Chapter 10

Abruzzo, Italy

Rural development and renewable energy (RE) in Abruzzo: Summary and conclusions

Main findings. *i*) Taking aesthetic as well technical considerations into account when siting RE installations can help integrate them better into rural landscapes. *ii*) Linking RE deployment to tangible benefits for the hosting community, such as better public services, improves public support dramatically. *iii*) Without a framework of co-ordination to benefit from economies of scale, a large number of small initiatives do not necessarily have the same impact on the regional economy as fewer large-scale initiatives.

Renewable energy in Abruzzo: A summary. Rural Abruzzo has been particularly exposed to the international crisis due to its dependence on the public sector and external investment. Regional unemployment rates went from 5.3% in 2003 to approximately 9% in 2010 although some areas suffered more than others. The coast, with its large number of small businesses clustered in specialised industrial districts, has been relatively resilient. The rest of Abruzzo lies on the Apennine Chain and has much lower population densities. Large protected forest areas shape the landscape, business activities are relatively limited and local economies are much more dependent on public transfers and external investment in specific industrial sectors, both of which plummeted during the crisis. The situation was worsened by the earthquake that hit L'Aquila, the regional capital, in 2009. Although Abruzzo has not specialised in the energy sector, and regional emissions of CO_2 are in line with the national average, RE deployment has become a regional priority to take advantage of the large amount of public subsidies available for RE at the national and European level. These subsidies are directed to local communities to buffer the current lack of public resources and allow them to retain a good standard of public services, while also creating some job opportunities. Abruzzo's 305 municipalities are all subscribers to the Covenant of Mayors, the European network which aims to promote RE and energy efficiency initiatives at the municipal level.

How is RE contributing to rural development? The region's high degree of participation in the Covenant reflects the regional government's goal of an RE action plan in each municipality. An action plan allows municipalities to access European and national subsidies for RE deployment. As a result several municipalities have been able to deploy small-scale RE installations. This provides long-term revenue which can be reinvested to satisfy specific needs, such as refurbishing a local school or renovating senior residences. Because of the close involvement of local communities, and explicit regional rules to preserve the landscape, RE installations are usually scaled to fit the local landscape without causing a dramatic and sudden change. As a result, RE deployment has proceeded at a relatively slow (albeit constant) pace, reducing the "gold rush" dynamic observed in other case studies.

Future challenges. There are no specific controls over local projects to ensure they really do offset the consumption of conventional fuels and reduce CO_2 emissions. Subsidies have "institutionalised" rent-seeking behaviour for RE deployment; a number of small installations would make little sense without the current high level of public subsidies. If small deployments were co-ordinated by a regional strategy, this would create a large enough regional demand to stimulate entrepreneurship around the RE sector. This lack of co-ordination also reduces the possibility of the region taking advantage of its forests to produce woody biomass. Local communities alone cannot manage the high co-ordination costs required for this business. Finally, regional policy should be targeted on rural areas in the mountainous part of the region, which are suffering most from the reduction of central government funding. This would improve the link between RE deployment and local economies while also making the policy more efficient.

The context

Abruzzo's socio-economic profile and performance

Abruzzo is a predominately rural region in the middle of Italy, on the Adriatic coast. It covers 10 800 square kilometres and its population in 2010 was 1.3 million people; its population density is lower than the national average. Abruzzo has a very diverse landscape, ranging from coastal, where the bulk of the population and economic activities are located, to mountainous, where the regional capital L'Aquila is located. L'Aquila was seriously hit by an earthquake in 2009, which damaged the historical centre of the city and most of its socio-economic activities. Other regional urban centres are Pescara, Chieti, and Teramo.

Abruzzo's population is ageing faster than the national average (Table 10.1). The region's elderly dependency rate – the proportion of working-age population to those over working age – is already higher than the Italian average. A high rate can lead to problems, especially in finding resources for the health system and other public services, which are mainly financed by the working population.

