Eco-innovation in Italy

EIO Country Profile
2011
The Eco-Innovation Observatory functions as a platform for the structured collection and analysis of an extensive range of eco-innovation information, gathered from across the European Union and key economic regions around the globe, providing a much-needed integrated information source on eco-innovation for companies and innovation service providers, as well as providing a solid decision-making basis for policy development.

The Observatory approaches eco-innovation as a persuasive phenomenon present in all economic sectors and therefore relevant for all types of innovation, defining eco-innovation as:

"Eco-innovation is any innovation that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle."

To find out more, visit www.eco-innovation.eu

Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Commission.
Country Profile 2011: Italy

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A note to Readers
Any views or opinions expressed in this report are solely those of the authors and do not necessarily reflect the position of the European Union. A number of companies are presented as illustrative examples of eco-innovation in this report. The EIO does not endorse these companies and is not an exhaustive source of information on innovation at the company level.

This brief is available for download from www.eco-innovation.eu/Italy
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Summary

Since early 2011, the European Union and its currency, the Euro, are facing significant challenges due to renewed financial and economical concerns on the European and International scene. National debts, financing schemes and discussions about the political and economical independence of member states have populated newspapers and other media throughout the year. The end of such discussions is not yet in sight.

The current status of Eco-innovation both in Italy and in the entire EU can only be seen in reference to the above referenced broader economical circumstances. Especially for what regards an outlook on future opportunities and threats. This includes the current trends in natural resources and energy use as well as in pollution and waste production and global carbon dioxide emissions that, according to the Carbon Dioxide Information Analysis Center (CDIAC), have increased by almost 6% in 2010 in comparison to 2009. The comprehensive CO2 emissions in the EU account for approximately 10-11% of global emissions.

Italy, being one of the founding members and the third strongest economy in Europe, has a significant role in this wider scenario, where laying the basis for a veritably sustainable economy could be the very key agenda for the next years.

How is Italy placed to continue playing an important role in Europe, not simply at an economical level, but more decisively as a co-creator of such future socially, economically and environmentally sustainable society?

Based on the analysis of the 2011 Eco-Innovation Scoreboard Italy’s eco-innovation performance has not changed significantly, although it appears weaker than in 2010. Currently, in the wider EU, Italy obtains the 16th position; in 2010 Italy ranked 12th. Italy displays positive performance, i.e. above the EU average, principally with regard to Environmental outcomes and socio-economic outcomes, while eco-innovation input, activities, and output are below the EU average. Particularly positive results are obtained in relation to certification of environmental management systems, energy productivity, greenhouse gas emissions intensity, Eco-Industry employment, and turnover in eco-industries. A very significant experience has been launched by IMELS – Italian Ministry for Environment Land and Sea, together with the Italian Ministry of the Economic Development, in the field of the environmental certification of products from firm clusters (industrial/productive districts, areas or supply chains). Room for significant improvement is evident with regard to total value of green early stage investments, firms having implemented innovation activities aiming at a reduction of material/energy input, eco-innovation related patents, publications and media coverage, water productivity, exportation of products from eco-industries.

To date, public policies in support of eco-innovation are in line with European and national plans. A number of measures have been and are being enacted both on the offer and the demand side, to promote the socio-economic increase of an eco-innovative culture, again both in the private and public sector.

Relatively new are the programs aimed at promoting the public demand for eco-innovation, i.e. green public procurement. By now environmental criteria to be included in public procurement procedures have been formally adopted by IMELS for seven product categories as well as for two service categories while such criteria are being defined for other widely diffused products and services. There is significant room for enhancing visibility of eco-innovative economical activities and products through similar programs.

Structural limitations to a swift permeation of eco-innovative economics are related to the highly complex and fragmented national setup of public administration and of local communities that slow down effective dissemination of practical information on available financing schemes to a huge number of operators, and also the practical roll-out of project-specific funds.
The initiatives on energy efficiency in buildings over the last few years, sustainable mobility and alternative fuels (LPG, methane) have confirmed very positive results in 2011 and can be considered as one of the established leading eco-innovation areas in Italy, together with renewable energy projects and sustainable constructions, just to mention a few.

'Newly' emerging eco-innovation areas include innovative cooling systems for industrial and real-estate applications, solidarity purchasing groups (so-called-GAS) with major benefits in relation to sustainable agriculture and related transportation, sustainable fashion and its wide range of sustainability benefits, purchasing groups for renewable energy plants (e.g. photovoltaic systems).

Policy development will require a careful evaluation over the next months since Italy’s government has published a very stringent financial maneuver to tackle public debt, however confirming one of the widely recognized and appreciated financial incentives for retrofitting buildings with energy-efficiency measures through tax exemptions.
1 Introduction

Within the last year the national or communitarian conditions for eco-innovation in Europe have not changed significantly, as the policies at EU and national level have been essentially confirmed.

However, the boundary conditions in terms of overall economical status of the European countries and the global economy are showing drastic changes. This regards a number of factors (e.g., national debt of countries and financing of such debts, both in Europe and worldwide, rules for financial institutions and financial transactions) that cannot be examined in this document, but that will reasonably bear strong influence over the economical development at EU and national level.

This said, where is the connection of these arguments with eco-innovation?

According to the Oslo Manual (OECD 2005), innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice.

Eco-innovation can be defined as [...] being the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives.¹

In other words, by the author’s point of view the development of eco-innovative products and services is the social and economical response to a misalignment with regard to environmental sustainability. The above mentioned topics relate to the very foundations of economics in Europe and worldwide. Any changes to European or global economic conditions and the adjustment of such rules will have direct and indirect effects on eco-innovation.

It would be very difficult to judge economy in any single European national state as an entity that is independent from the European Union, especially where binding financial parameters, especially of the common currency, the Euro, have introduced limitations to full independence of single member states (for instance devaluation of the “national currency”).

Where is Italy situated in this overall setting, both regarding its general economics and its potential for eco-innovation?

Italy is confirming its significant national debt, worth more than 120% of its GDP. In monetary value, this means roughly 1,890 billion Euros.

This is one of the highest national debts in Europe (after Germany) and worldwide, especially when compared to the countries that are currently under scrutiny for their national debts and their capacity to reduce it (Greece, Spain, Portugal, Ireland). The major question is, as is for the countries mentioned before, whether Italy has the capacity on its own to reduce such national debt, and how this will influence national policies in relation to eco-innovation.

In this context, what strikes the layman is that Italy, according to historical trade balance data a net exporter in Europe throughout most of the 1990s, has now (since the early 2000s) become one of the major net importing countries in Europe, with a growing trend (see figures 1.1 and 1.2 below).

¹ Final report MEI project about measuring eco-innovation, February 2007
Figure 1.1 | The Italian account balance between 1980 and 2008, in percent of GDP

Source: International Monetary Fund (IMF)

Figure 1.2 | Development of the Italian “production gap” compared to Germany, between 1998 and 2010

Source: JP Morgan
Also, over the last years the trend of Italy’s real Gross Domestic Product (GDP) has been that of an almost flat growth (less than 1% on average between 2002 and 2007); the forecast for 2011 is 0.1% according to EU Commission’s November 2011 estimate.

The Italian government has increased VAT from 20% to 21% in September 2011. Considering that Italy’s GDP is supported considerably by domestic consumption (above 60%), a number of studies indicate that such measure will further decrease any growth of GDP due to its potentially restrictive effects on consumption.

A further increase of VAT (from 21% to 23%) is planned for mid 2012 as part of the recent national plan to decrease the public debt.

The above referenced elements would be considered, in a typical economics approach, to play a dominant role when evaluating and forecasting national trends with regard to general economic strength, including eco-innovation or other eco-related sectors, like the renewable energy sector. Besides such paramount boundary conditions, principal direct challenges, if not threats, to eco-innovation in Italy are related to limited national resources\(^2\),\(^3\), growing costs and maybe even shortage of raw materials and energy (e.g. lanthanides, crude oil/natural gas)\(^4\), limited coherence among European, national and regional policies (e.g. interpretation of secondary raw materials at European and national level\(^5\), efficiency of financing schemes, energy efficiency measures at local level), administrative hurdles and inefficiencies (e.g. effective financial distribution of available national and European funds\(^6\)), complex bureaucracy (from national to regional and local scale), energy inefficient buildings stock. Such typical national and local characteristics will be further examined in the following pages.

Italy has an extraordinary variety of environmental settings, considering its limited land surface, as well as diverse social and economic structures throughout the country. Italy’s main issues in relation to sustainable development are found in basically all sectors that are commonly addressed with the idea of sustainability, i.e. the environmental, social and economic sectors.

Current observable negative trends, just to offer a number of examples, reveal inefficient water consumption, energy-inefficient transportation of goods\(^7\), significant land consumption\(^8\), (often in highly sensitive areas), an economically “weak” south\(^9\), a low percentage of the younger generations involved in the political and economical process\(^10\).

On the other side, the increasing interest of SMEs for eco-sustainable products and services, the growing social awareness with regard to needs and opportunities in the context of sustainability and eco-innovation, the significant reductions in CO2 emissions, can represent significant drivers for further improvement of eco innovation performance.

Overall, it is anticipated that the strong national and local cultural and social factors will play an eminent role in this broader perspective, especially as concerns their capacity to contribute to national and local action and development.

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\(^2\) ISTAT, 2012: I flussi di materia del sistema socioeconomico italiano
\(^4\) ISTAT. Anno 2011 LA DINAMICA RECENTE DEI PREZZI AL CONSUMO;
\(^5\) Filomena Daniela Piccolo, Comment on decision of European Court if Justice, Section III, 18 dicembre 2007, Claim C-194/05 (Faculty of Law, University Naples)
\(^6\) Enquiry www.FASI.biz November 2011 on unspent public funds, e.g. Industria 2015
\(^7\) Conto nazionale delle infrastrutture e dei trasporti - Anni 2009-2010, pubblicato dal Ministero delle Infrastrutture
\(^8\) Source: Report 2011 Legambiente based on data from Istituto di ricerche Ambiente Italia
\(^10\) Source: Ministry for Occupation and Social Policy, November 2011, The Young and the Occupation, Rapporto Censis Year 2011
2 | Eco-innovation performance

The analysis in this section is based on the EU 27 Eco-innovation scoreboard (Eco-IS) for the year 2011. Eco-IS via its composite Eco-innovation index demonstrates the eco-innovation performance of a country compared with the EU average and with the EU top performers. Eco-IS is based on 16 indicators which are aggregated into five components: eco-innovation inputs, eco-innovation activities and eco-innovation outputs as well as environmental outcomes and socio-economic outcomes.

![EU27 Eco-innovation scoreboard 2011, composite index](image)

**Source:** EIO, 2011

In comparison with the 2010 composite index, the updated index for 2011, which has been slightly revised in terms of data weighting and introduction of data thresholds, indicates that Italy obtains a weaker position when compared to the EU average (indexed at 100), i.e. from 98 in 2010 to 90 in 2011.

This position can be understood by looking at the single parameters that feed into the composite index.

**Eco-innovation input**

With regard to eco-innovation inputs, i.e. government R&D appropriations and outlays, total R&D personnel and researchers, green early stage investments, Italy obtains an index of 73 (100 is the EU average), as compared to 90 in 2010. This is principally due to the very low value of green early stage investments (26 out of 100).

As a background information, in the private sector, the Italian industry finances only 37% of research activities, with an EU average of 45% and of 52% in the US.

Positively, in October 2011, the Bank of Deposits and Loans (Cassa Depositi e Prestiti), an agency controlled by the Ministry of Finance, has approved the expansion of the resources to be dedicated to SMEs through the constitution of a new credit line for the banking system in order to finance SMEs. The instrument has been provided with additional 10 billions of Euros that will be in particular used to finance new investment programs and to increase the working capital of SMEs.
With the new resources allocated, the value of the Bank’s support to SMEs through the banking system amounted therefore to a total 18 billion euro and SMEs that have benefited from the funding are about 36 thousand.\textsuperscript{11}

However, to underline the current development of financing for companies, the following graphs show the major financial pressure that regards SMEs, i.e. over 95% of Italy's companies.

