User-Centred Energy Systems

UsersTCP 2022/23 Annual Report

Contents

Chair's Statement

> **"** There are decades where nothing happens; and there are weeks where decades happen.

There is an irony in starting with a quote from Lenin. In this case, it feels like it has been a year in which a decade has happened in the energy system. Since Russia's invasion of Ukraine we have tested the limits of the capacity to restructure our energy system – including an unprecedented test of our ability to reduce demand.

The European response has exceeded most commentators' expectations. The Financial Times, reporting findings from Ember, corroborated by the IEA, of 11% lower coal consumption in winter 2022/23 than previous years, alongside reductions in gas and increases in renewables to the point where they exceed fossil generation for the first time. At the same time, a concerted series of campaigns from governments helped citizens reduce their energy demand. While higher prices were a strong motivator, a substantial component of behavioural response was driven by national and personal energy security and environmental concerns. At the Users TCP, this is reflected in our member governments' priorities.

Over the last year our **Behavioural Insights Platform Task**, entered Phase 3, co-funded by the **J-PAL Poverty Action Lab** to carry out Randomised Control Trials in participating partner countries. The trials will focus on realizing flexibility from energy end-users – an essential component in cost-effectively delivering the energy transition. Our **Public Engagement for Energy Infrastructure Task** was successfully launched to identify common factors governing effective public engagement for energy infrastructures. By summer 2023, we expect to have launched our new 'CampaignXchange' Task coordinated by the IEA Secretariat. Still under development, the Task will assess factors behind successful energy and climate public engagement campaigns.

One of the key factors determining public acceptance of the energy transition is the perception of fairness. This is particularly the case with expenditure of public money, with many arguing that we will lose the democratic mandate to decarbonise unless the benefits of the transition are widely perceived as being equitably distributed. Our **Gender and Energy Task** assesses how different aspects of the transition may impact the social roles played by women and men differently, and how to design policies and programmes that acknowledge

and minimise such differences. Our **Hard-to-Reach Task** addresses impacts arising from social segments' differing degrees of engagement with actors in the energy system. If the transition is to affect the breadth of change needed, then engaging these groups will be important –to maximise participation, ensure an equitable distribution of benefits, and reduce social resistance to change. These Tasks look at the world through a predominantly social lens to understand how social and psychological factors impact on the form and speed of the transition.

Our other Tasks look from the other direction, assessing how particular technology driven solutions impact on people and society and how this, in turn, influences their individual, social and political acceptability. Here we focus on key enabling technologies helping overcome bottlenecks in the energy transition. As we progressively electrify large parts of the economy, including heat and transport, transmission and distribution system capacity will constrain the rate of decarbonisation. In this environment, we need to use our electricity networks at, as near to full capacity as possible - as well as progressively upgrading them to handle additional loads. This requires reducing demand to remain within network capacities, and shifting it to avoid peaks and to match varying renewable supply. Our **Social License to Automate Task** has reviewed best practice in user engagement with automated technologies to understand how trust is built and maintained between users and those looking to automate the shifting of demand. The Task entered a second phase in November 2022 to look more closely at the impacts of automation on different user groups, and the benefits and challenges of automation of community energy.

Our **Global Observatory on Peer-to-Peer, Community Self-Consumption and Transactive Energy** explores how local energy trading can achieve similar outcomes by constructing value for end users and energy networks through local supply-demand matching of distributed energy resources. Such 'local for local' matching maximises use of distribution network capacity, reduces local users' costs as well as creating greater headroom on the transmission network for larger scale renewable sources. Both these Tasks assess the social consequences of technology-based solutions to

understand drivers and barriers to uptake by energy end users. Again, issues such as trust, risk, value and fairness shape consumer acceptance and hence the capacity of these approaches to help deliver the transition.

Many of these issues were discussed in the Building Coordination Group's five-yearly Future Buildings Forum meeting in Canada last year, organised by the Energy in Buildings and Communities TCP. At the event, the Users TCP was named as a potential contributor to over half the identified topics. There is clearly a need to integrate end user perspectives in the broader programme of TCP built environment research. Many of the topics raised in the meeting have featured in our **Users TCP Academy**, including behavioural interventions for efficient heating and cooling, renovation loans for homeowners, heating for low-income households, energy retrofit one stop shops and energy communities. These reflect our continued interest in how the built environment shapes users' energy choices – and how users' choices in turn shape energy demand.

As the timeframes for meeting nations' net zero goals shorten and the pace of change accelerates, the challenges and opportunities of the energy transition will require quicker and more coordinated responses from governments, organisations and citizens. The Users TCP exists to help in this coordination, and to ensure the interests of all people are reflected in the policies, programmes, business models and technical systems that deliver this transformation. If you or your organisation have ideas, research programmes or resources that align with our goals then please reach out to the Users TCP so we can explore ways to collaborate. International collaboration is central to all we do, enabling us to learn lessons from each other's experiences. Sharing lessons learned costs little but saves others valuable time and resources, something, ultimately, we all benefit from in the context of the global challenge of decarbonisation.

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DAVID SHIPWORTH
CHAIR
May 2023

Overview & Key Achievements

The User-Centred Energy Systems mission is to provide evidence from socio-technical research on the design, social acceptance and usability of clean energy technologies to inform policy making for clean, efficient and secure energy transitions.

Main Policy Messages

Socio-technical research is needed to maximise social permission for, adoption of, and correct use of low carbon technologies.

Lessons from behavioural economics, psychology and sociology can be applied to energy policy, driving better outcomes. Many of the available behavioural levers are not being applied to their best extent.

Lessons learned from recent energy policy campaigns could help to improve their effectiveness in other countries.

Many of the technology solutions already exist but suffer from low uptake and performance gaps by making narrow and simplistic assumptions about users' needs and behaviour. Improving these implicit assumptions leads to more effective policy making, technology design and business models.

Value creation for power systems, consumers and wider society is often misaligned in emerging markets for peer-to-peer energy trading and demand side flexibility services. Aligning these requires rethinking market design and power systems regulation including a clear "social license to automate" DSM.

Local (customer level), short term (minutes to days) predictive models of generation and demand are a key missing technology bundle for both automation and uptake of distributed flexibility assets. Such models increase asset performance, improving service and reducing pay-back periods for customers.

Consumers respond to perceptions of risk (including supply disruptions and future price volatility) as well as financial rewards. Understanding the risk mitigation motivations of different consumer segments for investing in energy efficiency, DER assets, and participating in the energy system is increasingly important for companies and policy makers.

March 2022

EXCO
• 2021 Annual Report published

April

EXCO
• 5th ExCo meeting - Austria

May

BIP2
• Online Behavioural Insights Policy Toolkit launched

G&E
• Gender & Energy Task 2nd Newsletter

June

EXCO
• Newsletter #6

BIP2
• Behavioural Insights Policy Toolkit presented at Energy Transformations conference, UK

HTR
• Publication of Hard-to-Reach Energy Users Literature Review
• eceee Summer Study

GO-P2P
• 5th GO-P2P meeting on community energy with IERC in Ireland

September

BIP2
• Behavioural Insights Policy MOOC launched

BIP2, HTR
• IEA special workshop on Behaviour Change and Awareness Campaigns

October

EXCO
• 6th ExCo meeting - online

BIP2
• Workshop at SBE22Delft

HTR
• Hard-to-reach energy users: A literature review

November

SLA2.0
• Launch of Social License to Automate 2.0 Task

G&E
• White Paper on Gender Equality and Social Inclusion published with IEEE
• Report prepared for FEMM Committee of European Parliament: The Gender Dimension and Impact of the Fit for 55 Package

December

EXCO
• Newsletter #7

GO-P2P
• Final Peer-to-Peer Energy Trading Task Force report published jointly with INATBA

