Obduracy in Action

how Dutch local communities transform centralized energy systems

Conference Energy & Society, Krakow, June 4-6 2014
Overview

• Introduction
  – EU-production of Renewable Energy
  – Investors in Renewables
  – Perspective on consumers
• Theoretical framework
  – Actor-Network theory
  – Constraints and incentives
  – Obduracy
  – Scripts
• Community energy
  – Designing new scripts
  – Forging new connections
• Discussion
Renewable Energy in the EU
## Investors in renewables

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility</td>
<td>State or privately owned utility, energy company; own transmission or distribution network</td>
</tr>
<tr>
<td>Publicly owned non-energy firm or organization</td>
<td>Utility with main area of business outside energy (e.g. waterschap)</td>
</tr>
<tr>
<td>Independent power producer</td>
<td>Privately owned firm with main area of business electricity production</td>
</tr>
<tr>
<td>Farmer</td>
<td>Privately owned, main business is agriculture</td>
</tr>
<tr>
<td>Diversified company</td>
<td>Privately owned, main business is other than energy production</td>
</tr>
<tr>
<td>Power project developer</td>
<td>Privately owned, main area of business is to plan, build and operate power plants for other owners</td>
</tr>
<tr>
<td>Sole trader</td>
<td>Individuals or partnerships owning a production plant; either specialized or with other main area of activity</td>
</tr>
<tr>
<td>Association</td>
<td>Economic associations, social associations, community initiatives that own and operate one or several power plants.</td>
</tr>
</tbody>
</table>
**Theory: Actor-Network Theory**

- Networks of heterogeneous actors
- Collective strategies
- Our local socio-technical networks
  - Human actors
  - Buildings
  - Energy technologies
  - Infrastructures
• Cities as ‘socio-technical artefacts’
• Design by society:
  – Norms, values, assumptions are reproduced in products of design
• Design thinking as ‘politics of hope’
Concepts: Obduracy

• What?
  – Producing continuity
  – Reproducing status quo
  – Resisting change
Theory: Constraints

- Social traditions
- Cultural traditions
- Legislation
- Economic constraints
  - Market access
  - Grid access
- Fiscal (dis) incentives
- Technological constraints
Causes of obduracy

<table>
<thead>
<tr>
<th>Theme</th>
<th>Traditions</th>
<th>Social factors</th>
<th>Economic barriers</th>
<th>Physical aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical buildings</td>
<td>Restoration theory</td>
<td>Identity of place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decentralized energy</td>
<td>Consumers used for cheap ‘balancing’</td>
<td></td>
<td>Market paradigm geared at large scale commercial production</td>
<td>New infrastructure necessary</td>
</tr>
<tr>
<td>production</td>
<td>Centralisation bias</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure (transport)</td>
<td>Automobile ideology</td>
<td></td>
<td></td>
<td>High material ‘thickness’</td>
</tr>
<tr>
<td>Energy renovation</td>
<td>Moral views on housing and gender</td>
<td>Lots of work and hassle</td>
<td>High investments needed</td>
<td>Material not suited; layout not efficient</td>
</tr>
</tbody>
</table>
## Degrees of obduracy

<table>
<thead>
<tr>
<th>Theme</th>
<th>Cultural Traditions</th>
<th>Social factors</th>
<th>Economic barriers</th>
<th>Physical barriers</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical buildings</td>
<td>Restricted to insiders?</td>
<td>Politically unstable</td>
<td>moderate</td>
<td>complicated</td>
<td>Needs strengthening</td>
</tr>
<tr>
<td>Decentralized energy production</td>
<td>Strong centralization bias</td>
<td>New wave of community interest</td>
<td>Moderate, depending on policies</td>
<td>High, but possible to overcome</td>
<td>Strong political obduracy</td>
</tr>
<tr>
<td>Infrastructure (transport)</td>
<td>Strong automobile ideology</td>
<td>strong</td>
<td>enormous</td>
<td>high</td>
<td>Permanent?</td>
</tr>
<tr>
<td>Energy renovation</td>
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<td></td>
<td></td>
<td></td>
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</table>
Concepts: Scripts

