



Enhanced metering and billing for energy efficiency: what do Finnish customers want?



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Demand Side Management, Nov 14, 2012**

Agenda

- Background
- General observations on consumers and electricity use
- Finnish consumers' expectations concerning metering and billing
 - based on data from several studies

Background in several projects

MECHANISMS
Make Energy Change Happen Toolkit

Translation info + Suomi Deutsch Ελληνικά Магвар

Home Self-Check Step-by-step Tools and Ideas Dig Deeper Sitemap Community About

Are you planning a project to save energy in households or small organisations? Do you need advice on how to connect with energy users and work with them for lasting energy savings? This Toolkit, based on a European project called [CHANGING BEHAVIOUR](#), helps you find your way.

First time here?

Welcome! There are four pages that you start with. The [about](#) page explains where the toolkit comes from. The [toolkit introduction](#) explains how to get a quick overview in 15 minutes. The [structure and concepts](#) page explains what can be found behind what menu on this site and defines important concepts. Finally, you could start with a [self-check](#). It suggests personalized starting points based on your needs. You can also start with our [questions and answers](#), which apply the toolkit to typical questions by previous users.

Step-by-Step

The [step-by-step](#) guide offers you advice and tools for preparing, designing and evaluating your energy saving project.

Case Study Highlight

[Green Office Programme](#)
Certification and management scheme to reduce CO2 and resource consumption in offices
Target Group: [Offices and SMEs](#)

Project Story Highlight

[Micro-ESCOs](#)
Promoting energy efficiency investments in a residential area in Finland.

Dig Deeper

Insight on key factors in successful energy saving projects:

- [Backgrounds](#)
- [Case Studies](#)
- [Country Profiles](#)
- [Links](#)
- [Project Stories](#)
- [Questions & Answers](#)
- [Readings](#)
- [Target groups](#)

Customer value from smart grid services

JULKAISUJA
2 • 2012

Asiakkaan näkökulma älykkään sähköverkon lisäarvoon

Eva Heiskanen • Kaisa Matschoss • Miika Saastamoinen

KULUTTAJATUTKIMUSKESKUS

Sähkölaskun sisältö tutuksi

Sähkölaskun sisältö on tarkoin valittu ja ymmärrettävä. Laskun sisältö on tarkoin valittu, jotta se on helppo ymmärtää ja käyttää. Laskun sisältö on tarkoin valittu, jotta se on helppo ymmärtää ja käyttää.

1 2 3 4 5 6 kWh

Some general observations on electricity consumption



Electricity is not consumed consciously

- Invisible
- Derived consumption: result of comfortable home, keeping clean..
- Largely unconscious, routine
- Usage learned by copying others – without accompanying 'theory'
- Electricity is a foreign language
 - E.g. respondents to a survey by Motiva (Elvari project, n=1000) 68% could not say how much they consume in kWh



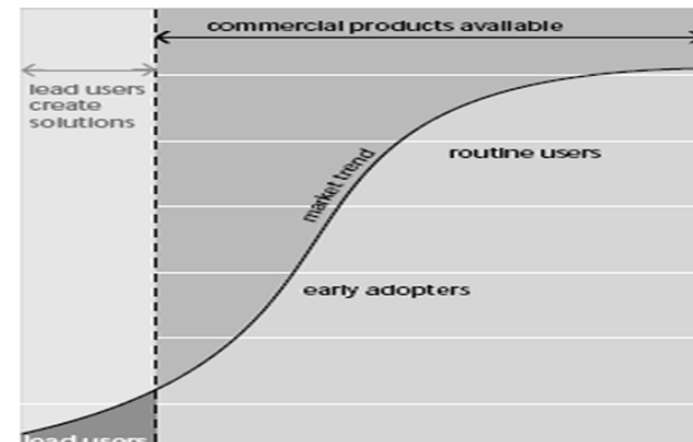
Impact of information on consumption

- Delayed billing until recently
- Relatively cheap price of electricity
- Conditions for information to influence consumption
 - problematization of the current situation
 - understandable connection between action and result
 - reasonable alternatives
 - one-off solutions (investments)
 - new routines
 - social confirmation

The current system has actually been pretty smart, since most things work pretty well and you haven't had to think so much about electricity!

The start of the construction of the 'intelligent end user'

- Evolutionary process (Klopfert & Wallenborn 2011)
- "Lead users" as innovators & early adopters
 - Heat pump installers (+ other microgen techs)
 - Home automation installers, ICT activists
 - Energy, environment and "house" activists
- About 10% of our respondents, corresponding to findings by von Hippel and colleagues



Finnish consumer's thoughts and expectations on metering and billing



Concerns and issues – ordinary consumers... but lead users too a bit

Interests of lead users concerning metering and billing

Confusion about electricity market

- Difficulties in understanding liberalized electricity market, role of different players, changing billing practices ...
- ... are hindrances for processing the available information

Oh, you can even buy electricity produced in the North?