\textbf{Figure 2.2 | The cost of money for Italian companies (major companies and SMEs) between 2005 and 2011}

\begin{quote}
\includegraphics[width=\textwidth]{figure2.2.png}

\textit{Source: data from Banca d'Italia and Thomson Reuters elaborated by CSC}
\end{quote}

Company financing between 2005 and 2011: the upper graph shows the cost of money for companies (in % interest); lower graph – the Euribor 3m interest spread, in %. The blue curve indicates small loans, generally related to SMEs.

It should however also be noted that government R&D appropriations and outlays (GRAO) based on the data for 2011 are above the average EU index (106 over 100).

Eco-innovation activities

For what regards eco-innovation activities, Italy obtains an index of 88, where the principal positive driver is related to ISO 14001 certificated companies/institutions, whereas firms having implemented innovation activities aiming at a reduction of material input and energy input per unit output appear to far below the EU average (53 and 61 of 100, respectively).

Even in this sector, the 2010 result, with an index of 104, was significantly better than the 2011 data, with an index of 88.

This appears understandable given the current structural layout of Italy’s firms, where more than 94 % have less than 10 employees (in 2008). Considering this small size, changes to any of the driving parameters of an economical activity are difficult to implement, as no personnel resources are potentially available to plan and implement such changes. Also, again, financial resources potentially required to execute similar efficiency measures are difficult to obtain (see eco-innovation inputs).

Despite these difficulties, the number of SMEs that invest in green economy is growing steadily. In 2010, the year just after the recession of 2008-2009, three manufacturing SMEs in ten (30.4%) invested in green technologies and products, with major energy efficiency or minor environmental impact. In 2011 the proportion has practically doubled, with almost six manufacturing SMEs (20-499 employees) out of ten who will invest in green technologies and products (57.5%)\textsuperscript{12}.

\textbf{Figure 2.3 | Status of reduced material (left) and energy (right) use in 2010}

\begin{figure}[h]
\begin{center}
\includegraphics[width=\textwidth]{figure2_3.png}
\end{center}
\end{figure}

\textit{Source: Eurostat 2010}

\textsuperscript{12} Green Italy Report 2011
Eco-innovation output
In terms of Eco-Innovation Output, measured by means of eco-innovation related patents, publications and media coverage, Italy rates significantly below the average EU index.

Positive, in relative terms, is the number of publications and media coverage, while still being below EU average. Significantly lower is the number of patents.

However, the number of patents is only one of the output indicators, which can be used in this analysis. In fact, the statistics on number of patents related to eco-innovation are difficult to be calculated in Italy, as there is not a national database on patents related to eco-innovation. In this context, the creation at regional level of observatories in the field of environmental patents (e.g. Marche Region) can contribute to fill the gap represented by the absence of a nationwide systematic monitoring of national and European patents with potential environmental impact and the growing interest of SME on this issue.

Indeed, as it will be seen in the further discussion, many of the outputs are aimed at the local market, where some of the measured parameters (e.g., patents) are less relevant due a good local and regional integration of the economic players. In fact, the overwhelming number of SMEs appears to be less focused on obtaining patents or preparing publications for their innovative products. Therefore, this outcome should not be overestimated.

According to the above paragraph, over the last years, information about ecology, climate change, sustainability and the related sustainable lifestyle have seen a fast increase in terms of country-wide information and publications.

The following graph depicts a comparison of Eco-Innovation media coverage in Europe, the USA and Oceania, where Europe shows a historically minor attention to publications on a topic like Eco-Innovation in, when compared to the US for instance.

Figure 2.4 | Media related information about eco-innovation in Europe, North America and Oceania

Source: EIO, 2011
Environmental outcomes
The actual Eco-Innovation Environmental outcomes, i.e. the real benefits of Environment, are evaluated in reference to material productivity, water productivity and energy productivity, together with greenhouse gas emissions (GHG). This result appears to be in conflict with the results for “eco-innovation activities”, according to which Italian companies are slow in introducing material and energy efficiency measures. However, Italian companies are known to produce efficiently; otherwise, the large number of very small-scale companies would not possibly survive.

On the other hand, i.e. eco-innovation outputs that are measured based upon specific measurable criteria of a recognised innovation process, the actual environmental status in Italy turns out to be significantly above the EU average index, especially in relation to material and energy productivity, and GHG. In particular, in Italy, GHG emissions show a decreasing trend from 2004 and accounted for 510.0 MtCO2eq in 2010 and for 504.3 MtCO2eq in 2011 (provisional data).

Notoriously, the water productivity Italy is less efficient as a result of high losses from the distribution grids (estimated recently in excess of 30%). However, given the disconnected nature of the Italian territory, this aspect might not be a surprising data, considering the need for building and doing maintenance on plants for water abstraction, storage and ducts.

Compared to 2010, Italy has further increased its position among the countries with net environmental outcomes (from 110 to 113%).

The environmental outcomes can arguably be taken as the single most representative parameter of eco-innovation. In other words, if there are positive indicators on eco-innovation input and activities and output, however without actual environmental outcomes, there should be further review of data and their representativeness and an interpretation of their effectiveness.

Socio-economic outcomes
The socio-economic outcomes index is based on data on the performance of “eco-industries” including exports, employment and turnover. Italy reached an index of 106 overall, i.e. 6% ahead of the EU average. This is owed principally to significant employment in eco-industries (48% above the EU average) and financial turnover in eco-industries (28% higher than typical turnover in the EU).

For what regards exports of products from eco-industries, measured as a percentage of total exports, Italy reaches only 41% of the EU average. This is interpreted as indicating a significant domestic demand for eco-innovative products, confirmed by the fact that Italy is among the major industrial producers in the European Union, thus requiring supplies from the eco-industry. Compared to 2010, the overall socio-economic index has grown from 96 (below the EU average) to 106, thereby confirming the growing awareness of the economical potential of eco-innovation and the significant potential for sales both at national and international level.

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13 Emission figures of the Italian emission inventory and other related documents are publicly available at [http://www.sinanet.apat.it/it/sinanet/serie_storiche_emissioni](http://www.sinanet.apat.it/it/sinanet/serie_storiche_emissioni)


15 eco-industries include waste management, water supply and treatment, materials recycling, renewable energy, control of air pollution, soil, groundwater, noise pollution, and biodiversity protection areas
3 | Established eco-innovation areas and markets

The origins of Italy’s established eco-innovative developments are mostly found in eco-industry sectors that are characterised by companies having branches with focus on renewable energy (hydroelectric, geothermal and bio-energy, solar cells, wind turbines, district heating, cogeneration of electric and thermal power), water and waste management, air purification, soil remediation, energy efficiency, and sustainable construction and sustainable mobility. Some of the initial innovative input was, at least in specific sectors (e.g. wind energy, photovoltaic systems), through foreign investors and import of technology.

This picture has radically changed and more and more national design and production is available in all of the above sectors, to some extent as a result of policies that promote use and production of greener energy, through generation of so-called green (since 1999), white (scheme started in January 2005) and black (since late 2004) certificates. In addition, numerous investments are being deployed also in manufacturing, ceramics, fashion industry, chemical production. Green certificates are traded separately from the energy produced via the GSE, i.e. the institution that manages energy services.

More than 30% of the “green” firms will hire throughout the year new employees, with a share of 41% of the total planned hires in industry and services. Out of these, 29% planned to be highly skilled employees and 15% personnel with university degrees16.

According to a comparative study conducted by company IR top on a sample of thirteen large Italian “Green” firms (compared to about 100 firms in France, Germany and UK), the average increase in turnover and of margins were significantly better than the comparative firms17.

Energy-Efficiency Measures
The “financial stability decree”, signed by the Italian Prime Minister, on the 6th December 2011 has confirmed the financial incentive by means of a 55% tax exemption for energy efficiency measures in housing, described already in the 2010 country brief. This fiscal incentive will last until the end of 2012 and will then be lowered to a 36% tax exemption. This instrument is seen as having triggered a significant growth in energy efficiency measures in housing, also historic buildings, at an overall moderate cost for the public. In the period between 2007 and 2010, about 996,100 requests for refurbishment have been registered18.

According to the Report “GreenItaly 2011”, 23.9% of Italian firms have introduced, between 2009 and 2010, or will have introduced, by 2011, investments in products or technologies for energy efficiency measures or reduced environmental impact. Also, among SMEs (between 20 and 499 employees) at the break 2010/2011 the percentage of green investments has doubled19.

The national institute ENEA is providing specific support on energy efficiency measures (among other topics), in order to reach the 20-20-20 target established by the EU.

A study prepared by Energy&Strategy Group, School of Management at the Polytechnics of Milan, indicates that energy efficiency measures, particularly in the private housing sector, could be as good as three times the Italian 2020 plans for energy savings (thermal and electrical).

16 Research by Unioncamere, AssoLombarda and Symbola
19 GreenItaly 2011 report.
Renewable Energy Sector

In 2010, Italy has produced 76.9 TWh of electricity by means of renewable energy systems, i.e. 22.8% of the gross national electricity demand, up 11% over 2009.

The table 3.1 and 3.2 highlight, respectively, the Renewable Energies (REs) Gross Installed Power (MW) and REs Gross Energy Production in the period 2008-2011.

Table 3.1 | Gross Installed Power 2008-2011

<table>
<thead>
<tr>
<th>Gross Installed Power (MW)</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro power</td>
<td>17.623</td>
<td>17.712</td>
<td>17.876</td>
<td>17.950</td>
</tr>
<tr>
<td>Wind</td>
<td>3.538</td>
<td>4.898</td>
<td>5.814</td>
<td>6.860</td>
</tr>
<tr>
<td>Solar</td>
<td>432</td>
<td>1.144</td>
<td>3.470</td>
<td>12.750</td>
</tr>
<tr>
<td>Geothermic</td>
<td>711</td>
<td>737</td>
<td>772</td>
<td>772</td>
</tr>
<tr>
<td>Bioenergies</td>
<td>1.555</td>
<td>2.019</td>
<td>2.352</td>
<td>3.020</td>
</tr>
<tr>
<td>Total REs</td>
<td>23.859</td>
<td>26.519</td>
<td>30.284</td>
<td>41.352</td>
</tr>
</tbody>
</table>

* First Estimated Data

Source: Energy Service Operator (GSE- Gestore dei Servizi Energetici) - www.gse.it

The following graphics show, respectively, the percentages of each Renewable Energy sources on the total Gross Installed Power in the year 2008 and 2011. In 2008 the Hydro power represented almost the total Gross Installed Power and in 2011 there was an increase of the solar plants. The comparison of Gross Installed power 2008-2011 shows an increment for each REs except Geothermic. The graphics have been elaborated starting by Table 3.1.

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20 http://www.gse.it/it/Dati%20e%20Bilanci/Osservatorio%20statistico/Pages/default.aspx
21 On the basis of data available at http://www.terna.it/LinkClick.aspx?linkticket=gY%2b3XUDUIjQ%3d&tabid=418&mid=2501.
The following graphics show, respectively, the percentages of each Renewable Energy sources on the total Gross Energy Production in the year 2008 and 2011. Accordingly to the Gross Installed Power, in 2008 the Hydro power represented almost the total Gross Energy Production and in 2011 there was a significant increase in the solar plants. The comparison of Gross Energy Production 2008-2011 shows an increment for each RE’s except Geothermic. The graphics have been elaborated starting by table 3.2.

Table 3.2 | Gross Energy production 2008-2011

<table>
<thead>
<tr>
<th>Gross Energy Production (GWh)</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro power</td>
<td>41.623</td>
<td>49.137</td>
<td>51.117</td>
<td>46.350</td>
</tr>
<tr>
<td>Wind</td>
<td>4.861</td>
<td>6.543</td>
<td>9.126</td>
<td>10.140</td>
</tr>
<tr>
<td>Solar</td>
<td>193</td>
<td>676</td>
<td>1.906</td>
<td>10.730</td>
</tr>
<tr>
<td>Geothermic</td>
<td>5.520</td>
<td>5.342</td>
<td>5.376</td>
<td>5.650</td>
</tr>
<tr>
<td>Bioenergies</td>
<td>5.966</td>
<td>7.557</td>
<td>9.440</td>
<td>11.320</td>
</tr>
<tr>
<td>Total REs</td>
<td>58.164</td>
<td>69.255</td>
<td>76.964</td>
<td>84.190</td>
</tr>
</tbody>
</table>

Source Energy Service Operator (GSE- Gestore dei Servizi Energetici) -  [www.gse.it](http://www.gse.it)
Renewable energy systems are found, according to a study conducted by Legambiente, in about 7,000 out of 8,092 municipalities in 2010 as shown in table 3.3.

