



Energy research Centre of the Netherlands

# The social embedding of micro CHP in 2030

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## **Research objective:**

**Describing and analysing future expectations on the societal embedding of micro combined heat and power (mCHP).**

With focus on:

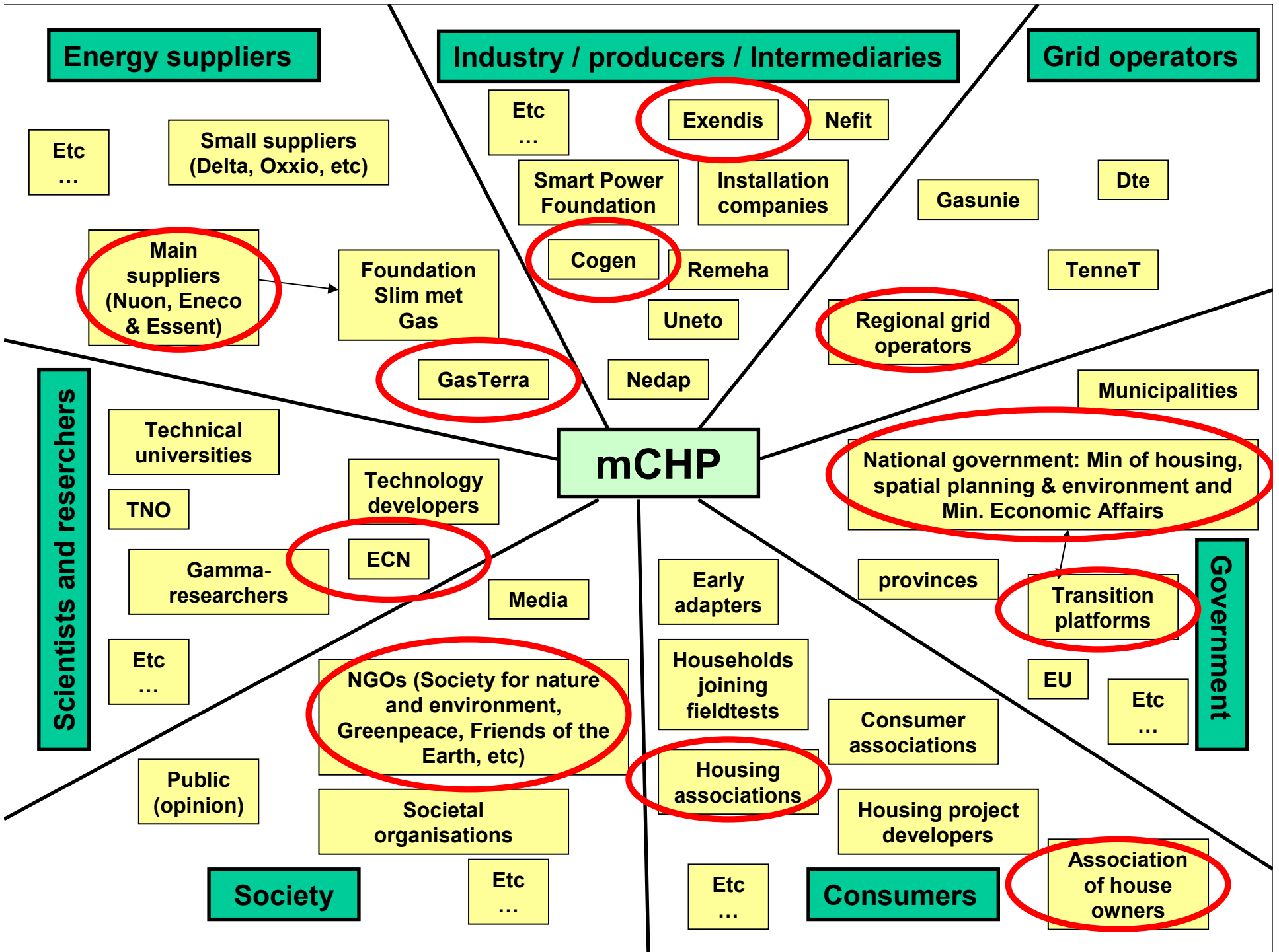
- Dutch households in 2030
- Market expectations of various stakeholders
- Stakeholders reactions on Virtual Power Plant scenario
- Socio-economic, policy, legal, technical and societal barriers and opportunities of mCHP
- Future roles, positions and responsibilities of stakeholders

