

**Italy's Second Progress Report under  
Directive 2009/28/EC**

**December 2013**

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  - 2.a Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy (Article 22(1)(e) of Directive 2009/28/EC).**
  - 2.b Please describe the measures in ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (Article 22(1)(f) of Directive 2009/28/EC).**
- 3. Please describe the support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan (Article 22(1)(b) of Directive 2009/28/EC).**
  - 3.1 Please provide the information on how supported electricity is allocated to final customers for purposes of Article 3(6) of Directive 2003/54/EC (Article 22(1)(b) of Directive 2009/28/EC).**
- 4. Please provide information on how, where applicable, the support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(c) of Directive 2009/28/EC).**
- 5. Please provide information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system (Article 22(1)(d) of Directive 2009/28/EC).**
- 6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purpose (Article 22(1)(g) of Directive 2009/28/EC).**
- 7. Please provide information on any changes in commodity prices and land use within your Member State in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources. Please provide where available references to relevant documentation on these impacts in your country (Article 22(1)(h) of Directive 2009/28/EC).**
- 8. Please describe the development and share of biofuels made from wastes,**

residues, non-food cellulosic material, and lingo cellulosic material (Article 22(1)(i) of Directive 2009/28/EC).

**9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within your country in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country (Article 22(1)(j) of Directive 2009/28/EC).**

**10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources (Article 22(1)(k) of Directive 2009/28/EC).**

**11. Please report on (for the preceding 2 years) and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020 (Article 22(1)(l),(m) of Directive 2009/28/EC).**

**11.1 Please provide details of statistical transfers, joint projects and joint support scheme decision rules.**

**12. Please provide information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates (Article 22(1)(n) of Directive 2009/28/EC).**

**Annex - Methodology used to estimate greenhouse gas emission savings in Italy.**

## 1. Sectoral and overall shares and actual consumption of energy from renewable sources (Article 22(1)(a) of Directive 2009/28/EC)

*Preamble:* the following tables include not only the data for the two-year period 2011 - 2012, but also those for the two years 2009 - 2010. This was done because some data for the period 2009 - 2010 which was set out in the first Progress Report has been updated in the light of the updated Eurostat rules and methods or the availability of new data.

**Table 1: Sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources<sup>1</sup>**

	2009	2010	2011	2012
RES-H&C [1] <sup>2</sup> (%)	8.97%	10.67%	12.49%	12.81%
RES-E[2] <sup>3</sup> (%)	18.81%	20.09%	23.55%	27.42%
RES-T[3] <sup>4</sup> (%)	3.69%	4.58%	4.69%	5.84%
<b>Overall RES share[4]<sup>5</sup>(%)</b>	<b>9.25%</b>	<b>10.63%</b>	<b>12.27%</b>	<b>13.53%</b>
Of which (%) from cooperation mechanism[5] <sup>6</sup>	0.00%	0.00%	0.00%	0.00%
Surplus for cooperation mechanism <sup>7</sup> [6]	0.00%	0.00%	0.00%	0.00%

**Table 1a: Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)**

	2009	2010	2011	2012
(A) Gross final consumption of RES for heating and cooling	5 109.2	6 465.0	7 217.7	7 387.5
(B) Gross final consumption of electricity from RES	5 245.4	5 770.9	6 838.1	7 839.8
(C) Gross final consumption of energy from RES in transport	1 288.6	1 572.9	1 575.3	1 551.6
<b>(D) Gross total RES consumption<sup>8</sup></b>	<b>11 643.2</b>	<b>13 808.9</b>	<b>15 631.2</b>	<b>16 778.9</b>
(E) Transfer of RES to other Member States	0.0	0.0	0.0	0.0
(F) Transfer of RES from other Member States and 3rd countries	0.0	0.0	0.0	0.0
<b>(G) RES consumption adjusted for target (D)-(E)+(F)</b>	<b>11 643.2</b>	<b>13 808.9</b>	<b>15 631.2</b>	<b>16 778.9</b>

*Note:* Components B and C cannot be compared precisely with the values shown in the previous version of the Progress Report and with the NAP, because the current tables are generated automatically by the file SHARES created by Eurostat and in the latest version of that file electricity

<sup>1</sup> Facilitates comparison with Table 3 and Table 4a of the NREAPs.

<sup>2</sup> Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Article 5(1)(b) and Article 5(4) of Directive 2009/28/EC divided by gross final consumption of energy for heating and cooling. The same methodology as in Table 3 of NREAPs applies.

<sup>3</sup> Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Article 5(1)(a) and Article 5(3) of Directive 2009/28/EC) divided by total gross final consumption of electricity. The same methodology as in Table 3 of NREAPs applies.

<sup>4</sup> Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)(c) and Article 5(5) of Directive 2009/28/EC divided by the consumption in transport of 1) petrol; 2) diesel; 3) biofuels used in road and rail transport and 4) electricity in land transport (as reflected in row 3 of Table 1). The same methodology as in Table 3 of NREAPs applies.

<sup>5</sup> Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAPs applies.

<sup>6</sup> In percentage point of overall RES share.

<sup>7</sup> In percentage point of overall RES share.

<sup>8</sup> According to Article 5(1) of Directive 2009/28/EC, gas, electricity and hydrogen from renewable energy sources shall only be considered once. No double counting is allowed.

consumption in transport is attributed to the C component, while in the NAP and in the previous Progress Report it was attributed to the B component. Last, in the light of the issue of the new technical regulations (e.g. on the procedures for measuring the energy generated by heat pumps) and of the new datasets available, some historical datasets contributing to measurement of the A component have been modified.

**Table 1.b: Total actual contribution (installed capacity, gross electricity generation) from each renewable energy technology in Italy to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in electricity<sup>9</sup>**

	2009		2010		2011		2012	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh
<b>Hydro<sup>10</sup></b>	<b>21 371</b>	<b>42 279</b>	<b>21 520</b>	<b>43 391</b>	<b>21 737</b>	<b>44 012</b>	<b>21 880</b>	<b>44 141</b>
Non pumped	13 827	26 296	13 976	29 856	14 193	33 283	14 326	36 303
<1MW	451	1 199	509	1 503	548	1 765	570	1 974
1MW–10 MW	2 137	4 907	2 155	5 529	2 271	6 351	2 335	7 018
>10 MW	11 239	20 189	11 312	22 823	11 374	25 168	11 421	27 311
Pumped	3 957	4 305	3 957	3 290	3 957	1 934	3 957	1 979
Mixed <sup>11</sup>	3 587	2 070	3 587	2 135	3 587	2 178	3 598	2 165
<b>Geothermal</b>	<b>695</b>	<b>5 342</b>	<b>728</b>	<b>5 376</b>	<b>728</b>	<b>5 654</b>	<b>728</b>	<b>5 592</b>
<b>Solar</b>	<b>1 142</b>	<b>676</b>	<b>3 470</b>	<b>1 906</b>	<b>12 773</b>	<b>10 796</b>	<b>16 420</b>	<b>18 862</b>
<i>Photovoltaic</i>	1 142	676	3 470	1 906	12 773	10 796	16 420	18 862
<i>Concentrated solar power</i>	0	0	0	0	0	0	0	0
<b>Tide, wave, ocean</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Wind</b>	<b>4 879</b>	<b>6 830</b>	<b>5 794</b>	<b>8 787</b>	<b>6 918</b>	<b>10 266</b>	<b>8 102</b>	<b>12 402</b>
<i>On-shore</i>	4 879	6 830	5 794	8 787	6 918	10 266	8 102	12 402
<i>Off-shore</i>	0	0	0	0	0	0	0	0
<b>Biomass<sup>12</sup></b>	<b>1 871</b>	<b>7 557</b>	<b>2 183</b>	<b>9 440</b>	<b>2 631</b>	<b>10 832</b>	<b>3 555</b>	<b>12 342</b>
<i>Renewable (biodegradable) share of waste</i>	703	1 616	716	2 047	742	2 208	754	2 163
<i>Solid biomass</i>	438	2.828	406	2 261	421	2 522	538	2 582
<i>Biogas</i>	359	1 665	480	2 054	732	3 405	1 274	4 620
<i>Bioliquids</i>	371	1 448	581	3 078	736	2 698	989	2 977
<b>TOTAL</b>	<b>29 958</b>	<b>62 684</b>	<b>33 695</b>	<b>68 899</b>	<b>44 787</b>	<b>81 561</b>	<b>50 685</b>	<b>93 339</b>
<i>Of which in CHP</i>	718	2 379	858	3 251	1 084	4 224	1 642	5 193

Note 1: By subtracting from the total electricity produced from renewable energy sources in each year the share allocated to transport (1 681 GWh in 2009, 1 783 GWh in 2010, 2 033 GWh in 2011, 2 162 GWh in 2012) one

<sup>9</sup> Facilitates comparison with Table 10a of the NREAPs.

<sup>10</sup> Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

<sup>11</sup> In accordance with new Eurostat methodology.

<sup>12</sup> Takes into account only bioliquids complying with applicable sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC, last subparagraph.

obtains, for each year, the value of the gross final consumption of electricity from renewable sources shown in line B of Table 1a.

*Note 2:* In the previous version of the Progress Report and in the NAP the biodegradable share of waste was included in solid biomass.

*Note 3:* In the previous version of the Progress Report and in the NAP, the output power indicated was gross power (whereas this version shows net values), and instead of the entire power of hydroelectric pumping installations (considered in this version) only the share virtually attributable to natural inputs was considered.

**Table 1c: Total actual contribution (final energy consumption<sup>13</sup>) from each renewable energy technology in Italy to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling (ktoe)<sup>14</sup>**

	2009	2010	2011	2012
<b>Geothermal</b> (excluding low temperature geothermal heat in heat pump applications)	<b>213</b>	<b>139</b>	<b>139</b>	<b>134</b>
<b>Solar</b>	<b>85</b>	<b>134</b>	<b>140</b>	<b>155</b>
<b>Biomass<sup>15</sup></b>	<b>2 725</b>	<b>3 927</b>	<b>4 481</b>	<b>4 485</b>
<i>Solid biomass</i>	2 621	3 815	4 044	4 210
<i>Biogas</i>	19	26	330	183
<i>Bioliquids</i>	28	25	22	21
<i>Renewable share of waste</i>	56	62	86	71
<b>Renewable energy from heat pumps</b>	<b>2 087</b>	<b>2.264</b>	<b>2 457</b>	<b>2 613</b>
<i>Of which aérothermal</i>	2 043	2 215	2 400	2 548
<i>Of which geothermal</i>	39	45	51	58
<i>Of which hydrothermal</i>	4	5	6	6
<b>TOTAL</b>	<b>5 109</b>	<b>6 465</b>	<b>7 218</b>	<b>7 388</b>
Of which DH <sup>16</sup>	137	144	161	171
Of which biomass in households <sup>17</sup>	2 240	3 437	3 545	3 619

<sup>13</sup> Direct use and district heat as defined in Article 5(4) of Directive 2009/28/EC.

<sup>14</sup> Facilitates comparison with Table 11 of the NREAPs.

<sup>15</sup> Takes into account only bioliquids complying with applicable sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC, last subparagraph.

<sup>16</sup> District heating and/or cooling from total renewable heating and cooling consumption (RES- DH).

<sup>17</sup> From the total renewable heating and cooling consumption.

**Table 1d: Total actual contribution from each renewable energy technology in Italy to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transport sector (ktoe)<sup>18, 19</sup>**

	2009	2010	2011	2012
<b>Bioethanol/ bio-ETBE</b>	<b>92</b>	<b>122</b>	<b>114</b>	<b>103</b>
<i>Of which Article 21(2) biofuels<sup>20</sup></i>	0	0	7	3
<i>Of which imported<sup>21</sup></i>	51	50	50	45
<b>Biodiesel</b>	<b>1 052</b>	<b>1 297</b>	<b>1.296</b>	<b>1 262</b>
<i>Of which Article 21(2) biofuels<sup>22</sup></i>	38	38	57	338
<i>Of which imported<sup>23</sup></i>	346	592	764	1 009
<b>Hydrogen from renewables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Renewable electricity</b>	<b>145</b>	<b>153</b>	<b>175</b>	<b>186</b>
<i>Of which road transport</i>	0	4	5	5
<i>Of which non-road transport</i>	145	149	170	181
<b>Others (as biogas, vegetable oils, etc.)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Of which Article 21(2) biofuels<sup>24</sup></i>	0	0	0	0
<b>TOTAL</b>	<b>1 289</b>	<b>1 573</b>	<b>1.575</b>	<b>1 552</b>
<b>TOTAL with multiplier factors used in the numerators for the purposes of the transport objective</b>	<b>1 327</b>	<b>1 617</b>	<b>1 647</b>	<b>1 899</b>

<sup>18</sup> For biofuels, only those compliant with the sustainability criteria set out in Article 5(1) last subparagraph of Directive 2009/28/EC are taken into account.

<sup>19</sup> Facilitates comparison with Table 12 of the NREAPs.

<sup>20</sup> Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

<sup>21</sup> From the whole amount of bioethanol/bio-ETBE.

<sup>22</sup> Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

<sup>23</sup> From the whole amount of biodiesel.

<sup>24</sup> Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

**2. Measures taken in the preceding 2 years and/or planned at national level to promote the growth of energy from renewable sources taking into account the indicative trajectory for achieving the national RES targets as outlined in the National Renewable Energy Action Plan (Article 22(1)(a) of Directive 2009/28/EC).**

Directive 2009/28/EC has been transposed by Legislative Decree No 28/2011, which included certain immediately applicable provisions as well as others to be implemented by subsequent Ministerial Decrees, which have since been issued.

The main implemented or planned measures consistent with the framework of the National Action Plan are set out below.

**Table 2: Overview of all policies and measures**

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and/or activity***	Existing or planned****	Start and end dates of the measure
<b>MEASURES IN THE HEATING, COOLING AND ENERGY EFFICIENCY SECTORS</b>					
Energy Efficiency Securities (White Certificates or EES) (Articles 29 and 30 of Legislative Decree No 28/2011 and Ministerial Decree of 28 December 2012)	Regulatory - Financial	The Ministerial Decree of 28 December 2012 provides that the EES scheme shall pursue the following annual energy saving targets: <ul style="list-style-type: none"> <li>• 4.6 Mtoe of primary energy in 2013;</li> <li>• 6.2 Mtoe of primary energy</li> </ul>	Obligated parties: <ul style="list-style-type: none"> <li>• Electricity distributors with more than 50 000 final customers;</li> <li>• Natural gas distributors with more than 50 000 final customers.</li> </ul>	<i>Existing and implemented measure, set out in the NAP.</i>  This mechanism, introduced in 2004, was updated, among others, by Legislative Decree No 28/2011 and by the Ministerial Decree of 28 December 2012.  The main amendments made are: <ul style="list-style-type: none"> <li>• inclusion of annual national quantitative targets for energy savings for the four-year period 2013-2016;</li> <li>• the introduction of type IV securities, certifying savings on energy other than electricity and natural gas, achieved in the transport sector and assessed by means of standardised sheets;</li> <li>• the introduction of type V securities, certifying savings on primary energy other than electricity and natural gas, achieved in the transport sector and</li> </ul>	2005 – n.a.



		<p>in 2014;</p> <ul style="list-style-type: none"> <li>• 6.6 Mtoe of primary energy in 2015;</li> <li>• 7.6 Mtoe of primary energy in 2016.</li> </ul>	<p>Parties joining the scheme on a voluntary basis:</p> <ul style="list-style-type: none"> <li>• Energy service companies (ESCOs);</li> <li>• Companies required to appoint an energy manager (SEM);</li> <li>• Companies under the control of obligated distributors;</li> <li>• Gas or electricity distributors not under the obligation;</li> <li>• Undertakings in the industrial, civil, services, commercial, agricultural, transport and public</li> </ul>	<p>assessed by means of methods different from those established for type IV securities;</p> <ul style="list-style-type: none"> <li>• reduction of the minimum energy saving thresholds for projects, which is currently 20 toe, 40 toe and 60 toe respectively for standard projects, analytical projects and ex-post calculation projects;</li> <li>• introduction of the durability coefficients which multiply energy savings to take account of the cases where the technical life-cycle of the actions exceeds their useful life, i.e. the period of right to issue of the certificates;</li> <li>• inclusion in the scheme on a voluntary basis of new entities meeting the requirements;</li> <li>• introduction of 18 new technical data sheets to quantify the primary energy savings eligible for submitting verification and certification applications;</li> <li>• the introduction of premiums via coefficients multiplying the number of certificates by large-scale infrastructure, industrial and transport projects.</li> </ul>	
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			services sectors, including public bodies, which appoint an energy manager or are ISO 50001 certified.		
Tax deduction for building renovations	Financial	Achievement of targets of energy efficiency and energy generation from RES	End-users owning existing buildings	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>Measure established by Budget Law 1998 and subsequently extended by several legislative measures which allow the deduction from IRPEF (personal income tax) of part of the costs incurred for restructuring the dwellings and common parts of residential buildings located in the territory of the State.</p> <p>Subsequent to the recent regulatory changes, introduced by Legislative Decree No 83/2012, Legislative Decree No 63/2013 and Stability Law 2014, taxpayers can also benefit from the following deductions:</p> <ul style="list-style-type: none"> <li>• for expenditure incurred in 2012, the deduction is 36% of the sums spent up to 25 June 2012, up to an expenditure ceiling of EUR 48 000 per property unit and 50% of the sums spent from 26 June 2012 to the end of the year, up to an expenditure ceiling of EUR 96 000 per property unit;</li> <li>• for expenditure incurred in 2013 and 2014, the deduction is 50% of the sums spent, up to an expenditure ceiling of EUR 96 000 per property unit and taking into account, in the event of ongoing works, of the expenditure incurred in the previous years;</li> <li>• for expenditure incurred in 2015, the tax deduction will be lowered to 40%;</li> </ul>	1998 - n.a.

				<ul style="list-style-type: none"> <li>from 1 January 2016 the tax deduction will become a structural measure and will return to being 36% of expenditure incurred.</li> </ul> <p>The various types of works eligible for tax deduction include “works for installing cabling in buildings, containing noise pollution, energy savings, static and anti-seismic measures for buildings and internal works”. Works to install home renewable energy generation systems are classified on a par with energy saving works.</p>	
Tax deduction for energy efficiency improvements	Financial	Achievement of targets of energy efficiency and thermal energy generation from RES	End-users owning existing buildings	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>Measure established by Budget Law 1998 and subsequently extended by several legislative measures which allow deduction from IRPEF (personal income tax) or from IRES (corporate income tax) of part of the costs incurred to improve the energy efficiency of buildings.</p> <p>Subsequent to the recent regulatory changes, introduced by Legislative Decree No 83/2012, Legislative Decree No 63/2013 and Stability Law 2014, the deductible percentages of expenditure have been set as follows:</p> <ul style="list-style-type: none"> <li>55% of expenditure incurred up to 5 June 2013;</li> <li>65% of expenditure incurred from 6 June 2013 to 31 December 2014 (up to 30 June 2015 if the energy upgrading is made on common parts of condominium buildings or concerns all the property units in the condominium);</li> <li>50% of expenditure incurred from 1 January to 31 December 2015 (up to 30 June 2016 if the energy upgrading is made on common parts of condominium buildings or concerns all the property units in the condominium);</li> <li>thereafter, the measure will become structural, with a 36% deduction rate.</li> </ul> <p>The following works are eligible:</p> <ul style="list-style-type: none"> <li>projects for the energy upgrading of existing buildings obtaining a limit</li> </ul>	2007 - n.a.

				<p>value of annual primary energy demand for heating at least 20% lower than the values listed in an <i>ad hoc</i> table (maximum deduction of EUR 100 000);</p> <ul style="list-style-type: none"> <li>• works on existing buildings, parts of existing buildings or property units thereof, concerning vertical opaque structures, horizontal opaque structures or windows, including blinds or shutters, up to a deduction ceiling of EUR 60 000 (eligibility for the relief is subject to compliance with the requirements of thermal transmittance U, expressed in W/m<sup>2</sup>K, set out in an <i>ad hoc</i> table);</li> <li>• installation of solar panels for the production of domestic or industrial hot water and to cover hot water demand in swimming pools, sports facilities, healthcare centres and residential facilities, schools and universities (maximum deduction: EUR 60 000);</li> <li>• replacement of heating systems with others based on condensing boilers and upgrading of the distribution system (maximum deduction: EUR 30 000);</li> <li>• replacement of heating systems with high efficiency heat pumps and low-enthalpy geothermal systems (maximum deduction of EUR 30 000);</li> <li>• replacement of conventional water heaters with heat pump water heaters for the production of sanitary hot water (maximum deduction of EUR 30 000).</li> </ul>	
Contributions for the generation of thermal energy from renewable energy sources and for small-scale energy efficiency projects (Legislative Decree No 28/2011,	Financial	Achievement of energy efficiency and thermal energy generation from RES targets	Public administrations and private parties (households, condominiums, businesses and farms)	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>Under Legislative Decree No 28/2011, from 2012 onwards, small-scale renewable thermal energy production and energy efficiency projects will receive an incentive proportionate to the amount of renewable thermal energy production or energy saving achieved. The incentive eligibility period cannot exceed ten years.</p> <p>Under the operational measures set out in the Ministerial Decree of 28 December 2012, the works covered by this incentive include: efficiency improvements on the shell of existing buildings (insulation of walls and</p>	2012 - n.a.

