</i></p> <p>Mr Tom Bastin, <i>Chair of the IEA Energy Efficiency Working Party</i></p> <p>Ms Gudrun Maass, <i>Chair of the IEA End-Use Working Party</i></p> <p>Ms Maria Eugenia Bartolomei, <i>Ministry of Energy, Argentina</i></p> <p>Mr Masaomi Koyama, <i>Ministry of Economy, Trade and Industry, Japan</i></p>
09:45 - 10:30	<p>What is behaviour change in the field of energy efficiency and why is it important?</p> <p><i>How can behavioural insights be harnessed to tweak traditional energy efficiency policies?</i></p>	<p>Prof. David Shipworth, <i>UCL Energy Institute and Vice-Chair IEA Demand Side Management Technology Collaboration Programme</i></p>
10:30 - 11:15	<p>Country and private sector experiences</p> <p><i>What policies and programmes can affect and sustain long-term behavioural changes?</i></p> <p><i>How have governments organised behavioural science teams to achieve more effective policy implementation?</i></p> <p><i>How are businesses harnessing behavioural insights both to improve their own efficiency and sell energy efficiency services?</i></p>	<p>Mr Yoshihiro Mizutani, <i>Director at Ministry of the Environment, Japan</i></p> <p>Mr Ken Haig, <i>Director of Market Development & Regulatory Affairs, Oracle Utilities, Japan</i></p> <p>Mr Sean Layerle, <i>Chief Product Officer, Advizzo</i></p>
11:15 – 11:30 Coffee break		
11:30 - 13:00	<p>Country and private sector experiences (continued)</p>	<p>Mr Karl Purcell, <i>Behavioural Insights Unit, Sustainable Energy Authority of Ireland, Ireland</i></p> <p>Mr Andrew Duvall, <i>Transportation Behaviour Analyst, National Renewable Energy Laboratory (NREL), United States</i></p> <p>Mr Fareed Al Asaly, <i>Ministry of Energy, Industry and Mineral Resources, Kingdom of Saudi Arabia</i></p> <p>Mr Mohammed Alkulaib, <i>Saudi Energy Efficiency Program, Ministry of Energy, Industry and Mineral Resources of Saudi Arabia</i></p>
13:00 – 14:00 Lunch		
14:00 - 14:15	<p>Introduction to the breakout session and plenary</p> <p><i>Ms Kaili Levesque, Chair of the IPEEC Executive Committee</i></p>	

14:15	Sectoral break-out groups. Discussions led by expert moderator.	
-	- 10 min presentation on specific country experience	
16:15	- Group discussions to answer set questions for each sector	
	<ul style="list-style-type: none"> ○ <i>How have behavioural insights shaped efficiency policy in this sector? How was knowledge from the behavioural sciences drawn on to design specific policies and programmes?</i> ○ <i>What have been the key outcomes and impacts from these policies and programmes? How were these results measured?</i> ○ <i>What has been learned from trying to influence energy users' behaviour in this sector? What challenges exist that are specific to this sector? What has worked? What hasn't worked? What would be useful to share with other countries?</i> ○ <i>Based on your experience, on which issues could countries collaborate and what benefits could collaboration have for achieving behaviour change in this sector?</i> 	
	Buildings / Appliances	<p>Moderator: Prof. Stephane Labranche, <i>Sciences Po Grenoble, France</i></p> <p>Country presentation: Mr Gervase Poulden, <i>Department for Business, Energy and Industry Strategy (BEIS), UK</i></p>
	Industry	<p>Moderator: Mr Martin Bornholdt, <i>Managing Director, DENEFF, Germany</i></p> <p>Country presentation: Mr Nelson Mojarro, <i>Representative of the Hydrocarbons Fund to Europe</i> and Ms Stephanie Ruiz López, <i>National Commission for Efficient Energy Use (CONUEE), Mexico</i></p>
	Transport	<p>Moderator: Dr Reuven Sussman, <i>American Council for an Energy-Efficient Economy (ACEEE), United States</i></p> <p>Country presentation: Ms Maria Eugenia Bartolomei, <i>MEN, Argentina</i></p>
16:15 - 16:20 Coffee break		
16:20	Reporting session from break-out groups	
-	Ms Kaili Levesque to invite moderators of each break-out group to present the summary of discussion outcomes to the whole group.	
16:45		
16:45	Recap in plenary and discussion on next step	
-	Ms Kaili Levesque to provide impressions	
17:00	Ms Maria Eugenia Bartolomei, Argentina, and Mr Masaomi Koyama, Japan, to wrap-up and outline potential next steps.	
17:00 Close		

Annex 2: Presentations with links

Morning Session

Introductory Presentation

By Mr Masaomi Koyama, *Ministry of Economy, Trade and Industry, Japan*

What is behaviour change in the field of energy efficiency and why is it important?

Behaviour and Energy Efficiency: Systems tell people how to act - people tell systems how to change

By Prof. David Shipworth, *UCL Energy Institute and Vice-Chair IEA Demand Side Management Technology Collaboration Programme*

Country and private sector experiences

Behavioural Insights & Climate Change Countermeasures

By Mr Yoshihiro Mizutani, *Director at Ministry of the Environment, Japan*, and Mr Ken Haig, *Director of Market Development & Regulatory Affairs, Oracle Utilities, Japan*

Continuous innovation in Behavioural Programs

By Mr Sean Layerle, *Chief Product Officer, Advizzo*

Applying Behavioural Science at SEAI: What We've Learnt so Far...

By Mr Karl Purcell, *Behavioural Insights Unit, Sustainable Energy Authority of Ireland, Ireland*

Behaviour Change and Transportation Research

By Mr Andrew Duvall, *Transportation Behaviour Analyst, National Renewable Energy Laboratory (NREL), United States*

Saudi Energy Efficiency Program

By Mr Fareed Al Asaly, *Ministry of Energy, Industry and Mineral Resources, Kingdom of Saudi Arabia*

Afternoon Sessions

Buildings and Appliances

Behavioural Insights in Residential Energy Efficiency – The French Experience

By Prof. Stephane Labranche, *Sciences Po Grenoble, France*

Country presentation: Behavioural Insights in Residential Energy Efficiency – The UK Experience

By Mr Gervase Poulden, *Department for Business, Energy and Industry Strategy (BEIS), UK*

Industry

Country presentation: Behaviour Change for Energy Efficiency in the Industry in Mexico, PRONASGEN

By Mr Nelson Mojarro, *Representative of the Hydrocarbons Fund to Europe* and Ms Stephanie Ruiz López, *National Commission for Efficient Energy Use (CONUEE), Mexico*

Transportation

Transportation workshop introduction

By Dr Reuven Sussman, *American Council for an Energy-Efficient Economy (ACEEE), United States*

Country presentation: Argentina's eco-driving programmes

By Ms Maria Eugenia Bartolomei, *MEN, Argentina*