

Case Study Analysis IMAGINE Low Energy Cities

- Odense -

Final version (22.08.2014)



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1) Case Study Odense

Introduction to the City of Odense

Odense is located in Denmark in the middle of the island of Fyn. The population of 190,000 inhabitants make Odense the third largest city in Denmark¹. Moreover, Odense is the largest city in the South Denmark Region.

The city has more than 100,000 workplaces, 40% of which are in the public sector. Most businesses in Odense (60%) are small and medium enterprises (SMEs) with less than 5 employees. Odense Municipality is governed by a council with 29 members and 5 specialist committees. The city has a strong focus on culture, business, a vibrant student scene and many parks and green areas.²

Local Energy policy

Odense Environmental Policy (“Odense Kommunes miljøpolitik 2012”)

The City of Odense first adopted an overall environmental policy in 2008. It formulated the goal to make Odense Denmark’s most sustainable city. Targets addressing the energy supply at the local level were, among others, also part of the policy (2015: 40% of energy supply for heating and electricity covered by renewable sources and reduction of energy consumption per m² to 0,4GJ and 28kWh, 2025: 60% of energy supply for heating and electricity covered by renewable sources and reduction of energy consumption per m² to 0,35GJ and 28kWh). The policy was revised in 2012 (“Odense Kommunes miljøpolitik 2012”). Thus, it sets the policy framework for local plans and actions.

The policy formulates an overall vision for the City of Odense which is framed in the phrase “Bæredygtige sammen” (“Sustainable Together”). The vision is refined through the following goals:

- Sustainability as a shared responsibility
- Odense as part of the green centre Fyn with climate-friendly and organic foods

¹ <http://www.odense.dk/topmenu/kommunen/english/about>

² <http://www.livcomawards.com/2010-awards/submissions/odense.pdf>

- Nature as a sustainable basis of life
 - Odense as an ambitious climate municipality
 - Consistent and sustainable urban transport system
 - Children and youths being ready to accept responsibility for a sustainable Odense
- The Strategic Energy Plan (“Strategisk Energiplan”) of the City of Odense is consistent with the local environmental policy. Thus, it can be considered one action within the implementation of the environmental policy. Overall, it sets a focus on collaboration, networks and communication.³

National strategy “Vores Energi”

In 2012, the Danish government adopted the national strategy “Vores Energi” which supports and provides the basis for local energy transition activities. It pursues the strategy to massively expand the capacity for energy generation from wind turbines in order to supply Denmark’s energy demand by renewable energy sources. The strategy formulates the following goals for the national level:

- 2020: 50% of all electricity supplied by wind turbines
- 2030: coal phased out of the energy generation process
- 2035: electricity and heat supply covered by renewable energy
- 2050: Denmark’s energy supply (electricity, heating, industry, and transport) comes from renewable energy.

The City of Odense tries to use the opportunity the national approach provides in terms of the formation and support of a local green economy (especially district heating and wind power industry).⁴

SEAP (Strategic Energy Plan – “Strategisk energiplan”)

The Strategic Energy Plan (“Strategisk energiplan”) forms the SEAP of the City of Odense. The goal of the SEAP is to supply the local energy demand for electricity and heating by renewable sources by 2030. The starting point for Odense is a share of 40% of renewable energy supply (electricity and heating) in 2010. To reach the goal of a energy supply based on renewable sources the SEAP formulates three focus areas:

- 1) Increased use of renewable energy
- 2) Intelligent supply and consumption of energy (smart grid)
- 3) Energy savings⁵

Increase the use of renewable energy through:

- Replacement of old wind turbines with newer and more energy efficient ones
- Placement of new wind turbines and solar power plants

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<http://www.odense.dk/topmenu/borger/bymiljoe/natur%20miljoe%20baeredygtighed/miljo/emneindgang/klima/energiplan/energi%20for%20alle/lokale%20og%20nationale%20mal>

4

<http://www.odense.dk/topmenu/borger/bymiljoe/natur%20miljoe%20baeredygtighed/miljo/emneindgang/klima/energiplan/energi%20for%20alle/lokale%20og%20nationale%20mal>

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<http://www.odense.dk/topmenu/borger/bymiljoe/natur%20miljoe%20baeredygtighed/miljo/emneindgang/klima/energiplan/energi%20for%20alle/den%20korte%20udgave%20af%20energiplanen>

- Use of biomass for energy generation (dominant energy source in the transitional phase until energy generation through wind and solar energy is sufficient)
- Production of sustainable biomass in Denmark (long-term)
- Production and use of green gas (gases that do not emit CO₂ when being burnt) especially for uses in transport and process heat
- Less burning of biomass and waste for energy production (in favour of recycling) (long-term)

Reach the intelligent supply and consumption of energy through:

- Increasing the connections to the district heating network
- Development of intelligent energy consumption (smart grid)
- Conversion of individual (building-based) heating energy production through oil and natural gas to district heating

Realise energy savings through:

- Energetic redevelopment of existing buildings
- Reduction of the energy loss within the heating network
- Minimize the loss of heating energy to the Odense Fjord through the provision of storage facilities
- Reduction of energy losses through changes to renewable energy sources
- Increasing the awareness among citizens and businesses of their opportunities in relation with energy savings⁶

Odense's approach to energy transition is characterized by the collaboration with local businesses and the formation of strategic partnerships. Networks, information and measures especially targeted at local business are central. Thus, the city tries to enhance the development of a local green economy. Furthermore, the City of Odense is very active in international city networks such as INTERREG projects and the Covenant of Mayors in order to exchange experiences and knowledge.

