

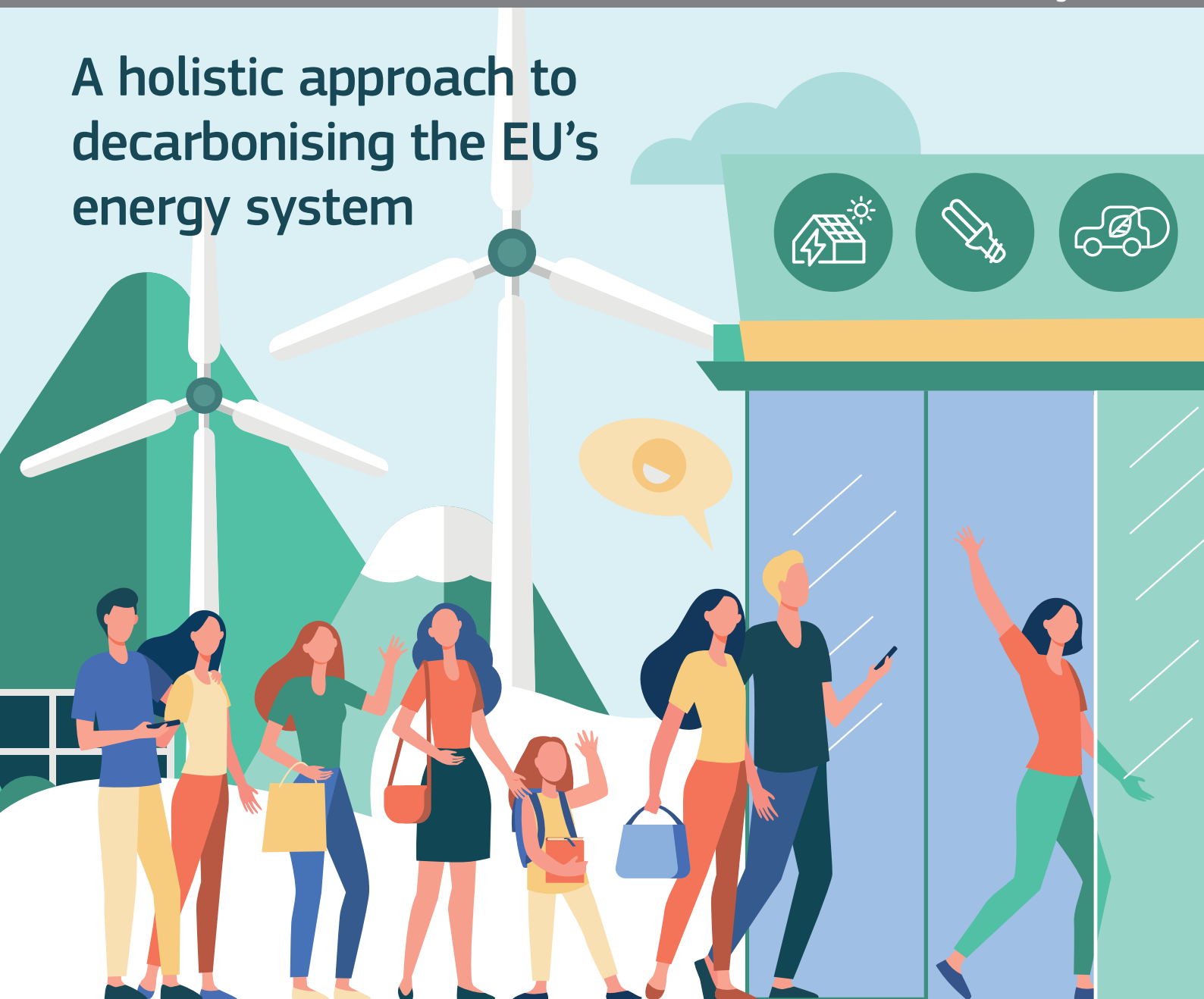


CORDIS Results Pack on social sciences and humanities in energy research

A thematic collection of innovative EU-funded research results

August 2021

A holistic approach to decarbonising the EU's energy system



Research and
Innovation

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Editorial

A holistic approach to decarbonising the EU's energy system

Innovation in clean energy technology is integral to achieving the EU's ambitious goal of being carbon neutral by 2050 - but to be ultimately successful, the EU must take a holistic approach, accounting for social innovation and participation of all stakeholders in the energy transition. This includes engaging consumers, households and EU citizens to enable changes in lifestyles and behaviours, and initiating dialogues with decision-makers in politics, academia and industry. This Results Pack showcases nine EU-funded projects that focus on the social and political issues that need to be addressed to decarbonise the EU's energy system.

The [European Green Deal](#), presented by the European Commission in December 2019, has the ambitious goal of making Europe the first climate-neutral continent. It lays out a new growth strategy to build a fair, resource-efficient and competitive economy where net emissions of greenhouse gases are reduced to zero by 2050.

