

Smart Metering consumer behaviour

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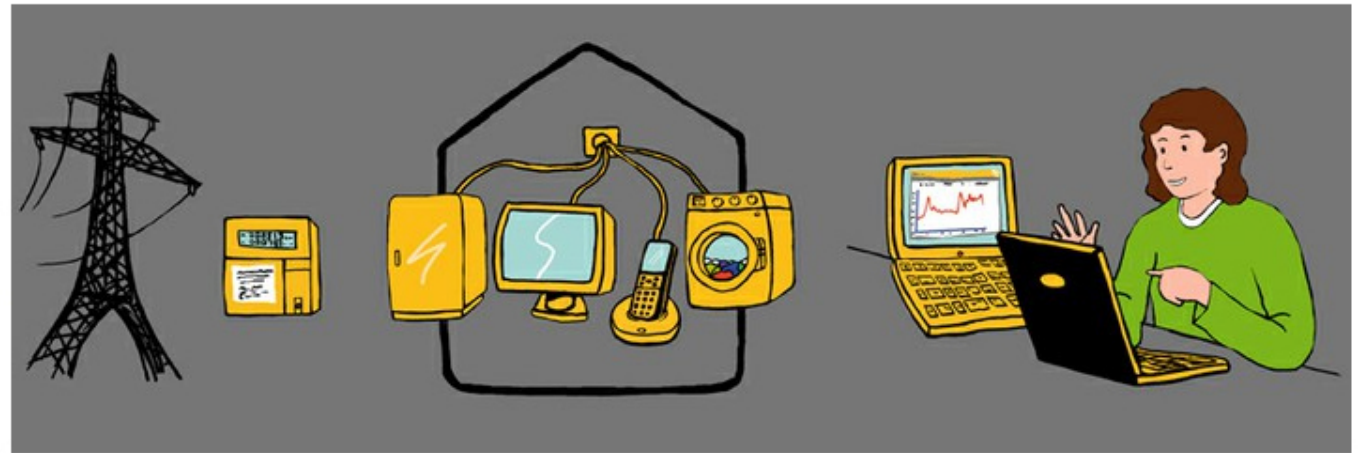
Smart Metering as a Chance

- I. Potential on consumer side
- II. Shortcomings of Present Approaches
- III. Smart Metering – Further Ideas

I. Potential on Consumer Side

Smart Meter: Intelligent Electricity Meter

Intelliekon



- electricity consumption in real time
- information about specific appliances
- should motivate to save electricity

Theoretical Saving Potential

- environmental psychology research on feedback:
12 % saving (Abrahamse et al., 2005)
- subjective saving potential: 6 – 10 %
(FORSA für Verbraucherzentrale Bundesverband, 2010)
- pilot projects, e.g. Zurich, CH, T-City Friedrichshafen, Intelliekon

First Results – Dutch Pilot Study

(van Dam et al., 2010; n = 54)

