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DSM Spotlight

The Newsletter of the International Energy Agency Demand-Side Management Programme

ieadsm energy efficiency

U.S. What Are the Actual Costs of Saving Energy?

Demand-side energy management policies and programs, particularly those focused on end-use energy efficiency that is delivered through electric and gas utilities, originated in the 1970s and have been widely adopted in the United States and in other OECD countries.

In recent years, interest in demand-side approaches in the U.S. has increased, both for cost effectively meeting electricity and natural gas needs and for reducing carbon dioxide emissions from the electric power sector. For example, six U.S. states have mandates to acquire all cost-effective energy efficiency in electric utility resource planning, and 15 states have enacted long-term, binding energy savings targets to be achieved through end-use efficiency delivered through electric utilities. Many more states assigned savings targets specific to each state-regulated efficiency program administrator. In 2011, U.S. energy efficiency program administrators who manage utility customer-funded efficiency programs spent about $5.4 billion on electric and gas energy efficiency programs, with spending projected to possibly more than double by 2025.

These utility customer-funded efficiency programs are overseen by state electricity and gas regulators and administered by more than 100 different entities (utilities, state energy agencies, non-profit and for-profit third parties). Policymakers, state utility regulators, administrators and implementers rely on information about lifetime costs and savings of these utility customer-funded efficiency programs to assess efficiency's potential, to design and implement programs in a cost-effective manner

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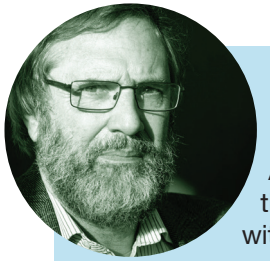
Note from the Chairman



Silver Bullet

As kids, many of us were in awe of the Lone Ranger. Hard to go wrong with cartoons and a TV series about a masked do-good cowboy. It took me, as a small Dutch boy, years before I discovered his first name wasn't "Lone", nor his family name "Ranger". The Dutch translators never bothered to do something with the name, and I gladly accepted "Lone" as the role model when we were playing cowboys and Native Americans.

The attraction of Lone was that he never killed anyone, and that he solved everything with his silver bullets.

This childhood memory comes to mind because I've been observing that more and more people are looking for a silver bullet to a solve problem. Perhaps as a reaction to an ever more complicated world.

In order to please politicians, policymakers tend to drift away from (international) collaboration and

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or to improve program cost effectiveness. Given both the current scope of efficiency programs and the expected growth in U.S. funding for existing and new programs, accurate assessments of program costs and impacts are an increasingly U.S. important policy and regulatory priority.

More broadly, knowing the costs of energy efficiency is important, for example, in comprehensive energy policy analysis and planning when decision-makers require estimates of all costs associated with all potential supply-side (i.e., generation) and demand-side resource options, such as in an integrated resource planning or similar process. Policymakers need to know where utility customer dollars are most effectively spent to satisfy customer energy needs and other objectives.

However, while analysis of both the energy-saving impacts and the costs of efficiency has been ongoing since programs of this type first appeared in the 1970s, it remains challenging and incomplete. The most important reason is that the data requirements for rigorous cost assessment are considerable and difficult to meet in practice.

The U.S. Department of Energy several years ago chose to fund Lawrence Berkeley National Laboratory (LBNL) to develop the U.S's most extensive database that can be used to provide more precise and comprehensive answers on the actual costs of saved energy. LBNL thus created the Demand-Side Management Program Impacts Database, which contains information on the results of electric and gas utility-funded end-use energy efficiency programs submitted by more than 100 efficiency program administrators to state regulators. The program database, for which analysis is completed and reported in this article, includes cost and energy savings data on more than 1,700 unique programs over one or more program years between 2009 and 2013, for a total of more than 6,000 program-years of data from 36 U.S. states. LBNL constructed the most comprehensive estimates to date in the U.S. of the full cost of saving energy through efficiency programs that are funded by customers of investor-owned electric utilities.

