Local energy cooperative – case study

Introduction

This case study provides the Dutch National Council of R&Dialogue evidence based input on the role of dialogue in energy implementation projects. Not only the local energy cooperatives and their developments are investigated; five other case studies are developed, namely: 1) carbon capture and storage in Barendrecht, 2) shale gas in Boxtel, 3) wind offshore near Noordwijk/Zandvoort, 4) gas production in Groningen and 5) gas storage project in Bergermeer.

This case study presents the process and development of a local energy cooperative in the Netherlands and the dialogue concerned with it. Local energy cooperatives are a fast growing group. The minister of Economic Affairs considers local energy produced by citizens as a future energy tool. [1] The first local energy cooperatives in the Netherlands occurred 20 to 25 years ago. Wind power cooperatives were founded end 80s, early 90s. The past few years, local energy cooperatives grew rapidly in different kinds of forms or sizes. The objective of this case study is to research the impact of dialogue on the development, progress and process of local energy cooperative and public support. Local energy cooperatives are considered start-ups with different forms of professionalism and maturity. This case study discusses the cycle of a local energy start-up, the topics local energy cooperatives have to deal with to reach professionalism, the role of governments and how they create public support.

This case study is based on interviews with several local energy cooperatives as Grunneger Power, Lochem Energie, Wij Krijgen Kippen, Vogelwijk Energie(k) and Texel Energie, experts in the field of local energy cooperatives as Planbureau voor de Leefomgeving (PBL), Rijksdienst voor Ondernemend Nederland (RVO), Anne Marieke Schwencke (AS I-Search) and Thijs de la Court (Klimaatverbond and former Alderman Lochem). By means of stakeholder interviews, analysis of company and policy documentation, laws and procedures this case study is assessed.

First, the development of local cooperatives in the Netherlands is introduced followed by an overview of policy measures for local cooperatives and the impact of the SER Energy Agreement. Subsequently, this case study focusses on the process local energy cooperatives have to go through, from first initiative towards a start-up company, and their developments and learning curve to become a mature and professional company. The focus lies on the developments as a start-up and the dialogue with the local community in the broadest sense. This case study takes a broad look at Dutch developments and developments abroad. Finally, conclusions and recommendations are provided.

Local energy cooperatives

The first local energy cooperatives were founded in the late 80s, early 90s. Wind cooperatives as *Zeeuwind, De Windvogel* and *Deltawind* are professional cooperatives with solid memberships. In total 15 wind cooperatives produce 85-90 MW represent 4% of the onshore wind power production. Depending on the measuring tools, several numbers are pending on the number of local energy cooperatives in the Netherlands. Recent studies from PBL and AS-I Search count 110 local energy cooperatives with a legal status of which only a few have production capacity at the beginning of 2014. Over 300 local energy cooperatives are active in the Netherlands if you take neighbourhood and district activities – who do not have a legal status - into account. Local energy cooperatives can be represented by umbrella organisations as *Energie-Nederland* [2] and *E-Decentraal*. The first generation local energy projects have implemented large-scale wind power projects and have funds for investment and financial and public support. Financial regulations as *Milieukwaliteit van de Electriciteitsproductie* (MEP subsidy)

[1] http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2013/11/08/kamerbrief-over-visie-op-lokale-energie.html

[2] Only in case of production and trade permits – leveranciersvergunning e.g. for TexelEnergie

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supported the business case and helped creating seed capital and public support. The liberalisation of the energy sector created room for initiatives from, amongst others, citizens. This development allowed for new entrants to the energy trade market and encouraged competition by enabling consumers to choose the energy company of their liking. [3] [4] [5] [6] [7] [8] [9]

Local energy cooperatives produce energy with different energy sources – predominantly wind power, solar power and in a few cases hydro power and biomass. Local energy cooperatives contribute to decentralized energy production (which is a larger category than decentralised renewables) [10] and provide electricity to the grid of the DSOs (Distribution System Operators). Decentralised production can also be generated by cogeneration units at industrial facilities producing e.g. heat and electricity for the regional industrial site. In addition to citizen led cooperatives, small-scale wind power and biogas is also produced by farmers (so-called *windboeren*) in rural areas of the Netherlands. It is difficult to measure what the impact of local energy cooperatives or individual production is on the total energy production since there are hardly numbers available. The following table shows the total of renewable energy usage and its percentages in the total energy mix.

