

First Italian progress report on Directive 2009/28/EC

December 2011

Template for Member State progress reports under Directive 2009/28/EC.

Article 22 of Directive 2009/28/EC requires Member States to submit a report to the Commission on progress in the promotion and use of energy from renewable sources by 31 December 2011, and every two years thereafter. The sixth report, to be submitted by 31 December 2021, will be the last report required.

Member State reports will be important for monitoring overall renewable energy policy developments and Member State compliance with the measures set out in Directive 2009/28/EC and the National Renewable Energy Action Plans of each Member State. The data included in these reports will also serve to measure the impacts referred to in Article 23 of Directive 2009/28/EC. Consistency in Member State data and reporting would be useful.

The purpose of the template is to help ensure that Member State reports are complete, cover all the requirements laid down in Article 22 of the Directive and are comparable with each other, over time and with National Renewable Energy Action Plans submitted by Member States in 2010. Much of the template draws on the template for the National Renewable Energy Action Plans¹.

When filling in the template, Member States should comply with the definitions, calculation rules and terminology laid down in Directive 2009/28/EC and those of Regulation (EC) No 1099/2008 of the European Parliament and the Council².

Additional information can be provided either in the prescribed structure of the report or by including annexes.

Passages in italics aim to guide Member States in the preparation of their reports. Member States may delete these passages in the version of the report which they submit to the Commission.

¹ C(2009)5174

² OJ L 304, 14 November 2008, p. 1.

1. Sectoral and overall shares and actual consumption of energy from renewable sources in the preceding 2 years (n-1; n-2 e.g. 2010 and 2009) (Article 22 (1) a) of Directive 2009/28/EC).

Please fill in the actual shares and actual consumption of renewable energy for the preceding 2 years in the suggested tables.

Table 1: The sectoral (electricity, heating and cooling, and transport) and overall shares of energy from renewable sources³

	2009	2010
RES-H&C [1] ⁴ (%)	8.20%	9.46%
RES-E[2] ⁵ (%)	18.81%	20.09%
RES-T[3] ⁶ (%)	3.83%	4.81%
Overall RES share [4]⁷ (%)	8.86%	10.11%
<i>of which from cooperation mechanism [5]⁸ (%)</i>	0.00%	0.00%
<i>Surplus for cooperation mechanism⁹ (%) [6]</i>	0.00%	0.00%

Table 1a: Calculation table for the renewable energy contribution of each sector to final energy consumption (ktoe)¹⁰

	2009	2010
(A) Gross final consumption of RES for heating and cooling	4 500	5 497
(B) Gross final consumption of electricity from RES	5 390	5 924
(C) Gross final consumption of energy from RES in transport	1 180	1 466
(D) Gross total RES consumption¹¹	11 070	12 887
(E) Transfer of RES <u>to</u> other Member States	0	0
(F) Transfer of RES <u>from</u> other Member States and 3rd countries	0	0
(G) RES consumption adjusted for target (D)-(E)+(F)	11 070	12 887

³ Facilitates comparison with Table 3 and Table 4a of the NREAPs.

⁴ Share of renewable energy in heating and cooling: gross final consumption of energy from renewable sources for heating and cooling (as defined in Articles 5(1)b) and 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.

⁵ Share of renewable energy in electricity: gross final consumption of electricity from renewable sources for electricity (as defined in Articles 5(1)a) and 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.

⁶ Share of renewable energy in transport: final energy from renewable sources consumed in transport (cf. Article 5(1)c) and 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.

⁷ Share of renewable energy in gross final energy consumption. The same methodology as in Table 3 of NREAPs applies.

⁸ In percentage point of overall RES share.

⁹ In percentage point of overall RES share.

¹⁰ Facilitates comparison with Table 4a of the NREAPs

¹¹ 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.

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 electricity¹²

	2009		2010	
	MW	GWh	MW	GWh
Hydro¹³:	16 458	42 279	16 806	43 393
non pumped	14 079	40 207	14 234	41 255
<1MW	466	1 699	523	1 910
1MW–10 MW	2 187	7 298	2 208	7 411
>10MW	11 427	31 210	11 503	31 935
pumped	2 378	2 072	2 572	2 138
mixed ¹⁴	2 378	2 072	2 572	2 138
Geothermal	737	5 342	772	5 376
Solar:	1 144	676	3 470	1 906
<i>photovoltaic</i>	1 144	676	3 470	1 906
<i>concentrated solar power</i>	0	0	0	0
Tide, wave, ocean	0	0	0	0
Wind:	4 898	6 830	5 814	8 787
<i>onshore</i>	4 898	6 830	5 814	8 787
<i>offshore</i>	0	0	0	0
Biomass¹⁵:	1 728	7 557	2 053	9 440
<i>solid biomass</i>	964	4 444	944	4 308
<i>biogas</i>	378	1 665	508	2 054
<i>bioliquids</i>	385	1 448	601	3 078
TOTAL	24 964	62 684	28 915	68 902
<i>of which in CHP</i>	581	2 379	745	3 251

NOTES:

- a) The power indicated is gross power efficiency.
- b) For hydroelectric sources, the power referred to is the actual power for plants which produce only from natural sources. For mixed systems, the virtual power has been calculated as a fraction of the power of the pumping plants, virtually attributable to only natural components.
- c) Production by solid biomass, biogas and bioliquid thermoelectric plants include renewable production of co-firing plants and production relative only to the biodegradable part for waste-fuelled plants.
- d) The power from solid biomass plants includes the parts which are viturally attributable to renewable production from co-firing plants and production relative only to the biodegradable part for waste-fuelled plants.

¹² Facilitates comparison with Table 10a of the NREAPs.

¹³ Normalised in accordance with Directive 2009/28/EC and Eurostat methodology.

¹⁴ In accordance with new Eurostat methodology.

¹⁵ Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) of Directive 2009/28/EC last subparagraph.

Table 1c: Total actual contribution (final energy consumption¹⁶) 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)¹⁷

	2009	2010
Geothermal (excluding low temperature geothermal heat in heat pump applications)	213	139
Solar	85	134
Biomass¹⁸:	3 033	4 028
<i>solid biomass</i>	2 763	3 721
<i>biogas</i>	19	26
<i>bioliquids</i>	250	281
Renewable energy from heat pumps:	1 170	1 195
- of which aerothermal	1 136	1 158
- of which geothermal	31	33
- of which hydrothermal	3	4
TOTAL	4 500	5 497
<i>of which DH¹⁹</i>	137	144
<i>of which biomass in households²⁰</i>	2 003	3 164

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)^{21, 22}

	2009	2010
Bioethanol/ bio-ETBE	117	155
<i>of which Biofuels²³ Article 21.2</i>	0	0
<i>Of which imported²⁴</i>	0	0
Biodiesel	1 063	1 311
<i>of which Biofuels²⁵ Article 21.2</i>	38	38
<i>of which imported²⁶</i>	415	713

¹⁶ Direct use and district heating as defined in Article 5.4 of Directive 2009/28/EC.

¹⁷ Facilitates comparison with Table 11 of the NREAPs.

¹⁸ Take into account only those complying with applicable sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

¹⁹ District heating and/or cooling from total renewable heating and cooling consumption (RES- DH).

²⁰ From the total renewable heating and cooling consumption.

²¹ For biofuels take into account only those compliant with the sustainability criteria, cf. Article 5(1) last subparagraph of Directive 2009/28/EC.

²² Facilitates comparison with Table 12 of the NREAPs.

²³ Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

²⁴ From the whole amount of bioethanol bio-ETBE.

²⁵ Biofuels that are included in Article 21(2) of Directive 2009/28/EC.

²⁶ From the whole amount of biodiesel.

Hydrogen from renewables	0	0
Renewable electricity	170	184
<i>of which road transport</i>	0	0
<i>of which non-road transport</i>	170	184
Others (as biogas, vegetable oils, etc.)	0	0
<i>of which Biofuels²⁷ Article 21.2</i>	0	0
TOTAL	1 350	1 650

²⁷ 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 28/2009/EC was transposed into national law by Legislative Decree No 28/2011. Some of the reforms laid down by Legislative Decree No 28/2011 were provided to enter into force following further implementing Ministerial Decrees. Some of said decrees have already been enacted and others are still in the definition stage. Set forth hereunder are the principal measures implemented or planned in accordance with Directive 2009/28/EC in line with the strategic guidelines contained in the National Action Plan for Renewable Energy (not shown, on the other hand, are measures previously described in the National Action Plan which have not undergone substantial amendment).

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
MEASURES RELATING TO THE HEATING AND COOLING SECTOR					
Energy Efficiency Certificates (White Certificates) (Legislative Decree No 28/2011 Articles 29 and 30)	Regulatory - Financial	6 Mteco of energy saved to 2012	Energy Services Companies, electricity and gas distributors, parties who have appointed an “energy manager”.	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>The mechanism was updated by Legislative Decree No 28/2011 of 3 March 2011 and by the new Guidelines published by the Italian Electricity and Gas Authority (AEEG) which entered into force on 1 November 2011. The main amendments relate to:</p> <ul style="list-style-type: none"> • introduction of type IV certificates, attesting attainment of savings of forms of energy other than electricity and natural gas, made in the transport sector and evaluated by way of standardised schedules, • introduction of type V certificates, attesting attainment of savings of forms of primary energy other than electricity and natural gas, made in the transport sector and evaluated by way of methods other than those provided for type IV certificates, • reduction of the minimum threshold of energy saved for submission of project now equal to 20 toe, 40 toe and 60 toe respectively for standard, analytical and final balance projects. • introduction of coefficients of durability which multiply energy savings. The coefficient of durability takes account of cases in which the technical life of the interventions exceeds their useful life, i.e. the period of right to the issue of the White Certificates. <p>Legislative Decree No 28/2011 also provides that methods be established for the White Certificate mechanism in order to reduce timescales and requirements for their attainment.</p>	2005 – not available
Tax deduction of 55% for building renovation	Financial	Reaching energy efficiency targets and production of RES	Final customers owners of existing buildings.	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>Extended by Law No 214 of 22 December 2011, until 31 December 2012</p>	2007-2012

		thermal energy			
Contributions for the production of thermal energy from renewable sources and for small energy efficiency interventions (Legislative Decree No 28/2011, Article 28)	Financial	Reaching of energy efficiency and thermal energy production targets from RES	Investors / Final customers	<i>Planned measure, supplementary to the NAP.</i> Legislative Decree No 28/2011 provides that from 2012 interventions for production of thermal energy from renewable sources and increase in energy efficiency of small dimensions have access to an incentive commensurate to the production of thermal energy from renewable sources or to generated energy savings. The period of entitlement to the incentive cannot be longer than 10 years.	2012-not available
Obligation of the integration of renewable sources in new buildings and existing buildings subject to significant renovation (Legislative Decree No 28/2011, Article 11)	Regulatory	50% cover consumption of domestic hot water and % variable cover consumption of heating and cooling	Final customers, owners of new or renovated buildings.	<i>Existing measure, supplementary to the NAP.</i> Plans for new buildings and plans for significant renovation of existing buildings must provide for the use of RES to cover consumption of heating, electricity and cooling according to the minimum integration principles and commencement dates indicated in Annex 3 to Legislative Decree No 28/2011. At the same time, in particular, cover must be guaranteed by way of RES of 50% of consumption provided for domestic hot water and the undernoted percentages of the sum of estimated consumption for domestic hot water, heating and cooling: <ul style="list-style-type: none"> • 20% when the application for the relevant building licence is submitted between 31 May 2012 and 31 December 2013; • 35% when the application for the relevant building licence is submitted between 1 January 2014 to 31 December 2016; • 50% when the application for the relevant building licence is issued from 1 January 2017. For public buildings, obligations are increased by 10%. Systems supplied by RES produced to fulfil the aforementioned obligations have access to the incentives provided for the promotion of RES, for the amount which exceeds that necessary for compliance with the abovementioned obligations. Failure to observe the obligations entails refusal of issue of the building licence. The Regions have the power to establish minimum quotas which are stricter than those provided in the Decree. 	June 2012-not available
MEASURES RELATIVE TO THE ELECTRICITY SECTOR					
Premium rate for photovoltaic systems ("Photovoltaic Energy Account ") (Legislative Decree No 28/2011, Article 25)	Financial	23 000 MW as at 2016 (approximate target subject to limits of annual expenditure amounting to EUR 6-7 billion)	Investors / Final customers	<i>Existing measure, supplementary to the NAP.</i> The incentive mechanism for photovoltaic systems (Energy Account) was updated by Ministerial Decree of 5 May 2011, regarding systems which entered into operation later than 31 May 2011. The mechanism provides, until 2012, incentives for electricity produced by photovoltaic systems by way of a premium rate constant for 20 years starting from the date of entry into operation of the system. From 2013, rather than a premium rate paid on all energy produced, the photovoltaic systems will receive a premium rate on the share of own consumption of energy produced and an "all-inclusive" rate on the share of the electricity fed into the grid. The law seeks to establish half-yearly cost limits in relation to installed power and provides for a progressive reduction in the rates over time.	August 2005-December 2016

				<p>The eligible interventions are those for new construction, total renovation or reinforcement, and fall within the following four specific categories:</p> <ul style="list-style-type: none"> • photovoltaic systems, divided into “small systems” and “large systems”, with differentiated rates between systems "mounted on buildings" and "other systems"; • photovoltaic systems supplemented with innovative features; • concentrated photovoltaic systems; • photovoltaic systems with technological innovation. 	
New incentive mechanisms (Decree No 28/2011, Article 24)	Financial	Reaching of targets of electricity production from RES	Investors / Final customers	<p><i>Planned measure, supplementary to the NAP.</i></p> <p>Legislative Decree No 28/2011 provides that those systems (excluding solar energy systems) which enter into operation from 2013 will have a new incentive scheme which replaces the one presently used (Green Certificates and current all-inclusive rates).</p> <p>The new incentives are in the form of tariffs which take account of the value of the energy (they can be premium rates, probably variable, and/or all-inclusive rates),</p> <p>The rates will be differentiated according to specific renewable source, size of the system and its date of entry into operation.</p> <p>As regards biomass, the efficient use of waste and by-products is preferred to the use of virgin biomass (in energy terms this should be destined as a priority to thermal use, as bioliquids should be used mainly for the transport sector).</p> <p>The duration of the incentives will be commensurate with the useful life of the systems. Systems over a certain power threshold (not less than 5 MW), shall have access to the incentives on the basis of a reverse auction procedure.</p> <p>Details of the new mechanisms and methods for access shall be contained in a Ministerial Decree the enactment of which, as at the date of this report, is imminent.</p>	2013-not available
MEASURES RELATING TO THE TRANSPORT SECTOR					