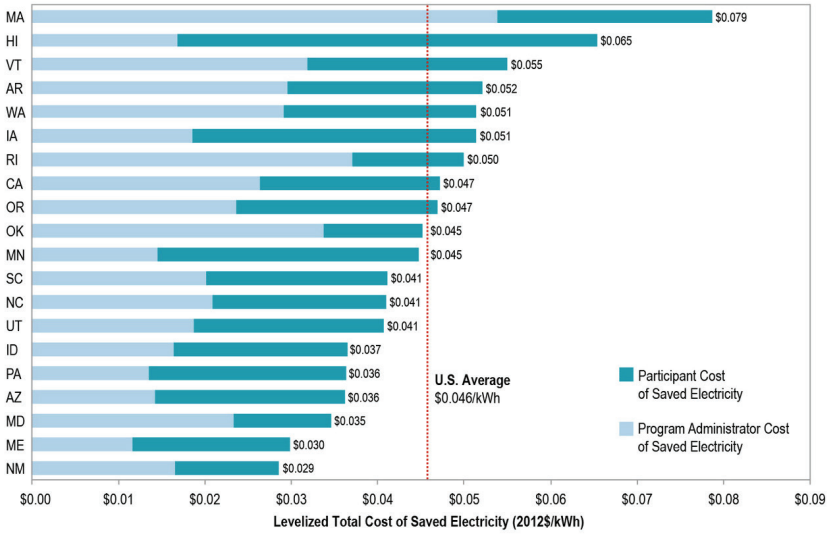
So What Are the Actual Costs of Saving Energy?

LBNL published the "The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs: Estimates at the National, State, Sector and Program Level" in April 2015. This report describes an analysis of the costs and impacts of U.S. efficiency programs using a subset of the LBNL database for which information is most complete, corresponding to 2,100 program years across 20 states. We account for energy-saving investments made by efficiency program administrators and by program participants, thus giving the *total* cost of saved energy,[1] a metric that resource planners, regulators and stakeholders can use for assessing the relative costs among electric energy efficiency programs and between efficiency and energy supply (generation) investments.

LBNL's estimate of the savings-weighted average cost of saved electricity was $0.046 for 20 states, which compares favorably with energy supply costs and retail rates. For the residential sector, the average total cost of saved electricity on a savings-weighted basis was $0.030 per kWh, for the subset of programs with claimed savings. Residential product rebate programs—especially lighting programs with an average total cost of $0.018 per kWh—were a primary driver of these results. If residential lighting-only programs were excluded to test the effect on the rest of the portfolio, the savings-weighted average total cost would have been $0.055 per kWh in the residential sector (72% higher) and

Total Cost of Saved Energy by State - 2009 to 2013

There is a large variability in the relationship of administration costs to participatant costs, as well as total costs, from state to state



Source: LBNL DSM Program Database

Footnote: Values in this figure are based on the 2009-2013 data in the LBNL DSM Program Impacts Database. CSE values are for program administrator costs are based on gross savings. Savings are levelized at a 6% real discount rate. The savings-weighted average CSE is calculated using all savings and expenditures at the level of analysis. The inter-quartile range and median CSE values are calculated for each program type.

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$0.054 per kWh for all sectors (18% higher) for the programs in our dataset. These results illustrate the prominent role that residential lighting programs have played in utility efficiency activities through 2013.

For the non-residential sector, the savings-weighted, average total cost of saved electricity was $0.053 per kWh, for programs with claimed savings. Prescriptive commercial and industrial rebate programs ($0.045/kWh) and custom commercial and industrial rebate programs ($0.052/kWh) account for more than 60% of the savings in the non-residential sector.

The graph on page 2 shows how the total costs, as well as administration and participant costs, vary among the 20 states in the study.

Hawaii and Massachusetts are at the upper tier for average cost of saved electricity values in this study. There are reasons for that. Retail electricity rates are above the national average in both states. Because of the higher rates, participating customers in Hawaii, with the highest retail electricity rates in the nation, are contributing a larger share of total costs than in most states. For Massachusetts, program administrators have implemented efficiency programs for more than 25 years, capturing much of the lowest-cost technical opportunities. Massachusetts also has a legislative mandate to pursue all cost-effective energy efficiency.

The LBNL study shows that efficiency can be cost competitive with supply alternatives and often cheaper. Moreover, comparison of the program administrator cost of saved energy with the total cost of saved energy can indicate the degree to which program administrator spending can leverage investment by participants. The relative distribution of costs between the program and its participants can be an indicator of barriers to investment in efficiency and suggest the balance of societal interest versus private interest in the benefits of saving energy.

How Have Energy Savings Costs Changed Over Time?

