Part 3.
Sustainable energy transition from the perspective of landscape architecture

Part Three explores sustainable energy transition from the perspective of landscape architecture.

Sustainable energy transition calls for landscape architecture because sustainable energy transition is also envisioned as renewable energy governance processes (Michalena & Hillis, 2013), since physical landscapes, institutions and societal actors are all involved in the process.

This part aims at understanding which role landscape architecture and landscape architects can play in sustainable energy transition, starting from the concept of territorialisation of energy policies (Raffestin, 2012), and the discourse of landscape integration into sectoral policies (Recommendation CM/Rec (2008)3 of the Committee of Ministers to Member States on the guidelines for the implementation of the European Landscape Convention).

Chapter 5 explores how the integration of landscapes into renewable energy policies can be influenced, thus leading to more sustainable energy landscapes. In this chapter, I chose to discuss different strategies for the region of Andalusia (Spain) and the Marston Valley (UK), for instance, the integration of landscape planning into territorial planning and the framework for ecosystem services used for bottom-up planning processes.

Chapter 6 provides a reflection on the instruments used for sustainable energy transition in Italy and focuses on the search for existing and possible relationships between energy planning and landscape planning at the territorial governance levels which is considered overlapping the concept of sustainable energy transition.

In order to explain the main characteristics of the Italian system, I analyzed both compulsory and voluntary energy and landscape plans, so as to underpin the possible levels for a more effective collaboration leading to more sustainable energy landscapes.

Lastly, chapter 7 focuses on what sustainable energy transition requires to landscape architecture and landscape architects.Indeed, professional landscape architects are increasingly being asked to deal with the planning and design of sustainable energy landsape and with decision-making processes concerning renewable energy deployment. The chapter focusses again on the Dutch and Italian context referring to The Netherlands as the country where the concept of sustainable energy transition has been strongly developed for the last decades.

The main aim of this chapter is to explore how the discipline of landscape architecture currently contributes to the formulation and implementation of sustainable energy transition, and to discuss potential outcomes for the future. Accordingly, the 31 landscape architecture projects in Italy and in the Netherlands were analysed in this chapter according to the transition management cycle framework (Loorbach & Rotmans, 2010). The study revealed that, in both counties, landscape architecture knowledge and skills are used to provide information and facilitate energy transition. The results suggest that, while engaging with energy transition, the Dutch landscape architects have enhanced their strategic planning and design skills. The Italian landscape architects, starting from their consolidated operational knowledge and design skills at the site scale, have begun to explore more strategic landscape planning and design. These observations show that the challenge of energy transitions can indeed contribute to a further advancement and maturing of the discipline.

Wind Farm, Biccari, Foggia, Italy.
(D. Moderini)

Wind farm, Harlingen, Friesland, The Netherlands.
(S. Minichino)

Chapter 5
Landscape architecture's possible role for integrating landscape in renewable energy policies

5.1 Introduction

Renewable energy strategies and policies are formulated on the European, national and regional levels involving States, energy utilities companies, NGOs, stakeholders and final users such as industrial companies and common citizens. Thus renewable energy matters involve the multi-level political system of the European countries. In addition, regional and local levels of governance have been increasingly influential for decision-making processes concerning energy. Despite this, the local dimension of these processes has often been neglected (Coenen & Truffer; Kern, 2012; Kern & Howlett, 2009).

The most controversial point of renewable energy deployment is the relationship between strategies, which often occur on the national or regional levels and the implementation phases concerning the decision-making process, the siting procedures and the realization of power plants, which occur on the local level (see e.g. Michalena & Hillis, 2012; Nadai & Van der Horst, 2010a). In addition, at the local scale renewable energy deployment needs the involvment of a wide number of actors for implementing renewable energy projects thus considering the landscape dimension of the process, namely local physical environment characteristics, stakeholder ideas and people preferences (Selman, 2010). Thus recently the most of the debate concerning landscape refers to local scale and renewable energy issues (Leibenath & Otto, 2013; Nadai & Van der Horst, 2010b).

In order to understand how policies shape landscapes and how landscapes could be used for shaping policies, the process of *territorialization* of sectoral

energy policies (Bagliani et al, 2010; Raffestin,1981; 2012) will be explored in this chapter. Thus, sustainable energy transitions deals with both *territorialization* of sectoral policies and regional and local governance.

The overall aim of this chapter is to discuss means of the possible integration of landscape into energy policies and eventually the role of landscape architecture for their formulation. The first question addressed in this chapter concerns whether landscape integration in renewable energy policy is practicable and eventually whether it is a useful means for sustainable energy transition. Then, the use of the concept of landscape for realizing an integrative approach to renewable energy deployment is analyzed, even without the involvement of landscape architecture discipline and professionals. Two cases are briefly described: the case ofthe Andalusia region (Spain) and its sustainable energy plan (PASENER, 2007-2013) and the Martson Vale project entitled *Energyscape and Ecosystem Services,* in the United Kingdom.

5.2 What landscape has to do with renewable energy policies? The European Landscape Convention proposition

After the subscription of the European Landscape Convention (Florence, 2000; Council of Europe Treaty Series no. 176, 2004) by several European Countries, a changed culture in approaching European landscapes has been emerging. Landscape thus is considered the place of everyday life. It is a multifunctional system that delivers a large range of services such as food and water provision but also recreation. These services are needed for human well-being. Landscape is envisioned as an integrative system (Dejant Pons, 2006; Selman, 2006; 2011). Thus in the 2000s, landscape is proposed as a concept aimed at collaborating with strategic and spatial planning. Indeed, at the European level, several documents were elaborated proposing spatial planning as the major means to plan sustainable territorial development: for instance, in 1999 the *European Space Development*, in 2007 the *Territorial Agenda of the European Union Towards a More Competitiveand Sustainable Europe of Diverse Regions* and in 2006 the *European Union Strategy for Sustainable Development*. According to the idea guiding these documents, space is considered as a general strategic framework for general and sectoral policies formulation and implementation (Adams, 2006). The European Landscape Convention also belongs to these frameworks and the publication of the *Guidelines for the Implementation of the Convention* (CM/Rec(2008)3) by the Committee of Ministers to Member States represents a strong call for thinking about the role of landscape in the European spatial planning system and thus landscape integration into sectoral policies and, more generally, into strategic planning.

This new approach to landscape requires a new scientific capacity in order to facilitate strong forward-looking actions related to sustainability as well as stakeholder and citizen participation. The European Landscape Convention and the Guidelines for the implementation propose landscape planning and management to promote landscape development stressing on the dynamic and transformative character of European landscapes (Jones, 2007; Pedroli et al, 2013; Prieur, 2006; Scott, 2011).

Despite a sustainable energy transition described as an inter-sectoral and multi-level process (see e.g. Loorbach, 2010; Rotmans & Loorbach, 2009), renewable energy policies are often approached from the sectoral perspective and landscape is often approached mainly from the sectoral perspective too, for instance from the perspective of protection. Thus it seems that renewable energy policies should address mainly the technological aspects connected to their development, and that the landscape issue claims for the minimization of those technologies in sensitive landscapes. Although the energy issue has not been considered in the text of European Landscape Convention, this document propones three innovative concepts regarding landscape, landscape architecture's scope as well as the landscape architect's role.

First of all, the European Landscape Convention considers clearly the necessity to deal with the drivers of landscape change such as agricultural and forestry policies, transport, infrastructures and regional or town planning (see the Preamble of the Convention). Secondly, drivers of changes are connected to a wider public, including stakeholders and people, and they should be taken into account for all the territory considering ordinary landscape as well as sensitive and special landscapes. Accordingly, the concept of landscape needs democratization. Thirdly, within this context, landscapes acquire various qualities that need to be explained beyond the conventional and consolidated categories taking into account chiefly people's well being (see the Preamble of the Convention). In addition, the European Landscape Convention states that landscape protection, management and planning are key actions for landscape developments and people's well being. These actions should be pursued by politicians, professionals and citizens.

Therefore, landscape architecture needs to deal with the drivers of landscape change, which are economic and political, and several other actors. In addition the discipline needs to reflect on new categories describing landscape qualities. Energy will become one of the most important drivers for landscape changes (Selman, 2010) and energy policies are very influential driving forces for landscapes changes.

From this perspective, landscapes is also considered a product of sectoral policies (Jakson, 1984; Bedard, 2009). In addition since landscape has a multi-functionality character, it is envisioned as a potential concept for policies coordination and eventually for spatial planning.

These considerations suggest various options for integrating landscape into sectoral policies: the first tackles the introduction of the spatial dimension in the policies formulation, and the second pinpoints the possibilities to framing policies through landscape discourse by envisioning landscape itself as narrative (see e.g. Sassatelli, 2009) and an agency (see e.g. Selman, 2010). Therefore framing policies through landscape polysemy aims to encompass different opinions to have more participated landscape transformations. Actually all relevant sectors of public life are connected to the landscape concept.

A third option considers the merging of the previous in the concept of *landscape governance* (Beunen & Opdam, 2011; Selman et al, 2000). This concept implies the change in scale and in organization about decision-making on

landscapes. Indeed the new concept of landscape as well as the spatial planning perspective refer to the decentralization of government power to the local level, including private stakeholders and citizens in the decision-making process. This implies a more structured reflection about the role of landscape architecture in the decision-making process.

This holistic approach towards landscape arose from the European Landscape Convention and undoubtedly offers interesting opportunities for spatial design disciplines, including landscape architecture by considering the potential of landscape as an integrative planning concept (Corner, 1999; Matthews & Selman, 2006).

In western countries, landscape relates to *territory* (see Raffestin, 2012) and *culture* (Creswell, 2003). The Landscape Convention proposed a third paradigm referring to politics: on one hand the social dimension of landscape (see e.g. Prieur, 2006; Luginbühl, 2013) and on the other hand landscape as a project (Fortin, 2005; Paolinelli, 2011; Pedroli et al, 2011). The first highlights the call for social inclusion in decisions concerning landscape, namely more participation and a new governance organization, the second refers to the substantive effects of the decision process on spatial configurations.

In conclusion, the European Landscape Convention's call for a strategic vision of the concept of landscape suggests landscape as integrative framework in spatial planning. Renewable energy is an emerging driver in shaping landscapes and since landscape and energy are envisioned as drivers of both social and geographical transformations, they need to collaborate in the process of sustainable energy transition. In addition, the European Landscape Convention underlining the integrative power of landscape in social decision and in discourse creation, focuses on landscape spatial dimension as means both of verification of policies and formulation of policies. The European Landscape Convention argues about the two characters of landscape: spatial visibility and integrative power (Nassauer, 2012; Van Damme et al, 2012).These features link renewable energy issues and landscape domain, eventually collaborating for policies formulation and implementation.

5.3 Territorialization of renewable energy policies and landscape

The concept of *territorialization* covers two principal phenomena: the process of territorial reorganization, which has affected different levels of public action and their relations; and the trend of taking the space, thus territory,(see Raffestin, 2012) as the reference point for policies and interventions. These phenomena are distinct but intertwined as common effects that induce the mobilization of new actors and the politicization of a fairly wide range of issues for the reinvention of the territory. The theme is also linked to that of regionalization and local development (Governa & Salone, 2004)

Territory thus is conceived as an instrument of policy. Indeed we can see the growth of negotiating practices, based on the conclusion of formal agreements and volunteers who engage a multiplicity of actors, public and private, in the pursuit of a collective interest for instance in urban planning or in agricultural development.

Particular attention is devoted to negotiating approaches that might facilitate the integrative logic, based on mutually oriented behaviors, rather than the distributive-oriented division of resources.

The logic of territorial policy approaches in different sectors, for instance local development policies and urban regeneration, is emerging in the decision-making process. Local authorities are looking for new operational methodologies involving local communities so as to share the main objectives as much as possible. To date, the role of landscape in *territorializzation* processes has been neglected in spite of the increasing role of landscape in local decision-making (Albrects, 2006; Bishop, 2011; Dramstad & Fjellstad, 2011;Smith et al, 2009).