• How?
  – Inviting energy use (buildings, infrastructure, spatial patterns)
  – Regulating household energy use (pricing, taxes, feedback price)
  – Inhibiting local production (regulation, fiscal policies, grid access, feedback price)
Energy Scripts

• Distribution of heat, light and power in a building
• Co-choreographs functional use
• Invites or discourages energy use
The stability (or obduracy) of buildings, in the sense that they are continually surviving threats from natural or man-made origin; as well as their architectural form, including traces of earlier use(r)s, are a function of the interaction of heterogeneous elements, such as building codes, new functions, economic pressures, cultural values, the weather, rules and regulations; these elements are related and mutually influence each other in the form of a network.

(paraphrase of Michel Callon, 1980)
Archetypical consumers

- Economic literature: consumers are homogeneous group of actors consuming along utility maximizing logic and making their consumption decisions based on comparison between different costs and prices
- The archetypical consumer is the private family household
- Energy as a homogeneous product
The production of consumers

- Consumers are very heterogeneous group
- Differentiated by the utilities: heavy consumers pay prices that are a fraction of those of the families
- Tax exemptions for heavy users
- Energy is a heterogeneous product with several features
Changes

- Consumers become prosumers
- Prosumers unite in local initiatives
- Initiatives involve outside networks
- ... (new regulations)
- ... (innovation)
- ... (new ‘regime’)
- Result: Change in socio-technical network
Prosumers

• Consumers become prosumers
• Defining & performing new roles

Carbon reduction, ‘the public’ and renewable energy: engaging with socio-technical configurations

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Table 3  Public roles and renewable energy

<table>
<thead>
<tr>
<th>Roles</th>
<th>Description</th>
<th>Proximity to technology</th>
<th>Level of awareness/active engagement with renewable energy</th>
</tr>
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<tbody>
<tr>
<td>Captive consumers</td>
<td>Pay bills to established energy suppliers.</td>
<td>End of wire. Distanced from the sources of renewable energy dispersed through national grid.</td>
<td>All energy customers unknowingly consume some energy from renewable sources.</td>
</tr>
<tr>
<td>Service customers</td>
<td>Actively choose between suppliers including green tariffs which partially or entirely involve renewable generation.</td>
<td>End of wire. Distanced from the sources of renewable energy dispersed through national grid.</td>
<td>Green tariff customers actively choose renewable energy supply.</td>
</tr>
<tr>
<td>Service users</td>
<td>Use the services (light, heat, motion etc.) provided by energy generated using renewable technologies, potentially in many different everyday settings and forms and function of building.</td>
<td>Not spatially close to technologies, but are explicitly so in heat networks and household/community modes of implementation.</td>
<td>The derivation of the energy services may be totally unknown to the user – or visibly, actively and deliberately promoted as being from renewable sources (e.g. in demonstration projects).</td>
</tr>
<tr>
<td>Financial investors</td>
<td>Invest in shareholding or interest earning arrangements relating to specific projects, to the broad financing of renewable energy projects or the investment choices of particular companies.</td>
<td>Investment opportunities may be locally restricted (e.g. RECs-banked projects in Wales); open to distant investors (e.g. JUICE Greenpeace-NPower tariffs for North Howe?); or in a small, benefits may be direct or explicitly tied spatially through community funds administered by local groups.</td>
<td>The derivation of the energy services may be totally unknown to the user – or visibly, actively and deliberately promoted as being from renewable sources (e.g. in demonstration projects).</td>
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<tr>
<td>Local benefactors</td>
<td>Receive benefits in addition to energy services; financial, infrastructural, educational, technological or intangible. Such benefits are increasingly negotiated in formal (planning) engagement.</td>
<td>While some campaign groups (e.g. Country Guardians) are not spatially linked, most protests are focused on local projects.</td>
<td>Such benefits may be visible and known to local people, or hidden and unknown, protest activity is by definition aware and actively engaged.</td>
</tr>
<tr>
<td>Project protestors</td>
<td>Actively object to projects through for example organisation of a local protest group, attending meetings, writing to press, lobbying, signing petitions etc.</td>
<td>Linked to local projects, tend to overlap with participants. Campaign groups may be spatially distant (e.g. Yes2Wind).</td>
<td>Supporter activity is by definition aware and actively engaged.</td>
</tr>
<tr>
<td>Project supporters</td>
<td>Actively engage in similar actions to protestors, although support is typically less visibly organised and vocal.</td>
<td>Explicitly linked to spatially-tied community or household modes.</td>
<td>Theoretically, any member of a community, in practice involvement is variable and participation can take different forms.</td>
</tr>
<tr>
<td>Project participants</td>
<td>Get involved in community mode of implementation, includes membership of organising groups; attending meetings; or hands-on installation or maintenance.</td>
<td>Necessarily spatially linked.</td>
<td>Intentionally through institutional arrangements (e.g. Windrotting) and ‘Company Driven’ micro-grids, but potentially less so (e.g. new owner of a ‘passive’ house).</td>
</tr>
<tr>
<td>Technology hosts</td>
<td>Owners of buildings or land, but not the renewable energy technology itself.</td>
<td>Normally proximate and part of household.</td>
<td>Necessarily active and aware, although may be acquired with house purchase rather than actively installed.</td>
</tr>
<tr>
<td>Energy producers</td>
<td>Directly owns and operates generation technologies.</td>
<td>Normally proximate and part of household.</td>
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</tr>
</tbody>
</table>