Citizen focus in transition to zero-carbon economy

The production and use of energy account for more than [75 %](#) of the EU's greenhouse gas emissions. Decarbonising the EU's energy system is therefore a central pillar of the Green Deal. While the transition to a clean energy system requires further scaling up of technological innovations in energy, buildings, transport, industry and agriculture sectors, these new technologies and ambitious strategies need to be embraced by citizens to have the desired impact.

The European Green Deal puts [people first](#), recognising the need for active public participation and confidence in the transition to make it a reality. It also accounts for the diversity of local, regional and national conditions and approaches that impact and shape the road to a zero-carbon economy. However, energy choices are not always rational and are therefore difficult to predict. More research is needed to understand the factors that drive individual and collective energy choices and energy-related consumer behaviour, the political, cultural, institutional, and organisational governance frameworks that determine citizen participation, and the changing roles of consumers and 'prosumers' in the energy system.

EU projects provide socioeconomic insights for future energy policies

The nine EU-funded projects featured in this Results Pack focus on the interdisciplinary and cross-cutting issues that need to be investigated to decarbonise the EU's energy system. This includes questions relating to socioeconomic, gender, sociocultural and socio-political aspects of the energy transition, as well as to educational needs of the future workforce.

Understanding the factors and incentives that drive individual and collective energy choices is central to enabling policymakers to craft targeted actions and strategies that encourage consumers to make more sustainable choices. The [ECHOES](#) project developed the innovative theoretical concepts of 'energy collectives' and 'energy memories' and studied their impact on smart energy technologies, electric mobility and energy-efficient buildings. Taking a bottom-up approach, [ENABLE.EU](#) conducted household surveys and other user-based exercises to increase understanding of the factors that drive energy choices in daily life as well as shed light on the main bottlenecks that discourage energy transitions. In a similar vein, using an 'Energy Living Labs' approach, the [ENERGISE](#) project developed and tested options for a bottom-up transformation of energy use in households and communities throughout Europe. The [SMARTEES](#) project took a closer look at the concept of social energy innovations and how they evolve over time, based on the experience of 10 European cities and islands.

Focusing on consumers' choice of household appliances, the [CHEETAH](#) project used discrete choice experiments to understand how policy interventions break down barriers to energy efficient consumer choices. Taking a similar approach, [PENNY](#) studied the psychological, social, economic and financial factors that influence energy efficiency in the residential sector, addressing two distinct consumer decisions: energy usage and adoption of energy-efficient products. Focusing specifically on labelling for energy class, the [CONSEED](#) project explored whether providing energy information in monetary terms would encourage people to buy more energy-efficient products.

For the [PROSEU](#) project, prosumers - people who produce and consume their own renewable energy - can play a key role in the EU's transition to a society based on renewable energy sources (RESs). Project partners from across Europe aimed to determine which incentive structures will make the mainstreaming of RES prosumerism possible. Finally, the [ASSET](#) project addressed the challenge of a rapidly evolving energy sector that requires creating new job opportunities, re-skilling the workforce, and the development of new interdisciplinary skills and expertise.

Unlocking the social forces that shape consumer energy choices and behaviour

An EU-funded project furthered understanding of what drives individual and collective energy choices. The study's findings are key to making EU energy policies more impactful and meaningful for local realities and to accelerating Europe's transition to a low-carbon economy.

Growing concerns over climate change are prompting governments, energy providers and various industries to respond with bold investments in energy-efficient technologies. Although many investments are empowering consumers to manage their energy usage more actively and efficiently, there are several barriers that prevent greater uptake of these technologies. Consumers' choices are complex and not always based on rational thought and behaviour.

The EU-funded [ECHOES](#) project brought together social scientists and actors involved in the energy market to study the reasons for the unpredictable nature of human decision-making. To answer these questions, project partners interviewed several thousand European citizens, conducted numerous case studies and analysed thousands of documents.



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An 'energy collectives' approach

ECHOES employed the innovative theoretical concept of energy collectives that examines consumers' energy choices on a micro-, meso- and macro-scale. "ECHOES took three different perspectives: how do individuals take energy-related decisions, which role does the local culture or lifestyle play in our energy decisions, and which are the differences in the decisions taken by individuals and companies or interest groups?" notes project coordinator Christian Klöckner. The focus was on analysing the impact of energy collectives on smart energy technologies (e.g. smart meters), electric mobility and energy-efficient buildings.

Project partners conducted case studies in five European countries to investigate how historical events could influence the energy culture of a society. To do so, they presented the concept of 'energy memories' that links established energy cultures to collective memories. "The energy memories concept enables excellent understanding of energy cultures and helps identify energy culture cracks – instances of energy culture instabilities – where policymakers can take targeted measures to influence prevailing energy cultures," adds Klöckner.



The energy memories concept enables excellent understanding of energy cultures and helps identify energy culture cracks – instances of energy culture instabilities where policymakers can take targeted measures to influence prevailing energy cultures.

