

How Social Dimensions can be used to inform Energy Tool Development

A qualitative Analysis of Tools for Energy Communities



ENPOWER
POWER IN OUR HANDS



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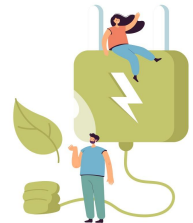
ENPOWER VISION



The overall vision of ENPOWER is to design, develop and demonstrate SSH-driven methodologies, interactive and AI-based tools and services for energy activated citizens and data-driven energy-secure communities towards a consumer-centric energy system.

ENPOWER includes 6 pilot projects which are Renewable Energy Community (REC) creators

<https://www.enpower-project.eu/>



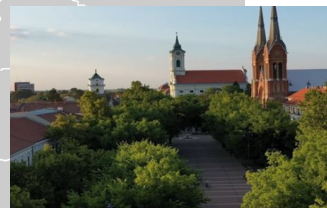
ENPOWER pilot sites



Ireland



Austria



Hungary



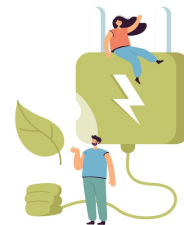
Portugal



Spain



Greece



ENPOWER workshops

- We ran deliberative workshops in Ireland, Austria, and Portugal to explore diverse views on **technical and social enablers** of energy communities
- Discussion themes centred around
 - Financial/economic drivers
 - Technical/operational aspects
 - Educational/communication concerns
 - Regulatory/legal framework
 - Environmental impacts
- In addition, two focus group workshops with prototype testers and non-testers of an engagement app were conducted in the Austrian pilot site



Dingle, Ireland



Poysdorf, Austria



Lisbon, Portugal



ENPOWER workshops

- Most RECs have dedicated engagement tools developed for them
- These tools are usually designed
 - to empower managing the production, distribution, and consumption of energy
 - and to support decentralization, participation, and behavioural change
- However, we observed a **disconnect between tool developers' intentions and community members' experience**



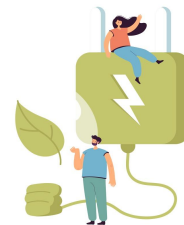
Dingle, Ireland



Lisbon, Portugal



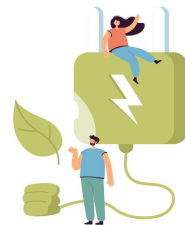
Poysdorf, Austria



Observations

Tools are often developed **for** the community and **not with** the community leading to

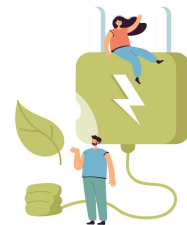
- **Misaligned assumptions** - Tools are often built based on inaccurate assumptions about users' digital and energy literacy
- **Underutilized social insights** - Community insights gathered using social methodologies are rarely translated into actionable technical specifications
- **Persisting Disconnect** - Developers and end-users often lack a common understanding due to knowledge disparity and differences in communication style
- **Limited adoption** - Tools for energy communities are often technically advanced but fail to engage users effectively



How to address the gap?

- Current tool development is primarily driven by technical demands of the energy assets, but often ad-hoc and lacking solid foundation in relation to psychological frameworks
- If at all, models and approaches developed in the social and behavioural sciences are often used inconsistently or suffer from fragmented or unsystematic application
- Systematic integration of social and behavioural dimensions into tool design remains underexplored, mainly due to unactionable recommendations

As a first step, our work proposes an attempt to systematically **align digital tool developments with behavioural and social dimensions**



Methodology

Step 1 – Identify social dimensions

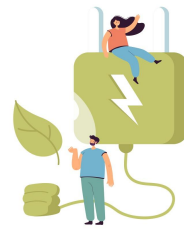
- Evaluate workshop outcomes for emerging social themes and motivational drivers
- Extract key social dimensions and specify their exact definitions