A follow-on study by LBNL, issued in January 2017, looked for any trends over the four years of the 2009-2013 data in their database. That study did find an increase in costs, particularly among experienced efficiency programs that had already acquired lower-cost efficiency measures, and thus had to search for more expensive efficiency measures. However, the upward cost trend still shows that energy efficiency, at least in the U.S., can often be the cheapest energy resource.

A technical brief of the study, Trends in the Program Administrator Cost of Saving Electricity for Utility Customer-Funded Energy Efficiency Programs, is available at https://emp.lbl.gov/sites/all/files/lbnl-1007009.pdf, with the full report plus presentation at https://emp.lbl.gov/publications/trends-program-administrator-cost/. The LBNL database has expanded to include newly available data from 2014-2015, with expansion to 45 U.S. states. Analysis of that new data, with corresponding reports, is underway.

This article was contributed by Larry Mansueti of the U.S. Department of Energy and the U.S. representative on IEA DSM Executive Committee. The article is adapted from and contains excerpts from the two reports cited, "The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs: Estimates at the National, State, Sector and Program Level" and "Trends in the Program Administrator Cost of Saving Electricity for Utility Customer-Funded Energy Efficiency Programs".

1 Often in the U.S. only *program administrator* costs of saved energy are used as a performance metric. These costs include the cost of designing and administering the programs, identifying energy saving measures for customers, promoting measures, providing any money incentives to customers and market allies (such as vendors that sell efficiency products) and verifying the savings, among other expenses. *Participant* costs are the costs, net of any money incentive offered by the efficiency program, that is actually paid by the customer to buy (and install) the efficiency measure. Using only the program administrator costs of saved energy has been subject to the criticism that it underestimates the full costs of energy efficiency. The criticism can be addressed by adding together the *program administrator* and *participant* costs, which is the total cost of saved energy metric.

IEA Turns Up the Heat

2nd IEA Global Conference on Energy Efficiency

The IEA arranged what they called a "high-level" meeting on energy efficiency in Paris on June 29th. The conference was a parade of dignitaries that often used the standard rhetoric, that we all know too well, about the importance of energy efficiency as being cheap, abundant and environmentally friendly, but see too little of in everyday practice. The fact that there was such a parade, however, could be useful for the future as it is always more difficult for a minister to go back on promises made publically in front of his peers. The parade at the conference was also interesting because of its comprehensiveness with ministers from such diverse countries as the UAE, Morocco and Ireland.

The conference might also be seen as a sort of dress rehearsal for the IEA's upcoming Energy Efficiency Market Report 2017 that will be released in early October. But the ambition goes further as the IEA recently announced its intention to put more focus on energy efficiency and that they should create a global exchange hub for energy efficiency.

The head of the IEA, Fatih Birol, opened the conference by paying tribute to the Technology Collaboration Programmes, TCPs, by reminding the delegates that "Through the Technology Collaboration Programmes, the IEA oversees a network of 40 international programs that bring together 6,000 technology experts from 53 countries, key companies, and top research institutions to accelerate energy technology innovation around the world. These programmes span a full range of energy technologies, including electric vehicles, CCS, smart grids, bioenergy and energy efficiency." And, as you are certainly aware, the DSM TCP is one of those programmes.

A Conference with Substance

We heard brilliant contributions from our old DSM partners from India, Ajay Mathur and Saurabh Kumar. Both of them are scheduled for DSM University webinars in September and October, respectively. Saurabh Kumar highlighted the success of the lighting programmes that his company, Energy Efficiency Services Limited (EESL), is running and that have reduced the price of LEDs by almost 90%! Ajay Mathur, who is now running the Indian think tank, The Energy and Resources Institute (TERI), talked about, among other things, the innovative PAT-programme (Perform-Achieve-Trade) in India, which will also be highlighted in the coming IEA Energy Efficiency Market Report.

Other important parts in the conference related to DSM were:

- Standards, where it is obvious that the policies to "benchmark" performance is important to secure a minimum performance of appliances and services, but also that a top standard could be a useful target to drive market development. The DSM TCP once had this ambition and it could be time to come back to this issue.
- Capacity building is of great importance. The DSM University could play a bigger role to support this.
- Multiple benefits were mentioned over and over again. Perhaps the DSM TCP will again explore new work in this area to analytically deal with these values.
- The future energy system will most probably make Prosumers of some of today's Consumers. The DSM University tackled one aspect of this in the webinar on peer-to-peer energy trading using blockchains.