Renewable energy usage in the Netherlands

In TJ	2000	%	2005	%	2010	%	2012	%
Total renewable usage	**29376**	**1.37**	**51604**	**2.31**	**86399**	**3.75**	**97800**	**4.53**
Of which heat	**19032**	**0.89**	**24692**	**1.11**	**34624**	**1.50**	**39332**	**1.80**
Of which electricity	**10344**	**0.48**	**26810**	**1.20**	**42197**	**1.83**	**45114**	**2.06**
Of which solar power	**474**	**0.0**	**34199**	**0.0**	**59444**	**0.1**	**253753**	**0.2**
Of which wind power	**2680**	**0.13**	**7320**	**0.33**	**16210**	**0.70**	**17780**	**0.81**
Of which hydro power	**362**	**0.02**	**361**	**0.02**	**364**	**0.02**	**361**	**0.02**
Of which biomass	**25613**	**1.20**	**41996**	**1.88**	**64228**	**2.79**	**71676**	**3.28**

Source: CBS 2014

The table below shows the electricity production and usage, and heat production at decentral and central level. For electricity it zooms in on import and exports, since this has been a topic of discussion when discussing excess production of electricity in Germany and the consequences for the Netherlands.

[3] http://www.pbl.nl/publicaties/energiecooperaties-ambities-handelingsperspectief-en-interactie-met-gemeenten
[4] Based on interviews with PBL, RVO, Anne Marieke Schwencke, Thijs de la Court, Wij Krijgen Kippen, Texel Energie, Lochem Energie, Vogelwijk Energie(k), Grunneger Power, NWEA, NLVOW, Energie-Nederland
[5] http://www.energie-nederland.nl/
[6] http://www.e-decentraal.com/
[7] http://www.duurzameenergieunie.nl/
[8] Interviews with PBL, RVO, Anne Marieke Schwencke, Thijs de la Court, Wij Krijgen Kippen, Texel Energie, Lochem Energie, Vogelwijk Energie(k), Grunneger Power, NWEA, NLVOW
[9] http://www.rvo.nl/subsidies-regelingen/milieukwaliteit-van-de-elektriciteitsproductie-mep
[10] Decentralised energy production is directly connected to the grid of DSOs. Centralised energy production is directly connected to the grid of the TSO (in the Netherlands TenneT) (definition of CBS).

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Electricity and heat in the Netherlands

In million kWh	2000	2005	2010	2012
Electricity production central	**56546**	**69208**	**75824**	**64032**
Electricity production decentral	**32880**	**31216**	**42326**	**38473**
Electricity import	**22947**	**23693**	**15584**	**32155**
Electricity export	**4031**	**5398**	**12808**	**15046**
Electricity usage	**108342**	**118719**	**120926**	**119614**
In TJ				
Heat production central	**32638**	**43038**	**44342**	**38820**
Heat production decentral	**186976**	**177766**	**187318**	**186500**

Source: CBS 2014

The contribution of renewable decentralized energy production is minor (the share of renewable electricity generation in the electricity mix is 12.2% in 2012 and 10.5% in 2013) and is mostly generated by wind power and biomass. Fossil electricity production has a share of 80.5% and with an overall production capacity of 24,000 MW they provide electricity for all types of consumers. The demand for renewable electricity is bigger than the Dutch production capacity. [11] Therefore, renewable electricity certificates are bought from other countries like Norway and Sweden to fulfil the demand and comply with legislation. With these certificates energy producing companies compensate their own production (non-renewable) with the bought renewable certificates. The demand for locally produced renewables is likely to increase. New and some established energy companies started to offer local energy products and services. The power usage of households is a 22% share of the total energy consumption of households and despite energy efficiency and saving measures it is expected that the total electricity usage of households will increase (mainly due to increased usage of electrical equipment, electric vehicles and heat pumps. The development of local cooperatives and their share in renewable energy production is seen as an emerging trend. [12] [13] [14] [15]

Decentralised production does not only focus on renewables, fossil energy sources are a part of decentralised production too. Usually it concerns cogeneration installations producing electricity and heat from (bio)gas, and biomass. Most decentralized production comes from cogeneration installations at industrial areas. The following table shows the decentralised production per source and their percentage in the total decentralized electricity and heat production (some energy sources are not mentioned). Local energy cooperatives mainly focus on renewable energy sources like solar, wind and hydro power.

