

Energy classes for households?

First results of a field trial

Dr. Corinna Fischer
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Energy Efficiency & Behaviour
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STROM
EFFIZIENZKLASSEN
FÜR HAUSHALTE

Our Profile

Oeko-Institut is a leading European research and consultancy institute working for a sustainable future.



- A non-profit association founded in 1977
- Offices in Freiburg, Darmstadt and Berlin
- Clients: European Union, national and state-level ministries, companies, foundations and non-governmental organizations

Background

- 25% of national electricity consumption by private households
- Average consumption 2 person household: 3440 kWh
- High savings potentials through investment behaviour (efficient appliances) and changed usage behaviour
 - If all appliances were highly efficient => 2295 kWh
 - Usage behaviour-related savings potential: 1104 kWh
 - Low-investment measures (switchable connector strips, efficient circulation pump, lighting): 1000 kWh
- Previous savings campaigns had limited impact:
 - Many individual bits of information without prioritization and without relation to overall electricity consumption
 - Low prestige of electricity saving
 - No „innovation management“ of electricity saving in private households

The project

- Field research project; supported by Ministry for Research and Education (BMBF)
- Running time: 01.04.2013 – 31.3.2016; Total budget: 577,044 €
- Research partners:



- Practice partners:



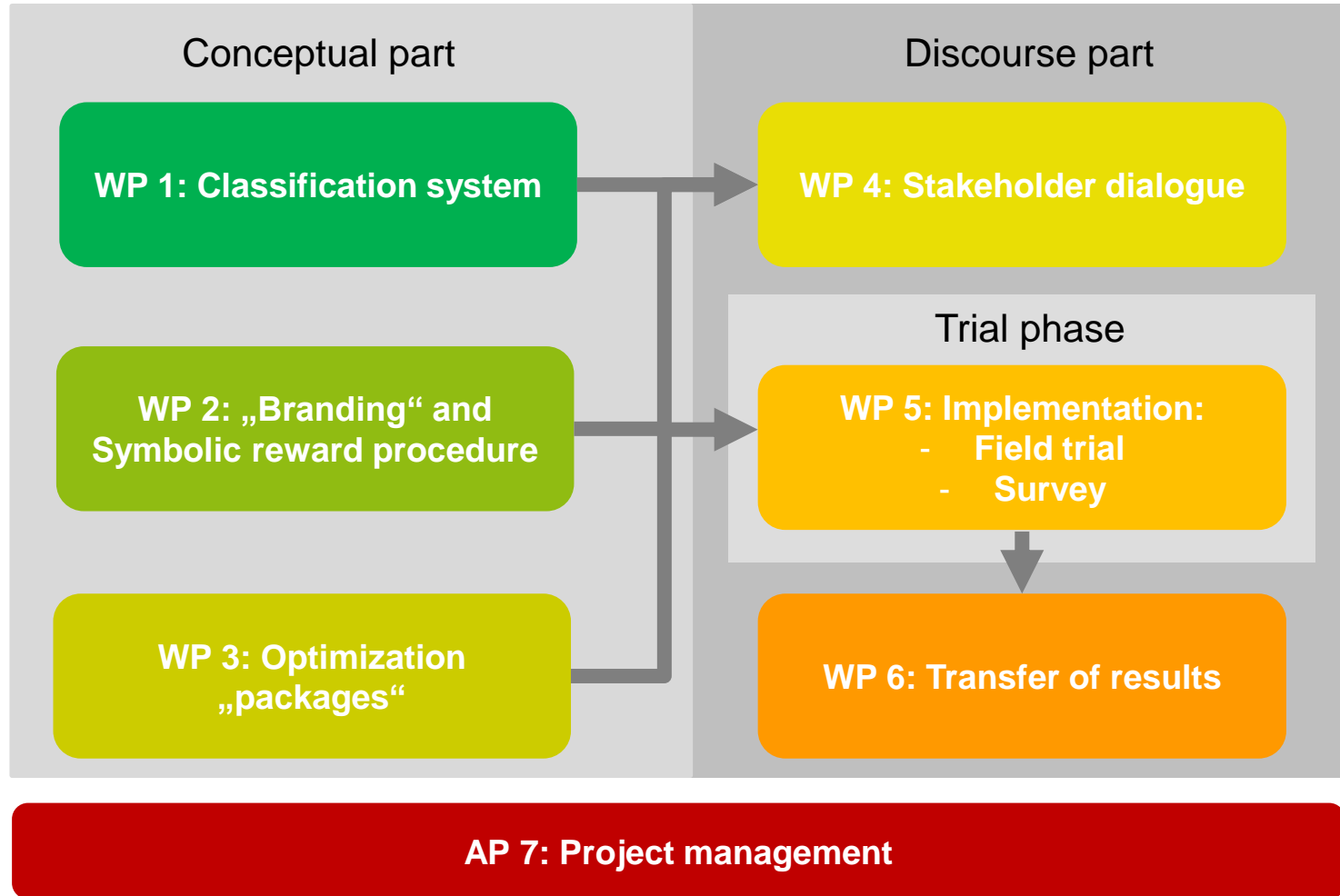
- Networks developed during the project:



Development and testing of a set of interventions

- Comparative label „Energy Efficiency Class for the Household“
 - Feedback tool for overall electricity consumption
 - Allowing comparison with similar households
 - Allowing for goal setting to plan a medium term savings strategy
- „Branding“ and symbolic reward procedure that enhance visibility
- Targeted „optimization packages“ for different target groups, building on the efficiency class
- If successful, system could be used by utilities, e.g. to fulfil their requirement of the Energy Efficiency Directive Annex VII to provide comparative feedback

Project architecture



Where are we now?

WP 1: Classification system

In 4 Schritten ans Ziel:
Ermitteln Sie hier Ihre Stromeffizienzklasse

1 Wählen Sie Ihren Gebäudetyp aus.

2 Wie wird ihr Warmwasser aufbereitet?

3 Wie viele Personen leben im Haus?

4 Wie hoch ist ihr Stromverbrauch im Jahr?

KLASSE STROM SPAREN

Gebäudetyp

Warmwasserbereitung

Personen

max. Verbrauch in kWh pro Jahr

Ihre Stromklasse →

1-2 Familienhaus, Reihenhaus oder Doppelhaushälfte	mit Strom <small>(elektr. Boiler, Durchlauferhitzer etc.)</small>	1	1.700	2.200	2.700	3.100	3.700	4.500	über 4.500
		2	2.500	3.000	3.500	4.000	4.400	5.000	über 5.000
		3	3.300	4.000	4.300	5.000	5.500	6.500	über 6.500
		4	3.600	4.300	5.000	5.600	6.200	7.300	über 7.300
		5	4.500	5.400	6.000	7.000	8.000	9.700	über 9.700
	ohne Strom	1	1.400	1.900	2.200	2.600	3.100	3.700	über 3.700
		2	2.200	2.500	3.000	3.200	3.600	4.000	über 4.000
		3	2.700	3.200	3.500	4.000	4.200	4.800	über 4.800
		4	3.000	3.600	4.000	4.400	4.900	5.500	über 5.500
		5	3.500	4.200	4.800	5.300	6.000	7.000	über 7.000
Wohnung im Mehrfamilienhaus	mit Strom <small>(elektr. Boiler, Durchlauferhitzer etc.)</small>	1	1.200	1.500	1.800	2.000	2.400	3.000	über 3.000
		2	2.000	2.500	2.900	3.200	3.500	4.000	über 4.000
		3	2.800	3.500	3.900	4.200	4.800	5.400	über 5.400
		4	3.200	4.000	4.500	5.000	5.500	6.500	über 6.500
		5	3.800	4.600	5.600	6.100	7.000	8.000	über 8.000
	ohne Strom	1	800	1.000	1.200	1.500	1.700	2.000	über 2.000
		2	1.400	1.700	2.000	2.200	2.500	2.900	über 2.900
		3	1.800	2.200	2.500	3.000	3.300	3.700	über 3.700
		4	2.000	2.400	2.800	3.300	3.700	4.000	über 4.000
		5	2.300	3.000	3.500	4.200	4.600	5.300	über 5.300

WP 1: Results

- 7-class scheme for 20 different household types; each is a combination of:

Residence type
(apartment or
detached house)

Electric water
heating y / n ?

No. HH members
(1 – 5 and more)

- Compatibility with „Stromspiegel“: From normative approach based on „best possible“ HH to descriptive approach based on quantiles

WP 2: Branding and symbolic procedure



≈ „Best in class saver“

2 focus groups (high and low electricity consumption)

- Feedback via efficiency class and tailored energy advice is welcomed
- Perceived independence and competence of adviser is crucial
- strong reservations against symbolic reward => dropped

WP 3: „Optimization packages“

- Original idea: Tailored packages of measures that could be especially attractive for certain „clusters“ of consumers
- Analysis of social milieus and socio-demographic data revealed no such clusters
- Instead: Development of individualized tool for tailored advice, ex-post analysis after field trial and survey

WP 5: Field phase

- 50 households each in Darmstadt and Freiburg (supply areas of the supplier partners); quotas for age, family status, electricity consumption
- Interventions:
 - Communication of energy efficiency class
 - Tailored electricity advice with goal setting
 - During 6 months period: keeping logbook (online or offline), meter readings, various online tools, newsletter
 - Final interview (end May 2015)

WP 5: Tailored advice

- By professional energy advisers (engineers)
- Use of a newly developed Excel tool
 - to facilitate structured and individualized energy advice
 - To be used by professional energy advisers
 - Building on the energy class
 - Allowing for goal setting: change of energy class and / or percentaged savings goal
 - Integrating option to participate in appliance exchange program
- Steps
 - Household data and electricity consumption
 - Detailed inventory of appliances and use patterns
 - Suggestion of priority measures that would help reach a savings goal
 - Half-automatic generation of short report