Table 10.1. **Abruzzo: Demographic data**

2008 data unless otherwise indicated

	Abruzzo	Italy
Population	1 323 987	59 619 290
Population share	2.2%	
Population density (km^2)	117 in/km^2	198 in/km^2
Elderly dependency ratio	32%	31%

Source: *OECD Regional Database, http://dotstat/wbos/.*

In economic terms Abruzzo stands somewhere between the relatively affluent north of Italy and the impoverished south. For instance, while the region's gross domestic product (GDP) per head at current values in 2009 was 82% of the Italian average, it was 119.5% of that of the southern area (encompassing Puglia, Campania, Calabria and Sicily; Table 10.2). The region displays different local development patterns reflecting a combination of endogenous local development, and external investment from the centre. On the one hand, the coastal areas in the north of the region have been able to specialise in sectors in which Italy enjoys a global competitive advantage: the so called *made in Italy* brand.[1] Production is often organised in clusters of small and medium enterprises (SMEs). On the other hand, lagging territories, usually located in the mountainous area, have been supported by a national industrial policy which since the 1950s has been localising manufacturing activities in capital-intensive industries such as automotive, pharmaceuticals, and chemicals. This policy has been particularly successful in Abruzzo in attracting large firms to the region. More recently the region has also benefited from the European Union's Convergence policy, formerly Objective 2 (see Box 10.1 below).

Table 10.2. **Abruzzo: Main economic indicators**

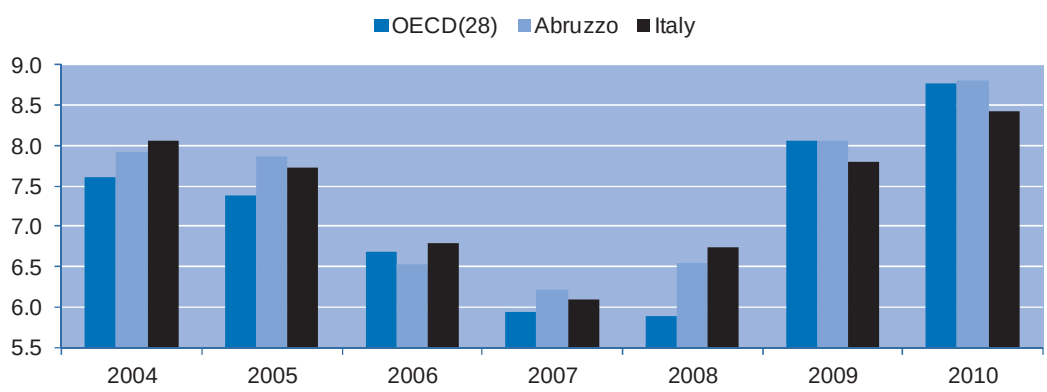
2008 data unless otherwise indicated

	Abruzzo	Italy	OECD gap
GDP per head in USD PPP (2007)	21 878.74	26 544.49	89%
Share of GDP (1995)	1.83%		
Productivity in USD PPP (2007)	57 382	64 783	105%
Unemployment rate	6.6%	6.9%	0.3%
Employment rate	59.7%	60.4%	-7.0%
Long-term unemployment	2.89%	3.2%	0.5%
Youth unemployment	19.61%	20.9%	4.3%
Infrastructure (motorway density) (2007)	0.27	0.11	
Tertiary education attainment (%)	19.7	17	
Patents per million inhabitants (2007)	31.9	46.1	

Source: OECD Regional Database, http://dotstat/wbos/.

Abruzzo is facing a challenging period in its economic history. GDP growth per head between 2000 and 2009 was 1.6%, lower than both the national average of 2.1% and the average for the south of Italy of 2.4%. Its regional unemployment rate has mirrored the national trend – it decreased until 2007, and subsequently increased until 2010 – but its performance has been worse than both Italy's and the OECD average (Figure 10.1).

Figure 10.1. **Unemployment rates in Abruzzo, compared with the average rate in Italy and in OECD regions**



Source: OECD Regional Database, http://dotstat/wbos.