\* http://provenenergy.co.uk/windrotting/
Prosumer’s house ...
Energy Initiatives in the Netherlands

2013: ca. 300 local energy initiatives

Early 2013: 213 local initiatives registered on hieropgewektnl.nl

2012: estimated 100 local initiatives in NL

Click:
Video on Sustainable Villages Network

Source: hieropgewektnl.nl, accessed 05-06-2013
Local Initiatives

• Prosumers unite in local initiatives
• 500 citizen initiatives in NL
• Case study’s:
  – Hooghalen
  – Franeker
  – Zuidhorn
  – Pekela
• Broad range of types, forms, visions
  – From informal groups to enterprises
  – From solar panels to low-carbon communities
• Facing constraints
Future visions

• Autarchy
• Smart grid
• Incremental approach
Grand Vision

• The quest for autarchy?
• However, we have never been self-sufficient
Incremental approach

Trias Energetica

1. Reduce demand
   • Insulation programs

2. Use sustainable energy
   • Green electricity
   • Green mobility projects

3. (Revised): Produce sustainable energy
   • PV-programs
   • Cooperatives
Designing new scripts

• Re-design of buildings & infrastructure
  – Lower energy use
  – Invite local energy production

• Conditions
  – New regulations
  – New technologies adapted to local production
  – New organisation pattern
Analysis Energy potential Oenkerk 2/7 – abstracted map of the village of Oenkerk
Analysis Energy potential Oenkerk 3/7 – map of the built environment of the village of Oenkerk
Analysis Energy potential Oenkerk 4/7 – typology of built environment in Oenkerk (relevant for legal requirements for different types of buildings/usage)
Analysis Energy potential Oenkerk 5/7 – repetition in built environment (insulation potential)
Analysis Energy potential Oenkerk 6/7 – Realized PV collectors & heat collectors
Analysis Energy potential Oenkerk 7/7 – Potential for PV/heat collectors
Creating new networks

- Local connections
- Regional support
- Connections to larger network
  - E-decentraal
  - Energie Akkoord
Below the surface
Local human and non-human network

- energy-advisors
- agriculture
- village hall
- local businesses
- farmers
- municipality
- camping
- buildings
- infrastructure
- school
- super-market
- forestry
- sportclubs

Local energy initiative
Conclusion

• Open up energy system
  – By designing new scripts
  – By forging new connections
• Strengthen local community
  – Commitment
  – Organisation
Investment and consumption behavior

Motives
- Value creation
- General benefit
- Legitimacy
- Risk attitude

Resources
- Capital
- Knowledge
- Network
- Reputation
- Information

Business model
- Shareholder driven
- Co-creation
- Circular
- Sustainable

Background
- Experience
- Access to partners
- Education
- Norms & Values