

# RES – Renewable Energy Sources in Italy

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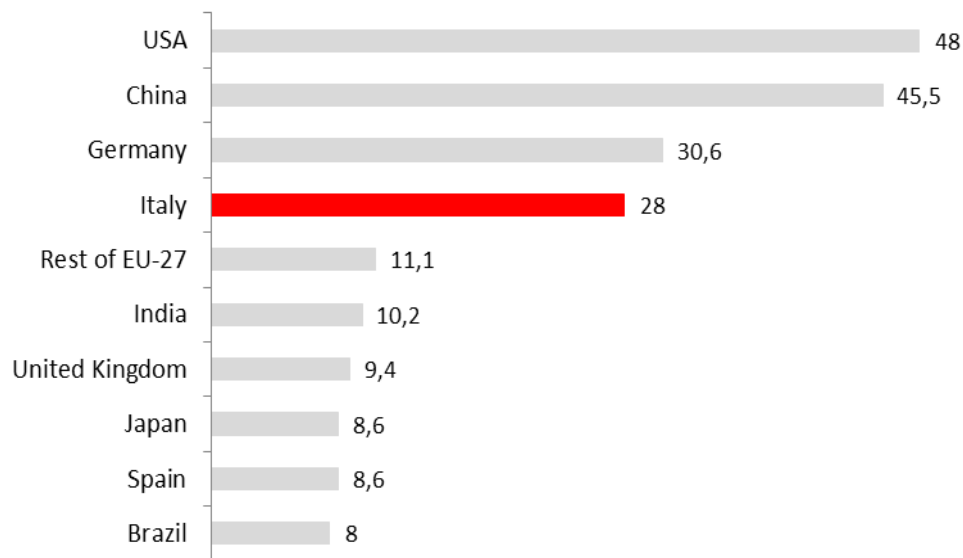
## Renewable Energy Sources in Italy

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With a yearly energy production from renewable sources (RES) of 84 TWh, Italy is one of the European leaders in RES development.

In 2011 Italy invested 28 bln \$ in RES - 4th largest investment among G-20 countries - with a growth rate 2010/2011 equal to +38%, and a growth rate 2006-2011 equal to +89%.

### RES investments in G20 countries 2011 (billion \$)

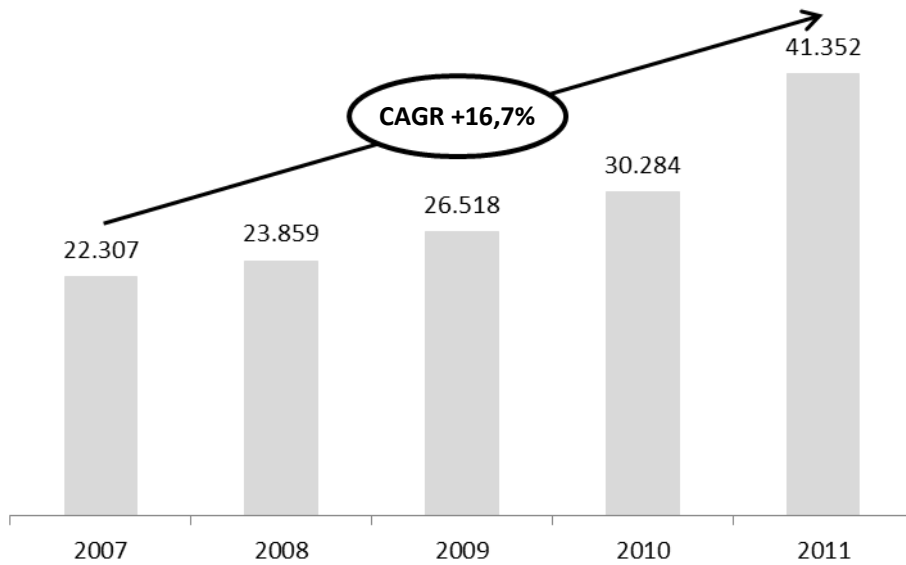


Source: The Pew Charitable Trusts – 2012

Over the last few years Italy has experienced a considerable development in RES, increasing by 16,7% CAGR 2007-2011.