Step 2 – Map social categories to application features

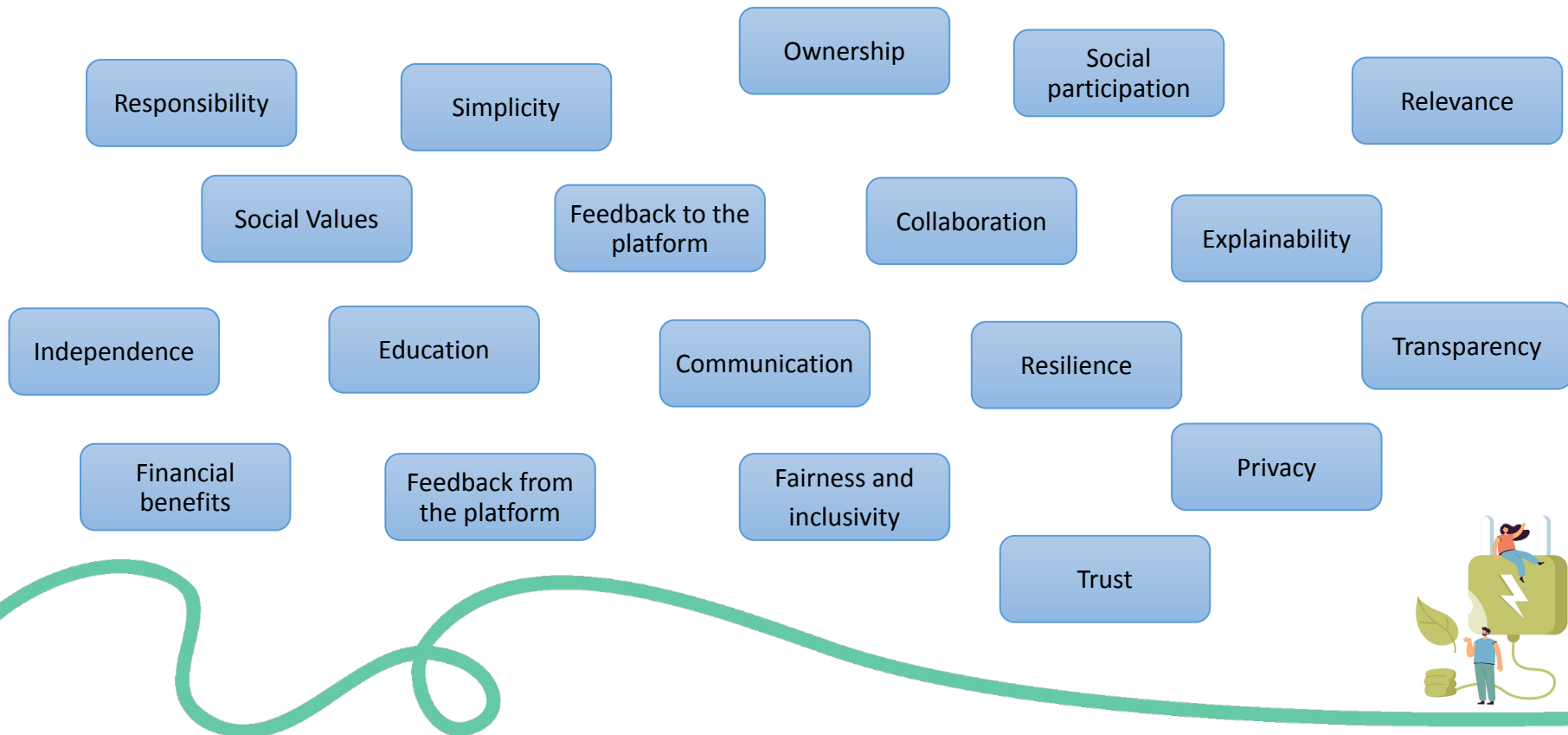
- Select one or more community tools to evaluate focusing on user interface and content
- Verify alignment with social aspects coded as included, partially included, or not included
- Average over opinion of multiple reviewers and refine the results in iterative group discussions