The regional economy has a greater concentration of manufacturing than the national average. The manufacturing sector, which includes the construction industry, employed over 144 000 people in 2009, representing 40% of the workforce. Construction, in particular, employed almost 45 000 people (12.4% of the workforce). Textiles and clothing, as well as firms producing metal products and motor vehicles, each employed more than 4% of the workforce. There are also significant numbers employed in the food and plastic processing industries. Industrial infrastructure is spread throughout the region, but is concentrated in valleys close to the main urban poles: Val Pescara, Val Sangro,

Val Trigno, Val Vibrata and Conca del Fucino. Some of these areas host industrial districts (Box 10.1). In the service sector, commercial activities employ the largest share of workers, at 70 000 employees or 19% of the total. Business support activities, especially legal and technical services, employ 15%. Tourism is another important sector, contributing 12% of regional GDP in 2010.

Box 10.1. **Marshallian industrial districts**

An industrial district is "a socio-territorial entity which is characterised by the active presence of both a community of people and a group of firms in a naturally and historically bounded area" (Becattini, 1990). This community shares a system of values and common practices that spread into the district through the customs and the institutional structure, including markets, firms, professional schools, trade unions and employers' organisations.

In 1890, the economist Alfred Marshall documented the existence of a form of organisation of production based on the concentration of people and small- and medium-sized firms specialised in different parts of a production process in some districts of English industrial cities. In these "industrial districts", internal economies of scale were replaced by external economies related to the existence of skilled workers, specialised suppliers, and an informal system of knowledge diffusion.

The notion of the Marshallian industrial district was revived by Becattini (1975) to explain why the specialised local production systems of small and medium enterprises (SMEs) in the Italian region of Tuscany were so successful when the large firm production model of Turin and Milan was experiencing a serious crisis. Nowadays industrial districts are a widespread mode of production in many countries, and have become an instrument of analysis of economics and a focus of policy strategies.

Source: OECD (2009), *Rural Policy Reviews: Italy 2009*, OECD Publishing, Paris, *10.1787/9789264056237-en*.

The topography of the region represented an early obstacle to the exploitation of the land, but also preserved high-value landscape and natural resources – today, the region still has 230 000 ha of forest. Forests were put under special protection in 1922, when the first park area was created in Abruzzo. Since then, Abruzzo has become a place of parks, with 36% of regional territory under special protection. The regional topology and the special regime for forest areas have also influenced agriculture and the tourism industry. Intensive agriculture is limited to a few zones on the plains and has specialised in high-value sectors such as wine production, which has skyrocketed over the last decades. Agricultural production is organised in smallholdings which cover 660 000 ha overall. However, while the seaside areas are tourist destinations during summer, the mountainous area and the national and regional parks gain little advantage from tourism flows as relatively few tourists visit these areas. Nevertheless, the presence of many protected areas has probably encouraged the regional and local authorities to develop very specific skills in the protection of landscape amenities and biodiversity. This has also affected regional regulation, which is particularly strong on protecting natural resources. Such expertise and skills may create the basis for new economic opportunities in the future.

Although Abruzzo is home to world-class research facilities and several universities, they are weakly connected to the regional productive framework. For instance, the region is home to the *Laboratori Nazionali del Gran Sasso* (LNGS) which is a particle physics laboratory. The LNGS is situated beneath the Gran Sasso, the largest mountain in the

Apennine chain, between the towns of L'Aquila and Teramo. The underground facilities are located next to a freeway tunnel, the 10 km-long *Traforo del Gran Sasso*, which facilitates the logistics. The experimental chambers are buried beneath about 1.4 km of rock, protecting the experiments from cosmic rays. The LNGS was opened in the 1980s and since 2006 has been the world's largest underground particle physics laboratory. Abruzzo also hosts three main universities located in L'Aquila, Pescara and Teramo. It has been difficult to identify linkages among these research bodies, the manufacturing industry and the myriad of active SMEs in the region.

Abruzzo's energy resources

The region has a mix of conventional and renewable sources of energy, but none of them is particularly significant. Unlike most of the other case studies considered, Abruzzo has not specialised in the energy sector and regional production and consumption of energy is in line with the size of its population. Abruzzo has natural gas, producing approximately 22 million m^3 in 2005 (Regione Abruzzo, 2009). The local population, however, do not favour such developments, especially along the coast. Gas field development is also constrained by the large proportion of the region under protection. According to the Italian system operator, the region generated a total of 6 292 GWh of electricity out of a national total of 308 062 GWh, and consumed 6 344 GWh out of a national total of 309 884 GWh, in 2010. More than 60% of the region's electricity is produced in conventional power stations managed by national operators, although renewable energy sources contribute 2 400 GWh a year. The lion's share of this comes from large hydro-electric installations, due to the regional topography and the relative abundance of water. Together these generate more than 2 000 GWh. Other renewable sources are wind energy, which have an estimated potential of 532 GWh; and photovoltaic, whose potential is 40 GWh (Terna, 2010). In spite of the region's large forested area, woody biomass is not used to produce energy or heating. The region has not assessed the potential of biomass for the production of energy.