Only in 2011 cumulated power capacity from RES rose by 36,6% with 11.068 MW new installations.

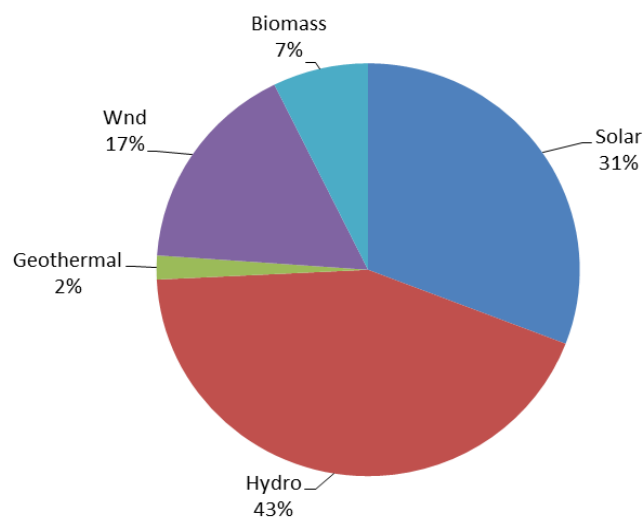
### Cumulated power capacity from RES, 2007-20011 (MW)



Source: GSE - Statistical Report, 2012

Photovoltaic (PV) yielded the best result, soaring by 267% with 9.280 MW new installations. Additional growing segments were wind and biomass that registered respectively 1.047 and 668 MW new installations.

### RES installed power capacity in Italy by source, 2011 (MW)

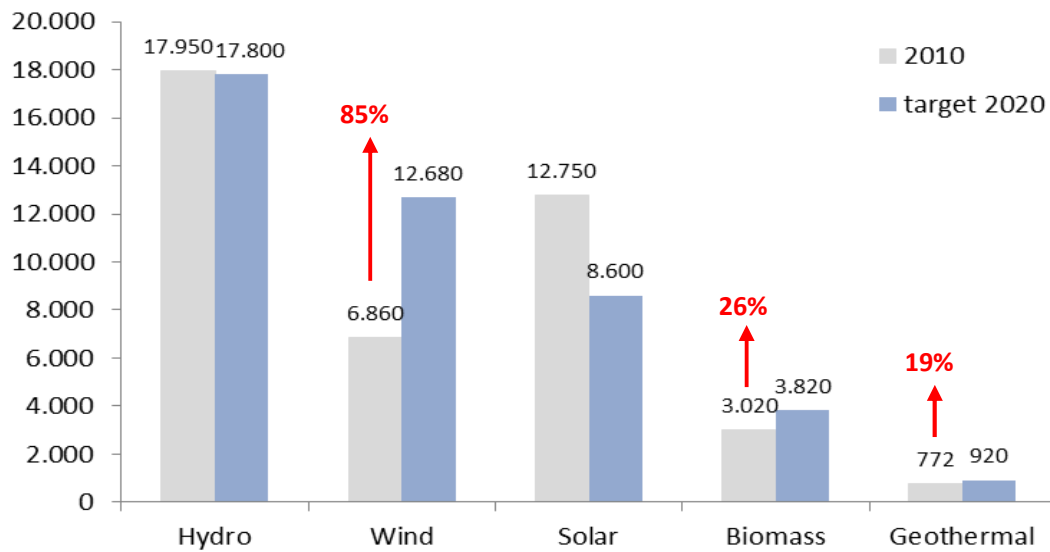


Source: GSE - 2012

In compliance with EU renewable energy targets (European Directive 2009/28/CE), by 2020 Italy is required to achieve 43.823 MW overall installed power capacity from RES, able to provide 98.885 GWh. The installed power capacity in Italy in 2011 was 41.352 MW, this result shows that the country will surely exceed the 2020 target. This means that there are significant investment opportunities in RES, notably in the wind and PV segments, where the most relevant growth is expected.