Local networks and activities especially targeted at local business:

- **MiljøForum Fyn** (<http://www.miljoforumfyn.dk/>)
The MiljøForum Fyn is a regional network of public and private actors on the Danish island Fyn (Funen). The City of Odense is one of the members.
The MiljøForum Fyn is a network of companies, educational institutions, NGOs, and public authorities. It originated in an environmental organisation ("Industriens Miljøklub Fyn") and was then developed into the current organisational structure (official year of foundation: 2000). The overall goal of the network is to exchange experiences to 1) create an environmentally sustainable development on Fyn, 2) enhance green cooperations on Fyn and 3) enhance environmental and occupational health and safety on Fyn. All member businesses commit themselves to prepare an environmental report every other year. The network is financed through membership fees.⁷
- **Odense Bæredygtighedsråd** ("Odense Sustainability Council")
(<http://www.odense.dk/home/subsites3/Baeredygtighedsraad>)

⁶

<http://www.odense.dk/topmenu/borger/bymiljoe/natur%20miljoe%20baeredygtighed/miljo/emneindgang/klima/energiplan/energi%20for%20alle/den%20korte%20udgave%20af%20energiplanen>

⁷ <http://www.miljoforumfyn.dk/om%20os>

The Odense Sustainability Council is a local network (informal institution) of 35 members who are employees of the public sector and private companies. Actors with expertise in environmental, social, health, and economic aspects are involved.

The Odense Sustainability Council is one result of the local environmental policy (“Odense Kommunes miljøpolitik”). Its overall goal is to create new, innovative solutions for the sustainable development of the City of Odense. Its members cover the following thematic areas: education and research, tourism, transportation, leisure, nature, agriculture, integration, housing, construction, children and youths, elderly and handicapped people, environmental groups, industry, trade and services. The Council meets three to four times a year.⁸

- **Klimaværket** (<http://www.odense.dk/klimavaerket>)

Klimaværket is an initiative of the City of Odense targeted at local businesses. It provides information tailored for different business sectors such as housing associations, shops, and private businesses (cafes, hotels, offices, hairdressers, etc.). The Klimaværket aims to help local businesses to save energy and hence money. It wants to increase the motivation of local businesses to realize climate mitigation measures and thus increase the competitiveness of Odense’s local businesses.⁹

- **Byaftalen (city agreement)**

Odense’s local administration and local housing associations made an agreement to collaborate with four thematic focuses one of which was “energy and climate”. Work groups were formed with members of the local administration, housing associations and Fjernvarme Fyn (operator of local district heating network). The workgroups developed an action plan for the social housing sector covering the aspects energetic modernization, energy efficient buildings, participation, and behavioural change. However, due to the lack of resources the measures of action plan were not realised.¹⁰

- **Education of craftsmen**

The City of Odense collaborates with the Danish network **Grøn Erhvervsækst** („Green Business Growth” <http://www.groenerhvervsvaekst.dk/>) and Fjernvarme Fyn (operator of local district heating network) to improve the education of local craftsmen in the fields of energy consulting, marketing and business development. The craftsmen are meant to work at the energetic modernization of buildings and create jobs at the local level.

After finishing the training of the first 27 local craftsmen, the municipality organized an “energy fair” in collaboration with Grøn Erhvervsækst. The fair gave the craftsmen who participated in the training the chance to present and offer their services to local homeowners and inform them about the energetic modernization of buildings.¹¹

⁸ <http://www.odense.dk/subsites3/baeredygtighedsraad/topmenu/odense%20baeredygtighedsraad>

⁹ <http://www.odense.dk/subsites2/klimavaerket>

¹⁰

<http://www.odense.dk/topmenu/indflydelse%20og%20politik/hoeringer%20i%20odense/afsluttede/afsluttede%202012/energiplan%20i%20horing/energiplan/hvad%20gor%20odense%20kommune%20selv#10>

¹¹http://www.groenerhvervsvaekst.dk/index.php?option=com_content&view=article&id=421:about-green-business-growth&catid=92&Itemid=117



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International projects and networks the City of Odense is or was involved in:

- Regions 202020 (<http://regions202020.eu/cms/>)
ENEREG projects funded by the EU, 2010-2013, collaboration of regions to develop measures to meet the European climate mitigation goals (EU 20-20-20)
- LoCaRe (<http://www.locareproject.eu/wm315427>)
Collaboration of six European Regions to develop low carbon solutions at the regional and local level, three strategic themes were defined: new climate, new energy, new leadership
- Covenant of Mayors
- INTERREG-projects:
 - o VACO2R (eco-labeling of businesses and voluntary agreements between local administration and local businesses to reduce CO2 emissions)
 - o ZERO TRADE (incorporate trade in climate mitigation, voluntary agreements between local administration and local retailers to reduce CO2 emissions)
 - o IMAGINE

Actors

City of Odense	
Contact person:	Klaus Winther
Address	Vattenfall A/S Fynswærket Havnegade 120 5000 Odense klaus.winther@vattenfall.com
Background	Member of the Odense Sustainability Council, manager of the local power station Fynswærket
Competencies	Energy transition activities in Odense, private sector
Interest profile	
Interview	03.12. 9:30 at Vattenfall Fynswærket, Havngade 120, 5000 Odense
Link	http://www.vattenfall.dk/da/klaus-winther-hansen-kontakt.htm

City of Odense	
Contact person:	Jane Immerkær
Address	Natur, Miljø og Trafik Nørregade 36-38 5100 Odense C jimn@odense.dk
Background	Local Authority, Department for Nature, Environment and Traffic (Natur, Miljø og Trafik), was involved in the development of the SEAP
Competencies	Substance, process
Interest profile	
Interview	05.12. 13:00 at Odense Castle, Nørregade 36-38, 5100 Odense C
Link	http://www.odense.dk/topmenu/kommunen/forvaltninger/by%20og%20kulturforvaltningen/natur%20miljoe%20og%20trafik