January 2023

PEEI
• Tender for Task Leader for Public Engagement for Energy Infrastructure Task
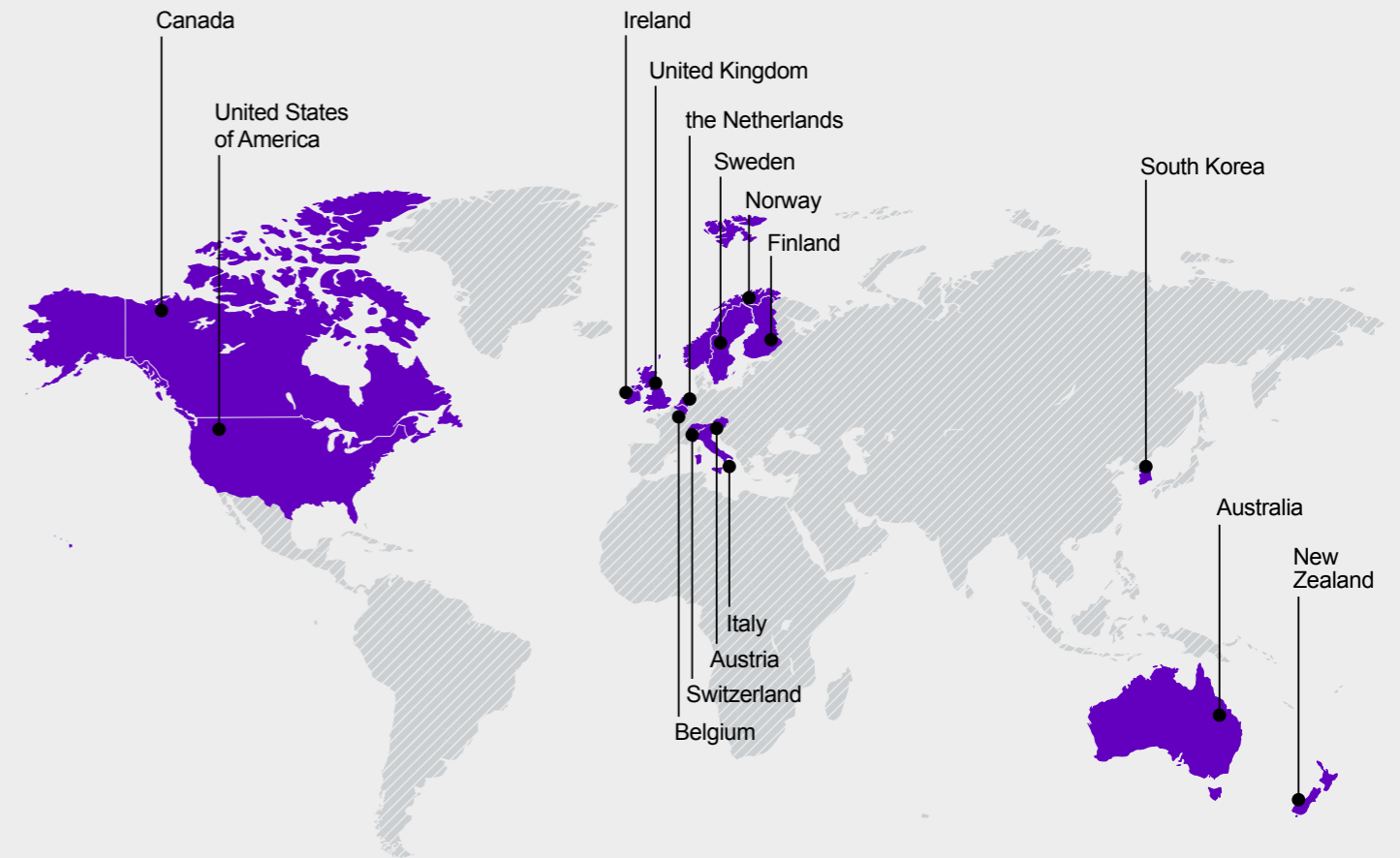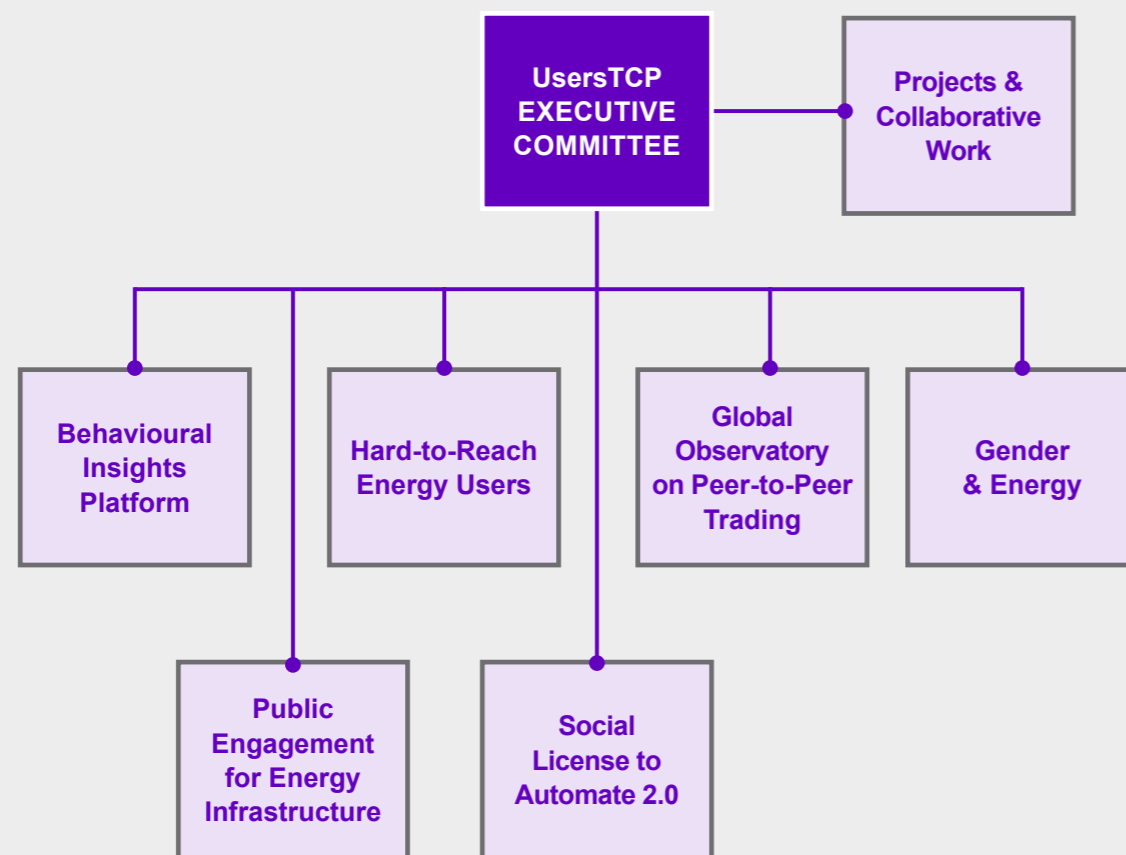
February 2023

GO-P2P
• 6th GO-P2P meeting on equitable decarbonization with Energy Coalition in the United States

UsersTCP Structure & Membership

Structure

We now have 15 Member governments positively engaged in this international collaboration, and our Tasks are the delivery mechanisms for our Strategy.

Members

Australia	Ireland	Norway
Austria	Italy	Sweden
Belgium	South Korea	Switzerland
Canada	Netherlands	United Kingdom
Finland	New Zealand	United States

Sponsors

The Copper Alliance partner with the UsersTCP to deliver the User-Centred Energy Systems Academy.

UsersTCP Tasks

The Users TCP's Tasks are the main international collaborative mechanisms through which we deliver on our strategy.

During 2022/23:

> Phase 2 of the Behavioural Insights Platform saw the launch of the Behavioural Policy Toolkit and a MOOC, as well as securing funding for Phase 3 in 2023/24, which will undertake randomised control trials of messaging around flexible energy use.

> The Social License to Automate 2.0 Task kicked off in November, focusing on the willingness of people to allow automated control of equipment such as heaters, storage units and dishwashers. The project will pay particular attention to the inclusivity and community aspects.

> The Hard-to-Reach Energy Users, GO-P2P and Gender and Energy Tasks continued to deliver influential research reports, including collaborations with IEEE and INATBA, as well as providing platforms for cutting-edge debate at events around the world. The GO-P2P will continue its work until at least 2025 and we are hoping to take forward a new Phase of the Hard-to-Reach Energy Users Task during 2023.

> We also developed new Task ideas for 2023/24. The Public Engagement for Energy Infrastructure Task, beginning in March 2023, will be led by IEECP and the Renewables Grid Initiative. The IEA are working with us to develop a second new Task, bringing together governments working on Effective Energy Campaigns during the energy crisis that we hope to kick off later this year.

![Behavioural Insights Platform — UsersTCP logo]

The Energy Sector Behavioural Insights Platform brings together policymakers and other experts to share knowledge related to the application of behavioural insights to energy policy. The Platform aims to improve the efficacy of demand-side energy policies by ensuring that human behaviour is accounted for throughout the policy cycle.

Phase 3

The Platform is set to start a new phase of work, Phase 3, which will run from March 2023 to February 2025. Phase 3 will examine how behavioural insights can be used to improve demand flexibility in several countries. It builds on previous phases, which examined how policymakers can use behavioural insights to change the decisions of energy consumers.

Key activities for Phase 3 (March 2023-February 2025) include:

1 Conducting field studies to promote demand flexibility in each participating country;

2 Creating a best-practice guidebook on applying behavioural insights to increase demand flexibility, and

3 Developing a community of policymakers and practitioners.

The Platform was awarded grant funding from the King Climate Action Initiative (K-CAI) on behalf of the Massachusetts Institute of Technology (MIT) and J-PAL. This grant will help co-fund the activities set out in Phase 3 and bolster the trials run in collaboration with participating government agencies.

Phase 3 will examine how behavioural insights can be used to improve demand flexibility in several countries.