<table>
<thead>
<tr>
<th>Year</th>
<th>Solar</th>
<th>Photovoltaic</th>
<th>Wind</th>
<th>Mini Hydro power</th>
<th>Biomass</th>
<th>Geothermic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>390</td>
<td>2.103</td>
<td>157</td>
<td>114</td>
<td>306</td>
<td>28</td>
<td>3.190</td>
</tr>
<tr>
<td>2009</td>
<td>2.996</td>
<td>5.025</td>
<td>248</td>
<td>698</td>
<td>604</td>
<td>73</td>
<td>5.591</td>
</tr>
<tr>
<td>2010</td>
<td>4.064</td>
<td>6.311</td>
<td>297</td>
<td>799</td>
<td>788</td>
<td>181</td>
<td>6.993</td>
</tr>
<tr>
<td>2011</td>
<td>4.384</td>
<td>7.273</td>
<td>374</td>
<td>946</td>
<td>1.136</td>
<td>290</td>
<td>7.661</td>
</tr>
</tbody>
</table>

Source: Comuni Rinnovabili 2012 / Rapporto di Legambiente
http://www.legambiente.it/sites/default/files/docs/rapporto_comuni_rinnovabili1.pdf

In 2010, the total financial incentives granted for the totality of renewable energy production (hydroelectric, geothermal, wind, photovoltaic, and biomass) was worth 3.7 billion Euros, of which 30% for photovoltaics, 27% for biomass and 25% for wind energy.

Due to existing inefficiencies of the electrical grid, in particular regarding the feed of discontinuous electrical power from renewable energy systems, Terna (the national operator of the grid) has approved, at the beginning of 2011, an investment plan of 7.7 billion Euros for development of the grid in the period between 2011 and 2020.

According to studies conducted by the main actors in the renewable market, the acceptance of renewable energy systems and related potential benefits is predominant among Italians, however with ongoing discussion about costs of feed-in tariffs and green certificates.

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12 www.anci.it
RINNOVA, verso il 2020

The Energy Service Operator (Gestore dei Servizi Energetici - GSE) in October 2011 launched "Rinnova, verso il 2020", an information area open to all, citizens, public administrations, businesses and industry professionals to facilitate the consultation of:

• the actions at the European, national and regional levels on renewable energy sources, energy efficiency, climate and energy and gas markets

• the insights and industry studies

• SIMERI, the Italian system for the monitoring of renewable energy, which allows to view the status of achieving the national target of 17% in 2020, following the evolution of energy demand met by renewable energy

• the authorization procedures provided for at national and regional level for the installation of renewable energy plants

• "Best Practices" of citizens, associations, businesses and governments for the diffusion of renewable energy, energy saving and energy efficiency and sustainable lifestyle

Wind energy

In 2010, the total installed power was about 6 GW_{electric} produced by 487 wind generators\(^{23}\), denoting an increase of almost 20% over 2009, however less sharp compared to previous yearly growth rates. One of the reasons could be significantly decreased market value of "green certificates" produced by wind generators.

Nonetheless, a forecast on the actual potential of wind energy is about 12.7 GW in 2020\(^{24}\), i.e. almost 7 more GW that could potentially be installed.

The potential CO2 savings related to the installed power in 2010 were approximately 11.5 million tons (considering the standard energy mix in Italy).

In addition to such established sectors, additional small-scale solutions are being deployed. An example is the small wind turbine ‘Libellula’ proposed by ENEL Green Power (see good practice example). Estimates on the potential for small-scale wind energy systems (<200 kW) show that Italy may install a total power of approximately 1 GW_{electric}\(^{25}\).

Wind generator "libellula" designed for Enel Green Power by Renzo Piano

Taking advantage of the research on lighter and more resistant materials, and new technology solutions, a new concept of wind turbine has taken shape, more sensitive to the winds present at low level and spread over the territory. The wind turbine designed by Renzo Piano Building Workshop, with a capacity of 55 kW, has a continuous generation of electricity because they can take advantage of low wind speeds with minimum in the order of 2 m/sec. The objective of this work is also a "natural" integration with the territory thanks to a low environmental impact. The preferred solution was therefore a two-bladed as opposed to three-bladed bladed turbines to reduce the visibility by one third, also obtaining, in cases of total absence of wind, a thin vertical line on the tower and the two vertical blades.

Source: \textit{http://www.enelgreenpower.com}

\(^{23}\) \textit{www.terna.it}

\(^{24}\) \textit{www.sviluppoeconomico.gov.it}

\(^{25}\) ANEV, the Italian Windenergy association

\(^{26}\) Biomass Energy Report dell Energy & Strategy Group (Politechnics of Milano)
Biomass is used to produce electricity, heat and for transport.

**Biomass for Electricity**

In 2010, electricity from biomass has reached 9.440 GWh, with an increase of +24,9 % compared to 2009. Table 3.4 shows the different contribution coming from solid biomass, biogas and bioliquids in 2010.

<table>
<thead>
<tr>
<th>Energy Production (GWh)</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid biomass</td>
<td>4.307,6</td>
</tr>
<tr>
<td>Biogas</td>
<td>2.054,1</td>
</tr>
<tr>
<td>Bioliquids</td>
<td>3.078,4</td>
</tr>
<tr>
<td>Total</td>
<td>9.440,1</td>
</tr>
</tbody>
</table>

*Source Energy Service Operator (GSE- Gestore dei Servizi Energetici) - www.gse.it*

Particularly, electricity from solid biomass has been of 4.307,6 GWh\_\text{electric} compared to the production of 2009, there was a decrease of -3.1%\(^27\).

A very positive development can be seen with regard to biogas, where Italy is also planning grid distribution of biomethane. At the beginning of 2011, 672 installations were counted (including biogas from landfills), with a yearly production of about 2.054 TWh (up to 23,4% over 2009). According to such development, Italy is the 3rd producer of biogas in Europe, with a significant potential for further increase (a 2012 forecast is that about 0.8 GWelectric will be installed). Also, there is a very strong potential for use of biomethane in transportation, considering that Italy has the highest number of cars powered by methane\(^28\). Finally, energy production from bioliquids in 2010 was of 3.078,4, +112% compared to 2009.

**Biomass for heating**

In 2008, the Italian APAT, now ISPRA, i.e. the Institute for Environmental Protection and Research conducted a study on the use of wood for heating of private homes. The outcome was that the yearly use of wood is about 20 million tons, used by approximately 20 % of the population more than 4 times a year. The savings with regard to CO2 emissions are in the order of 9 million tons per year. Due to the inefficient combustion of fire places or traditional ovens, heating with wood in such installations has however a significant contribution to fine particle emissions (so-called PM10).

Estimates indicate that heating with wood in traditional ovens causes about 30% of the total PM10 emissions. Wood pellet is the second most commonly used wood fuel in Italy, covering approximately 9% of total wood fuels consumption, making Italy as the largest European market for pellet stoves and using pellets for domestic heating\(^29\). According to AIEL (Associazione Italiana Energie Agroforestali) estimations\(^30\), in 2009 over 1.2 million of tons of pellet were distributed, 60% of which came from national production and the rest from importation. The large and still growing market of pellet stoves for domestic heating will probably continue to drive the demand for pellets in the coming years.

**Biomass for transport**

\(^{27}\) [www.gse.it](http://www.gse.it)

\(^{28}\) [www.gse.it](http://www.gse.it) and [www.crpa.it](http://www.crpa.it)

\(^{29}\) Source ETA Renewable Energies, 2009. Development and promotion of a transparent European Pellets Market Creation of a European real-time Pellets Atlas - Pellet market country report – ITALY. Available at the pellets@las website at [www.pelletsatlas.info](http://www.pelletsatlas.info)

\(^{30}\) Source: [http://www.aiel.cia.it/immagini/upload/pagineAIEL_2010.pdf](http://www.aiel.cia.it/immagini/upload/pagineAIEL_2010.pdf)
Another biomass sector are biofuels, like biodiesel and bioethanol, where Italy is the third producer in Europe. The production of biodiesel has been constant while bioethanol has sharply decreased, being more than offset by importation of bioethanol.

However, a second generation bioethanol plant, the first all over the world, is being built in Italy, as a result of an international joint venture led by Mossi and Ghisolfi. The new plant will be inaugurated and put into operation in the Piemonte Region during 2012 and it is expected to produce around 40-45 thousand tons of bioethanol per year.

Moreover, ENI group is carrying out important activities on second generation biofuels31.

**Photovoltaics**

In October 2011, almost 315,000 photovoltaic systems were operative, with a cumulative installed power of roughly 11.9 GW, about 9 GW of which were installed in 2011, thus accounting for the top power of new installations worldwide32. 12.5GW produce more than 1.9 TWh of electricity per year (0.6% of Italy's demand for electricity).

The total "saved" CO2-emissions from conventional fossil electricity production is estimated in approximately 23 million tons of CO2 per year. Also, minor importations of fossil fuels are worth at least 3 billion Euros.

According to ENEA’s 2011 study on photovoltaics, only 15% of PV modules and about 30% of inverters were produced by Italian companies, however showing a significant increase with regard to former years.

Nomisma Energia has estimated that between 2009 and 2010 about 20,000 new jobs have been created as a result of the increase in ‘renewable energy’. At the end of 2010, in total about 120,000 jobs were connected, directly or indirectly, to renewable energy systems.

**Solar thermodynamic**

In terms of technically innovative solutions, in July 2010, "the Italian utility Enel unveiled "Archimede", the first Concentrating Solar Power (CSP) plant in the world to use molten salts for heat transfer and storage, and the first to be fully integrated to an existing combined-cycle gas power plant. Archimede is a 5 MW plant located in Priolo Gargallo (Sicily), within Europe's largest petrochemical district. The breakthrough project was co-developed by Enel, one of World's largest utilities, and ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development.33

The use of molten sodium and potassium nitrate that reportedly leads to higher efficiency of the CSP and better heat storage at night, besides being environmentally safe, is a result of research activities conducted by Nobel Prize Winner Carlo Rubbia started in 2001, together with ENEA and ENEL.

**Smart cities/eco-industry districts**

In Italy, already the law-decree 112/98 (so-called Bassanini law) introduced the concept of industrial areas endowed with high quality environmental infrastructures (so-called Area Produttiva Ecologicamente Attrezzata) and established that “the Regions should discipline, by means of their own laws, the industrial areas and the ecologically equipped areas, equipped with the necessary infrastructures and systems suitable to guarantee the safeguarding of health, safety and the environment. The same laws shall also discipline the form of unitary management of the infrastructures and the services of the ecologically equipped area by the public or private actors.

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32 [http://www.gse.it/it/Conto%20Energia/Pages/home.aspx](http://www.gse.it/it/Conto%20Energia/Pages/home.aspx)
There are a number of EU projects that see or have seen active if not leading participation of Italian partners (SIAM, Ecomark, MEID, etc.) to define characteristics and practical development of ecological or sustainable industrial areas/districts.\(^{34}\)

Significant values can already be found in localised production districts and shared infrastructure (e.g., tanning district Vicenza, industry park Turin, Eco-park Bologna, ZIP Padova, mechanical district Brescia, leather district Prato, industrial district Ragusa, to mention a few among others), where short transportation routes and shared infrastructures provide high value with eco-innovative solutions for instance with regard to recycling of waste and use of energy.

In addition, the national institute ENEA is providing support for a number of integrated and potentially systemic topics, like conversion of the national transportation system, to reach the target of the EU.

Scenarios are being developed for a more integrated understanding of the role and values of urban green areas, and their transversal dimension with respect to many other important urban political issues (air quality, mobility, social demand, etc.).\(^{35}\)

Again, increasing is the regional expenditure for environmental protection measures. In 2009, the average expenditure per citizen was about 85 Euro, increased by 5% with regard to 2008.