At the start of the conference, there was an engaging discussion on technology versus regulations versus people. The leader of our Task 25 on Business Models for a more effective market uptake of DSM energy services, Ruth Mourik, was selected to make the case for "people". She must of done a brilliant job because results of the voting that followed had the "people" winning by a big margin over technology and regulations!

This article was contributed by Hans Nilsson, IEA DSM TCP Advisor, nosslinh@telia.com.

Task 24

Published in Special Issue on 'Storytelling and Narratives in Energy and Climate Change Research

Our IEA DSM Task 24 Operating Agent, Dr Sea Rotmann, helped co-edit a Special Issue on storytelling in the journal, Energy Research and Social Sciences (ERSS), together with Drs Mithra Moezzi and Kathryn Janda. This Special Issue, titled 'Storytelling and narratives in energy and climate change research' is the largest ERSS Special Issue to date with a grand total of 34 papers.

Included in this issue is our IEA DSM Task 24 paper called '"Once upon a time..." Eliciting energy and behaviour change stories using a fairy tale story spine'. It outlines the process of using a story spine, based on the commonly-known "Once upon a time..." fairy tale format, during participatory Task 24 workshops. Over 160 stories were collected by Behaviour Changers from many sectors, all over the world. This paper, however, focuses not so much on the participants (the storytellers), or the products (the stories), but the process (storytelling) and its usefulness in promoting empathy and engagement, fostering multi-stakeholder collaborations, and helping develop better interventions to change citizen energy-use behaviour. A more comprehensive 'A to Z of storytelling' report will be published later in the year as part of the Task 24 Subtask 8 Toolbox for Behaviour Changers.

In addition, Dr Rotmann co-authored the review article that serves as an introduction to the Special Issue with Drs Moezzi and Janda. It is titled 'Using stories, narratives, and storytelling in energy and climate change research' and outlines the Special Issue themes by providing some definitions and forms of storytelling, the folkloristic perspective, and insights into storytelling and the social sciences as well as in previous energy and climate change research. It introduces the Special Issue papers, broken into three major subheadings: stories as data, stories as inquiry and stories as process.

Twelve papers focus mainly on some aspect of energy supply, including stories from, and media representations of, people who live near or make their living from fossil fuels (seven papers); non-fossil fuels and/or renewables (three papers); and the electricity grid (two papers). There are ten papers on energy demand, including nine papers focused on buildings (eight with a residential focus) and one on personal mobility. There are three papers that consider elements of both energy supply and demand, and there are five papers that focus more directly on climate change than energy. There are also three papers that are broadly pro-environmental without being directly about either energy or climate change — one on the circular economy, one on Native American perspectives relating to sustainable design, and a methodological paper about researching pro-environmental behaviours.

The geography covers North America, the United Kingdom, Denmark, Sweden, Brazil, Japan, the 'Global South', and other locales, including international forums more generally. The review article concludes with insights and the three major traits that speak for the usefulness of storytelling in energy and climate change research: stories provide us with a different type of evidence, a different perspective and a different set of tools.

The 34 papers published in the Special Issue can be found here. The editors created this collection with the goal of providing structure and inspiration for academics, policy makers, and energy technology and services providers to consider how best to use stories and storytelling in their work. Although stories are neither benign nor neutral, Moezzi, Janda and Rotmann argue in this Special Issue that they are an important source of information as well as a useful process of communication and engagement. Storytelling is, after all, the longest and most well-known communication tool of human civilisation, something we'd do well to remember when facts and figures fail to create the urgent change tour world needs.

For more information on this Special Issue, or how to use storytelling in energy research, please contact IEA DSM Task 24 Operating Agent, Dr Sea Rotmann at drsea@orcon.net.nz.

DSMUNIVERSITY

This learning platform platform, jointly run by the IEA DSM Technology Collaboration Programme (DSM TCP) and Leonardo ENERGY, uses webinars to engage DSM and Energy Efficiency professionals in current topics of the day. The university has held over 30 webinars, all of which are posted online and can be found on the DSM TCP and Leonardo ENERGY websites and on YouTube.

After a short hiatus during the third quarter of 2017, the webinar series is back on.

We hope you will join us for one, if not all, of the upcoming webinars.