Concerning renewable energy policies, the concept of *territorialization* is connected mainly to the spatial dimension of renewable energy deployment such as planning and siting processes. These actions are intertwined with the landscape discourse.The phenomenon of *territorialisation* of sectoral policies, here energy policies, is the process with which these policies take shape in space. This depends on how they are formulated and implemented and adapted by institutions and people and by designs in a specific place (Sgard et al, 2010). Policy structures the space because it builds private and public choices.

Concerning renewable energy policies, the gap between the formulation and implementation phases, and between the different governmental levels, is envisioned as the existing distance between policies and projects development. Indeed, energy policies trigger landscape process and the transformation rules.

The actual implementation of renewable energy policies on the ground and the generation of electricity from renewable energy sources happen at the local scale. The main problem for renewable energy deployment at the local scale is the missing link between European energy policies such as the Directive 20-20-20, and the local level (Michalena, 2009; Michalena & Hillis, 2012), namely defined also as territorialization process. To this end landscape should have a key role in being integrated in spatial planning (see e.g. Terrados et al 2009), bridging the different scales where renewable energy policies are settled. Thus, the emerging concept of *energy landscape* has started to be employed in policies formulation and decision-making processes, representing a promising conceptual means to improve landscape integration into regional or local energy policy and beyond (see e.g.Blaske et al, 2013; Howard et al, 2013; Stremke et al, 2012a; 2012b).

5.4 Different approaches to landscape integration in renewable energy

Concerning the previpusly mentioned role of the concept of *energy landscape*[15], two examples are discussed in the following. The first emphasizes the land use dimension connected to renewable energy policies and its use of the concept of landscape for formulating spatial planning principles (Prados, 2010). This example concern the PANESER plan elaborated by the autonomous regions of Andalusia.The second deals with an experiment of *landscape governance*, calling for the active participation of the population in *energy landscape* construction

15 See also Chapter 1. p.25

and reflecting on the concept of *energyscape* for the Marston Vale in the United kingdom (Howard et al, 2012).The term landscape governance tackles the change in scale and the organization of decision-making in landscape because of the coordination and fusion of private and public resources. Landscape has been taken into account from the perspective of the ecosystem services concept (De Groot et al, 2010).

The land use approach. Andalusia region, Spain

Andalusia is a Spanish independent region, which chooses to address State measures on energy issues to plan its own incentives program and to authorize siting and construction of renewable energy power plants. The regional government settled out policies to increase mainly wind and photovoltaic power plants. Actions have been carried out on two fronts: the design of policies to promote renewable energies, and the spatial planning and urban development for new installations. Andalusia represents a successful case of renewable energy policies implementation.

In that respect the main action taken was the formulation of regional energy plans, the first of which was the 1995–2000 *Andalusian Regional Energy Plan*. A second plan was passed in 2003-2006.These plans set their own targets for energy promotion while at the same time introducing positions on the preferred siting of installations. The plans also launched the *Andalusian Energy Agency,* aimed at coordinating renewable energy implementation. In addition, in 2007, the Andalusia sustainable energy plan called PASENER was published. It is a strategic plan aimed at creating an initiative to promote new lifestyles and a new energy model for the whole region. The regional vision is in line with the national energy vision. Indeed Spain has worked with an energy mix resting on solid foundations that comply with international agreements. When the plans were conceived, Spain was one of the first countries to base energy development on wind power and solar photovoltaic.

Within the Spanish context, renewable energy deployment has been perceived as having the major impact on sensitive landscapes because new power plants were installed in the rural areas, or on the cast line, where conditions were more favorable as well as the landscape being more sensitive to changes (see e.g. Nadai & Laboussiere, 2007).

In Spain, as well as in many of European countries, the main problem due to renewable energy deployment was the unfinished dialogue between the implementation of the legislative measures to promote renewable energy and the sprawl of power plants (Nadai, 2007). The search for spatial planning rules was one of the major objectives both for national and local governments.Thus the PASENER plan related various plans and programs that have a bearing on energy planning to one another, aiming at emphasizing their cross-links with other public policies. This plan considers renewable energy as the most favorable instrument for creating sustainable territories, and it does not really deal with the most common side effects of renewable energy.

Concerning siting it refers directly to the Andalusian Spatial Plan. This plan

considers heritage, landscape and territory as strictly connected entities and thus it propones to manage them by only one integrated framework (figure 5.1). This framework was based on:

a) the inclusion of the energy system in the Andalusian land use model;

b) establishing landscape protection measures in energy planning and in plans for infrastructure, setting aside the coast and lesser urbanized inlandareasas preferred sites for both wind and solar systems,as well as agricultural land for energy crops.(Padros, 2010). However, the link between energy policies and landscape development is missing (Terrados et al, 2009) and the process has been developed with any proper integration of policies into spatial planning (Padros, 2010). In conclusion, Andalusian authorities included landscape reasoning on renewable energy deployment. However, their approach focused on spatial principles while considering landscape as mainly geographical entities.

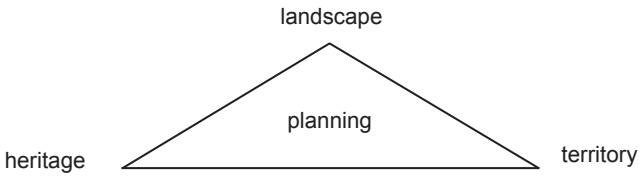

Figure 5.1 The scheme re-worked from Padros (2010), shows how landscape is considered within the PANESER plan.

The ecosystem service approach. The Marston Vale, United Kingdom

The Marston Vale is a sub-catchment of the Great Ouse River in Bedfordshire, United Kingdom. United Kingdom in the international context appears as one of the most interested countries for the integration of energy spatial planning via the concept of landscape (e.g. Howard et al. 2013; Smith, 2006).

The *Energyscape and Ecosystem Services* projects were developed by the Centre for Spatial Analysis and Policy, School of Geography (UK). The project aimed at exploring how the concept of *energyscape* and *ecosystem services* could help to guide the deployment of land-based renewables. *Energyscape* was defined as '*the complex spatial and temporal combination of the supply, demand and infrastructure for energy within a landscape'*(Howard et al, 2013:17).Thus energy could be confronted with other ecosystem services such as food provision, water regulation, conservation of biodiversity or creation of opportunities for recreation and education.

This project aimed also to explore possible scenarios for distributed renewable energy development. This approach considered a multi-disciplinary systems-approach that uses existing knowledge of landscapes, energy options, and the different perspectives of stakeholders.

Indeed, as the provision of energy becomes decentralized, the issues become more location and site-specific. Thus it is important to consider energy demand, production and supply in a more local area context.

The research was developed with the local authority and set out a

framework enabling the development of energy scenarios at any intermediate geographical scale between the national level and the household level, linking local production potential with the local level of consumption, and exploring the synergies and trade-offs between local renewable energy production on the one hand and the production of other land-based commodities on the other. This experiment used scenario outputs to inform and engage local stakeholders and also to elicit new information about strategies and plans that are being developed.

New tools are needed to allow politicians and technicians to understand how changes due to energy systems (both large and small) interact with ecosystem services, both in terms of technical assessment and in terms of planning decisions.

Broader vision is needed for the energy planning, using the concept of ecosystem services. Indeed it recognizes the importance of different spatial scales and uses scenarios to explore with stakeholders the desirability and feasibility of particular local or regional interventions into the energy system. The framework elaborated during the experiment for the Matrson Vale represents: (a) actual and potential energy sources, (b) energy transportation pathways, (c) the energy demandacross a local area and (d) the capability of seamlessly linking to examinations of other ecosystem goods and services (figure 5.2)

The research stated that an *energyscape* can help, in part, to address this by modeling energy demand, supply and flows through real landscapes, thereby helping to identify links, obstacles and important associations.

Figure 5.2 Modeled land used in the experiment on energyscapes in the Marston Vale in 2009. Source: Howard et al, 2013.

In conclusion the development of scenarios to explore what can be done locally, can help to inform local planning decisions and facilitate public engagement in the (otherwise rather abstract) energy debate on a more concrete and contextualized basis.

The concepts of ecosystem services and landscape are used to develop such inclusion. Indeed, landscape services are derived from the concept of ecosystem services and are connected to the concept of landscape functions. It means that landscape is capable of providing services to society. An evaluation of these services are connected with sectoral policies and could be useful to support decision-making. The landscape services method primarily aims to translate data to conceive a sustainable landscape transformation and explores landscape qualities connected to policies visions.

5.5 Conclusions

This chapter argued about the need, stated by the European Landscape Convention, to integrate landscape into renewable energy policies. The local dimension of these policies is often used as scale for the integration. Thus landscape is an integrative framework, which can help in these processes. The two analyzed cases showed how landscape was taken into account for developing renewable energy policies at the local scale.

In both cases the integration of landscape in spatial planning and thus in energy policies formulation is acknowledged. However, the projects showed two different approaches to the renewable energy deployment: land use planning and ecosystem services as tool for spatial planning. Thus, in the first case, an operational problem was identified, namely siting of renewable power plants and in the second the knowledge about energy and its implication as land use driving forces, is a strategies-related problem.

In addition siting principles and scenarios are the two means used in the different cases in order to integrate the landscape issue in the process of renewable energy diffusion. Both of the cases deal with the process of *territorialization* of energy policies for the national level to the local. They propones solutions for this problem, which are connected with landscape qualities. The first argues about a top down approach to the problem and the second one refers to a bottom up approach. Surely this fact is related also to the different approaches to energy. Indeed UK has developed a more integrative model of energy planning than Spain (Bale et al, 2012). In both cases, energy matters are acknowledged of a more inclusive and sectoral-integrated approach to spatial planning and the decision-making process connected to spatial planning.

What we can learn for the two cases is that planning, siting and design for renewable energy should take into account space as well as people's imagination, thus landscape. Spatial panning should be inclusive and integrative. Surveying people's opinion as well as their political will requires new methodologies in conceiving plans and policies. Thus landscape architecture and especially landscape design as an integrative and inclusive means (Baltas & Dervos, 2012; Nassauer, 2012; van Damme et al, 2012; Koh, 2013) seems to be one of the

possible tools for landscape integration into renewable energy policies. This proposition will be analyzed in the following chapters[16] trough several examples where landscape architects, while designing energy landscapes, dealt with such landscape integration into renewable energy policies and decision making process.

16 See also Chapter 7.

Biogas power plant, Collesalvetti, Pisa.
(S. Minichino)

Wind farms and gas storage, Port of Rotterdam, The Netherlands. (S. Minichino)

Chapter 6.
Energy plans and landscape planning for sustainable energy transition in Italy

6.1 Introduction

Sustainable energy transition processes are necessarily developed via the interaction of different actors, governmental and others, who are external to the administrative and political arena. Indeed, sustainable energy transitions involve the whole territory, economic initiatives, collective and individual habits. Thus sustainable energy transition processes are connected to the *territorial governance* (Davoudi et al, 2008; Faludi, 2012).

This chapter refers to the concept of territorial governance as "*the process of territorial organization of the multiplicity of relations that characterize interactions among actors and different interests. This organizational dimension refers to the construction of a shared territorial vision, based on the recognition and valorization of the territorial capital to create sustainable territorial cohesion at different levels."* (Davoudi et al, 2008: 37).

As previously mentioned, renewable energy deployment is one of the strategies for achieving more sustainable landscapes, and actions adopted by governments for their diffusion takes part of the wider process of territorial decision-making concerning energy. Renewable energy has only recently been considered in the *territorial governance*, and the expression of *renewable energy governance* is used for describing approaches, tools and actions used for governing renewable energy deployment on the territorial level (Michalena & Hillis, 2013). Currently, many countries, such as England, Germany and the Netherlands, adopted a such a perspective concerning the energy issue via the sustainable energy transition

concept. On the contrary, in Italy, such an approach is not strongly related to sustainable energy transition analytical and operational paradigm and not many actors are involved in energy-related decision-making processes (Pontrera, 2013).