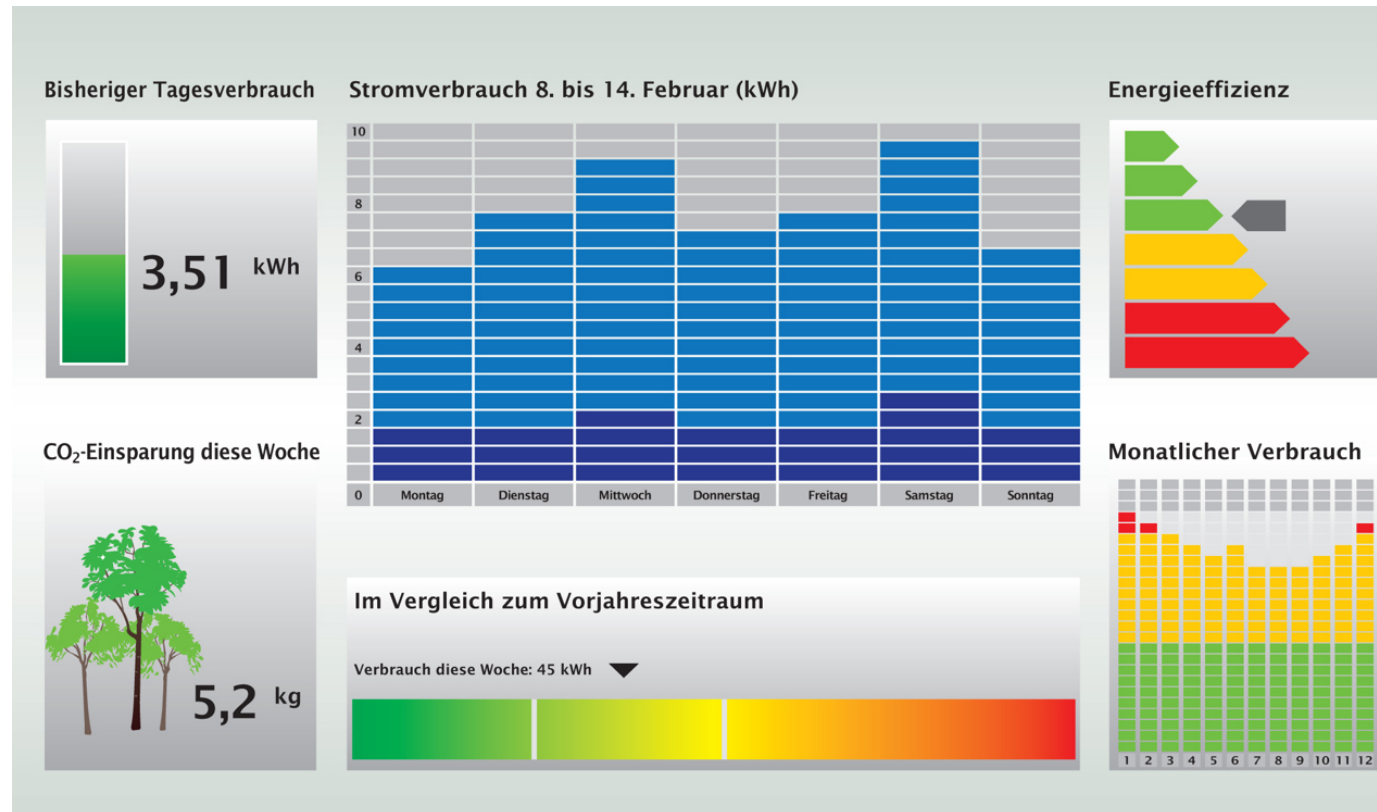
saving after 4 months  7,8%

saving after 15 months  1,9%

II. Shortcomings of Present Approaches

Mindset Homo Oeconomicus

- assumption:
money saving
motivates
- instrument:
feedback,
information



Mindset Homo Oeconomicus

- assumption: money saving motivates
 - instrument: feedback, information
- > realistic calculation – example:
monthly costs: 40 EUR
10% saving: 4 EUR

Unclear Cost-Benefit-Relation

- benefit for consumers
transparent consumption, saving potential,
gaining comfort (refrigerator example), ...
- costs for consumers
time afforded, costs for smart meter higher than savings,
loss of control, data security, ...

(FORSA, 2010; Intelliekon, 2011; Universität St. Gallen, 2011)

III. Smart Metering – Further Ideas

Motivation by Social Recognition

(Handgraaf et al., 2011)

- study on energy saving in office – PC
kind and communication of reward, N = 84
intervention: 4 weeks, last assessment after 8 weeks
 1. kind of reward
non-monetary (school grades) / monetary (up to 5 EUR)
 2. communication via email
public (everybody) / private (alone)
- results saved saved kWh & motivation
public > private email
non-monetary > monetary reward
public & non-monetary = 6% electricity saving

Motivation by Status

(Griskevicius et al., 2010)

- study on product purchase (cars, dish washer, ...)
 1. status motive activated / neutral
 2. place online / supermarket
 3. price expensive / good price
 4. product green / luxurious
- results

status activated – “green” products preferred, if:

 - a) bought in public supermarket
 - b) green product more expensive compared to luxurious