These are just some examples of the results that ECHOES produced. They show that policies need to do much more than provide knowledge and economic incentives to accelerate Europe's transition to a low-carbon economy

Firm policy recommendations

"ECHOES also offers three general policy recommendations that can inform almost any consumer-oriented energy regulation scheme on a governance level," notes Klöckner. Policymakers could reduce the regulatory, legal and procedural burdens consumers face when joining energy programmes. To strengthen their policy processes, they could employ data collection tools and monitor policy implementation with selected key performance indicators that also consider social aspects.

Ultimately, policies should target specific collectives and individual groups with similar needs and characteristics to increase policy acceptance. "Implementing these recommendations into energy policies and regulations has the potential to greatly improve the impact and acceptance of energy and climate policies," concludes Klöckner.

Key study findings

The project reported many interesting findings. For example, it found that most political documents assumed that people lack information to make the right choices and that economics steers people's choices. Results also showed that our emotional response to energy projects determines our choices and that this holds especially true for men. In addition, people are more willing to invest in renewable energy when this opportunity is presented in their city. What's more, people tend to engage in renewable energy initiatives if their actions are visible on social media platforms. Another interesting finding is that companies and organisations are struggling much more than individuals with changing energy legislation.

PROJECT

ECHOES: Energy CHOices supporting the Energy union and the Set-plan

COORDINATED BY

Norwegian University of Science and Technology
in Norway

FUNDED UNDER

H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/727470

PROJECT WEBSITE

echoes-project.eu/



Research sheds light on what shapes our energy decisions

What drives the energy choices we make? What motivates individuals, organisations and countries to adopt more sustainable energy behaviours? This EU-funded project embraced a bottom-up approach to changing energy behaviour, empowering consumers and citizens to make freer and better-informed energy choices.

The European Commission launched in February 2015 a new [strategy for a resilient energy union with a forward-looking climate change policy](#). The strategy has been designed with citizens at its core, where they take ownership of the energy transition and benefit from new technologies to reduce their bills and participate actively in the market. Empowering and involving citizen-consumers and communities is key to unlocking the full potential of the green energy transition strategy.

“Getting consumers on board is essential to shape Europe’s energy future. Energy production and energy consumption behaviours are heavily shaped by past, present and future individual and collective choices,” notes Stefano Proietti, coordinator of the [ENABLE.EU](#) project. The initiative gathered researchers in 11 European countries to identify what drives energy choices in daily life. It shed further light on the key bottlenecks that discourage energy transitions as well as the factors that motivate people to change.

Getting consumers on board is essential to shape Europe’s energy future. Energy production and energy consumption behaviours are heavily shaped by past, present and future individual and collective choices.

Key project findings

Project partners conducted household surveys, randomised controlled trials, interviews, participatory foresight exercises and econometric modelling to increase understanding of what factors drive energy decisions. Results showed that choices mostly relate to economic, demographic, cultural and governance aspects.

On the governance level, the project presented examples of challenges encountered in 9 European countries. In a poll more than half of the participants agreed that the lack of adequate policy implementation at the national or regional level is one of the three main governance barriers to energy transitions in Europe. This is followed by financial issues, insufficient incentives to change behaviour and frequent ‘stop-go’ policies.



The project also investigated how companies react to energy transition policies. "Results showed that a 10 % increase in energy price reduces CO₂ emission by 8 %, with a larger effect for larger firms. It also reduces employment by 3 % in large firms but has no effect on employment in small- and medium-sized enterprises," explains Proietti.

In terms of mobility, results revealed that travel modes tend to vary depending on the type of trip rather than across different countries. In particular, people seem to be using public transport less for activities related to shopping and involving children. With respect to car sharing, the number of people using these vehicles is limited given that the service is available almost exclusively in medium/big cities. Furthermore, levels of satisfaction with car-sharing infrastructure were low.

An experiment in Serbia showed that energy prices that are too low may limit the will to save energy, while another conducted in Germany showed that smart energy meters with instant billing can induce energy saving behaviour. "Given that a household has an average of 20 minutes a day to spend on all of its bills, the information needs to be clear and engaging," notes Proietti.

Ultimately, research revealed that dwelling attributes have a larger impact on heating costs than consumers' income level, daily routines or values. The energy efficiency of older dwellings can be improved with effective insulation, yet larger improvements are possible through deep renovations.

ENABLE.EU increased understanding of the underlying factors that drive consumer choices and of the effective solutions and tools that increase their participation in the energy system. By understanding what drives their energy choices, policymakers can make targeted decisions and encourage consumers to make more sustainable choices.

PROJECT

ENABLE.EU: Enabling the Energy Union through understanding the drivers of individual and collective energy choices in Europe

COORDINATED BY

Institute of Studies for the Integration of Systems in Italy (ISINNOVA)

FUNDED UNDER

H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/727524

PROJECT WEBSITE

enable-project.eu/

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How households can accelerate the transition to renewable energy

How are households shaping the energy landscape? Could changes to everyday practices make a difference? Through an 'Energy Living Labs' approach, an EU-funded project developed and tested options for a bottom-up transformation of energy use in households and communities throughout Europe.