Step 3 – Derive actionable recommendations

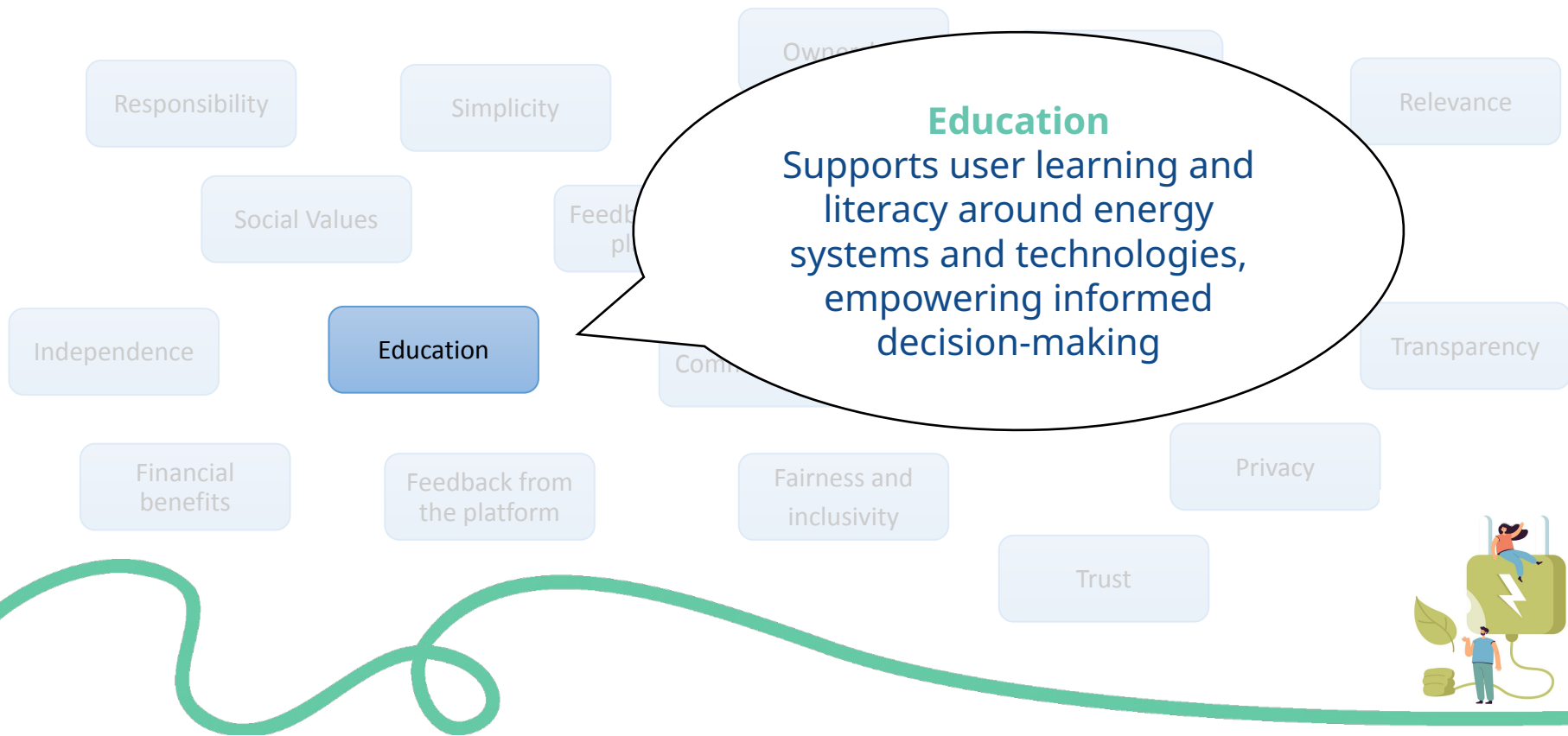
- Mapping of features to social dimensions can serve as exemplar for future developments
- Unmapped social dimensions can be indicative of missing features that could be included



Identify social dimensions



Example definitions



Example definitions

Fairness and inclusivity
Promotes accessibility and relevance for diverse user groups, considering different languages, abilities, and backgrounds.