This chapter aims to reflect on instruments used in *renewable energy governance* by searching for existing and possible relationships between sustainable energy transitions, energy planning and landscape planning devices in Italy.

Italian energy planning is envisioned both as strategic planning and a sectoral area of policies, Energy planning tools are both mandatory and voluntary, connected to territorial plans. They are elaborated on different territorial levels (De Pascali, 2008, Fagazzi & Fanfani, 2012). In Italy, landscape planning is the activity concerning landscape protection and management, referring to the compatible transformation of territories (Voghera, 2011). Landscape planning is mandatory for institutionally protected landscape and it happens at the regional administrative levels. It is often related or integrated into spatial plans. These activities institutionally call for a landscape architecture background.

In reason of that, this chapter focuses on planning and design tools, institutionally given to landscape architects, which these professionals could use dealing with renewable energy.

The question addressed in this chapter is: do common points exist between energy planning and landscape architects skills used in landscape planning instruments?

In the following paragraph, the general notion of renewable energy governance is explained and placed within the Italian context. Some of the most relevant Italian energy and landscape-planning instruments are described. Finally, reflections on possible interactions between the landscape architecture background and the analyzed instruments are proposed in the light of the sustainable energy transition.

6.2 The overlapping concepts of sustainable energy transition and *renewable energy governance*

General speaking, governance refers to ever-increasing variety of terrains and actors involved in the making of public policy, including energy subject.

Governance consists of policy networking (Hischemmoller et al, 2006), the public-private initiative and collaboration because the conventional system of governance are not able anymore to shape society. The shift is between governance and government. Whereas government refers to a monocentric interventionist perspective, governance refers to a polycentric model, which envisions concerted actions by decentralized actors, each of which has only limited coercive capacity. This model includes not only the governmental actors but also stakeholders and NGOs. Cooperation and workshops are the means used in these kinds of processes. Also scientific knowledge and the expert role changes being conceived more as intermediate between politics and people. Indeed scientists and technicians are less influential in such complex problems.

How different national governments decide to develop renewable energy

in their national territory is addressed by *renewable energy governance* paradigms (Southern et al, 2011), therefore, it identifies all the actors and locations beyond the central government involved in the policy-making process.

The promotion of renewable energy technologies and, more generally, of initiatives concerning sustainable energy transition, show that the coordination of various actors and institutions is needed. Moreover renewable energy involving territories and people refers to solving problems that are not institutionally framed. Within this context, *renewable energy governance* appears as regional and local governance in many European countries, underling the recognized territorial and regional dimension of renewable energy deployment. Indeed the regional and local dimension is acquiring interest in managing renewable energy diffusion. Thus, it includes the assessment of resource endowments, the identification of technical capabilities and advantages, the creation of renewable energy targets that suit the regional and local contexts, the formation of public-private partnerships, the establishment of regional renewable energy agencies, the drafting of regional energy strategies, pro-renewable reform of strategic planning frameworks, the creation of specialist research centers, funding demonstration projects, and support for renewable energy supply chains.

The innovation and deployment of renewable energy technologies involves a mix of established energy utilities and new business models and firms (e.g. energy service companies). Some renewable energy systems seek to satisfy conventional consumption patterns, for instance, grid connected technologies, whilst others are predicated upon new user practices such as room occupancy in passive solar homes. Renewable energy projects like wind farms can involve large and protracted planning processes, whilst other projects involve smaller planning applications, but solar water panels in conservation areas are just as protracted and daunting for the applicant.

Finally, such governance involves building consensus, or obtaining the consent or acquiescence necessary to carry out a program in an arena where many different interests are in play. Although the concept and the expression *renewable energy governance* has only recently emerged in the literature (see e.g. Michalena & Hillis, 2013), it stresses the problem of the coordination of government and other actors at the territorial scale. In addition, from the perspective of sustainable energy transition, different approaches have been developed within the governance idea. These approaches are recently described in two categories (Coenen et al, 2012; Truffer & Coenen, 2012): multi-level and transition management approaches. The multilevel approach refers to transition, which is envisioned as the interaction between three different levels of societal systems - macro, meso and micro and corresponding to landscapes, regimes and niches - where changes occur. This approach considers societal embedment in the processes structuring actions for achieving a more sustainable style of life. From this perspective, local dimension refers to a community working for common objectives. On the other hand, the transition management approach considers changes occurring at the local level and driven by a group of forerunners who are capable of steering the decision-making process at the governmental level (Loorbach, 2010; Loorbach & Rotmans, 2010). Concerning sustainable transitions, both of these approaches

highlight the importance of the structure of governance system, the inclusion of non-governmental actors in the governance system, a more flexible governmental organization and the regional dimension dealing with decision-making.Thus, the governance of renewable energy refers to the development of regional renewable energy discourse, the formation of regional networks, and the commitment of interests in the region. Realizing *renewable energy governance* requires, for instance, the formation of discourses that facilitate interactions and resource exchange, the mobilization of resource interdependencies through actor networks and the intermediation of different material interests and organizational priorities. Such activities call for the co-ordination between networks, discourses and interests steering towards a strategic policy objective.

In the light of that, a sustainable energy transition and *renewable energy governance* become overlapping concepts indicating the analytical and operational paradigm referring to actors, actions and procedures envolved in designing more sustainable landscapes.

6.3 Sustainable energy transition and renewable energy in Italy

In Italy, energy matter is under the aegis of the regional and national governmental levels (*Constitution of Italian Republic*,1173/2001). On the national level, energy is addressed by the *National Energy Strategy Plans* updated on March 2013. On the regional and local levels, there are several mandatory instruments such as regional or municipal energy plans and voluntary instruments such as the sustainable energy action plans promoted by the European Council after the approval of the so called 20-20-20 strategy in 2008.

Energy planning in Italy is described in the law number 10, January, the 9th1991. This is, up to day, the main law concerning the energy regulations in Italy. This law introduced also the concept of energy transition as the sum of energy-conscious energy habits and, design and planning principles, further developed by the law Bersani (79/1999).

The so called *Low10* introduced the mandatory formulation of municipal energy plans (in Italian *Piani energetici Comunali)* as the core tools for envisioning a more energy conscious spatial planning and design (De Pascali, 2008).This law was conceived for developing energy conscious principles both in strategic planning and territorial planning and design. Moreover the law introduced the concept of environment in the energy sector and thus the intention of integrating energy planning and territorial planning, arguing on three points for the Italian context: 1) national energy production should be self-sufficient; 2) renewable energy technologies should be developed; 3) energy conscious production and consumption should be consciously approached in territorial development.

Concerning the organization of the energy system in Italy, several energy production companies exist after the liberalization of the Italian energy market was completely realized in 2007. However, TERNA is the main subject in organizing the distribution network. On regional and provincial levels, several organizations exist in order to promote renewable energy and sustainable behavior in energy production and consumption on the local scale (Pepe, 2012). Other actors are

the GSE *(Electric sector management authority)*, GME *(market management authority)*, regional, provincial and municipal energy agencies.

The *National Energy Strategy* published in March 2013 underlines the possible role for the territorial governance in developing a more sustainable energy future. Thus this program calls for more inclusive processes involving local authorities and stakeholders. In addition the public debate is considered one of the most important tools in the overall setting of the energy strategies. In spite of that, the strategy considers landscape as synonymous of historical heritage referring to protected areas or ancient city centers (*National Energy Strategy,* 2013:135).

Currently, renewable energy constitutes a large part of the national energy production in Italy (11,5% share of renewable energy in gross final production, EUROSTAT, 2011). This followed the sharp increase of renewable energy in Italy according to a strong financial policy supporting renewable energy development. Such phenomenon is radically changed after the *Burden Sharing* law-decree (March 15th 2012). This indicated how the quantity of renewable energy should be distributed among Italian administrative regions for future implementation. The repartition is based on data concerning the consumption of energy in each territorial area. This document refers to the wider context of the National Energy Plan for renewable energy published in 2010. The *Burden Sharing* is an economic strategy aiming at influencing the diffusion of renewable energy, de facto limiting the regional and local initiative. Several authors criticized this law arguing that top down initiatives have priority on locally promoted actions (Puttilli & Bagliani, 2012).

However, in Italy, all the three main governmental levels - regions provinces and municipalities - deal with energy topics and produce energy plans aiming to describe the energy system and energy target for the competence area. The changed energy system includes renewable technologies and is very connected to the site- specific and local initiatives, and to the necessity to involve a wide number of actors. Thus the municipal level has started to get more and more important. In addition, the Italian government is thinking about the elimination of the provincial level in the national governance structure. Thus the provincial level is going to lose its role in formulating and implementing energy strategies and an energy initiative (see e.g. Salone, 2013).

From the perspective of sustainable energy transition, some tools of the Italian territorial governance concerning energy and landscape are analyzed. Regional, provincial and municipal energy plans as well as sustainable action plans, energy neutral districts and sustainable communities are described. Concerning landscape, regional landscape plan, landscape report and landscape guidelines for renewable energy are generally reviewed.

Environmental and Energy regional plans

Environmental and Energy Regional plans aim to formulate the regional objectives for the production of electricity and heat also from renewable sources and energy saving. They have a programming part, aiming at regulating and coordinating the free initiative of the market jointly with environmental objectives and targets. Thus the regional energy plan is also an environmental plan. The nature of this plan is

mostly stating objectives and not actually as steering future development strategies (Coralli et al, 2010).The regional environmental and energy plan is developed according to four steps: 1) the analysis of energy demand and supply, 2) the study of the main actions to be developed in the medium term to reduce primary energy consumption and 3) the increase of energy production from renewable sources and the mid-term scenario definition (Brandoni & Polonara, 2012).

Provincial Energy Plan

This plan also has an environmental dimension and it refers to the administrative areas of Province. It is subordinated to a regional energy plan regarding targets and objectives although it is more related to territorial planning instruments such as the provincial territorial plan concerning the individuation of areas for developing energy plants.

Municipal Energy Plan

This is a local plan aiming at regulating the municipal development concerning energy efficiency and energy production also using renewable energy sources. It is strictly connected to the ordinary urban planning instruments and strategies, for instance the *Municipal Urban Plan (Piano Regolatore Generale).* Thus the municipality is envisioned as an enabler for encouraging public-private collaborations oriented to partnerships and initiatives in energy generation systems and technologies and in the improvement of energy performance of public properties, building and vehicle fleet.In addition, community policies and initiatives provide adequate funding to municipalities for the performance of a number of capacity building tools, such as education campaigns and demonstration projects.

Sustainable Energy Action Plan

In the Italian context, the most used voluntary tool for sustainable energy is the *Sustainable Energy Action Plan* developed by municipalities. The project concerning the formulation of municipal sustainable energy plans is promoted by the European Commission and involves the local and regional authorities in which they agreed to increase energy efficiency and the use of renewable energy sources in their territories. This initiative, called *Covenant of Majors*, involves 4627 Italian municipalities and regional authorities (Comodi et al. 2012; Dall' O et al. 2013; Mega, 2013).This initiative launched a new framework, which accelerated the implementation of relevant European policies and funding instruments at the local level, starting with the mayor's political endorsement of European Union objectives, the adoption of a long-term vision for local sustainable development and culminating with integrated planning documents (see Heyvaert, 2001).

Covenant of Mayors signatories aims to reach and even to exceed the 20% emission reduction target CO2 by the 2020 through the implementation of actions addressing energy efficiency and the use of local renewable energy sources.

The *Sustainable Energy Action Plan* is a strategic policy document

developed, approved and implemented by the municipal council involving local stakeholders and citizens. It is considered both an operational tool because it aims to implement actions, and a communication tool because it serves the engagement of various actors in the process. The action plan adopts an integrated approach, including various sectors such as building, equipment and facilities, transport but also small scale energy production and land use planning referring to a multi-level governance model. The knowledge needed for the formulation of the plan refers to the current situation, mainly in terms of energy consumption and CO2 emission (Baseline Emission Inventory) and with regard to the actions for achieving a more sustainable future (action plan agenda and concrete actions for the territory of the municipality).