Article 28 and Ministerial Decree of 28 December 2012 “Thermal Account”)				<p>roofs, replacement of windows and doors and installation of shadings); the replacement of existing heating systems with more efficient equipment (condensing boilers); and the replacement or, in some cases, the new installation of equipment fuelled by renewable energy sources (biomass fired heat pumps, boilers, stoves and fireplaces, thermal solar systems also coupled with solar cooling technology for cooling purposes). The new Decree also provides specific incentives for any associated Energy Audit and Energy Certification of the above works, under certain conditions. The incentive consists of a cost subsidy to be paid out in annual instalments for a period from 2 to 5 years according to the actions implemented. The Decree allocates funds for an annual maximum cumulative expenditure of EUR 200 million for actions planned or implemented by the public administrations and an annual maximum cumulative expenditure of EUR 700 million for actions implemented by private parties.</p>	
Obligation to include renewable energy sources in new buildings and buildings undergoing major renovations (Article 11 of Legislative Decree No 28/2011)	Regulatory	50% coverage of energy consumption for the production of sanitary hot water, variable percentage of coverage of energy consumption for heating and cooling	End users owning new or renovated buildings	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>New building construction and major renovation projects must provide for the use of RES to cover heat, electricity and cooling requirements in accordance with the minimum integration principles and the start dates set out in Annex 3 to Legislative Decree No 28/2011.</p> <p>Specifically, the following conditions must be complied with simultaneously: 50% of energy consumption for sanitary hot water from RES, and the following percentages of the sums of consumption for sanitary hot water, heating and cooling:</p> <ul style="list-style-type: none"> <li>• 20% for building licence applications submitted between 31 May 2012 and 1 December 2013;</li> <li>• 35% for building licence applications submitted between 1st January 2014 and 31 December 2016;</li> <li>• 50% for building licence applications submitted from 1st January 2017.</li> </ul> <p>For public buildings the obligations are 10% higher. RES systems installed</p>	June 2012 - n.a.

				to meet the previous obligations benefit from RES incentives as to the share exceeding that necessary to comply with said obligations. Failure to comply with obligations leads to refusal to issue the building licence. Regions may establish stricter minimum quotas than those set out in the Decree.	
<b>MEASURES IN THE ELECTRICITY SECTOR</b>					
Premium tariff for photovoltaic plants ("PV Feed-in scheme") (Article 25 of Legislative Decree No 28/2011, Ministerial Decree of 5 December 2011 and Ministerial Decree of 5 July 2012)	Financial	25 000 MW by 2020 (indicative target subject to an annual expenditure ceiling of EUR 6-7 billion)	Investors/end users	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>The PV plant incentive scheme (Feed-in scheme) was updated in the past two years first by Ministerial Decree of 5 May 2011, and later by Ministerial Decree of 5 July 2012.</p> <p>The Ministerial Decree of 5 May 2011 covers power generation systems installed after 31 May 2011.</p> <p>The mechanism provided, up to 2012, for incentives to the electricity produced by photovoltaic plants by means of a premium tariff which is constant for 20 years starting from the plant commissioning date. Since 2013, instead of a premium tariff on all the energy generated, photovoltaic plants are granted a premium tariff on the self-consumed share of the energy produced and an "all-inclusive" tariff on the share of energy produced which is fed into the grid.</p> <p>The above-mentioned decree establishes six-monthly expenditure ceilings according to installed capacity and provides for gradual reduction of the tariffs over time.</p> <p>The Ministerial Decree of 5 July 2012 has revised the incentive schemes for PV electricity generation, by introducing a feed-in premium mechanism for plants with a capacity of more than 1 MW and a feed-in tariff for those with capacity of up to 1 MW. The Decree also set a maximum cap on the indicative cumulative cost of the incentives of EUR 6.7 billion per year. This ceiling was reached in July 2013. Consequently, the mechanism was discontinued (except for certain special cases, such as areas affected by</p>	2005-2013

				recent earthquakes, etc.).	
New incentive schemes (Article 24 of Legislative Decree No 28/2011 and Ministerial Decree of 6 July 2012)	Financial	Achievement of electricity generation from RES targets	Investors/end users	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>Under Legislative Decree No 28/2011 plants (excluding solar) in operation since 2013, would be supported by new incentives replacing the Green Certificates and the all-inclusive tariffs.</p> <p>The Ministerial Decree of 6 July 2012 has established new types of incentives for electricity generation from renewable sources other than PV solar. The incentives under the Decree apply to installations that are: newly built, entirely rebuilt, reactivated, upgraded or renovated, commissioned from 1 January 2013.</p> <p>The Decree sets a ceiling for the indicative cumulative cost of all the incentives granted to the plants, which cannot exceed the total value of EUR 5.8 billion per year. The new incentive system also introduces annual quotas of supported capacity for each year from 2013 to 2015, divided by type of source and plant and broken down according to manner of access to the incentives (auctions; Registers for constructions, complete reconstruction, reactivation, upgrading and hybrid systems; Registers for refurbishments).</p> <p>Under the Decree, the incentives are granted on the net generation of electricity fed into the grid by the plant: consequently, self-consumed electricity does not benefit from the incentives.</p> <p>The decree has two separate incentive schemes, according to type of renewable source, installed capacity and type of installation:</p> <p>A) an all-inclusive feed-in tariff (To) for plants with installed capacity of up to 1 MW, determined by the sum of the base feed-in tariff and the amount of any premiums (e.g. high-efficiency co-generation, emission reduction, etc.);</p> <p>B) an incentive (I) for plants with power output in excess of 1 MW and for those with power output of up to 1 MW which do not opt for the all-inclusive tariff, calculated as the difference between the base feed-in</p>	2013 - n.a.

				<p>tariff - to which any premiums the plant is entitled to are to be added - and the hour zone price of energy (in the zone where the electricity produced by the plant is fed into the grid). The energy produced by the plants eligible for the incentive (I) remains available to the producer. Access to the incentives laid down in the Ministerial Decree of 6 July 2012 is alternative to the net metering and simplified purchase and sale arrangements systems.</p>	
<b>MEASURES FOR THE TRANSPORT SECTOR</b>					
Obligation to release biofuels for consumption (Article 33 of Legislative Decree No 28/2011 as amended and supplemented)	Regulatory - Financial	Spread of sustainable biofuels (EU target by 2020; 10% of transport consumption covered from renewable sources)	Parties releasing fossil fuel for consumption	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>Those parties that release for consumption petrol and diesel from fossil sources for use as transport fuels must release for consumption in the national territory a minimum share of biofuels increasing over time. These parties may also meet their obligation by purchasing all or part of the equivalent share or the related rights from other parties. This system (“release obligation”), introduced by Law No 81 of 11 March 2006, is the incentive to the use of biofuels in transport.</p> <p>For the period from 2012 to 2014 the minimum share of biofuels to be released for consumption, calculated on the basis of the calorific power of the fossil fuel released for consumption, amounts to 4.5%.</p> <p>Legislative Decree No 28/2011 has strengthened this system, by providing <i>inter alia</i> that:</p> <ul style="list-style-type: none"> <li>- the minimum share can be increased by 2020;</li> <li>- starting from 2012 only sustainable biofuels may count towards fulfilment of the obligation;</li> <li>- from 1 November 2012, biofuels from waste and by-products are eligible for the double counting set out in Directive 2009/28/EC, provided that such waste and by-products are produced and converted into biofuels in the territory of the EU. As to by-products, a detailed list</li> </ul>	2007 - n.a.



				is provided, but in any case the double counting applies to all the biofuels obtained from cellulosic or lignocellulosic materials, regardless of whether these materials are classified as non-food, wastes or by-products.	
<b>MEASURES FOR ELECTRICITY GRIDS</b>					
Authorisation of works to connect to the electricity grids (Articles 4 and 16 of Legislative Decree No 28/2011)	Regulatory	Coordination between development of power-generating installation and that of the electricity grid	Grid operators	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>The construction and operation of certain grid development works are authorised by the competent Region via a single procedure. This authorisation process applies to works for the feeding in and collection of the electricity generated by a number of plants and not covered by the connection quotations signed by the grid operator and the power installation owners.</p> <p>The single procedure also applies to distribution grid works and infrastructure designed to improve the dispatching of the energy generated by already operating installations.</p>	March 2011 - n.a.
National transmission grid development plan (Article 17 of Legislative Decree No 28/2011).	Regulatory	Planning of the development of the national transmission grid	National transmission grid operator (TERNA S.p.A.)	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>TERNA S.p.A. has set out in a section of the National Transmission Grid Development Plan, the actions eligible for the above-mentioned single procedure, taking into account the current plant construction and operating licences.</p> <p>In the same section of the Plan, TERNA also sets out the grid reinforcement works necessary to ensure the full feeding-in and collection of the electricity generated by renewable energy installations. These works include storage systems to facilitate the dispatching of non-programmable RES.</p> <p>As to investments in storage systems set out in the Development Plan, the Ministry for Economic Development has approved an experimental</p>	March 2011 - n.a.

				programme for a total installed capacity of 35 MW classified as eligible by the Authority. The programme consists of six pilot projects located at critical points of the national transmission grid, where the level of power generation from renewable sources is particularly low.	
Compensation for work on the national transmission grid (Article 17 of Legislative Decree No 28/2011)	Financial	Works to adapt the transmission grid to the development of RES generation systems	National transmission grid operator (TERNA s.p.a)	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>The Regulatory Authority for Electricity and Gas (AEEG) ensures return on the investment for developing and operating the works included in the above-mentioned section of the Development Plan, taking into account effectiveness for the purpose of collecting the renewable energy, the speed of execution and commissioning of the works, with modulation according to the different electricity market zones and storage technologies.</p>	March 2011 - n.a.
Compensation for work on the distribution networks (Article 18 of Legislative Decree No 28/2011)	Financial	Works to adapt transmission networks to the development of RES generation systems	Distribution grid operators	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>The incentives providing return on invested capital are increased for upgrading projects designed according to smart grid concepts. These works consist in systems for the control, regulation and operation of loads and production units, including electrical car recharging systems. The amount of compensation is determined with reference to project size, calculated as number of active users involved, degree of innovation, speed of work execution and commissioning, and effectiveness for the purpose of full collection of the distributed production.</p> <p>The regulator has selected seven pilot projects introducing innovative technologies in the distribution network, on the basis of the ratio of benefit indicators to the cost of the pilot project (selection procedures and criteria set out in Decision ARG/elt 39/10).</p>	March 2011 - n.a.
National distribution network development plans	Regulatory	Planning of the development of the distribution networks	Distribution network operators	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>Distribution network operators publish each year a Development Plan setting out the main works planned and estimated completion times, also to</p>	March 2011 - n.a.

(Article 18 of Legislative Decree No 28/2011).				favour the coordinated development of the network and of power generation plants. The plans must be prepared in coordination with TERN and must be consistent with the contents of the National Transmission Grid Development Plan.	
Updating of the technical and economic conditions for accessing the networks (Article 19 of Legislative Decree No 28/2011)	Regulatory	Ensure the integration of the renewable sources in the electricity grid to the degree necessary to achieve the objectives set for 2020	Producers and grid operators	<i>Existing and implemented measure, supplementing the NAP.</i>  AEEG updates each year the consolidated text of the economic and technical conditions for connections to grids subject to third-party connection obligation (TICA, consolidated text of active connections) and performs quantitative analysis of the imbalance costs weighing on the electricity system as a consequence of the dispatching of each non-programmable renewable source, assessing the effects of the provisions set out in the TICA.  Should changes occur to market conditions, the regulator shall update the measures on the connection of power generation plants; this may be done at shorter intervals than those set out in Legislative Decree No 28/2011.	March 2011 - n.a.
<b>MEASURES FOR NATURAL GAS GRIDS</b>					
Support to the inclusion of biogas in the natural gas grid (Article 8 of Legislative Decree No 28/2011 and Ministerial Decree of	Regulatory	Injection of biomethane into the natural gas grid	Operators	<i>Planned measure, supplementing the NAP.</i>  Simplified procedures are in place for the authorisation by the Regions of construction of new methane distribution installations and the upgrading of existing ones.  Methane distribution plants and the pipelines linking them to the existing methane pipeline network are declared works of public interest and are non-deferrable and urgent.	2011 - n.a.

5 December 2013)					
Conditions for connecting biomethane plants to the natural gas grid (Article 20 of Legislative Decree No 28/2011)	Regulatory	Injection of biomethane into the natural gas grid	Biomethane producers and natural gas grid operators	<i>Planned measure, supplementing the NAP.</i>  AEEG must issue specific directives on the technical and economic conditions for providing connection of biomethane production plants to natural gas grids whose operators are required to allow connection by third parties.	2011 - n.a.
Incentives to biomethane injected into the natural gas grid (Article 21 of Legislative Decree No 28/2011, Ministerial Decree of 5 December 2013)	Financial	Injection of biomethane into the natural gas grid	Producers of biomethane.	<i>Existing and implemented measure, supplementing the NAP.</i>  The biomethane injected into the natural gas grid is eligible for one of the following incentive schemes: <ul style="list-style-type: none"> <li>• incentives to the renewable electricity generation, where it is injected into the grid and used in high-efficiency cogeneration installations;</li> <li>• issue of certificates of release for consumption if used as transport fuel;</li> <li>• a specific incentive, of pre-set duration and value, granted against injection into the grid irrespective of its use</li> </ul> The incentives are financed via the natural gas tariffs.	2013 - n.a.
<b>MEASURES FOR DISTRICT HEATING AND DISTRICT COOLING NETWORKS</b>					
Ranked as equivalent to primary infrastructure development works (Article 22 of Legislative Decree No 28/2011)	Regulatory	Spread of district heating networks	Owners of district heating networks, building contractors	<i>Existing and implemented measure, supplementing the NAP.</i>  The infrastructure for the installation of district heating and cooling networks from renewable sources is classed as primary infrastructure works.	March 2011 - n.a.

Network development planning (Article 22 of Legislative Decree No 28/2011).	Regulatory	Infrastructure planning	Municipalities	<i>Existing measure, supplementing the NAP.</i> Municipalities and Provinces design district heating and district cooling network development plans.	March 2011 - n.a.
Guarantee fund for district heating (Article 22 of Legislative Decree No 28/2011)	Financial	Support to infrastructure development	Investors	<i>Existing measure, supplementing the NAP.</i> A guarantee fund is established to support the construction of district heating networks, financed with a share of the proceeds from the sale of methane gas (this share is initially EUR 0.05/m <sup>3</sup> , charged to end users).	2012 - n.a.
<b>CROSS-CUTTING MEASURES</b>					
Kyoto fund	Financial	Construction of RES plants, energy efficiency and emission reduction projects	Investors/End Users/ Public Administration	<i>Existing and implemented measure, set out in the NAP.</i> In November 2011 a call of the Ministry of the Environment unlocked access to the revolving fund for Kyoto actions established by Law No 244/2007, for a total budget of EUR 3.5 million for the year 2011. The call is addressed to State authorities, Regions, local authorities, public hospitals, universities and national research centres. The money will fund up to 90% of the costs of projects concerning, <i>inter alia</i> : <ul style="list-style-type: none"> <li>• the integration of RES in buildings in combination with energy-efficient building technologies;</li> <li>• the promotion of high-efficiency (at least 85%) tri-generation (CCHP) plants for electricity generation, heating and cooling, in public complexes, public housing and in large shopping centres, in combination with renewable sources;</li> <li>• the use of heat from low-enthalpy geothermal systems, including heat pumps in private and public buildings.</li> </ul>	2012 - 2014

Provisions on sustainable bioliquids/biofuels (Legislative Decrees No 55/2011 and No 28/2011)	Regulatory	Promotion of sustainable biofuels and bioliquids (EU binding target for Italy by 2020: share of 10% RES in transport and share of 17% RES in total energy consumption)	Operators in the bioliquid/biofuel sectors	<p><i>Existing and implemented measure, supplementing the NAP.</i></p> <p>Legislative Decree No 55/2011, which transposed Directive 2009/30/EC, and Legislative Decree No 28/2011 require adoption of EU sustainability criteria.</p> <p>Ministerial Decree of 23 January 2012 as amended and supplemented put in place the national biofuel and bioliquid certification system, which establishes the methods for checking compliance with sustainability criteria.</p>	2012 - n.a.
International cooperation mechanisms (Articles 35 and 36 of Legislative Decree No 28/2011)	Regulatory - Financial	Achievement of targets. Possibility of international investments.	Other States, investors, TSOs	<p><i>Planned measure, provided for by the NAP.</i></p> <p>Legislative Decree No 28/2011 provides that any incentives to statistical transfer and joint projects must in any case be lower than the average weighted value of the incentives to electricity generation from renewable sources in Italy.</p>	2016 - n.a.
Simplified authorisation procedures (Articles 5, 6 and 7 of Legislative Decree No 28/2011)	Regulatory	Simpler and faster authorisation procedures	Investors/end users/Public Administration	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>Legislative Decree No 28/2011 cuts down red tape for the authorisation of RES power plants: it simplified the framework by establishing three types of authorisations:</p> <ul style="list-style-type: none"> <li>- single authorisation (<i>autorizzazione unica - AU</i>);</li> <li>- simplified authorisation procedure (<i>procedura abilitativa semplificata - PAS</i>);</li> <li>- notification to the municipality for minor works not requiring a building licence (<i>Edilizia Libera</i>).</li> </ul> <p>For certain plant types and sizes, the Regions may simplify authorisation procedures even further (several Regions have already issued legislation to</p>	March 2011 - n.a.

				this effect).	
Rationalisation measures (Article 12 of Legislative Decree No 28/2011)	Regulatory - Financial	Rationalisation of procedures	Investors/end users	<i>Planned measure, provided for by the NAP.</i>  Legislative Decree No 28/2011 provides for the adoption of simplification measures to reorganise economic and financial burdens and the different forms of guarantees required for connection, construction and operation of RES power plants and for the granting of incentives to these plants.	2013 - n.a.
Training and information (Article 14 of Legislative Decree No 28/2011)	Non binding	Information, changing people's behaviour	Operators, project designers, Regions, local authorities, citizens, undertakings, etc.	<i>Existing and implemented measure, supplementing the NAP.</i>  Legislative Decree No 28/2011 provides for the creation of an information portal on renewable sources and energy efficiency. The portal, created by GSE <sup>25</sup> , is addressed to citizens, businesses and public administrations. Its URL is the following: <a href="http://rinnova.gse.it">http://rinnova.gse.it</a> . The website contains, inter alia, information on authorisation procedures, good practices, steps to take for sustainability and energy saving, etc.	October 2011 - n.a.
Installer qualification schemes (Article 15 of Legislative Decree No 28/2011)	Regulatory	Quality assurance in the installation of RES power systems	Installers	<i>Existing and implemented measure, supplementing the NAP.</i>  The professional qualification for the installation and extraordinary maintenance of biomass-fired boilers, fireplaces and stoves, PV and thermal solar systems on buildings, low-enthalpy geothermal systems and heat pumps can be obtained by means of specific courses organised by the Regions.	August 2013 - n.a.
Breakdown of national targets among the Regions (Article 37 of Legislative Decree No 28/2011)	Regulatory	Improved coordination of functions between State and Regions and provision of guidance to grid	Regions and Autonomous Provinces, grid operators, energy producers	<i>Existing and implemented measure, set out in the NAP.</i>  The national targets are broken down among the Regions, in coordination with the regional authorities themselves. This serves as a stimulus for the Regions to plan their roadmaps to achieve the targets and improve and streamline authorisation processes consistently with their commitments. The	

<sup>25</sup> GSE ([www.gse.it](http://www.gse.it)) is the Energy Services Operator, i.e. the public company which in Italy manages incentives to renewable sources and energy efficiency.

		operators and producers		breakdown also helps grid operators make their grid development plans. The progress towards the targets in each Region is monitored, starting with the figures achieved and monitored at national level, by means of methods to be shared with the Regions, and via a standing working group, so as to identify promptly any obstacles to achievement of the targets.	
Interregional Operational programme on renewables and energy saving	Financial	Demonstration projects in the public sector, in network infrastructure and in the renewable power generation chain	Public administrations, grid operators, energy producers	<p><i>Existing and implemented measure, set out in the NAP.</i></p> <p>The purpose of public-sector actions is to help identify effective ways to improve energy efficiency and deploy RES in public buildings, thus ensuring that the public administrations set the example in this area. As concerns grid infrastructure, the programme supports experimentation with a medium voltage network model to favour grid access by non-programmable RES power producers, the creation of high-medium voltage conversion node, the upgrading of existing network infrastructure and the installation of energy storage systems at selected primary distribution stations. Furthermore, support schemes for certain RES production chains are in place</p>	

\* Indicate if the measure is (predominantly) regulatory, financial or soft (i.e. information campaign).

\*\*Is the expected result behavioural change, installed capacity (MW; t/year), energy generated (ktoe)?

\*\*\*Who are the targeted persons: investors, end users, public administration, planners, architects, installers, etc.? Or what is the targeted activity / sector: biofuel production, energetic use of animal manure, etc.)?

\*\*\*\* Does this measure replace or complement measures contained in Table 5 of the NREAP?



**2.a Please describe the progress made in evaluating and improving administrative procedures to remove regulatory and non-regulatory barriers to the development of renewable energy (Article 22(1)(e) of Directive 2009/28/EC).**

Paragraph 4.2.1 of the National Action Plan describes the current state of play of authorisation procedures for plants for the production of energy from renewable sources. To remove the regulatory and non-regulatory barriers identified by the review and improve administrative procedures supporting the deployment of renewable sources, Italy has decided to put in place certain additional measures.

The proportionality and necessity of administrative procedures are evaluated by comparing the complexity of the authorisation process (timing, number and complexity of the authorisations to be obtained) against the type of project to be implemented (energy source, size of the installation, location).

Legislative Decree No 28/2011, which transposed Directive 2009/28/EC, in order to ensure that authorisation procedures are proportionate, and necessary and that they are streamlined and expedited at the appropriate administrative level, as required by Article 13 of the Directive, has in part revised the general framework for authorising renewable energy installations (Articles 4-9). The current national framework sets out three types of authorisation procedures for installations using renewable energy sources (RES):

- **Single Authorisation (*Autorizzazione Unica - AU*)**. This procedure was introduced by Legislative Decree No 387/2003 which transposed Directive 2001/77/EC, to authorise plants producing electricity from RES and the associated works and infrastructure. The AU is required for installations exceeding specific power thresholds, and is issued at the end of a single procedure, carried out by an Interdepartmental Conference composed of all the competent administrations. This authorisation enables construction and operation of the power plant, where necessary also derogating from the applicable zoning rules. Legislative Decree No 28/2011 reduces the maximum duration of the procedure from 180 to 90 days, plus the time allotted to the Environmental Impact Assessment (EIA), where required. The Single Authorisation is issued by the Regions or the Provinces they delegate.
- **Simplified Authorisation Procedure (*Procedura Abilitativa Semplificata - PAS*)**. This was introduced by Legislative Decree No 28/2011 to replace the Notification of Start of Works (*DIA*). This simplified procedure can be used for the construction of RES energy installations below certain installed capacity thresholds (above which the *AU* applies) and for certain types of RES thermal energy plants. The PAS must be submitted to the Municipality at least 30 days

before commencement of works, together with a detailed report signed by a certified engineer and with project drawings and documents, also attesting to the project's compatibility with the applicable zoning plans and building codes, as well as its compliance with hygiene, health and safety rules. Under the PAS system, the application is authorised via tacit acceptance: 30 days after its submission, if no replies or notices have been issued by the Municipality, works can commence.

- **Notification to the Municipality of minor works not requiring a building licence (*Edilizia Libera* - *CAEL*)** - is the simplest authorisation procedure, applicable to certain small RES thermal or electricity plant projects, which are considered to be minor works and as such are exempted from building licences. The works commencement notification must be sent to the Municipality together with a detailed report signed by a certified engineer. In this case, there is no requirement to wait 30 days before starting works.

Legislative Decree No 28/2011 allows Regions to also apply the simplified authorisation procedure (*PAS*) to RES electricity installations having an installed capacity of up to 1 MWe, and the minor-works procedure (*CAEL*) to installations having a capacity of up to 50 kWe and to photovoltaic plants of any power capacity installed on buildings. As at the end of December 2013, the Regions which have made changes to the national authorisation thresholds are 13 in number.

In order to ensure the provision of information and improve transparency, Legislative Decree No 28/2011 provided for the creation of a national web portal, providing extensive and detailed information on renewable energy and energy efficiency: it includes information on the administrative procedures for constructing RES plants. GSE, the Energy Services Operator, tasked with creating the website (<http://www.gse.it/it/EnergiaFacile/Pages/default.aspx>), each year publishes a report on the authorisation procedures in force, broken down by Region and Province.

The Ministerial Decree of 10 September 2010 (National Guidelines for the authorisation of RES plants) provides for the monitoring of the effectiveness and efficiency of the authorisation procedures at regional and provincial level, in order to identify good practices and suggest improvements.

All the measures described above are summarised in Table 2.a.

**Table 2a: overview of all the measures taken to streamline administrative procedures**

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Existing or planned****	Start and end dates of the measure
<b>MEASURES TO STREAMLINE AND EXPEDITE ADMINISTRATIVE PROCEDURES</b>					
Single authorisation (AU) for large installations (Legislative Decree No 387/2003)	Regulatory	Streamlining and acceleration of authorisation procedures	RES Energy producers	<i>Existing and implemented measure</i>	2003 - n.a.
Halving of the time for issue of the single authorisation (AU) (Legislative Decree No 28/2011)	Regulatory	Acceleration of authorisation procedures	RES Energy producers	<i>Existing and implemented measure, supplementing the NAP</i>	2011 - n.a.
<b>MEASURES TO MAKE ADMINISTRATIVE PROCEDURES TRANSPARENT AND PROPORTIONATE</b>					
Web portal providing information on authorisation procedures (Legislative Decree No 28/2011)	Non-binding	Transparency of information	Engineers designing RES installations	<i>Existing and implemented measure, supplementing the NAP.</i>  The web portal providing information on authorisation procedures has the following URL: <a href="http://www.gse.it/it/EnergiaFacile/Pages/default.aspx">http://www.gse.it/it/EnergiaFacile/Pages/default.aspx</a>	2012 - n.a.
Monitoring of	Non-binding	Identification of	State and Regions	<i>Existing and implemented measure, supplementing the</i>	2012 - n.a.

authorisation procedures (Ministerial Decree of 10 September 2010)		good practices and recommendations for improvement		NAP	
<b>MEASURES TO STREAMLINE ADMINISTRATIVE PROCEDURES FOR SMALL, DECENTRALISED INSTALLATIONS</b>					
Introduction of the Simplified authorisation procedure (PAS) (Legislative Decree No 28/2011)	Regulatory	Streamlining of the authorisation procedures for small plants	RES energy producers	<i>Existing and implemented measure, supplementing the NAP</i>	2011 - n.a.
Introduction of the Notification of minor works not requiring a building licence (Edilizia Libera - CAEL) (Legislative Decree No 28/2011)	Regulatory	Streamlining of authorisation procedures for small plants	RES energy producers	<i>Existing and implemented measure, supplementing the NAP</i>	2011 - n.a.
Option for the Regions to change the national authorisation thresholds (Legislative Decree No 28/2011)	Regulatory	Adapting the national legislation to local contexts	Regions	<i>Existing and implemented measure, supplementing the NAP.</i>  As at the end of December 2013, the Regions which have made changes to the national authorisation thresholds number 13.	2011 - n.a.