Finally, with the aim to strengthen the economic role and development opportunities of production districts as well as supply chains, IMELS and Ministry of Economic Development have jointly launched a national environmental scheme aimed at labeling products and services from the clusters with clearly identified and verified environmental characteristics and performances.

**Environmental certification schemes**

Another area of excellence is the certification of environmental management systems EMAS and ISO 14001 in industry and in the public sector. Such certification schemes, beyond the related value of a mature market, allow effective relationships between various private and public actors at local and regional level and therefore the potential for a broader systemic change. In 2011, an increase between 6% and 10%, respectively, of new certifications and regarding the conformity of firms with environmental management schemes was evidenced in May 2011 with regard to the previous year, thus confirming the vitality of the market for certification schemes in a difficult economical setting.\(^{36}\)

Furthermore, starting from the implementation of EMAS scheme by firms of industrial/productive districts, areas or supply chains (the so called “production clusters”), IMELS and Ministry of the Economic Development are being developing the national environmental scheme mentioned above. This scheme has been experimentally implemented in the “mobile Livenza” district in the northern Italy.\(^{37}\)

**Sustainable constructions**

Consolidated initiatives are found also in sustainable construction as a result of public policies that have indicated minimum efficiency parameters and through private real estate investors that are focussing on doing better than what is required by regulations.

Ecoinnovation in the sustainable housing sector is of a higher importance when sustainability is coped with low cost housing.

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\(^{34}\) ENEA/MEID “Mediterranean Eco-Industrial Development”, http://www.medmeid.eu/

\(^{35}\) ISPRA - the Italian Institute for Environmental Protection and Research, http://www.isprambiente.gov.it/site/en-
gb/ISPRA/The_Institute/


\(^{37}\) http://www.distrettodelmobilelivenza.it/progetto-emas.php#
Considering that urban planning and housing regulations are regional competences in Italy, the sustainable housing sector varies from region to region, according to different initiatives that can be found at the local level and many valuable initiatives are widespread all over the Country.

Italy is an active member of the CECODHAS Housing Europe, the European Federation of Public, Cooperative & Social Housing - a network of 45 national and regional federations, which leads the Italian POWER HOUSE Platform. It covers the issues related to innovative technology solutions, as well as all matters related to the technical feasibility of renovation projects, from the preliminary analysis to the monitoring of the actual performances achieved after the interventions. There are several examples of projects realised especially in the Northern Italy which are part of the Power House Platform. In Italy there is a growing number of realised low-cost housing and low-cost social-housing interventions, which have tried to cope low budget needs with a certain degree of energy efficiency and architectural quality.

Among those latter, the Ancona IACP social housing – Social Housing (Marche), the Rehabilitation of the former Bersaglio furnace Faenza (Emilia-Romagna), the Chiari (Brescia) La casa ecologica Bresciana – social housing (Lombardia), are to be mentioned.

Some of the main sustainable and low-cost adjustments can be found in the use of active solar systems (photovoltaic and thermal), in a strong thermal inertia masonry, in the acoustic insulation, in the use of toxic free natural materials, in the reduction of electric and electromagnetic fields, in centralized and radiant heating system, in the reuse and recycle water systems and low consumption lighting system.

In the context of LEED - Leadership in Energy and Environmental Design scheme, Core & Shell Platinum Building in Vimercate, the Zero Energy House and the Filca ‘zero consumption bio-building’ can be considered three good practice examples.

The new Building 03 in the Vimercate Energy Park is the first Italian building to achieve the LEED Platinum Core & Shell 2.0 certification. The production of fluids is entrusted to two multipurpose hybrid condensing units Integra by Climaveneta. The control system, depending on climatic conditions and building requirements, decides the priority of one of the two units, one air cooled and the other water-cooled. The key benefit of multi-purpose units is derived from the full exploitation of concurrent requests recovery of heat and cold from the building.

The Zero Energy House, in Friuli Venezia-Giulia Region, aims at discovering a new harmony between building, man and the environment. The "Zero Energy" House is defined as a smart green building because it is completely automated and guarantees its inhabitants the highest level of comfort, safety and energy savings; it uses the innovative "Home Sapiens" home automation system for optimization of renewable energy resources and minimization of the consumption of non-renewable energy.

Finally, it can be mentioned the example of the Filca ‘zero consumption bio-building’ in a residential complex (see the box below).

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38 Edilizia e Territorio, Il Sole 24 Ore www.ilsole24ore.com
40 http://www.archinfo.it/leed-platinum-per-building-03-a-vimercate/0,1254,53_ART_5744,00.html
41 www.casazerenergy.net
Organic agriculture
The increasing of the biological production has been confirmed in 2011: Italy, with an area of over 1 million organic acres, occupies at global level the eighth place (after Argentina, China, USA, Brazil, Spain and India) and the second at European level. With a significant portion of organic production sent abroad, Italy is also the largest exporter of organic products (reaching stores across Europe, USA and Japan). Italy is also ranked first in Europe for the number of farms that have chosen the organic method.

In Italy, the high level of innovation of this sector is related to several important factors, that can be identified in: a significant percentage of women entrepreneurs (25%), youth (50% are under 50 years) and the use of innovative technologies. At worldwide level, Italy is the first producer of organic vegetables (with an area of 28,000 hectares of which 22% in conversion), cereal (with around 200,000 hectares of which 24% in conversion), citrus (23,000 acres of which 32% in conversion), grapes (with 52,000 hectares of which 42% in conversion) olives (over 140,000 hectares of which 31% in conversion). The Italian organic market is estimated at 3 billion Euros, and it is registering significant improvements (for example, 11.5% only in the first quarter of 2011).

A recent census by the National Information System on Organic Agriculture (SINAB) of the Ministry of Agriculture shows the existence of about 47,700 farms. Most of them are localized in Sicily’s and Calabria’s Regions. Indeed, according to this census, the Regions with mayor distribution of farms of transformation into organic products are mainly in Emilia Romagna’s, Veneto’s and Lombardy’s Regions.

Residence verdiana in Clusone, “the zero consumption bio-building”

Inside: the use of natural materials (wood and plant-based masonry paint); air exchange with mechanical ventilation and heat recovery; large windows. Outside: blinds, large balconies, and vegetation in green areas, provide shade with hot weather and better living experience.

Thin-film modules and technology-cell tandem “micromorph” produced by HelioSphera Peak Power:
- 10.0 kWp, annual power coverage: 10.0 kW / year,
- Effective surface: 72 square meters. The modules are attached to the roof to the east and west with double frame Alubel used to ensure continuous supply in the event of failure of a single module.

Certifications obtained: on the specific project in Clusone no environmental certifications were obtained at present, however Filca applies its internal protocol validated by a Technical and Scientific Committee and by a Technical Inspection Company. Since 2011 Filca Italy is a member of GBC, participates in standards committees and, in 2012, will activate the first two LEED certifications on two construction projects in Lombardy.

Monitoring systems: Internal temperature control system with programmable thermostats in each room. Electrical Switchboard display detects the instantaneous electric power consumption. At the end of the work a campaign will be started to monitor heat consumption as other currently ongoing projects.

Source: [http://www.filca.it](http://www.filca.it); [http://www.filca.it/static/template/popVideo.aspx?v=/static/upl/fl/filca1_F6360p%284x3%29FILCA1.flv&w=320&h=260](http://www.filca.it/static/template/popVideo.aspx?v=/static/upl/fl/filca1_F6360p%284x3%29FILCA1.flv&w=320&h=260) (Video re Filca and LEED certification)

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42 GreenItaly 2011 Report
43 SINAB,(Sistema d’Informazione Nazionale sull’Agricoltura Biologica, Bio in cifre 2010
44 Symbola, 2011, Green Italy - The green economy challenges the crisis
45 SINAB,(Sistema d’Informazione Nazionale sull’Agricoltura Biologica, Bio in cifre 2010
According to the estimation of Accredia\textsuperscript{46}, the organic food is distributed by health food stores, supermarkets, traditional shops, discounts, and other commercial tools – e.g. internet.

In the public schools and hospitals, the use of organic food has been institutionalized, by art. 59 of Financial Law 2000, through a specific Fund for the development for organic agriculture\textsuperscript{47}.

At the present time, the Interuniversity Research Centre for Sustainable Development (C.I.R.P.S), commissioned by Federbio (Italian Federation on Organic and Biodynamic Agriculture), is leading a project on the use and types of energy sources, in organic agriculture. The aim of this project is to identify possible strategies to reduce emission costs from energy consumption, as well as to assess economic and environmental impact, related to possible scenarios of interventions, in promoting the use of renewable sources and of energy efficiency\textsuperscript{48}.

In Italy, since 2011, it has been recorded a prominent interest in integrating the products obtained from recycling of organic wastes, with organic farming systems. Research activities are carried out in the use of green and mix compost (without sewages), or other kinds of organic wastes, to improve the organic farming and compensate the lack inorganic fertilization and pesticides.

Finally, innovative technologies are being used also in the production of organic wine for the elimination of sulphites\textsuperscript{49}.

**Sustainable urban mobility**

Mobility intended as transportation of people and goods is one of the key topics that affect a sustainable lifestyle almost at global level. Italy with its geographical characteristics is definitely one of the countries with significant mobility issues.

Italy, in particular the main urban areas across the country, has important transportation and delivery networks. Roughly 25% of greenhouse gas emissions (GHG) relate to transport (European Environmental Agency, 2009), with over 90% due to transportation via road (ISPRA, 2010). Over 70% of mobility demand in Italy concerns the urban areas, and therefore the efficacy of actions of sustainable mobility is affected by urban transport planning, whose guide-lines and technical schemes are ruled by national and regional laws. Sustainable mobility consists of a mix of actions aimed to reduce the pollution produced by vehicles, and they are different in terms of costs, modality of application in the single areas, efficacy in the short, medium and long period. Some examples of these actions concern the improvement of public transport, measures for road safety especially for vulnerable users as pedestrians and cyclists, promotion of cycling, use of LPG and methane instead of gasoline and diesel oil, policies of city logistics for distribution of goods, services of car sharing and car pooling.

Sustainable mobility concepts have gained attention by citizens and institutions starting from 2000, but the importance of their implementation is perceived especially in the big cities, where the traffic congestion is more significant. In the framework of the EU-Directive for the standard of emissions of vehicles, Italy has promoted the renewal of vehicles fleet (especially cars and motorcycles) with new ones less polluting; nevertheless the success of sustainable mobility policy also depends on the adoption of different actions into an integrated planning.

Furthermore, Italy participates to the European project MO-MO car sharing for the development of car sharing in the cities, and in 2011 in Italy there were approximately 21,000 registered users that shared about 600 vehicles located in about 400 parking spaces. Cities with major diffusion are Milan, Rome, Turin and

\textsuperscript{46} http://www.accredia.it/
\textsuperscript{47} Bioreport 2011: L’agricoltura boplogica in Italia. Ministero delle Politiche Agricole Alimentari e Forestali
\textsuperscript{48} http://www.federbio.it/comunicati-stampa.php?nid=628
\textsuperscript{49} http://www.federbio.it/comunicati-stampa.php?nid=628
Venice. The Car Sharing Initiative (ICS) is a national co-ordination structure involving the main Italian Municipalities to set up local car sharing services managed by different local companies but integrated in a standardised operational scheme. It is estimated that one shared car could replace 10-12 private cars and that the saving in terms of private cars could reach about 6000 cars. About 62% of users declare that they have not purchased a private car or a second private car. At the same time, users have had the opportunity to participate to important car-sharing initiatives. In fact after the great success of the first campaign with more than 1,500 new car-sharing users, in May 2010 the second car-scraping campaign has been launched: who dismantles a car will have free car sharing subscription for 18 months and € 600.00 bonus for the service. The lack of a private car determines a better use of public transportation and a reduction of area used for parking and in the traffic, and of kilometers covered with a car, together with estimated reduced CO2 emissions by roughly 7,000 tons/year\(^{50}\). In terms of eco-friendly vehicles, the Ministry of Environment financed the experimentation of hybrid vehicles in 2005 and electric vehicle in 2011. This second experimentation is expected to end in 2014. In relation to alternative fuels, Italy has a long tradition about use and dissemination of LPG (Liquefied Petroleum Gas) and CNG (Compressed Natural Gas).