Renewable energy policy in Abruzzo: Objectives, opportunities and challenges

The policy drivers: Why is Abruzzo implementing a renewable energy policy?

Before the financial crisis, Abruzzo largely deployed renewable energy in response to national and European regulation. Although the region had pioneered wind energy in Italy in the 1980s, these early installations were mostly demonstration projects managed by the central government with little involvement of regional authorities and local investors. In the early part of the century, the region had a lower unemployment rate than Italy as a whole – 5.3% in 2003 – so there was little need to look for new investment opportunities. The situation changed when the financial crisis hit the regional economy in 2009/10, causing unemployment rates to increase to almost 9%, while reducing transfers from central government. The region started focusing on RE as a way to attract investment from the national government and the EU into local communities. This is especially true in the mountainous areas, which are historically more dependent on external investment and on the public sector in general.

Unlike other regions, Abruzzo's RE policy is not an industrial-style policy, aiming to create a supply chain in an RE sector, nor is it designed to mitigate local pollution. The main driver of the regional policy is to give small cash-strapped municipalities access to public subsidies for RE installations. This policy option is consistent with the lack of easily accessible alternative sources of energy (solar radiation and wind speed are not very high in the region) and with the intense protection of landscape amenities which characterises the region.

The policy framework for renewable energy in Abruzzo's rural areas

RE deployment in rural Abruzzo depends on a complex set of policies cutting across four tiers of government: the European Union (EU), national, regional and local government (Figure 10.2). The EU influences regional and local dynamics through its environmental and agricultural policies and its structural funds, particularly the European Fund for Regional Development (EFRD). Abruzzo is under the Regional Competitiveness and Employment objective of the EU (Box 10.2).

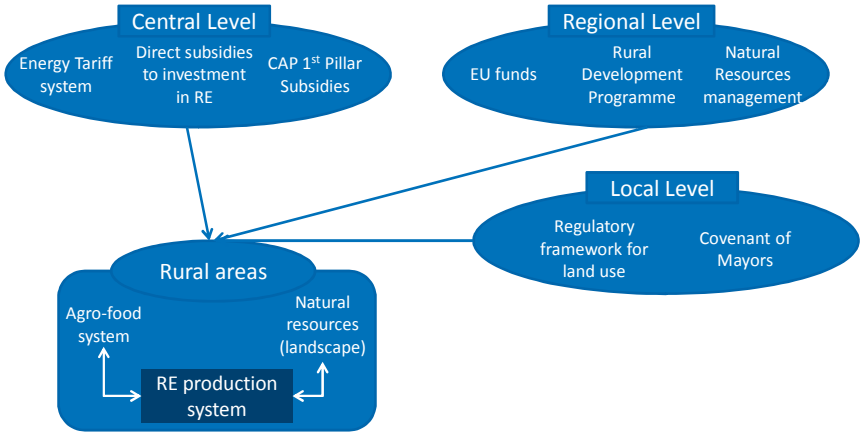
Box 10.2. **The EU's cohesion policy's competitive objective**

The Regional Competitiveness and Employment objective aims to strengthen regional competitiveness and attractiveness and promote job creation. Four priorities have been identified: increasing the adaptability of workers and enterprises; enhancing the access to employment and increasing participation in the labour market; reinforcing social inclusion and combating discrimination; and mobilising reforms in the fields of employment and inclusion. It is financed by the two EU structural funds. The EFRD and the national co-funding should funnel a total of EUR 47 million into the region between 2007 and 2013. The national government acts as an interface between regional governments and with the EU strategy and is also the key actor within the national energy policy, as it sets energy prices and defines the overall energy strategy.