**2.b Please describe the measures for ensuring the transmission and distribution of electricity produced from renewable energy sources and in improving the framework or rules for bearing and sharing of costs related to grid connections and grid reinforcements (Article 22(1)(f) of Directive 2009/28/EC).**

**Transmission, distribution, dispatching**

Installations producing energy from renewable sources enjoy dispatching priority, compatibly with the secure operation of the electricity grid.

In the past few years, the regulator has issued rules on the use of the electricity grid, reflecting the increase in the amount of energy from non-programmable renewable sources and grid security requirements. These provisions do not affect the requirement to upgrade the existing grid, also with regard to the current and future development of plants using non-programmable renewable sources.

Up to 2012, for production units using non-programmable renewable sources<sup>26</sup>, the actual imbalance price<sup>27</sup> is the selling price accepted in the spot market (Day-Ahead Market/Day Before Market - MGP) in the corresponding relevant period, in the area of the dispatching point (MGP price); this means that if the electricity effectively supplied to the grid by those units is different from the predicted amount, such units will not be charged the greater costs caused to the system which are thus covered by the public.

From 2013, the Authority has defined initial regulation of imbalances also for energy plants using non-programmable renewable sources; this is a first step towards applying the principle of correct allocation of costs to the parties that contribute to generate them. In order to avoid excessively sudden changes in the operation of power generation plants, for the share of electricity not exceeding the established threshold, imbalance prices are set at the price in the area of the dispatching point, whereas for the remaining share of electricity the price is calculated using the same criteria applying to non-authorized power generation installations<sup>28</sup>. The new regulations have repealed the remuneration for accurate forecasting, introduced in 2010 to incentivise the prediction of the quantity of electricity supplied to the grid and hence the programming of the

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<sup>26</sup> Energy plants using solar, wind, tidal, wave, landfill gas, sewage treatment plant gas, biogas, geothermal or hydraulic sources (in the latter case, only installations using flowing water).

<sup>27</sup> The unit value given by the difference between the planned electricity input and the actual amount supplied to the grid.

<sup>28</sup> The imbalance price for non-authorized energy generating installations is a function of the sign of the aggregate zone imbalance: in certain hours it may lead to greater revenue/lower charges (hence a positive margin) with respect to the hourly zone price (this happens in those hours when the imbalance of the power generating unit is of opposite sign to the zone's aggregate imbalance, and therefore, reduces the burden on the electricity grid). Conversely, at other times it might involve lower revenue/greater charges (hence a negative margin) compared to the hourly zone price (this occurs when the imbalance of the power installation is of the same sign as the zone's aggregate imbalance, and therefore increases the burden on the electricity grid).

activity of large production units (with a capacity of 10 MVA or higher) using non-programmable renewable sources.

The regulator has taken the following measures:

- Wind power plants, starting with those not yet commissioned in 2008<sup>29</sup>, receive the following network services (listed in Annex A17 to TERNA's Grid Code):
  - insensitivity to voltage drops;
  - ability to regulate active power;
  - ability to reduce power supply to the grid/switch off power generation;
  - ability to regulate reactive power.

These grid services enable effective modulation of power generation depending on changes of weather and grid conditions, thus improving dispatching and favouring greater deployment of wind power installations even without any changes to the existing electricity infrastructure.

For other wind power plants, there are schemes to compensate the costs incurred by producers to upgrade their installations on a voluntary basis for the supply of one or more grid services<sup>30</sup>;

- For distributed generation plants with low and medium voltage connection already operating in 2012 and having a plant upgrading plan, rules have been issued on the characteristics to be met by the new inverters, i.e. the new rotating machines and by the new interface protection systems in order to be installed on new power generating plants to be connected to the grid, to ensure broadening of the operating field (in terms of frequency and voltage)<sup>31</sup>;
- Approval of the procedure for reducing distributed generation under emergency conditions of the national electricity grid<sup>32</sup>. Under this procedure, to ensure the security of the national electricity grid, when no other actions are possible, TERNA, which also avails itself of the grid operators, may provide for disconnection of certain plants connected to medium voltage grids, having a capacity of 100 kW or more, using non-programmable PV solar or wind power

On the other hand, as concerns lesser generation installations using non-programmable renewable sources, since 2010<sup>33</sup> GSE has been producing aggregate forecasts for each market zone, acquiring via satellite, in real time, the data on availability of the power source and the consequent power generation. Consequently, for these power plants the forecasting burden is not placed on producers.

Lastly, since 2007 compensation is paid for non-generation by wind power plants due to generation reductions imposed by TERNA to ensure the operational safety of the

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<sup>29</sup> AEEG Decision ARG/elt 98/08.

<sup>30</sup> AEEG Decision ARG/elt 5/10.

<sup>31</sup> AEEG Decision 84/2012/R/cfr.

<sup>32</sup> Annex A72 to TERNA's Grid Code.

<sup>33</sup> AEEG Decision ARG/elt 4/10.

electricity grid, in order to safeguard the investments made in renewable sources.

Specifically, up to 2009 the compensation was based on past production<sup>34</sup>, while from 2010<sup>35</sup> compensation is based on the estimates made by a third party, GSE, based on actual wind data measured at the site, in the hours when the generation reduction is requested, using a model that simulates operation of the wind farm. The formula for compensating the power not generated by the wind farm includes a reliability index of the despatching service user in complying with TERNA's despatching orders, and includes a non-remunerated quota which applies when the wind turbines have not been fitted for the requested grid services.

### **Storage systems**

As concerns pilot projects for electricity storage, Article 17 of Legislative Decree No 28/2011 allows the national transmission system operator to include in the Grid Development Plan electricity storage systems designed to facilitate dispatching by non-programmable power generation installations. Under this decree and in accordance with Article 36(4) of Legislative Decree No 93/2011, operators can construct and operate on-site electricity storage systems using batteries. These storage systems can also be installed and operated by distribution system operators.

The objectives of the storage systems tested in the pilot projects are: to reduce the amount of non-production of non-programmable RES energy due to local grid congestion, and to provide the primary regulation service.

In compliance with the rules, the 2012 - 2015 Development Plan, drawn up by TERNA and approved by the Ministry for Economic Development, includes electricity storage systems, designed to facilitate energy dispatching by non-programmable RES plants.

To this end, the Authority has designed a specific incentive for investments in storage systems when they concern pilot projects whose characteristics are specified.

With regard to the investments in storage systems under the 2012-2015 Defence Plan, the Authority initially granted incentives to two pilot projects, for the installation of power-intensive storage systems in Sicily (Caltanissetta) and Sardinia (Ottana) with a maximum capacity of 8 MW each. Subsequently, still within the limits of the Plan, the Authority admitted to the incentive scheme another six pilot projects for a total capacity of 35 MW, located along strategic axes of the national transmission grid, where RES power generation is particularly weak.

Further actions to integrate storage systems in the electric infrastructure are under way, with funding from the Ministry of Economic Development, in the framework of the Interregional Operational Programme for renewable sources and energy saving (IOP Energy); in this case, the local distribution grid operator is installing these systems in

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<sup>34</sup> AEEG Decision 330/07.

<sup>35</sup> AEEG Decision ARG/elt 5/10.

three primary distribution stations located in areas with a high concentration of non-programmable renewable sources in the Regions of Calabria, Puglia and Sicily, and is designing a monitoring plan on the effectiveness of these storage systems and on developments for the further deployment of renewable energy generation.

AEEG has also selected seven pilot projects<sup>36</sup> that will receive incentives for the introduction of innovative technologies in the distribution grid (smart grids).

## Connections

As concerns network access conditions and allocation of connection costs, under the Italian regulations, grid operators must give priority to connection requests and works of RES power plants or high-efficiency cogeneration (CHP) plants. To this end, grid operators must ensure that these priority plants are connected to the grids within the timeframes set out in the Integrated Text on Active Connections (TICA<sup>37</sup>) which lists grid connection procedures obligations, timing and costs.

TERNA and those distributors with at least one primary distribution station must draw up and publish on their websites the maps of their high- and extra high-voltage grids and HV/MV primary distribution stations to provide updated qualitative indications, relative to grid capacity: this information makes it possible to identify critical lines and areas.

For renewable sources power plants, substitution procedures are also provided for in the event of inaction by the grid operator. The Regulatory Authority for Electricity and Gas may initiate the substitution procedure, on the applicant's request, in the following cases:

- more than 60 working days' delay in providing a quotation;
- more than 120 working days' delay in establishing the connection.

As to the connection costs to low and medium voltage grids, under the TICA, RES power plants are entitled to lower prices than those charged to power plants using traditional fuels.

In particular, the price for connecting RES installations, hybrid installations (the latter only if their thermal capacity is less than 300 MW and at least half of their energy is produced from renewable sources), and high-efficiency cogeneration plants, is the lowest of the two values A and B (in Euro):

$$A = CP_A \times P + CM_A \times P \times D_A + 100$$

$$B = CP_B \times P + CM_B \times P \times D_B + 6000$$

where:

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<sup>36</sup> Initially, 8 pilot projects were selected, but one distributor subsequently decided to forego the project.

<sup>37</sup> AEEG Decision ARG/elt 99/08.



- $CP_A = 35 \text{ €/kW}$ ,  $CM_A = 90 \text{ €/(kW km)}$ ,  $CP_B = 4 \text{ €/kW}$ ,  $CM_B = 7,5 \text{ €/(kW km)}$ ;
- $P$  is the power for the purposes of connection, which is equal to the greatest of zero and the additional power required for dispatching (which is in turn the difference, if positive, between the dispatching power requirement and the power already available for the connection before the works);
- $D_A$  is the straight line distance between the connection point and the closest medium/low voltage transformer substation in use for at least 5 years;
- $D_B$  is the straight line distance between the connection point and the closest high/medium voltage transformer substation in use for at least 5 years.

In the cases of new connection via underground cable, the distance-based (CM) connection price doubles, whereas in the case of connection of plants which cannot be reached by a carriageable road or which are separated from the existing distribution installations by stretches of sea, lake or wetland, the distance-based and power capacity-based (CP) connection prices are multiplied by three. If the connection line is provided in part by underground cable and in part by above-ground line, the formulas for calculating the consideration are more complex.

The connection price is paid by the connection applicant to the grid operator, as to 30% at the time of accepting the quotation, and as to the remaining 70% at the time completion of the works strictly necessary for the connection is notified. Alternatively, for amounts not exceeding EUR 2 000, grid operators can require in the connection agreement payment of the entire cost of the connection at the time of quotation acceptance.

The price does not include the costs of the authorisation process which must be paid separately to the grid operators, if they handle the process, and the costs of acceptance testing which must be paid to the distributor if the installation owner decides to establish the grid connection system on his own initiative.

For the connection of RES and high efficiency cogeneration power plants, the connection applicant can install independently the connection system as to the parts not involving work on the existing electricity grid, i.e. as usual, installation of the electricity line and of the power delivery system. The grid operator can allow the applicant to carry out works on the existing grid, subject to the requirements of security and continuity of the electricity service.

After completing the connection works done independently, the applicant sends to the grid operator the communication of completion of works, together with all the documents necessary for commissioning, operation and management of the relevant section of the grid. Commissioning costs are paid by the applicant, even where the outcome is negative. Within 60 working days from completion of the acceptance testing and in any case not before taking over the installed works, the grid operator shall reimburse the applicant for the amount paid at the time of quotation acceptance, plus the legal interest rate. The grid operator shall also pay a price equal to the difference, if positive, between the cost of the works done by the applicant and the connection price

set out in the quotation. If the difference is negative, its amount shall be paid by the applicant to the grid operator within the same time limit.

In the event of a set of power generation plants, if the applicant decides to do the connection on his own, this must apply to all the connections for the set.

For high- and extra high-voltage connections of RES power plants, at the time of submitting the application for the STMD (the connection works executive project), the applicant shall pay the grid operator a price covering the work and technical analysis performed to draw up the executive project. The price for renewable energy plants is half that charged to power plants using traditional sources.

This price is the sum of EUR 1 250 and the product of multiplying EUR 0.25/kW and connection power, up to a maximum of EUR 25 000.

The costs of works on the existing grid are never charged to the applicants in the case of generation plants using renewable sources.

If the applicant did not fully pay the cost charged for the connection at the time of accepting the executive project (STMD), before start of connection works the applicant shall submit, on the grid operator's request, a financial security consisting of a bank guarantee, covering the still unpaid connection price. This guarantee can be enforced by the grid operator if the connection is not executed within the time limit set out in the contract for reasons attributable to the applicant, or if the applicant defaults on payment of the connection price. If the applicant fails to implement the project, for instance due to site clean-up requirements, the grid operator is entitled to enforce a share of the guarantee covering the costs incurred up to that date, less any payments already made and plus any costs the grid operator will incur to restore proper operation of the electricity grid.

**3. Please describe the support schemes and other measures currently in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in your National Renewable Energy Action Plan (Article 22(1)(b) of Directive 2009/28/EC).**

**1. SUPPORT SCHEMES TO PROMOTE THE USE OF RENEWABLE ENERGY SOURCES IN THE HEATING AND COOLING SECTOR.**

**1.1. CURRENT SCHEMES**

As at the date of drafting this document (December 2013), the main national schemes promoting the thermal use of renewable energy sources are the White Certificates (or Energy Efficiency Securities), the Thermal Account and Tax Deductions.

**1.2. WHITE CERTIFICATES**

White Certificates (or Energy Efficiency Securities- EES) are tradable securities which certify energy savings in final energy uses. The legal basis of the White Certificate scheme was established by Ministerial Decree of 24 April 2001, Ministerial Decree of 20 July 2004, Ministerial Decree of 21 December 2007 and Ministerial Decree of 28 December 2012.

Compared with its description in the National Action Plan, the EES scheme has been updated and modified by the following acts: Legislative Decree No 28 of 3 March 2011 (transposing Directive 2009/28/EC), which transferred to GSE management of the scheme, until then managed by the Authority, and expanded its scope to cover energy efficiency projects on the electricity and gas grids; AEEG Decision No EEN 9/11 of 27 October 2011 (Guidelines for the drafting and evaluation of the projects referred to in Article 5(1) of the Ministerial Decree of 20 July 2004 as amended and supplemented and defining the criteria and methods for the issue of Energy Efficiency Securities, replacing the earlier Guidelines set out in AEEG Decision 103/03 of 18 September 2003); and the Ministerial Decree of 28 December 2012 which transferred to GSE management of the scheme and set out the national energy targets for the obligation period 2013-2016.

The Decree also approved 18 new technical data sheets and introduced “large-scale projects”, i.e. energy efficiency projects concerning infrastructure, industrial processes or the transport sector, generating annual savings of 35 000 toe, which are awarded a premium, consisting of additional White Certificates, according to the project's degree of technological innovation and the emission reductions achieved. For these projects, moreover, the applicant may opt for a scheme whereby the value of the certificate is constant throughout the project's life.

The White Certificates' scheme rests on the obligation placed on gas and/or electricity distributors with more than 50 000 final customers, to achieve pre-set annual energy savings targets. The following table sets out the annual targets, updated by the Ministerial Decree of 28 December 2012, for the period 2013- 2016 and expressed in millions of White Certificates, based on an average value of the durability coefficient of 2.5. This coefficient is calculated as the ratio of the savings predicted over the project's technical life-cycle and the savings which would have been achieved irrespective of any incentives, owing to technology and regulatory developments.

Year	Electricity Decree [Million EES/y]	Gas Decree [Million EES/y]
2013	3.03	2.48
2014	3.71	3.04
2015	4.26	3.49
2016	5.23	4.28

Electricity and gas distributors may meet their obligations by implementing projects on their own account or by purchasing securities on the market organised by the GME or via bilateral contracts, from “voluntary parties” which are: energy service companies (ESCOs), electricity and gas distributors with less than 50 000 final customers, and public companies and bodies which have appointed an energy manager (the officer formally responsible for energy saving and energy efficiency pursuant to Article 19 of Law No 10/1991), enterprises in the following sectors: industrial, civil, service, agricultural, transport and public services, including public bodies provided they have appointed an energy manager, or have implemented an energy management system certified under ISO 5001. Voluntary parties implement energy saving actions with final users and sell the White Certificates so obtained on the market organised by the GME or by means of bilateral contracts to obligated parties and to the other parties involved in the scheme.

To obtain the White Certificates, the obligated parties and the voluntary parties must carry out activities enabling achievement of a minimum threshold of energy savings. The amount of the savings achieved is certified by GSE, based on three evaluation methods:

- standardised evaluation which measures the annual savings achieved by the project based on the number of physical units installed. The annual savings achievable by each installed unit is established in the standardised evaluation sheets approved by AEEG, and in the technical data sheets approved by the Decree of 28 December 2012;
- analytical evaluation, which measures annual energy savings on the basis of

certain plant use parameters. The analytical evaluation sheets approved by AEEG, and the analytical technical data sheets approved by the Ministerial Decree of 28 December 2012, include calculation algorithms for measuring the savings achieved;

- post-hoc evaluation: this is used when the first two methods are not applicable and no pre-set algorithm is available for calculating the savings. Consequently, the balance of savings achieved by the project is measured on a post-hoc basis.

Projects eligible for White Certificates include certain technologies which use renewable sources in the heating and cooling sectors, such as:

- use of solar collectors to produce sanitary hot water (sheet 8-*bis*);
- installation of external air intake heat pumps instead of boilers in new or restored residential buildings (sheet 15);
- application in the civil sector of small cogeneration systems for space heating and cooling and to produce sanitary hot water (sheet 21-*bis*);
- application in the civil sector of district heating systems for space conditioning and to produce sanitary hot water (sheet 22-*bis*);
- installation of centralised systems for heating/cooling civil-use buildings (sheet 26);
- installation of electric heat pump to produce sanitary hot water in new and existing domestic systems (sheet 27);
- new installation of single household heating equipment fuelled by woody biomass with power output of up to 35 thermal kW (sheet 37 E);
- installation of heating equipment fuelled by woody biomass in greenhouse agriculture (sheet 40 E).

The white Certificates are issued for a period of 5 or 8 years for all the above projects, except for cogeneration (CHP) (sheet 21-*bis*). The Ministerial Decree of 5 September 2011 provides that high-efficiency cogeneration units are eligible for White Certificates for a period of 10 years, if commissioned from 7 March 2007 as new installations or refurbishment of existing installations. If these cogeneration units are coupled to district heating networks (sheet 22-*bis*) the period of entitlement to the White Certificates increases to 15 years. Cogeneration units commissioned between 1 April 1999 and 7 March 2007, under Article 29(4) of Legislative Decree No 28 of 3 March 2011 are entitled to White Certificates for a period of 5 years and in the amount of 30% of the number set out in the Ministerial Decree of 5 September 2011.

After the entry into force on 1 November 2011 of AEEG Decision No EEN 9/11 of 27 October 2011, the minimum thresholds for submitting projects were amended: the new thresholds are 20 toe, 40 toe and 60 toe respectively for standard, analytical and post-hoc calculation projects. The same decision provided that the energy savings achieved must be multiplied by durability coefficients. These coefficients are calculated by linking the technical life-cycle of the projects (i.e. the period of operation of the

equipment/device achieving the energy saving, which ranges between 5 and 30 years) to useful life (i.e. the period of entitlement to the EES), by applying an annual savings decrease coefficient (ranging from 0 to 2%), in order to take into account the cases where the technical life-cycle of the projects exceeds their useful life. This new coefficient has been introduced also to account for energy savings achieved beyond the EES entitlement period.

The following table lists durability coefficients set out in technical data sheets of projects for the reuse of renewable energy sources.

Sheet No	Title of the technical data sheet	Durability coefficient (T)
8- <i>bis</i>	Use of solar collectors to produce sanitary hot water	2.65
15	Installation of external air intake heat pumps in place of boilers in new or restored residential buildings	2.65
21- <i>bis</i>	Application in the civil sector of small cogeneration systems for space heating and cooling and to produce sanitary hot water	3.36
22- <i>bis</i>	Application in the civil sector of district heating systems for space conditioning and to produce sanitary hot water	3.36
26	Installation of centralised systems for the heating/cooling of civil-use buildings	2.65 / 1.87
27	Installation of electric heat pumps for the production of sanitary hot water in new and existing domestic systems	2.65
37	New installation of single-household heating equipment fuelled by woody biomass with power output of up to 35 thermal kW	2.65
40	Installation of heating equipment fuelled by woody biomass in greenhouse agriculture	2.65
41	Use of biomethane in public transport in place of methane	1.87

Depending on the type of energy saved (electricity, gas, fuels) there are five types of Energy Efficiency Securities:

- Type I securities, for energy savings achieved by reducing electricity consumption;
- Type II securities, for energy savings achieved by reducing natural gas consumption;
- Type III securities, for savings on energy other than electricity and natural gas, not used as transport fuels (e.g. savings of fuel oil or diesel [for heating]);
- Type IV securities, for savings on energy other than electricity and natural gas, achieved in the transport sector and assessed in the manner set out in Article 30

of Legislative Decree No 28/2011;

- Type V securities, certifying savings on primary energy other than electricity and natural gas, achieved in the transport sector and assessed by means of methods different from those established for type IV securities.

After the entry into force of AEEG Decision No EEN 9/11 of 27 October 2011, the types of Energy Efficiency Securities increased from four to five. The new distinction between Type IV and Type V EES was prompted by Article 30(1)(a) of Legislative Decree No 28/2011 which provides that to obtain Type IV EES it is necessary to implement specific actions in the transport sector such as those to promote the use of natural gas and LPG powered vehicles, and entailing the use of ad hoc standardised technical data sheets. On the other hand, Type V Energy Efficiency Securities are issued for energy savings obtained via actions in the transport sector which cannot be measured by standardised evaluation sheets and must therefore be assessed by means of analytical or post-hoc assessments.

The value of the White Certificates depends on the outcomes of their trade either on the market organised by the GME, or through bilateral arrangements between obligated parties (purchasers) on the one hand, and voluntary parties (sellers) on the other. Over the past few years, their average value has increased and, in obligation year 2012, the average value of certificates traded was about 104 216 EES net of VAT.

To enable obligated parties to recoup all or part of the costs borne to implement the actions, a component has been established on electricity and natural gas distribution tariffs. Legislative Decree No 28/2011 has extended this component to Type IV securities too, whereas prior to that it applied only to Type I, II and III securities. By AEEG Decision EEN 12/11 of 24 November 2011, the Regulatory Authority for Electricity and Gas set in EUR 86.98/toe of savings (both directly and via the purchase of White Certificates) the single tariff reimbursement payable to electricity and gas distributors for the year 2012. The Ministerial Decree of 28 December 2012 tasked the Authority with establishing new criteria and procedures to calculate the reimbursement so as to reflect the market price trends of White Certificates, and with setting a cap on the reimbursement.

The following tables are adapted from Table 3 of the *“Template for Member State progress reports under Directive 2009/28/EC”*.