Innovative Business Models for Scaling up Energy Efficiency

Speaker: Saurabh Kumar, *Managing Director of Energy Efficiency Services Limited (EESL)*

Date: September 28

PAT – An Innovative Programme to Promote Industrial Energy Efficiency

Speaker: Ajay Mathur, *Director General of The Energy and Resources Institute (TERI); Member of the Indian Prime Minister's Council on Climate Change; co-chair of the Energy Transitions Commission*

Date: October 20

Building Deep Energy Retrofit: Using Dynamic Cash Flow Analysis and Multiple Benefits to Convince Investors

Speaker: Jan Bleyl, *Task 16: Innovative Energy Services Operating Agent, working to advance the know how and market development of performance-based energy services.*

Date: November 23

How to design, implement and evaluate behaviour change interventions in a sector that is often overlooked but has huge energy efficiency potentials: hospitals

Speakers:

Sea Rotmann, *IEA DSM Task 24: Behaviour Change in DSM: Helping the Behaviour Changers' Operating Agent, over 300 experts from 20+ countries are working to translate behavioural theory into actionable practice in field research pilots all over the world.*

Reuven Sussman, *Senior Manager of the Behavior and Human Dimensions of Energy Efficiency program at the American Council for an Energy-Efficient Economy (ACEEE) in Washington, D.C., co-chair of the annual Behavior, Energy and Climate Change conference (BECC), member of the editorial board of the Journal of Environmental Psychology, and Secretary of the Environmental Psychology division of the American Psychological Association.*

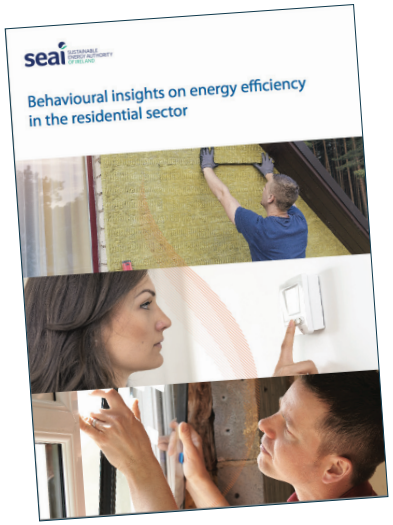
Kady Cowan, *Director of Environmental Sustainability Solutions at Carolinas Healthcare System in Charlotte, North Carolina.*

Date: December 21

Ireland Launches Report

Behavioural insights on energy efficiency in the residential sector

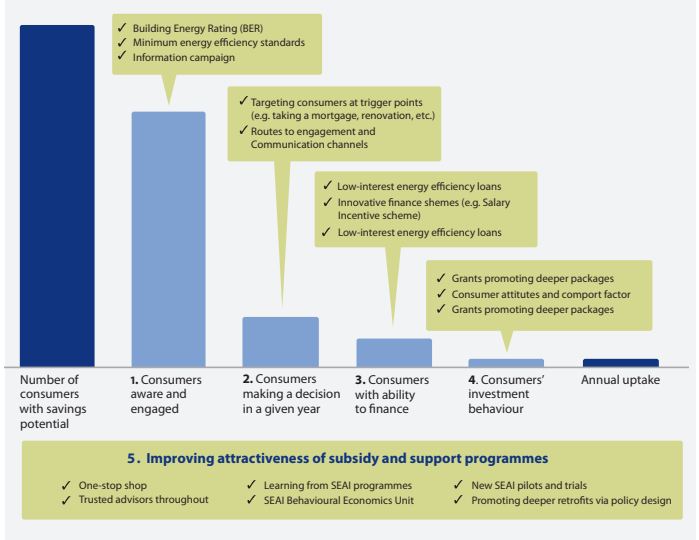
At the last IEA DSM 'National Day' in Dublin, the Sustainable Energy Authority of Ireland (SEAI) launched a report that brings together research findings and knowledge gathered by SEAI over the last six years on how to best stimulate home energy efficiency upgrades.



The focus of the report centres on consumer behaviour and decision making in the context of energy efficiency in the home. Research is gathered from consumer surveys, focus groups, design thinking exercises, pilots and trials, and data analysis. Much work has been done with consumers themselves, to ensure that we understand their motivations and barriers, and what their support needs are when seeking to upgrade the energy efficiency of their homes.

