Social learning and energy systems:

Implementing a high energy saving goal in a residential area

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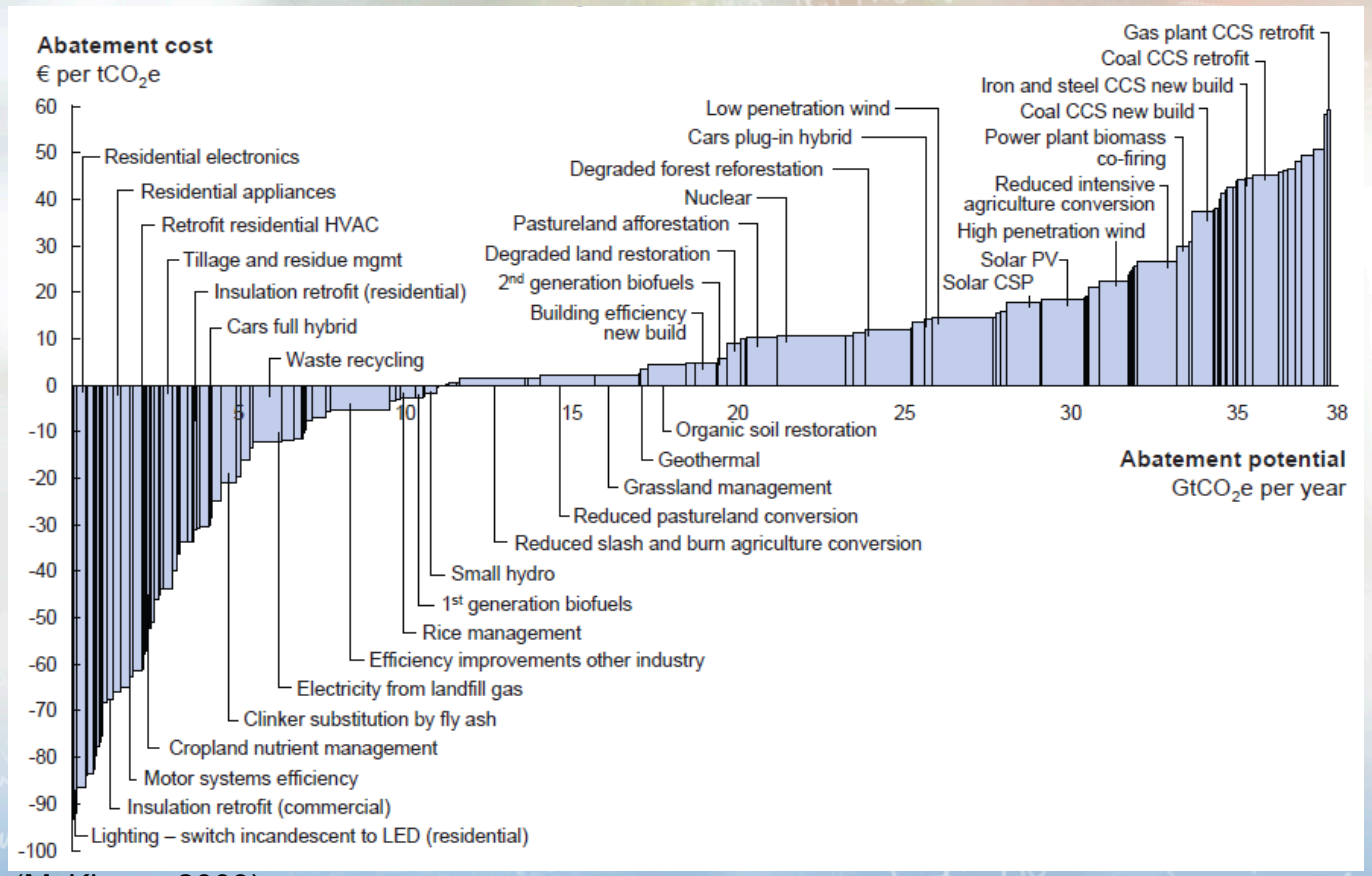
Starting point

Energy saving potentials from retrofitting



(McKinsey 2009)

Background: case study in Sweden

But what happens after renovation and retrofitting of residential areas?

How are new technologies adopted and integrated into peoples (professional and households) everyday lives?

- 1998 Governmental funding scheme: Local investment programmes to create the “green welfare state”.
- Navestad, renamed to Ringdansen, received most funding for renovation (Norrköping Municipality, Hyresbostäder)
- Energy saving target: 52 % (electricity, heating, water)
- Environmental, social and economic sustainability
- **Proposal:** A complex solar-geothermal conversion system .

Built: Conventional insulation measures + individual metering and billing of energy (electricity, heating, hot and cold water).