In that sense *Sustainable Energy Actions plan* has a territorial approach as well as a scenarios-based approach. The strategic environmental approach, including biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, and landscape is one of the strategies for its formulation and implementation. The path developed via this processes follows several pre-defined steps. The first is the signature of the *Covenant of Mayors*. After that, the steps consist of: a) a definition of long term vision; b) establishment of Covenant team; c) compilation of Baseline Emission Inventory; d) development of the action plan in close collaboration with local stakeholders and citizens. After these first phases, the sustainable action plan is submitted and the implementation phases starts. The monitoring phases are very important in the process (Covenant of Majors Guidelines, 2011).

Summing this up, plans are founded on the concept of integrated planning and a holistic approach to local energy systems, focusing on reducing the energy demand in several key sectors of activity as well as using local renewable energy resources to match local energy demands. Thus the main aim of the *Sustainable Energy Action Plan* is to translate the political commitment into concrete actions on the local level while being rooted in the theoretical framework of a sustainable energy transition. In addition, Italy is the European country with the most number of municipalities joining this initiative (web site of the *Covenant of Majors December*, 2013). In addition, this instrument is increasingly used and paired with the municipal energy plan (Brandoni & Polonara, 2012).

Energy neutral districts and sustainable communities

The concept of energy neutral district refers to energy that is consumed where it is produced. Indeed an energy district is an area where the energy demand is answered by the local energy production. The energy provision is given by different renewable energy sources, depending on the geographical characteristic of the place although also one technologies districts could exist, for instance, wind energy or photovoltaic districts. The networking of actors and the role of local authorities became very important in this situation. Essentially the energy district is an approach in searching for producing and consuming energy locally. Recently the concept of the energy district has been developed mainly for the biomass in the Italian context (Reho, 2009)

Sustainable communities are small communities aiming for self-energy production. Some projects have started to be developed for small communities, neighbourhoods or parts of the city also in Italy where various actions and experiments were proposed via commitment among local authorities, stakeholders, consumers, energy agencies and researchers who join the local policy-making process. This experience is also aimed at opening the decision-making process to the local communities (see for instance the just concluded European project ALTERENRGY, Energy sustainability for Adriatic small communities or the starting project Green Communities promoted by the National government for Southern Italy small communities).

In conclusion energy plans in Italy have started to be developed by large areas analysis estimating energy potential and energy fluxes. The sustainable energy transition perspective reveals the local dimension of the energy considering a wider range of factors such as technological innovation, private initiative and radical territorial transformations. In addition, *Sustainable Energy action Plans* and *Energy District and Energy Communities* are devices rooted in sustainable energy transition framework, referring to innovative model of territorial governance. At this end, these action plans are considered important means for further developing sustainable energy transition in Italy.

6.4 Landscape planning and design tools for sustainable energy transition

In Italy, landscape planning is under the aegis of the Ministry for Culture and the Environment and the regional governments. Landscape planning is described as one of the activities being part of the scope of landscape architecture. It is also an institutional activity regulated by the *Heritage and Landscape Statute* (*Codice dei beni culturali e del paesaggio,* Decree 42/2004).The Statute defines the scope of landscape planning (*art. 135*), the nature and structure of the landscape plan (*art. 143*) and indicates the way by which this plan has to be coordinated with other instruments of spatial planning and programming (*art. 145*). The Statute incorporated the principles of European Landscape Convention, although some crucial differences exist concerning the definition of landscape in decision-making processes and the public involvement concerning landscape transformations. Indeed, although the strategic role of landscape for envisioning future transformation is recognized, the concepts of protection and extraordinary values prevail (Santangelo, 2010; Serritiello, 2013a; 2013b) whilst landscape as an integrative framework in planning and design (Selman, 2010; 2012) is partially not considered.

Landscape plans

Landscape plan is a territorial plan which concerns specifically landscape characteristics. Generally, it is based on the analysis of the landscape types in the regional administrative boundaries. The landscape plan identifies valuable

elements of landscapes, factors of risk and degradation. It states the quality targets and proposes landscape management criteria according to compatible transformations.Thus *Regional landscape plans* are defined also as strategic plans and give guidelines for the territorial transformation on the regional scale. Indeed Decree 42/2004 endows regional governments with the task of designing strategic landscape plans, subdividing their territory into sub-regional landscape units, which are based on features created by the interplay between natural and human factors, and calibrating specific strategies and regulations. Landscape plans could be autonomous plans or integrated into the territorial regional plan, according to the will of the regional authority (Farinelli, 1991; Natali, 2011; Tassinari et al, 2013; Vitale-Bovarone, 2011). Generally these plans have a double objective: on one hand they aim to describe the characteristics of regional landscapes, and on the other hand, they aim to define the strategies for guiding the regional territorial transformations (La Riccia, 2010). The core idea of regional landscape plans is the definition of optimal spatial ambits for land use management (Poli, 2012).

This approach is applied also to renewable energy development, which is envisioned as new land use. Indeed landscape plans identify areas for the development of energy infrastructure (see for instance Landscape Plan for Emilia Romagna region, 2009) or give guidelines for energy landscape design (see for instance Landscape Plan for Apulia region , 2012; Cinà, 2010).

In conclusion, although landscape plans in Italy are strategic plans, they refer mainly to the operational knowledge of landscape architecture, resulting in analytical bases for the plan, for instance in creating landscape typologies maps or visual analysis plans.

Landscape Report (in Italian *Relazione Paesaggistica)*

This instrument was created by the Italian government (D.P.C.M. December the 12th 2005). It concerns the action for the implementation of the European Landscape Convention. The *Landscape Report* is mandatory for several types of projects, particularly for the institutionally protected areas (about 60% of the Italian national territory).

This instrument represented an innovation concerning the way in approaching landscape and landscape transformation in the Italian context because it is envisioned as a *designing tool*, aimed at guiding professionals (not only landscape architects) while designing territorial transformations (Scazzosi, 2006). Thus *Landscape Report* addresses many issues such as architectural design and the design of infrastructures, for instance highways and energy facilities. Indeed the *Landscape Report* is conceived for informing the design process. This instrument is envisioned also as a tool for implementing the topic of landscape among a wide group of professionals in the Italian context as well as improving methodologies and operational knowledge in approaching territorial transformations (Banchini, 2011).

The *Landscape Report* is grounded in the operational domain of landscape architecture knowledge. Although it is elaborated at the beginning of the design process, and it is part of the documentation of the preliminary project, aiming at

going beyond the general sectoral-framed design process (Scazzosi, 2006), its nature is very connected to the idea of mitigation or reduction of negative impact on the existing landscape (Serritiello, 2013). Essentially this instrument tries to coordinate different sectoral opinions about the transformation process and focuses on implemetation phases of policies or plans because it intervenes when a decision about the nature of the projects have just been decided.

Concluding on *Landscape Report*, it is particularly relevant for renewable energy diffusion and for the landscape architects' role in such a process. *Landscape Report* is a document for the implentation phases of the project and the executive designing phases. It refers to landscape characteristics and identifying site-specific criteria for the evaluation of landscape transformations and proposing mitigation actions according to the regional landscape plan strategies.

National and regional guide lines for renewable energy (DM 10-0-2010).

Guidelines as tools for designing landscapes are a common instrument. Indeed after the low, which introduced the *Landscape Report* as a site and case specific design and assessment framework, guidelines aimed at introducing design concepts and suggestions for designers, public administrations and single citizens to approach every day landscape transformations. Landscape guidelines refer to very different activities, such as positioning new infrastructures as well as advertising panels.Renewable power plants were also included in the categories of the projects that needed guidelines. National, regional and provincial renewable energy guidelines were elaborated concerning this topic, focusing on checklists and design principles. The concept of *congruence* (see also Selman, 2010) has been developed in order to reflect on renewable deployment and landscape transformations (Angrilli et al, 2012).

Thus also this tool, which deals mainly with methodologies for inserting and implementing new projects in the landscape, is rooted in the operational domain of landscape architecture.

6.5 Pairing of energy planning and landscape planning instruments

All of the aforementioned devices are connected to land management and spatial planning. Indeed both energy plans and landscape planning instruments have started to be integrated into spatial planning in order to implement both strategic and operational roles of these instrument in decision-making for spatial transformations. Indeed energy plans have started to be integrated in the regional and urban plans under the challenging topic of climate change and energy saving looking both for vertical and horizontal integration (Fragazzi & Fanfani 2011; Verones, 2013; Zanon &Verones, 2013).

Energy-related topics such as urban form and density, activities' allocation and mobility are recognized as being part of the spatial planning domain.

Landscape plans are also considered strategies that should be coordinated with spatial planning instruments.

In that respect several techniques have started to be explored in the Italian context

aimed at integrating these different levels via vertical and horizonyal integration procedures (table 6.1).

Table 6.1 Landscape planning, energy planning and territorial planning are confronted concerning integration on the different territorial governance levels in Italy.

	Competence	Specific laws	Policies	Vertical integration	Horizontal integration	Partecipation	Approach
Landscape planning	National and Regional Government	Codice dei Beni culturali e del Paesaggio (D.L. n°42 2004)	Regional Landscape plan	On trial in some regions	On trial in some regions	On trial in some regions	Analytical
Energy planning	National and Regional Government	Law n° 1 January, 9th 1991	National Energy Plan	On trial	On trial	no	Strategic
		Renewable energy Guides Lines (D.M.	Regional environmental and energy plan	On trial in some regions	On trial in some regions	On trial in some regions	Analytical and programmatic
		September the 10th 2010)	Provincial Energy plan	On trial in some provinces	On trial in some provinces	no	Analytical and programmatic
			Municipality energy plan	On trial in some municipalities	On trial in some municipalities	On trial in some municipalities	Operational
Territorial planning	Regional, Provincial and Municipal	Urban planning law n°1150, 1942	Regional territorial plan	On trial in some regions	On trial in some regions	On trial in some regions	Strategic
			Provincial territorial plan	On trial in some provinces	On trial in some provinces	no	Strategic
			Municipal urbanplan	On trial in some municipalities	On trial in some municipalities	On trial in some municipalities	

However, the regional landscape plan is super-ordinate and this trait makes a real integration with the other plans difficult (Magnosi, 2011). Although the role of landscape plan is still controversial for competences and parts played by local authorities and citizens, few cases exist concerning the integration of these three dimensions - energy, landscape and spatial planning - in the same plan (see e.g. Magnaghi et. al. 2013).

Although this research work did not investigate the state of art of these three dimension in the Italian strategic and spatial planning system, it is relevant to note that these issues are more and more frequently connected and simultaneously approached, searching for cross-sectoral initiatives. The previous *table 6.1* shows how landscape planning, energy planning and territorial planning appear in the Italian contexts, showing plans containing references or indications for the other matters.

6.7 Conclusions

In Italy energy planning aims mainly to formulate targets and landscape planning is envisioned as a framework in steering territorial transformations. Despite that, they do not refer directly to the implementation phase of targets or strategies.

Although the nature of these plans is very general, they essentially refer to renewable energy governance and sustainable energy transition.

The regional administrative level is considered the most important both concerning energy and landscape, whilst the local dimension is not really considered to be influential in decision-making. Thus energy planning is conceived as a strategic tool but it does not consider spatial issues, whereas landscape planning concerns spatial transformation but it does not deal with long-term visions or spatial principles for long term development (25-30 years).

Indeed landscape planning instruments are very connected with the operational domain of landscape architecture.