The European Commission is promoting several ambitious climate and energy targets with the goal of reducing greenhouse

gas emissions and decarbonising the economy, also evident in the [European Green Deal](#). However, results are not materialising

at the pace and scale needed to accelerate the energy transition. There needs to be a greater change, which requires cooperation between governments, businesses, communities and households.

From climate change awareness to action

Challenging social values, perceptions and habits regarding energy usage at home is playing a pivotal role in reducing energy consumption. The EU-funded **ENERGISE** project carried out an experiment to reduce energy consumption in more than 300 households in 8 countries. The goals were to lower indoor temperatures to a maximum of 18 °C and halve the amount of washing cycles over a 4-week period for each challenge.



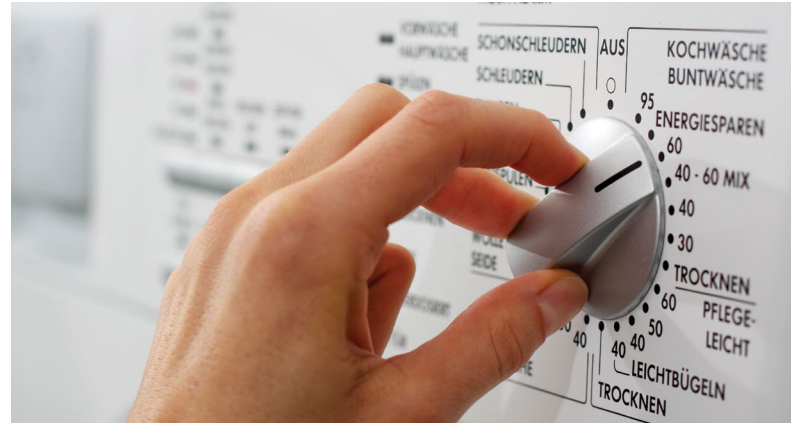
Our study proves that reductions in energy use are possible when people are given the time, space and means to reflect on their usual practices. Experiments can challenge tacitly accepted norms and assumptions that underpin current practices and encourage people to do things in new more sustainable ways.

“The results from our Energy Living Labs approach indicated that reducing indoor temperatures by 1 °C in winter results in an energy saving of around 6 %. One less laundry wash per week for households in Switzerland for one year would save around 13 million m³ of water, 10 million litres of laundry products and the equivalent annual electricity consumption of 90 000 households. A key finding is that all these savings are possible without compromising convenience and comfort,” notes project coordinator Gary Goggins. In certain cases, reductions were even more significant, and changes in the pattern of energy behaviour were maintained for 3 months after initiating the challenges.

“Our study proves that reductions in energy use are possible when people are given the time, space and means to reflect on their usual practices. Experiments can challenge tacitly accepted norms and assumptions that underpin current practices and encourage people to do things in new ways,” adds Goggins.

Placing people at the centre of ‘smart technology’ approaches

Study findings also suggest that people are more likely to react positively to energy savings by retaining their influence on their thermal comfort rather than counting on smart buildings or invisible heating systems that allow limited human interventions.



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Similarly, washing machines need to be designed in a way that allows transparency on the energy and water use of programmes. Users need to navigate easily between programmes and thus feel they can influence their environmental footprint.

A long-lasting and meaningful impact

The project's work will be instrumental in the design of policies and programmes that aim to facilitate the transition to a low-carbon society. Increasing awareness of climate change and its negative impacts or simply creating more efficient energy technologies are not enough to spur people into action. ENERGISE demonstrated that engaging and empowering people to do things in new ways has a meaningful impact on their energy consumption.

“Designing an initiative that dealt with diverse households in different countries with different cultures, social norms and expectations, different energy systems and material arrangements was challenging but also extremely interesting. It revealed how things that are taken for granted or considered ‘normal’ in one place might be ‘alien’, radical or unacceptable somewhere else,” concludes Goggins.

PROJECT

ENERGISE: European Network for Research, Good Practice and Innovation for Sustainable Energy

COORDINATED BY

National University of Ireland Galway in Ireland

FUNDED UNDER

H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/727642

PROJECT WEBSITE

energise-project.eu/

Leveraging social innovation to contribute to a resilient, low-carbon and climate-friendly EU

There is a need to better understand socio-economic incentives that encourage or discourage energy-responsible behaviour. An EU initiative is providing key insight into how social energy innovations evolve over time and what factors contribute to their success or failure.

"Social innovation in energy transition is a process of change in social relationships, interactions, configurations, and/or the sharing of knowledge leading to, or based on, new environmentally sustainable ways of producing, managing and consuming energy

that meet social challenges or problems," explains Christian A. Klöckner, coordinator of the EU-funded [SMARTEES](#) project. Policymakers require an analytical framework that delivers extensive interdisciplinary knowledge, enabling them to evaluate



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links, synergies and disconnects between energy technologies and services, infrastructure, markets, business creation and consumer behaviour.