The Italian Government has recently published and submitted to the EU Commission the National Plan for the RES development to 2020 aiming at reducing constraints to the development of renewables through the implementation of a number of administrative, technological, fiscal and financial measures.

### Italy's targets for renewable energy by 2020 - MW totally installed



Source: GSE - 2012; Italian Economic Development Ministry - National Action plan for the RES Development, July 2010

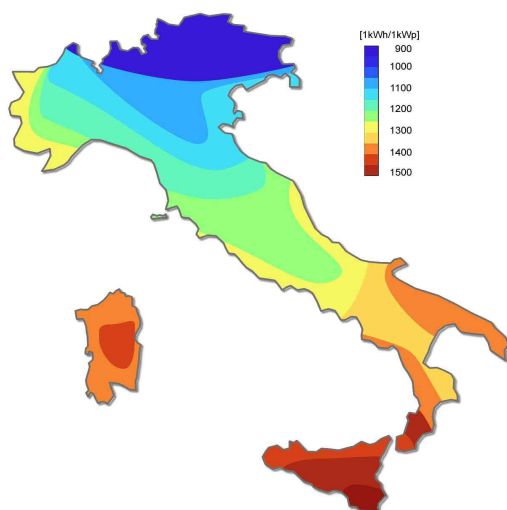
# Assets

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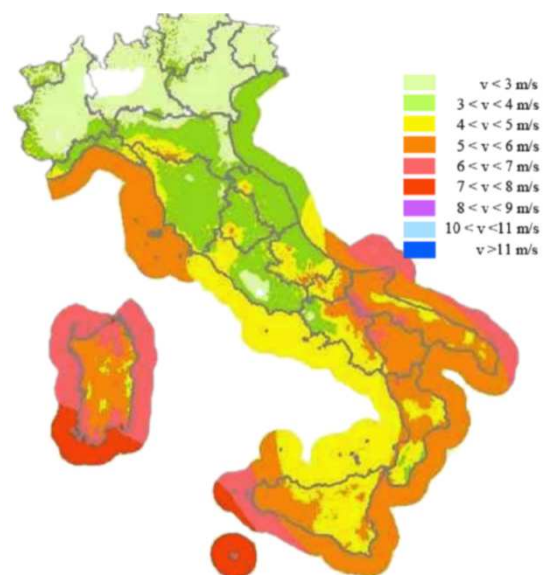
## Favourable Climate

Thanks to its geographical position, the Italian market is particularly profitable and ranks among the best in Europe, primarily in terms of resources, amount of solar radiation and wind flows both on Tyrrhenian and Adriatic Seas. In general Italy's Centre-South area benefits from a more favourable climate (in some parts of Sicily the incident solar radiation reaches 1,500 kWh/ kWp), with respect to Central Italy (1,300 kWh / kWp) and to Northern Italy (1,200 kWh/kWp).

## Annual Solar Irradiation 1kWh/1Kw<sub>p</sub>



## Wind Speed Distribution



## Market

- Strategic geographical position in the Mediterranean basin.
- Internal market with high growth potential.
- Feed-in government policy supporting energy generation from renewable sources, ensuring return rates among the highest in Europe.
- Low/null risk profile for grid-connected RES plants.

### **Industry and R&D**

- Strong manufacturing vocation in the Italian industrial system, notably in high technology sectors such as Mechatronic, Nanotechnology, Biotechnology.
- Italy's industrial system is extremely open to foreign investments as confirmed by the presence throughout the Country of a large number of foreign companies operating along the value chain of the various renewables (solar, wind, bioenergy, hydro, etc.).
- Innovative start-ups, often a result of academic spin-offs or public research centres which developed new technologies ready for industrialisation.