Ownership

Social participation

Relevance

Collaboration

Explainability

Transparency

Resilience

Privacy

Trust

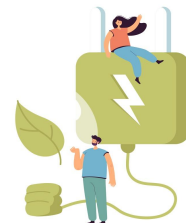
Fairness and inclusivity

Feedback from the platform

Financial benefits

Communication

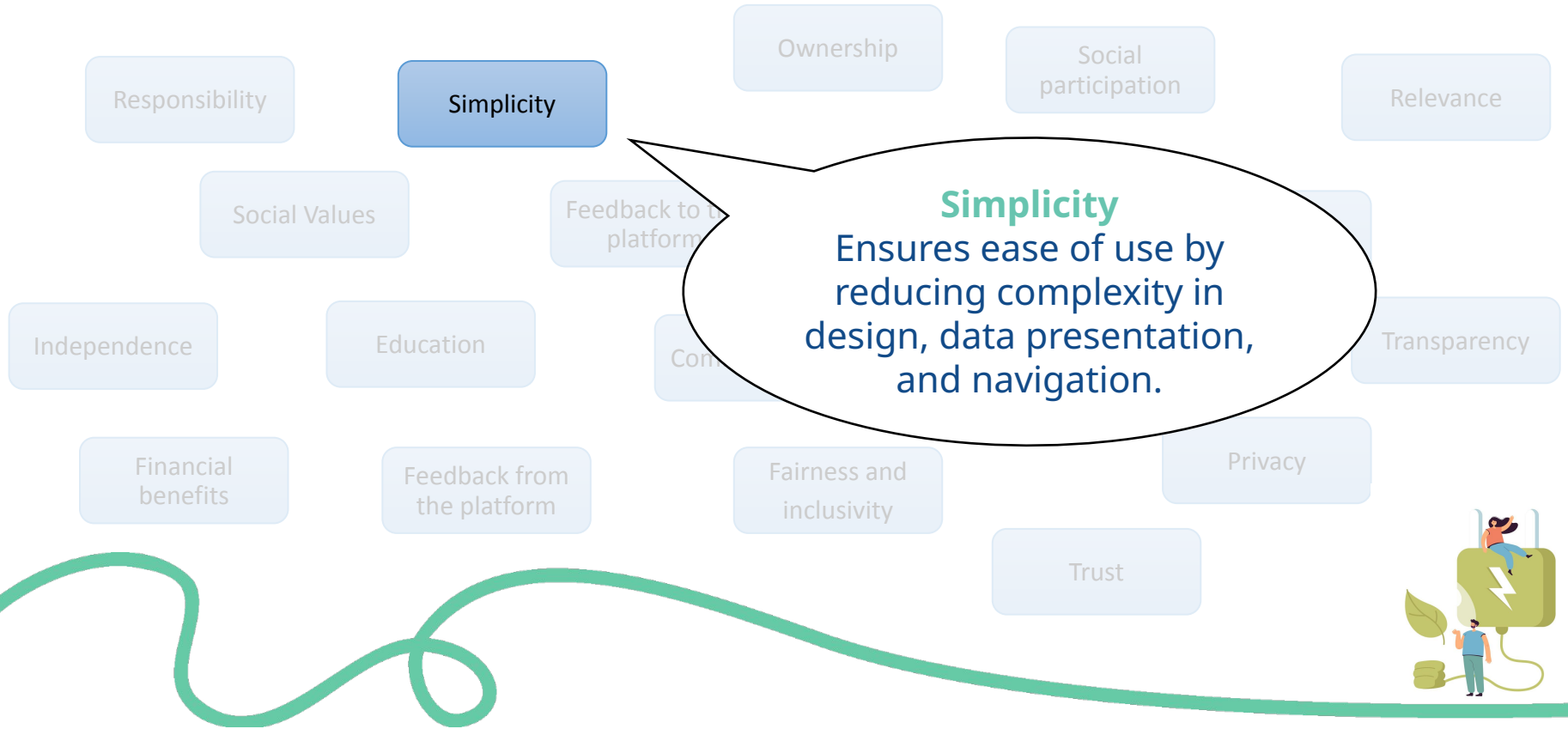
Independence



Example definitions



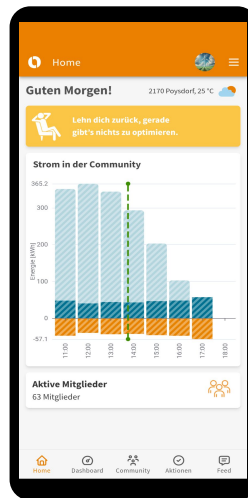
Example definitions



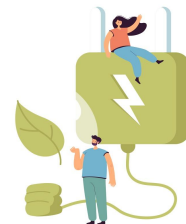
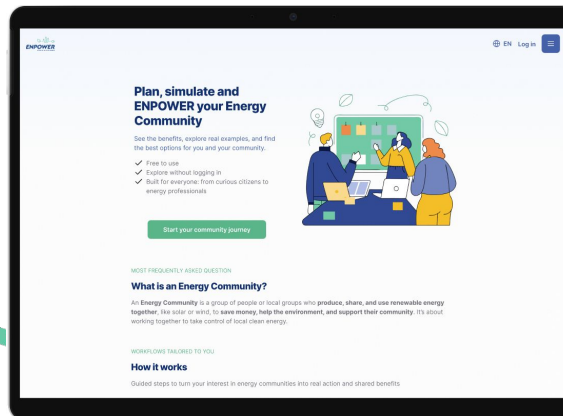
Community tools