The Ministry of Environment, Land and Sea is promoting the extension of the network of filling stations, through agreements between the government and oil companies, distributors of natural gas and local governments, and the increase of the vehicle fleet running on LPG and methane, through incentives for the installation of suitable power supply kit on the most polluting cars.

Currently, thanks to the measures taken by the Ministry of Environment, the distribution network of LPG and CNG in Italy can count, respectively, 2,900 and 860 stations. With regard to the circulating vehicle fleet, currently about 2.3 million vehicles are powered by LPG and CNG.

\(^{50}\) IoGuido/Carcityclub, [www.carcityclub.it](http://www.carcityclub.it)
4 | New trends and emerging eco-innovation markets

The objective - reaching a sustainable lifestyle
The actual potential of Eco-Innovation as one of the instruments of societal change towards a sustainable lifestyle, i.e. beyond the immediate objective of "mere" environment protection, is not yet recognised throughout all segments of society. In fact, it is often seen as a mere marketing instrument for merchandising of new products and technologies according to traditional marketing mechanisms.

The underlying principles of sustainability and related eco-innovative thinking are however to be understood as an integrated transformation of the current environmental, economical and societal paradigms.

Bearing in mind this broader perspective, with regard to new trends and emerging eco-innovation markets, the following examples are understood to have a good potential for innovative future development in Italy, since some of these show to have an intrinsic recognition of the very potential and driver of eco-innovation within the above mentioned larger picture.

Carbon footprint initiatives
In this framework, the carbon footprint represents a significant trend, which has started to develop both at public and private level. Carbon footprint is a measure of the exclusive total amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product, it effects all the life-cycle assessment and takes into account materials, manufacture, transport, use and disposal at every stage of development. Considering the valuable effect that the carbon footprint tool plays in tackling the Climate Change, the Ministry for the Environment, Land and the Sea (IMELS) decides to take a solid action in disseminating its adoption, by the Italian companies.

The Ministry for the Environment, Land and the Sea (IMELS) and several large national companies signed in December 20th 2011 a voluntary agreement for projects on "carbon footprint", i.e. life cycle greenhouse gas emissions in production processes, and a public-private task force has been established. The agreement provides a validation by the Ministry of carbon footprint.

The "carbon footprint" approach is already widespread in France and the United Kingdom but it is a new practice for Italy. This initiative allows companies to act proactively in order to reduce their emissions and it promotes also the production and distribution of clean techniques giving at the same time a positive message to consumers.

The companies involved will conduct the analysis and reporting of CO2 emissions and they will establish a system of "carbon management" to identify and implement the activities. IMELS will launch calls for tender to allow other companies to join the program and thus to promote a wider diffusion of the carbon footprint approach.
Barilla Center for Food and Nutrition – The Double Food Pyramid

The position paper: "The Double Food Pyramid", published in July 2011, by Barilla Center for Food and Nutrition, represents a valid indication about how important is to pay attention to food choices, not only regarding the health of people, but also for the environmental protection.

The Double Food Pyramid approach is based on the comparison between the classic food pyramid, focusing exclusively on the nutritional properties of the food, and the new concept of the environmental pyramid, where the food is classified in terms of its impact on our planet.

The environmental impact of the food has been assessed through the Life Cycle Assessment (LCA). This evaluation includes the analysis of the entire supply chain, including the cultivation, extraction and processing of raw materials, manufacture, packaging, transportation, distribution, use, reuse, recycling and final disposal. The Carbon Footprint, the Water Footprint and the Ecological Footprint has been evaluated in order to assess the food impact in terms of greenhouse gases emissions, use of water resource and the ability to regenerate the used land resources.

According to recent statistics, published by the Global Footprint Network (GFN), a city dweller, who lives in a country with a high income, requires an ecological area of about 6.1 global hectares (gha, approximately equal to 170 square meters per day), to maintain his level of wellness. This is more than twice the world average (2.7 global hectares).

For his wellness, an Italian city dweller requires on average a total of 137 square meters, of which the 31% (42 square meters) are exploited for its feeding and nutrition.

Short production chain

Awareness raising on the sustainable way of production, have notably improved the interest for farmers’ markets, or “short food circuits”, since the last years. This change has played an impact also on the activity of the local administrations and policy-makers, responsible of rural development51. By the economic point of view, this system not only allows production costs' savings, but also reduces the use and the costs of several elements, like: energy, conservation, packaging and fuel. By the ecological and sustainable point of view, the short food circuits decrease the impacts on the environment, food and health. This concept is expressed through the so called “food miles”, which is an indicator that calculates the environmental impact of food on the basis of the kilometres or miles covered from production place to the selling point besides, most of the products come from organic agriculture.

Another important innovation is represented by the Localised and Consortial Organisms, "GAS" - e.g. solidarity purchasing groups have been active for a number of years. According to the recent data, there are over 800 registered groups, but the double are estimated, if considering non-registered groups. The recognition by public agencies and national, regional governments is relatively recent. The GAS are principally active to make joint purchase of local and seasonal organic agricultural products. This way of working can potentially be extended to a greater variety of products and services, as well as it has already been applied to cooperative purchasing groups for renewable energy projects (Reteenergie). The original trigger may have been that of economic needs or opportunities. However the actual result of the GAS is much larger, as it influences the wider system of production and consumption and the relationship between the actors involved52.

51 http://www.rivistadirittoalimentare.it/rivista/2008-03/RBG.pdf
A crucial innovative issue of the short production chain is the integration of social and gender involvement in the sustainable food chain, the so called Social Agriculture. There are over a thousand projects for the reintegration of disabled or socially weak classes, through agriculture and the creation of didactic farms for schools. The income is mainly used for the sustainment of these Social Communities. The Government is looking at this system with big interest, so that it decided to give special financial incentives, in some Regions, through the National Strategic Plan for Rural Development Asse III and the Programme “gaining health”, approved by the Council of Ministers in 2007.

Under the social agriculture, it is also appropriate to mention the so-called: “Guerrilla Gardening”, founded in Milan, in 2006. These groups are in constant enlargement, all over Italy. They are interested in reclaiming and embellish abandoned sites in urban areas and in transforming them into green urban areas and/or urban (vegetable) gardens. This initiative gives rise to other kind of organizations, which are oriented to the requalification of abandoned sites, the fight against the sale of public land confiscated from criminal activities and converting it into sustainable and organic agricultural area. In this way, these kinds of organizations employ emarginated people and reduce impacts on the environment through the food miles.

Innovative products used in agriculture

Eco-innovation in agriculture is applied not only for the production of a fertilizer out of waste, but also for the by-products having substantial environmental benefits. Regarding the production of fertilizers from waste, the total production of compost was of 3.4 million t/2008, with an increase of 6.6% with respect of 2007, the production of compost from organic selected fractions was of 2.7 million ton/2008, with an increase of 12% respect of 2007. In 2008, the anaerobic digestion was 1.2% of total waste and the mechanic biological treatment was 22% of total waste, with a decrease of 12.3% respect 2007 due to less production of undifferentiated waste.

With respect to by-products having environmental benefits, innovative technologies for the sustainable management of soil and water in agriculture and for the maintenance of biodiversity and the agroecosystem in general, are produced and researched by the Council for Research in Agriculture (CRA). Among these, there are several innovative methodologies could be considered part of adaptation to climate change as, for example, tolerance to abiotic stress for cereals, innovative methodologies for phytosanitary defence from virus and bacteria, innovative cultivation techniques for cereals, citrus, grapes, olives, organic vegetables etc. with low environmental impact. Significant results on management of soil and water resource, previson models of production, use as fertilizer from olive residuals, zoo technique effluents in forage models, etc. can be found in the following websites: http://agritrasfer.entecra.it; http://sito.entecra.it/portale/cra_avviso.php?id=5244&tipo=&lingua=IT.

A collaboration agreement between ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development) and CRA (Council for Research in Agriculture) has been signed on the 3rd of May 2012. The main objective of this agreement is the development of systems to increase energy efficiency and the use of renewable energy in plant production process and in agro – food activities.

Sustainable urban planning

Processes of urban sprawl have progressively fostered growing interaction between cities and rural areas and little attention is paid to the “in- between” open space. Many Regions started to integrate the territory’s complex identity, structure, ecosystem, economy and landscape in urban planning, combining these multi-
criteria scenarios with an “integrated model for territorial and urban design”, integrating process and actions of rural and regional development with physical and landscape planning tools.

The role of agriculture in developing and planning of polycentric settlements system. The Strategic Scenario for the “Polycentric City of Central-Western Tuscany

In Tuscany the following analysis/design model was defined:

The agricultural park is conceived as a pro active tool aimed, first of all, to promote –involving farmers, local administrations and stakeholders- a strategic process aimed to foster and promote multifunctional and environment friendly agriculture assets. In this context the role of farming becomes more complex, aimed to produce not only edible (organic) goods for food short supply chains but even “public goods” such as environmental service (ES), leisure, tourism and social services, landscape and environment regeneration for the settlement conceived as a whole.

In such a scenario the agricultural periurban areas are conceived as a green infrastructure performing integrated and various functions accordingly with the various relationship and functions that they assume in containing and regenerating urban form (green wedges and corridors, greenbelts areas, core areas and stepping stones inside the urban settlement etc).

To each typology correspond possible and, often, innovative agricultural activities that call for a new design and management approach. Furthermore the scenario described configures the periurban agricultural spaces as a new form of “public spaces” to be designed and managed by the physical planning tools.

The current research/action activities carried on by the quoted research group –even with on field and bottom up actions- concern, among others: the studies for the design and participative planning process of the “Parco Agricolo della Piana” (www.parcodellapiana.it) promoted by the Tuscany Region, the Agricultural Park of Prato (www.parcoagricoloprato.org), the Montespertoli (Fi) Municipal Agricultural Park and the Pisa Agricultural Park and, last but not least, the system of the regional agricultural parks proposed by the Project for the Regional Territorial and Landscape Plan of Puglia region (PPTTR, http://paesaggio.regione.puglia.it/).

Sustainable fashion

Ecological fashion design and production represents a sector with a huge potential of development. Therefore, the fashion industry is one of the major economical growth areas, in Italy. This trend has been confirmed even throughout the last years of financial downturn, the benefits of a change towards ecological in the mid terms will have a wide range of benefits, in terms of effective sustainability.

There are three main areas in which the sustainability of the textile industry operates. On one hand, there is the issue of the material, which includes several aspects: the birth and consolidation of supply chains certified organic, the recovery of ancient traditions ennobled by modern technology, with the consequent development of innovative yarns and fabrics. Something begins to move also in terms of processes, where the most critical of the production cycle relate to the dyeing and fixing of the color, phases that result in the greatest impact on the environment, consuming approximately 85% water, 75% of the energy and 65% of the chemicals of the entire production cycle.

The attention, given to international standards of certification of materials used in textile production, is growing. Their distribution is extremely important, because it is part of the battle for the traceability of the product (against outsourcing), and often helps to promote fair trade, especially in the case of raw materials imported from abroad by companies caring the whole supply chain. Looking at the details of the certification of Italian companies that use organic cotton, for example, it can be noted that since 2005 there has been a

59 University of Florence – Faculty of Architecture - Department of Urban Regional Planning
60 Green Italy Report 2011
significant and sustained increase in the number of certificates issued by the Institute for Ethical and Environmental Certification - ICEA. While Italian firms certified in 2005 were just 12 according to GOTS criteria, today their number has risen to 79 (six times higher).

On the innovation side, in the period 2007-2009, the European Patent Office (EPO) has issued 1,170 European patent applications related to green technologies in the textile. Italy holds 6.5% of these requests. In the analysis of Italian green patent it is clear how these relate mainly to the improvement of technology process and production of manufactured goods and textiles, covering a share of 48.7%. The analysis for macro shows a heterogeneous distribution of these requests, with the North-West driving the production patent in Italy with a share of 57.6%, followed by the North-East with 20.5%, and the Centre with the 16.6%. For the macro and South Islands there is, finally, a share of 5.3%. The deposits of patents have helped 51 companies that, together, account for 82.2% of Italian applications published in this area. The patent activity of individuals rather contributes for 15.8% of the national total, followed by research institutes and universities with the 1.3%.