The data collected have been broken down according to the types of technologies covered by the AEEG-approved technical data sheets measuring the primary energy savings.

#### **Solar collectors** (technical data sheet No 8 T)

The certified energy savings from the installation of solar collectors for the production of sanitary hot water amount to: 43 371 toe in 2011, 37 535 toe in 2010 and 30 320 toe

in 2009. From 2012, thanks to the introduction of the durability coefficient, the value of the EES issued is equal to the certified savings multiplied by the applicable durability coefficient tau, including the adjustment. For technical sheets approved before the entry into force of the Guidelines, the savings which the project would have achieved over its technical life-cycle T were paid in advance by means of a single payment during useful life U.

In the year 2012 235 579 EES were issued for solar collector installation projects.

<b>Renewable energy support schemes in 2012</b>		
<b>Solar collectors</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	92.88
	Total subsidy in the year (€)	21 880 578

<b>Renewable energy support schemes in 2011</b>		
<b>Solar collectors</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	95.49
	Total subsidy in the year (€)	4 141 497

<b>Renewable energy support schemes in 2010</b>		
<b>Solar collectors</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	85.14
	Total subsidy in the year (€)	3 195 730

<b>Renewable energy support schemes in 2009</b>		
<b>Solar collectors</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	74.46
	Total subsidy in the year (€)	2 257 627



### Electric heat pumps (technical data sheet No 15)

The certified energy savings from the installation of external air intake heat pumps in place of boilers in new or restored residential buildings amount to: 269 toe in 2011 and 52 toe in 2010, while no savings were certified in 2009. As was the case for sheet 8T, the EES issued in 2012, which numbered 409, include the balance.

Renewable energy support schemes in 2012		
Electric heat pumps		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	92.88
	Total subsidy in the year (€)	37 988

Renewable energy support schemes in 2011		
Electric heat pumps		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	95.49
	Total subsidy in the year (€)	25 687

Renewable energy support schemes in 2010		
Electric heat pumps		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	85.14
	Total subsidy in the year (€)	4 421

Renewable energy support schemes in 2009		
Electric heat pumps		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	74.46
	Total subsidy in the year (€)	0

**Application of small cogeneration systems for space heating and cooling** (technical data sheet No 21-*bis*)

The data in the following tables concern the application in the civil sector of small cogeneration systems for space heating and cooling and the production of sanitary hot water. These applications also include the use of low-enthalpy geothermal heat and of heat from cogeneration or geothermal systems or from biomass or waste.

The certified energy savings from the application in the civil sector of small cogeneration systems for space heating and cooling and the production of sanitary hot water amount to: 21 217 toe in 2011 and 2 583 toe in 2010, while no savings were certified in 2009. In the year 2012, 60 826 EES were issued.

<b>Renewable energy support schemes in 2012</b>		
<b>Small cogeneration systems</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	92.88
	Total subsidy in the year (€)	1 151 433

<b>Renewable energy support schemes in 2011</b>		
<b>Small cogeneration systems</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	95.49
	Total subsidy in the year (€)	2 026 011

<b>Renewable energy support schemes in 2010</b>		
<b>Small cogeneration systems</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	85.14
	Total subsidy in the year (€)	219 917

<b>Renewable energy support schemes in 2009</b>		
<b>Small cogeneration systems</b>		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	74.46
	Total subsidy in the year (€)	0

### District heating systems (technical data sheet No 22-bis)

The data in the following tables concern the application in the civil sector of district heating systems for space heating and cooling and the production of sanitary hot water. These applications also include the use of low-enthalpy geothermal heat from cogeneration or geothermal systems or from biomass or waste.

The certified energy savings from the application in the civil sector of district heating and cooling systems for space heating and cooling and the production of sanitary hot water amount to: 212 091 toe in 2011 and 20 028 toe in 2010, while no savings were certified in 2009. In the year 2012, 60 826 EES were issued.

Renewable energy support schemes in 2012		
District heating systems		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	92.88
	Total subsidy in the year (€)	5 649 519

Renewable energy support schemes in 2011		
District heating systems		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	95.49
	Total subsidy in the year (€)	20 252 570

Renewable energy support schemes in 2010		
District heating systems		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	85.14
	Total subsidy in the year (€)	1 705 184

Renewable energy support schemes in 2009		
District heating systems		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	74.46
	Total subsidy in the year (€)	0

### Centralised heating and cooling systems (technical data sheet No 26)

The data in the following tables concern the application in the civil sector of district heating and cooling systems for space heating and cooling and the production of sanitary hot water. These applications also include the use of low-enthalpy geothermal heat from cogeneration or geothermal systems or from biomass or waste.

The certified energy savings from the application in the civil sector of district heating and cooling systems for space heating and cooling and the production of sanitary hot water amount to: 10 717 toe in 2011 and 20 028 toe in 2010, while no savings were certified in 2009. In the year 2012, 60 826 EES were issued.

Renewable energy support schemes in 2012		
Centralised heating and cooling		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	92.88
	Total subsidy in the year (€)	2 903 893

Renewable energy support schemes in 2011		
Centralised heating and cooling		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	95.49
	Total subsidy in the year (€)	1 023 366

Renewable energy support schemes in 2010		
Centralised heating and cooling		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	85.14
	Total subsidy in the year (€)	596 831

Renewable energy support schemes in 2009		
Centralised heating and cooling		
Energy Efficiency Securities (White Certificates)	Average price of the EES (€/EES)	74.46
	Total subsidy in the year (€)	0

### 1.3 THERMAL ACCOUNT

Under Legislative Decree No 28/2001, which transposed Directive 2009/28/EC, starting from 2012 small-scale renewable thermal energy production and energy efficiency projects are eligible for a new incentive proportionate to the amount of renewable thermal energy production or energy saving achieved, for a period not exceeding ten years.

Legislative Decree No 28/2011, the Ministerial Decree of 28 December 2012 on “Incentives for the production of thermal energy from renewable energy sources and small-scale energy efficiency projects” regulates the amount and procedure for granting incentives to these projects. The Decree allocates funds for an annual maximum cumulative expenditure of EUR 200 million for actions planned or implemented by the public administrations and an annual maximum cumulative expenditure of EUR 700 million for actions implemented by private parties.

The following parties are eligible for the scheme:

- 1) public administrations, both for projects to increase energy efficiency in existing buildings, and for projects for the production of thermal energy from renewable energy sources, which may also rely on third-party financing, an energy performance contract or an energy service contract, also through an ESCO;
- 2) private parties i.e. individuals, condominiums and businesses or farms, for RES thermal energy projects.

As to energy efficiency the following projects are eligible for incentives:

- thermal insulation of opaque surfaces enclosing the heated/cooled space;
- replacement of transparent surfaces inclusive of frames and shading enclosing the heated/cooled space;
- replacement of existing heating systems with heating systems using condensing boilers;
- installation of transparent surface screening and/or shading systems.

Incentives for these works are available only to public administrations. For this type of works, the incentive covers up to 40% of eligible expenditure, in compliance with specific unit cost thresholds and within a total incentive limit. The incentive is broken down into five yearly payments of the same amount.

As to small-scale RES thermal energy projects, the following actions are eligible for the scheme:

- replacement of existing heating systems with electric or gas heat pump systems, or aerothermal, geothermal or hydrothermal systems;

- replacement of existing heating systems for greenhouses and farm buildings with biomass-fuelled heating systems;
- installation of solar thermal collectors, also coupled with solar cooling systems, up to 1 000 m<sup>2</sup>;
- replacement of electrical water heaters with heat pump water heaters.

These incentives are available to both public administrations and private parties. For this type of project, the incentive is calculated on the basis of the estimated thermal energy performance, measured with reference to technology, plant size and climate zone. The value of the energy produced is measured with reference to plant technology and size coefficients. Premiums are awarded for low particulate emissions to biomass-fuelled heating systems. This incentive is broken down into either two or five constant annual payments, according to project type and size.

Under the Decree, for projects to install heat pumps or biomass boilers for heating with a nominal thermal power output between 500 kW and 1 000 kW, access to the scheme is conditional on entry in specific registers.

## 1.4 TAX DEDUCTIONS

Solar thermal systems, high efficiency heat pumps, low-enthalpy geothermal systems, and biomass heating systems can benefit from a wide-ranging support scheme for energy saving in the building sector via tax deductions. This is a voluntary mechanism, whereby individuals or businesses may deduct respectively from their personal or corporate income tax a percentage of the expenditure incurred for energy upgrading works on existing buildings. The deduction is staggered over 10 years.

Tax relief for energy saving projects is covered by the State annual and multi-annual budget. The scheme entered into force in 2007 (Law No 296/2006, Budget Law for 2007) and over time it has been amended and extended.

The 55% tax deduction introduced by Budget Law 2007 was extended to 31 December 2012 by Law No 214 of 22 December 2011. Its scope was also extended to include the replacement of conventional boilers with heat pump boilers for the production of sanitary hot water. Law No 90/2013, which converted Decree Law No 63 of 4 June 2013 extended to 31 December 2013 deductions for all project types already covered by the scheme. For works on common portions of condominium buildings or on all the property units of a condominium, a further extension to 30 June 2014 was granted. Furthermore, for expenditure incurred from 6 June 2013 (the date of entry into force of Legislative Decree No 63/2013) the amount of the deduction was increased from 55% to 65%. Last, Stability Law 2014 has further extended the 65% tax deduction rate for the energy upgrading of buildings.

In summary, expenditure incurred up to 31 December 2014 will be tax-deductible as to 65%. The tax deduction will fall to 50% in 2015 and will return to 36% in 2016. As to works on common portions of condominium buildings or concerning all the property units of a condominium, expenditure incurred up to 30 June 2015 will be tax-deductible as to 65%, while thereafter and up to 30 June 2016 the bonus will drop to 50%.

A cap has been place on the eligible amount of investment according to project type. The caps are listed below:

<b>TYPE OF PROJECT</b>	<b>MAXIMUM DEDUCTION</b>
Energy upgrading of existing buildings	EUR 100 000 (55% of EUR 181 818.18)
Installation of solar thermal panels	EUR 60 000 (55% of EUR 109 090.90)
Replacement of heating systems	EUR 30 000 (55% of EUR 54 545.45)

The tax deduction can be requested by all resident and non-resident taxpayers, including businesses, holding the property concerned under any title. In particular, the tax deduction is granted to:

- natural persons (including holders of a right in rem on the property,

condominiums for works on common parts of buildings, tenants and holders of the property in loan for use);

- taxpayers having income from business activities (individuals, partnerships, limited liability companies);
- groups of professionals;
- public and private entities not pursuing business activities.

The following table summarises the amounts deducted from tax for the promotion of energy saving and use of renewable energy for building heating and cooling in the years 2010 and 2011.

**Tax deductions of 55% by type of project (€)**

	<b>2010</b>	<b>2011</b>
<b>Overall energy upgrading projects</b> (Article 1(344) of Law No 296/2006)	EUR 29 000 000	EUR 49 765 000
<b>Works on the building envelope</b> (Article 1(344) of Law No 296/2006)	EUR 1 451 000 000	EUR 1 088 035 000
<b>Solar panels for the hot water production</b> (Article 1(346) of Law No 296/2006)	EUR 194 000 000	EUR 115 600 000
<b>Replacement of space heating systems</b> (Article 1(347) of Law No 296/2006)	EUR 859 000 000	EUR 566 600 000



## **2. SUPPORT SCHEMES PROMOTING THE USE OF RENEWABLE ENERGY SOURCES IN THE ELECTRICITY SECTOR**

### **2.1 Overview of incentive schemes for RES electricity generation**

During the period 2011-2012, the following incentive mechanisms for new RES electricity plants were in place in Italy:

- Feed-in scheme (Energy Account - *Conto Energia* - CE), for photovoltaic and thermodynamic solar plants;
- Green Certificates (*Certificati Verdi* - CV), for non-solar plants;
- All-inclusive tariffs (*Tariffe Onnicomprensive* - TO), for non-solar power plants having a capacity of up to 1 MW (200 kW for wind power plants).

For the sake of completeness, we should also mention the CIP6 /92 scheme (a feed-in tariff scheme), no longer available for new plants, as it has been replaced by the Green Certificate scheme.

Another type of facility for RES electricity generation is provided by the following simplified electricity take-off services:

- Simplified Purchase and Sale Arrangements (*Ritiro Dedicato* - RID), for programmable generation plants having a capacity of up to 10 MVA and to non-programmable plants of any capacity. Under this scheme, the energy is collected and paid for by GSE, which then places it on the market;
- Net Metering (*Scambio sul Posto* - SSP), for electricity plants of up to 200 kW. Under this scheme, the costs paid by users to purchase electricity from the grid are offset by the value of the electricity they produce and inject into the grid.

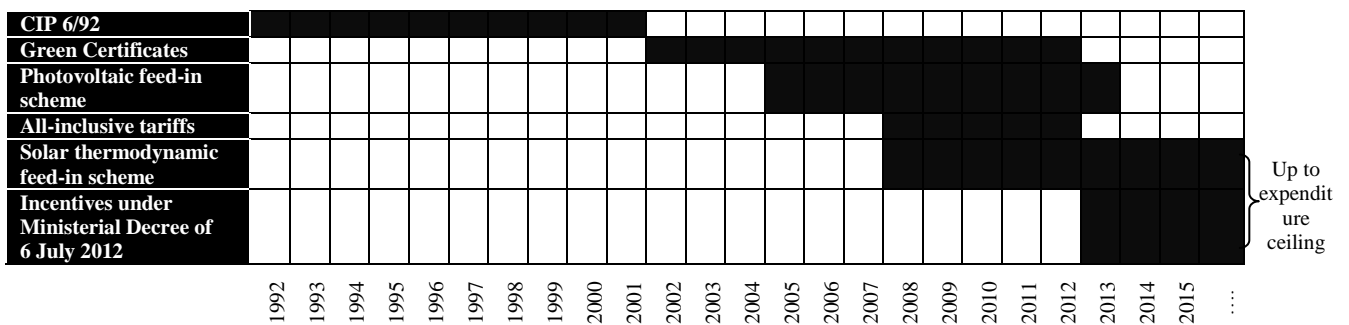
During 2013 certain major changes were made to RES electricity support schemes. As from January 2013 the Green Certificate and all-inclusive tariff schemes have been replaced by the incentives introduced by the Ministerial Decree of 6 July 2012. This Decree has introduced various types of subsidised tariffs (variable premium tariffs and new all-inclusive tariffs) and has established annual quotas of eligible installed capacity and new incentive application procedures involving entry in registers and descending-price auctions on the values of the incentives. Moreover, the plants benefiting from the incentives laid down in the Ministerial Decree of 6 July 2012 are excluded from simplified purchase and sale arrangements and net metering services.

As to the PV sector, the Feed-in scheme, which in past years played a key role in driving the growth of the PV sector in Italy via a feed-in tariff, exhausted its total budget (EUR 6.7 billion/year) for financing new investments in June 2013. From 7 July 2013 investments in photovoltaic plants no longer benefit from the special feed-

in tariffs of the Feed-in scheme (except for some special cases defined by law). New projects in the second half of 2013 have been mainly supported by net metering and/or via a tax deduction mechanism.

The Feed-in scheme for thermodynamic solar plants is still in force with some amendments introduced by the Ministerial Decree of 6 July 2012.

The following chart summarises the time sequence of the different RES electricity support schemes in Italy. The periods shown in the chart represent the time windows for accessing the schemes and not the duration of the incentives themselves. In any case, this is an approximate rendition which, for instance, does not include transitional periods or the actual commencement of the incentives to plants which applied for inclusion in the scheme close to its end date.



## RES electricity support schemes available in the period 2011 – 2012

Type of plant	Incentive scheme	Incentive period	Incentive	Price of energy
Non-solar RES plants	<b>Green Certificates</b>	15 years	Sale of green certificates issued for the power produced	Own consumption or free market
				Simplified Purchase and Sale Arrangements <sup>1</sup>
				Net Metering <sup>2</sup>
	<b>All-inclusive tariffs</b> (small-size plants <sup>3</sup> )	15 years	All-inclusive tariffs on the power injected into the grid	
PV Plants (PV solar)	<b>Fourth PV Feed-in scheme<sup>4</sup></b>	20 years	Fixed premium tariffs on the energy generated	Own consumption or free market
				Simplified Purchase and Sale Arrangements <sup>1</sup>
				Net Metering <sup>2</sup>
	<b>Fifth PV Feed-in scheme<sup>5</sup></b>	20 years	Plants with power output ≤ 1 MW: All-inclusive tariffs on the power injected into the grid and premium tariffs on self-consumed power	
				Plants with power output > 1 MW: Variable premium tariffs on the power injected into the grid and premium tariffs on self-consumed power
CSP plants (concentrating solar power plants)	<b>CSP Feed-in scheme</b>	25 years	Fixed premium tariffs on the energy generated	Own consumption or free market
				Simplified Purchase and Sale Arrangements <sup>1</sup>
				Net Metering <sup>2</sup>
<p>(1) Plants with power output below 10 MVA or non-programmable RES plants with any power output.</p> <p>(2) Plants with power output of up to 200 kW.</p> <p>(3) Plants with power output not exceeding 1 MW (200 kW for wind power plants).</p> <p>(4) In force from 31 May 2011 to 27 August 2012.</p> <p>(5) In force from 27 August 2012 to 6 July 2013.</p>				

### RES electricity support schemes available in 2013

Type of plant	Incentive scheme	Incentive period	Incentive	Price of energy
Non-solar RES plants	<b>Ministerial Decree of 6 July 2012</b>	20-30 years depending on source and installed capacity	Plants with power output $\leq$ 1 MW: All-inclusive tariffs on the power injected into the grid	Own consumption or free market
			Plants with power output $>$ 1 MW: Variable premium tariffs on the electricity injected into the grid	
PV Plants (PV solar)	<b>Fifth PV Feed-in scheme</b>	20 years	Plants with power output $\leq$ 1 MW: All-inclusive tariffs on the power injected into the grid and premium tariffs on self-consumed power	Own consumption or free market
			Plants with power output $>$ 1 MW: Variable premium tariffs on the power injected into the grid and premium tariffs on self-consumed power	
CSP plants (concentrating solar power plants)	<b>CSP Feed-in scheme</b>	25 years	Fixed premium tariffs on the energy generated	Own consumption or free market
				Simplified Purchase and Sale Arrangements <sup>1</sup>
				Net Metering <sup>2</sup>
(1) Plants with power output below 10 MVA or non-programmable RES plants with any power output. (2) Plants with power output of up to 200 kW. (3) In force from 27 August 2012 to 6 July 2013.				

## 2.2 CIP 6/92

CIP 6 is an incentive scheme, introduced in Italy in 1992, consisting of a subsidised feed-in tariff whose value is updated over time. It is therefore a type of feed-in tariff.

This scheme has now been discontinued (it was superseded in 2002 by the Green Certificates), but it continues to operate for those plants which joined the scheme during its validity period.

## 2.3 PV PLANT FEED-IN SCHEME

The Feed-in scheme has been regulated since 2005 by five Ministerial Decrees, the last being the Ministerial Decree of 5 July 2012 (Fifth Feed-in Scheme), which entered into force on 27 August 2012. The Fifth Feed-in scheme expired on 6 July 2013, i.e. 30 calendar days after the incentives reached an indicative cumulative annual cost of EUR 6.7 billion (the expenditure ceiling), as notified by AEEG in decision 250/2013/R/EFR.

The subsidised tariffs of the Fifth Feed-in scheme are granted to the following types of power plant:

- photovoltaic plants, divided by types of installations (Article 7 of Ministerial Decree of 5 July 2012);
- integrated photovoltaic plants with innovative characteristics (Article 8 of Ministerial Decree of 5 July 2012);
- concentrated photovoltaic plants (Article 9 of Ministerial Decree of 5 July 2012);

The projects eligible for the scheme are those for new installation, reconstruction and upgrading. The subsidised tariffs under the Fifth Feed-in Scheme cannot be cumulated with net metering, simplified purchase and sale arrangements or sale of power on the market (only for installations with power output up to 1 MW)

The Fifth Feed-in Scheme has two different incentive access mechanisms, based on type of generating station and nominal power output:

- **directly eligible** plants (up to 50 kW, installed on buildings and replacing Eternit (asbestos cement) roofs; integrated with innovative characteristics; concentration plants; installations by Public Administrations; etc.);
- plants, other than the above, which to access the scheme must be entered on *ad hoc ranking lists*, each with a cost ceiling, set out in the Decree. Actual receipt of the incentive is subject to position in the ranking vis-à-vis the **cost ceiling**.

## **Feed-in tariffs**

The incentives are granted for a period of 20 years. Unlike previous schemes, the Fifth Feed-in scheme provides an **all-inclusive tariff** for the net share of electricity injected into the grid and a **premium tariff** for the net share of electricity consumed on site.

Specifically, GSE grants:

- 1) on the share of net energy injected into the grid, for plants with nominal power output of up to 1 MW, an all-inclusive tariff, calculated on the basis of plant power output and type;
- 2) on the share of net energy injected into the grid, for plants with nominal power output of more than 1 MW, the difference, if positive, between the all-inclusive tariff and the hourly zone price. If the hourly zone price is negative, this difference cannot be higher than the all-inclusive tariff applicable to the plant. The energy produced by plants with nominal power output in excess of 1 MW remains available to the producer;
- 3) a premium tariff on the share of net energy production consumed on site.

In the case of a **plant with self-consumption**, the tariff shall be the sum of the all-inclusive tariff on the net share of energy injected into the grid and of the premium tariff on the net share of energy self-consumed.

A number of premiums on the baseline tariffs are also provided.

The tariffs under the Fifth Feed-in scheme are listed hereunder for the sake of completeness.

**Tariffs for photovoltaic systems commissioned in the first half year of application**

Power range [kW]	BIPV plants		Other photovoltaic plants	
	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]
$1 \leq P \leq 3$	208	126	201	119
$3 < P \leq 20$	196	114	189	107
$20 < P \leq 200$	175	93	168	86
$200 < P < 1000$	142	60	135	53
$1000 < P \leq 5000$	126	44	120	38
$P > 5000$	119	37	113	31

**Tariffs for photovoltaic plants commissioned in the second half-year of application**

Power range [kW]	BIPV plants		Other photovoltaic plants	
	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]
$1 \leq P \leq 3$	182	100	176	94
$3 < P \leq 20$	171	89	165	83
$20 < P \leq 200$	157	75	151	69
$200 < P < 1000$	130	48	124	42
$1000 < P \leq 5000$	118	36	113	31
$P > 5000$	112	30	106	24

**Tariffs for building-integrated PV plants with innovative features commissioned in the first half-year of application**

Power range [kW]	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]
$1 \leq P \leq 20$	288	186
$20 < P \leq 200$	276	174
$P > 200$	255	153

**Tariffs for building-integrated PV plants with innovative features commissioned in the second half-year of application**

Power range [kW]	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]
$1 \leq P \leq 20$	242	160
$20 < P \leq 200$	231	149
$P > 200$	217	135

**Tariffs for building-integrated concentrating photovoltaic plants commissioned in the first half-year of application**

Power range [kW]	All-inclusive tariff [€/MWh]	Premium tariff on electricity consumed on site [€/MWh]
$1 \leq P \leq 20$	259	157
$20 < P \leq 1000$	238	136
$P > 1000$	205	103

**Tariffs for building-integrated concentrating photovoltaic plants commissioned in the second half-year of application**

<b>Power range [kW]</b>	<b>All-inclusive tariff [€/MWh]</b>	<b>Premium tariff on electricity consumed on site [€/MWh]</b>
$1 \leq P \leq 20$	215	133
$20 < P \leq 1000$	201	119
$P > 1000$	174	92



## **2.4. FEED-IN SCHEME FOR CONCENTRATED SOLAR PLANTS**

The Feed-in incentive scheme for concentrated solar plants, set out in the Ministerial Decree of 11 April 2008 as amended by the Ministerial Decree of 6 July 2012, remunerates with *ad hoc* feed-in tariffs, the electricity produced by concentrated solar power plants for a period of 25 years. The tariffs are constant throughout the incentive period.