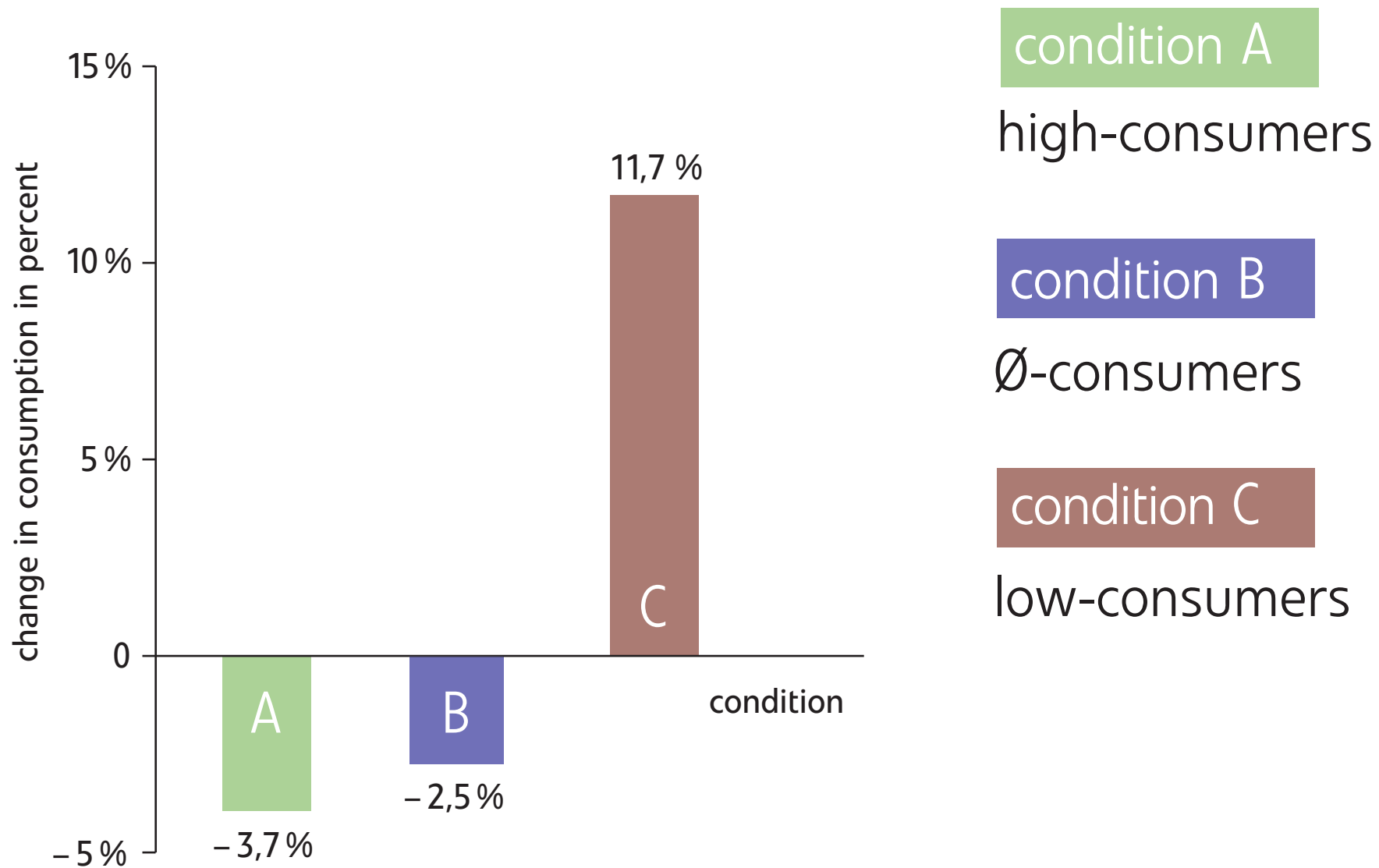
Inefficient Feedback

(Brandon & Lewis, 1999)

- study on energy saving in households
 1. feedback – individual / compared
 2. financial costs / environmental costs
 3. feedback by flyer / PC
- results

