Are energy decisions about energy?
A case study about Dutch private homeowners who consider energy renovation measures

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Hasselt
Challenges

- EU 2015: 25%
- EU 2050: 80%
- NL 2050: 75%
- EU NOW: 0.5-1.2%
- NL 2030: 20%

Limited impact current policies

1. instituting non-coercive policy instruments
2. placing the responsibility for energy efficiency solely on homeowners [1]
3. addressing homeowners in policies as rational decision makers [2]
4. overlooking the social aspects of renovation [3]
5. most policies ignore the diversity of concerns and motivations [4]

1. (Murphy, Meijer, & Visscher, 2012)
2. (Ariely, 2010; Lutzenhister, 2014; Maller & Horne, 2011; Murphy, 2014; Taranu & Verbeeck, 2017; Wilson et al., 2015)
3. (Bartiaux et al., 2014; Judson & Maller, 2014; Karvonen, 2013; Malone et al., 2018; Wilson et al., 2015).
Research question

What are the various stages in the decision-making process of private homeowners concerning energy renovation measures and what are the influencing factors in these stages?
Energy renovation measures

For instance:

- insulation
- HE-glazing
- solar panels
- renewable heat and cold
Data collection – case study

Case-study cityregion Parkstad Limburg (NL):

• Dutch frontrunner in energy policy.
• 8 municipalities with joint energy policy (PALET).
• 3 projects in which energy audits for their homes are offered to private homeowners

- 125,885 households
- 37% of total energy use
- 53 % owner-occupied homes

€200 million/year

VNG, 2018, Delheij et al., 2014, Parkstad monitor, 2016
Data collection - sampling

- Questionnaires (n=91)
- Interviews (n=52)

<table>
<thead>
<tr>
<th>Projects</th>
<th>Policy Makers</th>
<th>Policy Intermediaries</th>
<th>Policy Advisors</th>
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<tbody>
<tr>
<td>A</td>
<td>420</td>
<td>74</td>
<td>54</td>
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<td>B</td>
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<td>C</td>
<td>222</td>
<td>42</td>
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<td>Total</td>
<td>729</td>
<td>136</td>
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Multiple motivations and barriers

Motivations (n=71)

- Improve comfort: 22
- Environmental concern: 40
- Saving energy (costs): 51
- Becoming self-sufficient: 11
- Setting an example/personal interest: 2

Barriers non-adopters (n=20)

- House is already in a good condition: -4
- Already a low energy use: -1
- Too expensive: -6
- Other priorities: -5
- Lack of right information: -2
- Planning to do: -4
- Other: -4

"At some point I just decided to become “green”. In the long term I want to become self-sufficient" (Tamara, 33)

"It is more comfortable inside and it warms up faster" (Ben, 81, about cavity wall insulation)
"Because our home is also our piggy bank...Suppose we have to go to a nursing home then I can get a better price for a home that is “up to date”"

(Cor, 73)
“the space under the ground floor is too narrow to install insulation” (Elene, 25)

“we have massive walls and at the inside there is too little space to insulate” (Tamara, 33)

“we do not like the look of current solar panels, we will wait for future developments” (Arnold, 35).
Model for homeowners’ decision-making process

(Figure based on Ebrahimigharehbaghi et al., 2019; Rogers, 2003; Wilson et al., 2018 and the empirical material collected for this paper)
Environmental concern:
- want to make a positive contribution to the environment
- want to become “self-sufficient” in energy
- become ambassador for ERM

Socio-demographic factors:
- just moved into the house
- have changes in the household
- make use of the organisation of implementation measures by municipality
- want to improve thermal comfort
- combine the implementation of ERM with other construction work
- have salient events

Physical factors:
- want to make a positive contribution to the environment
- want to become “self-sufficient” in energy
- become ambassador for ERM

External factors:
- are uncertain about future developments in the collective energy system
- are uncertain about the remaining time living in the house
- do not want to change the appearance of the house
- perceive implementing ERM as inconvenient
- experience technical restrictions in the house
- have the perception that their house is in good condition

Additional factors:
- Increasing energy prices
- increasing media attention
- adequate policy actions
- are involved in community energy initiatives

Other factors:
- low energy prices
- no or inadequate policy actions
- do not want to get involved in community energy initiatives
Model for homeowners’ decision-making process

getting interested → gaining knowledge → forming an opinion → making a decision → implementing → experiencing

positive experiences in social network
- objective information
- tailored advice
- interpersonal communication
- skilled professional with good communication skills

advice from social network

advice from professionals
- too commercially motivated advice
- too general advice
- only contact by email or phone
- unrealistic prognoses for energy savings
- lack of knowledge of professionals

personal background
- interest in technology
- technical education or job
- sustainability at work

negative experiences in social network
Model for homeowners’ decision-making process

- getting interested
- gaining knowledge
- forming an opinion
- making a decision
- implementing
- experiencing

**Financial-economic factors**

- perceive ERM as a good investment
- make use of a low interest loan from local government
- want to decrease their energy bill
- want to increase their house value

- perceive the investment costs as too high
- have a lack of financial savings
- have other financial priorities
- already have a low energy-bill
Model for homeowners’ decision-making process with multiple influencing factors in the various stages of the process

Broers, W.M.H., Vasseur, V., Kemp, R., Abujidi, N., Vroon, Z. Decided or Divided? An empirical analysis of the decision-making process of Dutch homeowners for energy renovation measures. Energy research and Social Science, 2019. https://authors.elsevier.com/a/1ZhQ_oMjTBK0h
Recommendations for energy service companies

1. Offering credible advice focused on homeowners specific situation, their knowledge level about ERM* and personal needs and preferences in which the multiple influencing factors for homeowners are addressed in the various stages of the decision-making process.

2. Organising the implementation of energy renovation measures by skilled and trustworthy companies (less “hassle” for homeowner)

3. Offering several financing and guarantee options.

4. Facilitating ambassadors of ERM to inform people in their social network about ERM.

5. Combining 1-4 into an “all-in-one offer”.

* ERM: energy renovation measures
An example – **Solar Panel Project Parkstad**

- Solar panels for private homeowners
- Bundling customer-demand of 7 municipalities
- 1st Tender for 3500 houses (2nd also 3500 houses)

“all-in one offer”

- Organising the whole installation by a service provider (Volta Limburg)
- 15 years service & guarantee by municipality
- Financing option by municipality (low interest loan)
- Municipality as contract partner
- No check with “Office for Credit Registration” (BKR-toets)

monthly costs (financing & service) < monthly energy savings
Sample

Online survey

May 2019

Contacted: 2,822 *

1,492 respondents

53%

* Het betreffen deelnemers waarbij de zonne-installatie in 2017 of 2018 is geplaatst
Reasons to participate in the project

- Environmental concern: 30%
- Reduction of energy costs: 39%
- Becoming self-sufficient in energy: 16%
- Increasing house value: 11%
- Good investment: 4%

N=1492
Most **appreciated** in the project

- Offered service and guarantee: 22%
- Everyone can participate: 16%
- Financing from municipality: 24%
- De municipality as contract partner: 14%
- Everything is arranged: 24%

N=1492
More numbers...

94% has recommended the project to others.

Majority of homeowners is proud of their solar panels.

Majority of homeowners saw their wishes and expectations fulfilled in the project.
Impact

Average installed capacity of residential PV-panels per resident

- Parkstad Limburg
- The Netherlands

38% of the increase in 2017 is due to the Solar panel Project in Parkstad.
Thank you for your attention!

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