## Methodology

- Analysis future of mCHP by:
  - Literature Research
  - Stakeholder interviews:
    - Face to face reported interviews
    - Informal discussions
      - Selection stakeholders based on stakeholder analysis and categorisation (see next slide)
- Dissemination in 2008-2009: abstracts for presentations submitted.
- Report: ECN-E-08-038  
<http://www.ecn.nl/publicaties/default.aspx?nr=ECN-E--08-038>

## Methodology

- Terminology:
  - All stakeholders: 100%
  - Most stakeholders: 75% - 99%
  - Majority of the stakeholders: 50% - 74%
  - Minority of the stakeholders: 25% - 49%
  - Some stakeholders: 1% - 24%
  - None of the stakeholders: 0%



## Focus in stakeholder interviews

- Expectations of market development mCHP
  - size, planning, target group, competing technologies
- Opinion about Virtual Power Plant scenario
- Current and expected barriers and opportunities influencing mCHP:
  - Socio-economic factors
  - Technical aspects
  - Policy / legal features
  - Societal factors
- Current and future stakeholder relations in 2030
  - who are leading – following – opposing – not involved?

## Main conclusions (1)

**Stakeholders have different expectations on how to reach a large mCHP market:**

- There are/will be many barriers (financial, technical, legislative, infrastructural and societal) and many ways to overcome these. Ideas about how deviate!
  - Roadmap
- All agree that large investments are needed. But different opinions on who needs to invest (government, market parties, house owners, building associations, etc).

## Main conclusions (2)

- Most actors see mCHP as a transition technology existing until 2020-2030. Some believe in renewable mCHP that will exist longer.
  - Opinions on role of green gas differ
- Many predict that consumers (users) will change their behaviour automatically towards mCHP. But only some take into account the influence of habits, personal capabilities, social influences, motivations, attitudes, etc of the users on the future of mCHP.
  - purchase behaviour, heating habits & power consumption pattern

## Main conclusions (3)

- mCHP is considered to be a technology that easily fits in the current energy system
  - Potential side effect: enforce lock in
- Stirling technology is seen as more promising on the short run
  - For both technologies (Stirling, FC), differences in opinion on maturity of technology do exist

## Main conclusions (4)

- Lower energy bill is seen as major driver
  - Market parties don't expect that NGO's and consumer organisations will push these technologies
  - Profitability depends on many factors (uncertainty),
    - additional costs, user behaviour, energy prices etc.
- Given the current purchase mechanism: key role might be expected for installation companies
  - Can they handle the technology (maintenance and installing)
  - Profit margin.....
  - Might change due to white certificates (leasing)

## Main recommendations

1. Solve financial matters asap!
  - Find needed investors
2. Communicate clearly with key stakeholders
  - About responsibilities, uncertainties, performances, effects of gas & electricity prices, etc
3. Involve key stakeholders actively
  - installation companies, housing associations, consumer(s) organisations, etc
4. Increase research activities
  - on (changing) consumers behaviour, external control, effects on grid, Stirling vs fuel cells, etc
5. Improve technical features
  - External control possibilities, adapt to legislation, installation and repairing components

## Reference

ECN-report by C.F.J. Feenstra (ECN-E—08-038):

*The flexible future of micro combined heat and power.*

*An analysis of the social embedding of micro CHP in Dutch households in 2030.*

Download via

<http://www.ecn.nl/publications/default.aspx?nr=ECN-E--08-038>

Report includes management summary and complete interview reports with stakeholders



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