Source: European Commission, Regional Policy – Inforegio, *http://ec.europa.eu/regional_policy/index_en.cfm*.

The regional government is responsible for implementing rural development policy, part of the so-called "second pillar" of the EU's Common Agricultural Policy (CAP). Finally, local governments – provinces and municipalities – have a particularly important role. As in other case studies, municipalities can influence RE deployment as they control land use and zoning (building permits and siting of installations). In Abruzzo, local governments also have a prominent role due to their participation in the "Covenant of Mayors", the mainstream European movement involving local and regional authorities in the fight against climate change (see below).

Figure 10.2. **Renewable energy policy framework in Abruzzo**



Source: Abruzzo Government (2011), response to OECD questionnaire.

European policy

It was not until 2005 that a mandatory and comprehensive energy policy was adopted at the EU level. Before then, EU Member States pursued intergovernmental initiatives motivated initially by energy security in the 1970s and subsequently by environmental concerns in the 1990s. In 1997, in reaction to the Kyoto Protocol, the EU introduced non-mandatory targets for the RE share of total energy consumption for Member States. In 2006, the European Commission issued the Green Paper: *A European Strategy for Sustainable, Competitive and Secure Energy*. This asked Member States to implement a European energy policy built on three core objectives: *i*) sustainability – to actively combat climate change by promoting renewable energy sources and energy efficiency; *ii*) competitiveness – to improve the efficiency of the European energy grid by creating a truly competitive internal energy market; and *iii*) security of supply – to better co-ordinate the EU's supply of and demand for energy within an international context. In 2007 this was translated into mandatory shares of RE production for Member States in the form of the Renewable Energy Roadmap; these were further increased in 2009 in the EU's *Directive on Electricity Production from Renewable Energy Sources* (popularly known as the RES Directive). This set the overall mandatory goal of achieving 20% of RE in total energy consumption (10% of transport biofuels) by 2020, which has become part of the "Europe 2020" Strategy. Italy's national target for renewable energy is set at 17% of its gross final energy consumption for 2020 (from 5.2% in 2005). In the new set of rules, the EU also highlights the potential of RE to reduce energy dependence and promote economic development, especially regional development.

The EU promotes a range of initiatives supporting RE deployment that directly involve local and regional governments. The EU Directorate-General for Energy has created a specific initiative, the Covenant of Mayors, to give value to the role of local governments within the EU 2020 strategy to mitigate climate change. The assumption is that local governments can affect citizens' behaviour through local regulation, and reconcile public and private interests by integrating sustainable energy issues into overall local development goals. The Covenant of Mayors is usually based on a voluntary

commitment by signatories to meet and exceed the EU's 20% CO_2 reduction objective through increased energy efficiency and the development of renewable energy sources. The network does not provide any actual financial resources, but it obliges municipalities to design an action plan for RE and energy efficiency. This makes it easier for them to get financing when bidding for EU funds supporting renewables. Abruzzo is very active in this network.

Besides local initiatives, the EU also promotes international/interregional co-operation in the field of RE. For instance, the EU is supporting a programme to deploy offshore wind in the Adriatic Basin. This project, called POWERED, is worth approximately EUR 4.5 million. POWERED aims to define a set of strategies and shared methods for developing offshore wind energy in all the countries overlooking the Adriatic Sea. Offshore wind power could allow a rapid increase of installations, by reducing the problems related to landscape that are frequently the main obstacles to the creation of wind farms in densely populated areas or those with a high historical or landscape value. It involves all the regional (and national) governments in this area, providing them with funds to assess the quality of the wind resource, the potential impact of wind installations, and the feasibility of deploying prototypes. Abruzzo is the co-ordinator of this international network.[2]

National policy

In Italy, national government has exclusive jurisdiction over environmental issues and shares responsibility for energy policy with regional governments. Moreover, the national government must implement EU directives aimed at improving environmental performance (such as its climate change mitigation strategy) and increasing RE consumption. It also co-funds the EU's Cohesion Policy and co-ordinates the "first pillar" of the CAP, which includes farm income support for several energy crops. Until 2010, the national government lacked an integrated approach to RE, supporting deployment merely to fulfil EU mandates rather than to implement a true paradigm shift in the national energy model. However, the situation has now changed since the instability in North Africa in 2011 – which affected countries supplying fossil fuels to Italy – and a national referendum that rejected nuclear energy development. In this new context, the national government has had to reconsider its strategic approach to renewables and has started promoting a true integration of RE within the national energy framework.

