Important notice: this report has been submitted in the language of the Member State, which is the sole authentic version. Translation into the English language is being provided for information purposes only. The European Commission does not guarantee the accuracy of the data or information provided in the translation, nor does it accept responsibility for any use made thereof.

REPORT PURSUANT TO ARTICLE 3 OF DIRECTIVE 2001/77 /EC OF 27 SEPTEMBER 2001 REGARDING PROMOTION OF ELECTRICITY FROM RENEWABLE ENERGY SOURCES IN THE INTERNAL ELECTRICITY MARKET

DATA FROM 2008

1. - INTRODUCTION

This report responds to provisions in Article 3, paragraph 3 of Directive 2001/77 /EC of the European Parliament and European Council of 27 September 2001 regarding the promotion of electricity from renewable energy sources in the internal electricity market.

On 26 August 2005, the Council of Ministers a pproved the Renewable Energy Plan in Spain for 2005 to 2010. This plan to promote renewable energy sources replaced the previous one approved by the Spanish government in December 1999 that also ran until 2010.

The 2005 to 2010 Renewable Energy Plan (REP) reviews the previous objectives and establishes the general framework for the development of renewable energies until 2010, taking into account the degree of progress in achieving the objectives of the previous Plan in each of the areas. The overall goal of renewable energy consumption in 2010 was kept at a minimum of 12%. In terms of electricity production from renewable sources, the Plan assumes the minimum indicative target of 29.4% of the gross electricity consumption in 2010, set for Spain by Directiv e 2001/77/EC. For its part, the Plan sets a target for biofuels to represent at least 5.75%, specifically 5.83%, of the consumption of petrol and diesel in transport.

This is the fourth report to the European Commission, pursuant to the provisions of the Directive (Art. 3, paragraph 3), and summari ses the goals of renewable energy in terms of electricity along with the other two main objectives of the 2005 to 2010 REP until the end of this decade, the compliance measures taken, and the status of renewable energy with special reference to the degree of development of these sources in Spain up to 2008, both overall and more specifically for each technology, with explicit indication of the degree of target fulfilment. This situation is reflected in

section four, presenting the percentage of electricity generation from renewable sources compared to the gross consumption of electricity , and its evolution in recent years.

2. -OBJECTIVES OF RENEWABLE ENERGY PLAN 2005 TO 2010 AND AID UNDER THE PLAN

The Renewable Energy Plan 2005 to 2010 that is currently in force establishes a minimum overall objective of renewable energy consumption in 2010 of 12% in relation to the consumption of primary energy. In terms of electricity production from renewable sources, the Plan assum es the minimum indicative target of 29.4% of the gross electricity consumption in 2010, set for Spain by Directive 2001/77 /EC. For its part, the Plan sets a target for biofuels to represent at least 5.75%, specifically 5.83%, of the consumption of petrol a nd diesel in transport.

For individual areas, it highlights the important contribution provided by wind power, which increases the installed capacity target in 2010 to 20 155 MW, with an estimated production of 45 511 GWh in that year.

It also significantly increases biofuel objectives to 2.2 m TOE (Tonnes of Oil Equivalent) in 2010, solar photovoltaic energy now has a goal of 400 MW installed by 2010, the target for solar thermoelectric energy is raised to 500 MW, and biogas.

With respect to biomass, it is necessary to differentiate between the generation of electricity and for thermal uses. In the first, the target for growth in the period 2005 to 2010 is placed at 1 695 MW, the development of which has three elements, among others:

- The implementation of a co-combustion programme for joint combustion of biomass and coal in existing fossil fuel plants.

- A marked increase in the income for electricity generated by biomass electric plants.

- The momentum of the existing Interministerial Biomass Commission.

With respect to thermal biomass, the growth objective until 2010 is fixed at 583 ktoe and this includes the improvement of waste management logistics and a new line of subsidy as proposed in the new Plan , among other actions .

The attached table details the growth envisaged in the Plan for different areas (thermal, electric and biofuel) in accordance with the three major objectives of the REP 2005 to 2010, the forecast of primary energy consumption in 2010 and the contribution resulting from renewable energy to the primary energy consumption of 12.1% in that year.