In the case of hybrid systems i.e. those using both solar and other energy sources, only the electricity from the solar source is eligible for the incentive.

The incentive is granted to CSP plants and hybrid plants, newly constructed and commissioned after 18 July 2008, connected to the electricity grid meeting the following requirements:

- they must not use as heat transfer fluid or storage medium substances and preparations classed as very toxic, toxic and harmful under Directives 67/548/EEC and 999/45/EC as amended (this requirement does not apply if the plant is located in an industrial park);
- they must be equipped with a heat storage system with nominal power capacity in excess of 1.5 kWh/m<sup>2</sup> and must have a collecting area of more than 2 500 m<sup>2</sup> for plants commissioned by 31 December 2012. For plants commissioned after 31 December 2012 nominal power storage capacity varies according to collecting area (from > 1.5 kWh/m<sup>2</sup> for areas > 50 000 m<sup>2</sup> to no storage capacity for areas of up to 10 000 m<sup>2</sup>).

A maximum threshold of eligible power capacity is set, including the solar portion of hybrid plants, which is 2 500 000 m<sup>2</sup> of collecting area.

### **Feed-in tariffs**

The feed-in tariffs for concentrated solar power plants are granted for 25 years from plant commissioning. The amount of the tariffs varies according to:

- the integration fraction - i.e. the percentage of electricity generated each year from non-solar sources;
- the collecting area - the sum of all the areas of all solar collectors included in the CSP plant or hybrid CSP plant.

The incentives are paid exclusively for the electricity from solar source generated by the plant, as measured by a system located downstream of the generation units. The feed-in tariffs go to supplement the revenue from the sale of the electricity generated and injected into the grid.

**Tariffs for plants commissioned by 31 December 2012**

<b>Non-solar fraction</b>	<b>Tariff €/kWh</b>
Up to 0.15	0.28
Between 0.15 and 0.50	0.25
More than 0.50	0.22

**Tariffs for plants commissioned from 31 December 2012 to 31 December 2015  
having a collecting area of up to 2 500 m<sup>2</sup>**

<b>Non-solar fraction</b>	<b>Tariff €/kWh</b>
Up to 0.15	0.36
Between 0.15 and 0.50	0.32
More than 0.50	0.30

**Tariffs for plants commissioned from 31 December 2012 to 31 December 2015  
having a collecting area exceeding 2 500 m<sup>2</sup>**

<b>Non-solar fraction</b>	<b>Tariff €/kWh</b>
Up to 0.15	0.32
Between 0.15 and 0.50	0.30
More than 0.50	0.27

Plants commissioned in 2016 and 2017 shall receive the tariffs for the year 2015 minus respectively 5% and 10%. Barring further decrees, in the years after 2017 the tariffs granted to plants commissioned in 2017 shall continue to apply.

## 2.5. GREEN CERTIFICATES (GC)

Green Certificates are tradable securities, issued by GSE proportionately to the energy generated by a RES power plant, and in a number which varies according to type of renewable source and type of project (construction, reactivation, upgrading or renovation).

The scheme is based on the legal obligation for producers and importers of electricity from non-renewable sources to inject each year into the national electricity system a minimum quota of electricity from renewable sources. Possession of the Green Certificates serves as proof of compliance with this obligation: each Green Certificate certifies conventionally the generation of 1 MWh of renewable energy. Green Certificates are valid for three years: this means that the certificates issued in any given year (GC reference year) may also be used to meet the obligation for the following two years. The obligation can be met in either of two ways: by injecting into the grid electricity produced from renewable sources, or by purchasing the Green Certificates from the producers of green energy.

After ten years of operation, the Green Certificate system was replaced in 2013 by a new incentive system set out in the **Ministerial Decree of 6 July 2012**. Consequently, in the coming years the required quota will decrease progressively as set out in Legislative Decree No 28/2011.

### Changes in the required percentage of green certificates

Reference year (year of production from fossil sources)	Energy subject to the obligation (TWh)	OBLIGATION PERCENTAGE	Year of fulfilment of obligation	Millions of green certificates to be supplied (unit amount 1 MWh)
2001	161.62	2.00 %	2002	3.23
2002	180.91	2.00 %	2003	3.62
2003	203.15	2.00 %	2004	4.06
2004	193.75	2.35 %	2005	4.55
2005	202.65	2.70 %	2006	5.46
2006	189.94	3.05 %	2007	5.79
2007	186.73	3.80 %	2008	7.10
2008	186.91	4.55 %	2009	8.50
2009	153.71	5.30 %	2010	8.14
2010	147.80	6.05 %	2011	8.94
2011	170.95	6.80 %	2012	11.62
2012	152.19	7.55 %	2013	11.49
2013		5.03 %	2014	
2014		2.52 %	2015	
2015		0.00 %	2016	

Green Certificates are issued for a period of 15 years, in a number obtained by multiplying the net annual generation of supported electricity ( $E_i$ ), expressed in MWh, by a coefficient  $K$ , which is different for each renewable source. The amount of supported energy ( $E_i$ ) depends on the type of power plant (new construction,

reactivation, upgrading, refurbishment) and on the net annual energy generated. For newly constructed plants, the amount of supported energy  $E_I$  is the plant's net annual output.

From 2008 onwards photovoltaic plants may no longer join the Green Certificates scheme (but clearly those plants which joined it before that year continue to be covered by the scheme).

### Multiplication coefficients k for calculating the number of green certificates.

Source	Coefficient
On-shore wind turbines	1.00
Off-shore wind turbines	1.50
Geothermal	0.90
Tide, wave, ocean	1.80
Hydropower	1.00
Biodegradable waste, biomass other than that in the following point	1.30
Biomass and biogas produced from agriculture, breeding and forestry activities, obtained within the scope of supply chain understandings, standard contracts or short supply chains	1.80
Landfill gas, residue gas from sewage treatment processes and biogas other than in the preceding point	0.80

### Green Certificates issued from 2002 to 2013 (1 GC = 1 MWh)

Year	Hydroelectric	Wind turbine	Solar	Marine	Geothermal	Bioenergy	Total
2002	452 750	148 000	400	-	187 100	138 352	926 602
2003	596 100	181 200	800	-	482 500	270 444	1 531 044
2004	1 501 050	464 000	800	-	606 900	509 820	3 082 570
2005	1 692 900	1 281 550	1 100	-	629 950	772 889	4 378 389
2006	2 164 799	2 002 000	2 226	-	844 850	955 532	5 969 407
2007	2 921 494	2 653 229	3 096	-	865 644	1 324 515	7 767 978
2008	4 335 632	3 670 792	5 044	-	947 336	2 282 586	11 241 390
2009	6 927 945	5 541 061	4 887	4	936 341	4 515 434	17 925 672
2010	7 771 735	8 170 845	4 160	-	988 650	5 709 566	22 644 956
2011	7 089 222	9 227 086	3 695	-	1 308 575	5 753 295	23 381 873
2012(*)	6 625 225	12 479 362	2 271	-	1 378 913	6 626 520	27 112 291
(*) preliminary values							

### Indicative value of the Green Certificates issued from 2010 to 2012

	2010		2011		2012(*)	
	GC issued [million of GC, 1CV=1MWh]	GC value[million Euro]	GC issued [million of GC, 1CV=1MWh]	GC value[million Euro]	GC issued [million of GC, 1CV=1MWh]	GC value[million Euro]

Hydroelectric	7.8	679	7.1	582	6,6	532
Wind turbine	8.2	714	9.2	758	12.5	1 002
Solar	~0	~0	~0	~0	~0	~0
Marine	-	-	-	-	-	-
Geothermal electricity	1.0	86	1.3	107	1.3	110
Bioenergy	5.7	499	5.8	472	6.6	532
<b>Total</b>	<b>22.6</b>	<b>1 979</b>	<b>23.4</b>	<b>1 920</b>	<b>27.1</b>	<b>2 178</b>
GC reference value [€/MWh]**		<b>87.38</b>		<b>82.12</b>		<b>80.34</b>
<i>(*) preliminary figure</i>						
<i>(**) the value of the GCs collected by GSE the year after their issue was considered</i>						

## 2.6. ALL-INCLUSIVE TARIFFS

The All-inclusive Tariff incentive scheme (alternative to Green Certificates) is open to RES power plants with installed capacity of less than 1 MW (200 kW for wind power plants), commissioned between 2008 and 2012.

The scheme consists of fixed rates for off-take of electricity supplied to the grid, paid for 15 years, differentiated according to the type of renewable source. The value of the all-inclusive tariffs includes both the incentive component and the sales component of the electricity produced and supplied to the grid.

The table below shows the values of the all-inclusive tariffs, which differ according to source.

**Values of the All-inclusive Tariffs**

<b>Source</b>	<b>Tariff [EUR/kWh]</b>
Wind turbines for systems with installed capacity of less than 200 kW	0.30
Geothermal	0.20
Tide, wave, ocean	0.34
Hydroelectric other than in the preceding point	0.22
Biogas and biomass, excluding liquid biofuels with three exceptions (which are therefore not excluded): <ul style="list-style-type: none"><li>- pure vegetable oils traceable by way of the integrated management and control system provided by Council Regulation (EC) No 73/2009 of 19 January 2009;</li><li>- ethyl alcohol of agricultural origin from distillation of wine-making by-products;</li><li>- butchery waste, by-products of agricultural, agro-foodstuffs and forestry activities (these are not considered liquids even when they undergo liquefaction treatment or mechanical extraction in the production sites of said waste and by-products or in the electricity conversion system).</li></ul>	0.28
Landfill gas, residue gas from sewage treatment processes and liquid biofuels with the exception of pure vegetable oils traceable by way of the integrated management and control system provided by Council Regulation (EC) No 73/2009 of 19 January 2009	0.18

**Relative off-take power, off-take cost and cost of providing incentives to the plants under the All-inclusive tariff scheme between 2010 and the first half of 2012**

Type	2010			2011			2012		
	Power [GWh]	Power off-take cost [€mln]	Cost of the incentive (*) [€mln]	Power [GWh]	Power off-take cost [€mln]	Cost of the incentive (*) [€mln]	Power [GWh]	Power off-take cost [€mln]	Cost of the incentive (*) [€mln]
Pumped storage hydroelectric	0.9	0.2	0.1	0.5	0.1	0.1	1.0	0.2	0.1
Conventional hydroelectric	7.5	1.6	1.1	6.3	1.4	0.9	8.2	1.8	1.2
Run-of-the-river hydroelectric	504.4	111	77.3	626.2	137.8	91.0	808.9	178.0	115.7
Conduit hydroelectric				31.0	7.0	4.7	33.0	7.3	4.8
Wind turbine	1.8	0.5	0.4	4.4	1.3	1.0	12.3	3.7	2.8
Solid biomass	41.8	11.7	8.9	93.5	26.2	19.2	160.4	44.8	32.4
Bioliquids	95.8	23.9	17.5	121.4	30.4	21.3	194.2	42.2	27.2
Biogas	556.1	155.3	118.1	1 491.2	417.4	306.0	2 647.4	741.1	537.3
Landfill gas	123.7	22.3	14.0	167.5	30.2	17.7	204.5	36.8	21.1
<b>Overall total</b>	<b>1 331</b>	<b>326</b>	<b>237</b>	<b>2 542</b>	<b>652</b>	<b>462</b>	<b>4 070</b>	<b>1 056</b>	<b>743</b>
<b>Value of the power on the electricity market [€/MWh] (**)</b>			<b>66.9</b>			<b>74.72</b>			<b>77.00</b>
<i>(*) Indicative value obtained by deducting from the off-take cost of the supported power the revenue from the sale of the same power on the market</i>									
<i>(**) The average sale price of electricity from non-programmable renewable sources was considered</i>									

## 2.7. THE FEED-IN TARIFFS INTRODUCED BY THE MINISTERIAL DECREE OF 6 JULY 2012

The Ministerial Decree of 6 July 2012 sets out incentives for electricity generation from renewable sources other than PV solar, by means of plants which are newly constructed, entirely rebuilt, reactivated, upgraded or renovated, commissioned from 1 January 2013 onwards.

The Decree also regulates the shift of already operating plants, from 2016, from the Green Certificate Scheme to new incentive systems.

The Decree sets a cap on the indicative cumulative cost of all the incentives granted to the renewable energy installations, other than PV, **which cannot exceed the total value of EUR 5.8 billion per year.**

The new incentive system also introduces annual quotas of supported installed capacity for each year from 2013 to 2015, divided by type of source and plant and broken down according to manner of access to the incentives (auctions; Registers for constructions, complete reconstruction, reactivation, upgrading and hybrid systems; Registers for renovations).

### **Manner of accessing the incentives**

The Decree sets out four ways of accessing the incentives, based on the plant's installed capacity and type of project (Article 4):

- **Direct access**, in the case of new construction, complete reconstruction, reactivation or upgrading with installed capacity not exceeding a specified threshold (Article 4(3)), according to type of energy source or specific categories;
- **Entry in Registers**, in a position enabling applicants to be included in the annual quotas of installed capacity covered by the incentive (Article 9(4)), in the case of new construction, complete reconstruction, reactivation or upgrading with installed capacity exceeding the threshold for direct access to the incentives but lower than the cap above which participation in descending price auctions is required;
- **Entry in Registers for renovation projects**, in a position enabling applicants to be included in the annual quotas of installed capacity covered by the incentive (Article 17(1)), in the case of renovation of plants with installed capacity after the renovation exceeding the threshold for direct access;
- Award of the incentives via participation in **descending price auctions**, in the case of new construction, complete reconstruction, reactivation or upgrading with installed capacity exceeding threshold values (10 MW for hydropower plants, 20 MW for geothermal power plants and 5 MW for other RES power plants).

### **Type of incentives**

The incentives are granted on the net generation of electricity fed into the grid by the plant. Consequently, self-consumed electricity does not benefit from the incentives.



Two separate incentive mechanisms are available based on the plant's type, installed capacity and renewable source:

A) an **all-inclusive feed-in tariff** ( $T_o$ ) for plants with power capacity of up to 1 MW, determined by the sum of the base feed-in tariff - determined for each energy source, plant type and installed capacity class in Annex 1 to the Decree - and the amount of any premiums (e.g. high-efficiency co-generation, emission reduction, etc.);

B) an **incentive (I)** for plants with installed capacity of more than 1 MW and for those with capacity of up to 1 MW which do not opt for the all-inclusive tariff. This incentive is calculated by deducting from the base feed-in tariff - plus any premiums the plant is eligible for - the hour zone price of electricity (in the zone where the electricity generated by the plant is injected into the grid). The power produced by the plants eligible for the incentive (I) remains available to the producer.

Access to the incentives laid down in the Ministerial Decree of 6 July 2012 is alternative to the net metering and simplified purchase and sale arrangements systems.

### **Feed-in tariffs**

The value of the base feed-in tariffs ( $T_b$ ) for plants commissioned in 2013 is set according to energy source, type of plant and class of installed capacity (Annex 1, Table 1.1. of the Decree). The tariffs are reduced by 2% for each of the following years up to 2015. An exception is made if the actual annual quota of power capacity reached through registers and auctions is less than 80% of the expected value (Article 7(1) of the Decree).

The Decree also establishes a series of premiums ( $P_r$ ) which can be added to the base tariff, available to particular types of power plants meeting specific operating requirements (Articles 8, 26, 27, Annex 1, Table 1.1 of the Decree).

The duration of the new incentives is equal to the conventional useful life of each type of plant, set out in Annex 1 to the Decree.

**Annex 1, Table 1.1**

Renewable source	Type	Capacity	USEFUL LIFE OF THE POWER PLANTS	Base Feed-in tariff	
		KW	Years	€/MWh	
Wind turbine	On-shore	1<P≤20	20	291	
		20<P≤200	20	268	
		200<P≤1000	20	149	
		1000<P≤5000	20	135	
		P>5000	20	127	
	Off-shore wind turbine (1)	1<P≤5000	25	176	
		P>5000	25	165	
Hydropower	Run-of-the-river hydroelectric (and conduit hydroelectric)	1<P≤20	20	257	
		20<P≤500	20	219	
		500<P≤1000	20	155	
		1000<P≤10000	25	129	
		P>10000	30	119	
	Conventional (dams) or pumped-storage hydroelectric	1<P≤10000	25	101	
		P>10000	30	96	
Ocean (including tide and wave)		1<P≤5000	15	300	
		P>5000	20	194	
Geothermal		1<P≤1000	20	135	
		1000<P≤20000	25	99	
		P>20000	25	85	
Landfill gas		1<P≤1000	20	99	
		1000<P≤20000	20	94	
		P>20000	20	90	
Sewage treatment plant gas		1<P≤1000	20	111	
		1000<P≤5000	20	88	
		P>5000	20	85	
Biogas	a) products of biological origin	1<P≤300	20	180	
		300<P≤600	20	160	
		600/1000	20	140	
		1000<P≤5000	20	104	
		P>5000	20	91	
	b) by-products of biological origin listed in Table 1-A; d) unsorted waste other than that referred to in point c)	1<P≤300	20	236	
		300<P≤600	20	206	
		600<P≤1000	20	178	
		1000<P≤5000	20	125	
		P>5000	20	101	
	c) waste whose biodegradable portion is determined on the basis of fixed rates, in the manner set out in Annex 2	1<P≤1000	20	216	
		1000<P≤5000	20	109	
P>5000		20	85		
Biomass	a) products of biological origin	1<P≤300	20	229	
		300<P≤1000	20	180	
		1000<P≤5000	20	133	
		P>5000	20	122	
	b) by-products of biological origin listed in Table 1-A; d) unsorted waste other than that referred to in point c)	1<P≤300	20	257	
		300<P≤1000	20	209	
		1000<P≤5000	20	161	
		P>5000	20	145	
	c) waste whose biodegradable portion is determined on the basis of fixed rates, in the manner set out in Annex 2	1<P≤5000	20	174	
		P>5000	20	125	
	Sustainable bioliquids		1<P≤5000	20	121
			P>5000	20	110

*(1) Off-shore wind power plants whose operators do not use the option set out in Article 25(3), and perform at their own expense the works for connection to the electricity grid, are entitled to a premium of EUR 40/MWh.*

The following tables set out the initial results of the Ministerial Decree of 6 July 2013.

**Plants in receipt of the incentives under the Ministerial Decree of 6 July 2012 as at 30 June 2013**

Type	Number of plants	Power capacity [MW]	Annual supported power [GWh]
Conventional (dams) or pumped-storage hydroelectric	3	3.7	30
Run-of-the-river hydroelectric	171	80.6	495
Conduit hydroelectric	10	1,5	11
On-shore wind turbines	335	474.1	723
Off-shore wind turbines	1	30.0	75
Geothermal	3	76.5	357
Biomass	80	151.8	568
Sustainable bioliquids	5	4.4	9
Biogas	92	47.3	310
Landfill gas	5	3.4	18
<b>Overall total</b>	<b>705</b>	<b>873.3</b>	<b>2 594</b>

**Indicative annual cost of the incentives to electricity generation from renewable sources**

The “indicative cumulative annual cost of incentives” granted to renewable energy generation systems is an estimate of the potential per year cost, already committed even if not yet entirely incurred of the incentives granted to renewable energy generation systems under the various national incentive schemes adopted over time in this sector.

The following tables show a breakdown of the indicative annual cost between the different incentive mechanisms. More information and constantly updated data are available on website [www.gse.it](http://www.gse.it).

**Indicative annual cost of the incentives to electricity generation from renewable sources**

<b>INDICATIVE ANNUAL COST OF INCENTIVES TO RES ELECTRICITY GENERATION</b>	
(Updated as of 30 September 2013)	
Scheme	Indicative annual cost [million Euro]
<b>Green Certificates</b>	2 582.4
<b>All-inclusive Tariff</b>	1 308.3
<b>CIP6</b>	208.2
<b>Registers and Auctions under MD 06/07/2012</b>	396.5
<b>Operating plants under MD 06/07/2012</b>	8.7
<b>PV Feed-in scheme</b>	6 700.0
<b>TOTAL</b>	<b>11 204.1</b>

<b>INDICATIVE ANNUAL COST OF GREEN CERTIFICATES</b> <b>(updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Number of Green Certificates</b>	<b>Indicative annual cost</b>
	<b>[1 CV= 1 MWh]</b>	<b>[million Euro]</b>
<b>Hydropower</b>	8 293 975	666.3
<b>Wind turbine</b>	13 838 541	1 111.80
<b>Wave and tide</b>	3	0
<b>Geothermal</b>	1 473 805	118.4
<b>Biomass</b>	3 534 403	284
<b>Bioliquids</b>	3 842 334	308.7
<b>Biogas</b>	1 160 895	93.3
<b>Overall total</b>	<b>32 143 956</b>	<b>2 582.40</b>
<b>INDICATIVE ANNUAL COST OF THE ALL-INCLUSIVE TARIFF (updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Annual supported energy</b>	<b>Indicative annual cost</b>
	<b>[MWh]</b>	<b>[million Euro]</b>
<b>Hydropower</b>	1 471 276	213.7
<b>Wind turbine</b>	18 053	4
<b>Wave and tide</b>	0	-
<b>Geothermal</b>	0	-
<b>Biomass</b>	301 150	61.1
<b>Bioliquids</b>	440 390	70.1
<b>Biogas</b>	4 803 268	959.4
<b>Overall total</b>	<b>7 034 137</b>	<b>1 308.30</b>

<b>INDICATIVE ANNUAL COST OF CIP6 (updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Annual supported energy</b>	<b>Indicative annual cost</b>
	<b>[MWh]</b>	<b>[million Euro]</b>
<b>Hydropower</b>	0	-
<b>Wind turbine</b>	204 650	6.2
<b>Biomass</b>	1 602 170	191.6
<b>Biogas</b>	194 111	10.4
<b>Overall total</b>	<b>2 000 931</b>	<b>208.2</b>
<b>INDICATIVE ANNUAL COST OF REGISTERS AND AUCTIONS (updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Annual supported energy</b>	<b>Indicative annual cost</b>
	<b>[MWh]</b>	<b>[million Euro]</b>
<b>Hydropower</b>	1 151 150	86.3
<b>Wind turbine</b>	1 495 535	75.2
<b>Wave and tide</b>	0	-
<b>Geothermal</b>	356 517	11.7
<b>Biomass</b>	886 240	121.1
<b>Bioliquids</b>	31 816	1.5
<b>Biogas</b>	735 977	100.7
<b>Overall total</b>	<b>4 657 234</b>	<b>396.5</b>
<b>INDICATIVE ANNUAL COST OF PLANTS IN OPERATION (MD 6/7/2012 updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Annual supported energy</b>	<b>Indicative annual cost</b>
	<b>[MWh]</b>	<b>[million Euro]</b>
<b>Hydropower</b>	50 206	6.8
<b>Wind turbine</b>	3 664	0.6
<b>Wave and tide</b>	0	-
<b>Geothermal</b>	0	-
<b>Biomass</b>	2 604	0.6
<b>Bioliquids</b>	0	-
<b>Biogas</b>	3 890	0.8
<b>Overall total</b>	<b>60 364</b>	<b>8.7</b>
<b>INDICATIVE ANNUAL COST OF PV FEED-IN SCHEME (updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Installed capacity covered</b>	<b>Indicative annual cost</b>
	<b>[MW]</b>	<b>[million Euro]</b>
<b>Photovoltaic</b>	18 217	6 700
<b>INDICATIVE ANNUAL COST OF CSP FEED-IN SCHEME (updated as of 30 September 2013)</b>		
<b>Type of plant</b>	<b>Installed capacity covered</b>	<b>Indicative annual cost</b>
	<b>[MW]</b>	<b>[million Euro]</b>
<b>Concentrated solar power</b>	0	0

## 2.8. TAX DEDUCTIONS FOR RENEWABLE ENERGY SYSTEMS

Budget Law 1998 introduced the possibility of deducting from IRPEF (personal income tax) part of the costs incurred for restructuring dwellings and common parts of residential buildings.