### **National or International Mandatory Target**

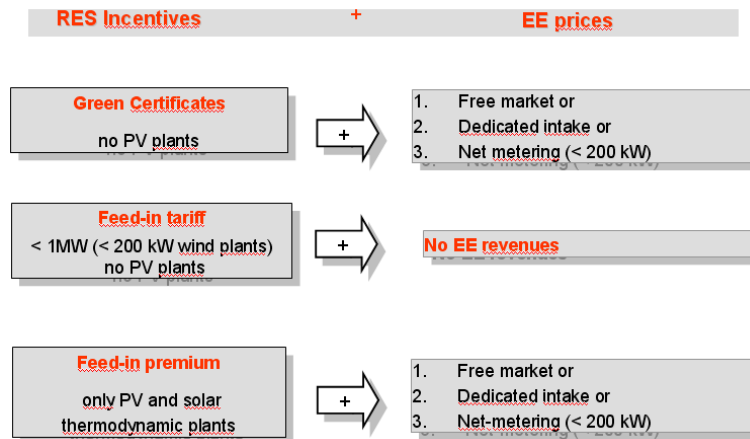
- European energy policy with specific objectives ("20-20-20 Policy").
- Italy's need to reduce dependence on energy from foreign sources.

## Incentives

The Italian government is currently working on a new incentive system to support the expansion of renewable electricity across the Country, which should be operative by September 2012.

The current incentive system is explained below.

### Overview of RES-E production support mechanisms in Italy



Source: GSE – Gestore Servizi Energetici (Italian Public Authority for RES)

RES Incentive	Description
<b>Green Certificates</b>	<ul style="list-style-type: none"> <li>• Obligation for producers and importers from non-RES to feed into the grid a % of electricity produced from RES via “new” plants</li> <li>• Based on a quota obligation on electricity from conventional sources for each producer/importer</li> <li>• Producers and importers shall feed in the electric grid an amount of RES-E</li> <li>• Producers and importers can fulfil their obligations via Green Certificate(s) issued in favour of their own renewable electricity production or other producers;</li> <li>• Support is granted through 15 years;</li> <li>• Green Certificates can be sold or purchased through bilateral agreements or through GME trading platform</li> </ul>

<b>Feed-in Tariff</b>	<ul style="list-style-type: none"> <li>• Type of source: hydro, biomass, biogas up to 1 MW and wind up to 200 kW.</li> <li>• Energy purchased at “incentive prices” inclusive of energy granted incentive and value.</li> <li>• Support duration: 15 years</li> </ul>
<b>Feed-in Premium</b>	<ul style="list-style-type: none"> <li>• Premium awarded to energy produced in PV and thermodynamic plants (CSP), to be added to the revenue from the electricity sold.</li> <li>• Support duration: 20 years</li> </ul>

Eligibility to combine the Italian renewable electricity support schemes with other public incentives (EU, national, regional, local) has to be investigated and assessed in accordance to laws and provisions currently in force.

In addition to strong incentive schemes and according to the European Directive in force (2009/28/CE), the Italian Government has established (in July 2010) the new national Guide Lines for Renewables. The objective is to overcome all administrative constraints in the authorization procedure for renewable power plants of any size and to guarantee equal regulation, timing and efficiency of procedures throughout the country.

In order to increase foreign investments in Italy’s RES sector, in May 2009 Invitalia signed a strategic agreement with GSE - *Gestore Servizi Energetici*, namely the public authority promoting RES development in Italy, to ensure support and awareness campaigns on environmentally-sustainable and responsible use of electricity.

### **RES-Manufacturing Plants Supporting Mechanisms**

Support mechanisms for RES manufacturing plants are managed by Invitalia, through Law 181/89 and tools such as Development Contract. Furthermore, Invitalia carries out thorough investigation into available national and regional incentives compliantly with ad-hoc requests by investors (e.g. R&D incentives).



## Investment Opportunities

In light of strong growth potential both in the domestic market and the Mediterranean area, Italy presents significant investment opportunities not only in terms of power plants implementation thanks to favourable climate conditions and to the incentive schemes for RES, but also in the manufacturing and research sectors thanks to strong industrial background and extensive research system all along the Country – such as the National Research Council (CNR) with whom Invitalia has signed a strategic agreement.