Major achievements during 2022/23

Behavioural Energy Policy toolkit

Following several rounds of feedback involving behavioural science experts and policymakers, the Behavioural Energy Policy Toolkit was finalised in March 2022. The toolkit is designed to help policymakers and practitioners design energy policies that are fit for purpose from a behavioural standpoint. It provides prompts, case studies, and tailored recommendations to support users in accounting for human behaviour when developing energy policies.
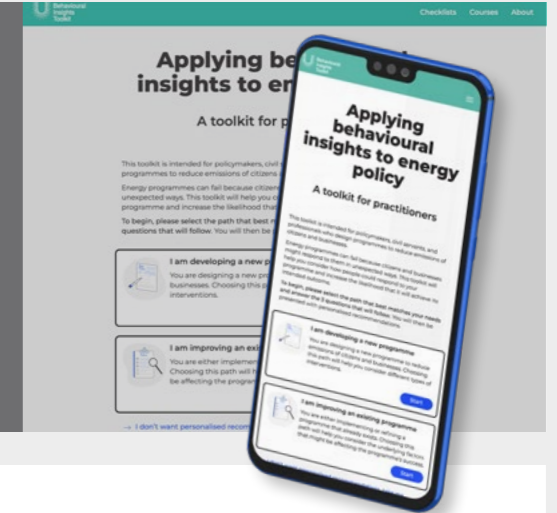
MOOCs

An online course was developed to complement the toolkit. The course is divided into three sections: the first section shows users how to best benefit from the online toolkit. The second section details how to design behaviourally informed energy policies. The third section focuses on research methods practitioners can adopt throughout the policy development cycle to ensure that policies achieve their desired outcomes. The course is free and can be accessed via the toolkit **here**.

Learning events & training

The toolkit was promoted at various events: the Users TCP Academy webinar, the Social Innovation in the Energy Transition (SIET) webinar, the Energy and Climate Transformations conference at the University of Manchester, and the SBE22 conference at the Delft University of Technology. Training workshops focused on applying the toolkit were also provided to teams working at BEIS and Ofgem.

PARTICIPANTS

Canada

Ireland

Netherlands

United Kingdom

UsersTCP
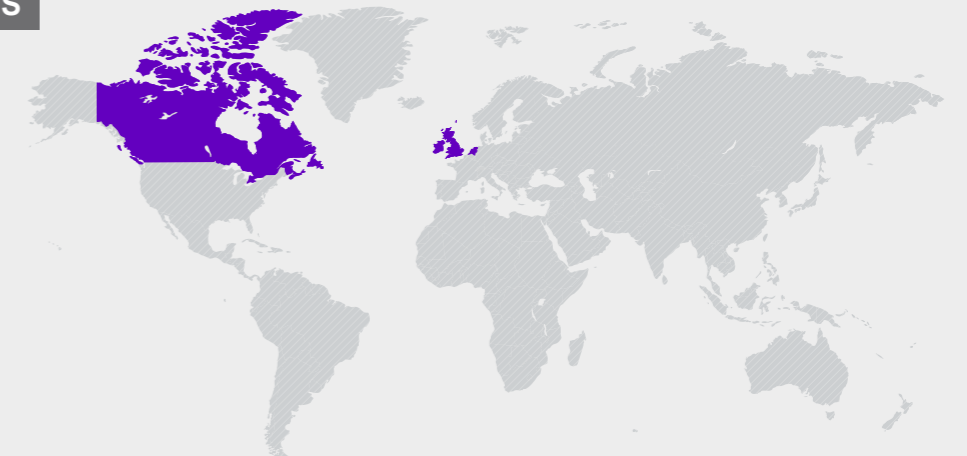
Launched in September 2019, the Global Observatory (GO-P2P) is a collaborative research project led by University College London (UCL).

It is a forum for international collaboration to understand the policy, regulatory, social and technological conditions necessary to support the wider deployment of peer-to-peer (P2P), community/collective self-consumption (CSC) and transactive energy (TE) models.

GO-P2P takes a multi-disciplinary approach to studying P2P/TE/CSC models, and is structured into the following sub-tasks (ST), each led by leading institutions in the field:

> **ST 1: Power systems integration** – led by Lucerne University of Applied Sciences and Arts (Switzerland)

> **ST 2: Hardware, software & data** – led by International Energy Research Centre (Ireland)

> **ST 3: Transactions and markets** – led by University of Colorado Denver, United States (United States)

> **ST 4: Economic and social value** – jointly led by Western Sydney University, Australia and Delft University of Technology, (TU Delft)

> **ST 5: Policy and regulation** – jointly led by Florence School of Regulation/European University Institute (Italy) and the NOVA School of Law (Portugal)

Participants, now more than 200, are from academia, industry and non-profits. There has been a high level of collaboration between them so far. First of all through the literature reviews drafted by sub-tasks in preparation for case study data collection. All literature reviews have been published in academic journals and enabled participants to collaborate with peers from all over the world. In addition to the literature reviews, there have been another 43 joint publications so far, of which 22 are in peer reviewed journal articles.

The main aim of GO-P2P is to collect data from pilots of P2P, TE and CSC across the world to analyse the main factors inhibiting or enabling the rollout of these peer-to-peer energy models across member countries. Based on this analysis, a Readiness Index assessing member country readiness will also be developed.

Our case study data provides valuable evidence to policymakers and industry stakeholders interested in the implications of scaling these models up. Evidence collected so far by GO-P2P has led to the following recommendations for scaling up P2P/TE/CSC models:

> Allow regulators to reap the benefits and manage the potential impact of P2P/TE/CSC markets, through for instance a modified licensing model- e.g. enable multiple supplier models, allowing consumers to purchase electricity from various suppliers.

> Change how domestic consumers are billed, by reviewing non-generation costs (policy and network costs), and making the electricity price reflective of the actual cost of supplying a consumer (through for instance locational marginal pricing).

> Facilitate the participation of a diverse range of entities in energy and flexibility markets, through for instance allowing for sub-metering, enabling individuals and devices to engage in a plurality of transactions behind and across the meter.

Major achievements during 2022/23

In October 2022, GO-P2P secured an extension to its mandate from the Users TCP Executive Committee. Its projected end date is now 28 February 2025.

In February 2023, NOVA School of Law (Portugal) became the joint leader of GO-P2P's sub-task 5 on policy and regulation.

NOVA SCHOOL OF LAW

All six literature reviews by GO-P2P sub-tasks have been published in leading academic journals. The literature reviews can be viewed on the GO-P2P webpage under 'Publications' **here**.

In December 2022, the Joint INATBA/GO-P2P Task Force published its key findings from interviews of seven start-ups conducting 16 pilots around the world of peer-to-peer energy trading using distributed ledger technologies (DLTs, e.g. blockchain).

The report is available on our website **here**.

PEER-TO-PEER ENERGY TRADING TASK FORCE

PARTICIPANTS

Australia

Belgium

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Italy

Netherlands

New Zealand

Switzerland

United Kingdom

United States
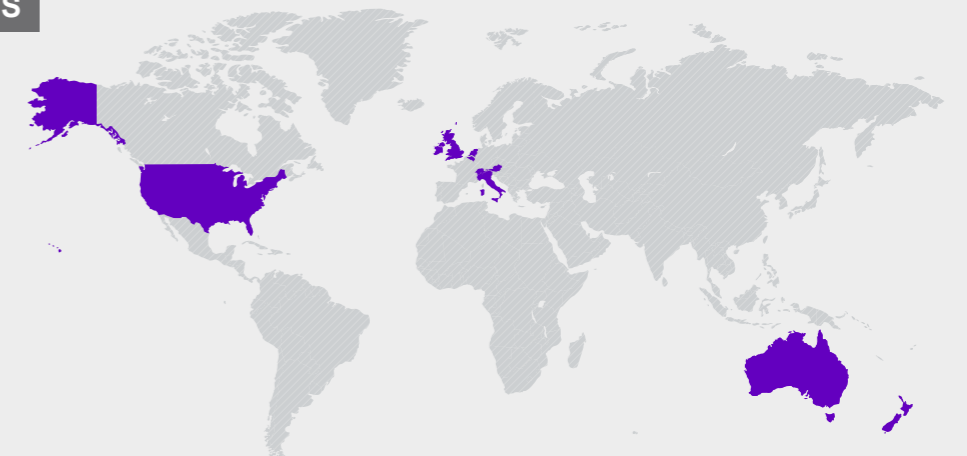
A very large proportion of residential and commercial energy users are hard-to-reach for one reason or another; this Task examines ways of overcoming their barriers by following good process when designing, implementing and evaluating various engagement strategies aimed at clearly-identified and characterised subsets of these audiences.

Our Building Blocks of Behaviour Change research process (Karlin et al, 2021) has guided us well through four years of the Hard-to-Reach (HTR) Task: In 2022/23, we focused on the *Design Phase* of behavioural programmes targeting the hard-to-reach via 19 case study analyses in 8 countries. These were further analysed in a methodology review (Karlin et al, 2022) and cross-country case study comparison (Mundaca et al, under review). Finally, we undertook several field research pilots under the *Deploy Phase*, including with commercial building operators (Rotmann & Karlin, 2021), SMBs (Uplight, 2022), the MUSH sector (Uplight, 2022), high-tech / high-income energy users (Uplight 2021, 2023), extremely vulnerable and marginalised residential energy users (Rotmann & Cowan, 2022), and those living in hidden hardship (Rotmann, in preparation).

