How to build trust in demand side automation

The **Social License to Automate Task** investigates the social dimensions of user engagement with automated technologies in energy systems to understand how householder trust to automate is built and maintained in different jurisdictions and settings.

In its first phase, the Social License to Automate Task undertook original research involving 26 residential demand-side automation projects across Australia, Austria, the Netherlands, Norway, Sweden and Switzerland.

The work brings together findings from institutional and policy studies, science and technology studies, energy sociology and human-computer Interaction studies to better characterise the social, technical and policy contexts in which automated control is permitted, trusted and functions successfully - or not.
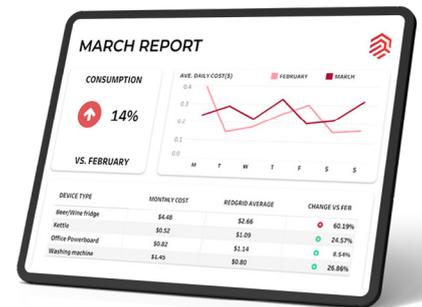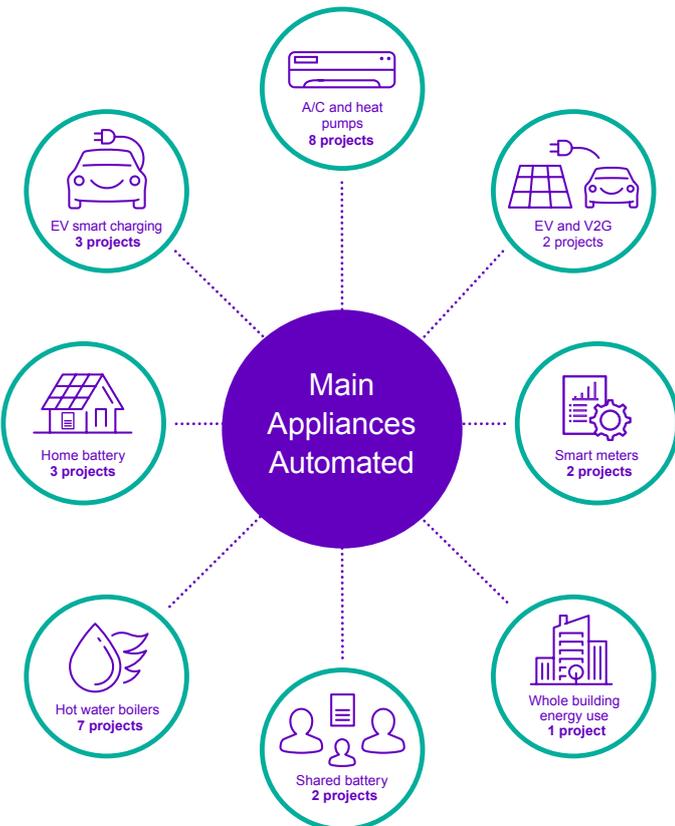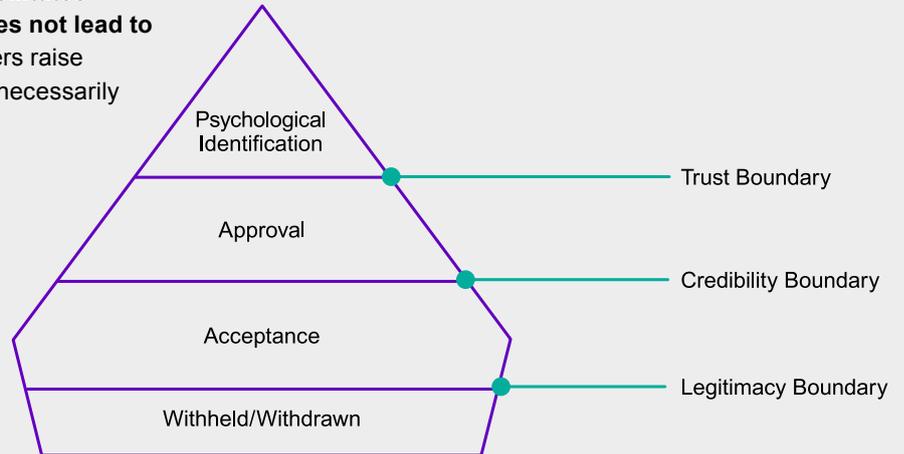
Observations for policy makers

> **Energy users' roles in electricity systems are changing.** Users can reduce or shift demand, while some can generate and store supply. Successful automation has the potential to reduce system costs and avoid disruptions.

> **Articulating the *why* is just as important as the *how*.** Energy users take up automated solutions to the extent that they align with their motivations and values. The desire to help address shared problems, such as avoiding blackouts, is often underappreciated.

> **Communication interfaces should be tailored to level of automation.** The role of interactions with households should vary from "helping" to "reminding" to "reassuring".

> **Allowing the full and fair value of flexibility to flow to users will build social acceptance.** Open competition amongst energy service providers and fair access for demand side flexibility to energy service markets and grid investment decisions is lacking.

> **Industry failure to understand social diversity threatens the viability of automated solutions.** Social science expertise has an indispensable role in the development, operation and evaluation of automation programmes.

Frequency control balancing

Peak load shaving

Voltage management

Trials and programs analysed

Self-consumption of individuals and/or communities

Bidding into spot, futures and wholesale markets

Key findings

Research insights

> **Public support for renewable energy does not translate into support for demand side management programmes.** The impact on energy users' lives is crucial to a social license to automate.

> **Better penetration of smart metering facilitates automation pilots and programs but does not lead to a social license to automate.** Smart meters raise further issues for energy users that do not necessarily lead to acceptance of automation.

> **History, geography and cultural factors affect the way in which automation programmes and their communication develop.** For example in Australia, programmes with detached households are prominent, whereas in Europe, community-based programmes are an increasing focus.

Psychological Identification — Trust Boundary

Approval — Credibility Boundary

Acceptance — Legitimacy Boundary

Withheld/Withdrawn

Main Appliances Automated

- A/C and heat pumps **8 projects**
- EV and V2G **2 projects**
- Smart meters **2 projects**
- Whole building energy use **1 project**
- Shared battery **2 projects**
- Hot water boilers **7 projects**
- Home battery **3 projects**
- EV smart charging **3 projects**

Lessons for project developers

> Develop and communicate a clear goal shared by the participants (e.g., avoiding blackouts during peak periods) following informed consent protocols

> Compensate users in ways they deem fair, and

> Update users about progress of the trial or program in a suitable manner

Mature projects:

> Give people well-defined roles

> Have meaningful and verifiable goals

> Become 'invisible' as users stop needing to think about their roles

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Social License to Automate

UsersTCP