Obligation of release for consumption of biofuels (Legislative Decree No 28/2011, Article 33)	Regulatory - Financial	Wider use of sustainable biofuels (Community target as at 2020: 10% of transport consumption covered by renewable sources)	Parties which release fossil fuels for consumption	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>The parties who release petrol and diesel for consumption, produced from non-renewable primary sources and destined for use in motor transport, have the obligation of release for consumption in Italy a minimum quota of biofuels; the same parties may fulfil the aforementioned obligation by acquiring, in whole or in part, the equivalent quota of the relative rights from other parties. That system (“release obligation”) constitutes the incentive for use of biofuels in transport.</p> <p>Legislative Decree No 28/2011 has strengthened that system, providing that the minimum quota, calculated on the basis of the calorific value, shall arrive at 5% by the end of 2014.</p> <p>Furthermore, it has been established that the calorific value of the second generation biofuels released for consumption is worth double for the purpose of calculation of the obligation.</p>	2007-not available
MEASURES RELATING TO THE ELECTRICITY GRIDS					
Authorisation of connection works to the electricity grid (Legislative Decree No 28/2011, Articles 4 and 16)	Regulatory	Coordination between the development of the production systems and the electricity grid	Grid operators	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>The construction and operation of some development works of the grid are authorised by the competent Region using a single procedure.</p> <p>The works which are functional to release and withdrawal of energy produced by a conglomeration of systems and not provided in the connection estimates subscribed between the grid operator and the owners of the systems can benefit from this authorisation procedure. Also the works and infrastructure of grids functional to the improved dispatching of energy produced by systems already in operation can benefit from the single procedure.</p>	March 2011 -not available
Development plan for the national grid (Legislative Decree No 28/2011, Article 17)	Regulatory	Planning of development of the national grid	National grid operator (TERNA S.p.A)	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>Terna S.p.A. includes, in a specific section of the development plan for the national grid, interventions which benefit from the single procedure described above, taking account of the authorisation procedures for construction and operation of existing systems. In the same section of the Plan, Terna identifies grid reinforcement interventions which are necessary to ensure full release and withdrawal of the energy produced by renewable source systems. These interventions also include accumulation of systems to facilitate dispatch of non-programmable RES.</p>	March 2011 -not available
Remuneration of interventions on the national grid (Legislative Decree No 28/2011, Article 17)	Financial	Adjustment of the grid for development of RES plants	National grid operator (TERNA S.p.A)	<p><i>Existing measure, supplementary to the NAP.</i></p> <p>The Italian Electricity and Gas Authority (AEEG) ensures remuneration of investments for the performance and management of works provided in the abovementioned section of the Development Plan, taking account of effectiveness for the purposes of withdrawal of energy from renewable sources, of the speed of operation and entry into operation of the works, also with reference, in a differentiated manner, to each area of the electricity market and various accumulation technologies.</p>	March 2011 -not available

Remuneration of interventions on distribution networks (Legislative Decree No 28/2011/2011, Article 18)	Financial	Adjustment of the distribution networks for development of RES systems	Distribution network operators	<i>Existing measure, supplementary to the NAP.</i> An increase in remuneration of the invested capital for modernisation interventions is provided according to “smartgrid” concepts. Those interventions consist of systems for control, regulation and management of power produced and production units, including the recharging system for electric cars. The level of remuneration takes account of the size of the project, in terms of active users involved, degree of innovation, speed of operation and entry into operation of the works, effectiveness for the purposes of full withdrawal of the distributed production.	March 2011 -not available
Development plans for distributions networks (Legislative Decree No 28/2011 Article 18)	Regulatory	Planning of development of distribution networks	Distribution grid operators	<i>Existing measure, supplementary to the NAP.</i> Distribution grid operators publish annually a Development Plan which indicates the main interventions and forecasts for performance times, also in order to favour coordinated development of the grid and production systems. Plans should be drafted in coordination with TERNA and in line with the provisions of the National Transmission Grid development plan	March 2011 -not available
Updating of the technical and financial conditions for access to the network (Legislative Decree No 28/2011, Article 19)	Regulatory	Ensure the integration of renewable sources in the electricity system in the amount necessary to reach the 2020 targets	Grid producers and operators	<i>Existing measure, supplementary to the NAP.</i> By 30 June 2013 and, thereafter, every two years the AEEG shall update the integrated text of the technical and financial conditions for connection to the grids with obligation of connection of third parties of the production plants (Integrated Text of Active Connections TICA). By said date and thereafter every two years, AEEG shall perform a quantity assessment of the balancing charges due by the electricity system connected to dispatching of each of the non-programmable renewable sources evaluating the effects of the provisions of TICA,	March 2011 -not available
MEASURES RELATIVE TO THE NATURAL GAS NETWORKS					
Support for biogas integration in the natural gas network (Legislative Decree No 28/2011, Article 8)	Regulatory	Feed in of biomethane to the natural gas network	Operators	<i>Planned measure, supplementary to the NAP.</i> Specific simplifications are provided for the authorisation procedure, by the Regions, for the production of new distribution plants for methane and for adjustment of the existing procedures. The methane distribution systems and conduits which, connected to the existing network of methane pipelines, are declared works of public utility and take on the character of non-deferability and urgency.	2011-not available
Conditions for connection to the natural gas network of biomethane plants. (Legislative Decree No 28/2011, Article 20)	Regulatory	Feed in of biomethane to the natural gas network	Biomethane producers and natural gas network operators	<i>Planned measure, supplementary to the NAP.</i> The AEEG must issue specific directives relating to the technical and economic conditions for the provision of connection services of biomethane production plants to the natural gas network whose operators have connection obligations for third parties.	2011-not available
Incentives for biomethane fed onto the natural gas network (Legislative Decree No	Financial	Feed in of biomethane to the natural gas network	Biomethane producers ,	<i>Planned measure, supplementary to the NAP.</i> Biomethane fed into the natural gas network is incentivised according to the following alternative methods: • by way of issue of the incentives for production of electricity from	2012 -not available

28/2011, Article 21)				renewable sources, in the case in which is fed into the grid and used in high yield CHP plants; <ul style="list-style-type: none"> • by way of the issue of certificates of gas fed-in for consumption where used for transport; • by payment of a specific incentive, due for the amount fed into the network regardless of use, of duration and value to be defined. The incentives are financed by way of the natural gas tariffs. A Ministerial Decree will specify the details.	
MEASURES RELATIVE TO THE DISTRICT HEATING AND COOLING (DH) NETWORKS					
Assimilation to primary town planning works (Legislative Decree No 28/2011, Article 22)	Regulatory	Wider use of District Heating and Cooling networks	Owners of DH networks, builders	<i>Existing measure, supplementary to the NAP.</i> The infrastructure for installation of energy from renewable sources distribution networks for heating and cooling are assimilated to primary town planning works	March 2011 - not available
Planning of development of networks (Legislative Decree No 28/2011, Article 22)	Regulatory	Planning of infrastructure	Municipalities	<i>Existing measure, supplementary to the NAP.</i> The Municipalities and Regions define specific development plans for district heating and cooling systems	March 2011-not available
Guarantee fund for district heating (Legislative Decree No 28/2011. Article 22)	Financial	Support for production of the infrastructure	Investors	<i>Planned measure, supplementary to the NAP.</i> A guarantee fund has been set up to support the production of district heating networks, financed by a consideration applied to the consumption of methane gas (initially this is equal to 0.05 eurocent/Sm ³ , borne by final customers).	2012 -not available
CROSS-CUTTING MEASURES					
Kyoto Fund	Financial	Production of RES systems, energy efficiency interventions and reduction of emissions	Investors / Final customers / Public authorities	<i>Existing measure, supplementary to the NAP.</i> By notice of the Ministry for the Environment, in November 2011 access was unfrozen to the Kyoto Rotation fund provided by Law No 244/2007 for a total amount of financing of EUR 3.5 million for 2011. The notice is addressed to central government, regions, local authorities, public health agencies, universities and national research bodies. The figure allocated is destined for co financing of up to 90% of interventions which relate to, <i>inter alia</i> : <ul style="list-style-type: none"> • the use of RES integrated into the building structures in combination with energy efficiency technology of the buildings; • promotion of high yield CCHP units (at least 85%) for the generation of electricity, heating and cooling, in public complexes, social housing construction and large distribution centres and sale of consumer products, in combination with the use of renewable sources; • the use of heat deriving from low enthalpy geothermal plants, including heat pumps in private and public construction. 	November 2011 -not available
Provisions on the subject of sustainable bioliquids/ biofuels	Regulatory	Wider use of sustainable biofuels (Community target 2020: 10% of	Operators in the bioliquids/biofuels production	<i>Existing measure, supplementary to the NAP.</i> Legislative Decree 55/2011, which transposed Directive 2009/30/EC and Legislative Decree No 28/2011 provide for adoption of the Community sustainable criteria. By 2012 the national system for verification of the	2012-not available

(Legislative Decree 55, Legislative Decree No 28/2011)		transport consumption covered by way of RES)		sustainability criteria will enter into force.	
International cooperation mechanisms (Legislative Decree No 28/2011, Article 35 and 36)	Regulatory-Financial	Reaching the target. Possibility of international investments	Other States, Investors , TSO	<i>Planned measure, supplementary to the NAP.</i> As regards international cooperation mechanisms, Legislative Decree No 28/2011 provides that any charges for statistical transfer and joint projects will in any event be lower than the average weighted value of the incentives for the production of electricity from renewable sources in Italy	2016-not available
Simplification of authorisation procedures (Legislative Decree No 28/2011, Article 5, 6,7)	Regulatory	Simplification and acceleration of authorisation procedures	Investors / Final customers/ Public authorities	<i>Existing measure, supplementary to the NAP.</i> Legislative Decree No 28/2011 provides for streamlining and acceleration of authorisation procedures for systems supplied by renewable sources, simplifying the framework by identification of three different types of authorisation: - Single authorisation (AU); - Simplified authorisation procedure (PAS); - Notice of Building Activity to the Municipality (CAEL). The Regions can, for some types and thresholds of systems, simplify further the authorisation procedures (many Regions have already legislated in that sense).	March 2011-not available
Rationalisation measures (Legislative Decree No 28/2011, Article 12)	Regulatory Financial	Rationalisation of procedures	Investors / Final customers	<i>Planned measure, supplementary to the NAP.</i> Legislative Decree No 28/2011 provides that, with a later decree, simplification measures will be introduced to organise the financial charges and various forms of guarantees required for authorisation, connection, construction operation of systems supplied from renewable sources and issue of incentives to those systems.	2013 –not available
Training and information (Legislative Decree No 28/2011, Article 14)	Non-binding	Information, change of behaviour	Operators, designers, Regions, local authorities, citizens, undertakings etc,	<i>Existing measure, supplementary to the NAP.</i> Legislative Decree No 28/2011 provides for the production of a computer portal on renewable sources and energy efficiency. The portal, produced by the GSE [Energy Services Manager] designed for citizens, businesses, public authorities, is available on the website http://rinnova.gse.it . It contains, <i>inter alia</i> information regarding incentives, authorisation procedures, good practices, sustainability and energy savings actions etc.	October 2011 – not available
Qualification system for installers (Legislative Decree No 28/2011, Article 15)	Regulatory	Guarantee of quality in installation of RES systems	Installers	<i>Planned measure, supplementary to the NAP.</i> Professional qualifications for installation and extraordinary maintenance of biomass boilers, hearths and stoves, photovoltaic and thermal systems mounted on buildings, low enthalpy geothermal systems and heat pumps can be gained through specific courses to be implemented by the Regions by December 2012.	August 2012 – not available
Interventions and measures favouring technological and industrial development (Legislative Decree No 28/2011, Article 32)	Financial	Technological and industrial development	Investors	<i>Planned measure, supplementary to the NAP.</i> Interventions and measures for technological and industrial development shall be identified by apposite Decrees. The interventions and measures shall provide support: • for experimental and technological development projects with particular reference to electricity grid infrastructures, accumulation systems, gasification and pyrogasification of biomass, second generation biofuels as well as new generation, innovative technology of energy conversion of solar energy, with	not available

				<p>particular reference to high-concentration photovoltaic energy;</p> <ul style="list-style-type: none"> • of innovation projects for processes and organisation of energy services; • of creation, extension and animation of innovation clusters • to funds for planning of interventions of installation of renewable sources and energy saving in favour of public authorities. <p>To finance the activities a reserve will be established in the balance-adjustment fund for the electrical sector supplied by revenues from the electricity and natural gas tariffs in equal measure, amounting respectively to 0.02 eurocent per kWh and 0.08 eurocent per sm³</p>	
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* 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, final customers, 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).

The National Action Plan, paragraph 4.2.1, describes the state of the art in authorisation procedures for renewable energy plants. To remove the regulatory and non-regulatory barriers which emerged at the analysis stage and improve the administrative procedures supporting development of renewable sources, Italy has decided to implement some additional measures.

In terms of Legislative Decree No 28/2011 which transposes Directive 2009/28/EC, in order to render the authorisation procedure more proportionate, necessary, streamlined and expedited at an appropriate administrative level, as required by Article 13 of the Directive, the general framework of authorisation for renewable energy plants has been partially reviewed (Articles 4-9). Three procedures are provided by current regulations for the production of renewable energy plants:

- **Single Authorisation (AU)** – procedure introduced by Legislative Decree 387/2003 which transposed Directive 2001/77/EC, for authorisation of electricity generating plants from renewable sources and connected infrastructure works. The AU, which is required for power plants above determinate thresholds, is issued at the end of a single procedure, performed by way of a Service Conference attended by all the administrations necessary and constitutes title to construct and to operate the plant and, also, where necessary, it acts as a variation to the town planning program. Legislative Decree No 28/2011 reduces the maximum duration of the procedure from 180 to 90 days, net of the timescales provided for production of an Environmental Impact Assessment (EIA) where necessary. Competence for the issue of the Single Authorisation is vested in the Regions or Provinces delegated by said Regions.
- **Simplified Authorisation Procedure (PAS)** – is the procedure introduced by Legislative Decree No 28/2011 to replace the Declaration of Commencement of Activities (DIA). The PAS can be used for the production of renewable energy source plants below the pre-established power threshold (above which the AU is required) and for some types of thermal energy plants from renewable sources. The PAS must be submitted to the Municipality at least 30 days prior to commencement of the works, accompanied by a detailed report, signed by a qualified project designer, and by the appropriate project plans, attesting also the compatibility of the project with town planning programs and current building regulations, as well as compliance with the safety and health-hygiene regulations. For the PAS, a tacit assent mechanism is in place: once 30 days have passed from the submission of the PAS without response or notification by the municipality, it is possible to commence the works,
- **Notice of Building Activity (CAEL)** is the requirement provided to simplify the authorisation procedure of some types of small plants for productions of electricity or heat from renewable sources and which can be assimilated to unrestricted building activities. The communication of the commencement of works must be sent to the Municipality, accompanied by a detailed report signed by a qualified project designer. It is not necessary to wait 30 days prior to commencing the works.

Legislative Decree No 28/2011 also gives the Regions the power to extend further the applicability of the PAS, to electricity production plants up to 1 MWe, and the applicability of the CAEL to plants up to 50 kWe or photovoltaic systems of any power mounted on buildings.

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).

Transmission, distribution, dispatching

The production units supplied by renewable sources have the right to priority of dispatch, in line with security of the electricity system.

For production units supplied by non-programmable renewable sources²⁸ the actual balancing payment²⁹ is equal to the valorisation price of the offers for sale accepted on the spot market (Day Ahead Market) in the corresponding relevant period, in the area in which the dispatch point is situated (Day Ahead Market price): that means that, where the amount of electricity effectively fed into the grid by those units is different from the estimated amount, the higher costs for the system are not attributed to those units and are, therefore borne by the public.

Over the last few years, the regulator has defined provisions for optimising use of the electricity grid, therefore reducing total dispatching costs, favouring the increase of production from non-programmable renewable sources and guaranteeing the security of the grid. However, those provisions do not involve elimination of the need to adjust the existing grid in relation to present and future development of plants supplied by non-programmable renewable sources.

As regards wind turbines, starting with the plants which had not yet entered into operation in 2008³⁰ the following grid services are provided (shown in Annex A17 to the Terna Network Code):

- provision of low voltage ride-through;
- active power regulation capacity;
- provision of reduction of power fed onto the grid/disconnection from the grid;
- reactive power regulation capacity .

Those grid services permit effective modulation of production in response to changes in weather conditions and grid conditions, thus improving dispatch and favouring greater distribution by the said production units with the existing electrical infrastructure.

In the case of other wind plants, procedures are provided for remuneration of the costs incurred by producers in the case of voluntary adjustment of the plants for provision of one or more grid services³¹. In particular, Terna was delegated to define the identification procedures for units with an expenditure limit of EUR 25 million. Effective costs:

- 5% goes toward reduction of premiums due to Terna, where present, for supply activities of resources for dispatching services;
- the remaining part is borne by final customers by way of dispatching fees.