Our research has uncovered more complex issues rather than simple solutions, but we have also identified some clear insights:

> Between 2/3 and 3/4 of energy users can be regarded as HTR. These energy users are HTR for very different reasons, and have very different barriers, needs and motivations.

> Our current methods and approaches to engaging those HTR energy users are often (culturally) inappropriate. We need to do better to sub-segment audiences, clearly identify target behaviours, and design tailored engagement strategies to reach different HTR audiences.

> In the residential sector, the most common assumption about HTR energy users is that they are low-income households. However, we have found that we need to differentiate further between high-income / high-consuming energy users, the "squeezed middle" (medium to high-income households, who have no property assets), and marginalised / vulnerable energy users (often low-income but with compounding and intersecting vulnerabilities).

> Among these different groups, which are all HTR for different reasons, are further sub-segments (e.g. between marginalised / forgotten; stigmatised / ostracised; and criminalised / illegalised vulnerable groups), which commonly intersect. These intersectionalities and sometimes conflicting mandates and barriers make engaging these groups exceedingly complex.

> The single-most successful way of engaging the most vulnerable and HTR energy users is using trusted community and frontline providers to help identify, recruit and engage them. However, most of these providers are also very HTR - unless trusted relationships have already been established and nurtured.

> In the non-residential sector, we have found that the only energy users who are well-researched and understood are those working in office buildings and settings.

> Utilities largely focus their energy efficiency programmes on residential and large commercial & industrial (C&I) customer segments, which means that 99% of Small & Medium Enterprises (SMEs) are largely underserved.

> Another underserved non-residential sector is the largely public, complex and diverse municipalities, universities, schools and hospitals (MUSH) segment. These sectors also require tailored energy behaviour training.

Major achievements during 2022/23

FIELD PILOTS: The HTR Task has attracted over €500,000 in co-funding for field research pilots in Canada, the US and Aotearoa New Zealand. These field pilots, which often involved qualitative research with residential and commercial HTR energy users, have shown that our research process is highly-useful, and that we need to adjust aspects to be more culturally-appropriate, especially when dealing with highly-marginalised audiences.

PUBLICATIONS & DISSEMINATION: The HTR Task has finally published its massive literature review as an eBook and co-authored two scientific papers, which are currently under revision. We continue to be asked to present at global energy, behaviour and equity conferences, including the IEA Energy Efficiency Working Party's special workshop in September 2022.

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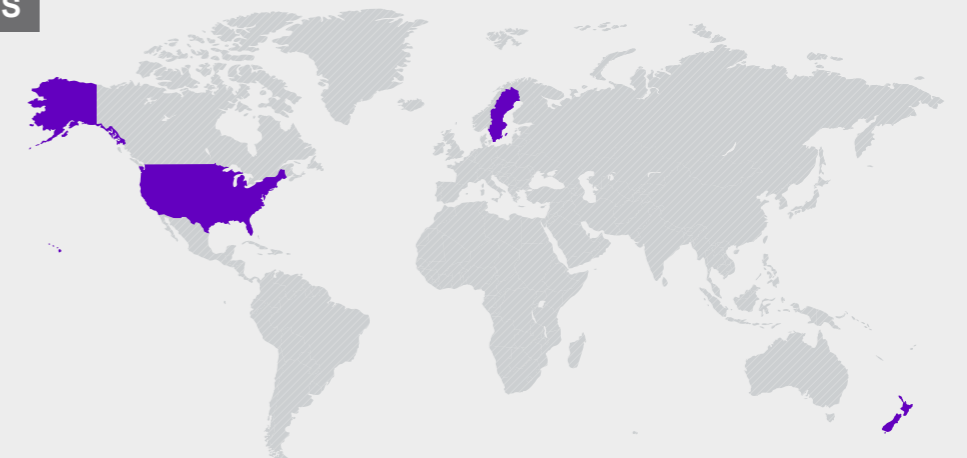
Empowering all: Gender in policy and implementation for achieving transitions to sustainable energy

This Task gathers researchers from the fields of gender and energy in a global network to analyse energy policy and technologies from gender perspectives and provide recommendations for policy design and implementation. Our aim is to support the participating countries in their work to design a more efficient and inclusive energy system, and through this also support ongoing efforts to foster energy transitions.

The role of gender in energy systems has been undervalued in the past. Yet, research has shown that norms and practices linked to gender have an impact on the development of policies, user systems and energy technologies, and that this can lead to the implementation of inefficient and excluding energy solutions. One central issue is that, often energy policies and technologies are assumed to be gender neutral when, in fact, they are gender blind. This means that they neglect the differential impacts on genders as well as socio-economic and cultural groups. Consequently, policies and technologies are less effective and may have unintended effects, hindering transitions to more sustainable energy systems.

Social science research on user adaption of energy technologies, including gender research, is often ignored when designing new energy interventions. This new international collaboration sets out to bridge this gap between research and practice. We carry out comparative studies between the participating countries starting from three main questions:

1 What "best practices" can we learn from earlier work on gender aware policy and technology interventions?

2 What cultural and material barriers exist within today's energy institutions that hinder the formulation and implementation of inclusive and gender-aware policies and technologies?

3 How can we use gender perspectives when designing energy technologies and user solutions to ensure they are inclusive and effective?

In addition, we publish educational materials, design new evaluation methods, and develop models and prototypes for new technology and user support. We also gather data to fill the gaps that exist concerning gender. Through stakeholder workshops with the energy policy and industry communities, we aim to find ways to solve the problems that are identified during the course of the project.

The work is led by Chalmers University in Sweden.

Major achievements during 2022/23

The Task has published several case studies applying gender perspectives to national energy and climate policies, energy consultants, smart grid development and energy entrepreneurship. These case studies were written by National Experts Beatrix Hausner and Azadeh Badieijaryani (Austria), Sylvia Breukers (Netherlands) and Martin Hultman, Kavya Michael, Helene Ahlborg and Oluafan Osunmuyiwa (Sweden).

Australian National Expert Reihana Mohideen and Task Leader Anna Åberg published a White Paper as part of their work with the Institute of Electrical and Electronics Engineers (IEEE) to develop **Gender Equality and Social Inclusion standards for digital technology development.**

Dutch National Expert Joy Clancy led the work requested by the Committee on Women's Rights and Gender Equality (FEMM Committee) of the European Parliament to make a gender impact assessment of the Fit4Fiftyfive Package (the package of legislation proposed by EU Commission to meet the EU's 2030 climate goals). Kavya Michael from Chalmers was a reviewer and Marielle Feenstra contributed as an expert. This work is a part of bringing the results and research of the task to EU policy makers.

National Experts Helene Ahlborg and Kavya Michael contributed to the first report on the results of the **OECD EPIC household survey,** to be published in June 2023.

Through a series of public and internal workshops, Boid AB, Sweden has used norm-creative design to develop a household planner that incorporates perspectives from gender research. Transitioning to sustainable energy use and addressing gender inequality in households requires a focus on responsibility and planning. The proposed household planner is designed to create an inclusive way of planning household contributions to sustainable energy use by focusing on everyday activities and diverse people using electricity as well as making information visible and central in the home.

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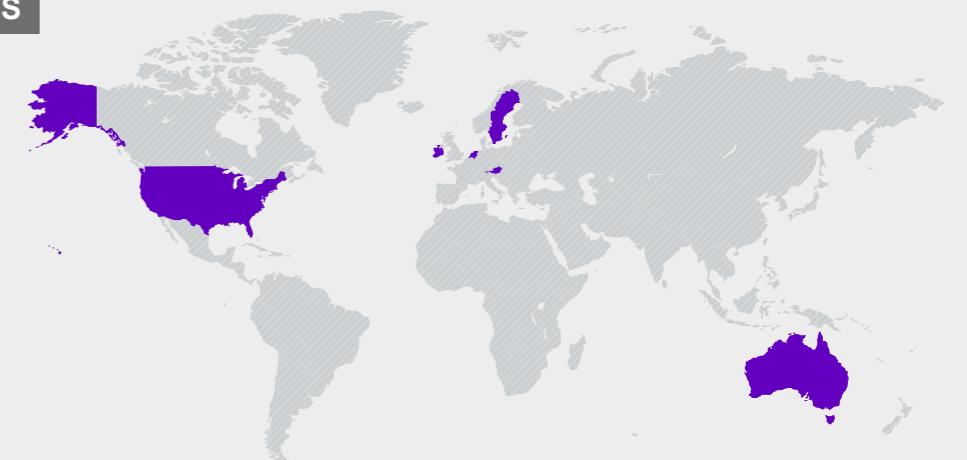
The aim of the Users TCP Task 'Social License to Automate 2.0' (SLA 2.0) is to provide in-depth knowledge and stakeholder-specific recommendations on how to promote user acceptance and the granting of a social license to automate in the context of DSM programs.

The Task builds on the identified research gaps from the previous Users TCP Task 'Social License to Automate', in particular regarding the role of user-diversity in flexibility potentials, the contribution potential of energy communities (ECs) to the granting of a social license in order to facilitate upscaling, and the identification of flexibilities via consumption profiles to allow more targeted invitations to participate.