The report explores what has been learned about householders' attitudes to improving the energy efficiency of their homes, and considers how government and its agencies can best encourage and support more households to upgrade. Various models of financing and the design of support schemes are also examined to consider what the most attractive design mix is for consumers. The big questions are explored, for example, how do we encourage more people to deliver deeper energy retrofits, and in doing so, maximise comfort, energy savings and help provide health and wellbeing benefits? To shed light on these questions, data has been compiled in the report from a range of sources including commissioned studies, funded research, pilots and trials conducted by SEAI, and also from SEAI experience gained via delivery of programmes in the residential sector over the last 10 years.

The key findings are useful to policymakers, programme delivery agents, intermediaries looking to drive and deliver household upgrades, and anyone else seeking to support the delivery of improved energy efficiency in the residential sector. SEAI's detailed analysis of the potential for energy efficiency improvements across all major energy-consuming sectors in Ireland identified that energy savings potential is largest in the residential buildings sector (13.5 TWh); however, much of the available energy saving potential remains untapped due



Consumer decision-making process can be influenced by policies and measures.

to a number of key barriers facing consumers. These barriers to the uptake of energy efficiency measures can be presented within a conceptual framework for the consumer decision-making process as presented above.

Both this process, and key SEAI findings that inform the evolution of policies and measures to drive increased uptake of home energy efficiency retrofits, are summarised within the framework. At each stage in the decision making process, there are key considerations and 'touch points' that are critical in supporting

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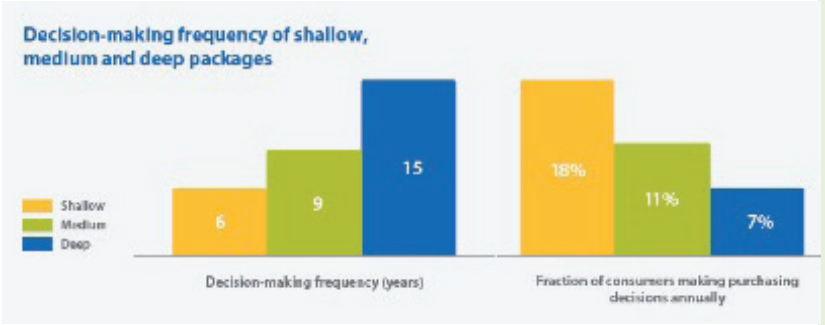
Ireland report – from page 7

householders to make a positive decision for energy efficiency improvements in their homes.



Opportunities to influence consumers to undertake a deep retrofit are estimated to occur only every 15 years.

A consumer decision to invest in a home upgrade is influenced by and dependent upon on a combination of enablers. These are understood to be awareness and buy-in; decision factor and frequency; ability to finance; investment behaviour and motivation. For a given consumer group, a fraction will be already aware and engaged in the idea of making an energy efficiency improvement. A sub-set of this group will make a decision in a given year – more often for room by room upgrades, and less often for major renovations. Fewer still will have the ability to finance a major upgrade, and within that group some will choose energy efficiency and others an alternative investment, like a kitchen upgrade or a holiday for example. Supporting consumers through this process is critical to drive uptake of energy efficiency improvements that will provide benefits in terms of improved comfort, reduced energy bills and healthier, more valuable homes.

The government also has drivers to deliver improved energy efficiency across the nation's housing stock. Ireland is subject to binding EU targets to reduce greenhouse gas emissions in non-Emissions Trading Scheme sectors by 2020 – including in transport, agriculture and buildings sectors. Transport and agriculture sectors have proven difficult to achieve cost-effective reductions. However, an improved building stock will contribute to reducing national emissions and also provide health and wellbeing gains while reducing pressure on public health resources. The wider economy can gain too from the economic activity associated with delivering upgrades and from increased consumer spending following reduced energy bills.

Upgrading the national housing stock is a huge challenge. It is estimated that over 1 million homes need improving - many need deep interventions to make them energy efficient. To date, over 350,000 households have made an upgrade with government support through SEAI grants. It is intended that through greater understanding of consumer behaviour and decision making, we can drive the breadth and depth of home upgrades across the country. Below is a summary of key insights gained through studies, consumer surveys, and data analysis conducted by SEAI over the last 6 years that will contribute to this aim.

Recognising the importance of consumer behaviour, SEAI is establishing a Behavioural Economics Unit whose overarching ambition is to help citizens and businesses to avail of the benefits of clean energy through the use of behavioural insights and rigorous evaluation.

Selected key findings from the report

The following findings, selected from a longer list in the report, are examples of findings that will include future policy development in Ireland – and have potential in other jurisdictions.