Furthermore, in 2010, incentives were introduced (what are known as the correct forecast payments) regarding programming of large production units (i.e. power greater than or equal to 10 MVA) supplied by non-programmable renewable sources. That is in order to promote improvement in forecasts for despatch of electricity by producers, consequently reducing system costs.

With reference to non-significant production units using non-programmable renewable resources, starting from 2010³² the GSE shall make aggregate forecasts for each area of the market, acquiring the data by satellite, in real time, relative to availability of sources and consequent production. For those production units therefore the forecast charges do not fall upon the producers.

Finally, since 2007 remuneration has been provided for lack of production from wind turbines due to reduction of production imposed by Terna to ensure security of the electrical system, that is, in order to safeguard investments made in the renewable sources sector.

²⁸ Units of production which use solar, wind, tide and wave energy, landfill gas and residual gases from sewage treatment processes, biogas, geothermal energy and hydraulic energy, the latter limited to natural flow units.

²⁹ The unitary value given by the difference between the estimated electricity and that actually supplied to the system

³⁰ AEEG Resolution ARG/elt 98/08

³¹ AEEG Resolution ARG/elt 5/10

³² AEEG Resolution ARG/elt 4/10

In particular, until 2009 reference was made to traditional production³³ while from 2010³⁴ new remuneration methods were defined, relying on estimates made by a third party, the GSE, based on the actual wind data measured in locus, in the hours in which reductions in production were requested and using a model which simulates the functioning of the wind turbines. The formula for calculation for lack of wind turbine production includes a dispatch-user reliability index, in complying with orders for dispatching issued by Terna, and provides for a deductible amount to be applied in the case in which the wind turbine production units are not adequate for provision of the grid services required.

Connections

With reference to conditions of access to the grid, and apportionment of connection costs, the Italian regulations establish that grid operators must treat as a priority requests for connection and production on connections for renewable energy production or high yield CHP plants. To that end, grid operators must ensure, for the purposes of the connection to the grid of said plants, performance of the activities within the timescale referred to the Integrated Text of Active Connections (TICA³⁵) which details procedures for grid connection, the obligations, timescales and connection costs.

In the event of inertia by the grid operator, replacement procedures are also provided for renewable source plants. The Italian Electricity and Gas Authority, following notification by the applicant, can commence the replacement procedure in the following cases:

- excess of 60 working days delay in making the estimate available;
- excess of 120 working days delay in the production of the connection.

As regards connection costs to low and medium voltage grid, TICA provides easier payment terms for renewable source plants compared to those applied to traditional source plants.

In particular, the charge for the connection of renewable source plants, hybrid plants (the latter provided they have thermal power under 300 MW and at least half of their production is attributable to renewable sources), and high yield CHP plants, is the lower of two values, A and B (in EUR):

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

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

where:

- CP_A = EUR 35/kW, CM_A = EUR 90/(kW-km), CP_B = EUR 4/kW, CM_B = EUR 7.5/(kW-km);
- P is power for the purposes of connection, equal to the higher value of zero and the additional power requested for feed-in (in its turn equal to the difference, if positive, between the power requested for feed-in and the power already available for connection prior to the interventions);
- D_A is the distance as the crow flies between the connection point and the closest medium/low voltage transformer substation existing for at least 5 years;
- D_B is the distance as the crow flies between the connection point and the closest high/medium voltage transformer station existing for at least 5 years.

In cases of new connection with underground cables the CM prices double, while in the case of connection of plants which are not reachable by road or which are separated from existing distribution plants by stretches of sea, lake or lagoon, the CM and CP prices are multiplied by 3. Where the line is in part underground cable and part above ground lines, the price calculation formulae are more complex.

The connection price is paid by the applicant to the grid operator as follows: 30% on acceptance of the estimate and the remaining 70% at the time of communication of completion of the strictly-necessary works for the physical production of the connection. Alternatively, grid operators in their own MCCs (methods and contractual conditions for provision of the connection service), can provide, up to an amount of not more than EUR 2 000, one single payment of the connection price at the time of acceptance of the estimate.

The price does not include management costs for authorisations which have to be paid separately to the grid operators, if managed by them, as well as inspection and testing costs which should be paid to the distribution company in the event in which the applicant decides to produce himself the grid plant for the connection.

³³ AEEG Resolution 330/07

³⁴ AEEG Resolution ARG/elt 5/10

³⁵ AEEG Resolution ARG/elt 99/08

For high yield renewable source electricity and CHP production plant connections, the applicant is given the option to produce the plant himself for connection, in those parts which do not involve performance of interventions on the existing electricity grid, that is to say, usually, the production of any electric lines and the system for delivery. The grid operator may permit the applicant to perform interventions on the existing network, without prejudice to safety requirements and safeguarding continuity of the electricity service.

Once the production by the applicant himself is completed, he sends the notice of completion of works to the grid operator, together with the documentation necessary for inspection and testing, operation and management of the relative stretches of the grid. The costs for inspection and testing are borne by the applicant even when the outcome is negative. Within 60 working days of completion of inspection and testing and in any event not prior to the acquisition of the works performed, the grid operator shall return to the applicant the price previously paid by said applicant at the time of acceptance of the estimate, plus interest at the legal rate. The grid operator shall also pay an amount equal to the difference, if positive, between the cost relative to the works performed by the applicant and the price for connection shown in the estimate. Where said difference is negative, the applicant shall pay said difference to the grid operator within said time limits.

In the event of batches of production plants, the exercise of the option for self-production of the connection, requires that production is dealt with by the applicant with reference to all batch connections.

For high and very-high voltage connections for renewable source plants, at the time of the submission of the application to obtain the STMD (Minimum technical requirements, i.e. the executive plan for the connection operations), the applicant shall make a payment to the grid operator to cover the management activities and technical analysis relative to formulation of the STMD. The prices fixed for renewable source plants are half of those prices applied to traditional source plants.

That price amount to the sum of EUR 1 250 plus the product of EUR 0.25/kW and the power for the purposes of the connection, up to a maximum of EUR 25 000.

The costs for works on the existing grid are never charges to applicants in the case of renewable source production plants.

Where the applicant has not paid the whole connection price at the time of acceptance of the STMD, prior to commencement of performance of the works, the said applicant shall submit, on request by the grid operator, a bank guarantee, equal to the portion of the payment for the connection not yet paid. The guarantee can be drawn down by the grid operator in cases in which the connection is not made within the terms indicated in the specific connection contract due to reasons attributable to the applicant, or in cases in which the said party is insolvent with regard to payment of the connection price. In the event of cancellation by the applicant, even following supervening requirements for site reclamation, the grid operator has the right to drawdown a portion of the guarantee corresponding to coverage of the costs incurred to that point, net of payments already made, increased by any costs which the grid operator must incur in order to restore working conditions 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).

The Commission reminds Member States that all national support schemes must respect the state aid rules as foreseen in Articles 107 and 108 of the Treaty on the Functioning of the EU. The notification of the report in accordance with Article 22 of Directive 2009/28/EC does not replace a state aid notification in accordance with Articles 107 and 108 of the Treaty on the Functioning of the EU.

*It is suggested that **table 3** is used to provide more detailed information on the support schemes in place and the support levels applied to various renewable energy technologies. Member States are encouraged to provide information on the methodology used to determine the level and design of support schemes for renewable energy.*

The information on support schemes in force that the “*Template for Member State progress reports under Directive 2009/28/EC*” suggests should be summarised in the form of a table (*Table 3 - Support Schemes for renewable energy*), are provided hereunder in detail. According to the support scheme and reference technology tables are compiled which take their cue from Table 3, adapting it to the cases examined.

1. SUPPORT SCHEMES AIMED AT PROMOTING THE USE OF RENEWABLE ENERGY SOURCES IN THE HEATING AND COOLING SECTOR

1.1. MECHANISMS CURRENTLY IN FORCE

As at the date of drafting of this document (December 2011), the main operating mechanisms at a national level which promote the use of renewable sources for heating are White Certificates (or Energy Efficiency Certificates- TEE) and Tax Deductions of 55%.

1.2. WHITE CERTIFICATES

White Certificates are negotiable securities which certify energy saving in final energy users. The White Certificates mechanism is based on the Ministerial Decree of 24 April 2001, the Ministerial Decree of 20 July 2004 and the Ministerial Decree of 21 December 2007.

With respect to that described in the National Action Plan, the White Certificates mechanism was updated and amended with the entry into force of Legislative Decree No 28 of 3 March 2011 (which transposed Directive 28) and Resolution AEEG No EEN 9/11 of 27 October 2011 (Guidelines for preparation and evaluation of projects pursuant to Article 5(1) of the Ministerial Decree of 20 July 2004 as amended, and for definition of the criteria and methods for the issue of the Energy Efficiency Certificates, which replace the previous guidelines set forth in AEEG Resolution 103/03 of 18 September 2003).

The White Certificates mechanism is based on the obligation for gas and/or electricity distribution companies with more than 50 000 final customers, to reach a pre-established annual energy saving target. The table below shows the annual targets updated by the Ministerial Decree of 21 December 2007, expressed in terms of primary energy saved (the unit of measure used is the Mteo -million tonnes equivalent of oil):

Year	Electricity Decree [Mteo/year]	Gas Decree [Mteo/year]
2008	1.2	1.0
2009	1.8	1.4
2010	2.4	1.9
2011	3.1	2.2
2012	3.5	2.5

The electricity and gas distribution companies can fulfil their obligations by performing interventions which give the right to White Certificates, directly with end-users. Alternatively, rather than performing interventions themselves, the parties bearing the obligation can acquire the securities on the market organised by the GME [Electricity Market Operator] or by way of bilateral contracts from the so-called “non-obliged parties” consisting of energy service companies (also known as ESCOs), distributors of electricity and gas with fewer than 50,000 final-customers, public companies and authorities equipped with “energy managers” (formally responsible for the preservation and rational use of energy pursuant to Article 19 Law No 10/1991). The non-obliged parties perform energy saving interventions with final customers and sell the White Certificates obtained to obliged parties.

In order to obtain White Certificates, obliged parties and non-obliged parties must perform activities which permit the reaching of a minimum threshold of energy saving. The amount of the savings achieved is verified by the Italian Electricity and Gas Authority (AEEG) by use of three different evaluation methods: standardised, analytical and final balance:

- standardised evaluation quantifies the annual savings of the intervention on the basis of physical reference units (or PRUs) installed. The annual savings which can be obtained by each device installed is established in the standardised technical evaluation schedules approved by the AEEG;
- analytical evaluation provides for a determination of annual energy saving in compliance with some parameters of use of the plants. In the analytical technical evaluation schedules approved by AEEG, specific calculation algorithms are set out to evaluate the savings made;
- final balance evaluation is used when the other two previous methods are not applicable and no predetermined algorithm is available to evaluate savings. The evaluation is therefore performed by final balance measurement of savings made by way of the individual intervention.

The possible interventions which can be performed giving right to White Certificates also include some types of technology which use renewable sources in the heating and cooling sector, such as:

- use of solar collectors for production of domestic hot water (schedule 8-bis);
- installation of aerothermal heat pumps instead of boilers in newly constructed or renovated residential buildings of (schedule 15);
- application in the non-industrial sector of small CHP units for heating and cooling and production of domestic hot water (schedule 21-bis);
- application in the non-industrial sector of district heating and cooling systems and production of domestic hot water (schedule 22-bis);
- installation of centralised systems for heating and cooling of non-industrial buildings (schedule 26);
- installation of electrical heat pumps for the production of domestic hot water in new and existing systems (schedule 27).

White Certificates are valid for a period of 5 years for all the abovementioned interventions with the exception of CHP (schedule 21-bis). In this case, the Ministerial Decree of 5 September 2011 establishes that high yield CHP units have access to White Certificates for a period of 10 years, if they entered into operation from 7 March 2007 as new units or upgrading of existing units. If the abovementioned CHP units are connected to district heating networks (schedule 22-bis) the period of entitlement to the White Certificates rises to 15 years. The CHP units which entered into operation after 1 April 1999 and prior to 7 March 2007, on the other hand, pursuant to Article 29(4) of Legislative Decree No 28 of 3 March 2011 have right to the White Certificates for a period of 5 years and in a number equal to 30% of that provided by the Ministerial Decree of 5 September 2011.

With entry into force on 1 November 2011 of Resolution AEEG No EEN 9/11 of 27 October 2011, the minimum thresholds for submitting projects were amended and established at 20 toe, 40 toe and 60 toe respectively for standard, analytical and final balance projects. The same resolution also established that energy savings made must be multiplied by what are known as “coefficients of durability”. Those coefficients are calculated comparing the technical life of the interventions (i.e. the period of functioning of the equipment or devices with which the energy saving is actually made, which varies between 5 and 30 years) to the useful life (i.e. the period of right to issue of the White Certificates), applying a coefficient of annual deterioration in savings (which varies between 0 and 2%), in order to take account of cases in which the technical life of the interventions exceeds their useful life. The introduction of the new coefficient was designed to evaluate also the energy savings generated outside the period of validity of the White Certificates.

The following table shows the coefficients of durability relative to the data sheets for interventions regarding use of renewable energy sources.

No of schedule	Data Sheet Title	Coefficient of durability
8-bis	Use of solar collectors for production of domestic hot water	2.65
15	Installation of aérothermal heat pumps electric instead of boilers in newly constructed or renovated residential buildings	2.65
21-bis	Application in the domestic sector of small CHP units for central heating and cooling and production of domestic hot water	3.36
22-bis	Application in the domestic sector of district heating for central heating and production of domestic hot water	3.36
26	Installation of centralised systems for heating and cooling of residential buildings	2.65/1.87
27	Installation of electric heat pumps for production of domestic hot water in new and existing domestic systems	2.65

One White Certificate corresponds to a saving of 1 toe (tonne oil equivalent). There are five types of Energy Efficiency Certificates depending on the type of energy saved (electricity, gas or fossil fuels):

- Type I securities, attesting energy savings made by reduction in the consumption of electricity;
- Type II securities, attesting energy savings made by reduction in the consumption of natural gas;
- Type III securities, attesting energy savings made by reduction in the consumption of energy other than electricity and natural gas, not destined for use for motor transport (e.g. saving of petrol or diesel);
- Type IV securities, attesting the achievement of savings of forms of energy other than electricity and natural gas, made in the transport sector and evaluated with the methods provided by Article 30 of Legislative Decree No 28/2011;
- Type V securities, attesting the achievement of savings of forms of energy other than electricity and natural gas, made in the transport sector and evaluated using methods other than those provided for the security of Type IV.

With the entry into force of Resolution AEEG No EEN 9/11 of 27 October 2011, the types of White Certificate are increased from four to five. The new distinction between Type IV and Type V White Certificates originates in response to Article 30 (1)(a) of Legislative Decree No 28/2011, in terms of which access to Type IV White Certificates requires performance of specific interventions in the transport sector such as those promoting use of vehicles running on natural gas and LPG and in respect of which the production of *ad hoc* standardised data sheets is provided. Type V White Certificates, on the other hand, attest the achievement of energy savings by interventions in the transport sector in respect of which standardised evaluation schedules cannot be prepared and which must, therefore, be subject to analytical or final balance evaluation.

The value of the White Certificates depends on the outcome of negotiations which take place either on the market organised by the GME, or by virtue of bilateral agreements between obliged parties (purchasers) and non-obliged parties (sellers). Over the last few years the average value of White Certificates has risen and during 2011, with reference overall to Types I, II, and III, the average value of exchanges was approximately EUR 93.45 EUR /White Certificate, exclusive of VAT.

