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Gender  
and  
Energy

# Gender, expertise and control in Dutch residential smart grid pilots

User-centred Energy Systems Academy

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Empowering all: Gender in policy and implementation for achieving transitions to sustainable energy. <https://userstcp.org/task/gender-energy-annex/>

## Identified gaps and barriers

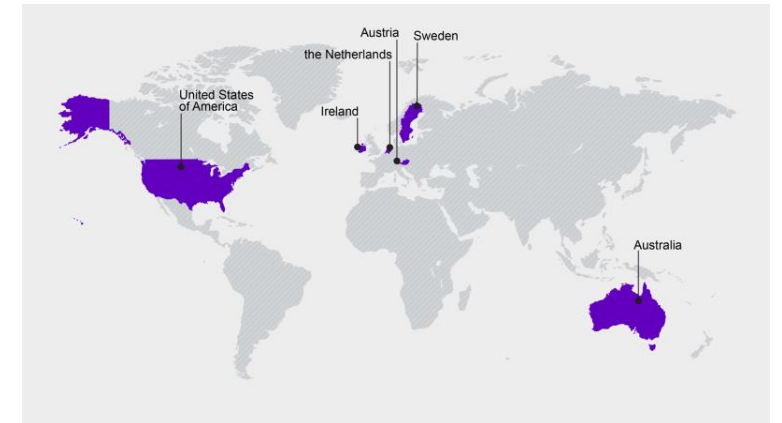
- The research – policy gap
- The policy – implementation gap
- Gender blindness in technology design
- Gender blindness and user blindness are connected

**Lead:** Chalmers University Sweden

**Other participating countries:** Austria, UK, Australia, USA, Netherlands, Ireland, Denmark

**Aims:** analyse energy policy and technologies from gender perspectives and provide recommendations for policy design and implementation

