

DIW Berlin

German Institute
for Economic Research



Influencing Electricity Consumption via Consumer Feedback: A Review of Experience



ECEEE 2007 Summer Study, La Colle sur Loup

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Agenda

- Introduction
- What is feedback, and how to give it
- Criteria for success of feedback
- Review of international experience
- How would the consumer like their feedback
- Conclusions



Why feedback?

Electricity conservation via

- Conscious choice of appliances
- Conscious use of appliances

But: Electricity is

- Invisible and emotionless
- related to diverse activities
- no transparent information on consumption

Idea: Feedback on consumption to increase consciousness

EU Directive 2006/32/EC: informative billing and other types of feedback „where appropriate“.



Feedback – on what, and how?

Increase feedback ...

- with increased frequency of information on consumption
- broken down to time, room or application
- offering comparisons (time series, comparison with average)^{C1}
- Information on env'tl impact
- via improved visual design

Does feedback deliver?

- Darby (2006): up to **20 %** savings via improved feedback
- Analysis of existing experience to deduce criteria for successful feedback approaches

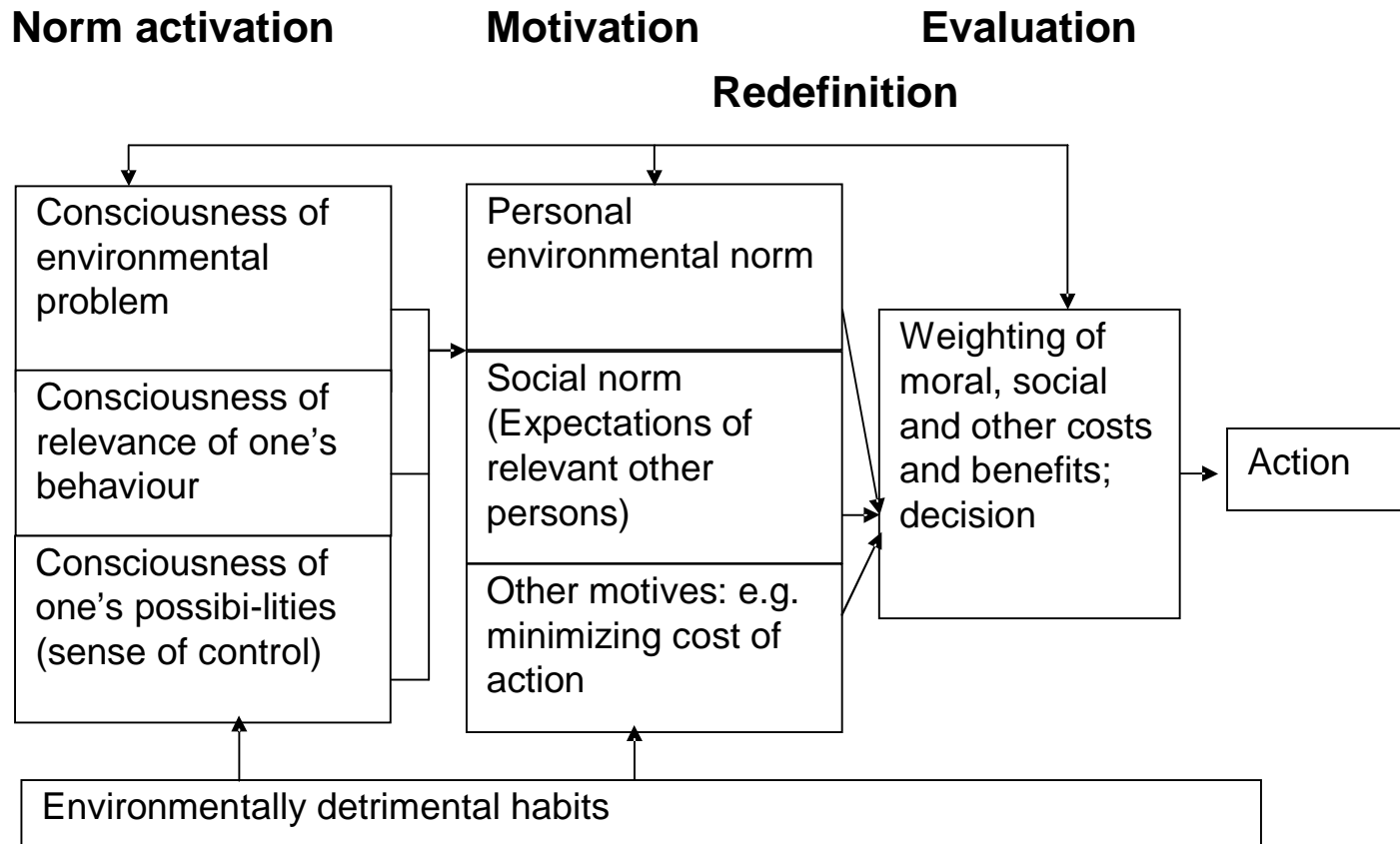


C1

hab ich als extra Punkte gemacht, weil ich denke, dass es jeweils spezifische Funktionen hat (die Vergleiche ermöglichen, den eigenen Verbrauch besser einzuordnen / zu bewerten, die Angabe des Umwelteffekts stimuliert vielleicht zusätzliche Motive)