In order to permit obliged parties to be able to recover, in whole or in part, the charges incurred for performance of interventions, a component has been established in the distribution tariffs for electricity and natural gas. With the entry into force of Legislative Decree No 28/2011 that component has also been extended to Type IV certificates, while previously it related only to Types I, II and III. By Resolution AEEG No EEN 12/11 of 24 November 2011, Italian Electricity and Gas Authority fixed the unitary refund contribution charge for distributors of electricity and gas in 2012 at EUR 86.98/toe saved (whether directly or by acquisition of White Certificates). In the preceding years the tariff contribution evolved as follows: for years 2004-2008 the contribution was 100 EUR /toe, for 2009, EUR 88.92/toe, for 2010 EUR 92.22/toe and for 2011, EUR 93.68 /toe.

The following tables are taken and adapted from Table 3 of "*Template for Member State progress reports under Directive 2009/28/EC*".

The data collected have been set out on the basis of the technology subject of the interventions shown in the data sheets for quantification of primary energy savings approved by AEEG.

Solar collectors (data sheet No 8 bis)

The certified energy savings by virtue of installation of solar collectors for production of domestic hot water amount to: 22 300 toe for the first half-year 2011, 37 535 toe for 2010 and 30 320 toe for 2009.

Support schemes for net renewable energy first half-year 2011		
Solar collectors		
Energy Efficiency Certificates (White Certificates)	Average price per toe (EUR /toe)	90.00
	Overall support in first half-year 2011(EUR)	2 006 979

Support schemes for net renewable energy in 2010		
Solar collectors		
Energy Efficiency Certificates (White Certificates)	Average price of White Certificates (EUR/toe)	85.14
	Overall annual support (EUR)	3 195 781

Support schemes for net renewable energy in 2009		
Solar collectors		
Energy Efficiency Certificates (White Certificates)	Average price of White Certificates (EUR /toe)	74.46
	Overall annual support (EUR)	2 257 625

Electric heat pumps (data sheet No 15)

The certified energy savings by virtue of installation of aérothermal electric heat pumps instead of boilers in newly constructed or renovated residential buildings amount to: 245 toe for the first half-year 2011, 52 toe for 2010, while for 2009 no savings were certified.

Support schemes for net renewable energy first half-year 2011		
Electric heat pumps		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	90.00
	Overall support in the first half-year 2011 (EUR)	22 049

Support schemes for renewable energy in 2010		
Electrical heat pumps		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	85.14
	Support whole year (EUR)	4 421

Support schemes for renewable energy in 2009		
Electrical heat pumps		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	74.46
	Support whole year (EUR)	0

Application of small CHP units for heating and cooling (data sheet No 21-bis)

The data shown in the tables below refer to application in the non-industrial sector of small CHP units for heating, cooling and production of domestic hot water. Those applications also include the use of low enthalpy geothermal heat and heat from geothermal CHP units or fuelled by biomass or waste.

The certified energy savings by virtue of application in the non-industrial sector of small CHP units for heating, cooling and production of domestic hot water amount to: 16 527 toe for the first half-year 2011, 2 583 toe for 2010, while for 2009 no savings were certified.

Support schemes for renewable energy in the first half-year 2011		
Small CHP units		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	90.00
	Overall support in the first half-year 2011 (EUR)	1 487 347

Support schemes for renewable energy in 2010		
Small CHP units		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	85.14
	Support whole year {EUR)	219 960

Support schemes for renewable energy in 2009		
Small CHP units		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	74.46
	Support whole year (EUR)	0

District heating systems (data sheet No 22 bis)

The data shown in the following tables refer to application in the non-industrial sector of district heating systems for heating, cooling and production of domestic hot water. Those applications also include the use of low enthalpy geothermal heat and heat from geothermal CHP units or fuelled by biomass or waste.

The certified energy savings by virtue of application in the non-industrial sector of district heating systems for heating, cooling and production of domestic hot water amount to: 78 500 toe for the first half-year 2011, 20 028 toe for 2010, while for 2009 no savings were certified.

Support schemes for renewable energy in the first half-year 2011		
District heating systems		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	90.00
	Overall support in the first half-year 2011 (EUR)	7 064 967

Support schemes for renewable energy in 2010		
District heating systems		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR/ toe)	85.14
	Support whole year (EUR)	1 705 219

Support schemes for renewable energy in 2009		
District heating systems		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	74.46
	Support whole year (EUR)	0

Centralised heating and cooling (data sheet No 26)

The data contained in the following tables refer to all interventions of installation of centralised heating and cooling and including *inter alia*: installation of aérothermal heat pumps instead of boilers in newly built or renovated buildings, the use of low enthalpy geothermal heat and heat from geothermal CHP units or supplied by biomass or waste.

The certified energy savings following installation interventions for centralised heating and cooling of non-industrial buildings amount to: 2.397 toe for first half-year 2011, 7.010 toe for 2010, while for 2009 no savings were certified.

Support schemes for renewable energy in the first half-year 2011		
Centralised heating and cooling		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	90.00
	Overall support in first half-year 2011 (EUR)	215 718

Support schemes for renewable energy in 2010		
Centralised heating and cooling		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	85.14
	Support whole year (EUR)	596 871

Support systems for renewable energy in 2009		
Centralised heating and cooling		
Energy Efficiency Certificates (White Certificates)	Average price of the White Certificates (EUR /toe)	74.46

	Support whole year (EUR)	0
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1.3. TAX DEDUCTIONS

Solar thermal energy plants, high efficiency heat pumps, low enthalpy geothermal systems and biomass heat generators have a wider incentive mechanism for energy savings in the building sector, by way of tax deductions. This is a voluntary mechanism which permits the possibility of deducting from income tax, whether personal income tax (IRPEF) or corporate income tax (IRES), 55% of the costs incurred for determinate energy efficiency upgrading interventions of existing buildings. The deductions must be spread over 10 years.

Tax relief for energy saving interventions is covered in the central government annual and multi-year budget. The system has been in force since 2007 following its introduction in paragraphs 344, 345, 346 and 347 of Article 1 of Law No 296/2006 (2007 Financial Law). Extension of the support system is decided during enactment of the annual financial law. ENEA [Italian National Alternative Energy Authority] is in charge of management and control of the tax deduction mechanism and parties wishing to claim this tax relief must send the documentation proving the interventions performed to that organisation.

With respect to that described in the National Action Plan, the 55% tax deduction mechanism has not undergone any particular changes. The measure was extended by Law No 214 of 22 December 2011 until 31 December 2012 and its range was extended also to costs for interventions to replace traditional water heaters with heat pump water heaters for the production of domestic hot water.

Depending of type of intervention, a cost limit is provided in respect of which the deduction can be claimed. The following table shows the values provided:

TYPE OF INTERVENTION	MAXIMUM DEDUCTION
Energy efficiency 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 central heating systems	EUR 30 000 (55% of EUR 54 545.45)

The parties entitled to the tax deduction are resident and non-resident taxpayers, even if corporate revenue holders, who are in possession, for any reason, of the building subject of intervention. In particular, the deduction is permitted for:

- natural persons (including those having a right *in rem* over the building, co-proprietors for interventions on jointly-owned common parts, tenants, persons who hold the building on loan);
- taxpayers who receive corporate revenue (natural persons, partnerships, capital companies);
- professional associations;
- public and private authorities who do not perform commercial activities.

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

The tables refer to individual interventions to paragraphs 346 and 347 of Law No 296 of 27 December 2006 as amended, which involve the use of renewable energy sources.

Installation of solar panels for production of hot water (paragraph 346 Article 1 of Law No 296/2006).

During tax year 2009, the installation of solar panels for the production of domestic hot water represented 15% of all interventions eligible for the 55% tax deduction mechanism.

Support schemes for renewable energy in 2009		
Solar thermal plants		Total (EUR)
Tax Deductions (55%)	Tax exemption/tax rebate	136 352 130.62

Replacement of central heating systems (paragraph 347 of Article 1, Law No 296/2006)

During financial year 2009, the replacement of central heating systems represented 30% of the total of interventions eligible for the 55% tax deduction mechanism.

The following table shows the total value of the deduction from replacement costs for central heating systems in 2009. The figure aggregates all the interventions regardless of whether these relate to heating systems served by renewable or non-renewable sources.

Support schemes for renewable energy in 2009		
Central heating systems		Total (EUR)
Tax deductions (55%)	Tax exemption/tax rebate	483 673 287.81

The diagram below shows the percentage share by type of replacement interventions for heating systems in 2009. The replacement of heating systems by systems supplied by renewable sources in 2009 made up approximately 16% of the total of the interventions eligible for the 55% tax deduction.

[PIE CHART]

Heat exchanger for district heating

Heat pump

Geothermal plant

Biomass boilers

Thermal plants from non-renewable sources

1.4. THE NEW INCENTIVES

Legislative Decree No 28/2001 which transposed Directive 28 provides that from 2012, thermal energy production interventions from renewable sources and energy efficiency increases of small dimensions are eligible for a new type of incentive, commensurate with thermal energy production from renewable sources or energy savings generated, for a period of not longer than ten years.

The incentives will be determined with a view to ensuring a fair remuneration of investment costs and performance of the interventions. Particular attention will be given to the public sector and social housing sector, in addition to sectors which may not be covered by support systems, in order to rationalise and maintain coherence with the present tax deduction mechanism. The details of the new incentive system and methods of access will be contained in a Ministerial Decree about to be enacted.

2. SUPPORT SCHEMES AIMED AT PROMOTING USE OF RENEWABLE ENERGY SOURCES IN THE ELECTRICITY SECTOR.

2.1. THE MECHANISMS CURRENTLY IN FORCE

As at the date of drafting of this document (December 2011), the main incentive mechanisms in Italy for the production of electricity from renewable sources are the following:

- Energy Account (CE), aimed at photovoltaic and thermodynamic solar plants ;
- Green Certificates (CV) aimed at plants not supplied by solar sources;
- All-inclusive tariffs (TO), aimed at plants up to 1 MW (200 kW for wind turbines) not supplied by solar sources;
- CIP 6/92 (it is no longer possible to gain access to this mechanism, as it was superseded by the introduction, under Legislative Decree No 79/1999, of the Green Certificates system; however plants previously granted access will continue to benefit).

Further forms of facilitation of electricity production from renewable sources are forms of simplified energy off-take services such as:

- Power off-take (RID), aimed at programmable plants up to 10 MVA and non-programmable plants of any power. The RID gives of the possibility to have the energy taken off (and remunerated) by GSE, which then places it on the market;
- Reverse Metering (SSP), aimed at plants up to 200 kW. Reverse metering provides the user with a refund of expenditure for the purchase of electricity taken off the grid on the basis of the value of the energy produced and fed onto the grid.

In the case of the Energy Account and Green Certificates, in addition to the incentive (the revenue from the sale of Green Certificates or the premium rate for photovoltaic and thermodynamic solar plants), RES producers can count on further revenue: the valorisation of the energy fed onto the grid by way of the electricity market, the RID and SSP) or own consumption (avoiding the cost of purchase of energy). That revenue remains also at the end of the incentive period.

On the other hand, producers who access the all-inclusive tariffs mechanism enjoy an “all-inclusive” revenue for the energy fed onto the grid: the all-inclusive tariff includes, in fact, the incentive and component of sale of the energy. At the end of the incentive period, obviously, only the incentive component expires.

The following table summarises the mechanisms described above:

Type of system	Incentive Mechanism	Period of Incentive	Incentive	Valorisation of the energy
RES plants (non-solar source)	Green Certificates Systems of any size	15 years	Sale of Green Certificates attributed to the energy produced	Own consumption and/or free electricity market Power off-takes(1) Reverse Metering (2)
	All-inclusive tariffs Small systems(3)	15 years	All-inclusive tariffs for off-take of energy supplied to the grid	
Solar plants	Energy Account Photovoltaic systems	20 years	Rates of Energy Account attributed to energy produced ⁴	Own consumption and /or free electricity market Power off-takes (1)
	Energy Account thermodynamic solar plants	25 years	Rates of Energy Account attributed to energy produced	Reverse Metering (2)
(1) Systems of power lower than 10 MVA or of any power in the case of non-programmable renewable sources. (2) Systems of power up to 200 kW. (3) Systems of power not more than 1 MW (200 kW for wind turbines). (4) Until 2012 (from 2013 photovoltaic systems will be incentivised with all-inclusive rates).				

2.2. ENERGY ACCOUNT FOR PHOTOVOLTAIC SYSTEMS

The Energy Account is presently regulated by the Ministerial Decree of 5 May 2011 (Fourth Energy Account). That Decree was issued to give continuity to the incentive mechanism for photovoltaic systems, previously commenced by earlier legislation: Ministerial of 6 August 2010 (Third Energy Account), Ministerial Decree of 19 February 2007 (Second Energy Account), Ministerial Decree of 6 February 2006 and Ministerial Decree of 28 July 2005 (First Energy Account).

Until 2012, the incentive consisted of a fixed premium, provided for twenty years, on all the electricity produced. The energy remains in the possession of the producer who, therefore, can independently valorise it (own consumption or sale).

From 2013, instead of a premium on all the energy produced, a premium will be paid on the share of the energy produced for own consumption and an “all-inclusive” tariff on the portion of energy supplied to the grid. The “all-inclusive” tariff is set at a value which includes the incentivising component and the valorisation component.

The Fourth Energy Account applies to photovoltaic systems which begin operation between 31 May 2011 and 31 December 2016, for an approximate target of installed power at a national level of approximately 23 000 MW, corresponding to an annual cumulated approximate cost of the incentives estimated at between EUR 6 and 7 billion. The photovoltaic power target to be installed by 2020, provided in the National Action Plan on Renewable Energy was then revised upwards, given the significant growth recorded in the photovoltaic sector in Italy over the past few years. Due also to a reduction in costs of photovoltaic technology, the setting of more ambitious targets was made to correspond to a progressive reduction in incentive rates, seeking a gradual convergence with the levels of support adopted by other European countries and limiting incentive costs and impact on electricity tariffs. In addition to the approximate aggregate cost corresponding to the target until 2016, targets have also been set for half-yearly costs in relation to installed power and an acceleration mechanism for reduction in incentives based on expenditure (and therefore installed power).

Power plants of not less than 1 kW connected to the electricity grid can have access to the incentives defined in the Fourth Energy Account. The plants are divided into the following categories:

- “photovoltaic systems”;
- “photovoltaic systems with additional innovative features”;
- “concentrated photovoltaic systems”;
- “photovoltaic systems with technological innovation” (a Ministerial Decree is awaited for the definition of this category).

In cases of ground-mounted systems on agricultural land, restrictions apply as follows:

- the nominal power of each plant cannot be greater than 1 MW and, in the case of land belonging to the same owner, the plants must be situated at a distance of not less than 2 kilometres from each other;
- no more than 10% of the area of agricultural land used by the applicant is used for installation of the systems.

“Photovoltaic systems”

The systems that the Ministerial Decree of 5 May 2011 refers to simply as “photovoltaic systems” are classified in two categories enjoying different incentive rates:

- “photovoltaic systems mounted on buildings”: systems installed on buildings using particular positioning methods;
- “other photovoltaic systems”: photovoltaic systems which do not fall within the previous types, including ground-mounted systems.

Additionally, the Fourth Energy Account provides a distinction between “large systems”, in respect of which admission to incentive rates is dependent on a ranking (known as “register”), and “small systems”, which have access directly to the incentive. “Large systems” are those:

- of power greater than 1 MW, mounted on buildings;
- of power greater than 200 kW, not mounted on buildings;
- of power less than 200 kW which do not operate “reverse metering”, not mounted on buildings.

Excluded from the definition of large systems are photovoltaic systems mounted on buildings and in areas belonging to public authorities.

In 2011 and 2012 “large systems” are eligible for incentive rates within determinate cost limits. The following table shows the targets for 2012.

