The Region of Liguria

Regional RES-e Map: Electricity from renewable energy sources (RES-e)

The region	Liguria
Number of inhabitants	1,560,748
Size (in km²)	5421
Capital	Genoa

Short description:

The Region of Liguria is located in northwest Italy and is a long, arch-shaped coastal strip stretching from France in the west to Tuscany in the east; to the south is the Ligurian Sea while the northern border is formed by the Regions of Piedmont and Lombardy. The geography of Liguria has led to the development of the tourist industry with many seaside resorts, while commerce and industry are also very active, with considerable stimulus coming from the ports and allied activities in Genoa and La Spezia. As far as the energy sector is concerned, Liguria currently produces exactly twice as much electricity as it consumes, exporting the surplus to other Regions such as Lombardy and Piedmont.

Share of RES (total primary energy): 1.5%

Share of RES-e (total electricity): less than 1% (0.85%)

Target RES-e (national or regional): Italy: 25%

The partner organisation: ARE Liguria Spa is the body, recognised by Regional Law no.18/99, appointed to provide technical support activity to the Ligurian Regional Administration in the field of energy policy. ARE Liguria also conducts activities related to European projects for the promotion of renewables.

	Number of plants	Total installed capacity (MW)	Typical installation size	Main present funding mechanism	Short-term perspective (2007)	Mid/long-term perspective (2015)	Main barriers
Wind	3	4.8	750 kW	Public funding – Green Certificates	Poor	Poor	Poor potential, environmental impact in rural areas
Wood biomass	0	0	0	Green Certificates	Medium	Good	Lack of sufficiently consolidated technology
Biogas	4	3.5	1000 kW	Green Certificates	Poor	Poor	High costs of investment, transition to other technologies (energy recovery)
Other biomass	0	0	0	0	Poor	Poor	Poor potential
PV	86 (28	0.561	3-15 kW	Public funding	Medium	Medium	High costs of

	are public)						investment. No reduced tariff
Hydro <10 MW	41	67	400-1500-5000 kW	Green certificates, Public funding	Good	Medium	Hydroelectric potential already largely exploited
Geothermal electricity	0	0	0	Green certificates	Poor	Poor	Lack of potential
Other RES-e							

Wind

The past: The first wind power plants in Liguria were not set up until after 2000 and therefore constitute a relatively new challenge in the field of renewables.

The present: At present there are 3 wind farms in Liguria with total installed capacity of 4.8 MW, established by means of regional cofinancing and equipped with windmills of average installation size 750-800 kW connected directly to the local distribution grid (Enel Distribuzione).

The main barriers & strategies to overcome them: It is planned to upgrade one of the wind farms, so as to double its installed capacity, though the project is currently at a standstill on account of the technical impossibility of the local distribution grid absorbing the amount of power foreseen. This problem could be solved by increasing the grid capacity, or rather intervening on the distribution line.

Other projects of a different type are at present being assessed: there are specific problems arising from the construction of wind power plants in Liguria's many protected areas; this factor slows down the already complex authorisation process linked partly to environmental impact assessments. Consequently, a great deal of impetus is required on the part of the local authorities in order to implement an effective policy promoting wind power, and this should be followed up by a series of incentives.

Short-term perspectives (until 2007): In the light of the aspects mentioned above, it is difficult today to assess the short-term prospects for wind power.

Mid/long-term perspectives (until 2015): Also taking into account the poor wind conditions in Liguria there is little likelihood of significant growth in the development of wind power in the medium/long term.

Wood biomass

The past: The generation of electricity from biomass is a new opportunity to harness the potential of renewables insofar as up till now this source of energy has only been used for domestic heating.

The present: There are no plants operating at present, but only some project designs within the framework of the PEAR (Ligurian Regional Environmental Energy Plan), which explicitly promotes cogeneration from wood biomass.