The various types of works eligible for tax deduction include works to achieve energy savings, including the installation of renewable energy systems meeting the energy demands of residential buildings (i.e. domestic uses such as lighting, powering electrical appliances, etc.).

A typical example of installations receiving this type of incentive are photovoltaic plants for residential use.

A series of legislative acts (Legislative Decree No 83/2012, Legislative Decree No 63/2013, Stability Law 2014) have determined the following situation:

- for expenditure incurred up to 25 June 2012, the deduction is 36%, with an expenditure cap of EUR 48 000 per property unit;
- for expenditure incurred from 26 June 2012 to 31 December 2014, the deduction is 50%, with an expenditure cap of EUR 96 000 per property unit;
- for expenditure incurred in 2015, the tax deduction will be lowered to 40%;
- from 1 January 2016 the tax deduction will become a structural measure and will return to being 36% of expenditure incurred.

The deduction is compatible with the Net Metering and with the Simplified Purchase and Sale Arrangements.

The VAT rate on purchase of the plants is 10%.

### **3. SUPPORT SCHEMES PROMOTING THE USE OF RENEWABLE ENERGY SOURCES IN THE TRANSPORT SECTOR**

Those parties that release for consumption petrol and diesel from fossil sources for use as transport fuels must release for consumption in the national territory a minimum share of biofuels increasing over time. These parties may also meet their obligation by purchasing all or part of the equivalent share or the related rights from other parties (as a rule, each 10 Gcal of biofuel released for consumption is rewarded by one “certificate of release for consumption”).

This system (“biofuel blending obligation”), introduced by Law No 81 of 11 March 2006, constitutes an incentive to the use of biofuels in transport.

For the period from 2012 to 2014, this minimum share of biofuels to be released for consumption, calculated on the basis of the calorific power of the fossil fuel released for consumption, amounts to 4.5%.

Legislative Decree No 28/2011 has strengthened this system, by providing *inter alia* that:

- a Decree may be issued, if necessary to attain the EU targets, to increase the minimum share before 2020;
- starting from 2012 only sustainable biofuels may count towards fulfilment of the obligation;
- from 1 November 2012, biofuels from waste and by-products are eligible for the double counting set out in Directive 2009/28/EC, provided that such waste and by-products are produced and converted into biofuels in the territory of the EU (one “certificate of release for consumption” is issued for every 5 Gcal of biofuel, instead of every 10 Gcal).

The by-products eligible for double counting are included in a detailed list, which is revised each year. Currently, the list includes:

- glycerine-containing water;
- fatty acids from oil refining, saponified fatty acids from the neutralisation of acidic oil residues;
- residues from the distillation reaction of crude fatty acids and glycerine-containing water; exhaust lubricating vegetable oils from fatty acids;
- lees and marc from winemaking;
- Category 1 and Category 2 animal fat in compliance with Regulation (EC) No 1069/2009, Regulation (EC) No 142/2011 and the Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels (2010/C 160/02).

The double counting applies to all the biofuels obtained from algae, cellulosic or ligno-cellulosic materials, regardless of whether these materials are classified as non-food, waste or by-products.

Moreover, up to 31 December 2014 a greater incentive is granted to biofuels produced in the European Union’s territory from raw material of EU origin. These biofuels receive a “certificate of release for consumption” for every 8 Gcal. The

same incentive is given if the obligated party releases the biofuels for off-grid consumption in mixtures where the share of biofuels is 25% by volume.

<b>Obligation to release biofuels for consumption</b>	
Obligation/quota: % of the energy content of fossil fuel released the previous year	2007: 1% 2008: 2% 2009: 3% 2010: 3.5% 2011: 4% From 2012 to 2014: 4.5 %
Penalty (€/Gcal)	From EUR 60 to EUR 90 for each Gcal not released for consumption
Estimated average price of the certificate (1 certificate = 10 Gcal)	400/450 € corresponding to 40-45€/Gcal



**3.4. Please provide information on how supported electricity is allocated to final customers for the purposes of Article 3(6) of Directive 2003/54/EC (Article 22(1)(b) of Directive 2009/28/EC).**

With the entry into force of the Decree of the Ministry of Economic Development of 31 July 2009 “*Criteria and procedures for providing to final customers information on the composition of the energy mix used to generate the electricity supplied and on the environmental impact of power generation*” (hereinafter the “Fuel Mix” Decree) electricity suppliers are required to inform final customers as to the composition of the energy mix used to generate the electricity supplied and on the environmental impact of its generation. In particular, electricity suppliers must provide, for the previous two years, the information necessary to trace the energy mix used, reporting it in the energy bills (at least once a quarter), on their website, and in the promotional materials given to customers during pre-contract negotiations, using the model set out in the Fuel Mix Decree. Final customers can thus compare their supplier’s energy mix with the average energy mix used to generate the electricity injected into the national electricity system (including any share of imported power). To ensure correct calculation of the energy mix used by individual power suppliers and by the national system, the Decree has laid down criteria to be followed by electricity supply companies, generators, importers and traders operating on the Italian electricity market.

The Decree gives GSE a key role in the fuel mix disclosure process. GSE’s main responsibilities under the Decree are the following:

- establish a procedure for the certification of RES origin of the electricity injected into the grid, ensuring that the certificates meet the following requirements: transferability from power generators to power supply companies, IT traceability and sole ownership;
- select technical procedures for calculating the energy mix of the parties to the disclosure process (from electricity generator to supplier company);
- specify and publish the energy mixes of the parties to the disclosure process, as well as the national complementary energy mix;
- carry out consistency checks, in cooperation with the national transmission grid operator - TERNA - on determination of the energy mix of the parties to the disclosure process;
- draft annual information reports;
- support the Ministry of Economic Development in delivering information on the environmental impact of electricity generation and on energy saving.

**4. Please provide information on how, where applicable, the support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material (Article 22(1)(c) of Directive 2009/28/EC).**

There are a number of regulatory provisions to encourage the most environmentally-friendly and efficient technologies.

## **ELECTRICITY SECTOR**

### **Premiums for photovoltaic plants (V Feed-in scheme)**

#### Premium for the replacement of Eternit (asbestos cement) roofs

This applies to the installation of PV plants on buildings involving the removal and safe disposal of Eternit or other asbestos roofing materials:

- EUR 30/MWh for PV plants with installed capacity not exceeding 20 kW, and EUR 20/MWh for PV plants with installed capacity exceeding 20 kW, if they are commissioned by 31 December 2014;
- EUR 20/MWh for PV plants with installed capacity not exceeding 20 kW, and EUR 10/MWh for PV plants with installed capacity exceeding 20 kW, if they are commissioned by 31 December 2014;
- EUR 10/MWh for PV plants with installed capacity of up to 20 kW, and EUR 5/MWh for PV plants with installed capacity exceeding 20 kW, if they are commissioned after 31 December 2014.

### **Premiums for installations using solid biomass, biogas or sustainable bioliquids (Ministerial Decree of 6 July 2012)**

#### Premium for the use of biomass from supply chain

Plants with installed capacity between 1 MW and 5 MW or with capacity above 1 MW in the case of refurbishments, using the supply-chain biomass included in the types listed in Annex 1, Table 1-B of the Decree, shall receive a premium of EUR 20/MWh.

#### Premium for GHG emission savings

Plants with installed capacity between 1 MW and 5 MW or with capacity above 1 MW in the case of refurbishments, using “Type a” biomass (products) or “Type b” (by-product) biomass are given a premium of EUR 10/MWh if their performance improves on the GHG emission reduction targets.

#### Premium for reduction in pollutant emissions

Plants with any installed capacity, including those refurbished, using “Type a” and/or “Type b” biomass receive a premium of EUR 30/MWh if they meet the atmospheric emission requirements set out in the table of Annex 5 to the Decree.

#### Premium for high-efficiency cogeneration

Plants using “Type a” biomass or “Type a” biogas or sustainable bioliquids receive a

premium of EUR 40/MWh if they operate in high-efficiency cogeneration mode. The premium drops to EUR 10/MWh if the high-efficiency cogeneration plants use “Type b” and/or “Type c” (municipal waste) biomass or “Type b” and/or “Type c” biogas.

Premium for high-efficiency cogeneration coupled with district heating

Plants using “type b” biomass receive a premium of EUR 40/MWh if they operate in high-efficiency cogeneration mode and use the cogenerated heat for district heating.

Premium for cogeneration biogas plants which recover 60% of nitrogen

Biogas plants with installed capacity of up to 600 kW receive a premium of EUR 30/MWh if they operate in high-efficiency cogeneration mode and if they recover nitrogen from the substances processed for the production of fertilisers, subject to specific conditions listed in the Decree.

Premium for cogeneration biogas plants which recover 30% of nitrogen

Biogas plants with installed capacity of up to 600 kW receive a premium of EUR 20/MWh if they operate in high-efficiency cogeneration mode and if they recover nitrogen from the substances processed for the production of fertilisers, subject to specific conditions listed in the Decree.

Premium for biogas plants which recover 40% of nitrogen

Biogas plants with installed capacity of up to 600 kW receive a premium of EUR 15/MWh if they recover nitrogen from the substances processed for the production of fertilisers, subject to specific conditions listed in the Decree.

**Premiums for geothermoelectric plants (MD 6 July 2012)**

Premium for total re-injection and zero emission

Geothermoelectric plants other than those receiving the alternative feed-in tariff for advanced technologies (see following paragraphs), with total reinjection of the geothermal fluid into its source formation and zero emission, receive a premium of EUR 30/MWh.

Premium for reducing non-condensable gases

High-enthalpy geothermal power plants, able to reduce by at least 95% the level of hydrogen sulphide and mercury contained in the fluid entering the production plant, receive a premium of EUR 15/MWh.

Alternative Feed-in tariff for advanced geothermal power technologies not yet fully commercial

The Ministerial Decree of 6 July 2012 introduced for not-yet fully commercial advanced geothermal electricity technologies a specific alternative Feed-in tariff which cannot be cumulated either with those set out in Annex 1 to the same Decree or with the premium for total re-injection and zero emissions.

## **THERMAL SECTOR (MD 28 December 2012)**

To be eligible for incentives, biomass boilers must meet specific requirements of efficiency, atmospheric emission and fuel quality.

## **TRANSPORT SECTOR**

In keeping with Directive 2009/28/EC, Article 33 of Legislative Decree No 28/2011 provides that, for the purposes of meeting the obligation to release for consumption, biofuels, including biomethane, for which the party releasing for consumption (using one of the approved means for verification of compliance with sustainability criteria, set out in Ministerial Decree of 23 January 2012 implementing Legislative Decree No 55/2011 transposing Directive 2009/30/EC), demonstrates that they were produced from waste and residues (as defined, identified and traced pursuant to Legislative Decree No 152 of 3 April 2006), non-food materials, including cellulosic materials, ligno-cellulosic materials and algae, are admitted to double counting compared to other biofuels. These materials are accordingly given one certificate of release for consumption for every 5 Gcal of biofuel (instead for every 10 Gcal).

Furthermore, in order to help reduce climate-changing emissions by using biofuels produced close to the place of use, an extra incentive is granted (up to 31 December 2014) to biofuels derived from materials originating from and processed in the EU. These biofuels are given a certificate of release for consumption for every 8 Gcal.

**5. Please provide information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system (Article 22(1)(d) of Directive 2009/28/EC).**

Article 15 (Guarantees of Origin) of Directive 2009/28/EC was transposed by Legislative Decree No 28/2011 similarly to the rest of the Directive. Specifically, Article 34 of the Decree provided that a subsequent Ministerial Decree would be issued, updating as appropriate the procedures for the issuance, recognition and cancellation of guarantees of the RES origin of electricity in keeping with the new EU framework.

A Ministerial Decree issued on 6 July 2012 introduced new support schemes for renewable energy installations other than photovoltaic. This Decree also implements the above-mentioned Article 34 of Legislative Decree No 28/2011. It confirms GSE's role as the Competent Authority for issuance of Guarantees of Origin in Italy and establishes the need to update the rules on the energy mix provided by suppliers to their final customers (Article 31).

Furthermore, Article 31(1) requires GSE to propose to the Ministry of Economic Development the procedure for the certification of renewable energy installations for their and for the issue and transfer of the guarantees of origin, as well as recognition and use (Article

Article 31(1) confirms the provisions of Article 34 of Legislative Decree No 28/11, namely that guarantees of origin are to be used solely for disclosure purposes.

Under Article 31(3) GSE shall issue, transfer at no charge to its account and consider available to itself the renewable energy guarantees of origin (REGOs) relating to the electricity generated and injected into the grid by RES power stations which:

- use the Simplified Purchase and Sale Arrangements for electricity under Article 13 of Legislative Decree No 387/2003;
- use the net metering scheme laid down in decision No 74/2008 as amended and supplemented;
- use all-inclusive incentives which include power off-take (plants under the CIP 6/92 scheme or the All-inclusive tariff scheme) by GSE.

The GSE then assigns the REGOs via Competitive Procedures (Auctions). GSE organises 5 such auctions each year.

Article 31(5) repeals the link between the number of REGOs which can be imported/used in Italy and the import of physical electricity: it provides that with effect from disclosure year 2012 foreign REGOs may be used to calculate the renewable share of energy mixes, also when no physical electricity is imported.

The issue, transfer and cancellation of the REGOs issued to electricity from renewable sources is managed by GSE through a dedicated IT system (database) launched during 2013. All the technical and operational procedures linked to certification of the electricity via GO are published in the GSE's website, to ensure

the highest transparency of processes and the system's reliability. Again from 2013 the Italian register has been linked to the international certificate exchange platform (HUB) operated by the Association of Issuing Bodies (AIB). By joining the AIB, GSE has undertaken to make the Italian Guarantees of Origin compliant with the European Energy Certificate System - designed by AIB in its "EECS Rules". These constitute a system of harmonised standards for the issuance, transfer and cancellation of EECS certificates, which guarantees, consistently with the relevant EU and national legislation, that the various national registers connected to the HUB are reliable, safe and interoperable.

Each transfer of REGOs within the Italian register takes place via the exchange platforms managed by GME (Energy Market Operator). In particular, all transfers from bilateral negotiations must be recorded, in terms of quantity and price, in the Bilateral Contract Platform, while the other trades take place in the organised REGO market.

**6. Please describe the developments in the preceding 2 years in the availability and use of biomass resources for energy purposes (Article 22(1)(g) of Directive 2009/28/EC).**

The data in Table 4 consists of estimates made on the basis of the data on biomass energy consumption, since raw material assessment methods based on direct measurement of quantities are not felt to be reliable enough.

**Table 4: Biomass supply for energy use**

	Amount of domestic raw material <sup>38</sup>		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU <sup>38</sup>		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU <sup>38</sup>		Primary energy in amount of imported raw material from non EU (ktoe)	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
<b><i>Biomass supply for heating and electricity:</i></b>												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)	7 735 474	8 350 500	2 679	2 892	1 386 656	1 220 713	480	423	32 532	15 978	11	6
Indirect supply of wood biomass (residues and co-products from wood industry etc.) <sup>39</sup>	2 064 224	2 209 988	772	835	1 798 286	1 654 829	690	653	128 238	149 867	54	63
Energy crops (grasses, etc.) and short rotation trees	2 539 766	2 861 961	610	684	57 532	114 433	51	104	490 391	504 123	437	460
Agricultural by-products/processed residues and fishery by-products	2 292 331	2 199 522	547	544								
Biomass from waste (municipal, industrial etc.)	5 204 662	5 379 550	1 354	1 341								
<b><i>Other</i></b>												
<b><i>Biomass supply for transport:</i></b>												
Common arable crops for biofuels	3 019	1 326	3	1	462 897	237 299	407	208	248 203	109 108	220	96
Energy crops (grasses, etc.) and short rotation trees for biofuels (please specify main types)												
Other (liquid waste and by-products, etc.)	11 834	11 834	10	10	20 946	20 946	18	18	25 725	25 725	23	23

<sup>38</sup> Data expressed in tonnes/year as is or tonnes/year volatile substance for materials intended for anaerobic digestion.

<sup>39</sup> This item also includes pellets, including imported pellets, even though this is not strictly speaking a raw material.

**Table 4a: Current domestic agricultural land use for production of crops dedicated to energy production (ha)**

Land use	Surface(ha)			
	Year 2009	Year 2010	Year 2011	Year 2012
Sugar beet	60 614	62 088	45 545	52 500
Rape seed	24 545	20 219	18 759	10 301
Sunflower	124 049	100 475	118 099	111 678
Durum wheat	1 254 082	1 281 608	1 198 974	1 303 863
Common wheat	568 273	548 867	533 606	615 751
Maize	916 158	926 776	994 773	980 473
Soy	134 704	159 511	165 955	152 993
Sorghum	39 902	40 306	42 335	37 099
Short-rotation coppice	6 000	6 000	7 000	7 000



**7. Please provide information on any changes in commodity prices and land use within your Member State in the preceding 2 years associated with increased use of biomass and other forms of energy from renewable sources. Please provide where available references to relevant documentation on these impacts in your country. (Article 22(1)(h) of Directive 2009/28/EC).**

**Changes in agricultural commodity prices in Italy in the period 2011-2012, associated with increased use of biomass and other forms of energy from renewable sources**

In the two-year period 2011/2012 no significant changes were recorded in the patterns of agricultural land use or in commodity prices associated with the use of biomass in Italy already reported in the period 2009/2010 (specifically, woody crops, cereals and fodder and oil seed crops).

The Ministerial Decree of 6 July 2012 introduced new incentives for the electricity generation sector designed to encourage the use of waste, residues and by-products, including for example agricultural by-products, livestock by-products and forestry/gardening residues. The purpose of this policy is to limit the potential impact on land use of the spread of dedicated crops and prioritise use of traditional agricultural crops, hence minimising the competition for agricultural land between energy crops on the one hand and food and animal feed crops on the other.

It is also thanks to this policy that the use of biomass in Italy, specifically agricultural and forestry biomass, for various types of energy generation (heat, electricity, CHP and biofuels) has not to date significantly affected the traditional patterns of agricultural land use in Italy, with some local exceptions (e.g. maize crops on the Po Plain, linked to the increase in the number of biogas plants) which might have had some reflections on the local agricultural system.

Furthermore, the actual quota of energy crops remains difficult to measure, as mentioned in the previous Report, because official statistics lump them together with traditional crops. The distinction can only be made in final use and destination for the food or energy supply chain, with the associated different market prices charged by producers to processors.

Energy crops fall under three main headings:

- cereal crops: annual grasses (maize, autumn-winter cereals, sorghum);
- oil seed crops: annual grasses (sunflower, rape, soy);
- ligno-cellulosic crops: annual grasses (fibre sorghum, kenaf, hemp), multiannual grasses (giant cane, miscanthum, switchgrass, reed canary grass, thistle) and tree crops (poplar, willow, robinia etc.).

As already pointed out in the first Report, it would be difficult to ascribe certain price increases in these commodities to their current energy uses. Price increase trends for common food and feed crops appear to be due essentially to the structural volatility of commodity prices in recent years. This volatility is driven by several global

factors (population growth, EUR/USD exchange rate, adverse weather, the policies of certain governments, rising demand and increase in energy use) which obviously also have local impacts.

The price trends recorded in Italy are similar to those found on the international market. International agricultural commodity prices have been subjected to fluctuations and recurring turbulence in recent years, with periodic spikes and troughs.

Among the various agricultural commodities, cereals continue to be the most sensitive to sudden price rises and falls. Thus, the price volatility of these commodities can depend both on local market factors and on the rising demand for agricultural commodities from emerging countries, especially in Asia, which have pushed up global consumption.

The following table shows the price changes in Italy of the main crops for animal feed and energy production over the past two years. As stated, the prices cannot be broken down according to energy and non-energy use.

Crops and direct by-products	Examples of indicative prices (EUR/t)			
	Year 2009	Year 2010	Year 2011	Year 2012
<b>WOOD ENERGY (wood-energy supply chain)</b>				
Firewood (EUR/m <sup>3</sup> )	35	38	36	n.a.
Pellets	201	209	230	225
Poplar	72	67	71	70
<b>CEREAL CROPS (usable for biogas production)</b>				
Durum wheat	194	180	286	283
Soft wheat	152	188	232	265
Maize	137	185	208	257
Barley	130	168	237	230
Rye	132	188	227	239
Sorghum	132	165	214	241
Triticale	127	170	212	280
<b>OIL SEED CROPS (usable for bioliquids production)</b>				
Rape seeds	270	290	405	437
Sunflower seeds	208	355	343	398
Soybeans	338	346	381	454
<b>COMMON FEED<sup>40</sup></b>				
Lucerne	119	108	104	114
Field bean	390	395	285	305
Sugar beet pulp	136	153	n.a.	n.a.
Common wheat pellets	91	119	155	174
Common wheat meal	123	149	207	214
Common wheat bran	91	115	150	170
Common wheat groats	94	120	161	176
Durum wheat bran and groats	86	111	146	165
Durum wheat pellets	92	120	156	174
Durum wheat middling	157	189	290	275
Durum wheat meal	103	134	179	190

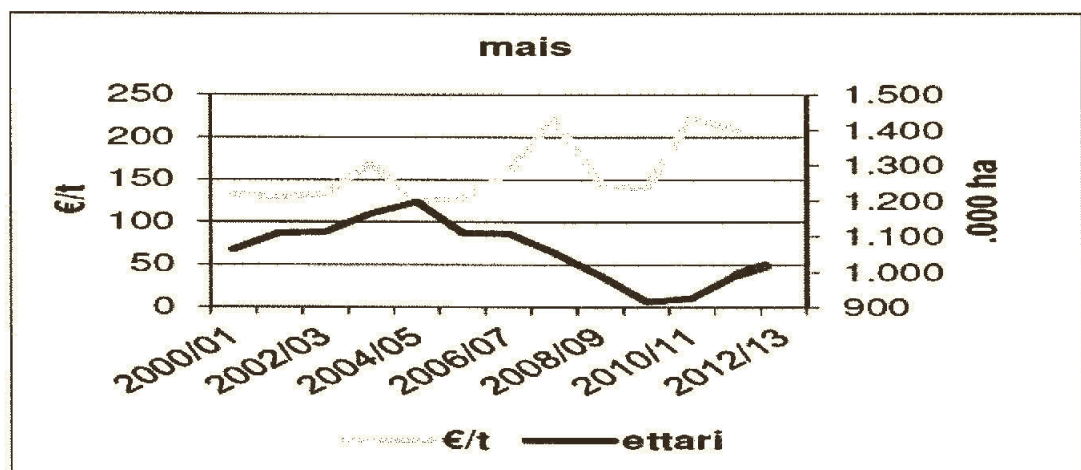
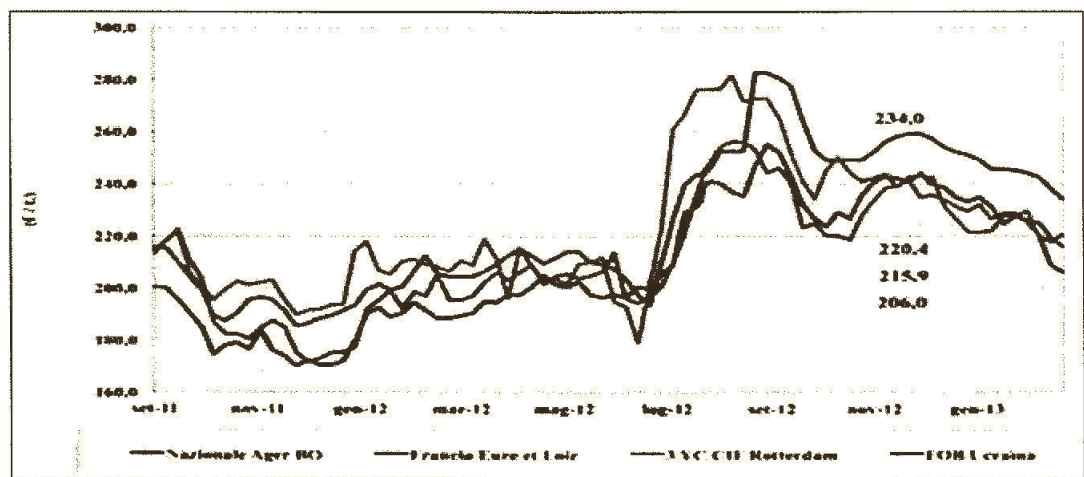
The price trends for the different commodities reveal a growth trend in the period 2011/2012 in commodity prices relating to the three sectors considered (thermal, biogas and bioliquids), with peaks for certain cereal and oilseed crops (e.g. rape, whose production in Italy has fallen sharply). The feedstuff sector has also been affected by turbulence on the international markets, and has overall recorded rising price trends over the past two years.