Green Business Growth	
Contact person:	Lotte Lindgaard Andersen
Address	Industrivej 3a 5500 Middelfart lla@groenerhvervsvaekst.dk
Background	Works for the network Green Business Growth, close collaboration with municipality e.g. in education of craftsmen
Competencies	Substance, process
Interest profile	
Interview	05.12. 09:00 at Odense Castle, Nørregade 36-38, 5100 Odense C
Link	http://www.groenerhvervsvaekst.dk/

City of Odense	
Contact person:	Anders Johan Møller-Lund
Address	Faaborg-Midtfyn Municipality Project manager – climate secretariat



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	Nørregade 4 5600 Faaborg ajoml@faaborgmidtfyn.dk
Background	Former member of Odense local authority, was involved in the development of the SEAP
Competencies	Substance, process
Interest profile	
Interview	03.12. 14:45 at Odense City Hall, Flakhaven 2, 5000 Odense
Link	

2) Transition Activities in Odense

Cluster	Activity	Manifestation	Description	Assessment
Strategic	Problem structuring	National legislation	Defines an overall approach to energy transition and sets mid- and long-term goals up to 2050, establishes focus on green growth	<ul style="list-style-type: none"> Goals and approach to energy transition influenced by national legislation Local policy framework defined to guide the transition process Great focus on green growth Economic opportunities of energy transition and actor networks are key issues in problem structuring
		Miljøpolitik	Overall environmental policy which defines long-term goals and vision, defines sustainability as a common task that needs cooperation among different stakeholders, sets the framework for sectoral plans	
		Energiplan	Sectoral plan which contains an analysis of the the local situation in regard to energy generation, supply and consumption	
	Envisioning	Miljøpolitik	Overall environmental policy which refers to the vision of Odense to become "Denmark's most sustainable city"	<ul style="list-style-type: none"> Definition of an abstract vision that guides the social, economic and ecological policies of the cities <ul style="list-style-type: none"> Update and integrate abstract long-term goals into one inspiring, attractive and imaginative transition vision for the future development of the city
	Exchange of perspectives	Participatory policy development	Participatory development of the Miljøpolitik allowed exchange of perspective among different stakeholders	<ul style="list-style-type: none"> Exchange of perspectives on strategic level is possible in participatory processes of developing Odense's overall policy framework and in local and regional actor networks Selective process of participation which qualifies as transition arena LA as facilitator who brings different stakeholders together and enables cooperation and innovation <ul style="list-style-type: none"> Identify and involve frontrunners
		Exchange and cooperation in local and regional networks (Green Business Growth, MiljøForum Fyn, Odense Sustainability Council, Klimaværket)	Ongoing processes of communication and cooperation with different stakeholders on local and regional level	
Tactical	Thematic visions	Goals of the Energiplan	Defines mid-term goals for renewable energy generation, distribution and energy efficiency by 2030, connects to Odense's long-term vision	<ul style="list-style-type: none"> Mid-term goals integrated under Odense's overall policy framework to guide the energy transition process
		Goals of the Klimaplan	Local climate mitigation plan with targets for 2025 and 2050	
		Regional Energiplan	Regional plan of the Fyn municipalities, currently under development	
	Agenda	Energiplan	Contains actions in the form of 30 projects, on-going development of new projects in an iterative process under the framework of the Energiplan	<ul style="list-style-type: none"> Energiplan as open framework, allows learning, innovation and cooperation LA as facilitator who brings different stakeholders together and enables cooperation and innovation Learning-by-oing approach <ul style="list-style-type: none"> Conduct systematic evaluation of projects to allow learning from the experiences made and to make sure that these contribute to defined goals and energy transition
	Networks	Green Business Growth, MiljøForum Fyn (regional networks)	Regional networks of public and private actors, City of Dobrich is one of the members	<ul style="list-style-type: none"> Several institutionalized actor networks on regional and local level Strong focus on promoting green growth Great importance given to to participation in networks to promote sustainable development, reaching municipal goals and energy transition Constant communication is carried on by LA on specific topics to develop
		Odense Bæredygtighedsråd ("Odense Sustainability Council"),	Local networks of public and private actors, initiated and maintained by the City of Dobrich	

		Klimaværket (local networks)		<ul style="list-style-type: none"> Odense´s strategies and plans Cooperation considered useful both by public and private actors
		Regional Energiplan (regional cooperation)	Cooperative development of the regional Energiplan of the Fyn municipalities, City of Dobrich is one of the members	
Operational	Experiments	Byaftalen (cooperation with local housing associations)	Cooperative development of an action plan for social housing by the LA and local housing association, definition of four areas of collaboration, one of which "energy and climate"	<ul style="list-style-type: none"> Failed experiment – cooperation with local housing associations: Action plan for social housing never realized because of scarce resources, LA considers the project not successful due to difficulties in communication and cooperation with investors Highly successful experiment of educating local craftsmen has led to the establishment of social innovations (new forms of cooperation) and the promotion of green growth <ul style="list-style-type: none"> Evaluate failed cooperation with local housing associations and learn from the experiences for future activities Develop a portfolio of experimental projects
		Education of craftsmen	Series of education and training courses for local craftsmen followed by local trade fairs targeted at private property owners	
	Implementation	Projects integrated by Energiplan	Implementation through 30 initial projects, open to introduce new projects by municipal and non-municipal actors	<ul style="list-style-type: none"> Project implementation guided by the local policy framework (Miljøpolitik and Energiplan) High level of cooperation among public and private actors in project development and implementation <ul style="list-style-type: none"> Develop and implement projects connected with win-win-situations for the public and private actors involved in cooperation, projects where win-win-situations cannot be created may also be necessary for energy transition, responsibility for development and implementation by LA
Reflexive	Monitoring/Evaluation	Energiplan and projects	Evaluation of projects and municipal plans	<ul style="list-style-type: none"> Evaluation of projects crucial for learning-by-doing approach and to ensure that projects contribute to overall goals of plans and policies Monitoring focused on tactical and operational activities <ul style="list-style-type: none"> Broaden the scope of monitoring and evaluation
	Adaptation/Adjustment	On project level	Evaluation of projects and measures, regular update of municipal plans	<ul style="list-style-type: none"> Adjustment of sectoral plans, targets and projects likely