The national focus has been mainly on wind and solar power, while heating and cooling technologies have had less support. This bias is reflected in the wind energy trends. At the end of 2009, the country's wind generation capacity had increased almost 30% on the 2008 figure, to 4 850 MW. The regions which added the most new capacity were Sicily, Puglia and Calabria, followed by Campania and Sardinia. Some developments are also taking place in central and northern Italy, in regions such as Liguria, Piedmont, Veneto, Emilia Romagna and Tuscany.

Italy started offering concrete support to RE deployment in 1999 through the gradual liberalisation of the electricity market, which also split production, distribution, and transmission into different activities. The reform granted priority grid access to electricity produced by renewable means and introduced a quota system. Early incentives were designed to support large-scale wind installations: in 2004, Italy introduced tradable green certificates. In 2005, in response to an EU directive, Italy enacted a feed-in-tariff (FIT) system specifically designed to support photovoltaic (PV) installations. In some parts of Italy, particularly in the south, FITs have generated a speculative bubble in

PV installations that has made Italy one of the largest markets for PV in the OECD; the tariffs have since been modified (Box 10.3). In Abruzzo, PV installation has been limited due to the fact that, unlike other regions (see the Puglia case study) the region has not implemented any specific measures to facilitate or speed up the authorisation process, which has to go through several administrative steps starting with local governments that manage land use.

Box 10.3. **Feed-in tariffs and the PV "bubble"**

Since the biennium 2005-2006, in response to an EU directive, Italy has supported PV energy and other selected RE technologies with a premium feed-in tariff (FIT) scheme: *conto energia*. FITs originally supported both small off-grid PV installations of up to 20 kW, and larger grid-connected PV installations of up to 1 MW, providing operators investing in RE with a bonus on top of the market electricity price for a period of 20 years. Although Italy's FIT focuses on solar energy, other small-scale renewable energy power plants (<200 kW for wind power; 1 MW for other sources) can also choose FITs, which are available for 15 years. These are worth between EUR 180 and EUR 300 per MWh, depending on the fuel source (IEA, 2009). In theory, the premium paid to developers was to compensate for the cost of RE installations and the transaction costs arising from the lack of certainty around the authorisation process, which was managed by regional governments. The availability of FITs, especially in their early version, spurred explosive growth in PV installation (Gazheli and Di Corato, 2011). For instance, the number of PV installations in 2007 was 7 647 with an overall capacity of 87 MW, but by the end of 2010, the number of installations had reached 155 977, and the total capacity was 3 469 MW.

This speculative bubble raised the prospect of very large PV deployments generating huge long-term rents for investors and correspondingly high energy costs for consumers, who are the ones financing FIT. In response, FITs were fine tuned in 2008 in an effort to better reflect the marginal cost of RE and to reduce their impact on the overall cost of electricity. In 2011, the incentives were redesigned once again to control costs and better integrate RE deployment into the national energy framework. Italy has announced gradual reductions in FITs for PV installations with the intent of capping subsidies to developers by the end of 2016 (IEA, 2011). In the course of 2011, tariffs were reduced by between 8% and 10% for small plants and between 14% and 20% for large plants. However, an additional tariff bonus can be obtained where energy efficiency interventions are implemented, making it possible to obtain an increase of up to 30% of the original tariff. As of 1 January 2013 the FIT will only be granted to electricity injected into the grid. Specific, lower, incentives will be available for off-grid production of solar energy.

Sources: GSE; IEA (2009), *Country Profiles: Italy*, IEA, Paris; IEA (2011), *World Energy Outlook*, IEA, Paris; Gazheli, R., L. Di Corato (2011), "Land-use Change and Solar Energy Production: A Real Option Approach", *Working Papers*, Fondazione Eni Enrico Mattei.