[11] ACM TrendrapportageMarktwerking en consumenten vertrouwen, november 2013: https://www.acm.nl/nl/publicaties/publicatie/12260/Trendrapportage-marktwerking-en-consumentenvertrouwen-in-de-energiemarkt---eerste-helft-2013/

[12] VNG 2013 – lokaal energiek: decentrale duurzame elektriciteit. Business case en maatschappelijke kosten-batenanalyse

[13] CBS 2014

[14] www.hieropgewekt.nl

[15] http://www.nwea.nl/windenergie-de-feiten

Decentralized production per source

Electricity MWh	2000	%	2005	%	2010	%	2012	%
Total decentralisded production	33.635214	37.3	31.531600	31.3	42.315833	35.8	38.474533	37.5
Total fossil fuels	28.877487	32	25.454508	25.3	31.931111	27	26.348843	25.7
Of which gas	26.670870	29.6	23.495673	23.3	30.533056	25.8	25.093793	24.5
Total renewable	2.784397	3.1	4.017158	4	7.977778	6.8	9.590240	9.4
Of which solar power	7710	0.0	34199	0.0	59444	0.1	253753	0.2
Of which wind power	829000	0.9	2.067000	2.1	3.993056	3.4	4.981829	4.9
Of which hydro power	142393	0.2	88000	0.1	104167	0.1	104388	0.1
Of which biomass	1.805294	2.0	1.827959	1.8	3.821111	3.2	4.250270	4.1

Source: CBS 2014

National policy

National government adopted the policy to increase the number of renewable energy in the energy mix. European and national policy focus on 14% renewables in the mix in 2020 and 16% in 2023. [16] This leaves room for decentralised generation and is specifically stimulated by financial and fiscal incentives as agreed upon in the SER Energy Agreement. In order to stimulate decentralised generation the Energy Agreement introduces tax reduction for collective energy production (of € 0.075 (ex. VAT) per kWh in 2014) for inhabitants of well-defined areas (*postcoderoos*). The concept of well-defined areas is that a lower energy tax tariff is in place for members of an energy cooperative or homeowner associations (*Vereniging van Eigenaren*) living in that well-defined area. The concept of well-defined areas is criticized; in addition the regulation is perceived complex and makes it difficult to reach a profitable business case. [17] Decentralised producers of electricity like households are allowed to apply net metering (Electricity produced is set off to the electricity consumed and exempted for energy tax. The producer receives the same price for the produced energy as for the consumed energy up until a maximum of an own production of 100 KWh excluding REB tax). In order to reach 20% energy savings in 2020, insulation of the built environment is promoted and funding programmes are developed. Insulation focuses on the reduction of heat – mostly gas supplied.

A regulation to promote sustainable energy production at decentralised level – for companies and organisations – is SDE+ (*Stimulering Duurzame Energieproductie and its successor*). This regulation provides subsidy (in 2014 € 3.5 billion available) for the production of sustainable electricity, heat, and green gas out of wind, water, solar, biomass and geothermal. When applying for the subsidy a feasibility study has to be handed in for capacities from 0.5 MW and more. The subsidy makes it possible for renewable energy production sources to compete with fossil energy production sources at a cost price level (with a maximum subsidy of € 0.15 per kWh). SDE+ reimburses the difference between the cost price of renewable energy production and fossil energy production depending on the technology, production rate and production period – 5, 12 or 15 years. Technologies with the smallest cost price difference – so-called “cheap” technologies have priority and will first benefit from the regulation.

[16] http://www.energieakkoordser.nl/energieakkoord.aspx

[17] Atrive, Business case Postcoderoos Co-creatie, august 2014. Analysis of local business cases under the postcoderoos framework.

Besides the stimulus of cost-effectiveness government uses other incentives to promote renewable energy sources, e.g. the implementation of offshore wind (in total 4500MW in 2023) is a relative expensive technology. It is expected that incentives will lead to employment in the offshore construction sector worldwide. [18] [19]

The start-up

Current energy policy (20% CO_2-reduction, 20% energy savings, 14% renewables in the mix in 2020) and policy incentives as SDE+ leave room for companies to act or interact to these policy lines. This case study will not go into detail on the trends experienced in society that contribute to initiatives like an energetic society [20] and local energy cooperatives. [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31]

Local energy cooperatives can best be perceived as start-ups in the business of energy companies, operating as producer, supplier, traders (retail) and service providers. In its most defining model the cooperative focuses on local public interest, (co-)financing by members and membership. For start-ups in the energy sector, several factors play an important role for 1) to start their activities and 2) to become a professional energy cooperative / organisation. First, the factors to become an energy cooperative / organisation are diverse; from ideological, idealistic reasoning, to hobbyism, to creating a new business model or to produce renewable energy. The second factor, become a professional energy cooperative / organisation is highly underestimated in terms of difficulty and hard work. For start-ups, it is very interesting to make use of the room that policy creates to enter the market and begin new developments.

Citizens want to be involved and play a role in societal developments concerning energy. In the Netherlands, local initiatives have taken and received room to play a role in the energy sector and operate as market players. As the number of initiatives is very diverse – from an ordinary citizens led volunteer initiative to professional company. This affects the way the initiatives are perceived – from an amateur initiative to a market competitor and direct threat for the established energy companies. It is the choice of the cooperative / organisation to become a professional company playing a role in the energy sector. This case study discusses several factors that play a role in the start-up and its developments, namely: volunteers, professionalism, business case feasibility, financial situation, public support, role of government, current systems.