The main opportunities in the **Solar sector** concern:

Opportunity	Description
Power Generation	<p><b>Roof Top Market</b>, thanks to high building density and strong incentive scheme, notably for public and new buildings with high energy efficiency standard.</p> <p><b>Commercial and large scale systems</b> are expected to become the most important segments by next few years, thanks to availability of free land, including reclaimable areas and factory roofs of numerous Italian SMEs</p>
Manufacturing	<p><b>Cells and modules manufacturing facilities</b> in order to serve:</p> <ul style="list-style-type: none"> <li>- The rapidly growing domestic market, also via specialised solutions (e.g. Building Integrated Photovoltaics, notably for buildings subjects to constraints as per National/Local Cultural and Historic Heritage protection provisions.</li> <li>- Attractive South-Eastern Europe and Mediterranean markets</li> </ul> <p><b>Auxiliary components and technologies manufacturing facilities</b>, such as production tracker systems, inverters or security SW, and systems specifically designed for PV applications;</p> <p><b>Industrial Automation</b> to develop innovative appliances (robot, laminator, tester, etc.) for PV technology manufacturing in partnership with advanced Italian mechatronic industry</p>
R&D	<p>Partnership and cooperation focusing on:</p> <ul style="list-style-type: none"> <li>- <b>Thin-Film Technologies</b>, aimed at increasing efficiency and range of applications of Thin-Film Technologies (a-Si, Cd-Te, CIS/CIGS)</li> <li>- <b>III Generation Technologies</b> – e.g. Dye Sensitized Cells, Organic Cells, Hybrid Cells.</li> <li>- <b>Smart Grid Technology</b> and <b>Storage Systems Technology</b>.</li> </ul>

Main opportunities in **Wind sector** concern:

Opportunity	Description
Power Generation	<p>The main opportunities in <b>power generation</b> concern future onshore plants, in particular in Central and Southern Italy. While Europe is undergoing increasing saturation of onshore market, Italy has still a wide potential to exploit – 16,000 MW as estimated by the National Association for Wind Energy (ANEV)</p>
Manufacturing	<p>The soaring demand for wind turbines and the relationship between turbine manufacturees and their component suppliers has become increasingly crucial in terms of reduction of shortage of key components. Driving manufacturers redefine their business strategies worldwide to efficiently respond to demand variations in terms of volumes and location of clients.</p> <p>Italian manufacturing SMEs can play a key role in supporting the wind industry evolution, through:</p> <ul style="list-style-type: none"> <li>- Vertical Integration (in-house solution) with greenfield or M&amp;A operations carried out by foreign investors to control the entire manufacturing process for wind turbines;</li> <li>- Industrial partnership (outsourcing solution) to overcome pitch points in the supply chain and guarantee high-level specialisation and quality from suppliers.</li> </ul>
R&D	<p>Partnership and cooperation focusing on:</p> <ul style="list-style-type: none"> <li>- Better models for aerodynamics and aero-elasticity</li> <li>- Materials with higher strength to mass ratios or increased fatigue resistance of major components, such as gearboxes</li> <li>- Generators based on superconductor technology</li> <li>- Development of low-wind regime turbines</li> <li>- Improved forecasting and control technologies to predict wind variability in order to efficiently manage wind farms and prevent grid congestion and instability effects.</li> </ul>

Main opportunities in the **Bioenergy sector** concern:

Opportunity	Description
Power Generation	<p>Thanks to available incentive schemes, main opportunities in <b>Power Generation concern:</b></p> <ul style="list-style-type: none"> <li>• Electricity production</li> <li>• Heat &amp; Electricity combined production.</li> </ul>
Manufacturing	<p>Main opportunities in manufacturing facilities concern the production of biomass generator on optimised technologies for cogeneration plant, electro-mechanical components, and electric generator.</p> <p>Interesting investment opportunities are available for development and implementation of “next generation” biofuel technologies.</p>
R&D	<p>Main opportunities in <b>Research &amp; Development</b> concern partnership and cooperation with Italian research systems (universities or public-private research centres) throughout the Country, such as:</p> <ul style="list-style-type: none"> <li>- <b>Biomass Research Centre at the University of Perugia</b>, leading centre for research on biofuels and biomass for power generation.</li> <li>- <b>Research Centre for Renewable Energy at the University of Florence</b>, multi-disciplinary institution carrying out R&amp;D projects covering second-generation biofuels, small-scale bioenergy HVAC, and algae cultivation for biofuel.</li> <li>- <b>Research Centre for Industrial Crops</b>, cooperating at international level in areas such as Genetic improvement, Genetics and genomics of plant species of industrial interest, Metabolomics, technology of enzymes, secondary metabolites and nutraceuticals.</li> </ul>