**Duneworks:** Case study in NL on Gender and Smart Grid technology – based on our work for 2 H2020 projects



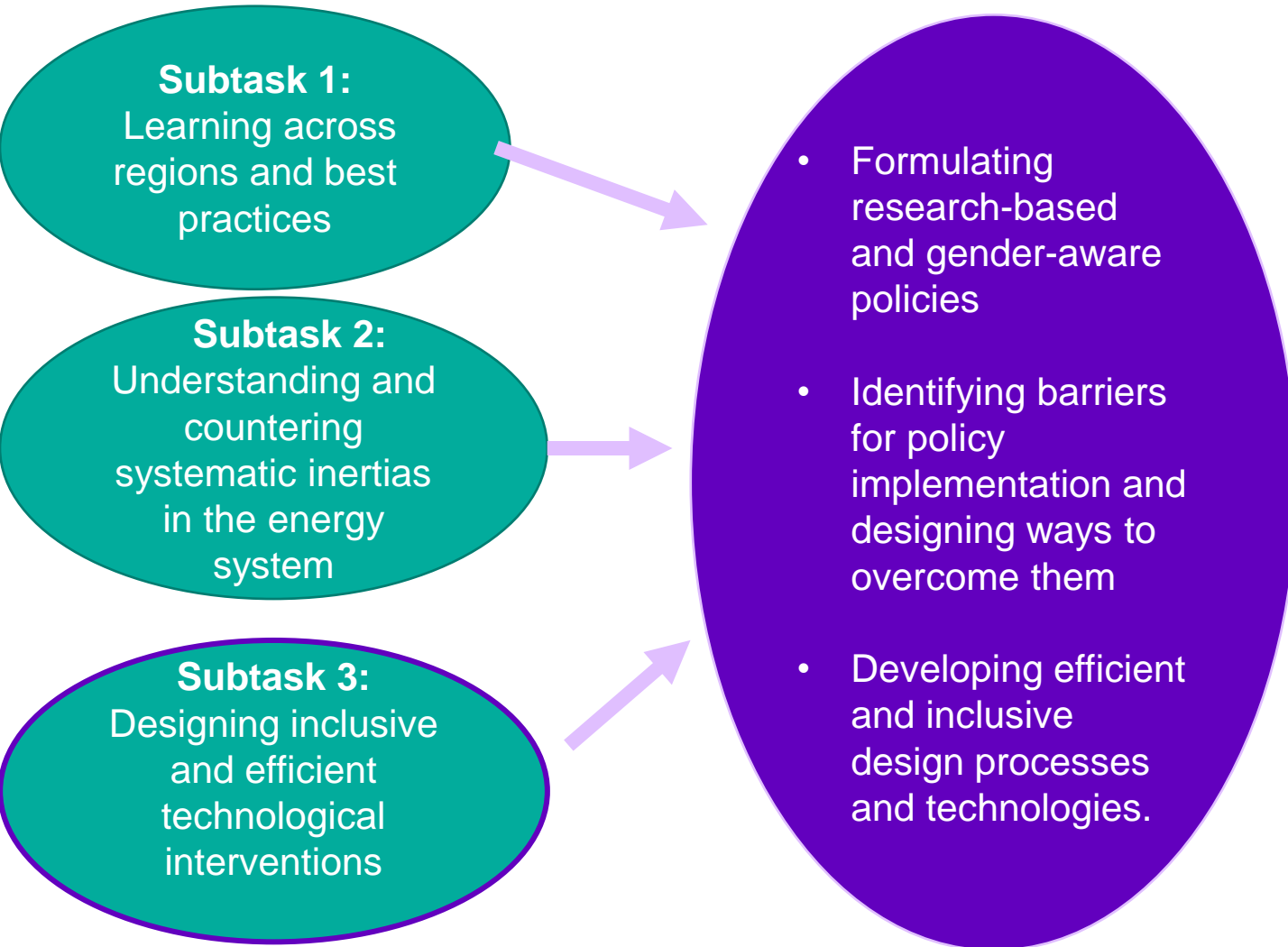


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# IEA G&E Task: organization of the work



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## Some milestones:

### Policy analysis tool to identify gender aware energy policy

- Fact sheet for technology developers providing guidelines for gender aware design
- A prototype for a household interface for energy planning developed using a norm creative process
- Technology workshops with designers
- Support to the 2022 OECD Greening Household Behaviour Survey on gender aware design

### Upcoming:

- Literature review on existing literature on gender, policy and energy use (2 articles forthcoming)
- Policy briefs for the participating countries
- Published case studies
- Policy workshops



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# Why gender?



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## **Gender:**

*“the socially constructed differences between what is considered masculine and feminine, and the corresponding roles (unlike sex which refers to biological differences)”*

## **Relevance:**

- Household practices: gendered
- Impact on effectiveness of flexibility arrangements
- Distributional impacts

**How do people experience the introduction of smart energy systems in their homes?**

**How do residential smart grid developments affect and how are they affected by household practices?**



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# What is a smart grid?



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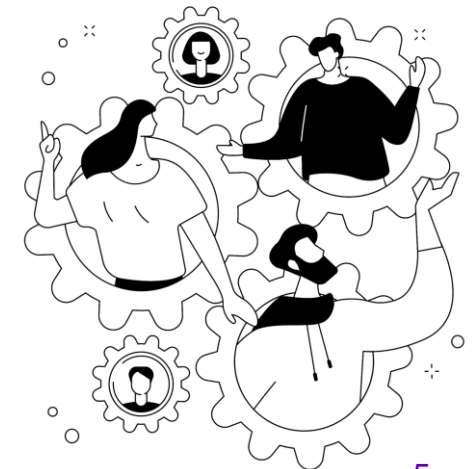
**A technical definition: an all-in-one type of solution that includes:**

- Energy monitoring and management systems (EMS)
- Renewable Energy Systems (RES)
- Other decentralised appliances such as heat pumps
- Storage systems (such as EV; batteries)
- Smart contracts and technologies
- Smart apps and interfaces

**A socio-technical definition: smart grids as a process:**

Networks (in the making), characterised by 'both information and energy flows, in order to control practices of distributed generation, storage, consumption and flexible demand' (Wolsink, 2012, p.824).