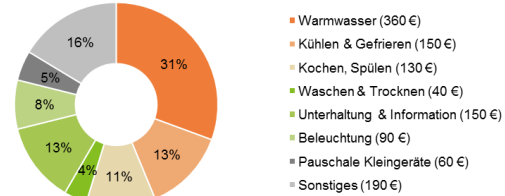
Example: Detailed analysis (section)

Electricity consumption per need area

Hot water	Typ. Value	Amount	Unit	Usage		kWh/year	Cost
Hand or face wash	0,1 - 0,3	0,15	kWh/usage	42	Times / week	328	81,90 €
Shower	0,3 - 3,0	1,50	kWh/usage	12	Times / week	936	234,00 €
Bathtub	2,1...4,5	3,00	kWh/usage	1	Times / week	156	39,00 €
Other						0	0,00 €
Hot water total (rounded)						1.420	354,90 €

Example: Report with recommendations (excerpt)

Your energy consumption and cost per need area



Evaluation of your energy consumption per need area

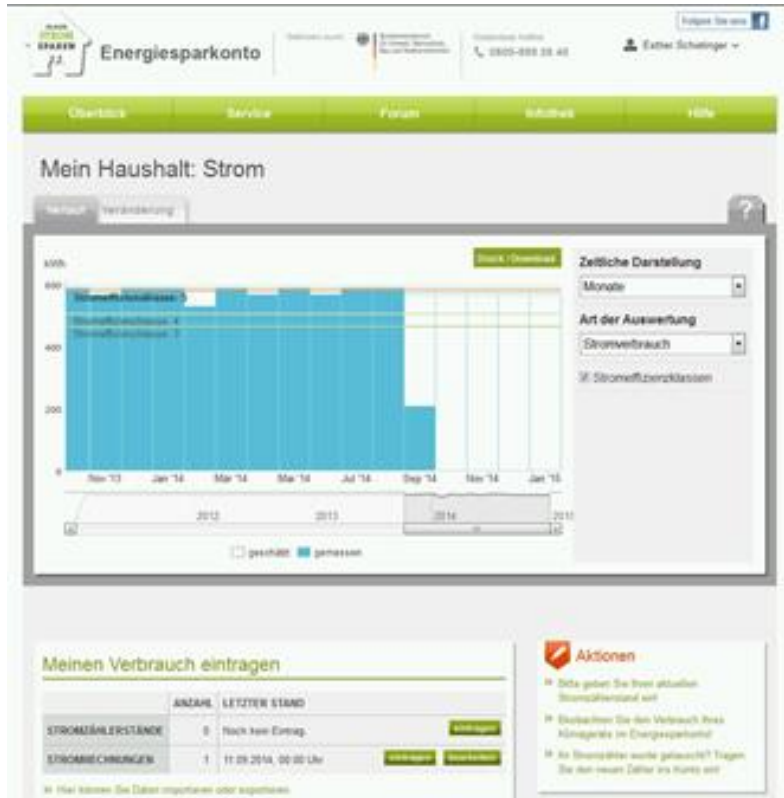
Hot water	Alert!	ICT	OK
Cold appliances	Alert!	Lighting	Need for action
Cooking and dishes	OK	Small appliances	Alert!
Laundry	OK	Other	Need for action

Savings measures

Your personal goal is to save 12 % electricity (640 kWh oder 160 EUR). To achieve a better efficiency class, you need to save 550 kWh

Priority short term measures	Einsparung kWh	Einsparung EUR
Water saving shower head	250	60 €
Optimize water heater settings	30	10 €
Adjust refrigerator temperature	30	10 €
(...)	(...)	(...)
Sum	770	190 €
Potential savings in %	14%	

Usage of online tool (as of Jan 26, 2015)



	F	D	Un-clear	Sum
monthly	5	5	1	11
(almost) daily	1	1	0	2
Frequently but irregularly	0	3	0	3
Once	7	7	1	15
Registration only	2	1	1	4
Sum	15	17	3	35

First conclusions and next steps

- Energy efficiency classes are well received and raise interest
- But barriers to roll-out (e.g. as feedback on the bill):
 - Competing guidelines by BDEW (supplier association)
 - Requires personal data (to define household type) => only voluntary
 - Software compatibility problems
 - Alternative distribution channels via „Stromspiegel“
- Tailored advice is promising
 - Semi-automatization allows for higher number of advice session, quality standards and quality control => co-operation with Federation of consumer centers running a large scale energy advice program?
 - Energy advisers are usually not specifically trained in electricity topics => development of specialized training program?
- Symbolic reward implies being „singled out“ and is NOT attractive

Thank you for your attention!

Do you have any questions?

Dr. Corinna Fischer
Öko-Institut e.V.

Freiburg Head Office
Postfach 17 71
79017 Freiburg

Tel.: +49 761 45295-223
E-Mail: c.fischer@oeko.de