When these factors, and perhaps even other factors, are positive the start-up can actually survive. As Anne Marieke Schwencke (AS I-research – independent energy researcher) mentioned it: “They have to get past the ‘valley of death’” in order to get past the start-up phase and obtain a position in the energy sector, like any other start-up. Specifically the transition from a volunteer based initiative to a company

[18] http://www.rvo.nl/subsidies-regelingen/stimulering-duurzame-energieproductie-sde
[19] Interviews with PBL, RVO, Anne Marieke Schwencke, Thijs de la Court, Wij Krijgen Kippen, Texel Energie, Lochem Energie, Vogelwijk Energie(k), Grunneger Power, NWEA, NLVOW, De Windvogel
[20] Energetic society: a society with active participation of its citizens in issues with public interest.
[21] A start-up is a company, organisation or partnership designed to search for a business model. These companies are in the phase of development and research for markets.
[22] Energie+ 2014, Energiecoöperaties: inlossen van een belofte
[23] P-Nuts 2013, Lokale duurzame energie in Nederland. Het speelveld bestormd.
[24] Rathenau Instituut 2009, Energietransitie begint in de regio
[25] PBL 2014, Energiecoöperaties: ambities, handelingsperspectief en interactie met gemeenten
[26] Respublica 2014, creating local energy economies: lessons from Germany – Caroline Julian
[27] Drift 2014, Aanjagen van transitie
[28] Energy Policy 2012 – Mobilizing community energy – Elizabeth Bomberg, Nicola McEwen
[29] Platform Duurzaam Fryslan – Handboek burgerparticipatie windmolens
[30] Lochem Energie – Met Frisse Wind
[31] http://www.asisearch.nl/wp-content/uploads/2012/08/ESSAY-Energieke-BottomUp-in-Lage-Landen-Schwencke-21082012-FINAL.pdf

with a paid workforce proves to be a challenge. Wind cooperation's in the Netherlands have developed into hybrid organisations with a combined paid workforce and volunteers.

Volunteers

Most start-ups begin with enthusiast ideas of a few interested, devoted people. They are willing to invest time, money, ideas and experiences to create a business (not getting into the actual or perceived reason for the initiative because this can be very diverse). Most local energy cooperatives start with volunteers, active people sharing time, knowledge and expertise in order to create a sustainable environment for themselves and their direct surroundings.

Volunteers need to have time to invest and have certain knowledge and experience – on, amongst others, the energy sector, on technologies, on legal and administrative procedures, on communication and volunteer management. This is rather difficult because usually initiatives come forth out of interest, ideology, opportunities, any perhaps many other reasons. For a volunteer and contributor to a start-up it is difficult to acquire, let alone maintain competences and expertise. As long as the start-up does not create profits or is unable to employ paid staff, volunteers are the spill in the start-up.

Professionalism

In order to start a company or organisation the volunteers need to have many competences. In order to create professionalism, knowledge and experience is essential. The competent volunteers need to coordinate each other's expectations on conduct of business, the use of technology, technical and operational issues, membership and volunteer recruitment, communication and marketing, finance and commerce, legal and regulatory issues and future perspectives. And still it needs to be stressed that we talk about people willing to work several hours a week without salary, on a voluntary basis.

The professionalism of local energy cooperatives is decisive for the development of decentralised production. The start-ups in the energy sector mainly focus on solar and wind power for electricity, cogeneration of heat and smart grids. These start-ups sometimes come forth out of so-called 'kitchen table initiatives' (*keukentafel initiatieven*) moreover based on idealism, some are more professional, focussing on a working business model. It can be suggested that the topics of dialogue are fairly different considering the professionalism of cooperatives / organisations.

The start-ups are supported by several umbrella organisations. Their position is subject to change, since they address all different kind of professionalism active in the sector; both the idealistic and professional initiatives. The umbrella organisations for local energy cooperatives are very different from one another (e.g. *Energie-Nederland* for energy producing and trade companies, *REScoop EU and NL, E-Decentraal* and *DE Unie* for local energy cooperatives) in terms of size, activities like lobby, advising service and support on topics as technology and finance. The activities of the umbrella organisations do not always match the maturity of the local energy cooperatives.

Financial situation

It is in the interest of every start-up to create a positive cash-flow in order to be able have and sustain activities. Activities can be membership recruitment, discounts on energy bills for customers, rental / lease agreements on e.g. solar panels, a shared electric vehicle, development of e.g. wind power projects, creating awareness and sharing energy-saving measures.