The values recorded on the Italian market are not too different from global food commodity trends, which since 2007 have been marked by a strong and persistent

<sup>40</sup> Feedstuff may be composed of: green or dried fodder (hay, silage); roots, tubers, seeds or various fruit (broad beans, lupins, barley, chestnuts, carobs, acorns); by-products of cereals (chaff, bran, maize straw); sugar by-products (molasses, beet pulp); meat or fish by-products.

volatility driven by structural factors which have made the markets more vulnerable to cyclic phenomena that are increasingly frequent in the agricultural sector. This at a point in time then agricultural policies, in particular the CAP, were easing up their market protection and price-control measures, which were the main tools of the old agricultural policy framework. Thus, the past direct-intervention approach (guaranteed minimum prices), has been replaced by a lighter set of rules forming a coherent framework pursuing interrelated and shared objectives.

The following graph shows the similarity of the maize price fluctuations recorded in the past few years on the main Italian Commodity Exchange (AGER Bologna), with those of three other major European markets (France, the Netherlands and Ukraine)<sup>41</sup>.



Maize production for energy use is a direct competitor, in terms of use of water, land and labour, with the share of maize going to the food and feedstuff market, mainly

<sup>41</sup> FOB (Free On Board); 3 YC (Yellow Corn) CIF (Cost, Insurance and Freight).

the domestic livestock sector. Therefore, the price impact of the bioenergy supply chain should not be underestimated. In the light of the global scene, Italian food commodity prices and land use patterns do not appear to be affected by significant shifts from food and feed crops to bioenergy crops, except for developments in specific areas of the country (e.g. biogas on the Po Plain).

**Changes in land use in Italy in the period 2011-2011, associated with increased use of biomass and other forms of energy from renewable sources.**

The table below sets out data on agricultural land use in Italy in 2011 and 2012.

<b>Agricultural land use in Italy</b> (utilised agricultural area: 12,856.000 ha) (total area of Italy: 30,132.000 ha) (forested area: 10,500,000 ha)	Year 2009	Year 2010	Year 2011	Year 2012
	ha	ha	ha	ha
<b>ARABLE CROPS</b>	<b>6 435 000</b>	<b>6 216 000</b>	<b>6 436 000</b>	<b>5 955 000</b>
Cereals and rice	3 480 000	3 473 000	3 439 000	3 350 000
Temporary fodder crops	1 997 000	1 797 000	2 009 000	1 826 000
Dried legumes	74 000	80 000	68 000	72 000
Oil seed and industrial plants	372 000	370 000	424 000	275 000
Fresh vegetables and legumes	441 000	434 000	434 000	374 000
Tuberous plants	71 000	62 000	62 000	58 000
<b>PERMANENT CROPS</b>	<b>2 496 000</b>	<b>2 479 000</b>	<b>2 424 000</b>	<b>2 299 000</b>
Fruits	601 000	578 000	587 000	513 000
Olives	1 125 000	1 166 000	1 137 000	1 100 000
Vineyards	770 000	735 000	700 000	686 000
<b>PASTURES AND GRASSLAND</b>	<b>4 283 000</b>	<b>4 568 000</b>	<b>4 503 000</b>	<b>2 359 000</b>

A large share of Italian bioenergy crops is located on the Po Plain, which produces most of the cereals and oil seeds that lend themselves to energy production, and where more than 60 000 hectares of agricultural area are estimated to be put to such use.

As to other renewable energy sources having potential impacts on the agricultural sector, regulatory restrictions on ground-mounted photovoltaic systems on agricultural land were put in place in early 2012 (by excluding large-scale ground-mounted PV plants on agricultural land from the incentive schemes). Until that time, PV plants had contributed to change agricultural land use patterns to a lesser overall extent but for a longer period than the switch to energy crops. At the end of 2012, the agricultural land areas occupied by photovoltaic plants reached 13 000 hectares, mainly located in Southern Italy, for a total ground-installed capacity of more than 7 000 MW.

8. Please describe the development and share of biofuels made from wastes, residues, non-food cellulosic material, and lingo cellulosic material. (Article 22(1)(i) of Directive 2009/28/EC).

**Table 5: Production and consumption of Art.21(2) biofuels (Ktoe)**

<i>Article 21(2) biofuels</i> <sup>42</sup>	2009	2010	2011	2012
Production – biodiesel	38	38	42.8	42.8
Consumption-biodiesel	38	38	57.3	337.6
Production – ETBE	0	0	1.3	1.3
Consumption – ETBE	0	0	7.1	2.5
Total production of Article 21(2) biofuels	38	38	44.1	44.1
Total consumption Article 21(2) biofuels	38	38	64.4	340.1
<b>Share of Article 21(2) biofuels on total RES-T (%) - NUMERATOR (without multiplying coefficients)</b>	<b>2.95 %</b>	<b>2.42 %</b>	<b>4.09 %</b>	<b>21.92 %</b>
<b>Share of Article 21(2) biofuels on total RES-T (%) - NUMERATOR (with multiplying coefficients)</b>	<b>5.73 %</b>	<b>4.70 %</b>	<b>7.82 %</b>	<b>35.83 %</b>

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<sup>42</sup> Biofuels made from wastes, residues, non-food cellulosic material, and lignocellulosic material.

**9. Please provide information on the estimated impacts of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within your country in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within your country (Article 22(1)(j) of Directive 2009/28/EC).**

In Italy, compared to other Member States, energy crops are not widespread, essentially owing to the weakness of the domestic market between farmers and the industrial processing system, which finds it more effective in terms of price and quantities to rely on imported agricultural commodities. For example, although our country ranks among the first in Europe as to biodiesel production capacity, its production is largely based on imported raw materials.

The main energy crops used to produce biofuels and bioliquids in Italy are sugar crops, cereal and oil seeds (mainly rape, sunflower and soybean), which however are not highlighted separately in official statistics and, similarly to the other annual crops which can be used to produce biofuels or biogas (maize, sorghum, triticale) are not distinguishable in the statistics from the same crops for food/feed use.

Irrespective of the energy or non-energy use of crops, it is necessary to avert the risk of negative environmental impacts of inappropriate farming practices, especially in intensive farming areas. Such impacts might include: excess irrigation and consequent draining of groundwater reserves; the intensification of farming practices (also on fallow land) involving intensive farming without rest periods; the conversion of permanent pastures and grassland to crops (however this phenomenon is quite limited in Italy compared to other European countries); excessive use of fertilisers and pesticides, the risk of nitrate leaching into the ground and threats to wildlife.

On the other hand, the growing focus on the sustainability of bioliquids and biofuels, pursued by European Directives 2009/28/EC and 2009/30/EC, has driven steady commitment to ensuring ecological balance and the careful protection of biodiversity. In the case of Italy, this concerns both rural areas with landscape value and large stretches of farmland and woodland.

Since only a few thousand hectares of energy crops are currently grown for bioliquid and biofuel production, they do not have a significant impact on the rural ecosystem. Therefore, as concerns impacts on biodiversity, water resources and soil quality, the growing use of bioliquids and biofuels in Italy does not appear to have significantly affected the local environment.



**10. Please estimate the net greenhouse gas emission savings due to the use of energy from renewable sources (Article 22 (1)(k) of Directive 2009/28/EC).**

Table 6 sets out the estimated net greenhouse gas emission savings due to the use of energy from renewable sources in Italy from 2009 to 2012. The values estimated in the first Progress Report (2009 and 2010) have been changed following updating of the calculation method.

The estimate was produced by a monitoring study on greenhouse gas emission savings due to the use of RES prepared by GSE for the Ministry of Economic Development, as required by Legislative Decree No 28/2011 (Article 40). The study will be published in 2014 on GSE's website ([www.gse.it](http://www.gse.it)).

**Table 6: Estimated GHG emission savings from the use of renewable energy (t CO<sub>2</sub>eq)**

Environmental aspects	Year 2009	Year 2010	Year 2011	Year 2012
<b>Estimated total net greenhouse gas emission savings due to the use of energy from renewable sources</b>	<b>56 191 640</b>	<b>60 447 137</b>	<b>63 775 086</b>	<b>70 942 213</b>
• Estimated net GHG savings from the use of renewable electricity	39 380 226	40 161 766	41 518 985	47 759 259
• Estimated net GHG savings from the use of renewable energy in heating and cooling	14 969 986	18 049 236	20 016 866	20 516 243
• Estimated net GHG savings from the use of renewable energy in transport	1 841 428	2 236 135	2 239 235	2 666 711

The data clearly show that the uptake of renewables for electricity generation, heating and transport has produced a steady increase in GHG emission savings over the years (from 56 million tonnes CO<sub>2</sub>eq avoided in 2009 to 71 million in 2012). The main savings were achieved in the electricity generation sector. The electricity sector has been assigned the entire quantity of generated electricity, including the share used by the transport sector; therefore this share has not been counted again in the transport sector (this was felt to be the best approach as it studied the replacement effect on the electricity market of the electricity generated from renewable sources with respect to the electricity which would have been generated from fossil sources).

The method designed and applied to the years 2009-2012 in order to produce the above estimates considers emission savings as the difference between the emissions which would have been produced by the fossil fuels saved (FFS) and the emissions caused by the renewable sources (RES) used. **The emissions considered cover the**

**whole life-cycle of the energy sources, in accordance with the Life-Cycle Assessment (LCA) approach.**

The emission savings are estimated by means of the following equation: the fossil fuel emissions saved thanks to the deployment of RES in the national energy system are measured against the emissions produced by the renewable sources themselves. Thus, for each renewable source, the emission balance is:

$$(1) \quad \begin{aligned} \text{Emission balance} &= \text{Emissions avoided (FFS)} - \text{Emissions produced (RES)} \\ \text{Emissions avoided} &= \sum_{\text{FFS}} (\text{FE}_{\text{FFS}} \times \text{FS}_{\text{FFS}}) \times \text{Annual RES production} \\ \text{Emissions produced} &= \text{FE}_{\text{RES}} \times \text{Annual RES production} \end{aligned}$$

where  $\text{FS}_{\text{FFS}}$  is the substitution factor of each fossil fuel and  $\text{FE}$  is the emission factor of the source/technology considered, calculated as emissions per unit of energy produced or used (g/kWh, t/ktep, t/TJ).

The GHG emissions considered are those of the main greenhouse gases:  $\text{CO}_2$ ,  $\text{CH}_4$  and  $\text{N}_2\text{O}$  as required by Article 22 of Directive 2009/28/EC (their respective global warming potentials expressed as a factor of  $\text{CO}_2$  are 1 for  $\text{CO}_2$ , 296 for  $\text{N}_2\text{O}$  and 23 for  $\text{CH}_4$ ).

The greenhouse gas emission measurement, in accordance with the LCA approach, includes upstream emissions – i.e. those linked to production of the energy source – the emissions caused by construction of the plant that will use the energy source (if significant) and the emissions produced during use (e.g. combustion) of the RES to generate electricity, heat or energy for transport:

$$(2) \quad \text{Emissions}_{\text{LCA}} = \text{Emissions}_{\text{plant operation}} = \text{Emissions}_{\text{upstream}} + \text{Emissions}_{\text{plant construction}}$$

In summary, the methods include the following steps:

- identify, for each final use sector (electricity, heat or transport), the main *energy supply chains* in Italy (penetrations of the various sources in the national market);
- identify, for each renewable source within each use sector, the *mix of replaced fossil fuels*;
- perform a *life-cycle analysis* for each *renewable supply chain* and for each *replaced fossil fuel* within each use sector, using formula (2);
- identify the *amount of energy* from renewable sources produced or used each year in each use sector;
- calculate the *emission balance* using formula (1).

The emission balance concerns the amount of energy used in final uses, i.e. the electricity generated and the fuels delivered to other final-use sectors, and varies according to the different RES plant technologies and performance.

A brief description of the method is attached to this report.

**11. Please report on (for the preceding 2 years) and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020 (Article 22(1)(l),(m) of Directive 2009/28/EC).**

As part of the review of the national energy system's policy priorities, during 2012 Italy has drawn up on its own initiative a National Energy Strategy (NES) addressing all energy-related issues. Under the Plan, the share of final consumption covered by renewable sources is expected to reach 19% by 2020, without prejudice to the fact that the only binding commitment is to achieve the 17% share assigned to Italy by the EU. On these premises, new interim trajectories can be traced for the growth of the share of energy from renewable resources on total consumption.

Directive 2009/28/EC establishes an indicative trajectory defined as the average share of electricity from renewable sources in the periods 2011-2012, 2013-2014, 2015-2016 and 2017-2018 and, lastly, in 2020. Based on the EU-set targets, we have identified, by interpolation, a reference minimum trajectory for the quantity of RES energy.

The data on actual final consumption of RES energy in 2011 and 2012 and the estimates for the following years have been used to obtain, by subtraction, the actual data (up to 2012) and predictions of excess/deficit RES energy production for the subsequent years. The values for 2009 and 2010 have also been recalculated.

As a consequence of the reduction in total (non-RES and RES) final energy consumption and of the concurrent greater than predicted increase in production from renewable sources in the two years in question, Italy recorded a surplus of 6.8 Mtoe and 7.2 Mtoe respectively in 2011 and 2012, compared to the above-mentioned minimum reference trajectory.

Based on the data of the past two years and on the growth estimates contained in the National Energy Strategy (NES), Italy's surplus in RES energy production, while narrowing from 2014 on, is estimated to persist up to 2020.

**Table 7: Actual and estimated excess and/or deficit (-) production of renewable energy compared to the indicative trajectory which could be transferred to/from other Member States and/or third countries in Italy (ktoe)<sup>43 44</sup>**

	actual				forecast							
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Actual/estimated excess or deficit production</b>	3 418	5 263	6 765	7 209	7 384	6 971	6 797	6 102	5 796	4 661	3 666	2 858

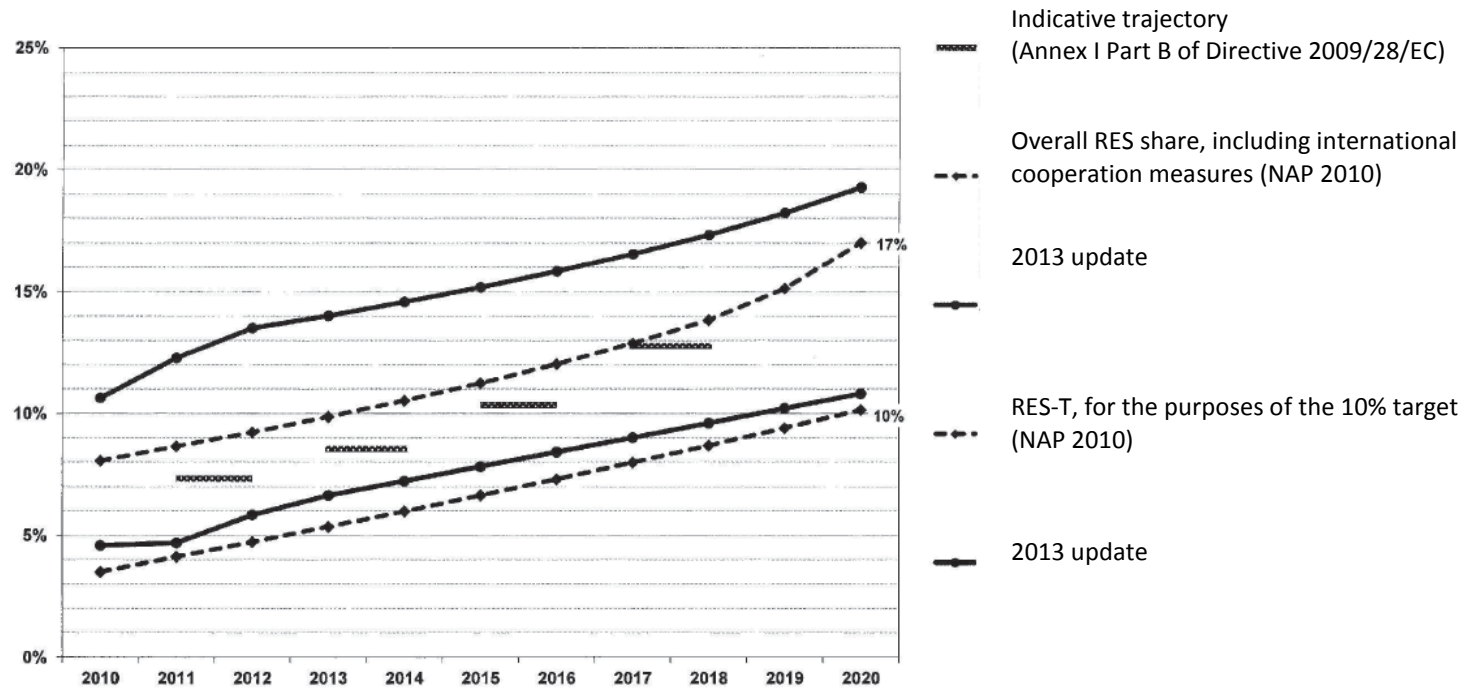
On the basis of the data recorded over the last two years and of the estimates set out in the National Energy Strategy (NES), new scenarios concerning the share of renewable energy in final energy consumption have been produced, different from those set out in the National Action Plan; they are outlined in the three graphs below (“2013 update”).

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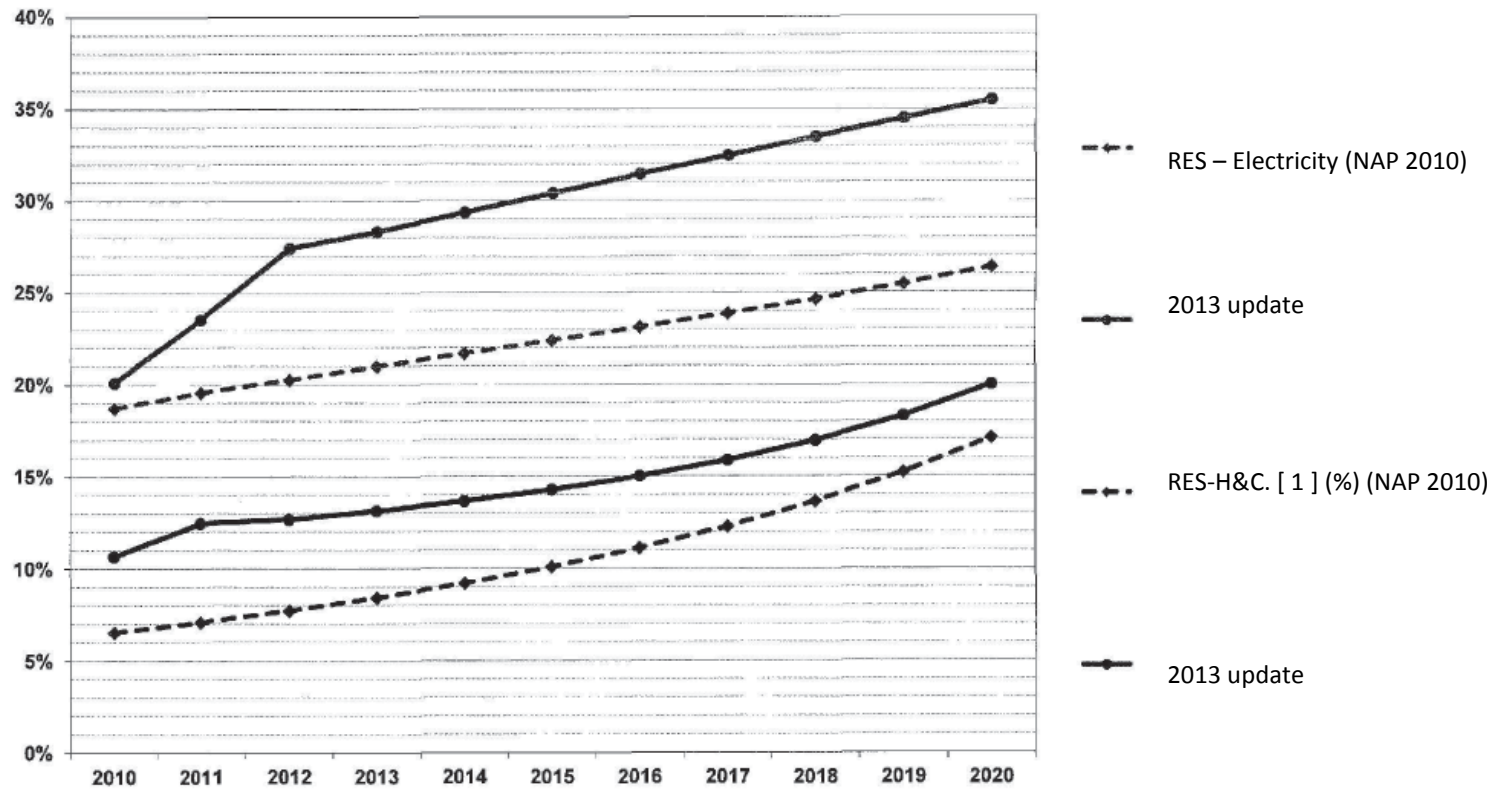
<sup>43</sup>Please use actual figures to report on the excess production in the two years preceding submission of the report, and estimates for the following years up 2020. In each report the Member State may correct the data of the previous reports.

