

***The Role of Regional Strategies in Realising Energy Neutrality in Regions:  
Experiences from the EU-LEE Project SUSREG***

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**Abstract**

The EU has high ambitions with respect to climate change mitigation and energy independence, and developed a broad range of instruments to realise these ambitions. SUSREG was a project within the IEE programme (Intelligent Energy Europe), where knowledge partners and local and regional authorities in six countries developed and implemented planning tools and strategies contributing to energy saving and renewable energy introduction. These strategies were set up to facilitate practical energy initiatives, like PV panels on dwellings or energy saving initiatives by housing corporations. The paper describes the main features of some of the regional strategies, and describes how and to which extent the strategies lead to practical energy initiatives.

The paper will focus on three regions: Greater Copenhagen (Denmark); the City Region of Arnhem and Nijmegen (the Netherlands) and Emilio Romagna (Italy). These regions give an impression of the diversity of cases within SUSREG, but also give the opportunity to draw some more general conclusions. One of the regions already show substantial progress in their process towards energy neutrality. Here the participation within SUSREG is one initiative within an existing regional strategy towards energy neutrality. Other regions are more in the beginning of the development of such a strategy. The participation in SUSREG helped the regions to speed up the process of development and implementation of the strategy. In these regions, it is too early to identify an increase in bottom up initiatives as a result of a regional strategy. The experiences in all regions support the importance of a broad vision on sustainability and quality. When improved energy efficiency is linked to other quality aspects of sustainability, the support among both the business sector and residents seems to increase. Strong partners in all three sectors of the triple helix (knowledge institutes, business and industry, government) can serve as an enabler for the development and realisation of ambitious plans.

Keywords: Sustainable development, energy neutrality, stakeholder engagement, triple helix cooperation

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## **Introduction**

The EU has high ambitions with respect to climate change mitigation and energy independence. These ambitions are described in the strategy 'Energy 2020'. The main objectives of this strategy are to reduce greenhouse gas emission by 20%, to increase the share of renewable energy to 20% and to make a 20% improvement in energy efficiency (European Union, 2011). This strategy is not only set up to mitigate climate change, but also to improve the energy security and energy independence of the EU. The strategy is formalised in the Energy Efficiency Directive (EED) (European Union, 2012) This directive asks member states to formulate National Renewable Energy Action Plans (NREAP's) and National Energy Efficiency Plans (NEEAP's). Local Strategic Energy Action Plans (SEAP's) describe the ambitions and activities of municipalities on a local level. Energy 2020 is considered as a first step, but more ambitious steps are necessary on a longer term. The EU roadmap 2050 describes the necessity to reduce greenhouse gas emissions in 2050 with at least 80% compared to the present levels, in order to limit the social and economic impact of climate change on the long term (European Commission, 2011).

The programme Intelligent Energy Europe (IEE) was set up to realise the ambitions of Energy 2020. IEE supported projects dealing with renewable energy, energy-efficient buildings, industry, consumer products and transport. The expectation was that by doing this, Europe would also boost its competitiveness, security of energy supply, and technological innovation (European Commission, 2015).

SUSREG is a project within the IEE programme that developed knowledge and tools to realise energy efficient buildings, cities and regions. Knowledge partners and local and regional authorities from six countries worked on the following objectives: to improve urban and regional planning processes, to support the use of sustainable energy resources and energy efficient building methods; and to improve the knowledge, attitudes and skills of planners with regard to sustainable energy. Partners came from Cyprus, Czech Republic, Denmark, Spain, Italy and the Netherlands (SUSREG, 2015).

The project was divided into three stages. In the first stage, existing planning tools for sustainable and energy efficient neighbourhoods were collected and described. This information was used to develop on the job training activities for officials within local and regional authorities. Each region applied the knowledge and skills acquired during the training sessions in a case study: an area where an intervention was prepared and if possible implemented, in order to improve the energy performance of the area. Finally, the overall results were disseminated by capacity building activities like workshops and presentations. The SUSREG project started in 2013 and finished in 2015. Saxion University of Applied Sciences, the institute where the authors work, took part in the development and execution of the training sessions, in the reflection on the case studies and in the national and international dissemination activities.