"SMARTEES's main aim is to understand how social energy innovation works in real situations, study how it can be transferred to other contexts and give policymakers and local initiatives tools to start their own processes and manage them successfully," notes Klöckner. It will generate knowledge on social innovation and tools on how to use this knowledge at local and structural levels.

Evaluating effects of policy interventions and social innovation

Project partners are concentrating on five types of energy- and mobility related social innovation. The experiences of 10 cities and islands in Denmark, the Netherlands, Romania, Spain, Sweden, Switzerland and the United Kingdom serve as reference points for these social innovation clusters. They analysed the socio-economic and structural drivers of all case study clusters by considering consumer driven renewable energy production, energy efficiency in buildings and low carbon regional transport. There was also a particular focus on consumer empowerment. A [policy brief](#) presents research on the factors that impacted the cities and islands' successes and failures.

By applying a model to the 10 cases, the researchers identified 4 main features that characterise structural change processes in energy transition at the local level, such as cities and neighbourhoods. The first is irreversibility. "One can speak of structural change only when the induced transformations are so rooted in the energy systems that they can't be easily reversed," comments Klöckner. The second is comprehensiveness. "Structural change implies a comprehensive change in local life affecting, for example, cultural and cognitive attitudes of citizens and local leaders, and procedures, rules and standards." The third is inclusiveness, where structural change must be a collective effort. Lastly, structural change needs to be contextualised through tailored strategies and tools.

SMARTEES will support the EU's energy transition and improve policy design by developing alternative and robust policy pathways that foster citizen inclusion and take local peculiarities into account.

Tool to enhance policy design and decision-making

All findings will feed into the policy sandbox, a novel policy analysis tool that demonstrates the effects of policy measures and social innovation in the cities and islands. It will help forecast the effects of policy measures and social innovation in similar local contexts. Policymakers will be able to test social innovation and various policy interventions relevant to their local circumstances, and then adapt and implement actions to advance energy transition.

"SMARTEES will support the EU's energy transition and improve policy design by developing alternative and robust policy pathways that foster citizen inclusion and take local peculiarities into account," concludes Klöckner. "Policymakers will have all the support they need to create frameworks in which social energy innovations thrive, ultimately driving this energy transition."

PROJECT

SMARTEES: Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability

COORDINATED BY

Norwegian University of Science and Technology in Norway

FUNDED UNDER

H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/763912

PROJECT WEBSITE

local-social-innovation.eu/



Translating consumer choice data into policies that encourage smart choices

Designing policies that spur households to choose more energy-efficient appliances will be critical to meeting EU energy efficiency targets, but it requires knowing what motivates consumers. Thanks to EU-funded research, now we do.



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The EU is targeting an [energy efficiency](#) increase of [at least 32.5 % by 2030](#), meaning reducing energy input required by about one third for the same output. In 2014, buildings accounted for [39 % of the EU's final energy consumption and residential ones for the majority of that](#), so engaging consumers to modify their choices and

behaviours could be a game changer. The EU-funded [CHEETAH](#) project has minimised the guesswork in the design of residential energy efficiency policy with highly targeted and detailed choice experiments in 18 000 households in 8 EU countries.



CHEETAH's DCEs allowed us to estimate the value to consumers of multiple attributes of a product (e.g. price, energy costs and warranty) and also of related policies (e.g. subsidies or energy labels). In addition, statistically analysing the DCEs enabled calculation of willingness to pay (WTP) for certain attributes, and thus assessment in a scientifically rigorous way of the relative importance of individual attributes to product choices. CHEETAH also analysed the relationship between WTP and socioeconomic factors.

Sharpening the focus on consumer cost-benefit rationale

CHEETAH got a head start on the design of its survey thanks to valuable outcomes from its sister project [BRISKEE](#). Ending in 2017, BRISKEE focused on household preferences and behaviours and, to a lesser extent, using those to develop reactive policy interventions. In a complementary way, CHEETAH set out to understand how policy interventions break down barriers to energy efficient consumer choices to foster tailored proactive policymaking.

The project exploited quantitative stated preference discrete choice experiments (DCEs) that ask people to choose amongst alternatives with various product and/or policy attributes. Project coordinator Barbara Schlomann of [Fraunhofer Institute for Systems and Innovation Research](#) (Fraunhofer ISI) explains: "CHEETAH's DCEs allowed us to estimate the value to consumers of multiple attributes of a product (e.g. price, energy costs and warranty) and also of related policies (e.g. subsidies or energy labels). In addition, statistically analysing the DCEs enabled calculation of willingness to pay (WTP) for certain attributes, and thus assessment in a scientifically rigorous way of the relative importance of individual attributes to product choices. CHEETAH also analysed the relationship between WTP and socioeconomic factors."