Strategic Activities

Problem structuring

The national Danish legislation defines an overall approach to energy transition and sets associated mid- and long-term goals up to 2050 (Odense Kommune 2012: 22; Odense.dk 08.04.2014a). This approach aims at realizing an electricity and heat supply based on renewable energy sources by 2035 through the substitution of CO₂ intensive energy sources by biomass. In the long run, biomass is then mainly to be substituted by wind energy to reach an energy supply completely based on renewable energy sources (Odense.dk 08.04.2014a). Furthermore, the national approach puts a strong focus on exploiting the opportunities of the necessary changes in energy generation and efficiency. It thematizes the possible role of Denmark as a pioneer in green growth, green export opportunities and positive effects on employment and economic competitiveness (Danish Government 2011: 29ff.).

This approach influences the local perception and handling of the problem. The local strategic approach follows the national guidance, right up to the mid- and long-term goals which are slightly more ambitious than the national ones (INTERVIEWS 8, 11). Also, the connection of energy transition with economic opportunities is reflected in the local approach. Both local strategies and actors express the focus on green growth (INTERVIEWS 9, 10; Odense Kommune 2012: 11). This can be considered central for the problem structuring in the City of Odense. The analysis of the local situation in regard to energy generation, supply and consumption is part of the Energiplan (see 'tactical activities'). Thus, its approach and methods are already influenced by the problem structuring on the national level.

One other aspect which is crucial for the structuring and handling of the problem at the local level is the perception of sustainable development and energy transition as a long-term goal which can only be reached in collaboration with stakeholders. This is, among others, reflected in the title of the local overall environmental strategy: "Sustainable Together" (Bæredygtige Sammen") (Odense Kommune 2012: 1). Thus, the cooperation among different local and regional actors plays a crucial role in Odense's strategies and plans due to the fact that energy transition (and sustainable development) is seen as a common task. This approach is seen to be connected with the new role for the municipality of facilitating (joint) activities of different actors and creating networks (INTERVIEWS 9, 10). Thus, the municipality describes its own approach as a long-term, step-by-step, learning-by-doing process framed by national and local policies and strategies (INTERVIEWS 9, 11).

Non-municipal actors such as the network Green Business Growth stress that communicating energy transition (and climate mitigation) as a positive process, pointing out opportunities and positive side effects as highly crucial for the success of their activities in relation with local and regional energy transition processes (INTERVIEW 10). Thus, energy transition is deliberately communicated from a positive point of view.

Odense has established a participatory process of problem structuring which involves local actors of different domains. Therefore, a shared, integrative perspective could be developed. The approach is based on the well-established understanding that sustainability can only be realized in cooperation with various actors (as expressed in their environmental strategy with the title "sustainable together"). Therefore, participatory strategy and project development is common practice.



Envisioning

The local environmental policy of the City of Odense (“Miljøpolitik”) defines the abstract, overall goal of Odense as “Denmark’s most sustainable city” (Odense Kommune 2012: 5). It defines an abstract vision with focuses on sustainable development and (sustainable economic) growth (Odense Kommune 2012: 5). Although not being very descriptive or illustrative, it can still be considered an abstract, overall, long-term vision against the background of Transition Management. It is a vision, easy to remember, which is also positively perceived by regional actors (INTERVIEW 10). Furthermore, the Miljøpolitik sets abstract, long-term goals to fulfill the vision (Odense Kommune 2012: 7). Thus, it can guide different actors and integrate their strategies, plans and actions towards an overall long-term goal.

The Miljøpolitik is one of three central policies of the City of Odense. Together with the business and growth policy and the health policy these are supposed to set the overall framework to sustainable development addressing the economic, social and environmental aspects of sustainability (Odense Kommune 2012: 5). Within this set of policies, the Miljøpolitik functions “like an umbrella for all environmental issues” (INTERVIEW 9).

Moreover, the Klimaplan of the City of Odense (see ‘thematic vision’) defined the long-term target of reaching CO₂ neutrality by 2050. This goal is oriented towards the national goals (Odense.dk 08.04.2014; INTERVIEW 9).

In general, the pressure of citizens and societal actors to convert to a more sustainable energy generation is perceived low (INTERVIEW 8). Therefore, municipal visions, goals and plans and the initiatives of the city administration and local politicians is key for the local energy transition process (INTERVIEW 8).

Odense has defined abstract, long-term goals which can function at a common reference frame and guide the transition process. Furthermore, it has developed a vision of the future development of the city which can qualify as a transition vision. However, at the moment these are part of different strategic documents. Furthermore, the vision (“to live is to play”) is connected with the year 2017 which is not sufficient as the long-term timeframe needed for energy transition. The integration of long-term goals and visions can improve their guiding function and makes it easier to communicate. Thus, a stronger mobilization of various actors to contribute to reaching the goal may be reached.