Support for biomass comes through the CAP, managed by national government. The CAP has evolved from a programme which was merely supporting farm incomes to one aimed at shaping farm activities and it has now put a focus on the production of biomass for energy. The first pillar provides incentives to produce specific energy crops – perennial crops – with the aim of diversifying crops cultures and promoting the "commoditisation" of biomass. Italy has fallen behind with respect to EU targets and needs to make up ground in this area relatively quickly. To do so, in 2011, the central government has set ambitious objectives for the use of biomass to produce electricity, biogas, biofuels and heating and cooling. In particular, the national government aims to increase the use of biomass for energy production from 4 million metric tons in 2010 to 10 million metric tons in 2015. The national government will assign each region a specific and mandatory target to increase the production, collection and use of renewable

energy. However, such a sharp increase in biomass production could create problems for regions as many of them do not have policies, markets or production chains supporting biomass use. Part of the problem is that the incentives are designed to support single production units rather than the creation of integrated supply chains. This is particularly true in Abruzzo. Although its large forested area means it has large potential for biomass production, on the other hand it has no strategy in place to take advantage of this resource, nor the capacity to do so.

National RE policy cuts across several ministries, which adds complexity to the development of a coherent energy strategy. The main institutional actors involved are the Ministry of the Economy, the Ministry of Economic Development, the Ministry of Agriculture, Forestry and Food, and the Ministry of the Environment. The interaction among these institutional bodies is complex; in general, each ministry has implemented its own agenda, often influenced by specific constituencies or lobbies. This lack of a co-ordinated approach to RE at the centre has made the role of regional government particularly important.

Regional and local policy

At the regional level, several different policies support RE deployment. Regional levels have co-ordinated different policies and resources related to RE. Abruzzo, for instance, is responsible for managing funds related to CAP Pillar 2 and ERDF (within the Regional Competitiveness and Employment Objective – see Box 2), which are allocated through programming documents defined at the regional level. Abruzzo's regional government shares responsibility with the national government for energy policies.

The main feature of Abruzzo's RE policy is its "granularity": its main aim being to support a large number of small local initiatives. Based on the assumption that a large number of small installations can have the same impact of few large RE projects on the regional economy and on overall CO_2 emissions, Abruzzo's RE policy is based on small initiatives promoted by municipalities. Intermediate governments, such as the provinces, provide municipalities with technical support and funding to help them to deal with the complexity related to RE. For instance, the province of Pescara supports local governments by providing them with energy managers with the technical skills to design and implement local interventions.

European structural funds have been used to enhance the role of local governments within the RE policy. In 2010 the regional government decided to push all 305 of its municipalities into the Covenant of Mayors network (described earlier) and involve provincial governments (L'Aquila, Teramo, Chieti, and Pescara) and the Italian association of municipalities (ANCI) as co-ordinators. The provinces received EUR 300 000 from the regional government to support municipalities in preparing their Emission Balance Inventories (EIB) – to assess the carbon emissions at the local level – and Sustainable Energy Action Plans (SEAP) – to list possible interventions to improve energy efficiency. These action plans should facilitate the funding of local initiatives. For example, the regional government has allocated EUR 35 million from EDRF 2007-2013 to support the implementation of the Covenant of Mayors in the region. A share of these funds (approximately EUR 15 million) has been specifically allocated to support initiatives in small municipalities, with populations of up to 15 000. Within this policy framework, the remit of rural municipalities goes far beyond merely authorising schemes. Since 2009 the Covenant of Mayors framework has also been used for educational activities, through the *Energiochi* (playing with energy) initiative which encourages

schoolchildren to visit regional RE installations to learn about environmental sustainability and energy security.

Another feature of Abruzzo's RE policy is its focus on the protection of its landscape and natural assets. Abruzzo has developed a full set of regional rules ensuring the siting of RE installations not only takes into account their efficiency in terms of energy production, but also their impact on the landscape. The regional government has produced detailed guidelines that prevent protected areas from being able to host RE installations, in particular wind turbines. These policies have drastically reduced access to subsidies in scenic areas, even if they are not formally protected.