The main barriers & strategies to overcome them: The main obstacles to the diffusion of biomass plants for the generation of electricity are the dearth of sufficiently mature technologies in relation to small-sized installations and the lack of integrated projects locally, i.e. projects which would make it possible to foster the woodland energy chain and harness both the production of electricity and the potential heat produced in cogeneration.

Short-term perspectives (until 2007): The initial phase of implementation of the PEAR foresees the creation of cogeneration plants to be tested and reproduced in Liguria, where the resource is plentiful. Therefore, the prospects are good.

Mid/long-term perspectives (until 2015): Once the PEAR implementation phase is complete, on the basis of the results achieved by 2010 and the experience gained, there will certainly be a very tangible possibility of increasing the production of electricity from wood biomass.

Biogas

The past: In the past in Liguria, biogas conversion plants for the generation of electricity have only been constructed at landfills.

The present: At present there are 4 plants operating in Liguria managed by private operators and with total installed capacity of 3.5 MW.

The main barriers & strategies to overcome them: Until now the high costs of investment for biogas plants, combined with the tendency to set up energy recovery plants for processing urban solid waste have been the main barriers to the diffusion of this technology.

Short-term perspectives (until 2007): On account of the reasons set out above it is unlikely that there will be significant diffusion of biogas technology. Proposals are currently being assessed for energy recovery plants processing urban solid waste.

Mid/long-term perspectives (until 2015): The long-term outlook is rather poor.

PV

The past: Photovoltaic solar has increased over the last few years due primarily to Italian State and Regional incentives for the public sector.

The present: At present, regional funding is frozen and, on the basis of the data inferred from the last call for tenders, which took place in 2004, the Ligurian Regional Administration has a total of 86 installations of which 28 are public, with capacity of around 560 kW. Some plants are still being set up.

The main barriers & strategies to overcome them: Currently, the main barrier to the spread of PV in Liguria is the high cost of installation and the impossibility of carrying out an energy account exchange with the distributor; if this were possible, it would be possible to benefit from a reduced tariff provided for parties that produce surplus electricity and transfer it to the grid. The legislation providing for transposition of Directive 77/CE/2001 foresees this option but it requires implementation Decrees in order to become operative. Another barrier to the diffusion of PV is the incompatibility of the typical Ligurian urban architecture and landscape.

Short-term perspectives (until 2007): The extension of the national call for “tetti fotovoltaici” (“PV roofs”) tenders combined with the application of incentive tariffs as per Legislative Decree no. 387 could make the use of PV attractive also for small installations.

Mid/long-term perspectives (until 2015): The long-term development of PV depends essentially on the introduction of suitable legislative measures and incentive policies. In fact, Liguria has excellent radiation characteristics that could be harnessed for future applications.

Small hydro (< 10 MW)

The past: The Region of Liguria has substantial hydroelectric potential which led to the development of many plants dating back as far as the beginning of the 20th century, in general served by storage reservoirs used for periods of low water.

The present: At present in Liguria there are 41 plants (dams, run-of-the-river and pipelines) with total installed capacity of 67 MW, typical installation sizes of 400 kW, 1500 and up to 5000 kW, managed mainly by private operators and/or former municipal utilities..

The main barriers & strategies to overcome them: The torrential nature of most of Liguria's streams and rivers and their limited length is the main barrier to the greater exploitation of hydroelectric potential. The presence of territorial and regulatory constraints represents a second obstacle to the development of hydro power: therefore, it would appear that the right strategy should be to direct efforts towards projects that are eminently feasible and have immediately viable detailed designs. A further barrier to the establishment of plants is the high cost of investment in respect of the low productivity in terms of kWh/year.

Short-term perspectives (until 2007): The Ligurian Regional Administration is currently assessing cofinancing options for the refurbishment of disused mini-hydro plants and/or waterworks pipelines, which means the short-term prospects are definitely good.

Mid/long-term perspectives (until 2015): Considering that the hydroelectric potential has already largely been exploited, and will be even more so over the next few years, the long-term prospects are certainly not great.