Recommendation:

Update and integrate abstract long-term goals into one inspiring, attractive and imaginative transition vision for the future development of the city. Integrate (already existing or newly developed or updated) long-term goals of the environmental policy (and the business and growth and the health policies) and the vision (“at leger at leve”) into one vision of the future development of the city. This vision should illustrate a picture of a different, more sustainable city. It should be inspiring, attractive and imaginative in order to be able to guide and motivate the actions of various actors (public, private, societal, citizens). It should be qualitative and easy to communicate. The development process should be participatory, involving frontrunners of institutions and networks (innovative people, experts, opinion makers, trend setters, generalists).

Exchange of perspectives

As mentioned above, the local authority of Odense considers sustainable development (and energy transition) to be a common task which can only be realized through the cooperation among public, private and societal actors (see ‘problem structuring’). Following this percep-



tion, the municipality allowed public participation in the development process of the Miljøpolitik and the Energiplan. This was done by applying different methods and formats of participation such as seminars, workshops, public hearings, internet platforms and separate meetings with selected stakeholders (INTERVIEWS 8, 9). The municipality of Odense initiated these forms of participation while also allowing local stakeholders to significantly influence the content of these events (INTERVIEW 9). Thus, an exchange of perspectives has been possible which also allowed direct influence of different actors on resulting policies and plans.

The City of Odense is legally required to draw up the Energiplan. However, the process to develop the plan is not legally defined. The municipality chose a pro-active approach actively involving different groups of stakeholders in the process. The resulting dialogue among public and private actors is considered to be open and valuable and is therefore approached by public and private actors (INTERVIEW 8, 9). The City of Odense considers its goals and policies to set the framework for a step-by-step process characterized through communication and learning (INTERVIEW 9). Within this process, the exchange of perspectives among different actors becomes crucial to develop new ideas.

Furthermore, the City of Odense is actively involved in many local and regional networks (see 'networks') (INTERVIEW 10). These are also platforms for the exchange of perspectives among different sets of actors with different thematic focuses. As they are characterized by more permanent forms of communication networks provide the opportunity of creating trust-full, more persistent forms of communication.

Odense already involves private and societal actors in policy development. There is an exchange of perspective at an very early stage of the development process and additional forms of continuous communication and exchange among municipal actors and private and societal actors and citizens. Therefore, various forms of knowledge is brought together and the co-production of knowledge through cooperation is possible. This exchange of perspective benefits the transition process. However, it is unclear to which extent these processes specifically include frontrunners and innovators.

Recommendations:

Identify and involve frontrunners. *The established processes of exchange, communication and participation already benefit the transition process. The goal of producing new and innovative solutions (projects, products, processes, instruments, etc.) can be further promoted by specifically involving frontrunners and innovators into these processes. These are actors with specific skills and characteristics (innovative, creative, communicative, involved in networks and institutions and with specific knowledge). The involved frontrunners should reflect the most important societal perspectives relevant to the topic and have different backgrounds (public institutions, businesses, knowledge institutions, NGOs, ect.).*

Tactical Activities

Thematic vision

As mentioned above, the Miljøpolitik sets the framework for sectoral goals and strategies concerning environmental aspects. The SEAP of the City of Odense ("Energiplan") is a sectoral, mid-term oriented plan focusing on the energy sector. It defines mid-term goals for renewable energy generation, increasing energy efficiency and energy savings and the realization of "smart grid" technologies. Furthermore, it refers to the national long-term goals in the energy sector (odense.dk 19.04.2014a).



The Danish legislation requires local communities to draw up local energy plans (INTERVIEW 8). The SEAP was developed in a participatory process within which selected participants (local utilities, large local industries, municipal administration, local politicians) collaboratively developed goals and measures (INTERVIEW 9). This approach reflects Odense's understanding of reaching the goal of sustainability only in cooperation with various local actors (see 'problem structuring').

Next to the Energiplan, the City of Odense developed a local climate mitigation plan ("Klimaplan 2010-2012") which also contains goals for 2025 and 2050 regarding the reduction of CO₂ emissions and concrete measures for the years 2010 to 2012 (Odense Kommune 2010: 10).

Furthermore, the City of Odense collaborates with its neighbouring municipalities in the field of energy generation and distribution. The Fyn municipalities are currently developing a regional energy plan to strengthen their efforts to reach local and national CO₂ reduction targets (INTERVIEWS 9, 11). All municipalities in Denmark are developing regional plans on a voluntary basis. The national government enhances these activities through financial incentives (provision of funding to finance the plan development process) (INTERVIEW 11).

Private actors orient their activities towards their own goals and timeframes. These depend on the lifecycle of their investments (investments in infrastructure for energy generation and distribution). However, they express interest and concern with municipal goals and plans. Thus, they consider sectoral goals and processes of the municipality. Furthermore, they appreciate the efforts of the City of Odense to integrate them into process of goal formulation and plan development (INTERVIEW 8).

Odense has developed a coherent system of guiding policies and strategies and subsequent plans which specify general notions and goals. Therefore, the thematic visions in place are suitable to guide specific measures within different sectors.

Agenda

The Energiplan of the City of Odense contains specific actions in the form of 30 projects (INTERVIEW 9) and thus can be considered a transition agenda against the background of Transition Management. These projects are only considered to be the starting point of the cooperative development and implementation of measures in the fields of energy generation, distribution and consumption. For this purpose, the LA of Odense provided local actors with the opportunity to suggest and discuss projects on the municipal website (INTERVIEW 9).