<sup>44</sup>When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe)

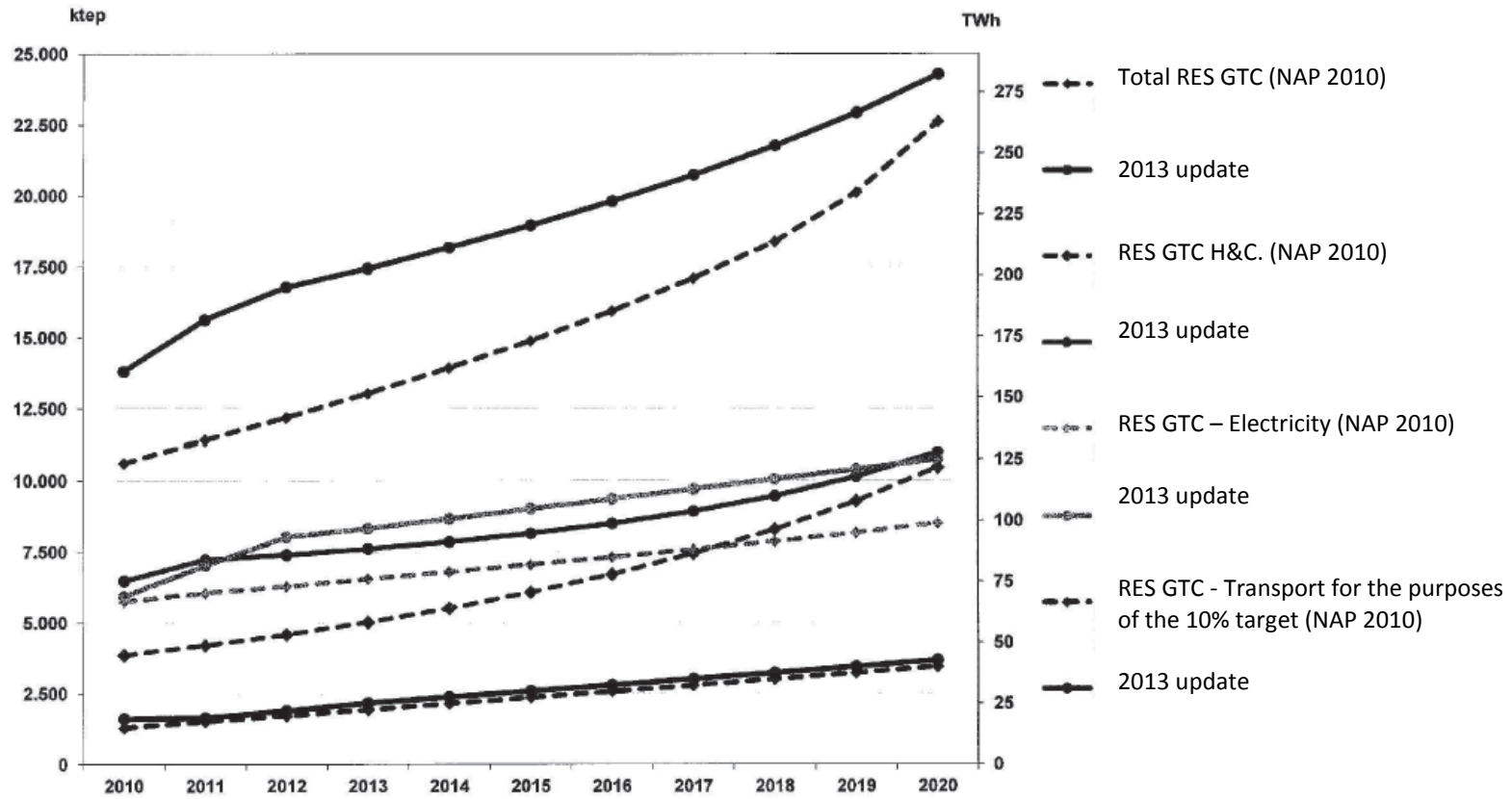
### Share of renewable energy in gross final energy consumption: total and transport for the purposes of the 10% target



### Share of renewable energy in gross final energy consumption: heating and cooling and electricity



Gross total RES consumption



### **11.1. Please provide details of statistical transfers, joint projects and joint support scheme decision rules.**

Recourse to the cooperation mechanisms defined in the Directive 28/2009/EC is an opportunity for Member States; therefore transposition of the Articles of the Directive concerning those mechanisms is at the States' own discretion.

Legislative Decree No 28/2011 transposed into national law the provisions on statistical transfers, joint projects between Member States and joint projects with third countries. While joint support systems are not explicitly mentioned in Legislative Decree No 28/2011 this does not preclude their subsequent adoption.

The relevant provisions of Italian law are described hereunder.

#### **Statistical transfers and Joint Projects with other Member States** (Article 35 of Legislative Decree No 28/2011)

Article 35 of Legislative Decree No 28/2011 provides that agreements relating to these two mechanisms will only be promoted if Italy falls short of its interim targets up to 2016.

The energy subject to statistical transfer, i.e. the share originating from the joint project, will be supported by an incentive whose value shall be lower than the weighted average value of the incentives granted to RES generating stations located in Italy, net of solar electricity production and incentives. The reference year for setting the amount of the incentive will be the year prior to conclusion of the agreement. Furthermore, the costs of implementing these projects will be covered from the electricity and natural gas tariffs, in a manner to be established by the Italian Electricity and Gas Authority after conclusion of the agreements.

The agreements shall be designed and implemented so as to ensure that the energy subject to statistical transfer, i.e. the share of energy from the Joint Project, contributes to attainment of Italy's targets under the Directive.

#### **Joint projects with third countries** (Article 36 of Legislative Decree No 28/2011)

With regard to international agreements concerning RES electricity generated in third countries and supplied to the Italian electricity system, the Decree provides that they will be concluded on the initiative of energy operators on the basis of *ad hoc* international agreements.

The amount of support to the energy injected into the Italian electricity grid will be defined in the individual agreements, based on the following parameters: greater production capacity and efficiency of the plants located in third countries and



average value of the incentives to RES generation by plants located in Italy. On the basis of these criteria, incentives to RES electricity generated in a third country will have the same duration as those available for the same energy source and plant type located in Italy, but the amount of the incentive will as a rule be lower.

The power will be generated and produced in ways ensuring that it contributes to attainment of Italy's targets. To this end, the electricity imported for the purpose of meeting the national target will undergo the necessary monitoring.

**12. Please provide information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates (Article 22(1)(n) of Directive 2009/28/EC).**

For statistical purposes, 50% of municipal waste has been considered renewable, in compliance with EUROSTAT rules.

The estimates on special waste are based on data supplied by ISPRA (Institute for Environmental Protection and Research, under the supervision of the Ministry of the Environment and Protection of Land and Sea) in its annual reports on the management of special waste. In particular, the information on each plant contained in the various editions of the reports (waste type and quantity, operator's economic activity), has allowed identification of the plants using solely organic waste. Only in these cases was the waste considered renewable. For all other uses, the waste was assumed to be non-renewable. With a view to improving and differentiating the estimates, GSE, which is in charge of the national statistical monitoring of renewable sources, is joining forces with ISPRA to receive more detailed and timely data, broken down by EWC code (European Waste Catalogue) and physical state. Fixed reference rates will be applied to determine the waste's organic share and calorific value.

Incentives to electricity from biodegradable waste are calculated in two alternative ways under national law:

- fixed rates for certain categories of waste;
- analytical determination methods for the remaining waste.

The share of generated electricity attributable to renewable sources and hence eligible for the incentive is set at a fixed rate of 51% of net generation if municipal waste is used downstream of waste separation for recycling. This fixed rate (very similar to the share considered for statistical purposes) was established through a testing campaign conducted on municipal waste processed by a representative sample of waste-to-energy plants.

For waste other than municipal waste, the incentive is calculated on the basis of test results, in accordance with European technical standards (C14, selective dissolution, product analysis).

It is likely that as more experience is gained in performing these tests, certain types of waste will be found to have recurring biodegradability percentage values, which may also be used for statistical purposes.

## Annex - Methodology used to estimate greenhouse gas emission savings in Italy

### Emission savings in the electricity sector

Over the period 2011-2012, the penetration of RES in electricity generation has yielded the savings shown in the following tables.

Reduction by source [t CO <sub>2</sub> eq.]	2011		2012	
	Total	Direct	Total	Direct
BIOENERGY - Biogas	1 468 420	1 480 171	1 995 421	2 093 636
BIOENERGY - Bioliquids	532 738	1 200 914	693 667	1 380 120
BIOENERGY - Biomass	2 263 866	1 996 616	2 371 444	2 092 055
WIND	5 122 792	4 456 188	7 278 043	6 338 837
GEOTHERMAL	2 983 427	2 558 474	3 078 394	2 644 696
HYDROPOWER	23 807 120	20 445 483	22 644 241	19 473 345
SOLAR	5 340 621	4 707 899	9 698 050	8 549 945
<b>TOTAL</b>	<b>41 518 985</b>	<b>36 845 746</b>	<b>47 759 259</b>	<b>42 572 633</b>
SPECIFIC EMISSIONS AVOIDED [g/kWh]	500	444	519	462

The annual balance is calculated for each year and each renewable source by means of the following equation:

$$\text{Emissions balance} = \text{Emissions avoided (FFS)} - \text{Emissions produced (RES)}$$

The emissions from fossil sources avoided and those produced by RES are calculated by means of the following formulas:

$$\text{Emissions avoided from fossil sources} = \sum_{FFS} (FE_{FFS} \times FS_{FFS}) \times \text{Gross electricity generation}$$

$$\text{Emissions produced} = FE_{RES} \times \text{Annual RES production}$$

where  $FFS$  are the replaced fossil fuels,  $FS_{FFS}$  is the substitution factor of each fossil fuel technology [%],  $FE_{FFS}$  is the emission factor of each marginal fossil fuel technology, calculated as the emissions needed to produce a gross electricity unit [g/kWh], and  $FE_{RES}$  are the emission factors of the possible RES source-technology per unit of energy produced (g/kWh).

Annual RES generation is recorded in the statistical reports produced by GSE-Energy Services Operators<sup>45</sup>, supplemented by the statistics published by TERNA-the National Transmission Grid Operator<sup>46</sup>. The main GHG emission sources for each renewable source analysed vary according to the plant's life-cycle:

<sup>45</sup><http://www.gse.it/it/Statistiche/RapportiStatistici/Pagine/Default.aspx>

<sup>46</sup>[http://terna.it/default/home\\_en/electric\\_system/statistical\\_data.aspx](http://terna.it/default/home_en/electric_system/statistical_data.aspx)

1. plant operating phase: results of projects by RSE (Energy System Research Centre) under System Research (SESAMO database<sup>47</sup>, EMAS data, Ecoinvent<sup>48</sup>), updated with electricity output data for 2009 published by TERNA<sup>49</sup>;
2. construction phase: databases Ecoinvent, NEEDS Project<sup>50</sup>, SESAMO;
3. upstream phase of biofuels: see the following summary table.

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<sup>47</sup> Brambilla C., Girardi P., Caizzi A. “Sistema di supporto alle decisioni SESAMO: la base dati LCA - il sistema elettrico e i suoi fattori di pressione” - RdS - Rapporto CESI, Milan 2002: <http://www.rse-web.it/documenti/documento/194554>

<sup>48</sup> SWISS CENTRE FOR LIFE CYCLE INVENTORIES “Ecoinvent Database V2.2 - 2010”.

<sup>49</sup> TERNA, Statistical data on generation, 2012. [www.tema.it](http://www.tema.it).

<sup>50</sup> NEEDS PROJECT 2009 “The NEEDS Life Cycle Inventory Database The European reference life cycle inventory database of future electricity supply systems”

<b>Main data sources on GHG emissions (typical values in gCO<sub>2eq</sub>/MJ of fuel supplied) for the upstream phase of bioenergies</b>			
<b>Supply chains</b>	<b>Name of supply chain<sup>51</sup></b>	<b>Data source</b>	<b>Typical greenhouse gas values [gCO<sub>2eq</sub>/MJ]</b>
<b>Biogas</b>			
Waste	-	-	-
Sewage sludge	-	-	-
Livestock manure	Biogas from livestock residues (distance 11-30km)	UNI-TS-11435	7.77
Agricultural and forestry activities	Biogas from dedicated crop (distance 21-70km)	UNI-TS-11435	17.17
<b>Bioliqids</b>			
Vegetable oils	Pure vegetable oil from rape seed	Directive 2009/28/EC	35
Biodiesel	Rape seed biodiesel	Directive 2009/28/EC	46
Biodiesel from vegetable and animal waste	Biodiesel from vegetable and animal waste	Directive 2009/28/EC	10
Other bioliqids	Bioliqids from vegetable and animal waste	Ecoinvent <sup>52</sup>	4.28
<b>Solid biomass</b>			
Biodegradable municipal waste	-	-	-
Other solid biomass	Wood chips from short-rotation coppice (temperate continental European forests)	Communication COM(2010)11	3

The mix of replaced fossil fuels is determined by considering that the electricity generated from each renewable source replaces the share of national energy from fossil fuels which was marginal in the tariff period of energy generation.

In detail, the steps indicated below were followed.

#### 1. Reconstruction of the hourly production of the main renewable sources

<sup>51</sup> In the case of sewage sludge and waste, the impacts are allocated to their production chain.

<sup>52</sup> Vegetable oil from waste cooking oil, at plant, FR [kg].

identifying, for each RES, the share of energy produced in peak working periods, off-peak working periods and holiday periods in 2011 (data from TERNA<sup>53</sup>).

2. Annual determination of the national Marginal Technology Indices for fossil fuel technologies considered by GME, broken down into: peak working periods, off-peak working periods and holiday periods in 2011 (annual calculations based on data from GME - the Energy Market Operator<sup>54</sup>). The values of the national Marginal Technology Indices were referred to fossil fuels only, and the marginal fossil fuel technology indices (*fossil MTI*) were thus determined: they indicate the percentage composition of the fossil technology replaced by the RES in a given tariff period (values referred to fossil fuels only).
3. Determination of the fossil fuel mix replaced annually by each source. The total annual electricity generation from each RES is divided into three tariff bands. This RES energy replaces the mix of fossil fuel technologies which was marginal in the same tariff band.

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<sup>53</sup> [http://www.terna.it/default/home\\_en/electric\\_system/transparency\\_report\\_en/generation.aspx](http://www.terna.it/default/home_en/electric_system/transparency_report_en/generation.aspx)

<sup>54</sup> <http://www.mercatoelettrico.org/It/GME/Biblioteca/RapportiAnnuali.aspx>

<b>Mix of fossil sources replaced by individual renewable sources in 2011 and 2012</b>					
<b>2011</b>	<b>Coal-fired power plants</b>	<b>Natural gas fired plants - CCGT</b>	<b>Natural gas-fired plants (technologies other than CCGT)</b>	<b>Fuel oil power plants</b>	<b>Gas turbine power</b>
BIOENERGY	7 %	86 %	0 %	7 %	0 %
WIND	7 %	85 %	0 %	8 %	0 %
GEOHERMAL	7 %	85 %	0 %	8 %	0 %
HYDROPOWER					
<i>Run-of-the-river</i>	7 %	85 %	0 %	8 %	0 %
<i>Conventional</i>	6 %	88 %	0 %	6 %	0 %
<i>Pumped storage</i>	6 %	88 %	0 %	6 %	0 %
SOLAR	5 %	89 %	0 %	6 %	0 %
<b>2012</b>	<b>Coal-fired power plants</b>	<b>Natural gas-fired plants(CCGT)</b>	<b>Natural gas-fired plants (other than CCGT and gas turbine)</b>	<b>Fuel oil power plants</b>	<b>Gas turbine power plants</b>
BIOENERGY	7 %	82 %	0 %	10 %	1 %
WIND	8 %	81 %	0 %	10 %	1 %
GEOHERMAL	8 %	81 %	0 %	10 %	1 %
HYDROPOWER					
<i>Run-of-the-river</i>	8 %	81 %	0 %	10 %	1 %
<i>Conventional</i>	6 %	84 %	0 %	9 %	1 %
<i>Pumped storage</i>	6 %	84 %	0 %	9 %	1 %
SOLAR	6 %	85 %	0 %	9 %	1 %

For each of the marginal fossil fuel technologies, GHG emissions were calculated along the plant's life-cycle per unit of power generated. The performances and emission factors of fossil technologies are referred to 2009.

The general structure of the life-cycle analysis derives from the SESAMO database held by research centre RSE. The database has been modified as follows:

- upstream data: they have been replaced by Ecoinvent data.
- operating data: they have been updated on the basis of the performances reported by TERN in 2009 and on the basis of the average emissions from the plants which have submitted an annual declaration pursuant to the EMAS regulation.

### **Emission savings in the heating sector**

Over the years 2011-2012, the penetration of RES in the heating generation has yielded the savings shown in the following tables.

Reduction by source [t CO <sub>2</sub> eq.]	2011		2012	
	Total	Direct	Total	Direct
Geothermal	532 310	466 952	509 994	447 165
Solar	432 355	403 302	476 178	444 214
<b>Bioenergy-solid biomass</b>	<b>9 829 809</b>	<b>8 821 299</b>	<b>10 105 673</b>	<b>9 095 514</b>
From municipal waste	241 709	193 902	198 004	158 841
Other biomass	9 520 153	8 496 615	9 848 145	8 821 586
<i>CHP + only Heat</i>	<i>704 668</i>	<i>603 083</i>	<i>954 832</i>	<i>819 768</i>
<i>Final uses – industrial sector</i>	<i>629 241</i>	<i>578 655</i>	<i>581 274</i>	<i>531 918</i>
<i>Final uses – residential sector</i>	<i>8 128 724</i>	<i>7 267 175</i>	<i>8 255 147</i>	<i>7 422 570</i>
<i>Final uses – commercial sector</i>	<i>52 486</i>	<i>43 381</i>	<i>51 860</i>	<i>43 010</i>
<i>Final uses - other sectors</i>	<i>5 033</i>	<i>4 321</i>	<i>5 032</i>	<i>4 320</i>
Charcoal	67 947	130 782	59 524	115 087
<b>Bioenergy-biogas</b>	<b>813 482</b>	<b>857 624</b>	<b>486 177</b>	<b>482 282</b>
Landfill gas	36 290	29 957	51 431	42 455
Biogas from sewage sludge	17 195	14 204	76 736	63 998
Other biogas	759 997	813 463	358 010	375 829
<b>Bioenergy-sustainable bioliquids</b>	<b>32 425</b>	<b>55 544</b>	<b>35 486</b>	<b>58 207</b>
<i>CHP + only H</i>	<i>32 425</i>	<i>55 544</i>	<i>35 486</i>	<i>58 207</i>
Heat pumps	8 376 484	6 987 456	8 902 735	7 422 449
<b>TOTAL</b>	<b>20 016 866</b>	<b>17 592 179</b>	<b>20 516 243</b>	<b>17 949 831</b>

The scenario of renewable source consumption in the heating sector in any given year is closely linked to the classification of uses, comprising sectors and sub-sectors, employed by EUROSTAT to draw up the energy balance<sup>55</sup>.

The EUROSTAT data are grouped into uses by the transformation sector (electricity generation plants, heat-generating plants and combined heat and power (CHP) plants) and final uses (industry, commerce, residential, agriculture, hunting and fishing).

The emissions balance following introduction of RES in the heating sector is evaluated separately for each sub-sector, and therefore requires knowledge of the penetration status of the RES in each specific consumption sector.

The assessments made concern *fuel entering the consumption sectors*. As concerns CHP plants, the energy consumption considered in this study is calculated taking

<sup>55</sup> <http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/questionnaires>.



into account the share of input energy reserved for heat generation only; this value must be consistent with the share of input energy for electricity generation.

One difference from the Eurostat data structure is that heat pumps are also covered, as required by Directive 2009/28/EC.

Each consumption sector is assigned the energy sources/supply chains it uses, based on the following (strongly conservative) assumptions:

1. Transformation sector - CHP plants: in line with the assumptions made for electricity generation, the solid biomass used is “wood chips from short rotation coppice (*Short Rotation Forestry*, SRF), while sustainable bioliquids include biodiesel, pure vegetable oils and other bioliquids (waste oils). The percentage shares of the different bioliquids have been determined on the basis of the statistical reports published by TERNA, by means of calculations and assumptions ensuring, for CHP plants, coherence between the heating and electricity sectors.
2. Transformation Sector - Heat-only plants. The sustainable bioliquids used are assumed to be exclusively pure vegetable oils, while the wood biomass consists of wood chips from forestry residues.
3. Final uses - Industrial: the solid biomass used consists of generic unprocessed residues, while sustainable bioliquids are other bioliquids (waste oils).
4. Final uses - Agricultural/forestry: the solid biomass used is wood chips from forestry residues.

Final uses - residential: the solid biomass used is wood chips from forestry residues (conservative assumption vis-à-vis an undetermined mix of wood chips from forestry residues and wood logs) and wood pellets from short rotation coppices, sourced in Europe.

The main GHG emission sources for each renewable source analysed vary according to each phase of the plant’s life-cycle:

1. operating phase: *JGCC 2006 - Guidelines for Greenhouse Gas Inventories (Stationary combustion)*;
2. plant construction phase (only for geothermal and solar thermal plants and heat pumps): Ecoinvent;
3. upstream phase of the bioenergies: in the following table.

<b>Summary of the main data sources on GHG emissions (typical values gCO<sub>2eq</sub>/MJ) for the upstream phase of the bioenergies</b>			
<b>Product</b>	<b>Supply chain</b>	<b>Data source</b>	<b>Typical greenhouse gas values</b>
Municipal solid waste (renewable)	-	-	-
Firewood and wood chips	Wood chips from short rotation forestry (71-200 km)	UNI-TS-11435	4.58
	Wood chips from forestry residues (71- 200 km)	UNI-TS-11435	1.66
	Wood pellets from short rotation forestry (European temperate continental forest) – using natural gas as process fuel.	COM(2010)11	19
	Generic unprocessed residues (0-70 km)	UNI-TS-11435	6.18
Coal	Charcoal from short rotation forestry (European temperate continental forest)	COM(2010)11	38
Landfill biogas	Landfill biogas	-	-
Sewage sludge biogas	Sewage sludge biogas	-	-
Other biogases	Biogas from livestock residues (distance 11-30 km)	UNI-TS-11435	7.77
	Biogas from dedicated crop (distance 21-70 km)	UNI-TS-11435	17.17
Bioliquids	Pure vegetable oil from rape seed	Directive 2009/28/EC	35
	Rape seed biodiesel	Directive 2009/28/EC	46
	Biodiesel from vegetable and	Directive 2009/28/EC	10
	Bioliquids from waste	Ecoinvent (waste oils)	4.28

The data used to characterise the mix of replaced fossil sources are taken from annual calculations based on Eurostat statistical data.

The analysis assumed that the replacement of fossil fuels with renewable sources depends on the sector of use, according to the following assumptions:

- Transformation sector: the renewable source replaces the best technology available, i.e. a natural gas boiler. Therefore the replaced fossil mix is 100%

natural gas.

- Final uses sector: emission savings in any given sector are calculated by considering the distribution of fossil fuel consumption in the sector, in the year in consideration.

Last, heat pumps are assumed to be used in the residential sector only.

In summary, the emission factors of the replaced fossil fuels, broken down by life-cycle phase come from:

- operating phase: *IPCC 2006- Guidelines for Greenhouse Gas Inventories (Stationary combustion)* which defines emission factors by consumption macro-sectors;
- construction phase: negligible emissions under a comparative LCA approach;
- upstream phase: Ecoinvent database.

### **Emission savings in the transport sector**

Over the years 2011-2012 biofuel consumption in the transport sector has yielded the savings shown in the following tables.

<b>Reduction by biofuel [t CO<sub>2</sub> eq.]</b>	<b>2011</b>		<b>2012</b>	
	<b>Total</b>	<b>Direct</b>	<b>Total</b>	<b>Direct</b>
Bio-petrol	235 550	334 153	208 727	301 197
Biodiesel	2 003 685	3 697 706	2 457 985	3 628 698
<b>Total</b>	<b>2 239 235</b>	<b>4 031 859</b>	<b>2 666 711</b>	<b>3 929 894</b>

The use of bio-petrol and biodiesel in the transport sector occurs mostly through mixing with petrol or diesel. Therefore each energy unit of biodiesel and bio-petrol is assumed to replace respectively one unit of diesel or petrol; the relevant emissions are calculated on the basis of the national average emissions from the stock of diesel or petrol vehicles. This makes it possible to assign an amount of emissions to each tonne of diesel and petrol used in Italy (operating phase).

The emission factors of diesel and petrol (replaced fossil fuels) in the operation

phase are based on calculations on data published by ISPRA<sup>56</sup> based on the COPERTA model, for the year 2010.

For the upstream phase, the main source is the Ecoinvent database, with the calculations necessary to adapt the data to the Italian or European context.

As to emissions from biofuels in the operating phase, CO<sub>2</sub> emissions are considered to be zero, whereas the emissions of CH<sub>4</sub> and N<sub>2</sub>O are the same as those of the replaced fossil fuel.

Emissions from vehicle manufacturing have not been considered because biofuels are mixed with fossil fuels (zero balance).

The biofuel supply chains analyzed for bio-petrol and biodiesel are listed in the following table together with the GHG emission factors used in the upstream phase.

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<sup>56</sup> ISPRA “Road transport data for the national survey, referred to time series 1990 - 2010 and emission calculation programme Copert 4 (version 9.0, October 2011)”