Assessment of policy impacts on rural development

Stimulating local economies

Abruzzo's focus on small installations means that small rural municipalities have been able to link RE to the delivery of key services and create new investment opportunities for local SMEs. For example, the municipality of Ancarano, a small rural town with a population of approximately 2 000, was able to place 360 square metres of PV panels on the roof of the old school; a project requiring an overall investment of EUR 250 000. The FIT received for the electricity produced was used to guarantee a loan to refurbish the school, benefitting 140 local children and allowing the community to keep its school, which was under threat from the national Ministry of Education's plan to rationalise the school system. In general, the large number of small interventions triggered by the Covenant of Mayors approach has created business opportunities for self-employed installers of renewable energy, although data on the overall employment impact are not available.

Abruzzo's bottom-up approach means local governments deploy small-scale installations with the support of the local community; citizens have a say in the siting and the sizing of the facilities (Box 10.4).

Box 10.4. A gradual and participatory approach to building public support

Tocco di Casauria is a town of 2 700 people in the mountainous part of the province of Pescara. The town was home to some early wind power demonstration projects in the 1980s. This experience showed the community the impact of wind energy on their day-to-day life, and also allowed the municipality to benefit from some extra funds deriving from the installation. At the end of the 1990s, two new turbines were installed with an overall installed capacity of 400 kW. In 2006 and 2009 more wind turbines were added, reaching a total installed capacity of 3.2 MW, based on wind turbines of 800 kW each. After the installation, the area was completely refurbished and trees that had been removed were replanted close to the wind turbines. As in other cases, the local community is now benefitting from public subsidies available for the production of RE, which has an impact on the local availability of public services such as schools and facilities for older people.

Tocco's experience demonstrates that it is possible to get a local community to support wind installations, provided that the intervention is done on a long-term basis (which allows locals to evaluate the impact and get used to the novelty) and without deploying large-size turbines which, although attracting more subsidies, could impinge upon other economic activities, such as tourism. RE is thus not considered "invasive" but rather as providing local communities with tangible advantages (better public services, in the case of Tocco) without compromising their basic values.

Main challenges

Abruzzo's decision to put local government on the front line of RE deployment has a number of drawbacks, as well as advantages. First, due to the absence of a guiding strategy, it is not clear who decides whether local projects actually make sense in terms of climate change mitigation and energy security. Second, public subsidies have become the only driver for RE deployment in the region. This is partly mitigated by the fact that benefits tend to be shared with local communities, but it triggers the same sort of rent-seeking behaviours that have been observed in regions promoting large-scale developments. Third, small deployments should be co-ordinated by a regional strategy to create enough regional demand to stimulate RE entrepreneurship. Without impinging upon the current system which allows municipalities to decide on the scale of installations, regional co-ordination could at least collect information about the overall demand for specific goods and services from the many local projects. Finally, wider co-ordination is certainly needed to take advantage of biomass as an energy source: this requires a number of different municipalities to work together. Because of strict regulations protecting forest areas, no single community could afford the cost of collecting biomass, considering the presence of an extended natural gas grid which already provide a cheap source of energy even to remote areas.[3] As a result, Abruzzo is not taking advantage of the most abundant and readily available renewable energy resource within its territory: the forest.

Abruzzo's RE policy also lacks a proper rural focus. While intended to support the communities suffering most from the reduction of public resources and external investment, the RE policy is implemented uniformly across the region. Though some resources are set aside for small communities, on its own this does not guarantee that mountainous rural municipalities have real access to public support. The policy could still misallocate resources by giving them to small municipalities which effectively belong to larger urban systems in the coast area. Introducing other conditions, such as the degree of rurality of local communities, could be a way to optimise the link between RE deployment and availability of public resources, as the policy intended.

Notes

1. This definition usually encompasses textiles, clothing and leather products. It can be also extended to machinery tools needed for the production of these items as well as to the agro-food industry, including wine.
2. For more see *www.powered-ipa.it/the-powered-project/*.
3. Italy has a very restrictive regime for activities within national parks; the economic activities that can be located within protected areas are very limited and biomass can only be harvested to protect the forest resource from fire and clean up roads.

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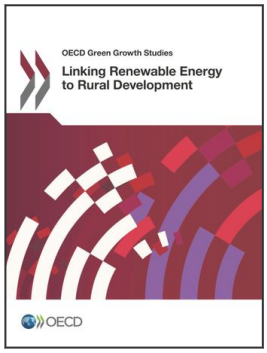

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