The central objectives of SLA2.0 are:

1 To analyse the role of gender and diversity factors in energy consumption flexibility, identification of gender- and diversity-specific individual and collective engagement approaches, and development of a gender-and diversity-sensitive engagement framework for automated demand-side management (DSM).

2 To analyse the technical characteristics, opportunities provided by different forms of energy communities, and individual and social context of community energy approaches, and thematic clustering of community energy approaches with a qualitative assessment of contribution potential based on social, technical, and economic factors.

3 To identify the consumption profile markers that can indicate existing flexibilities of users to support the identification of target groups via load profiles and definition of data quality criteria to enable the deduction of flexibility potentials based on load profile data

4 To expand the social license concept with regard to more inclusive and community-oriented approaches as well as development of stakeholder-specific recommendations on flexibility profile-based engagement approaches and use of community energy projects to reach more diverse user groups and increase adoption and scalability.

Major achievements during 2022/23

Having started in November 2022, the Task began a literature review on the role of gender and diversity factors in flexibility, looking at motivations and preferences for participation in demand-side management programmes, factors impacting household consumption and flexibility, the role of household dynamics, and the impact of different technologies on actively addressing household energy challenges. Through the application of a diversity perspective with a focus on gender, age and class, the team is analysing how different social categories interact with these aspects and best practice examples regarding engagement approaches are being identified. The methodology for analysing national case studies is currently being defined considering core research questions to be pursued and available data in the participating countries.

The Task is developing a methodology to characterise the technical, economic, social and organisational context of energy communities that exist and/or piloted in diverse countries, including Austria, Switzerland, Netherlands, Australia. Through clustering, energy community typologies are being developed based on their essential characteristics (e.g., mode of initiations, actors initiating the energy community, financing options and ownership, social and economic values they hold, existing distributed energy resources, governance models). The typologies will provide insights about the community context and will show how they contribute or hamper the granting of a social license to automate. The work will link typologies to issues such as legitimacy, credibility and trust and explore opportunities, key frictions and misalignments in the governance of resources in energy communities.

The Task started collecting data from national and international projects on households' load profiles as well as socio-economic and living situation related information. Based on data availability, a proposed methodology for analysing these datasets is in development and will be further discussed in the context of a workshop. The outcome of this analysis will be an assessment of user flexibility via the identification of consumption profile markers.

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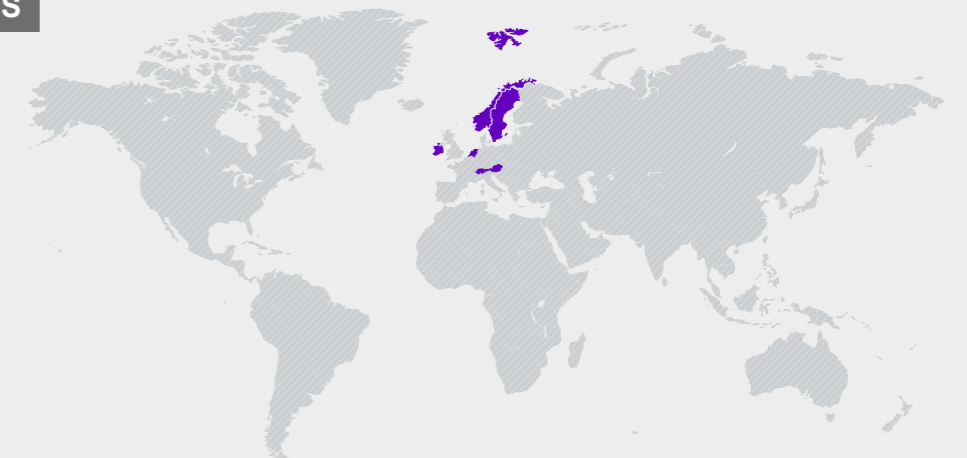
Engage4Energy: public engagement in the development of energy infrastructure as a crucial step towards acceptance and acceleration of the energy transition

The energy transition is changing the way energy is generated, distributed and stored. This has an impact on people and nature all over the world. In this context, public engagement is crucial to ensure that society's opinions, needs, and concerns are considered to enable a truly just and inclusive transition.

In this Task, to be launched in March 2023, we gather information on challenges and drivers of public participation, as well as best practices for the effective involvement of citizens and communities in energy infrastructure developments. The Task focuses on renewable energy production and electricity transmission and distribution.

This Task will deliver a set of good practice guidelines, including a support tool to help decision-makers determine which stakeholders to engage with, at what point in the process and with which engagement formats. The outputs will benefit practitioners who implement energy infrastructure projects, as well as policymakers, who develop policies and plan investments for the energy transition.
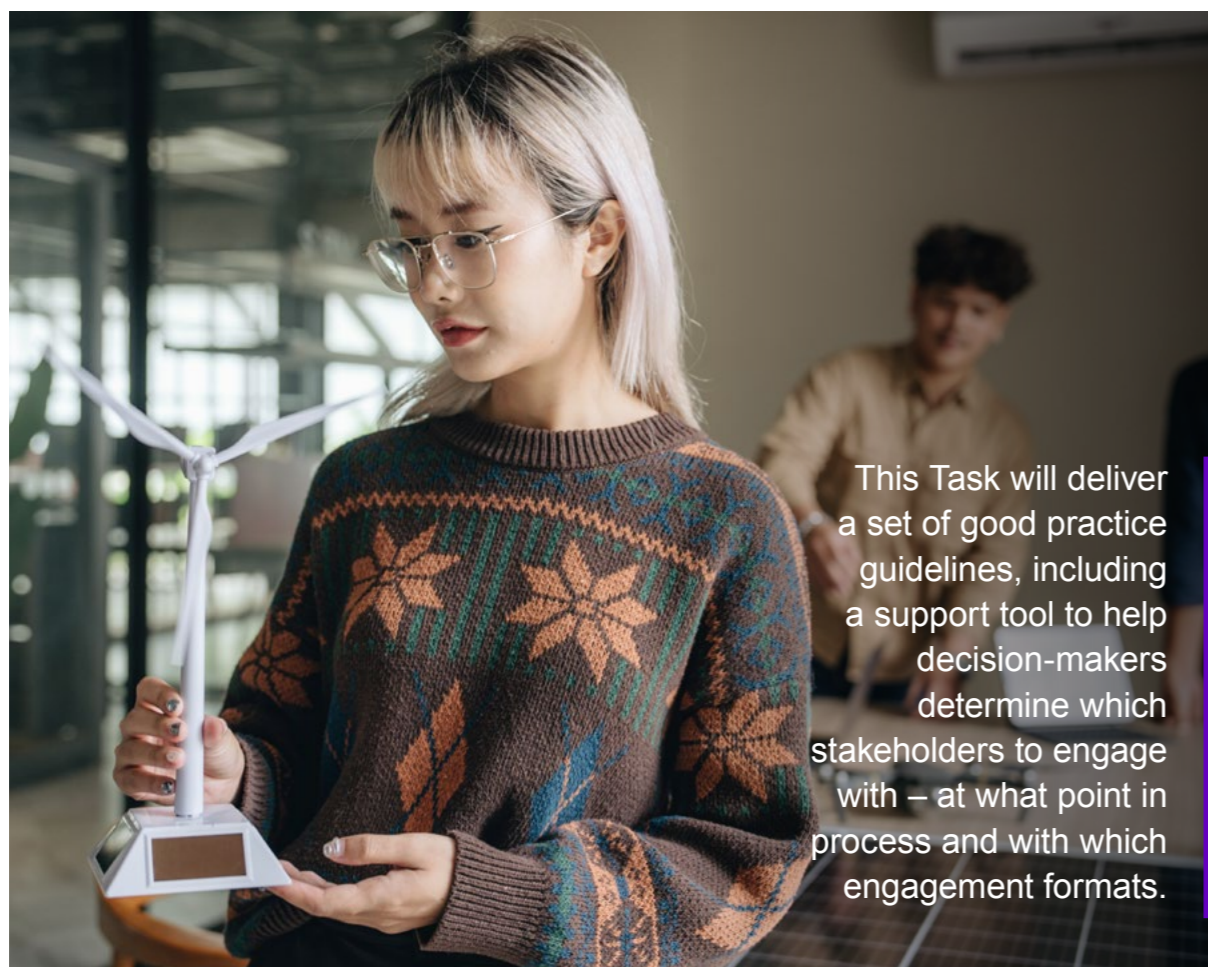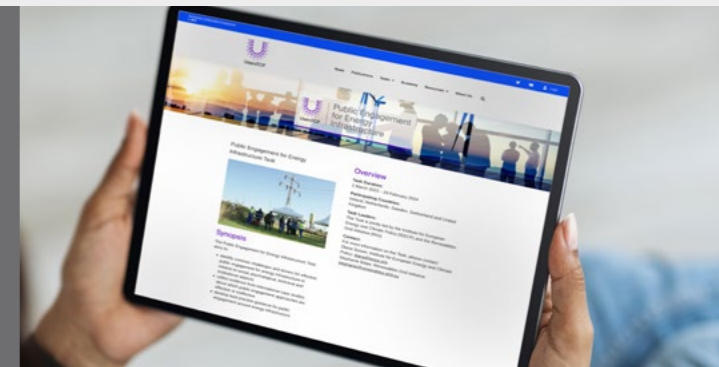
> This Task will deliver a set of good practice guidelines, including a support tool to help decision-makers determine which stakeholders to engage with – at what point in process and with which engagement formats.