Solar field, Venturina, Livorno.
(S. Minichino)

Offshore wind farm, Port of Rotterdam, The Netherlands.
(S. Minichino)

Chapter 7. Landscape planning and design for sustainable energy transition. A comparison between Dutch and Italian practices[17]

7.1 From renewable energy technology to sustainable energy landscape

Renewable energy is related to how landscapes are transformed, causing much controversy: the visual impact and noise of wind farms (Nadai & Van der Horst 2010b, Wolsink, 2012); the transformation of cultural or recreational landscapes, due to photovoltaic power plants or extensive biomass cultivation (Poncet et al, 2012); the loss of agricultural productivity and speculation in power plant development (Bagliani et al, 2010; Oles and Hammarlund, 2011); and finally, the questionable social, economic and ecological sustainability of renewable energy (Farina, 2013).

Promoting the use of renewable energy technology is one of the strategies, next to supporting energy efficiency and sustainable transport systems, for sustainable energy transition (Strong, 1992). In this paper, we refer to sustainable energy transition as a radical and structural change in the socio-technical domain of energy (e.g. Rotmans et al. 2007; Verbong & Geels, 2007) as well as environmentally conscious steps aimed at reducing energy consumption through the use of intelligent and bio-climate design principles, thus ensuring the optimum use of waste energy streams (Tillie et al, 2009).

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17 This chapter is co-authored by me and Sven Stremke, Wageningen University and it shows the main results from the analysis of the Italian landscape architecture energy-related practices via the Dutch ones. This chapter consists of the elaboration of the data collected during the period January-July 2013 when I had the chance to join the Landscape Architecture Group and the NRGlab, Energy Landscape and beyond, at the Wageningen University (NL).

Sustainable energy transition requires a different governance (Michalena & Hillis, 2012) in order to deal with multilevel and inter-sectoral approaches in policy formulation and decision-making.

The sustainability of renewable energy technologies development involves different knowledge domains because renewable energy projects have a social, economic, technological, and environmental component (Kern & Howlett, 2009). Landscape architecture is among the disciplines which can contribute to sustainable transformation (Musacchio, 2009b) in general, and energy transition in particular (Stremke, *in press*). In Europe, this potential is being increasingly explored. Over the past years we observed, for instance, a growing number of events dedicated to energy landscapes. UNISCAPE (European Network of Universities for the Implementation of European Landscape Convention) organized an international symposium entitled *Renewable Energy and Landscape* in 2012 to stimulate debate among academics and professionals. The *German Society for Garden Design and Cultural Landscapes* promoted initiatives dedicated to the planning and design of renewable energy landscapes in 2013 and, recently, the French scientific journal *Projets de Paysage*, promoted by *The Versailles National School of Landscape Architecture,* launched a call for papers on energy transition. In addition, various workshops have been organized, in order to stimulate landscape architects to think about a more sustainable energy future (table 7.1).

Table 7.1 Examples of three design workshops on energy landscapes between 2011 and 2013.

Workshop title	Promoter	Proposition	Case study
Energy landscapes 3.0	International Bauhaus Dressau Foundation, summer school 2011	Impacts of energy networks on settlement structures in Europe	Mediterranean area
Renewable energy and Landscapes	International workshop organized by ACMA (Italian Architecture Association) in collaboration with Universitat Politécnica de Catalunyin, 2012	Energy potentials for wind, solar and biomass in protected landscapes	Milan region, Italy
Energy Landscape Haute Normandie	EMILA (European Master in Landscape Architecture)2013	Energy future for the region	Haute Normandie, France

Within the context of European landscape architecture, this paper explores Dutch and Italian approaches to sustainable energy transition. The Netherlands and Italy[18] are chosen as cases for this study because they are both

18 In this chaper Italian context is analysed via Dutch landscape architecture practices and sustainable energy transition paths. That is the reason because The Netherlands appears the first in all the sentences concerning comparisons, unlike the previous chapters.

complementary and exemplary countries with regard to landscape architecture tradition and sustainable energy transition (table 7.2). Dutch landscape architecture stands out in strategic thinking, for instance pairing various design solutions and long term visions, whilst Italian landscape architecture is rooted in operational knowledge, namely site-specific design. The dissimilarities are largely due to different spatial planning systems. In the Netherlands, a comprehensive integrated model exist while in Italy, the urbanist tradition prevails in landscape planning and design practice (see e.g. Colavitti et al, 2013; Faludi & van der Valk, 1994).

Although the concept of sustainable energy transition is well known in the Netherlands, where most transition research has developed, the share of renewable energy is rather low compared to many other EU countries. In Italy, on the contrary, renewable energy is widespread despite the fact that the concept of sustainable energy transition is not very familiar among administrators and professionals[19].

Table 7.2. Comparison between the setting of landscape architecture and energy transition in The Netherlands and Italy.

	The Netherlands	**Italy**
Landscape architecture traditions	Landscape architecture historically has a strong role in regional planning and design	Landscape architecture, historically, has a robust role in site design
Transition theories	Developed within the Dutch academic context and are generally known by administrators and professionals	Not so common among administrators and professionals
Renewable energy implementation	Renewable energy has not yet been developed in line with European targets (IRENA,2013)	Power plants are very common in the landscape because Italy has a long tradition in producing energy from hydroelectric power (mainly in the Alps) and geothermal power (in the central areas of the county). Renewable energy has sharply increased (wind, photovoltaic and biomass) in the last five years

In addition, in Dutch academia and practice, landscape architects have started to envision sustainable energy transition in terms of *energy landscape*. An example of this can be found in the *Energy Valley Region* (see Roggema & van den Dobbelsteen, 2013) project for the northern provinces of The Netherlands, where both researchers and professionals have been involved and landscape architecture was included from the very beginning of the sustainable

19 see also Chapter 1.

enegy transion discourse. Academic landscape architects deal with the topic of *sustainable energy landscape* from a planning and design perspective. Sustainable energy landscapes are conceptualized as physical environments supported by locally available renewable energy without compromising the social, ecological and aesthetic characteristics of the landscape (see e.g. Stremke & van den Dobbelsteen, 2012; Sijmons et al, in press).

Italian landscape architecture academics and practitioners are somewhat less familiar with the concept of sustainable energy transition, mainly dealing with the site-specific dimensions and implementation phases of renewable energy (see e.g. Di Bene & Scazzosi, 2007; Zampieri, 2012). However, a discourse on sustainable energy landscapes has emerged and is advancing quickly (Marchigiani & Prestamburgo, 2011).

This chapter will examine a range of landscape architecture practices, both in the Netherlands and in Italy, using the theoretical framework of transition management (Loorbach & Rotmans, 2010). This is because energy transition is increasingly shaped by means of this framework (Smith et al, 2010).

7.2 Searching for landscape architect's contribution to sustainable energy transition

The main question addressed in this chapter is: what is the contribution of landscape architecture to sustainable energy transition in Italy and beyond?

In order to answer this question, Dutch and Italian landscape architects involved in sustainable energy transition were interviewed. Their renewable energy-related works served as another empirical basis of this research. In the following sections, materials and methods used during data collection and processing are described and the conceptual framework, based upon the transition management (TM) theory, is explained. Energy-related projects of landscape architects in both countries are then briefly described and a selection of projects illustrated in more detail ,focusing on the specific role and contribution of landscape architects in five regional cases. In addition, the opinions of a sample of Italian landscape architects concerning the role of landscape architecture in sustainable energy transition is discussed, in order to obtain a stronger common basis to examine the Italian context. Finally, the contributions of landscape architects to sustainable energy transition in Italy and beyond are discussed.

7.2.1 Materials and methods

Although the dialectic of landscape and renewable energy has been discussed at international level (Nadai & van der Horst, 2010b), the role of landscape architecture in sustainable energy transition has not been investigated to the same extent, especially not in Italy. Thus this study collected opinions and experiences directly from landscape architects.

A content analysis (Deming & Swaffield, 2011) was conducted through a conventional interpretive design (Patton, 2002; Stake, 2006). Both qualitative and quantitative techniques were used for substantiating and generalizing data interpretation for the Dutch and Italian contexts (table 7.3).

A total of eight landscape architecture offices were selected.[20]Semi-structured interviews were conducted between May and July 2013. In order to facilitate the conversation, the interviews started or finished with the LAs illustrating their ideas and opinions with hand-drawn sketches. The transcribed interviews were analyzed along with the Landscape architects' sketches, following a code process (Miles & Huberman, 1993).

Table 7.3 Methodological framework. Procedures for collecting data and data analysis techniques. Qualitative and quantitative approaches were used as a concurrent triangulation strategy.

Number	**Procedures for collecting data**	**Data analysis techniques**
1	Semi-structured interviews with representatives from eight landscape architecture offices in the Netherlands and Italy along with illustrations drawn specifically for this research by the LAs themselves	Tape-recorded materials and illustrations such as ideograms or conceptual frameworks were analyzed by an open coding process
2	Thirty-one energy-related projects from the portfolio of landscape architecture offices	Documents and materials from the interviews were analyzed using a quick scan criteria and through conceptual framework
3	Materials resulting from semi-structured interviews and secondary literature such as scientific articles, scientific and policy reports and policy documents Five regions, where several of the LAs' projects were developed, were analyzed.	Descriptions were tracked back to interviewees in order to verify accuracy
4	On line questionnaire with Italian landscape architect that are members of AIAPP (Italian Landscape Architecture Association)	Coding process searching for key words and quantitative analysis searching for shared cultures on landscape architecture approaches to energy landscape

From the landscape architecture firm's portfolio, and after the interview analysis, 31energy-related projects were gathered revealing a wide range of professional experiences. All 31 projects[21] were examined using the TM framework and five region where several of the projects were developed were selected for further study including a second literature analysis. Both the 31 energy related projects and the five regions are analyze as embedded cases (Yin, 2003; Stake, 2006).Analyses and interpretations were sent back to interviewees for comments and accuracy check.

In addition, an online questionnaire (Dillman & Bowker, 2001) was conducted (10 October – 17November 2013), aimed at collecting opinions from a wider group of Italian landscape architects not necessarily devoted to

20 See also chapter 4 and table 4.2 for interviewees education and backgrounds. The analysis reported in this chapter refers mainly to section 2 of the interviews format (see p.205).
21 For the overall list of cases see p. 201.

renewable energy. The questionnaire was sent to members of AIAPP because they represent the great many different backgrounds of Italian landscape architects. The questionnaire was developed using a standardized model offered by a common software provider, which also collects responses and tabulates the data in a spreadsheet and summary format. The questionnaire was send with an explanatory email. For the open questions, the analysis followed a code process, aimed at finding common key words used by respondents. Information emerging from the questionnaire served as additional empirical data on common opinions among Italian landscape architects (Gobo, 2009; Williams, 2004).

7.2.2 Key concepts from transition research

Transition research explores how to promote and steer society in a more sustainable direction dealing with persistent problems that are at the root of phenomena such as climate change and energy crisis. Sustainable energy transition, studied from a socio-technical perspective, is one of the main topics addressed by this research field.

The dynamics of sustainable energy transition are investigated in order to assist policy makers in decision making. The spatial perspective of sustainable energy transition has often been neglected, as well as the connected socio-spatial relations and dynamics (Coenen et al, 2012; Coenen & Truffer, 2012, Markard et al, 2012). Although the discipline of landscape architecture has, to the best of our knowledge, not yet been specifically involved in transition research, landscape architects seem increasingly to have a role in sustainable energy transition. Many landscape architects aim to achieve renewable energy goals while maintaining or developing sustainable landscapes. Landscape architecture, in other words, could meet the demand for spatial perspective and socio-spatial relations of sustainable energy transition. Among the growing body of literature on transitions (see e.g. Paredis, 2013), we refer to a specific theory called the transition management approach (Kemp & Loorbach, 2006; Loorbach & Rotmans, 2010). Management is understood as a reflexive and evolutionary governance process. This line of research refers mainly to the works of Kemp, Loorbach and Rotmans, who developed this approach within the Dutch context, using *The Fourth Netherlands Environmental Plan* (2001) as a basis. This approach was adopted in Dutch policy, and has influenced various transition platforms under the governmental *Energy transition program* started in 2004 and reformulated by the Dutch Energy Report published in 2011.In addition, the Dutch National Energy Agreement (July 2013) is also partially rooted in this approach.