During planning the opportunities for renewable energy penetration in various scenarios were used and evaluated. The production objectives and consumption of renewable energies were set by considering a scenario with an economic and energy growth trend based on recent increases in economic activity and energy demand, and a scenario of technological developments considered likely in each renewable area. The resulting scenario, on which the goals where set, is the REP Scenario (Renewable Energy Plan 2005 to 2010 Scenario) and is the result of integrating the baseline energy scenario and the likely scenario of technological change.

As regards the objective of at least 29.4% of power from renewable sources, in 2010 renewable energy will provide the system with more than 100 000 GWh, which is estimated to represent 30.3% of gross electrical energy consumption in that year according to the scenario used for preparation of the REP.

	Year 2010
GROSS ELECTRICITY CONSUMPTION	**337 407**
Total generation from Renewable sources (GWh)	102 259
% of Renewable Electricity in Gross Electricity Consumption (2)	**30.3%**

For its part, the estimated contribution of biofuels in 2010 is 2 200 ktoe to reach the target of 5.83% of projected consumption of petrol and diesel in transport in that year, thus also meeting the indicative target of 5.75% set for 2010 by Directive 2003/30/EC.

Biofuels Petrol and diesel in transport	2 200 37 735
% of Biofuels in petrol and diesel in transport	**5.83%**

With respect to the economic aid considered, in general and with regard to electricity generation, it is noted that the main support foreseen continues to be derived from the current bonus system in Spain, albeit with some changes. It is estimated that maintaining current levels of remuneration in some cases and improved remuneration in others as proposed, to be preconditions for achieving the proposed objectives.

The Plan involves investment during the period 2005 to 2010 of 23 599m Euros, with a total amount of aid for renewable energies of 8 492m, of which 3 536m correspond to public subsidies in the strict sense from the General State Budget of 681m investment aid and 2 855m in tax incentives for biofuel production; and 4 956m Euros representing the total aid during the generation of renewable electricity through the bonus system.

3. -PROGRESS IN THE ADOPTION OF MEASURES FOR THE IMPLEMENTATION OF PROPOSED OBJECTIVES.

This chapter provides an analysis of the measures taken in different are as to fulfil the objectives and highlights some of the most relevant aspects of the current status of those areas.

But before commencing with the sector analysis, of a general nature and of vital importance for the development of renewable energies, reference must be made to **Royal Decree 661/2007 of 25 May 2007,** regulating the activity of electricity production under a special regime, which aims to facilitate the achievement of the REP objectives for the year 2010, by revising the hitherto existing Royal Decree 436/2004 of 12 March 2004 and thus the remuneration for renewable energy expanding the types of generation that can receive aid, increasing the remuneration of those energies most required, such as different types of biomass, and introducing a new system of upper and lower limits for incentives to be received for energy production from renewable sources participating in the Spanish electrical energy market, ensuring in any case a reasonable return for these facilities .

3.1. Wind Energy Sector

During the 2005 to 2008 period most of the priority measures proposed in the REP for appropriate wind energy development in our country have been ongoing with highlight on the management of wind generation, the planning of electric transport infrastructure and the establishment of an appropriate regulatory framework at state legislative level - for land and marine wind energy.

The entry into operation, in June 2006, of the Control Centre of Renewable Energies (CECRE) has allowed management and control optimisation of th e generation of renewable energy producers - and in particular, wind energy - to integrate them into the system under conditions of maximum security. Previously, in March 2006, the System Operator issued the associated policy development: the functional specifications for control systems, both for the control centre liaising with CECRE and the wind farm for power control managed by CECRE.

Operating Procedure PO 3.7 for planning the non -managed generation was released late in 2006. This provides for the all ocation of wind farms to control centres, to allow where possible the automation of monitoring and operation, and Operating Procedure PO 12.3, regarding the response requirements of wind farms against voltage dips, with the objective that wind farms are ke pt in service when faced with instabilities in the electrical system, allowing the system itself to benefit from higher power and wind generation in the future.

The publication of Royal Decree 661/2007 of 25 May 2007 *regulating the activity of electricity production under the special regime* has strengthened the regulatory framework for plants with renewable energy sources, ensuring adequate remuneration for achieving the 2010 REP objective. Measures for managing renewable generation were also adopted to en sure their incorporation into the system under optimal quality and safety conditions.

In June 2007 Order ITC/1522/2007 *laying down the rules governing the guarantee of electricity origin from renewable energy sources and high efficiency cogeneration* was published. It transposes Directive 2001/77/EC on the guarantee of origin.