The Energiplan contains only a small number of measures as it was developed to function as a framework for the work of the municipality. It is supposed to be flexible enough to allow the development and integration of new ideas. Thus, the aim is to develop and implement new projects under the existing Energiplan (INTERVIEW 9). This function of a plan as a framework for an iterative process of project development and implementation reflects the self-definition of the municipality of Odense as a facilitator of actions and innovations who brings different actors together, supports the creation of actor networks and applies a learning-by-doing approach (INTERVIEW 9) (see also 'problem structuring').

TM suggests that it is not possible to measures and solutions to deal with a complex, long-term problem (such as climate change) beforehand. Rather, specific solutions have to be the result of actor interactions which communicate and cooperate and thus co-develop new insights and knowledge and innovative measures. This allows flexibility, adaptation and learn-



ing as knowledge and experiences evolve. Odense's approach to only define the first projects and to work as a facilitator of actor interactions and networks fits the TM methodology.

Networks

The City of Odense is actively involved in various networks at the local and regional level, partly as initiator, partly as member. On the regional level, Odense is member of the networks Green Business Growth and MiljøForum Fyn. While the former is a network of municipalities and businesses which focuses on promoting green growth on the local and regional level, MiljøForum Fyn focuses on enhancing sustainable development through the cooperation of a wider range of societal actors and organisations (miljoforumfyn.dk 19.04.2014). Furthermore, the City of Odense is also member in a regional cooperation of the municipalities of Fyn which are currently developing a regional energy plan (INTERVIEW 11).

Especially Green Business Growth can be considered a well established and accepted network as 90% of the municipalities on Fyn are members of this organisation (INTERVIEW 11). Thus, the network can be considered to be quite influential. Furthermore, the strong position of Green Business Growth is indirectly supported by the focus on green growth of the national legislation (see 'problem structuring').

On the local level, the City of Odense initiated the network "Klimaværket" within which the municipality cooperates with local businesses in order to promote the implementation of energy efficiency measures in these businesses and thus the support of local climate mitigation activities (odense.dk 19.04.2014b). Furthermore, there is a close cooperation with businesses not only in energy or business related topics but also in broader societal topics. These are discussed in Odense's sustainability council which is a local network of 35 municipal and private actors initiated by the municipality (Odense.dk 19.04.2014c). This network discusses a broad array of topics and is thus too broad for detailed energy specific questions (INTERVIEW 8). However, it has proven to be successful in cross-cutting topics such as the discussion of climate friendly food (INTERVIEW 8) and can therefore be eligible for discussing e.g. the implications of renewable energy generation for urban development and the quality of life of Odense's citizens.

The City of Odense considers it important to be member in these networks to promote the cooperation among different actors and thus innovation. The cooperation in networks is seen as a means to realize sustainable development. Especially the cooperative development of projects and the development and exchange of ideas is considered highly valuable (INTERVIEW 9). Furthermore, the exchange and cooperation with investors and owners of the energy grid is considered to be crucial for reaching municipal goals (INTERVIEW 9). As the cooperation of different actors is central to Odense's approach to energy transition (see 'problem structuring') this explains the city's active participation in regional and local networks and the high value which is attributed to these forms of cooperation.

Next to this institutionalized forms of actor networks, there are also less persistent forms of actor networks which form during the participatory development of municipal strategies, plans and projects such as the Miljøpolitik and the Energiplan (see also 'exchange of perspectives'). The LA of Odense actively communicates and cooperates with citizens and enables them to suggest and discuss projects either in direct verbal communication or on the municipal website (INTERVIEW 9). Furthermore, there are constant processes of communication with private actors which are focused on specific topics (INTERVIEWS 8, 9). Overall, these cooperative forms of strategy and project development are appreciated both by private actors (INTERVIEWS 8, 10) and employees of the municipality (INTERVIEW 9) and are crucial for the transition process in the City of Odense.



Odense actively promotes coalition building and networking of different actors and on different spatial scales. Various actors are also actively involved into the development and implementation of specific measures to realize municipal goals, strategies and plans. Furthermore, the cooperation in these networks has already resulted in the successful development and implementation of innovative projects. Therefore, the established networks have demonstrated their beneficial influence on the local energy transition process.

Operational Activities

Experiments

The actor networks established on the regional and local level play an important role in the development and implementation of experiments in Odense. This is an intended process which is promoted and appreciated by the City of Odense (INTERVIEW 9). There could be two projects identified which can be considered experiments against the background of transition management. Both are characterized by the close cooperation with private actors.

One of the experiments conducted is the education of craftsmen which was developed and realized in close cooperation with the network Green Business Growth (INTERVIEWS 9, 10). As part of this project, the City of Odense, Green Business Growth and Fjernvarme Fyn (operator of local district heating network in Odense) developed a concept to educate local craftsmen in the realization of state-of-the-art energy efficiency measures at private buildings. Furthermore, the education targeted at their skills in energy consulting, marketing and business development. Then, a “energy fair” was organized to give the craftsmen the opportunity to offer their services to private property owners (groenerhvervsvaekst.dk 20.04.2014; INTERVIEWS 9,10). After finishing the training of the craftsmen, the concept is evaluated and improved (INTERVIEW 10).

The education of craftsmen is considered successful both by municipal actors and the Green Business Growth network. Both sides express high appreciation for this project (INTERVIEWS 9, 10). The LA of Odense sees this cooperation with Green Business Growth as a multiplier of their efforts to reach their energy targets. The joint efforts contribute to reaching the municipal goals (INTERVIEW 9). The education of craftsmen is combined with direct communication and information targeted at citizens (property owners) at the local level (INTERVIEW 10). Thus, the municipality uses the cooperation with Green Business Growth and the local craftsmen to provide citizens “with information the municipality wants them to have” (INTERVIEW 9). By applying this cooperative approach, the City of Odense increases their influence compared to isolated municipal actions.