From survey results to macroeconomic insight and energy policy

The household survey data were used in energy models of residential buildings and appliances to evaluate the influence of policies on total energy demand. The energy demand outcomes were then incorporated into the [AsTra macro-economic model](#) to predict the effects of energy policies on the economy. Analyses demonstrated that effective policies reflect national, cultural and socioeconomic differences and transparently explain long-term costs and benefits. Regarding household appliances, implementing ecodesign requirements is very inexpensive relative to resultant energy savings; enhancing this is the most effective policy, with ecodesign and labelling capable of delivering significant savings by 2030. Significant energy savings in the residential heating sector can only be achieved with building insulation projects, requiring ambitious renovation programmes and large capital investments. Education and financial incentives will not be enough to encourage such investment; binding measures will be required.

Schlomann summarises: "Implementing the DCE results in energy-economic models has improved the models' resolution and predictive power, facilitating the design of more effective energy efficiency policies for the present and the future, particularly in the context of the [European Green Deal](#)." Thanks to CHEETAH, the EU is sprinting towards its energy efficiency goals with a clear target in sight.

PROJECT

CHEETAH: Changing Energy Efficiency Technology Adoption in Households

COORDINATED BY

Fraunhofer Society in Germany

FUNDED UNDER
H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/723716

PROJECT WEBSITE

briskee-cheetah.eu/



Understanding psychological, socioeconomic and financial factors that influence energy efficiency

Even though Europe is performing better than other industrialised countries with respect to energy efficiency, it's falling slightly short of its promise to cut greenhouse gas (GHG) emissions by at least 40 % by 2030. An EU initiative analysed consumer energy-related behaviour to improve the development of future energy efficiency policies.

Energy savings through energy efficiency is crucially important because it contributes to a variety of benefits, including the reduction of GHG emissions, one of the pillars of the Paris Agreement. Drawing up energy efficiency policies will ultimately help meet the required EU energy savings targets. "However, energy efficiency doesn't only depend on the availability of cheap technologies or policy interventions, it's largely influenced by the behavioural choices of users," says Cristina Cattaneo, coordinator of the EU-funded [PENNY](#) project.

PENNY studied the psychological, social, economic and financial factors that influence energy efficiency in the residential sector. It addressed two distinct decisions in the energy efficiency space: energy usage and adoption of energy-efficient products.

The role of individual behaviour in energy efficiency

In cooperation with energy companies and retailers from different EU Member States, the PENNY team applied an innovative methodology in conducting field experiments. This was done to test the effectiveness of behavioural interventions

aimed at influencing both energy use and investment decisions. The first is behaviour related to energy reduction that represents a routine, repetitive effort to decrease consumption on a day-to-day basis. The second is behaviour concerning investments that are one-time actions, such as purchasing new energy-efficient products like energy-saving and light-emitting diode lightbulbs or A+++ refrigerators.

One of the main findings was that information barriers are an important constraint of energy efficiency. "However, to fill in the knowledge gap of individuals, not all types of information interventions are effective," explains Cattaneo. "Policymakers should be aware that the format in which the information is presented is a strong moderator of the effectiveness of information policies."

Project partners also compared the acceptability of different types of policies. They found that policies targeting energy efficiency investments are more accepted by consumers than policies targeting reduction in consumption.



PENNY has advanced the understanding of consumer decisions in relation to both the use of energy and adoption of energy-efficient technologies.



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Future policies to maximise energy-efficient behaviour

Lastly, the researchers emphasised that financial motivations aren't the sole drivers of energy efficiency behaviour. There are a variety of barriers pertaining to individual behaviour – status quo bias, bounded rationality, reference-dependent preferences or strong environmental preferences – that can't be addressed using only economic and regulatory instruments. "The complexity and variety of barriers relating to individual behaviour call for

increasing insight from behavioural economics," adds Cattaneo. "This final result demands additional effort in studying consumer behaviour in order to design effective policy interventions in the energy efficiency domain."

"PENNY has advanced the understanding of consumer decisions in relation to both the use of energy and adoption of energy-efficient technologies," concludes Cattaneo. "It will contribute to supporting the development of energy efficiency strategies, policies and programmes across Europe."

PROJECT

PENNY: Psychological, social and financial barriers to energy efficiency

COORDINATED BY

Fondazione Eni Enrico Mattei in Italy

FUNDED UNDER

H2020

CORDIS FACTSHEET

cordis.europa.eu/project/id/723791

PROJECT WEBSITE

penny-project.eu/

The monetary value of energy efficiency gets consumers' attention

Helping consumers get on board with energy-efficient products is critical to sustainability and combatting climate change. Labelling for energy class that includes financial costs over a product's lifetime could be just the incentive we all need.

Understanding how consumers make their purchasing decisions is critical to encouraging a transition to products with greater energy efficiency over their lifetimes. While labelling according

to energy 'categories' is increasingly mandated, it is not clear whether/how this is affecting decision-making and what other factors might play a role.



Cost is important to most people's buying decisions. However, extrapolating financial costs over a product's lifetime is nearly impossible without specific and individualised data, leaving consumers to decide whether it is worth spending more to buy a product that is 'good for the environment'. The EU-funded CONSEED project set out to explore the energy efficiency investment process.