There are number of examples of companies focused on full recycling of plastic (for example company Quagga: www.quagga.it) and organic materials and accessories to produce high value ecological fashion, with good potential to interact with the current understanding of production and consumption at different levels. Their approach creates positive interactions with consumers throughout the product's lifetime, with designers that need to be aware of different eco-requirements and provision of materials for their design studies, with producers as well as with waste recyclers.

There are also examples of companies who decided to move in the direction of innovation to limit the environmental impact of the process or to intervene on the question of waste, significantly reducing the consumption of chemicals, water and energy (i.e. Maglificio Gordon Confezioni, Acquafil, Associazione Distretto Calza e Intimo, Filature Miroglio, Marchi & Fildi).

In this field, there are two important project lead by ENEA: BATTLE LIFE Project (LIFE 2005), which provides recommendations for the prevention of pollution and for the treatment of wastewater in the textile sector, and the Project INTEXUSA with the Polytechnic of Turin, which is developing the application of ultrasound treatment in washing and dyeing of different fibers.

Furthermore many high fashion companies are investing in research and development related to green textiles, leather, etc. to be launched both at national and international level (i.e. Gucci, Benetton, Fendi).

Thanks to the initiative of individual companies and networks that work together to tackle this new and important challenge, the whole Italian textile sector is fostering green innovation in products and processes.
Green events

Green Sports events like: "Il giro d'Italia (the famous national bicycle race) at zero impact" and other fashion, sports, and conference events have started to be organised, according to eco-innovative solutions. Some of the adopted options are: carbon-offsetting of the event's carbon footprint, local biological foods, use of biodegradable dishes. These types of events have the power to spread the broader idea behind the eco-innovative features.

Many cities, national and local environmental or social associations organize special events of one or more days, either in conjunction with international or European green events ranging from "a day without cars" to "fair trades initiatives" or, according to specific national green events or local initiatives.

All regions and local authorities organize the promotion of local products trough enogastronomic (food and wine) events, combining these events with archaeology and local history. For instance, only in May 2012, there have been realized 21 events distributed in different regions.

The national Association "time banking", i.e. direct exchange of services and knowhow, bypassing the monetary system. The association's approach is based on exchange of services and know-how through an exchange databank. This is not a new scheme, actually it is a historical social tool of interaction. It is nonetheless considered to have a strong potential for localized economical systems, thereby allowing intrinsically ecological solutions.

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64 http://mimmapallavicini.wordpress.com/2012/03/04/appuntamenti-e-eventi-verdi-2012/
65 http://www.agrirregioneuropa.unipv.it/dettagli.php?id_articolo=451
66 http://www.folclore.eu/It/Eventi/Italia/Enogastronomici/Maggio/
67 http://www.associazionenazionalebdt.it
Shared mobility
Car pooling schemes have been active for approximately 10 years and count now more than 3.5 million members. Also, in 2009, the motorway company 'Autostrade per l'Italia' has started a dedicated car sharing scheme, with reduction of the motorway fare for car poolers on motorways A8 and A9, also offering incentives to use the bike-sharing scheme in Milan.

Eco-certification in tourism
The association Legambiente has launched an initiative for ecological certification of hotels, B&B, camping sites in the Rome area, applying the Ecolabel certification scheme. The certification is already applied elsewhere in Europe, however the potential ecological benefits for Italian tourism industry with its vast extension are enormous.

Sustainable distribution (retail) chains
Similar benefits can be obtained in the distribution of goods through ecological malls and shops. A good practice example is Coop Adriatica that have opened a supermarket designed with the latest environmental technologies (see good practice example). In this context also the good practice example Pomì trace can be evidenced as being an example of sustainable cultivation and distribution.

### Eco supermarket in Conselice (RA)
Supermarket with about 600 square meters of sales area, located in an area where warehouses and abandoned buildings with asbestos in roofing and underground were demolished and remediated. The eco-store supermarket is a prototype of cutting-edge, for the quantity and quality of solutions, in relation to its entire life cycle, starting from the choice of building materials. In fact, the structure was conceived as a holistic system, in which individual solutions are organically integrated with each other, thus resulting in a "virtuous" balance.

*Source:* [http://www.adriatica.e-coop.it](http://www.adriatica.e-coop.it)

### Pomì trace - sistema di tracciabilità on line della filiera pomì
The project's objectives are to satisfy customers through the clear identification of actors, operative settings, involved skills and context of production. Identification of the specific responsibilities and registration of material flow. Improving the protection of consumers through easily accessible forms of communication, that allows to obtain important information about the history of the product.

On the website [www.pomionline.it](http://www.pomionline.it), in the section called "Traceability Pomì Trace", the consumer can choose the 10 commercial products, branded "Pomi". Subject to the provision of identifying data shown on the package such as a batch, production time, you can trace back the factory of production, the packaging line, the municipality of origin of fresh tomatoes, and eventually to the agricultural farms. Google Satellite also allows the location of the farm on a map. The growing interest of consumers not only with regard to the certainty of Italian product origin but also to identify the geographical area of production. Strengths are the speed of communication and the quality of data provided. Through dedicated and specific software all the information related to the stages of growing tomatoes from seed to a single box are retrieved. Innovative characteristics: It is the first large-scale system used in the tomato industry, usable by the final consumer, able to trace the source of the contents of more than 30 million units produced in 4 different plants, originating from approximately 300 agricultural farms.

*Source:* [http://www.pomionline.it](http://www.pomionline.it)
Public policy in support of eco-innovation

The main components of Italian public policy in support of eco-innovation have remained unvaried, if compared to the situation identified in 2010.

Eco-innovation is generally being identified indirectly through sustainable consumption and production and green purchase, (e.g. Preliminary Strategy Document on sustainable consumption and production, 2008), even though the Ministry of Environment states a clear definition of eco-innovation on their website, adopted from decision n. 1639/2006/EU. The targets recently stated by the new Eco-Innovation Action Plan (EcoAP) are also being promoted by the Council of Ministers and through numerous other publications.

Current policies are generally support measures for eco-innovation resulting in greater resource and energy efficiency in production processes in companies. Over the last few years there has been a realisation that eco-innovation can have both economic and environmental benefits, as clearly stated already in the Preliminary Strategy Document on sustainable consumption and production, 2008. National and regional policies are not perceived yet as broadly promoting systemic (transformative and radical) eco-innovative change aiming at changing general production and consumption patterns. The relevant policy documents identify structural limitations of the Italian economical and production system and the relevant difficulties related to change. The reiterated contribution of the European Union financial instruments (EU Framework Program 7 2007-2013, CIP-EcoInnovation, POR FESR-Regional Operational Programme of the European Regional Development Fund, Life +, EuroTransBio initiative (ETB), BEI - European Investment Bank, etc.) are being used to promote eco-innovation, among other topics, in a variety of projects.

In the framework of European Research Area, the Italian MIUR identified in June 2010 a portfolio of Research infrastructures⁶⁸ to be built or upgraded in order to develop scientific research and innovation programs with an international dimension. Among them there are five research infrastructures operating in the fields of environmental sciences⁶⁹ and six in energy (for example see PIBE on biomass⁷⁰ and MONSTER for solar energy⁷¹).

With regard to project Life +, in 2010, Italy was awarded, for the fourth year in a row, the largest number of projects and the highest amount of co-financing.

Unspent funds from the European Energy Programme for economic recovery are planned to be used to finance public projects in renewable energy and energy conservation through a fund established by the European Commission, European Investment Bank (EIB), Cassa Deposits and Loans (CDP) and Deutsche Bank. During the summer Italy has presented the updated national plan on energy efficiency. The objectives for 2016 are savings of about 9%.

Again, some of the major national and regional policies in Italy are still operative with regard to the demand side of eco-innovative products and services.

- Third and fourth feed in tariff for Photovoltaic solar systems (until 2016);

- White and green certificates;

- Tax exemption (55%) related to energy-efficiency measures/refurbishment of buildings;

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⁶⁸ http://www.infrafortier.eu/docs/national_roadmaps/Roadmap_Italy.pdf
⁶⁹ for example http://www.cmcc.it/welcome-ats-cmccs-web-site?set_language=en
⁷⁰ www.enea.trisala.it
⁷¹ www.enea.casaccia.it
Previously available incentives regarding energy-efficient white goods were however discontinued at the end of 2010.

There has however been significant discussion in the political area regarding discontinuation or decrease of such policy measures. Therefore several stakeholders have appealed for maintaining such financial incentives to safeguard the related investments implemented by industry and the positive developments in the labor market, especially in a period of general economic downturn.

Although the Italian Ministry for Environment, Land and the Sea (IMELS) has experienced significant cuts to its budget throughout 2011, a 600 million Euros revolving loan fund at a rate of '0.5% for small and medium enterprises and public and private entities to reduce CO2 emissions will be available by next March. The fund can be accessed through the Deposits and Loans Bank, to invest in innovative technologies and systems for energy efficiency and renewables. The mechanism can also act as a repository for resources resulting from the ETS auctioning.

Public-private alliance for boosting Green Chemistry in Sardinia - “Matrica”, the joint venture between Eni Polymers Europe and Novamont, the world leader company in bio-plastics, was born in Sardinia with the objective of transforming the Eni petrochemical site in Porto Torres into one of the largest green chemistry complex at an international level, capable of producing 350 thousand tons a year of biodegradable products of plant origin (intermediates, plastics, lubricants, additives), starting from local crops, in particular the thistle, cultivated in the marginal lands of Sardinia).

The investment of over one billion Euros, of which 500 million to be devoted to the remediation of the Eni group site and 300 million to construction of a biomass power plant using agriculture residues by EniPower. Seven new plants will be built - the first is expected to be operative in early 2014, the last in 2016 - to replace the old industrial structure, at a cost of 250 million and the prospect of spending by 550 to 685 employees today, once fully operational, a hundred of them in the research center that will operate in conjunction with the University of Sardinia. The Memorandum of Understanding among several national and local Public authorities, private entities and trade unions, has been signed in November 2011 to launch the project that will boost the recovery of the local economy in the fields of chemistry, agriculture, research and innovation and occupation too.

From 2007 to 2011, the Ministry of Environment has co-financed 106 municipalities, 15 metropolitan areas and 91 municipalities with over 30.000 inhabitants, for a total of about 200 millions of Euros for 187 projects of sustainable mobility. Most of them concern the improvement of public transport and parking areas, measures for increasing the safety road for pedestrians and cyclists, the promotion of cycling, and all projects already started. The Ministry carries out the monitoring of these projects and, starting from 2011 in cooperation with ANCI (national association of Italian municipalities), has launched a web-database for the collection of economical and technical information about the state of projects implementation, and the web-database for the collection of their environmental results is in progress.

The 2008 Financial Act has granted tax deduction to the so-called “Solidarity Purchasing Groups” (Gruppi di Acquisto Solidali - GAS). These groups operate at local level and manage the purchase of local goods, especially in relation to agriculture, for their members. This approach promotes the purchase of seasonal local goods at fair prices and a direct exchange of goods between producer and consumer, thereby minimizing energy inefficiencies related to transport, commercialisation, and storage of mostly fresh goods. Officially about 500 GASs are registered in Italy72, but the actual number is reasonably about double this size. Recently, the Umbria region has passed a law that is meant to provide direct financial contributions for establishing and managing the GASs.