Consumers' awareness and engagement

- Majority of owner-occupiers in Ireland consider energy efficiency options, but consumers have different drivers for investment in energy efficiency (i.e. aspirational, comfort/value seekers and cost-driven).
- Advice to householders need to come from a trusted source – understanding who is trusted is important.
- SEAI is currently working to extend the value of the Building Energy Rating (or BER) data set by adding a spatial field to all BER records to enable targeting of specific areas and certain demographics.

Decision-making frequency and trigger points

- It is very important to target consumers at their trigger points to convince them to make a positive decision regarding energy efficiency, especially considering how few consumers are likely to make decisions regarding major home improvements between now and 2030.
- Decision making frequencies for shallow medium and deep home energy efficiency improvement upgrades are estimated at around 6, 9 and 15 years, respectively
- This suggests that 18 in every 100 homes make a decision on a shallow retrofit every year, 11 in every 100 for medium and only 7 in every 100 for a deep renovation. Ensuring these are positive decisions for energy efficiency improvements is key.

Availability of finance

- Over 70% of householders who responded to a recent survey identified "not having sufficient funds" as the most relevant barrier to action.
- A recent modelling exercise shows that introducing low-interest rate energy efficiency loans combined with grants is an attractive option for Ireland because it is expected to improve the efficacy of existing grant programmes.
- The combined policy measures (grants and loans) promotes deeper retrofits with a minor increase in funding to buy-down interest rate.

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Ireland report – from page 8

Understanding consumers' investment behaviour

- A recent survey in Ireland has gathered quantitative data on consumer attitudes – for instance, the study quantified that grants have more than 30% additional emotional impact (i.e. 1 Euro grant corresponds to 1.3 Euro in consumers' minds).
- Consumers do not make purchasing decisions purely on costs and energy savings – the majority of consumers also consider the impact of energy efficiency investment on their comfort level.

Improving attractiveness of subsidy and support programmes

- The great majority of participant householders across all SEAI pilots and trials identified a trusted source as the key referral.
- A review of relevant subsidy schemes in other Member States have identified that energy consultants (who are trained and subsidised by the government) can increase awareness and confidence of government schemes.
- Skilled workforce for deep retrofit is essential for confidence and quality.

There are many more insights in the full report, click here to downloaded.

This article was contributed by Jim Scheer, Manager, Energy Modelling Group at SEAI, jim.scheer@seai.ie.

Note from the Chairman - from page 1

turn to the Lone Consultant, with his nice suit and tie and a silver colored tablet and smartphone.

Like rangers in law enforcement, consultants have a role in problem solving. But we need more then shooting bullets and arrows if we want to solve today's energy and environmental problems.

It's the unique proposition of the IEA's Technology Collaboration Programmes, or TCPs, that allows us to define research in "IEA" areas and then work on it with international experts and their networks.

In the case of the DSM TCP, we've proven that energy efficiency will never ever be a silver bullet topic. Often there is technology involved. Technology that although you have to be really on top of it to notice continues to develop faster then ever before. (If you question my statement just consider the development of storage, electric cars and ICT.)

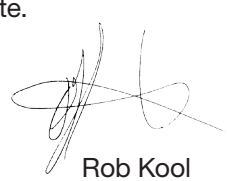
DSM recognizes that solutions for energy efficiency challenges are all characterized by a multiple disciplinary approach. Yes, we need the technology. When it comes to consumers this includes the technology of distributed networks with smart solutions for balancing, storage and delivering services to both consumers and companies. But, we also need to recognize the social aspects and financing.

Developing policies based on the integration of these different knowledge fields can be done in an efficient way by collaborating in international projects with national experts and participating in national and international workshops. Yes, it's not for free; international research costs money.

But if you ask the exact same question to the Lone Consultant, he will either give you a more limited answer or it will cost you (certainly if he has to bring in other super-hero consultant friends).

On top of this, and this is where I'll stop, the DSM TCP projects (IEA TCP projects in general) give you the opportunity to participate in the "Making of". All those that have had the opportunity to participate in a DSM TCP project will testify that you find the real added value there – in participation.

So if you're faced with energy efficiency challenges and have the opportunity to start a research project, remember a lone cowboy can be fun every once in a while, but only if he's run out of silver bullets and is ready to collaborate.



Rob Kool
IEA DSM Chairman

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