In August 2007 Royal Decree 1028/2007 *establishing the administrative procedure for processing applications for the approval of generation facilities in territorial waters* was published. This regulation is the legislation which applies specifically to wind farms at sea.

The adoption in May 2008 by the Council of Ministers of the new '2008 -16 Plan for the electricity and gas sectors ', provides adequate development of electrical transport infrastructure for the greater integration of renewable energy, providing about 29 000 MW in 2016.

Currently, wind power is one of the renewable sources where the related technology has reached a higher degree of maturity. For this reason, there are i mportant expectations for it to increase its future contribution to domestic energy supply to meet both national and European electricity demand. In fact, in Spain in just a dozen years, the contribution of wind power has gone from being considered insigni ficant

to playing a substantial role in the electrical balance.

The most important aspects in the wind sector for 2008 can be summarised as follows:

- High expectations on the part of the Autonomous Communities and developers, much higher than for the REP itself for 2010.

- Strengthening of the national wind industry's international reputation having consolidated its leadership status. The developer *Iberdrola Renovables* is at the forefront of the renewable wind energy sector worldwide, with nearly 9 000 MW accumulated at the end of 2008. In relation to national technology there are some noteworthy comments:

    - *Gamesa Eólica*: During 2008 it remained the largest supplier of wind turbines in Spain and third worldwide with a market share of approximately 12%. It is developing a 4.5 MW prototype.

    - *Acciona Windpower* and *Alstom Ecotécnia*: In Navarra in March 2009 and in Tarragona in March 2008 two separate 3 MW prototypes were put in place (in which IDAE participates through a technology Agreement).

    - *M. Torres*: It is developing a 2.5 MW prototype.

- Increasing participation of wind power in the national electricity market. During 2008 wind production was 31 802 GWh (as reported by the CNE in June 2009), which was an unprecedented contribution to annual gross electricity generation in our country of about 11.6%, reaching higher levels of penetration above 40% (in November 2008 a record was set for coverage at that moment in the system of 43%).

  This level of wind penetration is relatively higher to that of the other two countries with the highest power in service: the United States, where wind power accounted for approximately 1.5%, and Germany, with about 7% compared with their internal electricity balances in 2008. Moreover, as was the case in previous years, 94% of wind production during 2008 was awarded through the bidding system managed by the market operator.

- The autonomous communities in which more wind power was initiated during 2008 were: Andalucía (629 MW) and Castilla y León (408 MW), followed by

Castilla-La Mancha (254 MW) and the Valencian Community (215 MW).

- The following are major developments during 2008 in the regional regulatory domain:

  - Andalusia: Order on prioritisation in the access and grid connection process for wind farms.

  - Asturias: Final adoption of the Sectoral Guidelines for Regional Planning for wind energy utilisation, and Decree on procedures for the approval of wind farms (previous moratorium lifted).

  - Canary Islands: Various resolutions of public tenders for the allocation of power within the modalities of “installation or expansion of wind farms with associated consumption" and "new wind farms” on the islands’ power systems.

  - Cantabria: Draft of new Royal Decree for processing of wind parks.

  - Catalonia: Draft decree regulating the administrative procedure for the establishment of wind farms and photovoltaic systems.

  - Comunidad Valenciana: New public tender for the development and implementation of the regional wind energy plan.

  - Extremadura: Resolution of wind projects approved for implementation in the coming years, under the regional wind energy contest.

  - Galicia: New call for wind projects until 2012 and resolution of projects accepted for processing.

In connection with public aid, the REP does not provide investment aid for wind projects to achieve the objectives set, as public aid for production materialises through bonuses for electricity inserted into the grid.

3.2. Hydroelectric Sector

Spain currently has one of the most developed hydroelectric parks in the world, which shows that over more than a century of evolution has already achieved a high degree of utilisation of its water resources for electricity production.

Although the development of hydroelectricity in Spain has been growing, recently it has experienced a decrease in the provision of energy to the total electricity production in favour of other energy sources, placing it at roundabout 10% in recent years.