Forward look for 2023

Task to be launched in March 2023. You can find further information on our webpage **here**.

In spring, a **comprehensive literature review**, as well as **expert interviews** will explore different perspectives on public engagement within energy infrastructure development projects.

In summer, first results will be presented at the General Conference of the European Consortium for Political Research (ECPR).

In autumn, the Task leaders will hold a **stakeholder workshop** to collect and discuss good practices of public engagement in energy infrastructure projects.

Call for participation!

If you are a project developer in the energy field engaging with the public in infrastructure projects or you have been engaged as a stakeholder in consultation processes, please **contact us** if you wish to participate in our network of interested parties.

PARTICIPANTS

Ireland

Netherlands

Sweden

Switzerland

United Kingdom
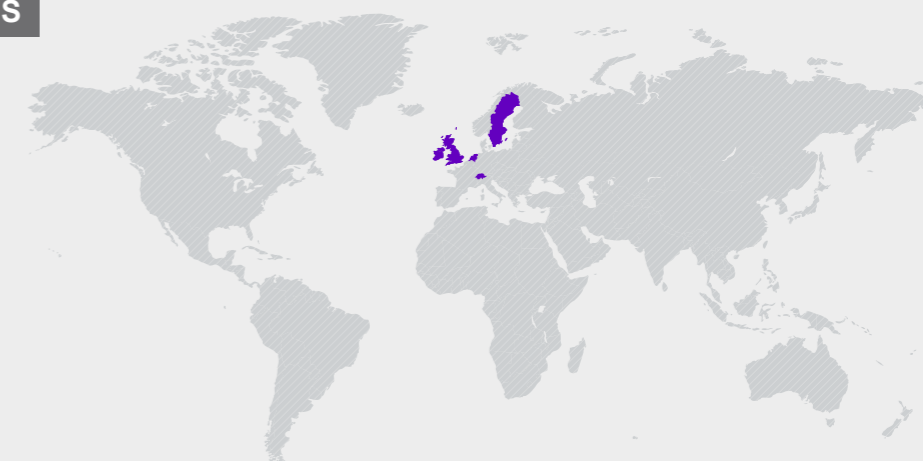
TCP Collaboration & Coordination in 2022/23

We are active participants in cross-TCP coordination groups and seek out opportunities for joint research

›	The Users TCP Chair contributed a chapter to joint IEA-TCP report **"Technology and innovation pathways for zero-carbon-ready buildings by 2030. A strategic vision from the IEA Technology Collaboration Programmes"**, published in September 2022

›	Our Chair represents the Users TCP at the IEA Buildings and Integrated Electricity Systems Coordination Groups (BCG and IESCG)

›	Our Chair participated in the **IEA EBC Future Buildings Forum** in October 2022

›	The Hard-to-Reach Task is working with EBC Task 79 on a publication on energy sufficiency

Collaboration with the IEA

We continue to work closely with the IEA secretariat across a number of areas:

›	The Users TCP Chair chaired a session, and two Users TCP Task Leaders presented their work at the **IEA special workshop on reducing energy demand with behaviour and awareness campaigns** of the IEA Energy Efficiency Working Party in September 2022

›	Our Chair sits on the advisory committee to the IEA's **Our Inclusive Energy Future: The Global Commission on People-Centred Clean Energy Transitions**

›	Our Chair sits on the consultative group for the IEA's Digital, Demand-Driven Electricity Networks Initiative (**3DEN**) project

›	We disseminate the IEA's Experts' Group on R&D Priority Setting and Evaluation (**EGRD**) documents through the Users TCP website

›	We contributed material to the **2022 Energy Efficiency Market Report**

›	The IEA Secretariat presented at the **December 2022 Users TCP Academy session**

›	We are co-developing a new Task on effective campaigns, that we hope to launch in 2023.

OECD Household Attitudes survey

During 2022/23, we worked with the OECD and IEA to analyse the energy-related data gathered during 2022 on household attitudes to pro-environmental behaviours and policy options. We co-funded data gathering in countries include TCP members Belgium, Canada, Netherlands, Sweden, Switzerland, the UK and the United States, as well as France and Israel. Our work analysing the data is led by Chalmers University, Sweden, the Task Leaders for the Gender and Energy Task. The energy report will be published in 2023.

User-Centred Energy Systems Academy

10 more webinars were added to the UsersTCP Academy knowledge base from March 2022 to February 2023, hosted by the European Copper Institute on their YouTube channel Leonardo Energy

Links to the video and presentation slides for these webinars can be found on the Academy page of the UsersTCP website: **https://userstcp.org/academy**

2022

March
How can energy standards help to promote Gender Equality and Social Inclusion?
PRESENTERS Reihana Mohideen (Australia), Greg Adamson (IEEE) and Anna Åberg (Sweden)

April
The tokenization of energy assets – The jump starter for decentralized energy markets
PRESENTER Kai Siefert (Managing Director of Riddle & Code Energy)

May
Project LEO – understanding the power of flexibility in a smart local energy system
PRESENTERS Saskya Huggins (Low Carbon Hub) and Charlotte Hewes (SSEN)

June
How are energy communities/districts contributing to energy transition?
PRESENTER Selin Yilmaz (Senior Researcher and Teaching Fellow @University of Geneva)

September
Energy Retrofits: The One Stop Shop as a solution to Consumer Hesitancy and Supply Chain Growth in Ireland
PRESENTER Josephine Maguire (Strategic Energy Authority of Ireland)

October
Passing a social tipping point: why achieving consensus on climate action just got a lot harder and what it means for the energy transition
PRESENTER David Shipworth (Chair, Users TCP)

November
Gender, expertise and control in Dutch smart grid pilots. Interoperability of smart energy management and household management
PRESENTER Sylvia Breukers (DuneWorks, Netherlands)

December
Recent IEA Analysis from the Energy Efficiency Market Report 2022
PRESENTERS Nicholas Howarth and Emma Mooney (IEA)

2023

January
Taking the burn out of heating for low-income households
PRESENTER Louise Sunderland (Regulatory Assistance Project)

February
How an EU Renovation Loan can fill the finance gap for European homeowners
PRESENTER Peter Sweatman (Climate Strategy & Partners)

2022/23 Executive Committee and TCP Changes

Executive Committee

All member countries form the Executive Committee of the UsersTCP with one voting delegate from each country. In April 2022, the ExCo met face-to-face for the first time since October 2019, in Vienna, Austria. The ExCo met online in October 2022.

Delegate changes in 2022/23

Ireland appointed Daire McCoy in May 2022 as their alternate delegate replacing Mr Jim Scheer.

Mr Ben Copp replaced Ms Abla Hanna in June 2022 as **Canada's** primary delegate.

In July 2022 **Austria** appointed Ms Tara Esterl as their primary delegate. Tara replaced Mr Peter Illich.

New Zealand nominated Mr Osmond Borthwick as their alternate delegate in July 2022, replacing Mr Marcos Pelenur.

Mr Sangku Park became the alternate delegate for **Korea** in place of Mr Eunbin Choi In August 2022.

In September 2022, Marianne Karlsson became the primary delegate for **Sweden**, in place of Ms Carolina Ahlqvist.

A full list of member delegates at February 2023 is shown in Attachment 1.

Committee Structure

Day-to-day operations are overseen by the Executive Steering Committee, supported by the Finance Sub-Committee and the Strategy Working Group. During 2022/23, these comprised:

Executive Steering Committee
> David Shipworth, Chair, UK
> Gerdien de Weger, Vice-Chair Finance, Netherlands
> Josephine Maguire, Ireland
> Samuel Thomas, Head of Secretariat
> Vikki Searanke, Secretariat Support

Finance Sub-Committee
> François Brasseur, Belgium
> Simone Maggiore, Italy

Strategy Working Group
> Ben Copp, Canada
> Tara Esterl, Austria
> Daire McCoy, Ireland
> David Shipworth, UK
> Samuel Thomas, Head of Secretariat

Attachments

Attachment 1

User-Centred Energy Systems ExCo Delegates as at February 2023

Australia

Primary
TBA

Alternate
Mr Iain McGill
UNSW Sydney, NSW
E: i.macgill@unsw.edu.au

Austria

Primary
Ms Tara Esterl
AIT Austrian Institute of Technology
E: tara.esterl@ait.ac.at

Alternate
Ms Sabine Mitter
Federal Ministry of Climate,
Environment, Energy, Mobility,
Innovation and Technology (BMK)
E: Sabine.Mitter@bmvit.gv.at

Belgium

Primary
Mr François Brasseur
Federal Public Service Economy,
SPF Economie
E: Francois.Brasseur@economie.fgov.be