## **Energy neutral buildings and areas**

The concept of energy neutrality of buildings and areas can be defined in many different ways. An overview of some of the definitions can be found in Schaefer et al (2014). In general, energy neutral buildings or zero energy buildings have no net use of fossil or nuclear energy. The energy needed in the building is from renewable sources on the building itself, like PV panels, small wind turbines or geothermal energy.

The European Energy Performance of Buildings Directive requires all new buildings to be 'nearly zero-energy' by the end of 2020. All new public buildings must be nearly zero-energy by 2018. The Buildings Directive limits the scope to building related energy: 'the calculated or actual energy that is consumed in order to meet the different needs associated with its typical use (...), heating energy needs, cooling energy needs (...) and domestic hot water needs' (European Union, 2010).

Energy neutral regions can be defined as regions that have no net use of fossil or nuclear energy. Not only the energy use in the built environment is considered, but also the energy use related to other sectors like transport, business and industry. For all the fossil energy that is used, the same amount of additional renewable energy is produced and made available outside the region.

Energy neutral buildings or regions are not necessarily autarkic or off grid. The total balance of energy use and (renewable) energy production is zero. Both local and (inter)national grids can help in transporting a surplus of produced energy to elsewhere, or importing energy from elsewhere in case of shortage of local production. The European Climate Foundation stresses the need for improvement of power grids on all levels, from local to European, to make them ready for a power supply dominated by renewables like wind and sun (Hewicker, Hogan and Mogren, 2011).

Within the SUSREG project, the Trias Energetica was used as an important framework for energy efficiency. The Trias Energetica identifies three steps: reduce the demand for energy by avoiding waste of energy and by implementing energy saving measures; use sustainable sources of energy instead of finite fossil or nuclear sources; as far as necessary, produce and use the needed fossil energy as efficiently and as clean as possible. (Roth, Alsema and Goud, 2014).

## **Energy neutrality and sustainability**

Within the SUSREG cases, energy neutrality was usually not considered as an aim on itself. It was considered as one of the quality dimensions of sustainability, within a broader perspective, as described by De Vries et al (2013). They state that sustainable area development should focus on the realization of synergy between quality issues like environmental quality, social quality, economic quality and spatial quality. It combines quality 'here and now' with quality 'elsewhere and later', and prevents in this way transfer of problems from the present to future generations, or from one location or country to other places. And finally, they stress that sustainability only can be realized in a situation with careful communication and stakeholder involvement. A broad quality perspective helps to realize neighbourhoods that are attractive for all stakeholders, and thus helps in creating societal support for sustainability.

## **Cases**

Three of the SUSREG cases with a strong regional focus were selected here for a further analysis. The national and regional context of the cases is described, and the specific activities executed within the project. An attempt is made to identify possible success factors within the different cases. Information was derived from internal reports from the SUSREG project, from interviews with partners and from discussions during project meetings. In addition to this, other available literature was studied.

### **City Region Arnhem – Nijmegen (The Netherlands)**

The City Region of Arnhem and Nijmegen is located in the eastern part of the Netherlands and has around 740.000 inhabitants (De Stadsregio, 2015) and a size of around 1,000 km<sup>2</sup>. The city region consists of 20 municipalities and has two main cities: Arnhem (150,000 inhabitants) and Nijmegen (175,000 inhabitants). For several years, this region had a regional council with decisive power on regional issues like spatial planning and transport and infrastructure. Since July 2015, this regional council has stopped and the cooperation between the municipalities only continues on an informal basis.

### **National context**

The most recent Dutch energy ambitions and actions were described in the national Agreement on Energy for Sustainable Growth (2013). This is a voluntary agreement, signed by 47 different parties with a background in government, business and NGO's. The main goals are an annual improvement of the energy efficiency of 1.5%, from 2013 to 2020, and an increase of the share of renewables from 4.5% in 2013 to 14% in 2020 and 16% in 2023. The action programme is expected to create 15.000 additional jobs in 2020, e.g. in the building sector and in the renewable energy sector.

Even though the agreement was signed by many stakeholders, it also met criticism. The NGO 'Urgenda', a network of experts in sustainability, went to the court in The Hague to appeal against the agreement, since they considered the agreement insufficient. The court followed their line of reasoning and concluded that the Dutch government is required to take more effective action to reduce the Dutch share to global emissions of greenhouse gases. According to Urgenda, this the first time that a judge has legally required a State to take precautions against climate change (Urgenda, 2015).