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72 www.retegas.org
The national policy related to Green Public Procurement (GPP) has seen further accomplishment since its initial launch with decree 11th April 2008 (the national action plan) and the with the subsequent decrees, the first of 12th October 2009 for GPPs. By this decree and successive decrees DM 22nd February 2011, DM 25th July 2011 and DM 7th March 2012 "minimum environmental criteria (MEC)" have been adopted for a number of products and services like paper, soil improvers, textiles, office furniture, public street lighting equipment and plants, IT equipment, windows and doors, food and catering services and energy services for buildings. Moreover MEC for some other products and services (among the others vehicles, cleaning services and products, waste management services and buildings) are being defined and formally adopted by decree. Also, according to legislative decree n.24 dated 3rd March 2011, an implementing decree of EU Directive 2009/33/CE, new cars for public authorities need to be evaluated with regard to a number of environmental criteria including relevant MEC defined by IMELS. Based on data prepared by the European Commission in 2010, the percentage of public procurement of the national GDP is approximately 14.08%.

According to this study, 31% of public procurement expenses are related to municipalities, 23% to government expenses, 24% to health agencies and 14% to regional and provincial institutions.

A significant opportunity to boost eco-innovation would be a wide diffusion of GPP especially for public buildings (e.g. schools, universities, offices, housing, etc.) for which MEC are under way and for related energy measures, for instance building insulation, heating and air conditioning systems for which MEC have already been adopted. 705 of Italian municipalities (8,092 in August 2011), i.e. almost 9% of the total number, have already adopted criteria related to environmental sustainability in their town planning instruments, e.g. energy efficiency like building insulation, including renewable energy systems.

The two Ministries, IMELS and Ministry for economic development have signed with several Regions a memorandum of understanding for the implementation of a national environmental labelling scheme which will also help firms to increase their competitiveness in the global market. As already mentioned, the scheme will enhance knowledge and experience at the cluster level to help firms to improve the quality of products and services while reducing their environmental impacts during the entire cycle of life.

A variety of trainings and courses, some of which with focus on eco-innovation, have been made available by ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development), through focused training sessions and through their on-line courses (http://odl.casaccia.enea.it/FADIIIGen/FadIIISite/index.htm).

Again, a number of financial support measures have been rolled out to train new entrepreneurs.

In the view of the World Summit on Sustainable Development “Rio + 20” that will take place in June 2012, Confindustria (the main industrial association representing Italian manufacturing and services companies) has recently adopted a Chart of principles for environmental sustainability (“Carta dei principi per la sostenibilità ambientale”)73 that recognizes the key role of eco-innovation. The aim of the Chart is to provide companies and associations with a voluntary instrument to support them in adopting the necessary behaviours and actions to move towards sustainable development and to respect the environment and natural resources. Guidelines have also been adopted in order to help in particular smaller enterprises in assessing their compatibility with the sustainable development principles adopted by the Chart.

Furthermore the “ITALIA DEGLI INNOVATORI”74 initiative has been launched by the Agency for Innovation and dissemination of technological innovation, and aims at recognizing the best examples of Italian technological innovation and excellence. The first edition of this award, launched by the Italian Government at Expo 2010 in Shanghai, has offered a showcase of the highest level of excellence of Italian innovation, representing an opportunity to facilitate access of Italian companies to global market with specific reference.

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to BRIC countries. In particular the initiative aims at promoting eco-innovation in several sectors (renewable energy, energy efficiency, sustainable agriculture, water, eco-building etc) and facilitating the match between supply and demand.

According to Pro Inno Europe Metrics, demand-side innovation policy in Italy is receiving attention mainly as pre-commercial procurement by the Ministry of Public Administration and Innovation and by the Ministry of Economic Development, which support regional policy (PON, POR) and regional actions, through its Unit for evaluation of investments (UVAL).

A major concern for policy measures in general and for eco-innovation in particular has been the contradictory and complex approach of the national government, throughout most of 2011 towards legislation on new incentives for eco-innovative policies. Also, national and regional institutions have struggled with planning a timely allocation and award of funds (e.g., project "Industria 2015"). Similar concerns have been raised in connection with EU funds that have not been, or only in small percentages, distributed to the funded partners.

The table below (Figure 5.1) presents a summarised analysis based on the table in ANNEX 1.
## Figure 5.1 | Policy measures addressing eco-innovations in Italy

<table>
<thead>
<tr>
<th>Group of policy measures</th>
<th>Type of policy measure</th>
<th>Focus of policy measures (tick if applies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Generic focus on eco-innovation</td>
</tr>
<tr>
<td>Equity/business support</td>
<td>Venture capital funds</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Public guarantee funds</td>
<td>X</td>
</tr>
<tr>
<td>Support for R&amp;D in public sector and industry</td>
<td>R&amp;D funding</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Collaborative grants</td>
<td>No information on relevance to eco-innovation</td>
</tr>
<tr>
<td></td>
<td>R&amp;D infrastructure</td>
<td>X</td>
</tr>
<tr>
<td>Fiscal measures</td>
<td>Tax incentives for R&amp;D and start-ups</td>
<td>Generic for all business purposes</td>
</tr>
<tr>
<td></td>
<td>Tax incentives for R&amp;D personnel</td>
<td>Generic for all business purposes</td>
</tr>
<tr>
<td>Education, training and mobility</td>
<td>Tailored training courses for companies, entrepreneurs</td>
<td>No measures with explicit focus on eco-innovation</td>
</tr>
<tr>
<td></td>
<td>Advise/consulting for start ups, companies, entrepreneurs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Placement schemes for students</td>
<td>No measures with explicit focus on eco-innovation</td>
</tr>
<tr>
<td></td>
<td>Support for R&amp;D workers recruitments</td>
<td>No information on relevance to eco-innovation</td>
</tr>
<tr>
<td>Networks and partnerships</td>
<td>Competence centres, clusters, science-technology parks</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Technology platforms and innovation networks</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Foresight and common vision building</td>
<td>No information on relevance to eco-innovation</td>
</tr>
<tr>
<td></td>
<td>Market intelligence and other forms of information sharing</td>
<td>X</td>
</tr>
<tr>
<td>Regulations and standards</td>
<td>Regulations, targets, cap &amp; trade schemes</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Performance standards, labeling, certification</td>
<td>X</td>
</tr>
<tr>
<td>Public procurement</td>
<td>“Green” public procurement of goods and services</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>R&amp;D procurement</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Pre-commercial procurement</td>
<td>X</td>
</tr>
<tr>
<td>Technology Transfer</td>
<td>Advisory support for technology adopters</td>
<td>Generic for all business purposes</td>
</tr>
<tr>
<td></td>
<td>Financial or fiscal support for technology adopters (e.g. grants for purchasing new technology)</td>
<td>X</td>
</tr>
<tr>
<td>Support of private demand</td>
<td>Tax incentives for consumers (e.g. for purchasing environmentally efficient products)</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Tax reductions for products and services (e.g. VAT reductions)</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Demand subsidies (e.g. eco-vouchers, consumer subsidies)</td>
<td>Generic for all business purposes</td>
</tr>
<tr>
<td></td>
<td>Awareness raising and information provision</td>
<td>X</td>
</tr>
</tbody>
</table>
6 | Main findings

Eco-innovation has been a slow starter in Italy. However, the last few years have shown a drastic increase both in terms of internal demand of eco-innovative products and service and also with regard to specific research and development of products and service to be marketed. Both the supply side and the demand side have grown, most probably with an initial trigger on the demand side, for instance in industry but also among consumers. The supply side is however rapidly closing the gap through dedicated financing schemes and funds, dedicated technology platforms and a variety of grass-root initiatives among young entrepreneurs and university spin-offs.

Lots more could have been and needs to be done in terms of supporting both the supply and demand side by means of clear-cut national and regional policies, efficient and capillary mechanisms and signals from the financing system (banks and venture capital providers). However the ball is rolling.

6.1 Strengths and weaknesses of eco-innovation in Italy

The target of supporting policies are often specific financial actors or companies. Based on the analysis of unsuccessful policies and comparison with other more successful examples worldwide, the target of support policies should be the territory.

There is an increasing interest of Italian citizens and industry for sustainability and ecological production, as shown by recent studies, where the protection of the environment is only shortly behind other critical topics like the financial crisis. This has the potential to raise the national demand side for eco-innovative products and services.

In fact, over the recent years, the interest of SMEs for eco-sustainable products and services has increased, however the national policies and the underlying economic structures, should be further strengthened to facilitate the transition towards sustainability and encourage investments in eco-innovative activities, while promoting the economical potential of eco-innovation business.

Figure 6.1 | Strengths and Weaknesses of Italy in promotion of eco-innovations

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Social awareness with regard to needs and opportunities in the context of sustainability and eco-innovation strongly grown over the recent years</td>
<td>• Scarce availability of risk capital for eco-innovative projects/start-ups</td>
</tr>
<tr>
<td>• Strong legal framework concerning environmental protection</td>
<td>• Insufficient reduction of waste and low recycling results at national level</td>
</tr>
<tr>
<td>• Significant reductions in CO2 emissions due to broad diffusion of LPG-powered cars and commercial vehicles (European Environmental Agency).</td>
<td>• Moderate to low incentives on the demand side (public and private)</td>
</tr>
<tr>
<td>• Widespread radio and media coverage of environmental topics</td>
<td></td>
</tr>
</tbody>
</table>

A great potential for efficient use (and production) of energy can still be developed in the public sector, where examples of excellence exist in different regions (both North, Centre and South), however denoting difficulties to reach capillary distribution at a national level.
Areas with huge potential of implementation are energy efficiency in public lighting and public real estate (heating), transportation, district heating, renewable energy systems (e.g. solar heating, hot water, and photovoltaic plants). This has been a weakness in recent years and can be a powerful tool in the coming years.

### 6.2 Opportunities and threats to eco-innovation in Italy

Italy has strong local cultural roots and traditions that would allow connecting nature and environment to eco-innovative services and products (agriculture, food/wine, art, history, tourism). There are infinite opportunities to benefit from such potential for promotion of high value eco-innovative products (e.g. agricultural products, wine, eco-innovative rearing of livestock, fish farms and related services). Italy is an industrially producing and exporting country, with share of industry production of GDP above the EU27 average (19.2% vs. 18.7%, source Eurostat). Compared to the five major economies in Europe (Germany, France, UK, Italy and Spain) only Germany attains a higher share of industry of the GDP. The other economies France, UK and Spain have a lower share of industrial production in their GDP (12.5%, 15.6% and 15.8% respectively). Therefore, Italy has the potential and the infrastructure to be an important player on the market for eco-innovative products.

#### Figure 6.2 | Opportunities and Threats for eco-innovations in Italy

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Sustainable agriculture - organic, social and Okm districts</td>
<td>- Financial manoeuvre decided by government to reduce public debt and related probable effects on private and public demand.</td>
</tr>
<tr>
<td>- Role of art and design in eco-innovation</td>
<td>- Strong soil consumption, due to natural constraints increasingly in areas with significant hydrogeological risks. 75</td>
</tr>
<tr>
<td>- Sustainable fashion</td>
<td>- Delocalisation of industry to locations abroad and thus potentially longer transport routes, besides missing opportunities to promote eco-innovative production of goods in Italy; this process appears however to be slowing down. 76</td>
</tr>
<tr>
<td>- Renewable energies</td>
<td>- Limited access of young citizens to the job market and to financing for innovative projects. 77</td>
</tr>
<tr>
<td>- Eco-friendly packaging</td>
<td>- Complex bureaucracy</td>
</tr>
<tr>
<td>- Sustainable tourism (reforestation, management of protected areas and parks, eco-certification)</td>
<td>- Fragmentation of the eco-innovation governance within public administration system</td>
</tr>
<tr>
<td>- Sustainable public transportation and transportation of goods</td>
<td></td>
</tr>
<tr>
<td>- Innovative Eco-industries in the international market</td>
<td></td>
</tr>
</tbody>
</table>

Potential threats are not to be underestimated, for instance the current economical conditions and the relevant cuts to private and public spending, i.e. demand, the related reduction of public services and potentially the impaired effectiveness of services provided through local public administrations.

Also, according to experts in economical disciplines, the current unit cost production costs in most of the EU member states have significant discrepancy with regard to Germany. Such unbalances have the power to impede exportation from “more expensive” countries and measures to reduce similar unbalances require active mid and long-term policy measures by the European Union.