Geothermal electricity NO RELEVANT APPLICATION

The past:

The present (which typical systems are installed in which sector & operated by whom):

The main barriers & strategies to overcome them:

Short-term perspectives (until 2007):

Mid/long-term perspectives (until 2015):

picture

OTHER RES-e: NO RELEVANT APPLICATION

The past:

The present (which typical systems are installed in which sector & operated by whom):

The main barriers & strategies to overcome them:

Short-term perspectives (until 2007):

Mid/long-term perspectives (until 2015):

picture

Main market actors: *(example)*

The main actors in the field of Ligurian renewable energy are essentially private companies set up following the liberalisation of the electricity market and the entry into force of the Bersani Decree (Law Decree no. 79 of 16/3/99) transposing EU Directive 96/92/EC.
In particular, after the introduction of the above-mentioned Decree, the following bodies were established:
- the Gestore della Rete di Trasmissione Nazionale (GRTN, or Italian Grid Authority) supplies dispatching service for the national transmission system and is the body appointed to qualify renewable energy plants and issue Green Certificates.
- Tirreno Power is a private company set up following the break-up of the former electricity monopolist ENEL, the owner of the main Ligurian hydroelectric and mini-hydro power stations.

Other market actors linked in various ways to renewable energy sources are the former municipal water/gas/electricity/waste disposal utilities:
- AMGA – Azienda Mediterranea Gas e Acqua (Genoa), which owns several small hydroelectric plants installed on waterworks pipelines
- ACAM – Azienda Consorzio Acqua Metano (La Spezia), owner of 2 hydroelectric plants, one wind farm and one biogas plant
- AMAIE – Azienda, former utility in the Municipality of San Remo.

As for the public administration and/or other organisations, the following bodies should be mentioned:
- Ligurian Regional Administration
- Provincial Administrations of Genoa, Savona, Imperia and La Spezia
- ARPAL (Regional Environmental Protection Agency)
- Università degli Studi di Genova
- Environmental associations
- Research institutes.

Other actors:
- Autorità per l'Electricity ed il Gas (AEEG), an independent authority created by Law no. 481 of 14 November 1995 in order to regulate and control the electricity and gas sectors. One of its functions is to set the tariffs for collection of electricity by producers
- ENEL Distribuzione – the (almost exclusive) electricity distributor for Liguria, and the network operator with whom electricity producers must deal for grid connection
- UTF – Ufficio Tecnico di Finanza – a fiscal agency which installs electricity meters to measure the amounts produced
- IDREG – Owner of mini-hydro plants
- NEG MICON – Supplier of windmills for wind farms

(1-2 pages about the companies, stakeholders and market actors for all RE technologies in your region including an explanation and a list of actors/companies)

Conclusions: *(example)*

At present the process of implementation of the PEAR (Ligurian Regional Environmental Energy Plan) approved in December 2003 involves plans to set up activities related to the production of electricity from renewable sources essentially in the field of wood biomass by means of the promotion of cogeneration plants. The other sectors which the PEAR is directed at are solar thermal and energy certification, therefore entailing the pursuit of objectives that do not directly concern the generation of electricity. In this regard it should be remembered that Liguria produces exactly twice as much electricity as it needs for its own energy demands, exporting the surplus to surrounding Regions.

Two sample areas have recently been selected from among Liguria's Mountain communities to test two pilot actions entailing the setting up of some plants powered by wood biomass using both traditional steam technology and innovative organic fluid cycles.

In addition, another very interesting sector for the promotion of electricity from renewables in Liguria is small hydro, since the Region has many disused installations which could be revamped without an excessive financial outlay. The Ligurian Regional Administration is currently assessing the methods of funding and operation to arrange a Regional call for tenders aimed at the refurbishment of old plants that lend themselves to technically feasible projects with viable detailed designs or plants to be installed on waterworks pipelines in the presence of drops in altitude that are still to be harnessed.

(0.5 – 1 page conclusions for the project, please outline what conclusions can be drawn for your future project activities, what are the main technologies you will concentrate on, etc.)