Also evaluations of earlier versions of the Dutch Energy Efficiency Action Plan were critical. Schüle et al (2013) concluded that the NEEAP has, 'absence of ambition and enthusiasm, lack of funding, lack of legislation and lack of implementation'.

### **Regional context**

In the beginning of the 21<sup>st</sup> century, many cities and regions in the Netherlands formulated strategies for energy or climate neutrality. An inventory by the NGO Urgenda in 2009 resulted in a list of more than 50 cities with the ambition to be energy neutral or climate neutral, between 2020 and 2050 (Urgenda, 2009). Both the cities of Arnhem and Nijmegen and the City Region Arnhem – Nijmegen formulated such strategies.

In Arnhem, the covenant 'Energy made in Arnhem' was signed in 2011 by 59 organisations ranging from housing corporations to universities, schools, hospitals and business parks (city of Arnhem, 2011). It contained a list of more than 100

projects, dealing with built environment, transport and infrastructure and research and development. The evaluation of this covenant in 2014 showed positive results. The number of partners had grown from 59 to 117. At the moment of the evaluation, over 200 projects were finished or still running. The energy consumption in households was in 2014 8.3% lower than in 2009, and in businesses 6%. The share of renewable energy increased from 3.6% in 2009 to 5.3% in 2014. According to the evaluation report, large scale projects for production of renewable energy were being prepared at the moment of evaluation (City of Arnhem, 2015a). A follow up of the first programme was published in May 2015 (City of Arnhem, 2015b).

Nijmegen published a road map for an energy neutral city in 2045, in June 2013 (City of Nijmegen, 2013). Both government and businesses set up several projects within the municipality. According to the monitoring results of the programme, the total energy use in 2015 was 15% lower than in 2008, and the share of renewables was 6.5%. Mid 2015, 5 wind turbines are under construction and will increase this figure very soon (Power2Nijmegen, 2015).

The City Region Arnhem and Nijmegen published a region wide strategy and related projects in 2013, with the name Groene Kracht (Green Power) (Lodder et al, 2013). This strategy focuses on the topics that need to be covered on a regional level: regional transport and infrastructure; location of large scale facilities for renewable like wind turbines and solar parks; large scale energy infrastructure like heat networks. This strategy also created a framework for the policy in the smaller municipalities, that do not have the skills, time or power to develop strategies like the two main cities in the region. The long term ambition of this strategy is, to be energy neutral as a region in 2050. For the shorter term, this is translated into an annual improvement of energy efficiency of 1.5% until 2020, and a total share of renewable energy of 16% in 2020. The regional project office of Green Power closed down, as the regional council stopped. The consequences for the running regional projects are not clear at the moment.

### **SUSREG cases: high standards of sustainability in urban expansion areas**

The specific SUSREG cases in Arnhem dealt with energy efficient renovation of existing dwellings, and with the development of a strategy to trigger real estate developers to develop energy neutral dwellings in an urban expansion area. The difference with the previous expansion projects was, that developers received less binding conditions for the spatial quality, but were seduced to present bids that will meet high standards of sustainability. A so called 'Ambition document' was composed for the development of this neighbourhood, emphasizing sustainable ambitions on energy, water and green, mobility and building flexibility. Also a toolbox was presented with innovative solutions to meet these ambitions. The bids with the best scores on these ambitions will be invited to develop parts of this pilot-area. Not only real estate developers were approached in this way, but also housing corporations and individuals with plans to construct their own home. The city received positive response on this approach in a market consultation. After this, the procedure was formalized by the city council in July 2015 (Verwey, 2015). At date, results of this new procedure are not yet available.

The case study area in Nijmegen is part of a larger area designated for expansion of the city of Nijmegen. The original urban plans for this area were evaluated with GPR

Urban Planning, an integrated quality assessment tool for residential areas. Due to the economic crisis, the demand for new houses reduced significantly, thus causing a delay in the development process for the Grote Boel. This offered the opportunity to assess the plan again with GPR Urban Planning and evaluate different scenarios for this development.