The second project which can be considered an experiment is the agreement between the local municipality and local housing associations to collaborate in four fields, one of which was “energy and climate”. An action plan for the social housing sector was developed, covering the aspects energetic modernization, energy efficient buildings, participation, and behavioural change. The measures were not implemented due to the lack of resources (odense.dk 20.04.2014). Thus, the experiment was not successful. This fits the impressions of members of the LA of Odense which describe the cooperation with investors as a challenge and see the need to increase the communication and collaboration with this group of actors (INTERVIEW 9). The evaluation of this failed experiment may help the municipality of Odense in this regard.

Odense has started to establish an environment which facilitates the interaction of different actors. As TM suggests that solutions to complex problems (such as climate change) are the



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result of actor interactions it is likely that further innovation will emerge from these processes of communication and cooperation. The developed experiments fit the transition goals and agendas of Odense and are systematically evaluated.

Develop a portfolio of experimental projects. *The development and implementation of further experimental projects could further promote the energy transition process. These projects should be designed for learning, i.e. they should comprise innovative, risky projects which explore possible solutions. Experiments should not only be technical solutions but also alternative processes, instruments, forms of organisation, etc. They should fit to Odense's overall approach towards energy transition (as the education of craftsmen) and enhance and support local strategies, plans, goals and visions. They should be derived from these and support their realization. Furthermore, different experiments should be coherent and mutually support each other. They should be developed, implemented and evaluated in a systematic manner in order to learn as much as possible from them. Therefore, developing a portfolio of experimental projects which includes establishing a systematic approach towards the design, implementation and evaluation of experiments is beneficial for local energy transition.*

Implementation

All projects of energy transition developed and implemented in the City of Odense are guided by the Miljøpolitik and the Energiplan (INTERVIEW 9). The Energiplan does not define a set portfolio of projects which is to be implemented by 2020 but only contains the first 30 projects developed in a participatory process (INTERVIEW 9). Thus, the framework of local long- and mid-term goals plays an important role in guiding project development and implementation as this process is designed to be open for non-municipal actors and innovations (see also 'exchange of perspectives' and 'envisioning'). Therefore, the identified local and regional networks play an important role in project implementation. These are considered partnerships for project development and implementation (INTERVIEW 10). The cooperation among different actors in project development and implementation is seen as an approach which can result in a coordinated use of resources of public and private actors and thus to reach a commonly defined goal more efficiently (INTERVIEW 9). Also, the direct communication with citizens is considered to be crucial as private property owners have to implement individual measures to contribute to municipal goals. Therefore, the City of Odense also engages in direct communication with citizens which is considered to be very resource intensive but necessary to reach municipal goals (INTERVIEW 9).

Following the strategic approach of the City of Odense, the experiments conducted by the local actors strongly focus on the promotion of green growth. This is, among others, expressed in the evaluation of this projects, which includes the development of the annual turnover of the businesses which participated in the educational courses (INTERVIEW 10). Furthermore, the economic benefits for businesses and property owners are strongly communicated in order to get these actors to participate and to reach political support (INTERVIEW 10).

Odense develops and implements measures and project in cooperation with various actors. This is beneficial for the local transition process as successful transitions require action not only by public actors but also by private and societal actors and citizens. Odense has defined a framework of policies and plans which safeguards that individual projects contribute to overall long-term goals.



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Reflexive Activities

Monitoring/evaluation

As the City of Odense applies an approach which is characterized by the constant development of new projects rather than defining a set of measures for implementation until 2020, the evaluation of each project becomes crucial to make sure that these contribute to the overall goals defined by the Energiplan and the Miljøpolitik. The City of Odense evaluates each project to allow improvements of future projects and to realize the process which is characterized by a learning-by-doing approach (INTERVIEW 9) (see also 'agenda'). Also, the experiment of educating local craftsmen is evaluated after each course to allow improvements before a new course is started (INTERVIEW 10). Moreover, the City of Odense intends to evaluate and update the Energiplan in 4-year-intervalls (INTERVIEW 9).

Overall, the evaluation strongly focuses on the tactical and operational activities of the City of Odense. This suits the applied approach which is characterized through the constant development of new projects. However, in order to safeguard that these projects contribute to mid- and long-term goals, activities on the strategic level have to be included in the evaluation.

Odense has established effective monitoring and evaluation processes targeted at their policies, strategies and plans. However, these demonstrate weaknesses capturing the TM specifics such as slowly emerging changes on the landscape level, the development of local niches, actor networks and innovations or the monitoring and evaluation of the TM process itself.

Recommendations:

Broaden the scope of monitoring and evaluation. *Monitoring and evaluation should not be limited to goals and effects of municipal plans and policies. All activities targeted at influencing or stimulating the transition process should be subject to monitoring and evaluation. Also, framework conditions and the progress in energy transition should be included. This is crucial to stimulate modulation and refinement of future activities and to support learning about the problem at hand and possible solutions. Therefore, a broader approach towards monitoring and evaluation is needed. Non-technical aspects of energy transition should be captured as well as slow, long-term (e.g. changing trends, world views, external events) and short-term changes (e.g. innovations, actors and initiatives). External processes, i.e. beyond the city level (e.g. new institutions and regulations) may be as important as changes on the local level (e.g. actor networks, new businesses). A broader, more inclusive approach towards monitoring and evaluation also allows a better adjustment of measures and processes and adaptation to changing developments.*

Adaptation/adjustment

As the LA of Odense evaluates each project (see 'evaluation') the adjustment of projects is likely. Furthermore, the Energiplan which guides short-term activities through the definition of mid-term goals is also regularly evaluated. Therefore, the adjustment of tactical activities becomes possible as well. Evaluation and update intervals of Odense's Miljøpolitik has not been specified.