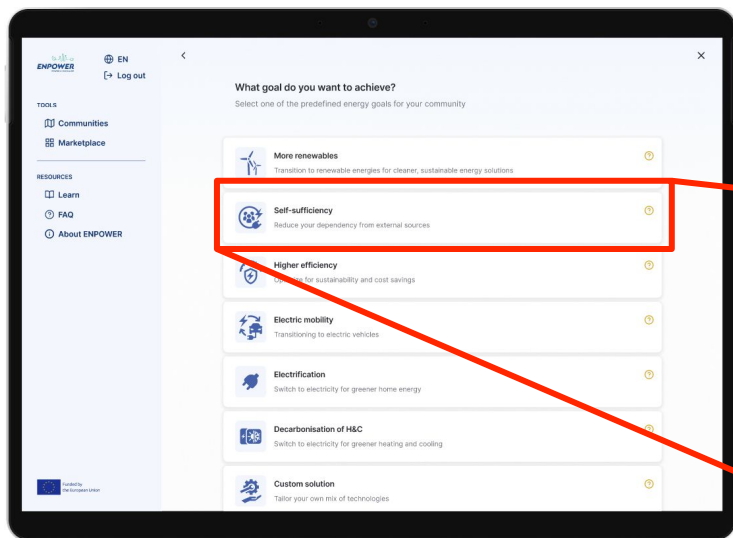
The OurPower marketplace provides a platform to connect small local energy producers with consumers



The CARTIF planning tool is designed for citizens and experts to create and develop their REC by simulating energy scenarios

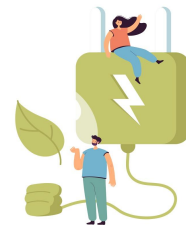
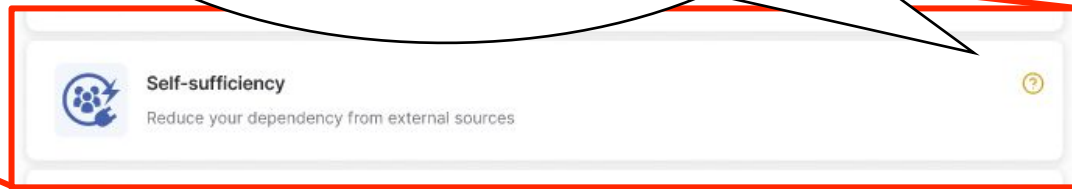


Example feature alignments

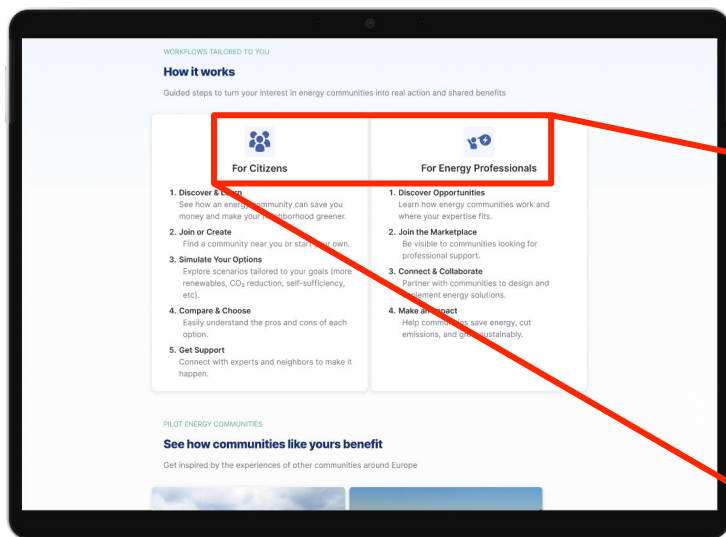


Education

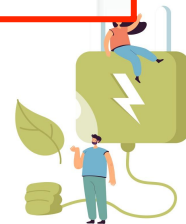
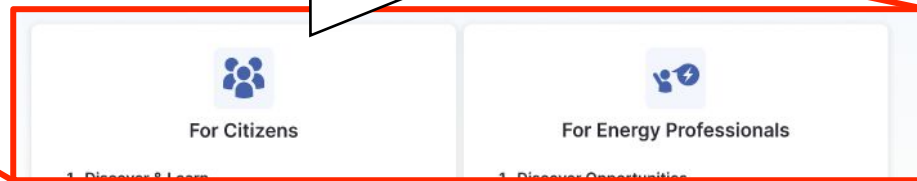
Supports user learning and literacy around energy systems and technologies, empowering informed decision-making