LARGE photovoltaic systems (“building mounted” and “other systems”)	1 st half-year 2012	2 nd half-year 2012
COSTS LIMITS	EUR 150 M	EUR 130 M
Approximate power targets	770 MW	720 MW

“Photovoltaic systems with additional innovative features”

Photovoltaic systems of power not greater than 5 MW, which use non-conventional modules and special components, developed specifically to integrate with and replace architectural elements of the buildings, have the right to specific incentive rates,

“Concentrated photovoltaic systems”

Concentrated photovoltaic systems are a particular type of photovoltaic system in which the sunlight is concentrated on the photovoltaic cells by way of optical devices. Companies and public bodies who are owners of systems whose power does not exceed 5 MW can have access to the incentive rates for this type of system.

The following tables show the rates for all systems from 2012 to 2016.

Systems mounted on buildings	1 st half-year 2012	2 nd half-year 2012	1 st half-year 2013		2 nd half-year 2013	1st half-year 2014	2 nd half-year 2014	1st half-year 2015	2 nd half-year 2015	1st half-year 2016	2 nd half-year 2016
Power range	Premium rates on energy PRODUCED		All-inclusive rate on energy SUPPLIED to the grid	Premium rate on energy OWN CONSUMPTION	MINIMUM REDUCTION of the rates compared to the preceding half-year						
[kW]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]							
1 ≤ P ≤ 3	0.274	0.252	0.375	0.230	-9%	-13%	-13%	-15%	15%	-30%	-30%
3 < P ≤ 20	0.247	0.227	0.352	0.207							
20 < P ≤ 200	0.233	0.214	0.299	0.195							
200 < P ≤ 1000	0.224	0.202	0.281	0.183							
1000 < P ≤ 6000	0.182	0.154	0.227	0.149							
P > 5000	0.171	0.154	0.218	0.140							
Other photovoltaic systems	1 st half-year 2012	2 nd half-year 2012	1 st half-year 2013		2 nd half-year 2013	1st half-year 2014	2 nd half-year 2014	1st half-year 2015	2 nd half-year 2015	1st half-year 2016	2 nd half-year 2016
Power range	Premium rates on energy PRODUCED		All-inclusive rate on energy SUPPLIED to the grid	Premium rate on energy OWN CONSUMPTION	MINIMUM REDUCTION of the rates compared to the preceding half-year						
[kW]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]							
1 ≤ P ≤ 3	0.240	0.221	0.348	0.201	-9%	-13%	-13%	-15%	15%	-30%	-30%
3 ≤ P ≤ 20	0.219	0.202	0.329	0.184							
20 ≤ P ≤ 200	0.208	0.189	0.276	0.172							
200 ≤ P ≤ 1000	0.172	0.155	0.239	0.141							
1000 ≤ P ≤ 5000	0.158	0.140	0.205	0.127							
P > 5000	0.148	0.133	0.199	0.121							
Photovoltaic systems integrated with innovative features	1 st half-year 2012	2 nd half-year 2012	1 st half-year 2013		2 nd half-year 2013	1st half-year 2014	2 nd half-year 2014	1st half-year 2015	2 nd half-year 2015	1st half-year 2016	2 nd half-year 2016
Power range	Premium rates on energy PRODUCED*		All-inclusive rate on energy SUPPLIED to the grid	Premium rate on energy OWN CONSUMPTION	MINIMUM REDUCTION of the rates compared to the preceding half-year						
[kW]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]							
1 ≤ P ≤ 20	0.418	0.410	0.543	0.398	-3%	-4%	-4%	From 2015 the tariffs for “photovoltaic systems with additional innovative features” are the same as for “systems mounted on building” or “other buildings”.			
20 ≤ P ≤ 200	0.380	0.373	0.464	0.361							
200 ≤ P ≤ 5000	0.352	0.345	0.432	0.334							
Concentrated plants	1 st half-year 2012	2 nd half-year 2012	1 st half-year 2013		2 nd half-year 2013	1st half-year 2014	2 nd half-year 2014	1st half-year 2015	2 nd half-year 2015	1st half-year 2016	2 nd half-year 2016
Power range	Premium rates on energy PRODUCED		All-inclusive rate on energy SUPPLIED to the grid	Premium rate on energy OWN CONSUMPTION	MINIMUM REDUCTION of the rates compared to the preceding half-year						
[kW]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]	[EUR/k/W]							
1 ≤ P ≤ 200	0.352	0.345	0.497	0.334	-3%	-4%	-4%	From 2015 the tariffs for “concentrated photovoltaic systems” are the same as for “systems mounted on building” or “other photovoltaic systems” (depending on type of installation).			
200 ≤ P ≤ 1000	0.304	0.298	0.387	0.289							
1000 ≤ P ≤ 5000	0.266	0.261	0.331	0.253							

From 2013 the half-yearly reduction planned for tariffs may undergo acceleration. That increased rate reduction is regulated by a formula which operates only if the cost determined in a given period is higher than that expected (“approximate cost of power target”). The approximate cost levels are shown in the following tables:

All "photovoltaic systems" ("building mounted" and "other systems")	1 st half-year 2013	2 nd half-year 2013	1 st half-year 2014	2 nd half-year 2014	1 st half-year 2015	2 nd half-year 2015	1 st half-year 2016	2 nd half-year 2016
APPROXIMATE COST	EUR 240 M	EUR 240 M	EUR 200 M	EUR 200 M	EUR 155 M	EUR 155 M	EUR 86 M	EUR 86 M
Approximate power targets	1 115 MW	1 225 MW	1 130 MW	1 300 MW	1 140 MW	1 340 MW	1 040 MW	1 480 MW

"systems with additional innovative features"	1 st half-year 2013	2 nd half-year 2013	1 st half-year 2014	2 nd half-year 2014
APPROXIMATE COST	EUR 22 M	EUR 30 M	EUR 37 M	EUR 44 M
Approximate power targets	50 MW	70 MW	90 MW	110 MW

"concentrated systems"	1 st half-year 2013	2 nd half-year 2013	1 st half-year 2014	2 nd half-year 2014
APPROXIMATE COST	EUR 19 M	EUR 26 M	EUR 32 M	EUR 38 M
Approximate power targets	50 MW	70 MW	90 MW	110 MW

Results of Energy Account for photovoltaic systems in 2010.

2010 data			
Solar photovoltaic	Incentivised energy produced	GWh	1 813
	Average incentivised value	EUR/ kWh	0.408
	Incentive support	EUR million	739

2.3. ENERGY ACCOUNT FOR THERMODYNAMIC SOLAR ENERGY PLANTS

The incentive mechanism for thermodynamic solar energy plants regulated by the Ministerial Decree of 11 April 2008 remunerates the electricity produced by a thermodynamic solar energy system with appropriate fixed rates for a period of 25 years. In the case of hybrid systems i.e. supplied both by solar sources and by other sources, only the electricity deriving from solar sources is eligible for incentives with Energy Account rates. In order to have access to the incentives, the systems must be connected to the electricity grid and comply with determinate technical requirements (minimum capitulation areas, heat accumulation system, etc).

Incentive rates are variable on the basis of the system's "solar fraction" i.e. the portion of electricity produced which is attributable to the solar source: systems with a higher "solar fraction" are accorded higher rates. Systems which enter into operation by the end of 2012 will receive the rates indicated in the following table:

Solar fraction	Rate [EUR/kWh]
System in which the solar fraction is higher than 85%	0.280
System in which the solar fraction is between 50% and 85%	0.250
System in which the solar fraction is lower than 50%	0.220

The rates applied to systems which enter into operation in 2013 and 2014 will be reduced by 2% each year (once obtained, they remain constant for the 25 years of the incentive scheme).

The Ministerial Decree of 11 April 2008 provides that, on request, the GSE may perform a preventive check of the plan of the system; six such requests have been made as at today's date (of which 1 in 2010). No solar thermodynamic energy plant has however requested access to the incentives system.

2.4. GREEN CERTIFICATES

The Green Certificates incentive system introduced by Legislative Decree No 79 of 16 March 1999, is based on the obligation borne by producers and importers of electricity to feed into the electricity system a determinate portion

of new energy produced from renewable sources, equal to a determinate percentage of the volumes of production and imports from non-renewable sources made in the previous year, with a deductible of 100 GWh for each operator.

Electricity produced in CHP, own consumption and exports are exempt from the obligation. The obliged quota varies on an annual basis with an increase of 0.75% for the period 2007/2012.

After a decade of operation, the Green Certificates system will be replaced from 2013 with a new incentives system. As a result, the obliged quota in for the following years will be progressively reduced in accordance with the provisions of Legislative Decree No 28/2011.

Reference year (Year of production from fossil sources)	Energy subject to obligation (TWh)	PERCENTAGE OBLIGATION	Year of fulfilment of obligation	Millions of green certificates to be cancelled (size 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		6.80%	2012	
2012		7.55%	2013	
2013		5.03%	2014	
2014		2.52%	2015	
2015		0.00%	2016	

The parties who bear the obligations can fulfil them by directly supplying the system with energy produced from renewable sources, or acquiring securities (called Green Certificates) from other producers proving the “green” production of that quantity of energy (each green certificate usually proves the production of 1 Mwh of renewable energy). The law has therefore created an obliged demand for green certificates, which permits producers from renewable sources to obtain revenue from the sale of Green Certificates, in addition to valorisation of the electricity they produce.

The sale of Green Certificates can take place both on the market organised by the GME and by way of bilateral contracts. In order to avoid the price of green certificates falling in situations of surplus supply (something which has occurred constantly from 2006 to date) it is provided that the GSE will buy back, at a pre-established price, those green certificates not used to fulfil the obligation.

Green Certificates are issued for a period of 15 years in a number equal to the product of the “net annual production of incentivised electricity (E_i)”, expressed in MWh, for a coefficient K, different for each renewable source. The incentivised energy E_i depends on the category of plant design interventions performed (new construction, reactivation, reinforcement, upgrading) and on the net annual energy produced. For new plants the incentivised energy E_i corresponds to the net annual production of the plant. The table below shows the various multiplicative coefficients for awarding 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
Hydroelectric	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 chain.	1.80
Landfill gas and residue gas from sewage treatment processes, biogas other than those of the preceding point	0.80

From 2008, photovoltaic systems are no longer permitted access to the Green Certificates mechanism although systems which had access prior to that date continue to benefit from that mechanism.

Results of the Green Certificates mechanism in 2010.

2010 DATA			
Hydroelectric	Green certificates 2010 issued	number of green certificates	7 581 013
	Average financial value	EUR million	647
Wind turbine	Green certificates 2010 issued	number of green certificates	8 147 983
	Average financial value	EUR million	696
Geothermoelectric	Green certificates 2010 issued	number of green certificates	969 349
	Average financial value	EUR million	83
Photovoltaic Solar	Green certificates 2010 issued	Number of green certificates	4 160
	Average financial value	EUR million	0.36
Bioenergy	Green certificates 2010 issued	number of green certificates	5 428 421
	Average financial value	EUR million	463
Total RES	Green certificates 2010 issued	number of green certificates	22 130 926
	Average value green certificates 2010*	EUR /MWh	85
	Average financial value	EUR million	1 889

* Approximate value, given the trading on the stock exchange, bilateral negotiation and Green Certificates bought back by GSE

For the production of electricity from renewable sources in 2010 more than 22 million green certificates were issued in respect of an obliged demand, however, of only 8 million green certificates. Consequently, GSE bought back a large quantity of the Green Certificates not absorbed by the market.

The cost of buying back the Green Certificates (approximately EUR 1.3 billion) is covered by a component of the electricity tariffs, while the cost of cancellation of the green certificates (which can be estimated at around EUR 600 million) by the obliged parties, i.e. producers and importers from non-renewable sources, can be considered reflected in the price of supply of electricity.

2.5. ALL-INCLUSIVE TARIFFS

The “all-inclusive tariff” incentive system (the alternative to Green Certificates) is open to renewable source plants of power of less than 1 MW (200 kW for wind turbines), which entered into operation after 1 January 2008.

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

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

Source	Tariff [EUR/kWh]
Wind turbines for systems smaller 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"> - 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; - ethyl alcohol of agricultural origin from distillation of wine-making by-products; - 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). 	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

Results of the “all-inclusive tariffs” (TO) mechanism in 2010.

DATA 2010			
Hydroelectric	Energy drawn under the TO system	GWh	457
	Cost of energy drawn under the TO system	EUR million	102
	Incentive charge	EUR million	71
Wind turbine	Energy drawn under the TO system	GWh	1.5
	Cost of energy drawn under the TO system	EUR million	0.5
	Incentive charge	EUR million	0.4
Bioenergy	Energy drawn under the TO system	GWh	762
	Cost of energy drawn under the TO system	EUR million	200
	Incentive charge	EUR million	149
Total RES	Energy drawn under the TO system	GWh	1 220
	Cost of energy drawn under the TO system	EUR million	303
	Incentive charge	EUR million	220

2.6. CIP 6/92

CIP 6 is an incentive mechanism which was introduced in Italy in 1992, consisting of a form of administered remuneration of energy, by way of an incentivised rate whose value is updated over time. Conceptually it can be seen as a type of feed-in tariff.

Presently it is no longer possible to have access to this mechanism (in 2000 it was replaced by the Green Certificates system) however it continues to apply to those plants which signed the appropriate agreement during the lifetime of the provision.

Results of the CIP 6 mechanism in 2010.

2010 DATA			
Hydroelectric	Energy drawn under the CIP 6 system	GWh	178
	Average value remuneration paid	EUR/KWh	0.152
	Cost of energy drawn under the CIP 6 system	EUR million	27
	Incentive charge	EUR million	15
Wind turbine	Energy drawn under the CIP 6 system	GWh	816
	Average value remuneration paid	EUR /KWh	0.104
	Energy drawn under the CIP 6 system	EUR million	85
	Incentive charge	EUR million	32
Geothermoelectric	Energy drawn under the CIP 6 system	GWh	283
	Average value remuneration paid	EUR /KWh	0.155
	Cost of energy drawn under the CIP 6 system	EUR million	44
	Incentive charge	EUR million	25
Bioenergy	Energy drawn under the CIP 6 system	GWh	4 872
	Average value remuneration paid	EUR /KWh	0.202
	Energy drawn under the CIP 6 system	EUR million	984
	Incentive charge	EUR million	669
Total RES	Energy drawn under the CIP 6 system	GWh	6 149
	Average value remuneration paid	EUR /KWh	0.185
	Energy drawn under the CIP 6 system	EUR million	1.139
	Incentive charge	EUR million	742

2.7. THE NEW INCENTIVES

Legislative Decree No 28/2001, which transposed Directive 28, provides that those plants (excluding solar) entering into operation from 2013 will be incentivised with new schemes which, therefore, shall go on to replace the present incentive system (Green Certificates and present all-inclusive rates).

The new incentives shall take the form of tariffs which take account of the value of the energy (these can be premium tariffs, probably variable, and/or all-inclusive tariffs). The duration of the incentive system will be commensurate with the useful life of the plants.

The tariffs will be differentiated according to the specific renewable source, size and date of entry into operation of the plant. As regards biomass, the law encourages the efficient use of waste and by-products rather than the use of virgin biomass (in energy terms that must be destined as a priority to thermal use, and also bioliquids should be destined principally to the transport sector).

Plants above a certain power threshold (not less than 5 MW) have access to the incentives on the basis of a reverse auction procedure.

The incentives will be determined for the purpose of ensuring a fair remuneration for the investment and operation costs of the plants. The details of the new incentive system and the methods for access will be contained in a Ministerial Decree which is shortly to be enacted.

3. SUPPORT SCHEMES FOR PROMOTION OF USE OF SOURCES OF RENEWABLE ENERGY IN THE TRANSPORT SECTOR

The parties which release for consumption petrol and diesel produced from non-renewable primary sources and destined to be used for motor transport, have the obligation to release a minimum amount of biofuels for consumption in Italy; those parties can fulfil that obligation also by acquiring, in whole or in part, the equivalent quota or corresponding rights from other parties. That system (biofuel blending obligation) constitutes the incentive for the use of biofuels in transport.