Most start-ups cannot compete with established parties (who operate large coal power plants) in terms of profit, market share and competition without support (e.g. subsidy) or large investments from banks or individuals. Renewable energy producers can profit from available subsidies. Currently, the government finances with the instrument SDE+, supporting and stimulating companies and non-profit organisations to produce energy by means of renewable sources. Since 2007, national government created this

stimulus programme as successor of the Environment quality of electricity production (*MEP: Milieukwaliteit van Elektriciteitsproductie*). The SDE+ is the main financial instrument to support the business case. It is a requirement to attract investment, besides bank loans and own investment by the cooperative's members. Provinces and municipalities provide few subsidies, participate, provide loans and guarantees from (revolving) energy funds or create possibilities for initiatives to cooperate. An example of a municipal initiative is a municipality initiating sustainable projects, inviting the local cooperative to participate and cooperate. For most cooperatives this means choosing between cooperative with a municipality or autonomy.[32] [33] [34]

There is a difference in possibilities that policies and regulations create for technologies. Current developments show that with the SDE+ subsidy wind power can be viable. Therefore, onshore wind power initiatives take a leap in the Netherlands and can be implemented relatively easy. The targets for wind power contribute positively to this trend. Solar power on the other hand has taken a drastic increase in the past few years, but has to deal with a lack of straight targets for solar power and changing regulations. Investors are still hesitant to step into the solar market, due to a lack of security in return on investment. [35] [36] [37]

Regulations as the *postcoderoos*, netting and fiscal benefits can work complementary and contrary to each other. The *postcoderoos* is highly debated and discussed as the regulation does not stimulate or facilitate the development of local energy cooperatives. This might be because due to e.g. netting Dutch state experiences declining state revenues. The interviewees all mention that regulations can help and are necessary to stimulate and support the transition. The regulations should have a long term perspective, be consistent and create preconditions for market players. [38] [39]

Public engagement

Citizens found a local energy cooperative for different set of reasons. The involvement of citizens in the first place, asks for involvement of the local community and shows a direct action of people wanting something to change or be active. These are the first steps to public support and engagement.

To actively involve the local community, visibility, marketing and communications are essential tools for the local energy cooperatives in order to get members and customers. It starts with the founders of the cooperative, volunteerism, membership recruitment, involving as many people as possible in the streets, neighbourhoods, village and city in which the cooperative is active. Beside this, they need to create acceptance for their products like solar panels or windmills in the local environment and awareness in behaviour e.g. with the 'sharing car' and insulation measures.

Since a local energy cooperative is by the people, for the people, the link between the cooperative and citizens can be shorter than municipalities and energy companies. By taking citizens along in the decision-making process more support is created. Local energy cooperatives have learned that a co-

[32] http://www.rijksoverheid.nl/documenten-en-publicaties/persberichten/2007/07/13/nieuwe-stimuleringsregeling-duurzame-energieproductie.html
[33] http://www.rvo.nl/subsidies-regelingen/milieukwaliteit-van-de-elektriciteitsproductie-mep
[34] PBL 2014, Energiecoöperaties: ambities, handelingsperspectief en interactie met gemeenten
[35] http://www.rvo.nl/sites/default/files/bijlagen/Inventarisatie%20van%20nieuwe%20organisatievormen%20en%20financieringsconstructies%20in%20de%20nederlandse%20zonnestroommarkt.pdf
[36] http://www.energie-nederland.nl/wp-content/uploads/2013/10/Energietrends-2013.pdf
[37] http://www.pbl.nl/nieuws/nieuwsberichten/2014/sterke-groei-van-zonne-energie-mogelijk-zonder-overbelasting-van-het-net%20
[38] Interviews with PBL, RVO, Anne Marieke Schwencke, Thijs de la Court, Wij Krijgen Kippen, Texel Energie, Lochem Energie, Vogelwijk Energie(k), Grunneger Power, NWEA, NLVOW, De Windvogel
[39] www.polderpv.nl

decision making process creates more and better support for energy implementation projects like wind power parks or solar power parks, though the size may still be small. By involving local communities in the decision-making process, local energy cooperatives try to incorporate and adapt to the power citizens have in postponing or decline energy implementation projects whereof many examples are available. This dialogue model takes more time, asks for good management, and distribution of knowledge and experience but creates local support and shared ideas. [40] [41] [42] [43] [44] [45] [46] [47]

To increase local support citizens have the opportunity to become member of the cooperative or / and customer. Membership provides support for the cooperative, financial compensation on e.g. the energy bill and other forms of compensation. Members subscribe the business model of the cooperative and can invest in it. Together they want to support and achieve goals. Customers get their energy supply from an energy company – in this case a local energy cooperative or a joint venture. An alignment with other decentralised energy producers and centralised energy producers (e.g. cooperation with DE Unie, *Eneco* or *Greenchoice*) creates shared responsibilities and can create a more vital business case.