The evaluation resulted in a plan with a better integration of sustainable energy in the urban design, a stronger emphasis on bicycle use, better balance in green spaces and a higher chance of success for implementation of the development as planned. The first tangible results of this new plan are some innovative nearly zero-energy initiatives from different developers. Under the name 'GB4All' (Green Building for All), 60 dwellings in a nearly zero energy concept will be developed. These buildings are not only very energy efficient, but also very flexible. The dwellings are constructed with standard dismountable parts, leading to a high level of flexibility in design and use. When house owners want to reconstruct their house after a few years, they can replace the building parts and give back the what they do not need anymore. This results in a building concept that is presented as 100% recyclable (GB4all, 2015). The use of the integrated assessment tool also resulted in an improved cooperation between experts with different disciplines. It also lead to a closer cooperation with the neighbouring town of Arnhem (van Ginkel, 2015).

### **Greater Copenhagen Region (Denmark)**

The Greater Copenhagen Region includes the city of Copenhagen and 28 neighbouring municipalities in an area of 2570km<sup>2</sup>. The number of inhabitants is around 1.7 million.

#### **National context**

Denmark has a long tradition with renewable energy, especially wind turbines and biogas plants. According to DTI (2004), the development of wind turbines and biogas started already in the 1980's. National financial instruments like profitable feed-in tariffs stimulated both the realization of wind turbines and biogas plants.

The most recent plan in this respect is Danish Climate Policy Plan (Danish Ministry of Climate, Energy and Building, 2013). The target of this plan is to reduce the Danish greenhouse gas emissions with 40% in 2020, compared to 1990. It further states, that a reduction of 80 – 95% in 2050 is necessary, in line with the recommendations of climate scientists, to limit the impact of climate change to an acceptable level. The Danish government developed a Climate Change Act (2014) and a Climate Change Council (2015) to implement these ambitions. However, the government also states that the Danish emissions are strongly dependent on European policy instruments, especially a properly working system for Emission Trading (ETS). External assessors were very positive on the quality of the Danish National Energy Efficiency Action plan. It was considered of 'extraordinary quality', and the country 'progressed very well' in realizing its ambitions (Schüle et al, 2013). These observations show that the national context for ambitious climate and energy policy can be considered as very positive in Denmark.

#### **Regional context**

The city of Copenhagen hosted the last global Climate Change Conference within the United Nations Framework Convention on Climate Change, in 2009. Even though Denmark was already rather pro-active with respect to energy saving and renewable energy, this conference was an extra trigger for the Greater Copenhagen Region to put

more effort on this topic. One of the results was the launch of Gate 21, a 'partnership between local authorities, private companies and research institutions working together for a sustainable society and green business development' (Gate 21, 2015). In the past years, Gate 21 developed several projects in the Greater Copenhagen Region, related to sectors like Energy and Resources, Transport, and Built Environment. Gate 21 was one of the initiators of the Danish participation in the SUSREG project. Gate 21 does not limit its work to the Greater Copenhagen Region, but has its office in Albertslund near Copenhagen. Therefore, a strong focus of the work can be found in this region.

### **SUSREG Case: Regional Strategic Energy Planning**

The SUSREG project in Denmark concentrated on the realisation of a Regional Strategic Energy Plan in the Greater Copenhagen Region. The objective of the project was to achieve a consensus among all relevant stakeholders on the transition to a fossil-free society not later than 2050. To achieve this objective in the most cost-efficient way the stakeholders analysed a number of scenarios comprising various renewable energy supply options, including wind, biomass, solar energy.

The finally agreed scenario aims at a completely fossil free heating and power supply sector in 2035, and fossil free transport sector in 2050. The ambition is to reduce the gross energy demand in the region in 2020 with 6.3% compared to 2012, and to reduce the CO<sub>2</sub> emissions with 27%. During the next years about 10-15 billion DKK (1.3 to 2.0 billion EUR) need to be invested in each year, by all stakeholders involved. The Energy Plan states that the total costs for the society in meeting the energy demand using renewable energy would be of the same magnitude as if the maintaining the supply using fossil fuels. Therefore, it is considered as cost effective to do this substantial effort.

The SUSREG project made it possible to organise training sessions and discussion meetings for several of the stakeholders involved in this process. Main stakeholders in this process were the 29 municipalities, the regional authority, knowledge institutes, businesses in the energy and waste sector and national and regional public transport companies.

According to the participants of the training sessions, these sessions played an important role for the preparation for the negotiation process. They brought the knowledge of the participants to a higher level and provided opportunities for interdisciplinary and cross sector exchange of knowledge and ideas. The experiences in the Greater Copenhagen Region are expected to serve as an example for other regions in Denmark that want to develop a strategic energy plan.