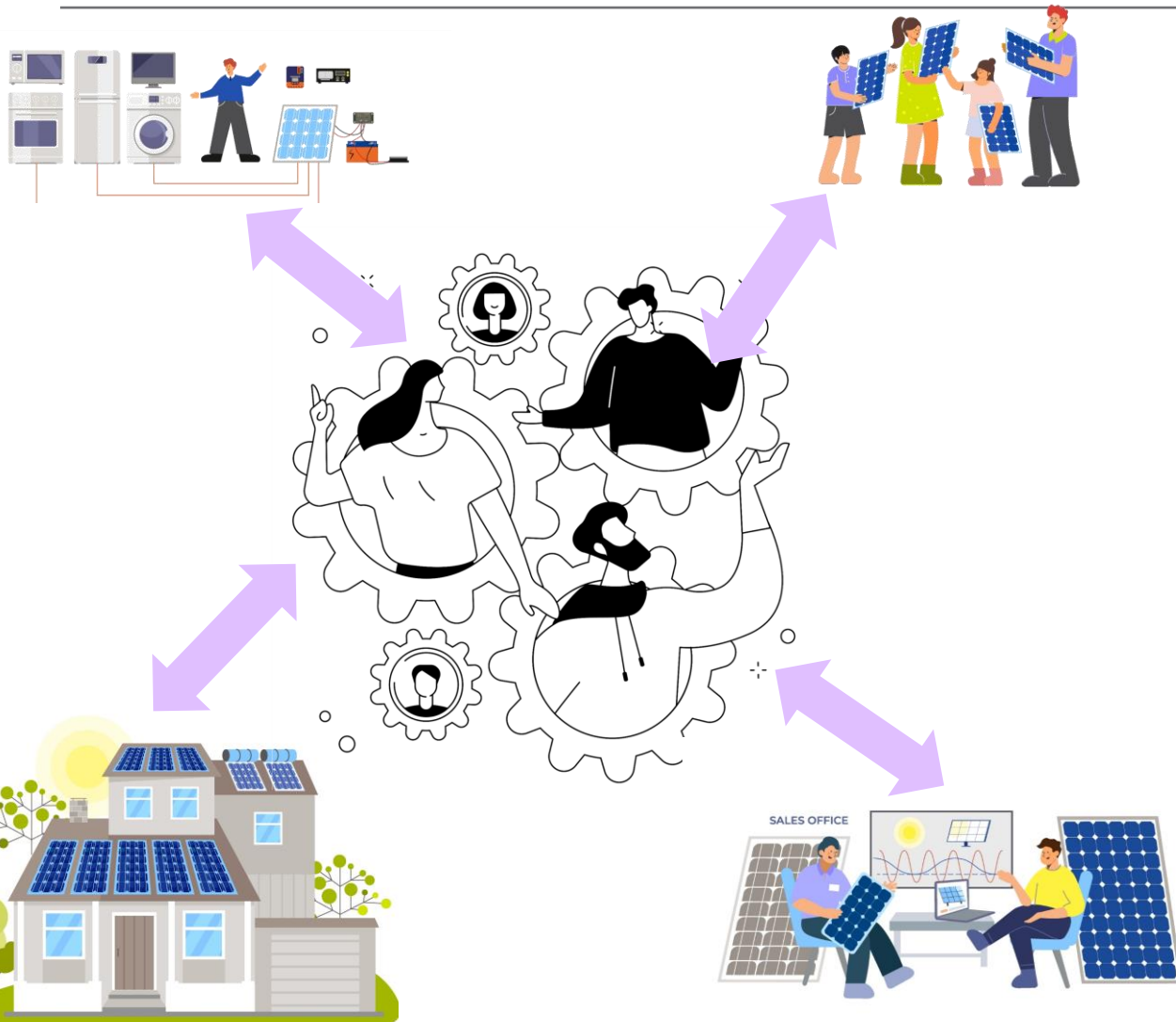
Understanding smart grids as socio-technical systems in the making to open up discussions about how these new practices are imagined and how control is envisaged.





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# Household management ↔ Energy management



## Who does what?

- Material and cognitive housekeeping
- Digital and technical (maintenance) housekeeping
- Interest and expertise

How does interest in and expertise about residential smart grids build up for different members of the household?