Money talks – but when do people listen?

Eleanor Denny, project coordinator and associate professor of economics at [Trinity College Dublin](#), says: "Our decision model identified a large number of potential benefits, costs, enablers and barriers to the adoption of lower-energy technologies, and our core research question explored whether providing energy information in monetary terms would encourage people to buy more-energy-efficient products."

Eleven large-scale national surveys of selected products in five countries focused on: household appliances, residential properties, personal vehicles, tractors, and heating and cooling systems in the hotel sector, commercial properties and industrial machinery. Three field trials tested actual purchasing decisions by households via: an in-store field trial for household appliances, an online field trial in the property market, and an in-store field trial in the car market. Three discrete choice experiments presented participants with a choice between two products in the same category varying according to several characteristics, including price and energy efficiency.

Monetary labels increased the demand for energy efficiency. The increase was considerably larger for products with higher energy expenditure such as cars and properties and much smaller or insignificant for appliances.

energy cost forecasts to a property advertisement influenced sales prices and rents. The amount people were willing to pay for more energy efficiency increased in the areas where the new monetary label was shown, suggesting demand for energy efficiency increased because of monetary labelling.

Outcomes showed that most European households are aware of and value energy efficiency when investing; however, the influence on investing is mixed and lack of uptake is partly due to lack of affordability and/or financing. CONSEED made three key recommendations. First, monetary labelling should be available at the point of sale, particularly for larger investments such as properties and cars. Secondly, labelling should account for country and household consumption differences, perhaps with online/in-store comparative energy cost calculators that consider household-specific factors. Finally, long-term financing for energy efficiency should be available with terms that reflect the longer payback period for energy investments.

The team has raised awareness with policy briefs, industry bulletins, posters, factsheets, videos, scientific conferences and journals as well as in the media. Project outcomes are already informing revisions in energy labelling at the national level. You may be pleasantly surprised to find associated financial data in addition to energy rating when you purchase your next home or car.

PROJECT
CONSEED: CONSUMER Energy Efficiency Decision Making

COORDINATED BY
Trinity College Dublin in Ireland

FUNDED UNDER
H2020

CORDIS FACTSHEET
cordis.europa.eu/project/id/723741

Money talks louder when energy efficiency matters more

According to Denny: "Monetary labels increased the demand for energy efficiency. The increase was considerably larger for products with higher energy expenditure such as cars and properties and much smaller or insignificant for appliances." As an example, a field trial in Ireland explored how adding annual

Empowering ordinary citizens to play a key role in Europe's transition to clean energy

The growth of European prosumers – people who produce and consume their own renewable energy – is challenging existing energy market structures and institutions. An EU initiative is helping to put prosumers and citizens at the centre of Europe's energy transformation.



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Transitioning to a low-carbon future based on renewable energy sources (RESs) is resulting in a new role for citizens. It's turning passive energy consumers into active energy-producing citizens, or prosumers. "Energy transition is an opportunity not only for a more sustainable and low-carbon/net-zero energy system, but also for a more democratic and inclusive one," comments Inês Campos, coordinator of the EU-funded [PROSEU](#) project. "Prosumers are right in the middle of this concept."

Overall, the aim is to determine what incentive structures will make the mainstreaming of RES prosumerism possible. In doing so, PROSEU will safeguard citizen participation, inclusiveness and transparency in the [Energy Union](#) – a European Commission strategy that targets accessible, affordable, secure, competitive and sustainable energy for all Europeans. The project seeks to help the Energy Union achieve its goal of empowering citizens to interact with the energy market as prosumers.

Finding out what supports or limits prosumer initiatives

The PROSEU team began by documenting and analysing the current state of the art in RES prosumer initiatives across Europe. A survey of 198 collective prosumer initiatives in 9 EU countries has contributed to a [report](#) on the current state of play of prosumer collectives, such as energy communities and cooperatives. It presents the demographics, technology use, organisation, financing, motivation and perceived factors that hinder and facilitate collective prosumers. The report identifies several internal and external obstacles to the successful mainstreaming of RES prosumerism. A [guidance document](#) offers recommendations for transposing EU directives into national legislation. A [policy brief](#) provides recommendations to policymakers, legislators and administrations on the implementation of rights allowing prosumers and energy communities to participate in the rollout of the Energy Union.

Project partners identified and analysed the regulatory frameworks and policy instruments relevant to RES prosumer initiatives in the 9 participating countries. Based on this, they produced an in-depth [review](#) that reveals the main challenges

and opportunities such frameworks have had on collective RES prosumers. Findings show that the current legal framework at EU level represents a clear opportunity for collective prosumers. It provides a starting point to draw on policy implications for improving legal frameworks relevant to collective RES prosumers throughout Europe.