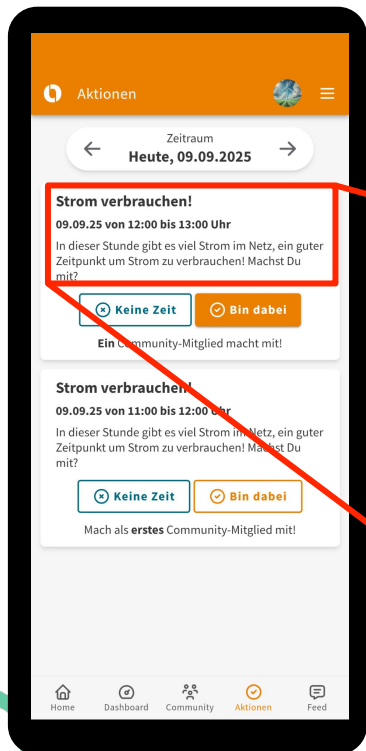
Example feature alignments



Fairness and inclusivity
Promotes accessibility and relevance for diverse user groups, considering different languages, abilities, and backgrounds.



Example feature alignments



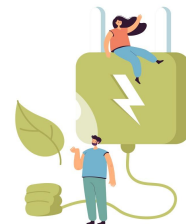
Relevance

Ensures that information and functionalities are meaningful and directly applicable to users' needs, goals, and context.

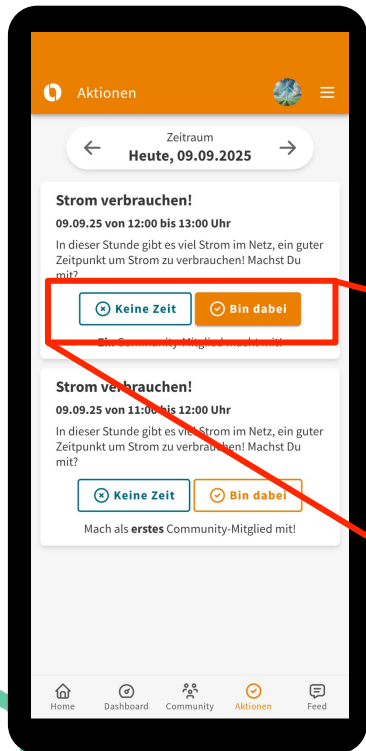
Strom verbrauchen!

09.09.25 von 12:00 bis 13:00 Uhr

In dieser Stunde gibt es viel Strom im Netz, ein guter Zeitpunkt um Strom zu verbrauchen! Machst Du mit?



Example feature alignments

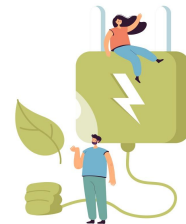


Simplicity

Ensures ease of use by reducing complexity in design, data presentation and navigation.

Keine Zeit

Bin dabei



[CENTRO
TECNOLOGICO] **CARTIF**



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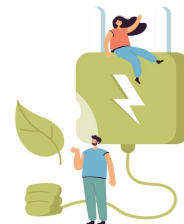
If a tool scores high across relevant social dimensions it can be used as exemplar for similar applications

If a tool scores high across relevant social dimensions it can be used as exemplar for similar applications

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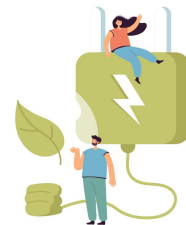
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- Resilience
- Fairness and inclusivity
- Social participation
- Transparency
- Trust
- Social values
- Financial benefits
- Education
- Explainability
- Collaboration



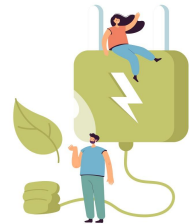
Preliminary conclusions

- We propose a methodology for facilitating better alignment between findings from engagement with energy communities and tool developers
- By reviewing actual tool features with respect to the social concerns observed during community engagement research we aim to provide more actionable and therefore more impactful recommendations
- We only had access to two applications in this study, which both are still under development; therefore, not all features were available yet and the presented results must only be interpreted qualitatively
- A major limitation is that alignment between features and social dimensions is subjective; however, the proposed approach tries to mitigate against this by applying clear definitions and by averaging over the opinions of multiple reviewers



References

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- Schubert, I., Sohre, A., Hearn, A.X., Timpano, F., Martz, J. & Giacometti, M. (2024). Enpower: Summary report on focus groups for Ourpower's ServeU-App. App features that could engage energy community members and future members. DOI: 10.6084/m9.figshare.25498189



Ηγεσία .
Καινοτομία .
Επιδόσεις .

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Thank you



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