## Already in Italy

According to FDI Markets database, over the last three years (2007 – 2010 ) Italy has attracted 61 RES foreign investment projects) for an overall investment value of \$ 8,15 billion, ranking third among the most attractive European countries for RES FDI.

Italy's attractiveness in the sector is confirmed by Ernst & Young attractiveness index, which ranks Italy fifth in the world and third in the EU.

### Top 10 European Countries receiving FDI in RES, 2007-2010 (US\$)

Destination Country	2007	2008	2009	2010	Total
UK	2.945.180.000	10.532.390.000	6.523.170.000	1.298.680.000	21.299.420.000
Germany	827.300.000	4.820.132.000	1.835.440.000	1.956.900.000	9.439.772.000
Italy	1.488.400.000	2.074.460.000	4.103.830.000	487.400.000	8.154.090.000
Spain	1.789.340.000	4.491.510.000	781.030.000	481.700.000	7.543.580.000
Portugal	2.308.050.000	2.003.550.000	2.352.120.000	530.000.000	7.193.720.000
France	997.730.000	4.188.170.000	1.201.160.000	383.340.000	6.770.400.000
Belgium	487.800.000	2.019.030.000	128.120.000	-	2.634.950.000
Greece	541.200.000	1.404.230.000	505.550.000	3.400.000	2.454.380.000
Netherlands	440.440.000	1.139.020.000	431.600.000	52.980.000	2.064.040.000
Sweden	332.700.000	218.670.000	286.500.000	579.690.000	1.417.560.000

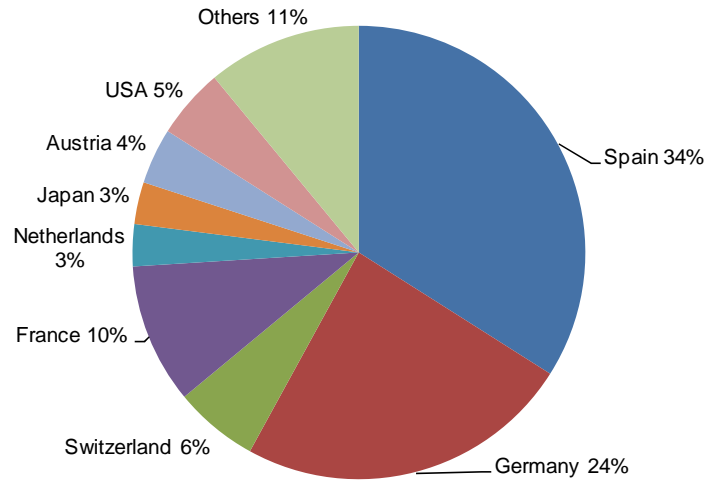
Source: FDI Markets

Spain is the main source country of RES investments in Italy with 21 projects (34%), followed by Germany (15 projects). The remaining projects are distributed among many other European and extra-European countries.

Most projects concern power generation plants – i.e. investments performed by the Spanish multinational ODPE in Apulia (a series of power plants built across the Region; 6 MW capacity once connected) and Piedmont, where ODPE will build 17 solar facilities for overall 75 MW installed capacity).