PC > flyer

Results by Baseline Consumption



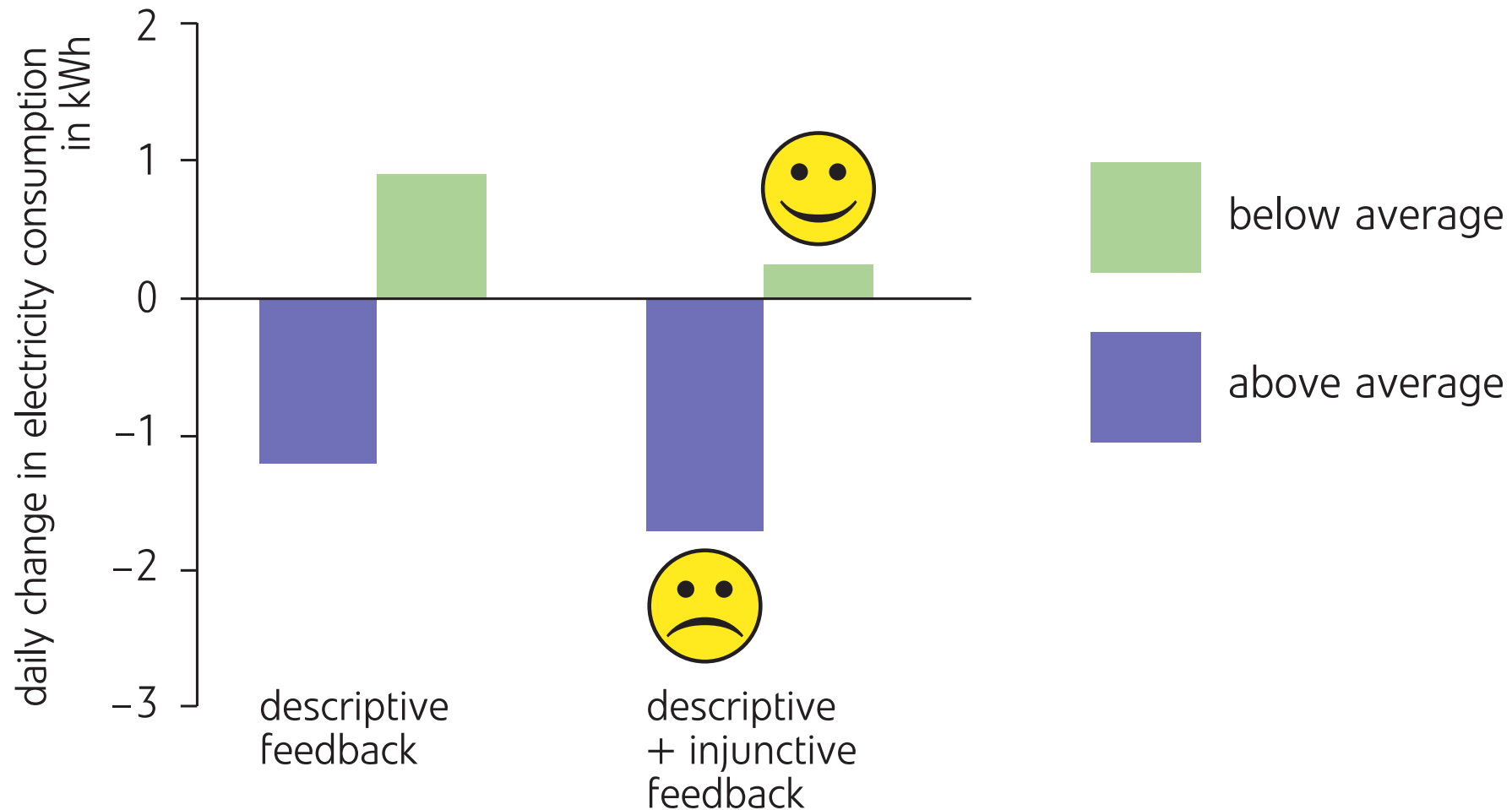
Norm Activation

(Schultz et al., 2007)

- problem
high household electricity consumption
- comparative feedback
prevent boomerang-effect
- two distinct norms
is-norm: descriptive / should-norm: injunctive
- intervention
average baseline consumption (287 households)
comparative feedback via door hangers
descriptive information: own + average consumption of
neighbourhood + saving tips
injunctive: + smiley above / below average



Results Norm Activation



Practical Application

(Zeit Wissen)



- OPOWER, USA
consumers of 33 energy suppliers
- comparative feedback
own electricity consumption each 3 month
average consumption of whole neighbourhood
consumption of most 'saving' neighbour
smiley, if own consumption is below average
- result
> 1 Mill. households, electricity consumption – 2,5% yearly
summer 2009 – 3,5% = saving 86.000 t CO₂

Summary

_money & feedback alone are not sufficient

_address variety of motives, z. B. status, norms

_complexity as challenges and chance

understand target group / tailored motivation
design social interventions, social marketing
use environmental psychology know how,
social sciences

_design sustainable behaviour changes