Alternate
Mr Geert Deconinck
KU Leuven – ESAT/Electa
E: Geert.Deconinck@kuleuven.be

Canada

Primary
Mr Ben Copp
Natural Resources Canada
E: Ben.Copp@nrcan-rncan.gc.ca

Finland

Primary
Mr Jussi Mäkelä
Business Finland
E: jussi.makela@businessfinland.fi

Ireland

Primary
Ms Josephine Maguire
Sustainable Energy Authority
of Ireland
E: josephine.maguire@seai.ie

Alternate
Mr Daire McCoy
Sustainable Energy Authority
of Ireland

Italy

Primary
Mr Simone Maggiore
Ricerca sul Sistema Energetico
(RSE S.p.A.)
E: Simone.Maggiore@rse-web.it

Alternate
Mr Marco Borgarello
Ricerca sul Sistema Energetico
(RSE S.p.A.)
E: marco.borgarello@rse-web.it

Netherlands

Primary
Ms Gerdien de Weger (Vice-Chair)
Netherlands Enterprise Agency
E: gerdien.deweger@rvo.nl

Alternate
Ms Nicole Kerkhof
Netherlands Enterprise Agency
E: nicole.kerkhof@rvo.nl

New Zealand

Primary
Ms Nina Campbell
Ministry of Business, Innovation
and Employment
E: Nina.Campbell@mbie.govt.nz

Alternate
Mr Osmond Borthwick
Ministry of Business, Innovation
and Employment
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Norway

Primary
Mr Even Bjørnstad
ENOVA SF
E: even.bjornstad@enova.no

Alternate
Mr Tor Brekke
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Republic of Korea

Primary
Mr Kwangon Kim (Kevin)
Korea Energy Agency
E: luciankim84@energy.or.kr

Alternate
Mr Sangku Park
Korea Energy Agency
E: skupark@energy.or.kr

Sweden

Primary
Ms Marianne Karlsson
The Swedish Energy Agency
E: marianne.karlsson@energimyndigheten.se

Alternate
Ms Helena Karresand
The Swedish Energy Agency
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Switzerland

Primary
Mr Markus Bareit
Swiss Federal Office of Energy (SFOE)
E: markus.bareit@bfe.admin.ch

Alternate
Mr Klaus Riva
Swiss Federal Office of Energy (SFOE)
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United Kingdom

Primary
Ms Emma Claydon
Department for Business, Energy and
Industrial Strategy
E: emma.claydon@beis.gov.uk

Alternate
Prof David Shipworth (Chair)
UCL Energy Institute
E: d.shipworth@ucl.ac.uk

United States

Primary
Ms Monica Neukomm
US Department of Energy
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Attachment 2

Energy Sector Behavioural Insights Platform
2022/23 Record of Activities & Participants

Publications in 2022/23

Date	Publication	Intended Audience	Location
March 2022	Energy Sector Behavioural Insights Platform - Progress report	Members	
May 2022	Finalised the toolkit	Public	Online here
September 2022	Energy Sector Behavioural Insights Platform - Progress report	Members	
October 2022	Finalised MOOCs and uploaded them on the toolkit	Public	Online here

Workshops & Conferences in 2022/23

Date	Conference	Intended Audience	Location
May 2022	Social Innovation in the Energy Transition (SIET) webinar	Public	Online
June 2022	The Energy and Climate Transformations conference	Public	University of Manchester, UK
September 2022	BEIS & OFGEM toolkit workshop	BEIS (behavioural science and policy teams working in the energy field)	Online
	IEA special workshop on Behaviour Change and Awareness Campaigns	IEA energy efficiency working group	Online
October 2022	Workshop at SBE22Delft	Public	Delft University of Technology

Management/Experts Meetings in 2022/23

Date	Conference	Intended Audience	Location
March 2022	BI Platform experts meeting: toolkit update, MOOCs structure, and dissemination activities	Members only	Members only
September 2022	EnR expert meeting: toolkit update, MOOCs update, Introduction to Phase 3	Members only	EnR members

Activities Planned for 2023/24

Date	Activity
August 2023	Secure Implementation partners for Phase 3 trials
December 2023	Design trials
August 2024	Implement trials
December 2024	Finalise data analysis and write-up
April 2025	Finalise guidebook for practitioners
Ongoing	Community building & talks

Participation

Countries participating in this Task are Canada, Ireland, Netherlands, United Kingdom and Switzerland.

The Task Leaders are **Jesper Akesson:** jesper@thebehaviouralist.com and **Ondrej Kacha:** ondrej@thebehaviouralist.com from The Behaviouralist.

🌐 Visit the Energy Sector Behavioral Insights Platform website **here**.

Global Observatory on Peer-to-Peer Trading Task
2022/23 Record of Activities & Participants

Publications in 2022/23

Date	Publication	Intended Audience	Location
July 2022	Peer-to-peer, community self-consumption, and transactive energy: A systematic literature review of local energy market models	Public	Read here
September 2022	Defining Peer-to-Peer Energy Trading, Community Self-Consumption and Transactive Energy models: Concept Definition Paper	Public	Read here
December 2022	Peer-to-Peer Energy Trading Task Force- DLT Standardisation Efforts in Peer-to-Peer Energy Trading Applications: Expert Interviews and Lessons Learned	Public, standardisation bodies	Read here

Workshops & Conferences in 2022/23 (including webinars)

Date	Conference	Intended Audience	Location
June 2022	Fifth GO-P2P meeting	Public (day 1), GO-P2P participants (day 2)	Online
February 2023	Sixth GO-P2P meeting	Public (day 1), GO-P2P participants (day 2)	Cork, Ireland

Collaborations with IEA Secretariat, Other TCP's or International Organisations

Date	Conference/Publication	Intended Audience	Location
June 2022	Collaboration with IEA 3DEN team re policymaker decision tool	3DEN and UCL	

Activities Planned for 2023/24

Date	Activity
May 2023	Webinar on pilots GO-P2P plans to collect data on

Participation

Countries participating in this Task are Australia, Belgium, Ireland, Italy, Netherlands, New Zealand, Switzerland, United Kingdom and United States.

The Task Leader is **Anna Gorbatcheva:** GO-P2P@userstcp.org from University College London.

🌐 Visit the Global Observatory on Peer-to-Peer Trading website **here**.

Attachment 2

Hard-to-Reach Energy Users Task

2022/23 Record of Activities & Participants

Publications in 2022/23

Date	Publication	Intended Audience	Authors
June 2022	Process matters: Assessing the use of behavioural science methods in applied behavioural programmes	Public, researchers, policy makers, programme managers	eceee summer study proceedings Online **here**
	Piloting Home Energy Assessment Toolkit (HEAT Kits) to empower hard-to-reach energy users.	Public, researchers, policy makers, programme managers	eceee summer study proceedings Online **here**
August 2022	eceee Study proceedings - To what extent has COVID-19 impacted hard-to-reach energy users?	Public, industry	Online **here**
October 2022	Hard-to-reach energy users: A literature review	Public, researchers, policy makers, programme managers	Online **here**
	International research on energy hardship programmes	Public	Online **here**

Workshops & Conferences in 2022/23

Date	Conference	Intended Audience	Location
June 2022	eceee Summer Study	Public	Online
	2nd national expert workshop, France	Public	Online
August 2022	Hidden hardship #1, Wellington	Invited stakeholders	Online
September 2022	IEA EE Working Party special meeting	Public	Online
November 2022	BECC conference	Public	Online
	OERC conference	Public	Online
	Hidden hardship #2, Auckland	Invited stakeholders	Online

Management/Experts Meetings in 2022/23

Date	Conference	Intended Audience	Location
March 2022	New Zealand stakeholder workshop	Policy makers	
Monthly	US expert meetings (online)	US funders and project partner	
Quarterly	Energy Hardship Reference Group	NZ stakeholders	

Collaborations with IEA Secretariat, Other TCP's or International Organisations

Date	Activity	Intended Audience
September 2022	IEA EE Working Party special meeting	Presentation
	Gender Task	Contributed to their ten recommendations
	ERANZ (Electricity Retailers Association NZ)	Evaluated their EnergyMate pilot
December 2022	Franklin Energy	US utility
	Former Annex 66 by EBC	Co-authored Nature Climate Change paper on sufficiency
Ongoing	Fuel Poverty Research Network	Presentations, co-authorship
	Fuel Poverty Research Network	Funders, NEs
	See Change Institute	US Project Partners, sub-contracts
	Uplight	US energy providers
	MBIE Energy Hardship Reference Group	NZ stakeholder group called by Ministry of Business, Innovation & Employment
All year	Mercury & Genesis Energy	Hidden hardship research with two largest retailers in NZ

Activities Planned for 2023/24

Date	Activity	Intended Audience
March 2023	3rd National Expert meeting in Wellington	Public
April 2023	Finalise field research pilots: HEAT kits and Hidden Hardship	Experts
May 2023	Proposal for Phase 2, present in Nova Scotia	Vulnerable
July 2023	Finalise country reports for Phase 1	SMBs
November 2023	BEHAVE conference	Public
Under revision	Publish Cross-Country Case Study Comparison in ERSS	Public

Participation

Countries participating in this Annex are New Zealand, Sweden and United States.