Since the plan was only recently approved (summer 2015), it is not yet possible to identify the specific impact of the plan and the preparation process. However, the support expressed for the contents of the plan is substantial (Terkelsen and De Vries, 2015).

### **Emilia Romagna / Romagna Forlivese (Italy)**

Emilia Romagna is one of the regions in the Northern part of Italy. The total population is around 4.5 million inhabitants, and it covers an area of around 22.000 km<sup>2</sup>. Its capital is Bologna. The SUSREG partner was not this region as a whole, but the Union of municipalities Romagna Forlivese. This is a group of 15 municipalities with a total population of about 188.000 inhabitants.

## **National Context**

Italy published its first National Renewable Action Plan and National Energy Efficiency Action Plan in 2010. The most recent national Energy Strategy was published in 2014. Italy intends to achieve and exceed the European 20-20-20 targets, work on security of supply and foster sustainable growth in the energy sector. The external assessment of the contents and implementation of the first edition of the NEEAP was rather negative: ‘experts were critical about the plans’, ‘little or no progress seen in the last three years’ (Schüle et al, 2013).

## **Regional context**

The Union of municipalities of Romagna Forlivese is established in a process of administrative reform in the province of Emilia-Romagna. In this process, some responsibilities are transferred from the individual municipalities to the Union. One of these tasks is energy planning. Even before the administrative reform, the group of municipalities used to work together to develop common tools for urban planning and practices of involvement with local and regional stakeholders. In this period, the municipalities prepared a common SEAP (Sustainable Energy Action Plan), as agreed within the EU in the Covenant of Mayors.

The joint SEAP states targets to be reached by 2020, first of all almost a reduction of the CO<sub>2</sub> emission with 10,000 tons reduction compared to 2005, within the built environment. The municipalities prepared and revised a common local Regulation about energy efficiency and green building (including different kinds of incentives connected with renovations) that is going to be adopted by each of the 15 municipalities, as an addendum of the more general regulation about local urban building regulation. Moreover, they planned to prepare a common local urban building regulation, according to the regional and national law and their specific competencies.

## **SUSREG case: energy renovation of buildings in small historical urban centers**

The SUSREG team focused on energy renovation of buildings in small historical urban centers. Romagna Forlivese is characterized by small urban communities built around ancient historical centers. The design of energy renovation in these buildings is strongly influenced and limited by regulation, conservation and structural safety needs, costs of materials, etc. The team developed “Guidelines for urban regeneration and energy renovation within the historical centers of Romagna Forlivese” (Tollari et al., 2015). These guidelines serve as a non-binding framework to create more coherence in initiatives connected with energy sustainability and urban planning in the area. They provide information on technical issues and solutions for several types of challenges in these historical buildings, but also pay attention to more soft skills like citizen participation.

The added value of the SUSREG project was the provision of training activities for professionals involved, and the facilitating of intensive communication between local businesses in the building and energy sector and the energy planners and urban planners of the Union of Municipalities. The work also resulted in an energy helpdesk for citizens.

The experience within the SUSREG project demonstrated that urban planning and urban regeneration initiatives can be integrated within local and regional energy planning, providing a very important added value. The participants experienced that discussing about practical local needs and interventions mobilizes knowledge, skills, ideas, supports a clear vision of tools to be adopted, and provides professional growth



as well as business opportunities. Public officers within the region can maintain good relations with local stakeholders and also make a good fund raising job whenever it is needed; local and regional professionals can develop and extend their expertise focusing on the needs the context they belong to, SMEs and new entrepreneurs can rely on opportunities in the region to develop and test new technological and business solutions. It creates conditions where a transition to a low carbon economy can contribute both to business competitiveness and attractive areas (Filippi, de, 2015).

### **Conclusions and final observations**

The cases discussed above are quite different, both in context and scale, and in aims and activities. Therefore, a comparison of the cases and a description of the lessons learned should be done with care. Nevertheless, it is valuable to reflect on the three cases and finish this paper with some observations about the possible role of regions in achieving energy neutrality, and the success and failure factors involved. These observations could serve as input for further in depth research.