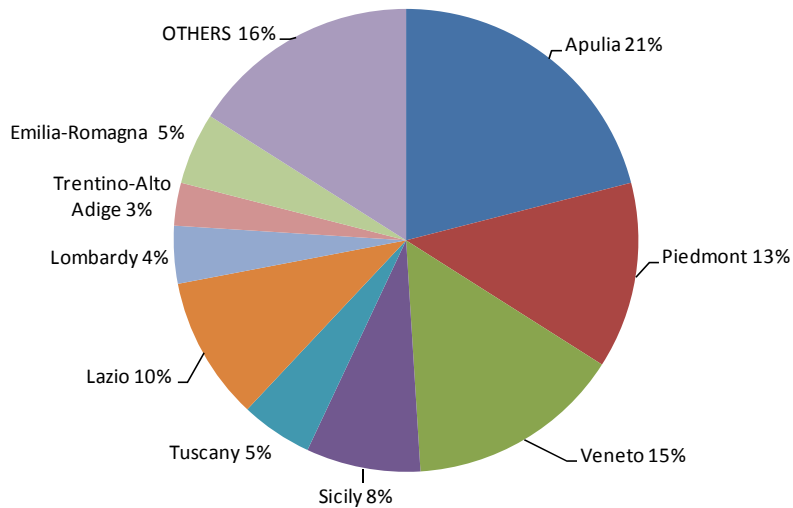
Some other projects include manufacturing activities such as Grup Guascor investment. The Spanish company is interested in opening a factory in Gela (Sicily) to manufacture PV elements including panel supports and solar tracking mechanisms required to assemble panels aimed at a \$900 mln solar power plant investment with 180 MW overall installed capacity in the Country. Since 2007 the most attractive Regions have been Apulia (21% of projects), followed by Veneto (15%) and Piedmont (13%).

### RES FDI in Italy - by Source Country (2007-2010)



Source: FDI Markets

### RES FDI in Italy - by Destination Region (2007-2010)



Source: FDI Markets

The following table based on *Reprint* database, includes only some of the RES foreign companies based in Italy. It is therefore to be intended as incomplete and simply aimed at providing some examples as to players operating in power generation and manufacturing activities in Italy.

### Some Foreign RES Companies in Italy

<b>Manufacturing</b>			
<b>COMPANY</b>	<b>SOURCE COUNTRY</b>	<b>DESTINATION REGION</b>	<b>TURNOVER (mln €)</b>
CONERGY ITALIA SPA	Germany	Veneto	66
REPOWER ITALIA SRL	Germany	Lombardy	4,2
SOLOON SPA	Germany	Veneto	99,5
VESTAS BLADES ITALIA SRL	Denmark	Apulia	88
VESTAS NACELLES ITALIA SRL	Denmark	Apulia	214
<b>Power generation</b>			
<b>COMPANY</b>	<b>SOURCE COUNTRY</b>	<b>DESTINATION REGION</b>	<b>TURNOVER (mln €)</b>
GAMESA ENERGIA ITALIA SPA	Spain	Lazio	3,2
GUASCOR ITALIA SPA	Spain	Lazio	10
T.E.R.N.I. SOLAR ENERGY SRL	France	Umbria	3,7
E.ON AG (PARCO EOLICO DI FLORINAS SRL)	Germany	Sardinia	4,4
E.ON AG (Parco Eolico Iardino S.r.l.)	Germany	Lombardy	3,8

Source: Reprint

## Success story

### Giovanni Buogo – Sales Manager Aleo Solar Italia Srl, established in Italy in January 2008 and based in Treviso

“Italy offers good general conditions thanks to Government promotion of photovoltaics; and we have seen here a promising future market for our premium modules. We decided to establish our headquarters in the Veneto Region. Due to its provision of good connections to infrastructures and its large potential for successful business activities,. Northern Italy is also very interesting as a sales area. From the beginning of our expansion plan in Italy, we have received a great deal of support from Invitalia. Through such support, we were also able to establish contacts with local authorities and politicians. Invitalia was very helpful for us in Italy overall. We also successfully cooperated with the job centre of Treviso”.

Aleo solar AG produces and sells high-quality solar modules using silicon cells, and provides whole solar systems to the global photovoltaic market. The company was founded in 2001 and has been listed in the Frankfurt Stock Exchange's Prime Standard since 2006. The Aleo Solar Group currently employs 788 staffs. Its manufacturing facilities in Prenzlau (Germany) and another two production sites in Spain and China have a 250 MW annual capacity. The company generated € 376,1 million revenue in 2009 (based on preliminary calculations).