Legislative Decree No 28/2011 has reinforced this system, providing that the minimum share, calculated on the basis of calorific value, shall arrive at 5% by the end of 2014.

Furthermore it was established that the calorific value of the biofuels pursuant to Article 21(2) of Directive 28 is worth double for the purposes of the calculation of the obligation.

Obligation of release for consumption of biofuels	
Obligation/quota: % of energy content of fossil fuels released in the preceding year	2007: 1% 2008: 2% 2009: 3% 2010: 3.5% 2011: 4% 2012: 4.5% By end of 2014: 5%
Penalty (EUR /Gcal)	From EUR 60 to 90 per Gcal not released for consumption
Average estimated price of the certificate (1 certificate = 10 Gcal)	EUR 600 equal to EUR 60/Gcal

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).

The general charges for the electricity system³⁶ which appear on electricity bills and are paid by final customers also include the rate component A₃, for the purpose of covering the costs of incentivising renewable energy sources and used to fund the “*Account for new plants from renewable sources and other similar sources*”³⁷. That component is applied to the electricity bill of all final customers (partially exempt are only large-scale energy consumers).

The commercial code of conduct for the sale to final customers connected to the low voltage grid³⁸ establishes, among other things, the minimum amount of information relative to the financial and contractual conditions of supply and the rules for guaranteeing clarity and transparency of contractual terms and conditions which operators selling on the free electricity market are bound to observe and make known in the promotion of contractual offers to final customers.

The provisions on the subject of transparency of invoicing documents defined by the Code apply;

- to customers accorded greater protection (domestic customers and small businesses connected to the low voltage grid);
- to customers of the free electricity market connected to the low voltage grid.

The commercial code of conduct requires information to be provided showing all the general charges of the electricity system, under the item relating to grid services, without prejudice to the possibility for the final customer to request his supplier to provide details of the general and system charges and the obligation for the seller to publish at least once a year a notice regarding the average weight of the system charges on the final price, prepared by the Italian Electricity and Gas Authority and published on the Authority’s website by 31 January of each year with respect to the previous year.

Starting from 2012, it is provided that the costs relating to incentives for renewable energy by way of the A₃ component shall be highlighted and separated from all the other components relative to general system charges.

³⁶ Defined in Decree of 26 January 2000 by the Minister for Trade and Industry in concert with the Minister for the Treasury and Budget and Economic planning.

³⁷ Referred to in Article 54(1)b) of the AEEG Resolution No 348/07 (Integrated text on Transport)

³⁸ AEEG Resolution ARG/com No 202/09

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).

A system of obligation for release for consumption of biofuels is in force in Italy. The parties who release petrol and diesel fuels for consumption, produced from non-renewable primary sources and destined for use in motor transport, have the obligation to release for consumption in Italy a minimum quota of biofuels; those parties can also fulfil said obligation by acquiring, in whole or in part, the equivalent quota or corresponding rights from other parties. That system ("release obligation") constitutes the incentive for use of biofuels in transport.

Transposing Directive 2009/28/EC, Article 33 of Legislative Decree No 28/2011 provides that, for the purposes of complying with the obligation, the contribution of biofuels, including biomethane, in respect of which the party releasing them for consumption must show (by way of the methods permitted for verification of compliance with the criteria of sustainability, pursuant to Legislative Decree No 55 of 31 March 2011, which transposed Directive 2009/30/EC), that these are produced from waste and by-products (as defined, identified and outlined pursuant to Legislative Decree No 152, 3 April 2006), materials of non-food origin, including, cellulosic material and ligno-cellulosic material, algae and equivalent for release for consumption of a quantity equal to twice the amount released for consumption of other biofuels. In other words, it was established that the calorific power of the second generation biofuels released for consumption are worth double for the purposes of calculation of the obligation.

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 34 of Legislative Decree No 28/11 implementing Directive 2009/28/EC, provides that by a later Ministerial Decree the methods of issue, recognition and use of the guarantee of origin (GoO) of electricity from renewable sources will be updated in compliance with the provisions of Article 15 of Directive 2009/28/EC. Said Article 34 of Legislative Decree No 28/2011 establishes that the guarantee of origin will have exclusively the purpose of permitting suppliers of electricity to prove to final customers the share or quantity of energy from renewable sources in its own energy mix (the GoO will be the only instrument which can be used for that purpose) and will not be relevant for the purposes of:

- recognition of the support mechanisms for production of electricity from renewable sources;
- recognition of the origin from renewable sources of electricity bearing guarantee of origin for the purposes of application of support mechanisms (contrary therefore to that which occurs now within the scope of the Green Certificates mechanism where it is permitted that imported electricity equipped with a GoO is exempted from the obligation of purchase of Green Certificates);
- the use of statistical transfers and joint projects;
- the determination of level of achievement of national targets on the subject of renewable sources.

As a consequence of the updating of the methods of issue, recognition and use of the guarantee of origin, Article 11 of Legislative Decree No 387/2003 which transposed Article 5 of Directive 2001/77/EC will be repealed. Presently, in fact, in Italy the GoO is that provided by Directive 2001/77/EC.

It can be requested on annual net production of electricity of each plant supplied by renewable sources, where the energy is not less than 100 MWh and prior technical identification of the plants is issued.

The duty to issue the GoO is borne by the GSE (the same public body called upon to manage the incentive mechanisms for renewable sources), which has drawn up an “*identification procedure of the plants supplied by Renewable Sources and for the issue of the Guarantee of Origin*”, later approved by a Ministerial Decree (Ministerial Decree of 21 December 2007).

The mechanism is based on the prior identification of the plant as supplied by renewable sources and the subsequent verification that, in a certain year, the plant actually produced a given quantity of electricity; the GoO is then issued on that quantity of energy produced.

The Guarantee of Origin can be issued:

- on all the electricity produced annually by solar, wind, hydroelectric, geothermal, geothermoelectric, thermoelectric from biomass, bioliquids and biogas plants;
- on only the share of electricity attributable to the biodegradable part of the waste products used in thermoelectric plants,
- on only the share of electricity attributable to renewable sources in hybrid plants.

The results of the identification activities of the plants as at 31 December 2010 are shown in the following table.

Source	Number	Power (MW)	Capacity for production (GWh)
Hydroelectric	83	1 478	4 184
Wind turbines	9	181	376
Solid biomass	2	29	184
Bioliquids	2	1	7
Biogas	5	7	39
Total	101	1 696	4 790

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).

It is suggested that tables 4 and 4a are used to provide more detailed information on the biomass supply.

The data shown in Table 4 refers to estimates (subject to updating) made on the basis of the data relative to biomass energy consumption, insofar as the evaluation methodologies of the quantities of raw materials based on the direct survey of the quantities are presently undergoing improvement.

Table 4: Biomass supply for energy use

	Amount of domestic raw material ³⁹		Primary energy in domestic raw material (ktoe)		Amount of imported raw material from EU (39)		Primary energy in amount of imported raw material from EU (ktoe)		Amount of imported raw material from non EU(39)		Primary energy in amount of imported raw material from non EU (ktoe)	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Biomass supply for heating and electricity:												
Direct supply of wood biomass from forests and other wooded land energy generation (fellings etc.)**	6 447 033	8 900 000	1 612	2 225	1 036 316	1 222 629	259	306	874 792	784 434	219	196
Indirect supply of wood biomass (residues and co-products from wood industry etc.) ⁴⁰	2 052 203	1 945 351	513	486	1 411 341	2 058 239	353	515	400 613	501 366	100	125
Energy crops (grasses, etc.) and short rotation trees (please specify)	494 439	674 887	187	228	-	-	-	-	-	-	-	-
Agricultural by-products / processed residues and fishery by-products **	2 247 678	2 364 693	595	600	-	-	-	-	-	-	-	-
Biomass from waste (municipal, industrial etc.) **	4 684 731	5 035 434	1 108	1 207	-	-	-	-	-	-	-	-
Others												
Biomass supply for transport:												
Common arable crops for biofuels	86 735	86 735	77	77	219 479	126 359	196	113	464 820	558 407	415	499
Energy crops (grasses, etc.) and short rotation trees for biofuels	-	-	-	-	-	-	-	-	-	-	-	-
Others (ethyl alcohol of agricultural origin, liquid waste etc)	153 948	97 390	111	75	49 931	120 435	32	77	32 722	78 927	21	51

³⁹ Data expressed in tonne/year tq (as is) or tonne/year sv. (volatile substance) for materials destined for anaerobic digestion. The data relative to liquid biofuels are expressed in tonne/year oil equivalent.

⁴⁰ This item also relates to pellets, also including the quantity of pellets imported even if these are not strictly raw materials.

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

Land use	Surface (ha)	
	2009	2010
Durum wheat	568 273	548 867
Common wheat	1 254 082	1 281 608
Sugar beet	60 614	62 088
Maize	916 158	926 776
Sorghum	39 902	40 306
Rapeseed	24 545	20 219
Sunflowers	124 049	100 475
Soya	134 704	159 511
Poplars and SRF	6 000	10 000

7. Please provide information on any changes in commodity prices and land use within Italy 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 Italy. (Article 22(1) h) of Directive 2009/28/EC).

When assessing commodity price impacts, it is suggested to consider at least the following commodities: common food and feed crops, energy wood, pellets.

Changes in price of agricultural products in Italy in the two-year period 2009-2010, connected to the greater user of biomass and other forms of energy from renewable sources.

The regulatory systems and subsidies provided by the Common Agricultural Policy (CAP) have a decisive impact on the relationship between biomass and agricultural production. The CAP has undergone reforms separating support for farmers from the actual quantities produced and diverting it onto the land, incentivising cross-compliance in agriculture. This reform has offered the possibility to cultivate any agricultural raw material on “set-aside non-food” areas, i.e. on fallow land not destined for cultivation of foodstuffs thus benefiting equally from the subsidies.

In Italy agro-energy crops are not yet completely widespread. Demand has almost always been dependent on regulatory interventions and quotas eligible for tax benefits, which limited the demand for agricultural raw materials by the industrial transformation system. For example, in productive capacity for biodiesel, Italy is among the leading countries in Europe, but raw materials for transformation are for the most part imported.

Energy crops have been given scarce consideration by the official statistics. They are in fact difficult to distinguish from similar food crops, following the disappearance of incentives which separated “true food” and “non- food” crops: the difference is only in final use, without indication of which, production of food or energy depends only on market prices or agreements between producers and transformers.

Biomass from energy crops can essentially be produced:

- from arboriculture of short or very short cycle trees (2-5 years) using rapid growth broad-leaved trees, primarily for the production of woodchips to be used for fuel (e.g. poplar, willow, eucalyptus);
- from annual crops which can be used for production of biofuels (e.g. rapeseed, sun flower, soya);
- from annual crops which can be used to generate biogas (e.g. maize, sorghum, triticale).

The following table shows some price variations in Italy over the last two years for the main crops destined for production of animal foodstuffs and energy production. The prices are not distinguishable between energy use and non-energy use.

Crops and direct by-products	Examples of approximate price (EUR /t)	
	Year	Year
	2009	2010
WOOD ENERGY (wood-energy production)		
poplar - willow - robinia - eucalyptus - reed	65	68
pellets	201	209
woodchips	35	42
SPECIAL CEREAL CROPS (usable for biogas production)		
common spelt	152	188
durum spelt	194	180
maize	137	185
sorghum	132	165
triticale	415	415
OIL SEED CROPS (usable for bioliquids production)		
Rapeseed	354	384
Sunflower seeds	208	355
Soya seeds	338	346
COMMON ANIMAL FOODSTUFFS		
field bean	390	395
alfalfa	102	114
sugar beet pulp	136	153
farinaceous bulk-common wheat	123	149
middlings and bran bulk-common wheat	91	115
groats bulk-common wheat	94	120
cube bulk-common wheat	91	119
farinaceous bulk-durum wheat	103	134
middlings, bran and groats bulk-durum wheat	86	111
cube bulk-durum wheat	92	120
middlings bulk-durum wheat	157	189

It appears extremely difficult to attribute the limited usage for energy purposes to reasons of price increases. Price increase trends for food crops and common animal foodstuffs appear to be due essentially to the structural volatility of the commodity prices in question. The price trends recorded in Italy are not dissimilar to those found on the international market. Fluctuations at an international level of the price of agricultural commodities have been subject to persistent turbulence over the past few years with a clear alternation between very steep rises and similarly sudden price reductions.

Cereals are in fact among the products with most significant variability. For example, considering the trends in the price of maize sold on the main international markets (specifically US reference variety US No 2 Yellow (f.o.b. Gulf) from 2008 to 2011, it is noted how the price reached in June 2008 of USD 280/tonne then fell between July and September 2009 to USD 150/tonne, rising steeply again for the whole of 2010 until reaching USD 309/tonne in April 2011. A completely similar trend is that of sorghum. Wheat too dropped from USD 500/tonne in March 2008 to USD 230/tonne in July 2009, and then rose steady throughout 2010 to USD 361/tonne in February 2011.

From 2008 to date the European Commission has sent three notices on the volatility of agro-food prices. In particular, price estimates of the main agricultural products proposed by the Commission from 1997 to 2009, highlight the cyclic aspect of price variability (similar to that found on a worldwide scale), with the abovementioned price crisis for cereals which occurred in mid-2009 (30% lower for durum wheat and common wheat compared to September 2008 and 25% lower for maize, again compared to the previous year). That was followed by decisive and continuous growth of the price of said cereals for the whole of 2010, until reaching the peak of 106% more for common wheat in February 2011 and 69% more for maize, compared to the price in February 2010.

In Italy, the price of maize which was EUR 129/tonne in July 2006, rose to EUR 283/tonne in March 2008 (+119%), then fell to EUR 139 /tonne by September 2009 (-51%) before rising again to EUR 290 /tonne in February 2011 (+109%).

The following graph shows how the fluctuation of the price of maize recorded in Italy recently is similar to that which has occurred in other European countries (France and the Netherlands).

GRAPH

Legend:

A.G.E.R. Bologna Commodity Exchange

France Eure-et-Loir

3 Yellow corn Rotterdam

In order to complete the discussion on maize, furthermore, it appears useful to provide an analysis of the overall intended use of all maize crops on the Italian market. In 2009 for example, 89.5% was destined to livestock use, 7.4% for human foodstuffs and 3.1% to non-food uses.

That stated thus far as regards maize can be extended to other agricultural products.

Among the causes of rising and falling of prices for agricultural products which act for the most part on the short term, in addition to variable and endogenous factors specific to the individual markets, are:

- unfavourable climatic trends, with exceptional atmospheric conditions capable of compromising agricultural-year production and harvests on a national scale;
- scarcity of stocks and consequent choice of internal policy, which have repercussions on imports/exports with other markets;
- devaluation of the dollar and increase in production costs, mainly due to continuous rises in the price of oil, with consequent effects of international speculation.

Variables which, on the other hand, have mainly long-term impact:

- instability of global markets, with greater demand for food from the emerging countries, especially the Asiatic countries (e.g. an increase in meat consumption in the emerging countries has repercussions on demand for maize, causing an increase in the consumption of animal foodstuffs containing this cereal, to the disadvantage of other intended uses);
- structural reforms involving the agricultural sector, which in the case of Europe presently are caused principally by the definitive passage from a Common Agricultural Policy of support for prices to direct aid for agricultural income.

Obviously, it is fundamentally important not to underestimate the impact which bioenergy production can have on prices (take, for instance, the case of maize in the United States or sugar cane in Brazil, both destined for ethanol production). However, no such impact can be observed in Italy.

In the global scenario, the prices of the Italian agro-foodstuffs supply chain, on a par with intended use of agricultural land, do not appear at the moment to be greatly affected by the specific substitutive dynamics of intended use of land areas exclusively for bioenergy crops, without prejudice to effects which may be found in specific areas of the country.

Variation of use of land in Italy in the two year period 2009-2010, connected to the greater use of biomass and other forms of energy from renewable sources.