What is considered important is a dialogue with the local community and local authority? According to the interviewees the following is important. Knowing local representatives and knowing what the people in the community want and expect, increases the chances of success. A broad network can also provide the necessary manpower, knowledge and competences local energy cooperatives need in order to be and stay in business. Only a few local energy cooperatives generate energy (mostly electricity), mostly because it is so difficult to get past 'the valley of death' as Anne Marieke Schwencke called it. Without a viable business case it is difficult to provide an interesting proposition for the members of the cooperative and the community. Most cooperatives do not (yet) generate power or heat and currently function as resale organisation. Being a part of the system (in terms of grid usage, production, rules and regulations etc.) entails responsibilities that requires expertise and generally go beyond the capacity of local communities. Not all local energy cooperatives are aware of that when they start to develop their ideas into a start-up and are rather soon confronted with this reality. Technical knowledge about generation, impact of generation on the grid ask for necessary manpower, knowledge and experience in technique and rules and regulations accompanied with it. [48] [49] [50]

Role of government

Government at all levels, play a role in the development of local energy cooperatives. Rules and regulations focussing on the development of local energy production have changed over time. Dutch policy and regulations are perceived inconsistent and with short term implications. For local energy cooperatives, and for all players in the field, this makes it difficult to develop a business case and attract investors – including investing members of the cooperative. The SDE regulation is not by everyone perceived as consistent as budgets and fiscal benefits vary from year to year. The SER National Energy Agreement focusses on bottom-up developments and manners to facilitate the development. The well-defined areas and the opposition it evoked, are examples of a dialogue not aligned with one another. Especially for new parties wanting to enter the market, consistent policy, rules and regulations is

[40] Lochem Energie – Met Frisse Wind
[41] HierOpgewekt
[42] Wij Krijgen Kippen
[43] VogelwijkEnergie(k) Den Haag
[44] Grunneger Power
[45] Energie+ 2014, Energiecoöperaties: inlossen van een belofte
[46] Rathenau Instituut 2009, Energietransitie begint in de regio
[47] P-Nuts 2013, Lokale duurzame energie in Nederland. Het speelveld bestormd.
[48] https://www.vng.nl/files/vng/20130129_lokaal_energiek_samenvatting.pdf
[49] Organisatie voor Duurzame Energie
[50] http://www.asisearch.nl/wp-content/uploads/2012/08/ESSAY-Energieke-BottomUp-in-Lage-Landen-Schwencke-21082012-FINAL.pdf

important for the flexibility and viability of their business. The interviewees mentioned that the unclear position of national government creates distrust.

The ambitions of local energy cooperatives do not always fit government rules and regulations. Rule of law is always lagging behind on developments in society. Dialogue and lobby activities are tools used to improve cooperatives' ability to act. Furthermore, there is a significant difference in level of knowledge and ability to act between the different levels of government – municipality, provincial and national. Municipalities and provinces can facilitate and support the developments and ambitions of local energy cooperatives. Several municipalities and cooperatives have established constructive collaboration. However, increased concern is expressed on the tendency of municipalities to lean on volunteers to realise local energy and climate targets (the so-called 'energetic society debate). This can lead to an over-extending of the capacity and motivation of local initiatives. [51] [52]

European developments

According to the European initiative REScoop (Renewable Energy Sources Cooperative), a platform for citizen initiated cooperatives in Europe, a total of 2397 cooperatives are registered in September 2014. It entails legal registered initiatives. Most cooperatives can be found in the United Kingdom (UK), the Netherlands, Belgium, Germany and Italy. The information of REScoop provides an insight in the number of citizen initiatives, but due to changing developments the information is not exhaustive or complete. Research on local energy initiatives is only recently started and ongoing, a lot is still unknown. Some countries like Denmark and Germany have many local energy cooperatives active, others like Poland and Czech Republic have no bottom-up developments yet. Besides this, there is a difference between initiatives generating energy, and initiatives creating awareness, active in resale and with a legal status only.

United Kingdom

In the UK, it is estimated that there are 146 operational community energy installation, generating a total of 58.9 MW – 50 in England generating 21.6 MW, 83 in Scotland generating 33.7 MW, 13 combined in Wales and Northern Ireland with a capacity of 3.7 MW. Most used technology is wind power and solar PV. There are many more community energy projects at various stages of development, many of them completing feasibility studies/environmental impact assessments, awaiting planning permission decisions, arranging financial support, etc.. Community energy projects are supported by the Scottish Government through CARES (the Community and Renewable Energy Scheme) which provides grants and loans to communities wishing to pursue a local renewable energy project.