The adaptation and adjustment of goals, strategies, plans and projects is a direct result of the extent of the monitoring and evaluation activities. Broadening the scope of these activities to meet the requirements of TM will therefore result in a more effective adaptation of local activities.



Role of LA in Odense

The approach of the City of Odense to energy transition is characterized by two fundamental aspects: On the one hand, Odense is strongly dedicated to promoting economic growth in “green” industries and branches (green growth) on the local level. On the other hand, energy transition as one component of sustainable development is considered a common task which can only be realized in cooperation of public, private and other societal sectors. Consequently, members of the local administration see the local authority in the role of a facilitator which should bring different actors together, enabling and promoting cooperation and innovation. Thus, different local and regional actor networks play an important role in Odense’s transition process. There could several institutionalized networks be identified. These were partially initiated by the local authority; in others, the City of Odense is only one member among others. The institutionalized networks act as independent actors developing and implementing projects and thus influencing the local transition process. Furthermore, they reflect Odense’s focus on promoting green growth as they are most often networks of private businesses and the public actors whose joint activities focus on developing projects which are beneficial for the economic development in “green” industries. Overall, the local authority considers the work of these networks and its membership in these as highly important and valuable.

The City of Odense regards energy transition to be an open step-by-step process which is characterized by constant learning. Consequently, the local authority did not determine a defined set of measures as part of their transition agenda but only developed the first 30 projects when developing the sectoral energy plan. These projects shall only constitute the first step with further projects being cooperatively developed further along the process. This iterative process is guided by the long-term goals and the framework set by the overall environmental policy of the city. This formulates mid- and long-term goals and defines guiding principles. Furthermore, it is connected to Odense’s abstract overall vision which applies the slogan “to live is to play” and formulates the overall goal of Odense becoming “Denmark’s most sustainable city”. Thus, the environmental policy integrates the transition activities of different actors and sectors and safeguards that these are oriented towards the overall goals.

The experiments developed by the City of Odense are well integrated in the local approach to energy transition. Their development and implementation occurred embedded in the local and regional networks and aimed at promoting green growth. It bears mentioning that these were not technical demonstration projects (as in the other case study cities) but a series of training courses targeted at educating local craftsmen in energetically retrofitting buildings and installing devices for renewable energy generation. These training courses have been undertaken several times in connection with their evaluation and constant improvement. Furthermore, these are considered highly successful by actors in and outside the local administration. Thus, these experiments fit well to the characteristics of Odense’s local transition process and fulfil their goal in further promoting the local energy transition.

3) Recommendations for further transition process

- **Update and integrate abstract long-term goals into one inspiring, attractive and imaginative transition vision for the future development of the city.** Integrate (already existing or newly developed or updated) long-term goals of the environmental policy (and the business and growth and the health policies) and the vision (“at lege er at leve”) into one vision of the future development of the city. This vision should illustrate a picture of a different, more sustainable city. It should be inspiring, attractive and imaginative in order to be able to guide and motivate the actions of various actors (public, private, societal, citizens). It should be qualitative and easy to communicate. The development process should be participatory, involving frontrunners of institutions and networks (innovative people, experts, opinion makers, trend setters, generalists).
- **Identify and involve frontrunners.** The established processes of exchange, communication and participation already benefit the transition process. The goal of producing new and innovative solutions (projects, products, processes, instruments, etc.) can be further promoted by specifically involving frontrunners and innovators into these processes. These are actors with specific skills and characteristics (innovative, creative, communicative, involved in networks and institutions and with specific knowledge). The involved frontrunners should reflect the most important societal perspectives relevant to the topic and have different backgrounds (public institutions, businesses, knowledge institutions, NGOs, ect.).
- **Develop a portfolio of experimental projects.** The development and implementation of further experimental projects could further promote the energy transition process. These projects should be designed for learning, i.e. they should comprise innovative, risky projects which explore possible solutions. Experiments should not only be technical solutions but also alternative processes, instruments, forms of organisation, etc. They should fit to Odense’s overall approach towards energy transition (as the education of craftsmen) and enhance and support local strategies, plans, goals and visions. They should be derived from these and support their realization. Furthermore, different experiments should be coherent and mutually support each other. They should be developed, implemented and evaluated in a systematic manner in order to learn as much as possible from them. Therefore, developing a portfolio of experimental projects which includes establishing a systematic approach towards the design, implementation and evaluation of experiments is beneficial for local energy transition.
- **Broaden the scope of monitoring and evaluation.** Monitoring and evaluation should not be limited to goals and effects of municipal plans and policies. All activities targeted at influencing or stimulating the transition process should be subject to monitoring and evaluation. Also, framework conditions and the progress in energy transition should be included. This is crucial to stimulate modulation and refinement of future activities and to support learning about the problem at hand and possible solutions. Therefore, a broader approach towards monitoring and evaluation is needed. Non-technical aspects of energy transition should be captured as well as slow, long-term (e.g. changing trends, world views, external events) and short-term changes (e.g. innovations, actors and initiatives). External processes, i.e. beyond the city level (e.g. new institutions and regulations) may be as important as changes on the local level (e.g. actor networks, new businesses). A broader, more inclusive approach towards monitoring and evaluation also allows a better adjustment of measures and processes and adaptation to changing developments.



- Evaluate failed cooperation with local housing associations and learn from the experiences for future activities
- Develop and implement projects connected with win-win-situations for the public and private actors involved in cooperation,
- projects where win-win-situations cannot be created may also be necessary for energy transition, responsibility for development and implementation by LA



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