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# What, why and how



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## What:

- Introduction of smart grids in homes and communities and how it affects dynamics within households and within the community

## Why:

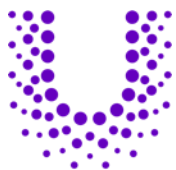
- Improve our understanding of how residential smart grid configurations shape & challenge (and are shaped and challenged by) everyday practices
- In view of a more citizen and community-centred energy transition: learn how residential smart grid configurations can contribute to community values
- Learn how to improve the effectiveness and attractiveness of SG configurations

## How: analytical lens:

- Build-up and concentration of smart grid interest and expertise;
- In relation to experienced **control, comfort, safety and trust** (lived experiences and emotions)

Analysis of empirical data on experiences with smart grid deployments in 2 Dutch pilots based on interviews, workshops and focus groups

- **What are the gendered experiences related to the build-up of smart-grid related interest and expertise?**
- **To what extent is smart grid expertise (likely to become) concentrated with one person within the household?**
- **What are the gendered experiences related to comfort, control, safety, and trust (in the technology and the technology providers)?**



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# Residential smart grid pilots:



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## SchoonSchip (Amsterdam)

30 arks; 46 households. Participants: mostly living as two-gendered couples, children living with them. Progressive urban residents, DIY attitude and lifestyle. Circularity; strong sense of community; idealistic.

Solar pv; home batteries; heat pumps; one connection to the grid; sandbox; allowed to act as e-supplier within the community. Aim: energy neutrality, self-consumption, and connect to other smart grid communities in the neighbourhood

- 5 interviews (resident; municipality; DSO, 2 technology providers); 2 focus groups (13 residents) (2021);



## De Wals / Voorhout

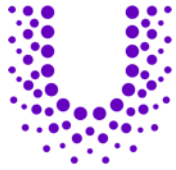
33 homes; participants were mainly pensioners. Most of them moved into the senior homes because of the characteristics of the homes and surroundings (not because of the SG).

Solar pv; home batteries; heat pumps; (EV & charging poles; collective battery). insulation, passive/active cooling, and some additional smart home features like automatic or remote-controlled air circulation and a Velux window as safety valve for air quality. The buildings were designed to be energy net-positive.

10 interviews with residents; 3 interviews with technology providers; 1 workshop with residents (2021); 2 focus groups with 11 residents (2022);







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# Findings - SchoonSchip



*“My first feeling is that of failure, I feel it is my responsibility because others can do it and I cannot.”*

*“I am ‘forced’ to deal with the digital stuff in our home, but I also don’t know much about it. And when I find out such things (underperforming battery), then I think: why is this not generally known here?”*

- Few respondents that are energy-and digitally skilled
- Experienced control: expressed need for tailored support (from detailed data to rules-of-thumb)
- Feeling incompetent – withdrawal/ increase in lack of interest/expertise
- Not-acknowledging own build-up of knowledge
  
- **Accumulation and concentration of smart-grid related interest and expertise** – uneven patterns, somewhat gendered
- **Digital – material housekeeping** – gap, somewhat gendered
- **Experiences of control, comfort, safety and/or trust** – not very strongly gendered



# Findings - Voorhout



- Most respondents are not highly energy-and digitally skilled, yet the few that are, are men, not women
- Male respondents considered themselves to be the main spokespersons
- Experienced control: differences women and men
- Female respondents experience risk to become dependent on their male counterparts or others
- Women do not appreciate their role in identifying problems related to the smart grid (asking about responsibility in case of malfunctioning)
- **Accumulation and concentration of smart-grid related interest and expertise – gendered**
- **Digital – material housekeeping – gap, gendered**
- **Experiences of control, comfort, safety and/or trust –gendered**

*However, I also need to understand some things, in case he is not around or away or whatever ...then I also need to understand it all a bit (...) ....but I also need to understand it in my own way.”*

*These homes were supposed to allow you to be independent (longer), but that’s not how I feel here. (...). I mean, I need to be self-reliant and then I would like to stay here. But eh....if things stay the way they are now, and he passes away (I hope not)...but in any case, then I will be gone. Then I will leave.”*

# Gendered concentration and build-up of smart grid expertise?

Overwhelming complexity - new dependencies and risks of lock-out

Risk of undermining experienced control, comfort, safety and trust.

