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ICT for Community Energy

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Abstract - Community energy initiatives are becoming more and more widespread. For them to be successful and flourish, engagement from people in the community is a prerequisite. ICT can provide the means to support engagement, by helping people to assess the impact and benefits of a CE project and by capturing and disseminating the benefits. Also, ICT can support with the design and management of a CE project; and lastly ICT can support research on the topic.

Keywords - Community energy, ICT, engagement, participation, CIVIS.

I. INTRODUCTION

Due to changing dynamics in social structures, technology, economics and politics, the traditional role division between citizens and government has started to shift. This shift is often referred to as a transition: “a gradual, continuous process of societal change where the structural character of society (or a complex sub-system of society) transforms” [1]. A result of this transition is the fact that community-led initiatives arise more and more, of which specifically the number of communities that generate their own energy is notably growing [2]. Also known as ‘community energy’ (CE), this refers to initiatives where communities exhibit a high degree of ownership and control of an energy project, as well as benefitting collectively from the outcomes [3]. Although often characterised by a high degree of motivation from the people involved, we propose that for these initiatives to flourish in practice, information- and communication technologies (ICT) can support community engagement; a crucial prerequisite for a successful initiative. This topic is part of the FP7 CIVIS project, that explores the potential of social networks and communities to significantly reduce energy use and carbon emission.

II. ICT FOR COMMUNITY ENERGY

For a CE initiative to become more than a daydream of a few, engagement is needed from the broader population. CE projects can address both the supply and demand of energy, for example realising a communal windmill or collective buying of energy. Engagement in turn means that people have to understand the goal of the initiative, feel connected to it, and are willing to take action to reach this communal goal. Engagement is therefore the result of the weighing of impacts and benefits, and is thus very much coloured by people’s values [4]. Values are what people find important; they can range from individual and collective accomplishments, competence or autonomy, to community spirit and environmental protection. For people to make a well-informed assessment of a CE initiative, thereby addressing the values people hold, we propose that ICT can service as a supporting tool in CE initiatives.

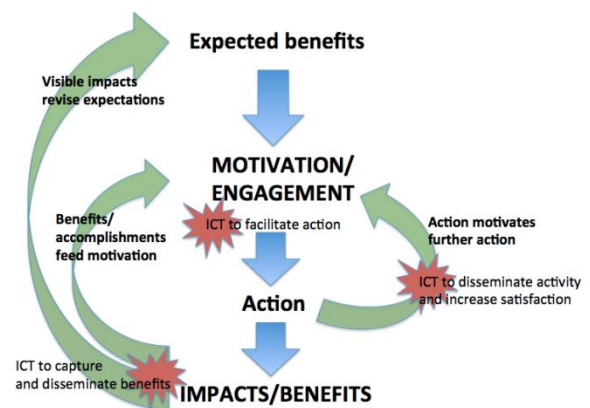


Fig .1. Possible intervention points for ICT to support engagement.

The range of potential roles for ICT in relation to maximizing engagement for CE may be grouped into three categories: ICT to support engagement (as depicted in Figure 1 above); ICT to support project design/management; and ICT to support research. The three categories, and how ICT can specifically support, are briefly explained here:

III. ICT TO SUPPORT ENGAGEMENT

- Remove specific barriers (e.g. crowdfunding for financing project or sourcing volunteers);
- Facilitate action and participation (e.g. providing practical information, awareness-raising);
- Support sharing info/ advice/experiences (knowledge-sharing) (e.g. online forum facility including video, audio and interactive media for user-generated content);
- Create opportunities for interaction between citizens and enhancing experiences of social gratification from collective activities (e.g. gamification and social gaming element to maximize social presence, trust, reciprocity, fairness etc.);
- Give feedback to participants/citizens others' participation and activity including the enjoyable aspects of participation in collective action (e.g. Content posted on the platform by participants);
- Give feedback to participants/citizens about the positive impacts, accomplishments and benefits (broadly defined) of the CE initiative (e.g. Content posted on the platform by project , e.g. to promote pro-social values by broadening the usual discourse about benefits beyond financial ones);
- Improve the measurement and assessment of impacts and benefits of all kinds and collating an evidence base and disseminating this (e.g. using digital media of various kinds. This could also spur other communities/actors to follow suit);
- Disseminate benefits, accomplishments and activity more widely beyond the community and to other stakeholders (e.g. this could include supporting and disseminating user-generated content (UGC), i.e. first-hand accounts about project benefits/impacts or experiences of participation.

IV. ICT TO SUPPORT DESIGN

ICT can support design and management of projects/initiatives (e.g. feedback from users/citizens to project designers/leaders/coordinators to support consensus-building, decision-making and data

collection). Applying the feedback in turn can lead to more engagement if people see that their input is used.

V. ICT TO SUPPORT RESEARCH

ICT can support research and data collection/sharing (e.g. platform functionality to allow/facilitate research activity and data collection on engagement, attitudes and user experience such as discussions, polls and making data available to other projects/researchers). This would also help in the accumulation of an evidence base. Applying the data in turn can lead to more engagement by making the value of the initiative more explicit.

VI. CONCLUSION

We argue that perceived benefits and impacts from a CE initiative can play an important role in supporting engagement and that ICT can play an important role in both addressing the evidence for assessment of impacts and in capturing and representing these to increase participants' awareness of these impacts/benefits. Furthermore, ICT can be used as a supporting tool for the design and management of an CE project itself, and for broadening the evidence base for research purposes.

VII. ACKNOWLEDGEMENTS

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REFERENCES

- [1] P. Martens and J. Rotmans, "Transitions in a globalising world", *Futures* 37, 2005, pp. 1133–1144
- [2] N. de Koning et al, "Participatie en zelforganisatie in het energiedomein: 9 methodes (TRANSLATED: Participation and self-organisation in the energy domain: 9 methods)". Delft: TNO R11862, 2014.
- [3] G. Walker and P. Devine-Write, "Community Renewable Energy, What should it mean?" *Energy Policy* 36, 2010, pp. 497-500
- [4] D5.2 Current Public Engagement. [Online]. Available : <http://www.civisproject.eu/>

VIII. ABOUT THE AUTHORS

Caroline van der Weerdt specialises in sustainable consumer behaviour at TNO.

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Björn Palm's research is related to energy conservation in the built environment, particularly HVAC systems, but also use of ICT for reduction of environmental impact