The table below shows the data describing the use of agricultural land in Italy in 2008 and in 2010.

Use of agricultural land in Italy (total area Italy: 30 132 000 ha)	Year 2008	Year 2010
	ha	ha
ARABLE LAND	7 352 000	6 939 000
Cereals and rice	4 007 000	3 920 000
Fallow land without subsidies	not available	263 000
Tobacco, oil seed and industrial plants	241 000	228 000
Fresh vegetables and legumes	482 000	228 000
Potatoes, beet, fodder roots and brassicas	120 000	117 000
Dried Legumes	60 000	111 000
Flowers and plants	not available	13 000
Total fodder crops	1 898 000	1 797 000
Fallow land without subsidies	542 000	263 000
PERMANENT CROPS	2 590 000	2 323 000
vineyards	783 000	761 000
olives	1 145 000	1 019 000
Fruits and other crops	662 000	543 000

The Italian agricultural system is made up prevalently of small businesses, with some problems relative to the low levels of aggregation of supply. Less than 3% of the agricultural businesses have a Utilised Agricultural Area (UAA) greater than 50 hectares, but such parcelling involves 43% of the total UAA. The average value of holdings, which differ at a territorial level throughout the Italian peninsula of 7.6 hectares (in the 27-country EU the average is 12.6 hectares).

A large portion of Italian bioenergy production is situated in the area of the Po Valley where most of the oil seed crops for energy purposes are produced. For example, in Veneto, the area declared for energy crops for biodiesel in 2008 amounted to 6 560 hectares while in 2010 the area cultivated with rapeseed reached 6 250 hectares. Lombardy and Veneto, in that order, also have the greatest productive capacity for biodiesel. Among the energy crops, only sorghum (destined for biofuel production) shows an increase in cultivated area of 13%.

At the end of 2010, furthermore, approximately 10 000 hectares were cultivated for Short Rotation Forestry, while it appears more difficult to trace the exact quantities of maize and other cereals destined for biogas production. Due to sector and market characteristics, Italian energy crops still have high production costs which are scarcely compatible with production which does not have a high unit value, unless resorting specifically to incentivised measures in support of those crops.

At present in Italy crops intended for energy purposes do not appear to cause risk or threats to flora, fauna, biodiversity or preservation of the ecosystem balance of agricultural land.

As regards other renewable sources and their potential impacts on the agricultural sector, one can perhaps evaluate the case of photovoltaic energy. At the end of 2010, of approximately 3 470 MW of photovoltaic power installed, 15% were plants produced in the agricultural sector; overall the ground area occupied by photovoltaic systems exceeded 3 300 hectares for power installed of 1 465 MW.

In that respect it is pointed out that Legislative Decree No 28/2011 provides that, for solar photovoltaic systems with ground-mounted panels on agricultural land, access to government incentives is permitted on condition that the nominal power of each plant is not greater than 1 MW and, in the case of land belonging to the same owner, the systems are positioned at a distance of not less than 2 kilometres from each other and not more than 10 per cent of the area is used for such installations.

It is also necessary to consider the long-term effects of the new CAP reforms which involve a complete liberalisation of the markets for products of animal origin and the abolition of the milk quota system by 2025. Those reforms could cause a reduction in livestock production due to the effects of higher production costs which characterise the sector in Europe, with consequent lower demand for land destined for production of foodstuffs and which could therefore be converted to use for energy crops. According to the estimates of the European Environment Agency (EEA), the

area used for energy crops should increase by 50% between 2010 and 2030, passing from 8% to 12% of the total UAA, approximately 162 000 000 hectares. The largest contribution is given by the main European agricultural producers (Poland, Spain, Italy, United Kingdom, Lithuania and Hungary), and also Germany and France due to greater competitiveness between the energy crops and crops destined to export products (according to some scenarios and initial estimates, in Italy the areas destined for energy crops could increase from approximately one million hectares in 2010 to more than 2 million hectares in 2030).

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

Table 5: Production and consumption of Article 21(2) biofuels (Ktoe)

Article 21(2) biofuels ⁴¹	2009	2010
Production – biodiesel from used oils	38	38
Consumption – biodiesel from used oils	38	38
Total production Article 21. 2. biofuels	38	38
Total consumption Article 21.2. biofuels	38	38
% share of 21.2. fuels from total RES-T	3.21%	2.59%

⁴¹ Biofuels produced from waste, residues, cellulosic materials of non-food origin and ligno-cellulosic materials.

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 Italy in the preceding 2 years. Please provide information on how these impacts were assessed, with references to relevant documentation on these impacts within Italy. (Article 22 (1) j) of Directive 2009/28/EC).

In Italy, while there is significant productive capacity for biofuels (approximately 2 400 000 tonnes of biodiesel per annum and approximately 200 000 tonnes per annum of bioethanol can be produced), approximately 700 000 tonnes of biodiesel and 100 000 tonnes of bioethanol are produced each year, making Italy the fourth European producer of biofuels.

Notwithstanding this high level of production, only 100 000 hectares, that is to say, less than 1% of the utilisable agricultural areas, are used for energy crops for biofuels. It is estimated that approximately 80 000-90 000 tonnes of biofuels are produced in domestic crops.

As regards bioliquids, it is estimated that approximately 300 000 hectares are dedicated to oil seed crops (approximately 2% of the agricultural areas used). No particular recent increases in total area of these crops have been recorded.

For these reasons (small dimensions and little increase in same) it is considered that there has been no significant impact on water resources, quality of water or quality of soil in Italy.

As regards agricultural biodiversity, presently in Italy the risks from cultivation of crops destined for production of biofuels are very low.

At most, the loss of utilisable agricultural areas (UAA) gives greater cause for concern due to the extension of ground-mounted photovoltaic systems.

Even if non-food crops destined for production of biofuels were to record high profitability, it is envisaged that it is unlikely that they would spread extensively in a country characterised by high fragmentation and many different types of crops.

The potential impact which the spreading of single energy crops could have (sun flower, soya, rapeseed etc) over large extensions of land is not different from those which have presently other crops (durum spelt, common spelt etc) because the productive processes are the same, as are the areas which can be destined to their cultivation.

Furthermore the CAP, and also the agro-environmental measures which are greatly popular with the Italian farming community, imply respect for cross-compliance and application of the laws on maintenance of the lands in good agricultural and environmental conditions (CGO – Obligatory Management Criteria; BCAA – Good Agricultural and Environmental Conditions). These oblige producers to apply a crop rotation system such that the same crop cannot be rotated on the same land, thus favouring agricultural biodiversity.

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).

For the calculation of net greenhouse gas emission savings from the use of renewable energy, the following methodology is suggested:

- For biofuels: In accordance with Article 22(2) of Directive 2009/28/EC.
- For electricity and heat it is suggested to use the EU wide fossil fuel comparators for electricity and heat as set out in the report on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling⁴², if no later estimates are available.

If a Member State chooses not to use the suggested methodology for estimating the net greenhouse gas emission savings, please describe what other methodology has been used to estimate these savings.

The following table summarises the results of the balance of greenhouse gas emissions achieved with the use of energy from renewable sources in Italy in 2009 and 2010.

Table 6: Estimated GHG emission savings from the use of renewable energy (t CO₂eq)

Environmental aspects	2009	2010
Total estimated net GHG emission saving from using renewable energy⁴³	55 302 118	61 431 068
- Estimated net GHG saving from the use of renewable electricity	42 402 274	46 195 825
- Estimated net GHG saving from the use of renewable energy in heating and cooling	11 270 901	13 257 410
- Estimated net GHG saving from the use of renewable energy in transport	1 628 944	1 977 833

For the purposes of calculation of the net reduction of GHG emissions the method used is that proposed in "Template for Member State progress reports under Directive 2009/28/EC".

- for biofuels: the provisions of Article 22(2) of Directive 2009/28/EC;
- for electricity and heating: the EU reference parameters for fossil fuels for electricity and heating were used as contained in "Report on the requisites of sustainability for the use of sources of solid and gaseous biomass for production of electricity, heating and cooling"(COM(2010)11).

The basic assumptions are the following:

- GHG emissions during the phase of use of renewable energy are taken to be zero;
- emissions due to the production of machinery and equipment are not considered.

In particular, as regards bioenergy:

- the life cycle of the fuel is considered, without taking account of the positive or negative effects of GHG deriving from modifications of the intended use of the land;
- for bioenergy, not having sufficient levels of detail on the various types of biomass used, reference is made to the most conservative emission factors shown in Annex V to Directive 28 and Annex II to Report COM(2010)11;
- emissions from combustion of biodegradable urban waste, biogas from sewage treatment plants and landfill gas are considered as belonging to the process from which they derive and are therefore taken to be zero;
- efficiency of electrical conversion of 25% and heat conversion efficiency of 85% are assumed (values suggested by Report COM(2010)11).

Annexed to this report is a document which provides details of the methodology used.

⁴² Report available on: http://ec.europa.eu/energy/renewables/transparency_platform/doc/2010_report/com_2010_0011_3_report.pdf.

⁴³ The contribution of gas, electricity and hydrogen from renewable energy sources should be reported depending on the final use (electricity, heating and cooling or transport) and only be counted once towards the total estimated net GHG savings.

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) and m) of Directive 2009/28/EC).

Directive 2009/28/EC provides an approximate trajectory identified as average quota of cover of consumption of energy from renewable sources for the two-year periods 2011-2012, 2013-2014, 2015-2016 and 2017-2018 and, finally for 2020.

On the basis of that provision, of the data relative to total final customers of energy and the estimate of their performance for the years to come, a minimum reference trajectory for the quantities of energy from renewable sources has been identified for interpolation starting from 2005,

An estimate of the excess or deficit of renewable energy produced has been extracted from the data relative to final consumption of energy from renewable sources for 2009 and 2010 and from estimates of these for future years, calculating the difference from the actual data (2009 and 2010) and the estimate (for the following years until 2020).

As a consequence of the reduction of total final energy consumption and simultaneous increased growth in production from renewable sources in the two years considered, Italy has recorded a surplus of 2.8 M toe and 4.3 M toe respectively for 2009 and 2010, compared to the minimum reference trajectory referred to above.

On the basis of the data recorded in the last two years and the new growth targets in the photovoltaic sector, differently from that provided in the National Action Plan of 2010, it is estimated that the Italian surplus in production of energy from renewable sources, albeit reducing from 2014 onwards, shall remain positive until 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 to Italy (ktoe)^{44, 45}

	Year n-2 (2009)	Year n-1 (2010)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual/estimated excess or deficit production (Please distinguish for type of renewable energy and for origin/destination of import/export)	2 760	4 234	5 320	5 797	6 128	5 853	5 654	4 733	4 236	2 837	1 582	513

With respect to the forecasts indicated, it is considered that a possibility remains for recourse to international cooperation mechanisms, without prejudice to the agreements already concluded, as an instrument to contain the charges for reaching targets, or as a replacement strategy in the event of failure, even partially, to reach the specific development targets for renewable energy or containment of consumption.

On the base of the data recorded in the last two years and the new, more ambitious, targets for the photovoltaic sector, new scenarios are outlined in the three diagrams below (“2011 update”) of cover for final consumption by way of renewable energy sources, compared to the scenarios set out in the National Action Plan.

⁴⁴ 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 to 2020. In each report the Member State may correct the data of the previous reports.

⁴⁵ When filling in the table, for deficit production please mark the shortage of production using negative numbers (e.g. -x ktoe).

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RES Quota for final gross consumption: total and transport sector for the purposes of the 10% target

Approximate trajectory (Annex I part B Directive 2009/28/EC)

Overall quota of RES, including international cooperation measures (NAP 2010)

Update 2011

RES-T, for the purposes of the 10% target (NAP 2010)

Update 2011

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RES Quota for final gross consumption: heating and cooling sector and electricity sector

RES – electricity

Update 2011

RES heating and cooling (NAP 2010)

Update 2011

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RES Final gross consumption

Final gross consumption – RES Total (NAP 2010)

Update 2011

Final gross consumption – RES heating and cooling (NAP 2010)

Update 2011

Final gross consumption – RES electricity (NAP 2010)

Update 2011

Final gross consumption – RES Transport for the purposes of the 10% target (NAP 2010)

Update 2011

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 is an opportunity for Member States and therefore transposition of the articles of the Directive concerning those mechanisms is at the discretion of the States. Italy, by Legislative Decree No 28/2011, transposed into its national legal system the provisions on the subject of statistical transfers, joint projects between Member States and joint projects with third countries. The joint support systems have not been explicitly mentioned in Legislative Decree No 28/2011 but that does not preclude in any way the possibility for their subsequent application.

Described hereunder are the specific provisions of the Italian legal system.

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 promotion of agreements pertaining to these two mechanisms is dependent on failure to reach the intermediate targets until 2016.

The energy subject of statistical transfers, i.e. the shares originating from joint projects, will be supported by way of an incentive, the extent of which shall have a lower value than the average weighted value of the incentives accorded for electricity production from plants supplied by renewable sources situated in Italy, net of production and net of the value of incentives for electricity from solar sources. For the definition of the amount of that incentive the year of reference will be that prior to the stipulation of the agreement itself. Furthermore, it is provided that cover of the costs for implementing these projects is ensured by the electricity and natural gas tariffs according to methods which will be established by the Italian Electricity and Gas Authority following conclusion of the agreements.

The agreements are stipulated and managed using methods which ensure that the energy subject of statistical transfers, i.e. the share of energy coming from the Joint Project, contributes to the reaching of the Italian objectives fixed by the Directive.

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

As regards the international agreements on electricity from renewable sources produced in countries not belonging to the European Union and supplied to the Italian electricity system, the Decree provides that their stipulation is effected on the initiative of parties operating in the energy sector on the basis of international agreements concluded for that purpose.

The support to be given to the energy supplied to the Italian electricity grid will be defined in the individual agreements, respecting the criteria of greater production capacity and efficiency of plants situated in third countries and average value of the incentives paid for production by plants from renewable sources situated in Italy. On the basis of those criteria, the incentive for electricity production performed in a third country will be paid for a period equivalent to that provided for the same source and type of plant design situated in Italy, but usually of a lower amount.

Production and importation will take place by methods that ensure that the imported electricity contributes to the attainment of the Italian targets. To that end, the necessary measures will be established to ensure the monitoring of electricity imported for the purpose of attainment of the national target.

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).

Please note that in the first progress report (2011 report) Member States are invited to outline their intentions with regard to the questions addressed in Article 22(3 a-c). In addition, Member States are also welcome to provide any other information considered relevant to the specific situation of developing renewable energy of each Member State.

For statistical purposes, until 2010, 50% of urban waste was considered renewable, in compliance with the EUROSTAT rules.

With a view to improving and differentiating the estimates, for the years following 2010, the GSE, responsible for the national statistical monitoring of renewable sources, will receive on an annual basis from ISPRA (Italian Institute for Environment Protection and Research, supervised by the Ministry for the Environment and Protection of the Land and Sea) data relative to the energy use of waste in every incineration or co-incineration plant, disaggregated by CER code and by physical state. For the attribution of the biogenic quota and calorific value of the waste, fixed rates are used; those rates can be updated also on the basis of new regulatory or legislative provisions relating e.g. to incentives for energy produced from the biodegradable part of the waste.

For the purpose of disbursement of incentives for the production of electricity from biodegradable waste, national law at present provides two alternatives:

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

The share of production of electricity attributable to renewable sources recognised for the purposes of access to incentives is taken as fixed rate of 51% of net production in the event of the use of urban waste following waste separation for recycling. That fixed rate (very similar to the share considered for statistical purposes) was identified by the legislator following a product analysis campaign on urban waste taken from a significant sample of waste-to-energy plants.

For the purpose of incentives, for waste other than urban waste, it is necessary to proceed by way of analytical determination methods, on the basis of European technical laws (C14, selective dissolution, product analysis).