The Dutch case is characterized by a relatively weak national policy context but a strong drive towards energy neutrality in the region itself. Possible stimulating factors for this strong drive could be the political context, the presence of strong knowledge institutes and the presence of strong players in business and industry. Both the cities of Arnhem and Nijmegen have a long tradition of pro-active local environmental policy. Knowledge institutes like the Radboud University Nijmegen and the University of Applied Sciences Arnhem – Nijmegen have faculties and departments focusing on environment, energy and sustainability. A third factor is the presence of strong players in the sector of business and industry related to energy and environment. Both cities have several highly qualified businesses in the energy sector, like electricity production companies and network companies, and firms involved in engineering and consultancy. In fact, all parts of the Triple Helix are well presented in the region and have a long tradition of cooperation. Even though the national policy context is relatively weak, the region manages to formulate high ambitions and implement these ambitions in successful projects. The involvement of the smaller municipalities in the region is possibly under pressure, as a result of the finalisation of the Regional Council. It is too early to determine the actual consequences, but this is an interesting field for further research.

The Copenhagen Region is characterized by a strong national policy and a strong drive towards energy neutrality in the region itself. Also here, all parts of the Triple Helix are well presented and communicate and cooperate intensively. Since the present regional plan was only very recently approved, it is not yet possible to determine the effectiveness of the strategy. However, the region and the country already have a long tradition with renewable energy.

The region Romagna Forlivese has a relatively weak national policy and until now a limited regional experience with energy strategies. The history of the region itself is one of relatively small municipalities, with an average population just above 10.000. This has consequences for the expertise and power of the local authorities. The region has SMEs in the building sector, but lacks strong businesses in sectors like energy and sustainability. This can also be a limiting factor in the formulation and implementation of ambitious policies regarding energy and climate. The formation of the Union of municipalities seems to help the region to expand its expertise and power, and gives room to ambitions in this field. The training activities of the SUSREG project also helped in acquiring up to date knowledge on energy and

sustainability, and lead to closer cooperation and communication between different stakeholders in the region. This can be seen as an important success factor in the region.

The cases above show on the one hand, that energy ambitions and activities of regions are strongly influenced by national and EU policy. On the other hand, regions can develop firm climate strategies even in a situation with limited national ambitions, if the right local and regional conditions are available. The presence of a regional political body can help to make this happen.

Regions have a number of scale advantages, to realise energy neutrality. They are often a more suitable scale for optimising physical planning of renewable energy infrastructure like wind turbines, photovoltaics, biofuels or heat networks. Single cities can have more limitations in this respect, simply because they do not have enough open space for facilities like biofuels, wind parks or large scale solar parks. Regions can also be a more suitable scale for knowledge exchange and cooperation between stakeholders and sectors. This is especially the case if the region has strong players in the different sectors of the Triple Helix.

The coming years will make clear if these regions really manage to realise all of their ambitions towards energy neutrality. Monitoring of these and other regions can help in identifying success and failure factors more in detail, and in developing tools for a further improvement of the effectiveness of energy and climate policy in Europe.

## References

- City of Arnhem. (2011). *Convenant Energy Made in Arnhem*. Arnhem: city of Arnhem.
- City of Arnhem. (2015a). *Energie made in Arnhem 2014. De basis staat! (Energy made in Arnhem 2014. The first steps are made!)*. Arnhem: city of Arnhem.
- City of Arnhem. (2015b). *New Energy made in [Arnhem]. Programma 2015 – 2020*. Arnhem: city of Arnhem.
- City of Nijmegen. (2013). *Power2Nijmegen. Op weg naar een energieneutrale stad in 2045. Routekaart. (Power to Nijmegen. Roadmap to an energy neutral city in 2045)*. Nijmegen: city of Nijmegen.
- Danish Ministry of Climate, Energy and Building. (2013). *The Danish Climate Policy Plan. Towards a low carbon society*. Copenhagen: Ministry of Climate, Energy and Building.
- DTI (2004). *Greater Copenhagen Region. Regional RES-e Map: Electricity from renewable energy sources (RES-e)*. Copenhagen: Danish Technological Institute.
- Dulk, den, F.W. (2012). *Op weg naar minimum energie woningen met EPC <- 0. (towards minimum energy dwellings with EPC <-0)*. Utrecht: Agentschap NL. .
- European Commission. (2011). *Communication from the commission to the European Parliament, the council, the European Economic and Social Committee and the Committee of the Regions: Energy Roadmap 2050*. Brussels: European Commission.
- European Commission. (2015). *Intelligent Energy Europe – the IEE programme*. Delivered from <https://ec.europa.eu/energy/intelligent/about/iee-programme>, consulted at August 26, 2015.
- European Union. (2010). *Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)*.
- European Union. (2011). *Energy 2020 – A strategy for competitive, sustainable and secure energy*. Luxembourg: Publications office of the European Union.
- Filippi, F. de. (2015). *The case study Emilia Romagna*. Internal SUSREG publication. Rubano: Sogesca.
- Gate 21. (2015). *Gate 21, porten til grøn vækst (Gate 21, gateway to green growth)*. [www.gate21.dk](http://www.gate21.dk), consulted at 1<sup>st</sup> of September 2015.
- Green Building for all (2015). *Ontwerp je eigen woning (design your own home)*. [www.gb4all.nl](http://www.gb4all.nl), consulted at September 1<sup>st</sup>, 2015.
- Groezinger, J. et al. (2014). *Overview of Member States information on NZEBs. Working version of the progress report – final report*. Cologne: Ecofys Germany.