## Both pilots:

- Concentration of **digital and technical energy expertise** and know-how (gendered in Voorhout, less so in SchoonSchip)
- Those that **feel competent** are more likely **to take action to regain control** – gendered, mostly in Voorhout
- **Experience of not being in control:** gendered (mostly in Voorhout)
- Experiences of **safety and trust:** idem
- Gender intersects with age, socio-economic background, educational background

How can the designers and implementers of residential smart grids better take account of these differences – both from the perspective of distributive justice as well as from a more instrumental perspective of effectiveness of smart grid solutions?

*“We did not expect that there would be so much technology in the house that we don’t understand anything about.”*



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# Preliminary conclusions



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- Our findings: certain socio-economic and cultural context of the specific pilots. **Need to understand the implications of scaling up smart grids** to other sections of the population, and considering issues of **digital and energy literacy, access to technology, needs of the less resourced or vulnerable population** in the adoption of smart energy technologies
- What would that mean in terms of **designing the smart grid process to enable shared learning and inclusive practices?**
- Institutional dimension of responsibility: who is responsible for what exactly?

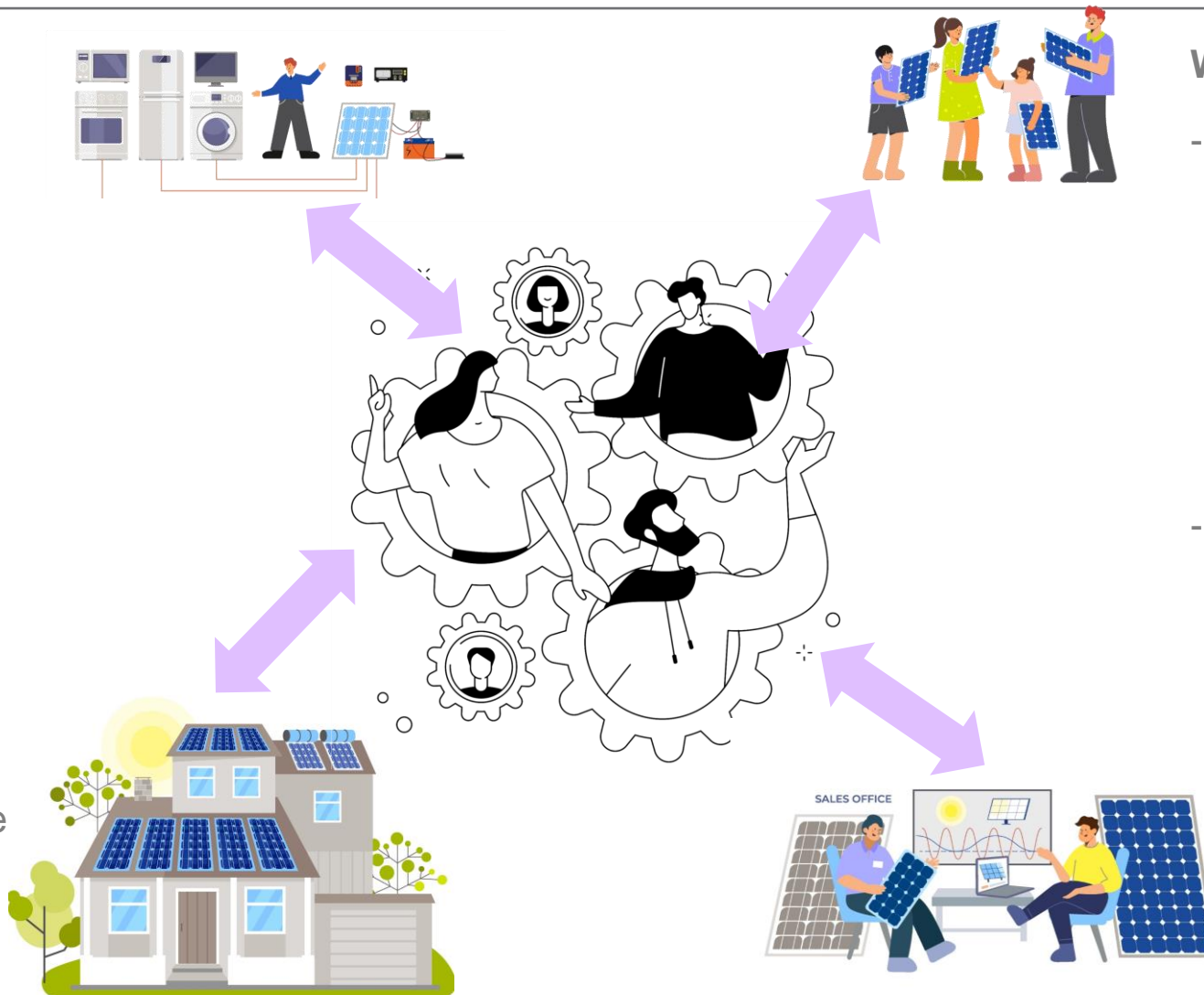


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# Household management ↔ Energy management

Rather than dreaming about the smart grid promise:

- A flawless and seamless experience
- Unburdening
- Enhanced comfort, ease of use, in control
- Trust that the smartness of the system is contributing to lower energy bill, to decarbonization, to the generation values that matter for households and communities



What we need:

- actively exploring and articulating in each context to what extent value generation and retention can be organised in such a manner that households and communities will not lose out.
- Co-create scenarios, together with the diverse envisaged users and stakeholders, enabling people and communities to take up an active role in the design and governance of smart energy systems





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# Questions?

## Thank you

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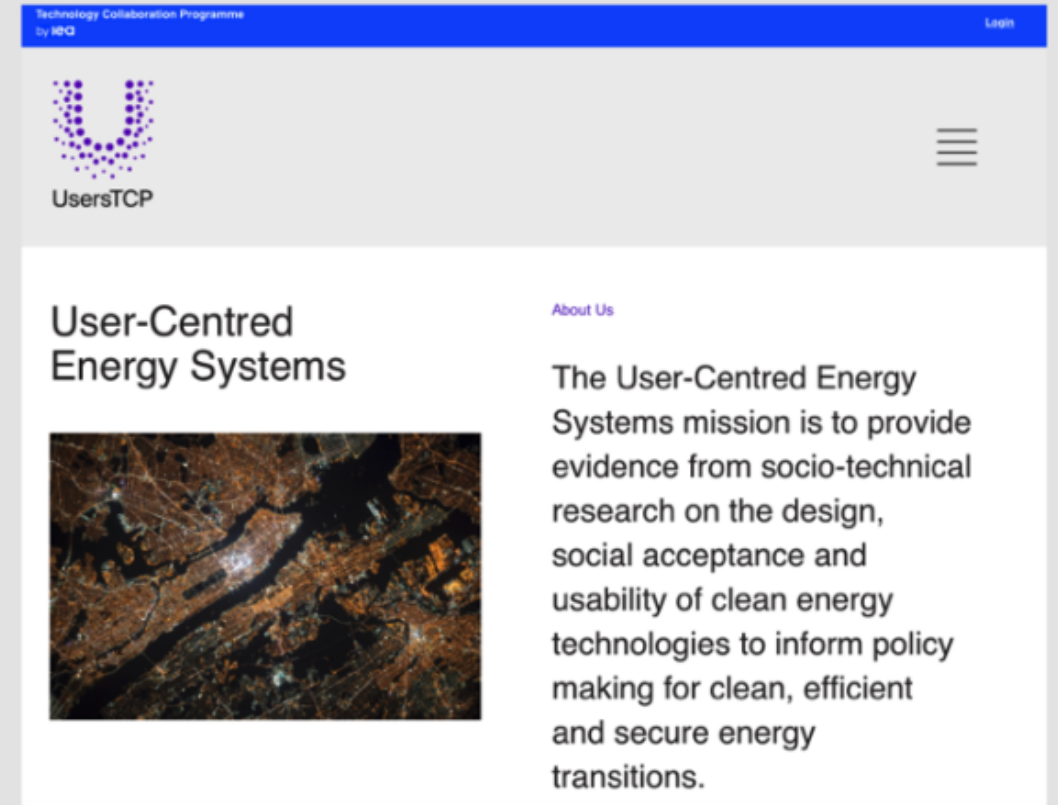




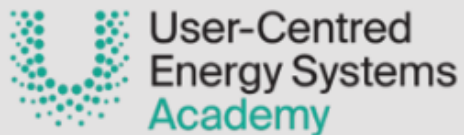
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