It is likely that also the experience gained in the field of analysis will show recurring trends in the percentage of biodegradability of some categories of waste, which can also be used for statistical purposes.

ANNEX - METHODOLOGY USED FOR THE ESTIMATE OF REDUCTION OF GREENHOUSE GAS EMISSIONS IN ITALY IN 2009 AND 2010

For the calculation of the reduction of greenhouse gas (GHG) emissions it is necessary to know:

- the emission factors E_{FER} , i.e., specific GHG emissions of each renewable technology;
- the emission factors E_F , that is the specific GHG emissions of each fossil fuel source replaced;
- the substitution factors, which indicate the percentage of fossil fuels substituted by the individual technologies to renewable sources.

While the European legislator provides indications for the reference sources of fossil fuels (stating explicitly the numerical value of the emission factors which can be used as a first approximation) the "*Template for Member State progress reports under Directive 2009/28/EC*" does not contain detailed indications on the calculation of the emissions deriving from energy production from RES, with the sole exception of bioenergy, in respect of which European Commission Notice (2010)¹¹ specifies that it is necessary to consider the whole fuel cycle.

Evidently it can be considered that the Member State is left free to decide whether to use an LCA-type approach or a simplified approach which evaluates only direct emissions (phase of operation) and those of biofuels energy supply chain (fuel life cycle).

Considering it legitimate to consider which direct emission of greenhouse gases deriving from the production phase/use of the energy are zero for all the renewable sources (during combustion of biomass they are customarily taken to be zero), we can thus summarise the approach which may be adopted:

- for bioenergy, emission factors are equal to fuel life cycle emissions;
- for the other RES, the emission factors can be taken to be zero.

1. Calculation of the net reduction of GHG emissions in transport

The "*Template for Member State progress reports under Directive 2009/28/EC*" provides some indications for the determination of emission factors of biofuels and fossil fuels.

Relative to the emission factors of biofuels, it is possible to use the "typical" reduction of GHG emissions of the respective production supply chains, shown in Annex V, parts A and B to Directive 2009/28/EC, expressed in percentages compared to the reference fossil fuels.

With respect to the reference fossil fuels, the emission factor to use in the calculations is the latest available value for average real emissions for the fossil share of petrol and diesel consumed in the Community (indicated in the report published pursuant to Directive 1998/70/EC). Alternatively, if those data are not available, the value to use is 83.8 gCO_{2eq}/MJ.

The net reduction in emissions of CO₂ equivalent can be calculated using the following formula:

$$\text{Net reduction (gCO}_{2\text{eq}}) = \sum [\Delta E * E_F * \text{MJ of biofuels}]$$

where:

- ΔE % is the "typical" reduction of biofuel ;
- E_F is the emission factor of the reference fossil fuel for transport (assumed at 83.8 gCO_{2eq}/MJ).

The "typical" reductions do not depend only on the type of biofuel (biodiesel, bioethanol or other biofuels): they vary significantly on the basis of the type of biomass used and the production supply chain. At the moment statistical data is not available for Italy on consumption of biofuels disaggregated on the basis of the production supply chain. It is considered appropriate, therefore, to adopt a conservative approach in the choice of typical reductions, choosing the worst ones, i.e. those which involve the lowest percentage of reduction of GHG emissions:

- bioethanol: 32% (from cereals)
- biodiesel from waste: 88 % (biodiesel from vegetable and animal waste)
- imported biodiesel: 36% (from palm oil)
- other biodiesel: 40% (from soya)
- other biofuels from waste: 80% (biogas from organic urban waste as compressed methane)
- other biofuels not from waste 40 % (hydrotreated vegetable oil from palm oil).

The reduction of emissions for use of electricity from RES in the "non-road" sector is taken to be zero given that that there is no comparison with a reference fossil fuel (nil balance).

The following tables summarise the results of balance of the greenhouse gas (GHG) emissions by virtue of the use of renewable sources of energy in transport (2009 and 2010).

Table 1: Estimate of net reduction of GHG emissions with use of renewable energy in the transport sector in Italy in 2009

	Energy		Percentage reduction (most conservative chosen)	Reduction factor (E _F = 83.8)	Net reduction of GHG emissions
	kteo	MJ			
			%	g CO _{2eq} /MJ	t CO _{2eq}
Bioethanol	117	4 898 556 000	32%	27	131 360
Biodiesel	1 063	44 505 684 000			
from waste	38	1 590 984 000	88%	74	117 326
importation	415	17 375 220 000	36%	30	524 176
other	610	25 539 480 000	40%	34	856 083
Electricity from RES	170	7 132 213 800			
on road	0	0	-	(83.8)	0
non-road	170	7 132 213 800	-	0	0
Other biofuels (biogas, vegetable oils etc.)	0	0	0		
from waste	0	0	80%	67	0
not from waste	0	0	40%	34	0
Total	1 350				1 628 944

Table 2: Estimate of the reduction of the GHG emissions with use of renewable energy in the Transport sector in Italy in 2010

	Energy		Percentage reduction	Reduction factor (E _F =83.8)	Net reduction of GHG emissions
	kteo	MJ			
			%	g CO _{2eq} /MJ	t CO _{2eq}
Bioethanol	155	6 489 540 000	32%	27	174 024
Biodiesel	1 311	54 888 948 000			
from waste	38	1 590 984 000	88%	74	117 326
importation	713	29 851 884 000	36%	30	900 572
other	560	23 446 080 000	40%	34	785 913
Electricity from RES	184	7 703 712 000			
on road	0	0	-	(83.8)	0
non-road	184	7 703 712 000	-	0	0
Other biofuels (biogas, vegetable oils etc.)	0	0	0		
from waste	0	0	80%	67	0
not from waste	0	0	40%	34	0
Total	1 650				1 977 833

2. Calculation of the net reduction of GHG emissions by virtue of the use of renewable sources for producing electricity and heat

For the production of electricity and of heating /cooling sectors it is necessary to distinguish between:

- bioenergy, emission factors are equal to fuel life cycle emissions (direct emissions are taken to be zero);
- other renewable sources, with direct emissions of zero.

The net reduction of GHG emissions can be evaluated as follows:

$$\text{Net reduction (gCO}_2\text{eq)} = \sum [\Delta E * \text{MJ energy from RES}]$$

where:

- $\Delta E = E_{F(\text{el,h,c})} - E_{\text{FER}(\text{el,h,c})}$ (gCO_{2eq}/MJ);
- $E_{F(\text{el,h,c})}$ are the emissions deriving from the reference fossil fuels for the production of electricity, heating and cooling
- $E_{\text{FER}(\text{el,h,c})}$ are the emissions from renewable energy sources for electricity, heating and cooling.

As regards the reference fossil fuel emissions (EF), the "Template for Member State progress reports under Directive 2009/28/EC" invites the use, in the absence of more recent estimates, of the Community reference parameters for fossil fuels, presented in the "Report on the requisites of sustainability for the use of sources of solid and gaseous biomass for production of electricity, heating and cooling" (COM(2010)11). The reference values (EF) are the following:

- for the production of electricity: 198 gCO_{2eq}/MJ
- for the production of heat: 87 gCO_{2eq}/MJ .

Assuming that during the production of energy from renewable sources other than biomass, greenhouse gases are not emitted, it can therefore be said that the reduction of emission corresponds to fossil fuel emissions avoided.

In the case of bioenergy it is essential to take into account the fuel life cycle.

The "typical values" for emissions attributable to production of biofuels prior to conversion into energy (gCO_{2eq}/MJ of fuel produced), determined by the Joint Research Centre (JRC) for the European Commission, are shown in Annex V, part D to Directive 28 and in Annex II to Report (COM(2010)11).

The "typical values" of emission reductions depend greatly on the type of biofuel, raw material and supply chain. At present, sufficiently disaggregated statistical data is not available for Italy which may permit distinguishing all the supply chains for production of solid biomass, biogas and bioliquids. It is deemed appropriate, therefore, to adopt a conservative approach in the choice of typical reductions, choosing the worst ones, i.e. those which involve the smallest percentages of reduction of GHG emissions.

In particular, for the reduction of emissions in the electricity sector we assume the following typical emission of greenhouse gases:

- biodegradable part of urban waste: 0 gCO_{2eq}/MJ
- other solid biomass: 33 gCO_{2eq}/MJ (wood briquettes or pellets from short rotation coppice – tropical and sub-tropical forest - natural gas as process gas)
- landfill and sewage treatment gas: 0 gCO_{2eq}/MJ
- biogas from animal manure etc: 7 gCO_{2eq}/MJ (from liquid manure)
- biogas from agricultural and forestry activities : 28 gCO_{2eq}/MJ (from the entire corn plant)
- crude vegetable oils: 35 gCO_{2eq}/MJ (from rapeseed)
- generic biodiesel: 54 gCO_{2eq}/MJ (from palm oil)
- biodiesel from waste: 10 gCO_{2eq}/MJ
- other bioliquids: 57 gCO_{2eq}/MJ (ethanol from cereals – fuel of non-specific process).

In relation to the reduction of emissions in the heating sector the following typical GHG emissions are assumed:

- biodegradable part urban waste: 0 gCO_{2eq}/MJ
- other solid biomass: 33 gCO_{2eq}/MJ (wood briquettes or pellets from short rotation coppice – tropical and sub-tropical forest - natural gas as process gas)
- landfill gas emissions and sewage sludge: 0 gCO_{2eq}/MJ
- other biogas: 28 gCO_{2eq}/MJ (from entire corn plant)
- bioliquids: 57 gCO_{2eq}/MJ (ethanol from cereals – fuel of unspecified process),

The overall GHG emissions of the final energy source (electricity, thermal energy for heating and cooling) are calculated dividing the emission factors of biofuel by the efficiencies (electricity and heating efficiency) of the respective energy systems (systems which produce electricity, heating and cooling).

The life cycle emissions of bio-fuels, expressed as gCO_{2eq}/MJ of final energy product (electricity, heat or cooling), are therefore calculated according to the following formula:

$$E_{\text{bio el}} = E_{\text{comb}} / \eta_{\text{el}}, \quad E_{\text{bio h}} = E_{\text{comb}} / \eta_{\text{h}}$$

where:

- E_{comb} = GHG emission factor originating from the production of fuel from biomass prior to energy conversion (gCO_{2eq}/MJ of fuel produced);
- $E_{\text{bio el}}$ = GHG emissions for the production of electricity;
- η_{el} = electricity efficiency, defined as electricity produced divided by annual consumption of fuel;
- $E_{\text{bio h}}$ = GHG emissions for the production of useful heat;
- η_{h} = thermal efficiency, defined as the normal annual heat produced, generated to cope with demand for economically justifiable heating, divided by the annual consumption of fuel.

For an initial calculation, the efficiency of net electricity conversion (relationship between net electricity produced and energy content of fuel) is taken to be 25% and the efficiency of thermal conversion of 85% (values suggested in Notice COM (2010)11).

In the case of heat pumps which provide for the use of electricity, we consider only the heat from renewable sources, calculated according to the methods shown in Annex VII to Directive 28.

The following tables summarise the results of the balance of GHG emissions for the individual FES technologies in the electricity and heating sector for 2009 and 2010.

Table 3: Estimate of the reduction of the GHG emissions with the use of renewable energy in the electricity sector in Italy in 2009

	Gross Production 2009	Typical emissions (operation + fuel cycle)	Emissions (operation + fuel cycle $\eta = 25\%$)	Reduction factor ($E_{fossil} = 198$)	Net reduction of GHG emissions
	GWh	g CO_{2eq}/MJ	g CO_{2eq}/MJ	g CO_{2eq}/MJ	t CO_{2eq}
Hydroelectric	42 279	0	0	198	30 136 329
Wind turbines	6 830	0	0	198	4 868 709
Solar	676	0	0	198	482 195
Geothermal	5 342	0	0	198	3 807 649
Biomass	4 444				
from urban waste	1 616	0	0	198	1 152 027
other solid biomass	2 828	33	132	66	671 862
Biogas	1 665				
From landfill emissions	1 373	0	0	198	978 603
From sewage treatment plants	20	0	0	198	14 327
From animal manure etc	88	7	28	170	54 101
From agricultural and forestry activities	184	28	112	86	56 874
Sustainable bioliquids	1 448				
crude vegetable oils	1 050	35	140	58	219 141
biodiesel	1	54	216	-18	-84
biodiesel from waste	5	10	40	158	2 871
other bioliquids	392	57	228	-30	-42 331
Total	62 684				42 402 274

Table 4: Estimate of the reduction of the GHG emissions with the use of renewable energy in the electricity sector in Italy in 2010

	Gross Production 2009	Typical emissions (operation + fuel cycle)	Emissions (operation + fuel cycle $\eta = 25\%$)	Reduction factor ($E_{fossil} = 198$)	Net reduction of GHG emissions
	GWh	g CO_{2eq}/MJ	g CO_{2eq}/MJ	g CO_{2eq}/MJ	t CO_{2eq}/
Hydroelectric	43 393	0	0	198	30 930 530
Wind turbines	8 787	0	0	198	6 263 374
Solar	1 906	0	0	198	1 358 597
Geothermal	5 376	0	0	198	3 832 013
Biomass	4 308				
From urban waste	2 048	0	0	198	1 459 805
Other solid biomass	2 260	33	132	66	536 872
Biogas	2 054				
From landfill emissions	1 415	0	0	198	1 008 453
From sewage treatment plants	28	0	0	198	20 117
From animal manure etc	221	7	28	170	135 245
From agricultural and forestry activities	390	28	112	86	120 793
Sustainable bioliquids	3 078				
crude vegetable oils	2 682	35	140	58	559 916

biodiesel	1	54	216	-18	-91
biodiesel from waste	19	10	40	158	10 847
other bioliquids	376	57	228	-30	-40 645
Total	68 902				46 195 825

Table 5: Estimate of the reduction of emissions of greenhouse gases by use of renewable energy in the thermal sector in Italy in 2009

	Final consumption 2009	Typical emissions (operation + fuel cycle)	Emissions (operation + fuel cycle $\eta=85\%$)	Reduction factor ($E_{fossil} 87$)	Net reduction of GHG emissions
	kteo	g CO_{2eq}/MJ	g CO_{2eq}/MJ	g CO_{2eq}/MJ	t CO_{2eq}/
Geothermal	213	0	0	87	775 655
Solar thermal	85	0	0	87	309 357
Solid biomass	2 763				
from urban waste	56	0	0	87	203 981
other solid biomass	2 707	33	39	48	5 460 161
Biogas	19				
from landfill emissions	5	0	0	87	18 213
from sewage treatment plants	1	0	0	87	3 643
other biogas	13	28	33	54	29 423
Sustainable bioliquids	250	57	67	20	208 724
Heat pumps (heat from RES)	1 170	0	-	87	4 261 744
Total	4 500				11 270 901

Table 6: Estimate of GHG emission reduction with the use of renewable energy in the thermal sector in Italy in 2010

	Final consumption 2009	Typical emissions (operation + fuel cycle)	Emissions (operation + fuel cycle $\eta=85\%$)	Reduction factor ($E_{fossil}= 87$)	Net reduction of GHG emissions
	kteo	g CO_{2eq}/MJ	g CO_{2eq}/MJ	g CO_{2eq}/MJ	t CO_{2eq}
Geothermal	139	0	0	87	506 310
Solar thermal	134	0	0	87	488 097
Solid biomass	3 721				
From urban waste	62	0	0	87	225 836
Other solid biomass	3 659	33	39	48	7 380 395
Biogas	26				
From landfill emissions	6	0	0	87	21 855
From sewage treatment plants	2	0	0	87	7 285
other biogas	18	28	33	54	40 219
Sustainable bioliquids	281	57	67	20	234 606
Heat pumps (heat from RES)	1 195	0	-	87	4 352 807
Total	5 497				13 257 410