TM concerns paths or processes that aim for a long-term and multi-dimensional change from a consolidated socio-technical system to a more sustainable one. The TM cycle (Loorbach & Rotmans, 2010), is structured into four elements: i) transition arena, ii) agenda or program, iii) experiments or projects, and iv) monitoring and evaluation (table 7.4). It has been emphasized that weak points can emerge when applying this framework, for instance, when focusing on technology rather than social issues and when objectives overlap, therefore not being consistent. Transition research, however, has introduced concepts that are very familiar to the discipline of landscape architecture: long-term systemic change, learning processes, structural transformation, regional and local scales and people

involvement in sectoral choices (see e.g. Voß et al. 2009).

Table 7.4. Main concepts and definition of the TM approach (Loorbach & Rotmans, 2010).

Elements of the TM cycle	Description for energy transition
i)Transition arena	A specific network of frontrunners and societal platforms who consider uncertainties in order to come up with innovative ideas and actions based on shared long-term visions. For instance, an arena is made up of policy makers, stakeholders, experts and inhabitants, who have begun discussions on the energy future for a certain area.
ii)Transition agenda or program	Is about vision and image creation. The main aim is to search for innovation on a tactical level, for instance, by formulating an Energy Action Plan.
iii)Transition experiment or project	Is where transition agenda issues are developed. They are chosen strategically because they are expected to make a major contribution to the transition. These activities occur on an operational level, such as the design of a specific power plant for a pilot area.
iv)Monitoring and evaluation	Deals with a critical reflection on the transition path or projects. It is a participatory process. This activity can also refer to the monitoring of results. For instance, collecting opinions on data on the implementation phase of an Energy Action Plan.

7.3 Contribution of Dutch and Italian landscape architects to sustainable energy transition

Before starting with the content analyses, renewable energy projects of landscape architecture firms were briefly summarized. Firstly, a quick scan analysis of the landscape architecture projects is described by comparing a) the renewable energy sources, b) the different types of commissioners, c) the nature of project assignments, and 4) the spatial scale level and time horizon of the work. Secondly, the TM framework is used to investigate whether the landscape architecture projects were developed within one or more phases of the TM cycle.
Tables 7.5 and 7.6 summarize the results of this analysis for the Netherlands and Italy respectively.Concerning the nature of the assignments, both Dutch and Italian professionals were required to produce spatial principles and plans for renewable energy power plants. In spite of this, Dutch landscape architects proposed various spatial concepts to guide decision makers in the selection of site strategies for power plants, often working directly with citizens. In contrast, Italian landscape architects often proposed just one solution as the outcome of their projects. Indeed, they mainly acted as consultants for commissioners who aimed for consistency in project approval and development.Finally, Dutch landscape architects were frequently involved in the formulation or assessment of goals for spatial quality while Italian landscape architects contributed more to the implementation of projects, dealing with environmental impact and landscape assessment. This first analysis provided the basis for the below, in-depth examination of selected cases that are not only representative for landscape architecture practices in the Netherlands and Italy but also relate to at least two phases of the TM cycle.

Table 7.5 Range of renewable energy projects developed by the Dutch landscape architecture firms. The projects were compared against the four stages of the transition management cycle. Columns highlighted in gray indicate projects that relate to at least two stages of the TM cycle.[22]

		NL1_1	NL1_2	NL1_3	NL1_4	NL2_1	NL2_2	NL2_3	NL2_4	NL2_5	NL3_1	NL3_2	NL4_1	NL4_2	NL4_3
Renewable energy sources		wind	mix	mix	bio	mix	mix	wind	wind	mix	solar	solar	mix	wind	wind
Commissioner(s)		P	F	F	L	N	-	N	P	L	NPL	N	N P L	N	L
Nature of landscape architect assignment		s	d	d	v&d	a	v&d	a	s	v&d	d	d	v&d	s	s
Scale level assignment	Regional				x	x	x	x	x	x			x	x	
	Local	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Site	x	x	x	x		x		x	x	x		x		x
Time horizon assignment	Far future				x		x			x			x		
	Near future	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Present				x		x			x			x		
i) Transition arena					x								x		
ii) Transition agenda or program		x			x	x			x	x			x		
iii) Transitinon experiment or project					x		x			x			x		
iv) Monitoring phase															

Definition of symbols: commissioner: N) national government, P) provincial government, L) local government (municipality or association of municipalities), F) Foundation or NGO; Nature of assignment: a) visual and environmental assessment of power plants, d) design of power plants, s) site of power plants, m) mitigation of power plants and landscaping, v) vision/spatial strategy for development.

22 The first four rows of the table are a synthesis of the aalysis described in Chaper 4.

Table 7.6 Range of renewable energy projects developed by the Italian landscape architecture firms. The projects were compared against the four stages of the transition management cycle. Columns highlighted in gray indicate projects that relate to at least two stages of the TM cycle.[23]

		IT1_1	IT1_2	IT2_1	IT2_2	IT2_3	IT2_4	IT2_5	IT2_6	IT3_1	IT3_2	IT3_3	IT3_4	IT3_5	IT3_6	IT4_1	IT4_2
Renewable energy sources		solar	solar	wind	mix	wind	geo	mix	wind	mix	mix	solar	mix	bio	mix	wind	geo
Commissioner(s)		C	C	F	N L F	C	C	C	C	F	C	C	F	C	P	C	F
Nature of landscape architect assignment		m	s&m	d	v	d	d	v&d	s& d	v	d	m	v	m	v&d	a&v	a
Scale level assignment	Regional			x				x	x			x		x		x	x
	Local			x		x	x		x			x		x	x	x	x
	Site	x	x		x	x			x	x	x	x	x	x		x	
Time horizon assignment	Far future								x			x					
	Near future		x	x			x	x	x			x		x	x	x	x
	Present	x			x	x			x	x	x	x	x	x		x	
i)Transition arena				x	x	x		x							x		x
ii)Transition agenda or program								x							x		
iii)Transition experiment or project					x	x		x									
iv) Monitoring phase																	

Definition of symbols commissioner: C) electricity utility company, N) national government, P) provincial government, L) local government (municipality or association of municipalities), F) Foundation or NGO; Nature of assignment: a) visual and environmental assessment of power plants, d) design of power plants, s) site of power plants, m) mitigation of power plants and landscaping, v) vision/spatial strategy for development.

23 The first four rows of the table are a synthesis of the aalysis described in Chaper 4.

7.3.1 Selected embedded cases

The analysis of energy projects by Dutch and Italian landscape architects revealed that five regions had started to engage with sustainable energy transition calling for landscape architects. Hereafter, we introduce the five embedded cases, namely (1) *Hoeksche Waard*, and (2) *Goeree-Overflakkee*, both located in South Holland; (3) the provinces of Friesland, Groningen, Drenthe and North Holland in the north of The Netherlands; (4) Fortore Valley/Apulia in southern Italy, and (5) Province of Vercelli/Piedmont in northern Italy (figure 7.1).

Figure 7.1. Location of the five embedded cases

1)Hoeksche Waard, South Holland, The Netherlands

Hoeksche Waard is one of the 20 protected landscapes in the Netherlands. It is an intensive farming landscape, and according to the local authorities, energy is considered fundamental for the future of the region.
In 2008, the municipalities of the region (*Binnenmaas, Cromstrijen, Korendiijk,*

Oud-Beijerland and Strijen grouped in the *Hoeksche Waard Committee*) joined a common initiative to develop regional spatial strategies that included the siting of new wind farms. In the *Environmental policy plan*, the *Hoeksche Waard Committee* agreed on the 20-20-20 targets, aiming for a 20% share of renewables by the year 2020. The Committee promoted the energy issue in a wider perspective, including energy-conscious principles for economic and spatial development, in line with the local and provincial planning strategies. This took place within the framework of a wider energy vision developed for the province of South Holland by the provincial authorities.The collaboration of the municipalities was the starting point for the creation of the transition path. Strategic and spatial planning were the contexts within which the transition agendas were formulated.

Several transition projects currently deal with the development of agro-clusters and more sustainable agricultural production (table 7.7).

2)Goeree-Overflakkee, Province of South Holland, The Netherlands

Goeree-Overflakkee is a polder-based island in the Delta region of the Netherlands.

The island has had wind farms since the 1990s, after the formation of a steering committee of public and private actors, who developed an overall wind plan for the island. In 2010, ISGO, which was committee of the former municipalities of the island started to coordinate a comprehensive development for the island. The aim was to develop an energy self-sufficient island by the year 2030. This is in accordance with the provincial energy strategy that encourages bottom up initiatives (*Space and Energy Research Agenda, 2013)*.

The transition arena started with the municipalities themselves who drew up the local agenda. Several transition projects are now implementing the proposed energy targets (table 7.7).

3) Provinces of Friesland, Groningen, Drenthe and North Holland, northern Netherlands

The northern area of the Netherlands is a heterogeneous landscape where energy has always been an issue (oil and natural gas extraction). In the early 2000s, the provinces of Friesland, Groningen, Drenthe and North Holland joined the *Energy Valley* initiative.The *Energy Valley* covers the geographical area of northern Netherlands as well as the public-private initiative supporting transition energy projects for the region.

The initiative formally began in 2003. It was developed by the Energy Valley Foundation, which implemented the transition process of the region, for instance, by working on bio-based energy and decentralized energy systems. The main goal is to develop the regional economy through a more sustainable energy system involving the housing, transport, industrial and agricultural sectors.

The transition arena was promoted by national and provincial governments, research centers and private actors who formulated energy visions for the region. Several transition experiments and projects have been developed, aimed at promoting an energy-based local economy (table 7.7).

4) Fortore Valley, Apulia, Italy

The *Fortore Valley* is a geographical area in the *Dauni* mountains between *Apulia* and *Campania*, in the south of Italy.

The main economic activities in this area are agriculture and energy provision; wind farms have been developed since the early 1990s. At the end of the 1990s, several explorative workshops were organized by the *CODIF (former association promoting renewable energy in Italy*) in order to understand how additional renewable energy technologies could be implemented in the area. Energy was acknowledged as the new way to revive the local rural economy. In 2001, the company *Fortore Spa* was set up to coordinate the activities of national government, local authorities, local stakeholders and inhabitants.

The transition arena was promoted by national authorities, involving several local actors, who created agendas and developed projects that converted the region's economy from mainly agricultural to energy. Monitoring was started by the local energy agency (see table 7.7).

5) Province of Vercelli, Italy

The province of Vercelli is an administrative area located in the Piedmont region, in the north of Italy. Its landscape is characterized by traditional wet rice cultivation. Several power plants exist in this area (thermal, biomass and hydro).

In 1999, the Vercelli *APEVV* (*provincial energy Agency*) was created to develop sustainable energy projects with the contribution of the municipality of Vercelli, the provincial government, a local university (*Politectico di Torino)* and *ENEA* (Italian National Agency for New Technologies, Energy and the Environment).

The idea of a more sustainable energy future started within the European program called *Sustainable Energy Europe*, which the province of Vercelli joined in 2005. In 2009, the provincial government published the Provincial Energy Plan. The provincial government also participated in the European-funded ENERSCAPE project (2011-2013), which focused on the sustainable development of renewable energy technologies in Mediterranean landscapes. The Vercelli area is considered as a very sensitive traditional agricultural landscape, which is why the region became involved. The ENERSCAPE project formed the basis of a sustainable action plan for the region.

The transition arena was created by provincial institutions, which by collaborating with local government and actors, promoted various experiments which strengthened the institutional will to adopt a more sustainable energy transition in the area.

Table 7.7 below provides an overview of the sustainable energy transition in the five embedded cases.

Table 7.7. Comparison of the Ssustainable energy transition developed in the five regions.