Hewicker, C., M. Hogan, A. Mogren (2011). *Power perspectives 2030. On the road to a decarbonised power sector*. Brussels / Berlin: European Climate Foundation.

Leydesdorff, L. (2012). *The Triple Helix of University-Industry-Government relations*. Amsterdam: University of Amsterdam, Amsterdam School of Communication Research.

Lodder, A. et al. (2013). *De Groene Kracht – Routekaart (the Green Power – Road Map)*. Nijmegen: city Region Arnhem and Nijmegen.

Power2Nijmegen (2015). *Monitoring Energiecijfers (Monitoring Energy statistics)*. [www.power2nijmegen.com](http://www.power2nijmegen.com), consulted at 1<sup>st</sup> of September 2015.

Roth, E., et al. (2013). *Experiences and best practices in sustainable urban planning*. Utrecht: W/E Consultants. Derived from [www.susreg.eu](http://www.susreg.eu).

Roth, E., E. Alsema, J. Goud. (2014). *Energie voor nieuwbouw- en herstructureringslocaties. (Energy for new residential areas and restructured areas)*. Utrecht: W/E Adviseurs.

Schaefer, W.F. et al. (2014) *What 's in it for you? (Costs and benefits for making dwellings energy neutral regarding a group of private owners)*. Aix-les Bains: Proceedings of EuroSun 2014: International Conference on Solar Energy and Buildings.

Schüle, R. et al. (2013). *Improving and implementing National Energy Efficiency strategies in the EU framework. Findings from Energy Efficiency Watch II Analyses*. Wuppertal: Wuppertal Institute, and others.

Social and Economic Council of the Netherlands. (2013) *Energieakkoord voor duurzame groei (Energy Agreement for Sustainable Growth)*. Den Haag: Social and Economic Council of the Netherlands.

SUSREG. (2015). *SUSREG – empowering sustainable planning*. Derived from [www.susreg.eu](http://www.susreg.eu), consulted at 1<sup>st</sup> of September 2015.

Terkelsen, E. , Vries, B.J. de. (2015). *Towards Sustainable Regions. Conference Paper 7th conference on Sustainable Cities and Buildings*. Copenhagen: Passivhus.

Tollari, F. et al. (2015). *Rigenerazione Urbana e riqualificazione energetic nei centri storici dell'unione della Romagna Forlivese. Linee Guida, Giugno 2015. (Urban regeneration and energetic improvement of historic town centres in the Union Romagna Forlivese. Guideline, June 2015)*. Unione di Comuni della Romagna Forlivese.

Urgenda. (2009). *Klimaatneutrale Steden in Nederland. Een Urgenda Inventarisatie. (Climate neutral cities in the Netherlands: an Urgenda inventory)*. Amsterdam: Urgenda.

Urgenda. (2015). *Urgenda wins the case for better Dutch climate policies*. Derived from <http://www.urgenda.nl/en>, consulted 28<sup>th</sup> of August 2015.

Vries, B. J. de, et al. (2013). *Toolkit Sustainable Urban Fringes*. Deventer: Saxion University of Applied Sciences.

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