Corinna daheim; 2/06/2007

A heuristic model of environmentally relevant behaviour



International Experience: Review

Database:

5 review studies, 19 original papers on effects and reactions, with a total of 26 projects from 11 countries

Assessment with respect to

- Project design
 - Context (mostly model projects / R&D)
 - Goals (motivation, satisfaction, load shift, consciousness, preferences ...)
 - Size and location (generality vs. site-specific features)
- Characteristics of the feedback given



International Experience: Review (2)

Characteristics of the feedback (and hypotheses)

- Frequency (the more directly and the more frequent, the better) C2
- Duration of project (the longer the better)
- Content (emphasis on consumption & cost; few env. impacts)
- Breakdown (the more the better)
- Medium and mode of presentation (electronically, interactive, written paper? Comprehensibility and appeal?)
- Comparisons (to stimulate competition, to increase transparency, e.g. historic or normative comparison)
- Additional information and other instruments (combinations with financial incentives, goal setting, personal commitment)



C2

dies als Hypothese kennzeichnen, ebenso bei breakdown. Mit diesen (bisher erst aus der Theorie abgeleiteten) Überlegungen habe ich versucht, zu begründen, warum der jeweilige Aspekt (z.B. Frequency oder breakdown) wichtig ist.

Corinna daheim; 2/06/2007

Results

1. Does Feedback work?

- Yes, mostly (usually 5-12 %)

2. Which types work best?

Common features of “best cases“:

- Multiple options for feedback electronically available for choice
- Interactive element
- Feedback given more often than monthly
- Detailed, appliance-specific breakdown
- Comparisons with previous periods



Results (2)

Relevance of criteria for „best performance“

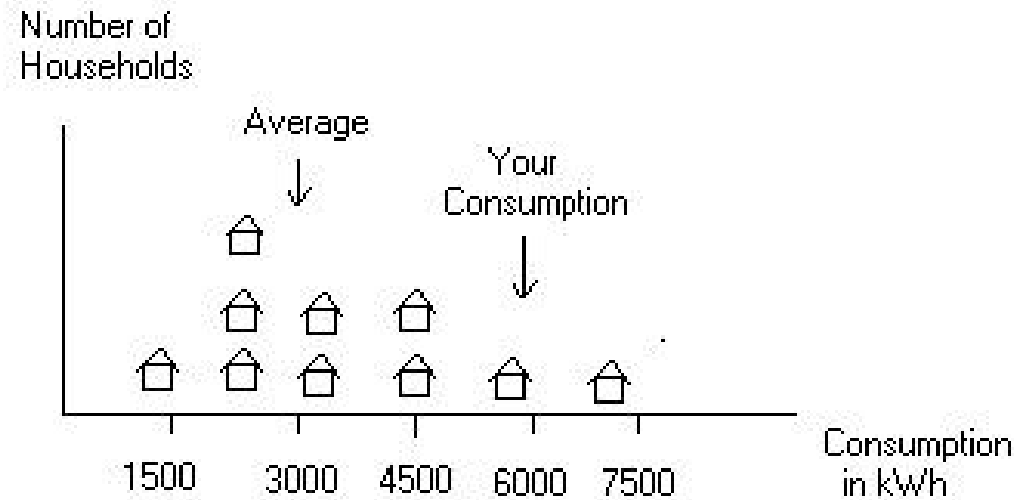
- Frequency: **helpful** but not sufficient
- Duration of project: **no clear indications**
- Content: **no clear indication**, but environmental information seems to be as effective as other (€, kWh) information
- Breakdown: **potentially useful**
- Medium and mode of presentation: **little attention paid to, but seems relevant. „Billing“ projects not among the best performer**
- Comparisons: **On average, no significant impact** (cancelling out between high and low consumers)
- Additional information and other instruments: **No clear evidence**

How would households prefer their feedback?

- More details, more frequent feedback, based on actual consumption
- Normative feedback motivates saving behaviour
- Easy-to-understand information
 - Feedback based on actual consumption in a given period
 - Clear labelling and explanations
 - Clear indication of different components of price
 - Support by graphic presentations
 - Pie charts for breakdown
 - Vertical bar charts for historic comparison
 - Horizontal bars for lowest to highest consumption
- Major differences between nations!

Example: Distribution graph, tested in USA and Norway (consumer research)

Compare your electricity consumption with other households similar to yours



Conclusions

Caveats: Data restraints!

- Lack of well-documented large-N studies
- Lack of international comparative studies
- Lack of data in general

However: Feedback appears to be useful when it

- is given **frequently** (though this alone is not sufficient)
- involves **interaction** and **choice** for households
- involves appliance-specific **breakdown**
- is given over a longer period
- may involve historical or normative comparisons
- presented in an understandable and appealing way



Final remarks

- Feedback start-up is demanding
- Little motivation in energy utilities to give feedback
- EU legislation provides a window of opportunity by obliging suppliers to disclose electricity features
- Subsidiarity, however, allows for different levels of stringency and choice of measures

Thank you

Your comments are welcome!