Transition path	1) Hoeksche Waard (NL1_4)	2) Goeree - Overflakke (NL2_4)	3) Provinces of Friesland, Groningen, Drenthe and North Holland (NL4_1)	4) Fortore Valley (IT2_2,3,5)	5) Province of Vercelli (IT3_6)
Description of the transition process	Ongoing process envisioning a self-sufficient region by 2050 (local initiative)	Ongoing process started under the label a of self-sufficient region by 2030 (local initiative)	Ongoing process supported by private and public initiatives (regional initiative)	Envisioning future development based on renewable energy (inter-regional initiative)	Developing sustainable RETs deployment for the province of Vercelli (regional initiative)
i) Transition arena	Hoeksche Waard Committee, landscape architects, local agricultural association (2011)	Municipality of Goeree-Overflakkee, local stakeholders, NGOs and citizens (2010)	National and local government, energy utility company stakeholders, NGOs and researcher (2003)	European researchers, national and local governments, associations and local stakeholders (2004)	European researchers, regional administratio province of Vercelli, its municipalitie local stakeholders the provincia energy agency (2010)
ii) Transition agenda or program	Long term strategy, (Structuurvisie HoekscheWa ard, Ruimtelijk Plan, 2009) Environment and energy (Milieu en energie, 2010) Environmental policy plan (Structuurvisie Hoeksche Waard, Innovation program Beautiful Netherland (Mooi	Goeree-Overflakkee Neutral energy 2030 (2011) Renewable Energy agreement Goeree-Overflakkee (2012) Provincial energy strategy Zuid-Holland op St(r)oom!2013	Transition energy Valley master plan (2004) Energy agreement (2007)	PERSEA report (2002) Fortore SpA (energy utilities company) creation, 2001) SEAPs promoted by Municipalities (submitted in the last five years)	Energy plan Province of Vercelli (2009) Province of Vercelli Energy Actio plan (in progress)

Transition path	1) Hoeksche Waard (NL1_4)	2) Goeree - Overflakke (NL2_4)	3) Provinces of Friesland, Groningen, Drenthe and North Holland (NL4_1)	4) Fortore Valley (IT2_2,3,5)	5) Province of Vercelli (IT3_6)
	Netherland, 2011) Provincial energy strategy (Zuid-Holland op St(r)oom!, 2013)				
iii) Transition project(s) or experiments	Agro-clusters and biomass production in agriculture	Tidal power station, Grevelingen The ecoHotel, Greenpoint Holland Zealand, Sustainable marina of the future , the Energetic Region	About 200 projects are ongoing concerning several thematic areas such as algae, green gas and wind farms, power plant construction	Several projects were developed and are now operative, such as wind power plants under *Fortore Energia*	
iv) Monitoring and learning	-	-	-	Monitoring program developed by the local energy agency ASEA (2008)	-

7.3.2 Landscape architects' involvement in sustainable energy transition

In this section, the various roles of landscape architects in the sustainable energy transition are described for each of the five selected embedded cases summarizing the spatial principles and concepts for sustainable energy transition in the five regions that were developed by landscape architects (see also table 7.8 p. 141).

1) Hoeksche Waard: Agrolab project

Landscape architects (NL1_4) were involved at the very beginning of the transition process when the municipalities formulated the long-term spatial strategy *Structuurvisie Hoeksche Waard, Ruimtelijk Plan, 2009*, and the implementation program. In 2011, landscape architects, the *Hoeksche Waard Committee* and the LTO Agricultural Association joined the project *Agrolab* defined as *design practice,* aimed at exploring possibilities for regional landscape development of the upcoming bio-based economy within the innovation program *MooiNederlands* (*Beautiful Netherlands, 2011*). Landscape architects proposed a bio-based economy in order to develop innovative approaches to renewable energy in agricultural landscapes.

"It could be an interesting and innovative approach to develop Hoeksche Waard as an experimental garden for the bio-based economy, which is not only about saving or about renewable sources, but also about how you could use organic materials for more purposes than food or energy …" (interview NL1).

After organizing open workshops, landscape architects suggested spatial strategies in locating areas where different activities could be performed as new energy-related land uses, such as *urban farming, composting farms, algae farming, agro-energy parks* and *innovation cells.* In addition they illustrated what the energy land uses could look like (figure 7.2)

In conclusion, the project represented a good basis for discussion and the creation of transition arenas, using visual materials for widely shared discussions. In addition, landscape architects were also involved in formulating agendas, which were integrated in the spatial planning documents, and in organizing several site projects (table 7.8)

2) Goeree-Overflakkee: Sustainable Landscape project

LAs (NL2_4) got involved in the *Goeree-Overflakkee* energy transition after the creation of the arena and agenda for the island. They were asked to study a mix of renewable sources (tidal, biomass, solar and wind) and to propose different spatial strategies for the implementation. Based on existing energy scenarios, the landscape architects' firstly overlaid potential energy maps and studied landscape characteristics. After this, working closely with stakeholders and inhabitants, landscape architects proposed a conceptual framework explaining how different renewable energy strategies could be translated into spatial principles named

pragmatic, opportunistic, monumental and narratively spatial concepts (figure 7.3). These principles were conceived as design principles and showed the possible relationships between renewable energy and spatial organization.

"…what design has to offer is integrate goals and concrete local initiatives within the existing landscape and envisioning possible future landscapes." (interview NL2).

For *Goeree-Overflakkee*, landscape architects were involved in the transition projects and formulation of experiments. They also developed a set of spatial principles for locating renewable energy technologies. In addition, using the more traditional landscape architecture skills such as mapping, visual analysis and visualization, they produced a set of different scenarios or transition paths to support and facilitate decision-making processes (table 7.8).

3) Provinces of Friesland, Groningen, Drenthe and North Holland: Grounds for Change project

Landscape architects (NL4_1) were involved in the project called *Grounds for Change,* at the very beginning of the creation of the transition arena. This project primarily aimed at bridging energy planning and spatial design and resulted in a regional energy vision shared by government and stakeholders for the north of the Netherlands (van Dam & Noorman, 2005; Roggema & Van den Dobbelsteen, 2006; 2013). During a number of workshops, called *design charrettes* (Condon, 2007; Roggema, 2013), academics and professionals were divided into spatial planning and energy design teams, which consisted of regional planners, urban designers, civil engineers, environmental designers and several landscape architecture students. Their collective work was matched with the proposals of energy planners and, finally, the spatial planning team came up with a pallet of design proposals for future energy landscapes.

"The commission was really about imagining how a sustainable energy system would be leading the future development of the whole north of the Netherlands... what would it mean, how would the north of the Netherlands then look? In this case we were able to consider all forms of sustainable energy, showing the potential spatial developments" (interview NL4).

Landscape architects were directly involved in the *design charrettes* where they started to produce drawings in order to make the line of reasoning more concrete for the stakeholders involved in the process. At the end of the drawing sessions, landscape architects processed these materials for further discussions. Consequently, several power plants were built in the region and the interviewed landscape architects and their firms were asked to propose spatial principles for locating wind turbines (figure 7.4).

For the Energy Valley, landscape architects had a strong role in the transition arena, in structuring the problem on the relationship between energy

and landscape. Above all, the design techniques and the products, based on conventional and more contemporary landscape architecture skills such as *design charettes* were used for the creation of agenda and programs (table 7.8).

4) Fortore Valley: Path of the wind project

Landscape architects (IT2_2,3,5) started to deal with this new energy landscape in southern Italy when they won the *Landscape in the Wind* competition for the design of a wind farm in 2001. Afterwards, they got involved in the discussion for the transition arena of the *Fortore Valley*, as well as in the site-design of several wind parks. In the first phase of the process, they were asked to create a strategy for territorial marketing, starting from the historical and visual values of the landscape. The proposed strategy was named the *Path of the Wind (La strada del vento)*. Landscape architects identified the crest line of the *Dauni Mountains,* as the ideal path to connect different wind power plants and develop leisure activities also connected to the agriculture. In the implementation phases of several projects, landscape architects collaborated with *Fortore Spa,* the company in charge of the project development. In addition, landscape architects worked alongside engineers in the design of wind farms providing historical, visual and landscape semiology analysis as well as spatial principles for the configuration of wind farms (figure 7. 5).

"… our work was on the proposition of a concept for future physical interventions… we said that the turbines were part of a much larger system that we had called the "path of the wind" (interview IT2).

In addition, landscape architects proposed spatial concepts to be used in the elaboration of municipal spatial plans, also focusing on energy and landscape. For *Fortore Valley*, the role of landscape architects was very important for the arena creation, highlighting the possible meaning of renewable energy for local development. After the agenda setting, in which they were not involved, landscape architects created thought-provoking spatial principles that were primarily used for the formulation of projects or implementation of experiments (table 7.8)

5) Province of Vercelli: ENERSCAPE project

Landscape architects (IT3_6) were involved in the European project ENERSCAPE for the province of Vercelli. The common platform for the project was to develop the most suitable strategies, considering the ecological landscape and heritage aspects, for renewable energy policies. The motivation of this project was a shared opinion about the weak connection between energy programming and territorial planning policies in Mediterranean countries (Mugnoz, 2012).Scenario techniques for envisioning future energy landscapes were developed by the Vercelli team. The definition of scenarios was based on local area analysis, landscape values and energy potentialities in the time frame of 8-10 years, in line with the energy plans of the province of Vercelli. LAs proposed green belts in order to both implement

renewable energy technologies and improve the ecological connection in the future energy landscape (figure 7.6). Accessible imagery highlighted the various opportunities for local administrators and citizens.

"…switching scales and playing with different types of representation formed the strategic dimension of our work informing the territorial plans. But the goal was also to see how the landscape can change in practice and figure out if this was the right direction and provide a wider public with possible scenarios" (interview IT3).

In *Vercelli*, LAs formulated spatial strategies for compensative intervention and showed how the new power plants could positively transform landscapes. Their representations and spatial principles aimed at informing both people and provincial energy plans (table 7. 8.)

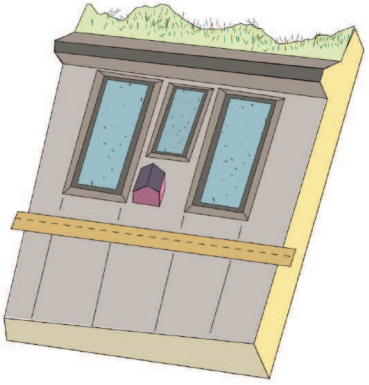

Figure 7.2. Hoeksche Waard Agrolab project: The photograph shows the wind turbines characterizing the existing energy landscape of the Hoeksche Waard. Below, the plan shows the possible location of algae farms as one of the elements of the new energy landscape. The drawing shows a possible spatial configuration of functions within such an algae farm. Source: Vista. Landscape architecture and urban planning.