Portugal

In Portugal, local energy cooperatives have not taken such a loop (yet), not many initiatives have been identified. This can be related to the cap for total capacity of medium sized power plants that has already been reached as Portugal is already well above the 2020 targets. It is suggested that there is no 'space' for potential local cooperatives and it is not probable this will change any time soon.

France

Local energy cooperatives and initiatives are currently under investigation in France. With the information available, France has identified 10 local cooperatives. The impact of the local initiatives like professionalism and production capacity is currently under investigation and will be published at the end of 2014.

Germany

[51] PBL 2014, Energiecoöperaties: ambities, handelingsperspectief en interactie met gemeenten
[52] Interviews with PBL, RVO, Anne Marieke Schwencke, Thijs de la Court, Wij Krijgen Kippen, Texel Energie, Lochem Energie, Vogelwijk Energie(k), Grunneger Power, NWEA, NLVOW, De Windvogel

Germany is our consortium partner with most experience in local initiatives. They also struggle with data and accurate information collection. The 'Energiewende' and the Renewable Energy Sources Act changed developments in the energy sector. The Renewable Energy Act guarantees feed-in tariffs with a set rate for 20 years stimulating renewable production. And German state-owned banks provide credit loans from 2012 till 2017 for renewable projection plans and energy-saving measures. The decentralised policy system gives municipalities the possibilities to delegate policies and implementations. In 2012, 26% of the total energy production in Germany came from renewable sources. The renewable facilities are for 40% owned by private households and 10% by farmers.

First there is an distinction between bioenergy regions (promoting the expansion of the bioenergy industry) whereof at least 21 have been identified by FNR. Bioenergy Villages of which at least 159 have been identified but it is suggested that there are more than 400. A bioenergy village covers its energy needs (electricity and heat) at least with 50% of regionally produced bioenergy. The citizens are involved in decision-making and bear the thought of a bioenergy village with active involvement. The bioenergy plants are at least partially owned by the heat customers or the local farmers who sustainably provided biomass from the surrounding. The generation of heat and power from biomass may be supplemented by the use of other renewable energies. Another example is Energy Cooperatives, of which in 2013 about 888 were identified by the German Agency for Renewable Energies. They have increased significantly in recent years including wind, solar and bioenergy technologies. Renewable Energy Municipalities is another term that is used. They have a variety of legal forms: 1) limited partnership with a limited liability company as general partner (GmbH & Co. KG), 2) registered co-operative (eG), 3) public-law institution (AöR), 4) civil-law association (GbR), 5) foundation, 6) energy contracting, 7) bonds payable to bearer.

Denmark

Denmark strives to have 100% of its energy supply covered by renewables by 2050. This initiative started in the 1970s following the debate and necessity to become self-sufficient. When reaching this goal in 1997, the Ministry of Climate and Energy and Finance focussed on environmental take on the energy problems. Due to decentralisation, municipalities have independence on financial means and policy design when it comes to renewables. The dialogue with local communities is developed as laws ensure funds for local community developments as compensation measure for onshore wind, and ensuring that 20% of the shares should be offered to local population in order for them to benefit from the wind power. These laws came into place after the local ownership of wind project declined. Most initiatives focus on wind power (offshore), biomass and wave power. [53] [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65]

[53] http://rescoop.eu/
[54] Based on input from the consortium partners of R&Dialogue.
[55] Haggett et al 2013 - Community Energy in Scotland: the Social Factors for Success
[56] Harnmeijer et al 2013 – The Community renewables economy, starting up, scaling up and spinning out
[57] http://www.unendlich-viel-energie.de/media/file/198.trendresearch_Definition_und_Marktanalyse_von_Buergerenergie_in_Deutschland_okt13..pdf
[58] http://www.germanenergyblog.de/?page_id=283
[59] http://www.kommunal-erneuerbar.de/
[60] www.wege-zum-bioenergiedorf.de;
[61] http://www.wege-zum-bioenergiedorf.de/bioenergiedoerfer/
[62] www.sustainableenergy.dk/
[63] http://www.forbes.com/sites/justingerdes/2012/10/29/project-zero-a-roadmap-for-local-energy-security-and-carbon-neutrality-in-southern-denmark/
[64] http://www.metaefficient.com/renewable-power/danish-island-is-energy-self-sufficient.html
[65] http://www.energsustainsoc.com/content/4/1/11

R&Dialogue

Conclusion

In the development of local energy cooperatives the dialogue on themes affected by these transition is very important. We identify different topics important in the energy transition at local level for local energy cooperatives. First of all, a local energy cooperative is identified as a start-up, a new market player in the energy sector that responds to set targets and policies.