The Task Leader is **Dr Sea Rotmann:** drsearotmann@gmail.com from Sustainable Energy Advice Ltd, New Zealand.

🌐 Visit the Hard-to-Reach Energy Users Task website **here**.

Gender & Energy Task

2022/23 Record of Activities & Participants

2022/23 Record of Activities & Participants

Date	Conference	Intended Audience	Location
March 2022	Revez, Alexandra, et. al. . "Climate Action and the Local Authority Development Plan". OPR Case Study Paper CSP05. Office of the Planning Regulator. Dublin	Planners, Policy makers	Online **here**
May 2022	2nd Task newsletter	Academic	Online **here**
June 2022	Breukers, Sylvia., Boekelo, Martin. & Oberti, Benedetta: Gender, expertise and control in Dutch residential smart grid pilots. ECEEE summer study	Academic	Online **here**
	Foulds, C., et. al, including Dunphy N. from the gender and energy task: An agenda for future Social Sciences and Humanities research on energy	Academic	Online **here**
July 2022	Osunmuyiwa, O. and Ahlborg H. : "Stimulating competition, diversification, or re-enforcing entrepreneurial barriers? Exploring small-scale electricity systems and gender-inclusive entrepreneurship" in Energy Research & Social Science	Academic	Online **here**
Nov 2022	White paper: Mohienne, R., Åberg A. and Mareels, I. Gender and Technology: The Case of the Energy Sector	Policy, academic, public	Online **here**
	Hauser. B, Badieijaryani, A. et. al.: Austria's Integrated Energy and Climate Plan. A critical analysis	Public (German)	Online **here**
	ÖGUT Factsheet: Creating energy technologies, that are meaningful and usable for all	Public (German)	Online **here**
December 2022	Hauser. B, Badieijaryani, A: State of the art of German literature: Engendering energy policy	Policy, academic	Online **here**
	Hauser. B, Badieijaryani, A. et. al. Case study on Energy Consulting in Austria	Policy, academic	Online **here**
	Dunphy, N. P., & Lennon, B.. Whose Transition? A Review of Citizen Participation in the Energy System. Routledge Handbook of Energy Transitions, 430-444.	Academic & broader	London, Routledge
January 2023	Breukers et. al. : What is the Problem that Smart Home Technologies Solve? Commentary on the Buildings & Cities special issue 'Energy, Emerging Technologies and Gender in Homes'.	Academic & broader	Online **here**
	Osunmuyiwa, O et. Al: Dismantling Power and Bringing Reflexivity into the Eco-modern Home. Commentary on the Buildings & Cities special issue 'Energy, Emerging Technologies and Gender in Homes'.		London, Routledge

Management/Experts Meetings in 2022/23

Date	Conference	Intended Audience	Location
March 2022	Subtask 3 meeting		
May 2022	Subtask 2 meeting		
June 2022	Internal Workshop		
August 2022	Management meeting		
October 2022	Normcreative technology workshop with Boid		

Collaborations with IEA Secretariat, Other TCP's or International Organisations in 2022

Date	Publication	Intended Audience	Location
November 2022	Report prepared for FEMM Committee of European Parliament: The Gender Dimension and Impact of the Fit for 55 Package	European Parliament, European Commission, Policy Makers, Public	Online
Ongoing	JPI Climate and MAGICA	Policy, research	Vienna, Austria
Ongoing	Public Engagement for Energy Infrastructure Task (Irish Partners alongside Dr Evan Boyle and Aiofe Deane from MaREI UCC)	Policy, research	Online
Ongoing	IEEE Gender, Equality and Social Inclusion working group on standards	IEEE members, research policy	Online

Activities Planned for 2023/24

Date	Activity	Intended Audience	Location
March 2023	Management meeting	Task members	Online
April 2023	International Research about the energy transition in the built environment. Organised by RVO. Marielle Feenstra speaking.	Innovation experts from research institutes, education and industry	Utrecht NL (also online)
	Publication: Paper by Duneworks and Boid in collaboration with Aalborg University in EIST Special issue on socio-technical transitions and behaviour/practices	Public	Sweden/ Netherlands
April– September 2023	Iteration of design concept and user tests, Boid	Public	Gothenburg
May 2023	Applied workshop on future-oriented engagement tools feeding into co-created interactive tool kit. Online	Multiple stakeholders	Online **here**
May 2023	Hybrid conference on concepts and ethics of SSH and climate change in Graz, Austria	Multiple stakeholders	Online **here**
June 2023	Management meeting	Task members	Online
	6th European Climate Change Adaptation Conference- ECCA 2023: Actionable Knowledge for a Climate Resilient Europe; Dublin Castle, Ireland	Academic, Artists, Policy Makers	Online **here**
August 2023	Publication: Report on state of the art and good practices	Policy, Academic and public	
December 2023	Where are we now? Where do we want to go? How do we get there? Workshop linked to Joy Clancy's Farewell Symposium	Researchers from Global South & North on gender and energy	Enschede, \ Netherlands (also online)
In review	Publication: Ahlborg, H., Michael, K., Unsworth, S., Hategekimana, S., Osunmuyiwa, O., Åberg, A. and Hultman, M. "Inclusive energy transitions from a power and policy perspective – reviewing the uptake and marginalization of critical social science in scholarship on energy users"		
	Celtic Interconnector: Opportunities and challenges symposium in UCC	Multiple stakeholders	Online **here**
Spring 2023	Publication: Policy briefs based on the research of the task	Policy, Academic and public	
Fall 2023	Policy workshop organised together with the Swedish Energy Agency	Policy makers	
January 2024	Final workshop in Vienna	Public and Academic	Vienna, Austria

Participation

Countries participating in this Task are Australia, Austria, Ireland, Netherlands, United States and Sweden.

The Task Leader is **Anna Åberg, Chalmers University of Technology:** anna.aberg@chalmers.se.

🌐 Visit the Gender & Energy Task website **here**.

Attachment 2

Social License to Automate Task 2.0
2022/23 Record of Activities & Participants

Management/Experts Meetings in 2022/23

Date	Conference	Intended Audience	Location
November 2022	First Task Meeting (Kick-Off)		Online

Collaborations with IEA Secretariat, Other TCP's or International Organisations

Date	Activity	Intended Audience	Location
March 2023	Start of collaboration with IEA 3DEN	Policy makers	Online (report)

Activities Planned for 2023/24

Date	Activity	Intended Audience	Location
March 2023	Task Meeting 2		
June 2023	Task Meeting 3		
September	Task Meeting 4		
Summer 2023	Continue collaboration with IEA 3DEN	Policy makers	Online (report)
TBD	Presentation of literature review results	Scientific audience and practitioners	TBD (potentially EnR Behave 2023, Maastricht)
July 2023	Presentation of energy community clustering typology and results	Scientific audience and practitioners	IAEE 2023, Milan (conference paper)
Jan 2024	Presentation of flexibility profiles results	Scientific audience	TBD
Oct 2023	UsersTCP Academy Webinar		Online

Participation

Countries participating in this Task are Austria, Netherlands, Norway, Sweden, and Switzerland.

The Task Leaders are **Lisa Diamond:** Lisa.Diamond@ait.ac.at from AIT Austrian Institute of Technology and **Andrea Werner:** andrea.werner@technikum-wien.at from University of Applied Sciences, Vienna.

🌐 Visit the Social License to Automate Task website **here**.

About the International Energy Agency (IEA)

The IEA is at the heart of global dialogue on energy, providing authoritative analysis, data, policy recommendations, and real-world solutions to help countries provide secure and sustainable energy for all.

The IEA was created in 1974 to help co-ordinate a collective response to major disruptions in the supply of oil. While oil security remains a key aspect of their work, the IEA has evolved and expanded significantly since its foundation.

Taking an all-fuels, all-technology approach, the IEA recommends policies that enhance the reliability, affordability and sustainability of energy. It examines the full spectrum issues including renewables, oil, gas and coal supply and demand, energy efficiency, clean energy technologies, electricity systems and markets, access to energy, demand-side management, and much more.

Since 2015, the IEA has opened its doors to major emerging countries to expand its global impact, and deepen cooperation in energy security, data and statistics, energy policy analysis, energy efficiency, and the growing use of clean energy technologies.

IEA Technology Collaboration Programmes

The Technology Collaboration Programme supports the work of independent, international groups of experts that enable governments and industries from around the world to lead programmes and projects on a wide range of energy technologies and related issues. The experts in these collaborations work to advance the research, development and commercialisation of energy technologies. The scope and strategy of each collaboration is in keeping with the IEA Shared Goals of energy security, environmental protection and economic growth, as well as engagement worldwide.

The breadth of the analytical expertise in the Technology Collaboration Programme is a unique asset to the global transition to a cleaner energy future.

These collaborations involve over 6 000 experts worldwide who represent nearly 300 public and private organisations located in 55 countries, including many from IEA Association countries such as China, India and Brazil.