The researchers also explored new business models that prosumers are implementing in Europe as a result of the participatory involvement of different stakeholders in the 9 countries. This led to a [report](#) that analyses the different business models adopted to generate renewable energy. It explains why RES communities and citizen energy communities are necessary, what kinds of value they might be trying to acquire in the energy transition, and how they can be empowered through EU countries' energy policies and regulations.

The consortium is currently working on a roadmap for mainstreaming prosumerism until 2030 and 2050. It is gathering research and analyses of the socio-cultural, regulatory, economic and technological incentive structures for prosumers and from the participatory involvement of around 160 expert stakeholders.

Uncovering the potential of prosumerism

"PROSEU is discovering who prosumers are and how they work. This knowledge will be vital considering that the energy transition can greatly benefit from the widespread participation of citizens," concludes Campos. "Prosumers are only beginning to be recognised as key actors in this transition, so we're helping them take the next step in becoming a mainstream player in new energy systems."

PROJECT

PROSEU: PROSumers for the Energy Union: mainstreaming active participation of citizens in the energy transition

COORDINATED BY

FCIENCIAS.ID - Association for Research and Development of Sciences at the University of Lisbon in Portugal

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CORDIS FACTSHEET

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PROJECT WEBSITE

proseu.eu/about-proseu


PROSEU is discovering who prosumers are and how they work. This knowledge will be vital as the energy transition can greatly benefit from the widespread participation of citizens.



Targeted educational services get us up to speed for a sustainable energy transition

Transitioning to a carbon- and climate-neutral economy requires tremendous technological innovation and the creation of new job profiles and business models. Tools and courses for all stakeholders are uniting players and getting them moving quickly in the same direction.

Climate change and CO₂ emissions, strongly related to the combustion of fossil fuels, are having a detrimental impact on economies around the globe. In response, the EU has developed challenging climate and energy targets and is on track to meet its [2020 goals](#) while targeting [climate neutrality by 2050](#).

Supporting this endeavour, the EU-funded [ASSET](#) project has developed multidisciplinary courses and tools integrating technology with societal dimensions and business-entrepreneurial competencies, all related to the energy transition. There is something for everyone, from citizens and professionals to businesses and policymakers.



A steep learning curve accelerates progress

To identify the skills required and the existing gaps and mismatches, ASSET began by creating a sustainable ecosystem of energy transition and education stakeholders. This community includes representatives of the social sciences and humanities, something that is rare in technology-driven energy transition initiatives. Based on the fruitful multi- and interdisciplinary dialogue and outcomes, the team developed a wealth of innovation and educational services to get us all up to speed in supporting the EU's energy transition.

ASSET targeted two main markets, massive open online courses (MOOCs) and renewable energy sector employees. Project coordinator Sara Diez Mínguez of [Atos Spain](#) explains: "ASSET offers educational programmes including video lessons, readings, assessments and discussion forums for in-person, online and blended learning. We have developed two tools to bring industry and academia together and numerous [MOOCs](#) that serve these and other target groups in tailored ways."

ASSET's Marketplace tool provides a platform for academia and industry to interact directly, ensuring prompt attention of academia to industry needs. The Learning Graph tool helps academia quickly and easily develop and update courses for students, researchers and engineers. Finally, ASSET's [freely accessible MOOCs](#) include topics from renewable energy technologies and microgrids for energy control and management to behavioural change to minimise energy consumption and green professionalism and ethics.

A holistic value proposition

ASSET helps universities, research centres and training entities to accelerate programme creation and share materials integrating technological, societal and entrepreneurial facets of the latest energy-relevant topics. For companies in the energy sector, it provides a direct link to universities and training centres to quickly upskill personnel in technological, innovation and business subjects. Taken together, ASSET programmes help students and employees acquire the latest energy-related competences in high demand.

The benefits do not stop with industry and academia thanks to the unique inclusion of a societal component in the energy equation. ASSET also targets governmental authorities, societal actors such as NGOs and individual citizens. Diez elaborates: "ASSET helps policymakers, energy authorities, administrative bodies and regulators reach the public through university courses focused on behaviours and their societal impacts. Private organisations, professional associations and citizens can enhance their competencies, energy awareness and understanding of the socioeconomic impacts of individual and collective actions."

Check out ASSET's [video explaining the benefits for policymakers and industry](#). [Join the ASSET community](#) today; you will enhance your competitiveness while supporting the EU as it tackles one of the greatest challenges of our time.



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PROJECT

ASSET: A holistic and Scalable Solution for Research, Innovation and Education in Energy Transition

COORDINATED BY

ATOS SPAIN SA in Spain

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CINEA implements two societal challenges of the Horizon 2020 programme: Secure, clean and efficient energy, and Smart, green and integrated transport. CINEA provides technical and financial management services at all stages of the programme and project life cycle – from the calls for proposals, evaluation of projects and the award of financial support, to the follow-up of project implementation and control of the use of funds allocated.

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In this Results Pack we showcase seven innovative EU-funded projects that demonstrated efficient, cost-effective and socially acceptable technology solutions that motivate consumers to engage in basic energy-saving behaviours.



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