Results

Table: Renovation results: energy and water consumption (Karlsson 2008)

	Before renovation (at the time of the application, 1997)	Estimated use, 2004	Estimated savings, 2004 (%)
Total energy purchased	37,601 MWh	18,259 MWh	51.4%
- energy for heating	29,238 MWh	13,817 MWh	52.7%
- electricity	8361 MWh	4441 MWh	46.9%
Cold water consumption	252,530 m³	103,809 m³	59%

But these results raise questions:

- No independent research results
- The goal was probably not achieved primarily by the retrofitting measures invested in since it might have been due to
  - *fewer flats (from 1600 to 900)*
  - *new tenants (new contracts)*
  - *new use of buildings (from residential to commercial)*

(Vidén & Botta 2006)

So are there missed opportunities to save more energy?

Objective and research questions

The main objective is to explore energy-related practices, especially the learning aspects of these practices.

Research questions:

- What are the energy-related cross-professional and tenant practices in this case?
- How can they be understood as parts of social learning processes?

This paper also aims to contribute to policy development in the field of assessing and evaluating government funded refurbishment projects.

Social learning - definition

[Social learning] can be characterised as a combined act of discovery and analysis, of understanding and giving meaning, and of tinkering and the development of routines. In order to make an artefact work, it has to be placed, spatially, temporally, and conceptually. It has to be fitted into the existing, heterogeneous networks of machines, systems, routines, and culture.

-(Sørensen 1996)

Methodology and data collection: Ringdansen, Navestad

- ❑ Qualitiative research
- ❑ Case study methodology
- ❑Observations
- ❑Interviews:
  - ❑Tenants (19)
  - ❑Professionals (10)

Lost opportunities for exploring

❑Individual metering and billing should make energy use and costs more visible, generating economic incentives for reduced use. Individual metering and billing could make it possible for tenants to discover energy in new ways.

I don't really like this system. I spoke to a technician earlier, but he used such technical terms that I didn't understand anything.
(Tenant, Interviewee #3)

❑Monitor your energy use on the internet, but according to HNAB only about 5 % of all households in Ringdansen ever logged on to the system.

One household's statement is quite telling:

Interviewer: *Do you check on the Internet how much energy you use?*
Respondent: *How do you do that then?*
Interviewer: *You can log on to a webpage with your own data and watch statistics about how much energy you use and compare it with how much you used before and also compared to other tenants in the block.*
Respondent: *Oh, I didn't know you could do that. I will tell that to my husband, he will think that is really exciting.*
(Tenants, interviewee # 11)

Lost opportunities for exploring

❑The use of an immediate interface is unknown to tenants.

Respondent 1: *I thought that it (i.e. the thermostat) would be better than it was. I thought that it was pretty cool to have a thermostat indoors, only because I've seen them on TV but later I was …*

Respondent 2: *Always in American movies.*

Respondent 1: *Yes, everybody has a thermostat as a temperature control device, and they can lower their thermostat because it is often very warm inside. But we have more like …*

Respondent 2:... *Raise the thermostat because it is so cold.*

Respondent 1: *Yes it is like that here.*
*(*Tenants, interviewees *#19)*

Psychological measures and cultural explanations

- Practices among repairmen:
  - Removing the handle from the radiator and putting it back again - Would not influence the heating system, but was usually enough to satisfy the tenant.
  - Use own thermometer to prove “right” indoor temperature – but some tenants don’t care: “It is still cold”. - Some tenants are lonely and need social contact.
  - Finding explanations in the immigrant background of tenants:

Then it is like some … come from slightly warmer countries, and they are used to that and have a hard time getting used, perhaps, or what you might say! (Professional, interviewee #7)

Barriers and opportunities for social learning

- **Barriers:**
  - The tenants in this case study have limited opportunities to discover the energy system through the means available to them. Advances in interface design seem in some ways to have passed unnoticed in the energy technology field.
  - Ambiguous social roles are likely to be barriers to social learning processes for energy savings if households are expected to learn about energy saving measures from professionals.
  - Intuitively, professionals avoid certain areas, such as tenants' clothes, but are happy to make suggestions about how to furnish the apartments. In addition, professionals mislead tenants about how they manage energy-related problems in the flats. This is not a sustainable relationship between professionals and households and is a barrier to social learning.

Barriers and opportunities for social learning

❑Opportunities

❑ There are opportunities for social learning between professionals and tenants, since professionals are based and employed in the neighbourhood, but these opportunities have not been seized.

❑ Due to its relative visibility, water use and costs are perceived as easier to regulate and manage in tenants' everyday practices. Hot water might be a good starting point for communication and interaction about energy savings in households.

❑ The electricity system offers opportunities for social learning, since the housing company controls the purchase, distribution, metering, and billing of electricity in the neighbourhood. This degree of control, which is unusual in Sweden, arguably entails responsibility to communicate with tenants about electricity use and energy saving measures in the home.

Conclusions

❑ Focus shifted from energy producing measures to energy consuming measures, though the organization had not been developed to manage and support either the tenants or technical/maintenance professionals in their new roles.

❑There is a significant gap between how professionals understand and attribute meaning to the heating system and how tenants are involved in social learning.

❑ Policy implication of this case study is that means to evaluate and assess results must be determined early in a project to secure relevant baseline data from before the renovation. Resources must also be allocated to collect, analyse, and diffuse the results of evaluation and assessment.

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Thank you!
Any questions?

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