It is not worth saving, because you have to pay the distribution charge in any case

Electricity bills are unintelligible

- Not just because of the bill itself
- But because of the unusual billing practices (arrears)
- And the product itself (kWh vs. minutes)



Nobody at our workplace understands their electricity bill

Role of electricity companies?

- Finnish consumers see their electricity providers as reliable sources of information concerning
 - bills, consumption data, deviations, and other facts
- As proponents of energy saving, the role of electricity companies is not so clear...

It is not in their interests to reduce electricity consumption! If people consume less, they have to raise the prices to maintain their income

What is lacking: relative importance of different things

- Some people (lead users) know fairly much about what is important
 - based on own monitoring or
 - easy rules of thumb
- Many consumers struggle to understand what makes a difference
- Comparison to other households helps people understand, what is 'normal'









I noticed the importance of hot water only after my kids moved out and our electricity bills were halved

What is lacking: the role of appliances

- People do not consume electricity, appliances do
 - need breakdown by appliance, not real time data
- Especially large equipment that are hard to measure (ventilation, AAHP, heating, hot water tank... also cold appliances, standby)

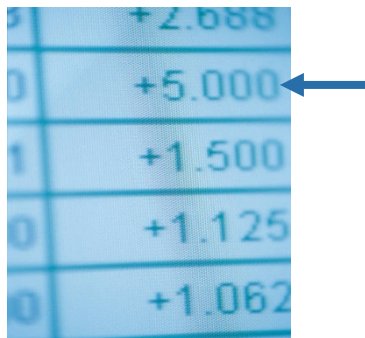
Electricity bill by appliance

Total consumption January: 306 kWh
Price including distribution and taxes: eur 50,15
Consumption by appliance

	Appliance group	kWh	eur
	Lighting	61,2	10,04
	Refrigerator, freezer	47,8	8,12
	TV and accessories	36,7	6,24
	Electric sauna stove	27,5	4,67
	Laundry appliances	12,2	2,07
	Cooking appliances	18,4	3,13
	Electric floor heating	36,6	6,22
	Others	65,7	11,17

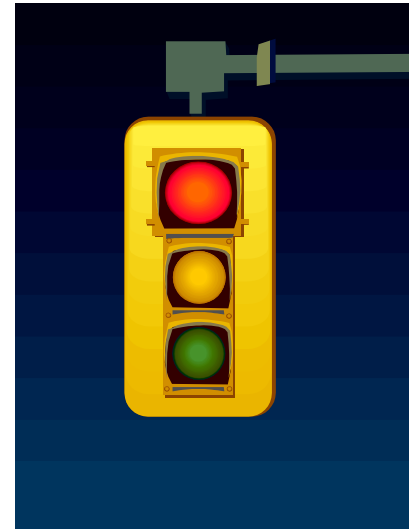
What raises interest: alarms

- A use scenario with alarms raised a lot of interest – though not everyone wanted to 'get alarmed'
- People wanted interpretations and suggestions for what to do next



What raises interest: simple visualisations

- Some consumers were interested in displays
- Information that is always visible helps in discussions among the family, educating youngsters, making consumption visible
- Desire to know if we are going in the right direction
- Could be helpful for time-of-use tariffs and avoiding peak loads



What raises interest: fresh and personalised advice

- Our lead users were critical about advice concerning lower room temperatures: these people have heard it before
- People wanted fresh advice, more specific, concrete, personalised....

Advice by electricity providers should be tailored to your consumption. It should tell you what is going wrong.

I would like more ideas on how to save electricity. Lots of places repeat the same thing about lower room temperatures... Are there alternatives to sitting in the cold and dark?

What is appreciated: feedback and reminders



”The advice may sound trivial, but the fact is that one never remembers everything one knows in real-life situations”

Lead users are critically co-operative

- The relative advantage needs to be clear
 - for customers: model calculations, real-life examples
 - for service providers: business logic
 - for the environment/society!
- Customizability and scalability are needed
 - Different levels of service for different needs
 - Alternative user interfaces
 - Customizable user profiles
- Testing and trials
 - Tested services, designed interface, privacy and data security!
 - Opportunity for trial use and simulations



Conclusions

- It is difficult to provide good information on electricity consumption
 - New information is used in relation to prior knowledge, beliefs, concerns and capabilities
 - People have diverse backgrounds, needs, capacities and experiences
- It is not difficult to improve on the current situation
 - Regular feedback on one's own consumption, others' average consumption and topical advice will help a lot
 - Information on where electricity is consumed and when unusually much is consumed would help more
 - Making electricity use more visible and understandable provides a start for an evolutionary process
 - **Public debate is a central ingredient in this process...**

especially as we go ahead...

If there were some kind of shortage, then I would accept that [indirect load control for demand response], but since we don't have a shortage now ... it is a bit difficult to accept those kinds of notions



Thanks!

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