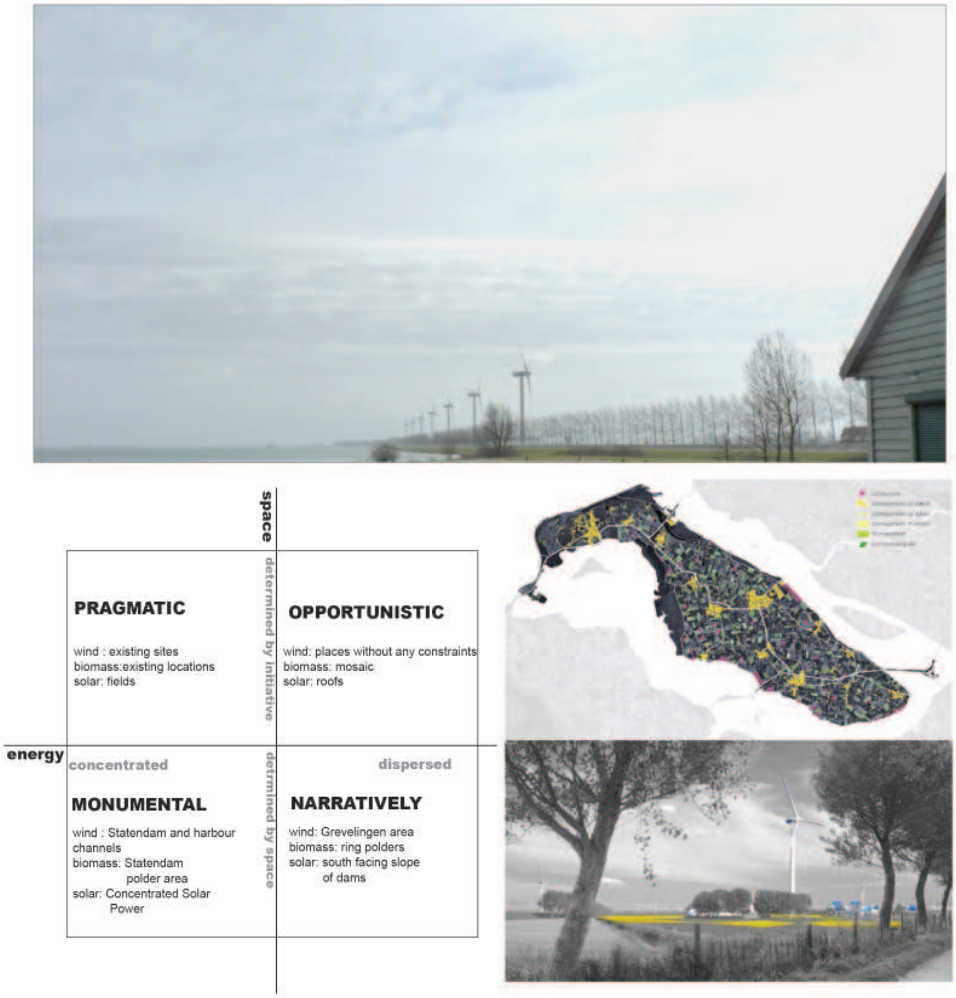

Figure 7.3. Goeree-Overflakkee Sustainable Landscape project: The existing wind energy landscape is shown on the photograph (courtesy of Renée de Waal). The scheme on the lower left shows the different scenarios for renewable energy development on the island .The right image presents one of the plans produced to imagine a future energy landscape and the corresponding specific visualization for the 'opportunistic scenario'. Source: Goeree-Overflakkee duurzame energie in het landschap, HNS Landscape architecture. English translation by the authors.

Figure 7.4. Energy Valley: The photograph shows an example of an energy landscape in Friesland. The two plans show the design products developed by landscape architects during the study and design workshop organized within the Grounds for Change project. The first illustrates the landscape characteristics related to possible energy land use, and the second shows a possible site specific transformation connected to hydropower generation Source: Bosh Slabbers web site.

Figure 7.5. Fortore Valley Path of the wind project: The photograph shows one of the wind farms designed by landscape architects located in Biccari, Apulia (2013). The first illustration shows landscape semiology was used to develop the wind farm site design in the international competition Landscape in the wind (2001) and used also in other projects. The plan illustrates the visual spatial concept named 'path of the wind' envisioned by landscape architects as a potential merging between Tyrrhenian and Adriatic seas. Source of all images: Daniela Moderini and Giovanni Selano.

Figure 7.6 Vercelli green belt energy project: The first photograph shows the existing energy landscape. The plan illustrates the greenbelt proposed by landscape architects and applicable to the whole province. The photomontages reveals how energy provision could be integrated into the existing wet rice cultivation. Source: LAND.

Table 7.8 Overview of landscape architect involvement in the four phases of the TM cycle. Landscape architects developed spatial principles or concepts that are also simplified in the table

	Agrolab project(NL1_4)	**Sustainable Landscape project (NL2_5)**	**Grounds for change project (NL4_1)**	**The Path of the wind projects (IT2_2,3,5)**	**Enerscape project (IT3_6)**
i) Transition arena	Collaborating on the regional environmental policy plan		Energy-landscape potential map and design proposals	Territorial marketing concept creation	Renewable energy scenarios verification and design strategy and proposals for compensation and mitigation actions
ii) Transition agenda or program	Elaborating landscape scenarios connected to bio-based economy for the region	Developing a toolbox and mindset for spatial quality for new projects and experiments formulation			Design concepts and guidelines for renewable energy deployment
iii) Transition project(s) or experiments	Developing agro cluster projects	Proposing spatial principles for siting power plants	Projects development: implementation phase of wind farms giving spatial principles	Conceiving strategy for agro-energetic district development Siting and design power plants	
iv) Monitoring and learning	-	-	-	-	-
Concepts introduced by landscape architects	Urban farming, composting farms, algae farming, agro-energy parks, innovation cells	Pragmatic, opportunistic, monumental, and narratively energy landscapes	Landscape types connected to energy	Path of the wind	(Energy) green belt

7.3.3 Italian landscape architects opinions on sustainable energy transition (part II)[24]

Along with the above analysis of five regions, a questionnaire was conducted to

24 In this chapter questions 1,2,7, 8, 9 from the online questionnaire were used as empirical base for the analysis.

investigate the opinions of Italian landscape architects on the involvement of landscape architecture in sustainable energy transition. About 120 landscape architects (15% of all members) returned the questionnaire. Considering the short time scheduled for the questionnaire and the relative high response rate, the data were useful for amore in depth interpretation of the Italian context. In addition, we have received many emails from LAs from our sample over the past months, encouraging us to pursue this topic further and to share the results as soon as possible.

As table 7.9 shows, the great majority of respondents (72%) were mainly involved in design activities in their professional practices and considered landscape as a place and a conceptual framework for the design process. Surprisingly, renewable energy was quite a frequent activity for these professionals (65%),in terms of power plant assessment (32%) and visualizing future transformation (28%). Respondents ()believe that landscape architects could have a relevant role in sustainable energy transition ,particularly in situations where the landscape was more sensitive to transformations. Although the majority of respondents (60%) concluded that landscape architects are capable of contributing to sustainable energy transition both strategically and operationally, they felt that they have not yet been adequately involved strategically in the transition to sustainable energy.

Table 7.9 Main results of the questionnaire 'Italian landscape architects and renewable energy'.

Questions		**Share of respondents**		
Landscape definitions	Geographical space	32%		
	Design framework	27%		
	Arena of discussion	16%		
	Mentioning *heritage*	15%		
	Mentioning *territory*	5%		
	Mentioning *ecosystem*	7%		
Nature of practice	Planning	12 %		
	Design	72 %		
	Management	7 %		
	Other	9 %		
Frequency of dealing with renewable energy in projects	Frequently working on this topic	15%	assessment siting design and mitigation visioning	32% 20% 20%
	Sporadically working on this topic	53%		28%
	Never worked on this topic	32%		
Renewable energy and landscape architects' role	Landscape architects have a very important role	88%		
	Landscape architects can only really contribute in specific situations	9%		
	Landscape architects have no role	3%		
Possible role for the discipline	Strategic	36%		
	Operational	4%		
	Both	60%		

7.4 Discussion and conclusions

7.4.1 The transition management framework and the contribution of landscape architects

The transition management literature highlights an increasing need to involve the local dimension of renewable energy in policy formulation in order to conceive more sustainable landscapes. The role of Italian and Dutch landscape architects in energy-related projects was investigated to examine how they contribute to sustainable energy transition. The analyzed projects revealed that great many landscape architects are directly involved in the transition. However, differences exist between the two countries.

Although the cases in the Netherlands explicitly relate to TM were compared to cases in Italy that do not explicitly refer to this theory, the framework assisted in highlighting situations where Italian landscape architects were involved in energy transitions beyond the conventional competences of landscape architects in Italy.

This study shows that many Dutch landscape architects pursuit a strategic approach to sustainable energy transition. Compared to other countries, they are less often involved in the implementation of renewable energy technologies. This is due to the relevance of transition research in the country and a strong track record of strategic landscape planning and design. Apart from that, traditionally, engineers deal with the implementation of designs and plans after landscape architects have conceived them. Italian landscape architects, on the contrary, approach energy transition mainly by operational design whereas, so far, their strategic role in the transition is far less acknowledged.Energy transition is often relegated in some domains and landscape architects intervene to solve sectoral-framed problems, such as the design of photovoltaic power plants, or siting wind turbines according to land use regulations. However, in the five selected cases, renewable energy was approached from the wider perspective of sustainable energy landscapes.

Possible contributions of landscape architecture to sustainable energy transition have recently been proposed, such as helping to build synergy between energy technology and people (Schoebel & Dittrich, 2010), and bridging landscape and energy policies by helping in the evaluation of social concerns (Perrotti & Henrion, 2013). This means that the technical approach in designing energy landscape is at least partly being replaced with a more integrated sustainable spatial planning and design (Stremke, *in press)*.

The projects analyzed in this chapter have shown how landscape architecture has started to form a bridge between renewable energy goals at a local level with implementation strategies.

The embedded cases outlined in this chapter deal with spatial strategy highlighting the failure of the sectoral interpretation of the problem of the diffusion ofrenewable energy technologies. Notably, these cases show an initial crossing point from assessing power plants to verifying renewable energy policies bylandscape architects in both countries. In addition, some cases, such

as *Hoeksche Waard*and the *Province of Vercelli*, highlighted the potential of landscape architects in linking the development of strategies with implementation of renewable energy, by means of traditional design tools to inform policies and governance. This happens when the energy-related sectoral vision is replaced by a local energy strategy calling for a wider number of actors in the transition process, including Landscape architects. These professionals are required to deal with inventive, even visionary design proposals, rooted in a more energy-conscious approach.

7.4.2 Landscape architects and sustainable energy transition

Landscaoe architects challenged the topic of sustainable energy transition by making use of the deeply-rooted knowledge of their discipline, such as simultaneously working at different scale levels and time horizons in conceiving possible solutions, and carrying out visual and perceptual analyses. Initially, both Dutch and Italian landscape architects were involved in sustainable energy transition, dealing with the visual impact of power plants or site design. This means that operational knowledge of landscape architecture is required for sustainable energy transition.

In addition, innovative professional skills are employed, for example in terms of communication. Because of their broadly recognized design and communication skills, Dutch landscape architects are actively involved in renewable energy technology-related participatory processes. In Italy, landscape architectsare considered mostly as key informants in these processes by consulting governments or energy utility companies.

Sustainable energy transition faces a high degree of uncertainty concerning, for instance the market development, stakeholder behavior, and citizen preferences. These rather unpredictable forces will indeed affect the physical landscape. In dealing with uncertainty, Dutch landscape architects propose a set of strategies and tools, focusing on spatial quality. Many Italian landscape architects, on the contrary, propose a single optimal or preferred solution, with the societal imperative of preserving the cultural landscape throughout the country.

7.4.3 Italian landscape architecture and sustainable energy transition

The prevailing Italian practice of developing ‘optimal solutions’ for energy transition rather than a set of proposals, needs to be critically evaluated. This would entail more awareness on the part of Italian landscape architects of the societal and democratic involvement in energy transition.

This research has shown that Italian landscape architects have consolidated design skills at the site scale. These skills have recently been improved also regarding renewable energy technologies, for instance by proposing

design guidelines. These skills, in combinations with operational design knowledge could be used for strategic design, for instance through regional and long-term visions for transformation.

Simultaneously, the consolidated site-specific design skills could increasingly be used for the inclusion of the spatial dimension into Italian energy planning. This forms another possible contributions of the discipline of landscape architecture to sustainable energy transition.

In conclusion, this paper has highlighted the need to include the spatial dimension in the transition to sustainable energy. Although this is one of the most obvious aspects of energy transition, renewable energy diffusion is very much connected to economic and policy questions where the landscape, as an arena of discussion, plays a significant role. In this sense, traditional landscape architecture skills, such as visual analysis and site design, as well as the more contemporary methods such as scenario development, become a *means* of landscape planning and design rather than a *product* of the planning or design process, thus facilitating inter-sectoral collaboration in the decision-making process. In this sense, it might be rewarding to reverse the perspective of this paper and consider the role of sustainable energy transition for a more structured reflection on landscape architecture in Italy and beyond.

Solar field and thermal electrical power station, Perelli, Livorno (S. Minichino)