As a start-up, local energy cooperatives have to deal with marginal business cases in local renewables, and challenges as professionalism, volunteers and volunteerism, finance and financial situations, public support and engagement, role of government and the current system. As a start-up, they need many competences and skills in order to play a role and make a significant contribution to the energy sector in terms of production, members, employment etc.. The impact of cooperatives producing or supplying energy is still minor, according to research from PBL and Anne Marieke Schwencke, 16 wind cooperatives produce 85-90 MW, 85 cooperatives are formally established and operational, 40 cooperatives supplying energy by resale. [66]

National, regional and local policies and rules and regulations have a significant effect on the flexibility and climate for cooperatives to invest in a start-up. Identified is that a dialogue with local communities is more common and necessary when local energy cooperatives want to invest in energy implementation projects, compared to established parties. The direct changes in the environment and the local character of the projects ask for more involvement of the local community. An organisation by the people, for the people – as local energy cooperatives can be positioned and framed, needs an open dialogue and can accomplish much. As one interviewee said: “Citizens are very powerful and when they join forces, they are a strong collective capable of many things”.

In the case study research of local energy cooperatives we can conclude the following:

- Due to political choices room was created for sustainable developments onto which local energy initiatives stepped in, as niche player;
- The local energy initiative is a market player in a niche sector and can develop towards a start-up;
- There are different levels of maturity of local energy cooperatives: the more idealistic ones and the ones based on business models;
- The start-up is confronted with topics as professionalism, volunteerism, knowledge, experience, technology, financial circumstances, changing and being a part of the current system, public support and engagement and the role of government and competition;
- Local energy cooperatives are highly dependent on volunteers and the right expertise active in their cooperative;
- Local energy cooperatives are linked to the decentralised energy grid and affect players in the field at centralised energy production level directly when they become material;
- Due to the diversity in local energy cooperatives umbrella organisations for local energy cooperatives are very diverse too which makes the dialogue diverse and difficult;
- The impact of local energy cooperatives on society and technology implementations is significant and require a dialogue with several stakeholders;
- Policies and regulations are perceived inconsistent and short term based; not helping forward the development of local energy cooperatives;
- In order to be able to realise energy projects, local energy cooperatives need to be visible and communicate to the local community;
- Local energy cooperatives are mainly by and for the people – since they are small-scale and local;

[66] PBL 2014, Energiecoöperaties: ambities, handelingsperspectief en interactie met gemeenten

- Citizens are essential in the support for the implementation of energy projects and are taken along in the decision-making process of energy projects by local energy cooperatives;

Recommendations

- Bottom-up developments like local energy cooperatives create a shift in the business-as-usual of existing companies. In the dialogue on the energy transition all stakeholders should be involved discussing the course of the energy transition and the role of the stakeholders involved.
- Dialogue with local communities and stakeholders in the field is of vital importance to be and stay in business. Bottom-up initiatives require dialogue since they are from the people for the people. In the end, local support is found for energy projects. Learning-by-doing is an important credo – learn from existing local energy cooperatives.
- Bottom-up initiatives are start-ups and a (local) market player in the field of energy. They are a niche party investing in opportunities. It is best to perceive and treat these initiatives as such and create preconditions for all market players in order to stimulate these developments.
- Umbrella organisations should effectively support local energy cooperatives. Due to the difference in maturity of cooperatives umbrella organisations do not always accommodate the ambitions of cooperatives. Umbrella organisations and their members should have a constructive dialogue on their role, function and expectations.
- Policy and regulations – of all levels of authority – should accompany the business model of cooperatives and have a more consistent, long-term policy. Authorities can facilitate and develop frameworks in terms of regulations, fiscal and financial rules etc.. A dialogue with the involved parties creates trust and understanding, possibly resulting in room for further investment in renewable energy projects.
- Local energy cooperative have to stay visible and communicate to / have a dialogue with local communities and their network in order to stay ambitious, attract manpower, experience and knowledge, create opportunities for funding and investments and receiving subsidies, and customers in order to maintain their business case – just like all other professional companies.
- It is crucial that cooperatives can develop and realise viable renewable energy projects and consequently develop interesting propositions for local communities aiming at localizing profits. Considering the marginal business cases for renewables concern is expressed about the long term viability of the cooperatives.
- Recognize and acknowledge the developments in the bottom-up sphere and initiatives by citizens as a part of changing policy with respect to the energy transition and sustainable energy targets. Cooperatives have proven to be an effective force pressuring for policy changes. They can address the potential of local production, opportunities for strengthening local economies by localizing and sharing profits.