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75 Source: Report 2011 Legambiente based on data from Istituto di ricerche Ambiente Italia,
76 National Institute for International Commerce, data as of June 2010, Italy and international Economy 2009 - 2010
77 Source: Ministry for Occupation and Social Policy, November 2011, The Young and the Occupation, Rapporto Censis Year 2011
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ANNEX 1. Policy measures addressing eco-innovations in Italy

<table>
<thead>
<tr>
<th>GROUP OF POLICY MEASURES</th>
<th>TYPE OF POLICY MEASURE</th>
<th>SPECIFIC MEASURE (national, regional)</th>
<th>FOCUS OF POLICY MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply side focus</td>
<td>Equity/business support</td>
<td>Venture capital funds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Regional Funds exist that invest in eco-innovation or related projects/companies (e.g. Toscana Innovazione)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>- The China Development Bank Securities has chosen Italian research facility Nomisma to consult on investments in Europe. Among other investments, the &quot;Made in Italy&quot; sectors with brands, process innovation and technology are supposed to be the primary targets in Italy. Eco-innovation is not an explicit target, but might benefit from similar financing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public guarantee funds</td>
<td>- <a href="http://www.insme.org/it/l2019associazione-insme#implique">http://www.insme.org/it/l2019associazione-insme#implique</a> (finanziato da MiniSvEconomico)</td>
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<tr>
<td></td>
<td></td>
<td>- <a href="http://www.fondigaranzia.it/">http://www.fondigaranzia.it/</a> MiniSvEconomico Guarantee funds provided through the Ministry for Economic Development are managed through Mediocredito Centrale (<a href="http://www.mcc.it/">http://www.mcc.it/</a>) The Ministry for economic development has granted new funds to a public guarantee fund with focus on innovation and renewable energy in SMEs, especially in southern Italy. Also, regional agencies manage regional guarantee funds, e.g. Agency &quot;Veneto Sviluppo&quot; has made available funds granted by the Veneto region for a guarantee fund available to industry. This fund is generic and has no explicit focus on eco-innovation.</td>
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<tr>
<td></td>
<td>Support for R&amp;D in public sector and industry</td>
<td>R&amp;D funding</td>
<td></td>
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<tr>
<td></td>
<td>Collaborative grants</td>
<td><a href="http://www.uniud.it/ricerca/finanziamenti/comunitari/programmi-di-cooperazione-">http://www.uniud.it/ricerca/finanziamenti/comunitari/programmi-di-cooperazione-</a></td>
<td>No information available on relevance to eco-innovation</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>Link</td>
<td>Notes</td>
</tr>
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<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>R&amp;D infrastructure</strong></td>
<td>No information obtained</td>
<td></td>
<td>No information available on relevance to eco-innovation</td>
</tr>
<tr>
<td><strong>Fiscal measures</strong></td>
<td><strong>Tax incentives for R&amp;D and start-ups</strong></td>
<td><a href="http://www.istruzione.it/web/ricerca/agevolazioni-fiscali-per-finanziamenti-alla-ricerca-scientifica">http://www.istruzione.it/web/ricerca/agevolazioni-fiscali-per-finanziamenti-alla-ricerca-scientifica</a></td>
<td>X *) generic for all business purposes</td>
</tr>
<tr>
<td><strong>Education, training and mobility</strong></td>
<td><strong>Tailored training courses for companies, entrepreneurs</strong></td>
<td>- <a href="http://www.careernews.it/21948-formazione-per-nuovi-imprenditori/">http://www.careernews.it/21948-formazione-per-nuovi-imprenditori/</a></td>
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<td></td>
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<td>- <a href="http://www.careernews.it/21948-formazione-per-nuovi-imprenditori/">http://www.careernews.it/21948-formazione-per-nuovi-imprenditori/</a></td>
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<td>- <a href="http://www.riditt.it/">http://www.riditt.it/</a></td>
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</tbody>
</table>

*) No measures with explicit focus on eco-innovation were identified, however they reasonably apply also to eco-innovation.
 ADVISE/CONSULTING FOR START UPS, COMPANIES, ENTREPRENEURS  
- Support start ups Lombardia, InnovHub Milano (Chamber of Commerce Milano), 
  No information available on relevance to eco-innovation  

PLACEMENT SCHEMES FOR STUDENTS  
Spinoff Politecnico, fondo Mecenati  
X *) No measures with explicit focus on eco-innovation were identified, however they reasonably apply also to eco-innovation  

SUPPORT FOR R&D WORKERS RECRUITMENTS  
- Incentives for R&D workers to return to Italy  
  http://www.sr.camcom.it/files/promozione/INCENTIVI_AUTOMATICI_PER_ASSUNZIONE_RICERCATORI.pdf  
  No information available on relevance to eco-innovation  

NETWORKS AND PARTNERSHIPS  
Competence centres, clusters, science-technology parks  
Turin - Environment Park  

Technology platforms and innovation networks  
- Technology parks (Trieste Area Science Park, ...)  
  - http://www.venetoinnovazione.it/  
  The regional agency for applied research, innovation and tech transfer (no explicit focus on eco-innovation)  
  - http://www.regione.piemonte.it/pianocompetitivita/misure.htm  
  - APSTI – Associazione Parchi Scientifici e Tecnologici Italiani, the national network of scientific and technological parks (PSTs); the majority of PSTs are members of APSTI (31 associati); a number of PSTs have areas that are focused on eco-innovation  
  X  

FORESIGHT AND COMMON VISION BUILDING  
No information available  
No information available on relevance to eco-innovation  

MARKET INTELLIGENCE AND OTHER FORMS OF INFORMATION SHARING  
- Banca Dati Ecosmes (ENEA)  
  - http://www.riditt.it/temi/operatori/74  
  X  

DEMAND SIDE FOCUS  
REGULATIONS AND STANDARDS  
Regulations, targets, cap & trade schemes  
Stringent national regulations with regard to environmental topics (air emission, waste water discharge, soil protection, hazardous substances, etc.)  
Environmental Action Strategy for Sustainable Development (EASSD-2002): EASSD’s four broad priority themes:  
  - Climate Change and stratospheric ozone;  
  - Protection and sustainable valorisation of Nature and Biodiversity;  
  - Quality of the environment and quality of life in urban areas;  
  - Exploitation of resources and waste generation;  
  Priorities addressed in this last section are the use of natural resources, production-consumption cycles, water resources and waste.

Performance standards, labeling, certification
705 of Italian municipalities, i.e. almost 9% of the total number, have adopted criteria related to environmental sustainability in their town planning instruments, e.g. energy efficiency. Incentives for environmental certification of SMEs (Decree SVS/03/2230), e.g. EMAS,

**Public procurement**

**“Green” public procurement of goods and services**
DM 12th October 2009 "minimum environmental criteria" for: paper, fertilizers DM 22nd February 2011 "minimum environmental criteria” for: textile products, office furniture, public lighting systems, IT (computer, stampanti, apparecchi multifu fnzione, fotocopiatrici); per opportuna consultazione è disponibile la relazione di accompagnamento legislative decree n.24, 2011, implementing EU directive 2009/33/CE, introduces the requirement to verify energy efficiency, environmental impact, CO2 emissions, during the entire life cycle. DM 25th July 2011 "minimum environmental criteria“ for: Collective catering, food, external doors and windows http://www.dsa.minambiente.it/gpp/page.asp?id=78 ForumCompraVerde.it

**R&D procurement**
ETAP (Environmental Technologies Action Plan) - CIP Eco-innovation In May 2010 the Ministry of Economic Development, together with IPI (Institute for Industrial Promotion), has recognised the opportunity to launch R&D procurement and anticipated pilot projects with focus on environment. Regional procurement for research and development projects

**Pre-commercial procurement**
A framework is being prepared to launch tests for PCP.

**Technology Transfer**

**Advisory support for technology adopters**
COTEC Foundation - RIDITT - Italian grid for dissemination of Innovation and Tecnology transfer among firms, promoted by the Ministry of Economic Development and managed through IPI (Institute for Industrial Promotion). *) generic for all business purposes

**Financial or fiscal support for technology adopters (e.g. grants for**
FESR: sostenere i progetti di investimento promossi dalle Pmi finalizzati all’immissione in commercio di prodotti, di processi o di servizi nuovi o migliorati dal punto di vista tecnologico, produttivo, commerciale, organizzativo e gestionale, nonché finalizzati al miglioramento dell’efficienza produttiva, dell’impatto ambientale, con particolare

<table>
<thead>
<tr>
<th>Public procurement</th>
<th>“Green” public procurement of goods and services</th>
<th>R&amp;D procurement</th>
<th>Pre-commercial procurement</th>
<th>Technology Transfer</th>
<th>Advisory support for technology adopters</th>
<th>Financial or fiscal support for technology adopters (e.g. grants for</th>
</tr>
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<tbody>
<tr>
<td>DM 12th October 2009 &quot;minimum environmental criteria&quot; for: paper, fertilizers</td>
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<td>ETAP (Environmental Technologies Action Plan) - CIP Eco-innovation In May 2010 the Ministry of Economic Development, together with IPI (Institute for Industrial Promotion), has recognised the opportunity to launch R&amp;D procurement and anticipated pilot projects with focus on environment. Regional procurement for research and development projects</td>
<td>A framework is being prepared to launch tests for PCP.</td>
<td>COTEC Foundation - RIDITT - Italian grid for dissemination of Innovation and Tecnology transfer among firms, promoted by the Ministry of Economic Development and managed through IPI (Institute for Industrial Promotion). *) generic for all business purposes</td>
<td>FESR: sostenere i progetti di investimento promossi dalle Pmi finalizzati all’immissione in commercio di prodotti, di processi o di servizi nuovi o migliorati dal punto di vista tecnologico, produttivo, commerciale, organizzativo e gestionale, nonché finalizzati al miglioramento dell’efficienza produttiva, dell’impatto ambientale, con particolare</td>
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<tr>
<td>Support of private demand</td>
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<tr>
<td><strong>purchasing new technology</strong></td>
<td>riferimento a iniziative per lo sviluppo di eco - innovazione - Projects Remake (region Lombardy) and Search and Develop IV, together with Innovhub, co-finance measures on energy efficiency and waste reduction</td>
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<tr>
<td><strong>Tax incentives for consumers (e.g. for purchasing environmentally efficient products)</strong></td>
<td>55% tax reduction, presently confirmed but with potential diminished percentages over the next years; private organisms (e.g., environmental association legambiente, GAS) are using group purchasing schemes to obtain better economic conditions Fourth Italian feed-in tariff for PV is confirmed, though with decreased contribution over time, between 2011 and 2016 Green certificates White certificates between March and April 2011 national incentives for installation of GPL/methane-based motors in private vehicles (funds exhausted in April 2011)</td>
<td>X</td>
<td></td>
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<tr>
<td><strong>Tax reductions for products and services (e.g. VAT reductions)</strong></td>
<td>contribution for purchase of “greener” cars. property tax reduction for new cars with low emissions in a number of municipalities</td>
<td>X</td>
<td></td>
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<tr>
<td><strong>Demand subsidies (e.g. eco-vouchers, consumer subsidies)</strong></td>
<td>Vouchers for research and innovation and financial contributions for patenting</td>
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<tr>
<td><strong>Awareness raising and information provision</strong></td>
<td>Forum Compra Verde (<a href="http://www.forumcompraverde.it">www.forumcompraverde.it</a>), one of the main online actors with regard to GPP and also private public procurement. EcoSMEs is the main result of the eLCA project, a European project that has involved 45 experts from the United Kingdom, Germany, Italy, Spain and Greece who have combined their knowledge of IPP, Information&amp;Communication Technologies, Management&amp;Marketing and Training. <a href="http://www.riditt.it/">http://www.riditt.it/</a> - COTEC Foundation</td>
<td>X X X X</td>
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</table>
About the Eco-Innovation Observatory (EIO)

The Eco-Innovation Observatory (EIO) is a 3-year initiative financed by the European Commission’s Directorate-General for the Environment from the Competitiveness and Innovation framework Programme (CIP). The Observatory is developing an integrated information source and a series of analyses on eco-innovation trends and markets, targeting business, innovation service providers, policy makers as well as researchers and analysts. The EIO directly informs two major EU initiatives: the Environmental Technologies Action Plan (ETAP) and Europe INNOVA.

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www.eco-innovation.eu