During the period 2005-2008, there was progress on the priority actions included in the REP 2005 to 2010, which established mechanisms for overcoming barriers in the hydroelectric industry. The following highlights the development of these measures:

- Regarding the promotion of open competition in State infrastructure and use of ecological flows, in November 2007 the 'Collaboration Agreement between the Ministry of Environment, Rural and Marine and IDAE to promote the potential state-owned hydroelectric dams in the area of the Hydrographic Confederations' was signed within the existing Collaboration Protocol between the MARM and the Ministry of Industry, Tourism and Trade for the development and implementation of the AGUA Programme activities for the promotion of Renewable Energies.

  The purpose of the Convention is the achievement of specific studies for the technical, environmental and economic assessment of 41 state-owned dams distributed on river basins subject to hydroelectric development, and the drafting of statements as a basis to invite tenders for those considered viable.

  Throughout 2008, studies were undertaken of the Hydrographic Confederations of the Ebro, Júcar, Guadiana and Duero, which are being finalised during 2009, and during this year the other contests have taken place.

- In May 2007, the Royal Decree 661/2007 of 25 May was published, which regulates the activity of electricity production under the special regime. This Royal Decree established the regulatory framework for plants with renewable energy sources, ensuring adequate rewards for each sector.

Regarding public aid for investment, the REP does not provide any subsidies to hydroelectric projects to achieve the objectives. Public aid for the production materialises through bonuses for electricity inserted into the grid.

3.4. Solar Thermoelectric Sector

The following table presents actions carried out in the area of Solar Thermoelectricity during the period 2005 to 2008 in connection with each of the measures contained in the Renewable Energy Plan

SOLAR THERMOELECTRIC

Measures	By	Term	Actions Period 2005 to 2008
Promote direct solar radiation.	National Institute of Meteorology	2006 - 2007	Some Autonomous Communities have begun to map out direct sunlight in their respective regions.
Application for public aid of the first projects.	UE, Autonomous Communities	2005 - 2010	Aid applied to the first projects developed during 2006. No direct aid to projects was given between 2007 and 2008.

Support for the realisation of demonstration projects (Component rating and budgets in the first projects). (*)	IDAE (*Institute for Energy Diversification and Saving*), CIEMAT (*Centre for Energy, Environment and Technology Research*)	2005 -2010	Meetings were held with the principal promoters of demonstration projects. Meetings were held with the leading associations of the APPA sector (Association of Renewable Energy Producers) and Protermosolar. Participation in joint development of solar thermoelectric plants with the major developers, such as IBERSOL Puertollano centre (with Iberdrola), the Almadén 20 centre (along with SEPIDES and ABENGOA) or the Direct Steam Generation centre (with Iberdro la, Sener and CIEMAT). Other demonstration projects are being studied to assess the participation of the IDAE.
Maintenance of the conditions of the RD 436/2004, increasing the limit of the legal framework up to 500 MW, and RD 2351/04. (*)	Ministry of Industry, Tourism and Trade	2005 - 2010	In 2007 the Royal Decree 661/2007 of 25 May was published, which regulates the activity of electrical energy production under special regime. In this Royal Decree the installed capacity target is increased to 500 MW and tariffs and bonuses updated.
Promote the creation of a component industry for the sector	Ministry of Industry, Tourism and Trade, CIEMAT	2005 - 2010	In this period the main Spanish companies have positioned themselves as component manufacturers.

(*) Measures included as priorities in the REP Summary 2005 to 2010.

The period 2005 to 2008 began marked by Royal Decree 436/2004, which established the first specific objective for the area (200 MW), with an associated tariff that allowed the economic viabilit y of the projects.

Subsequently, Royal Decree 661/2007 increased the target from 200 MW to 500 MW, as proposed in the REP 2005 to 2010, maintaining some associated tariffs that allowed the viability of the projects.

Thanks to this framework, the technology has experienced a growing development, with major associated investment and numerous initiatives underway.

The takeoff of the technology occurred during 2008 with nearly 800 MW under construction. Likewise, in 2008 the world's first commercial plant using solar thermoelectric energy with accumulation in molten salt, Andasol 1 , was launched.

As regards **public aid for investment**, the REP provides grants to the first projects, amounting to EUR 6.2 m.

Regarding **public aid for the operation**, the legislation in force during 2008 was the RD 661/2007. This establishes two alternatives for economic remuneration for energy generated by solar thermoelectric technology: by regulated tariff or via sale on the open market.

3.5. Solar Photovoltaic Sector

The following table presents actions carried out in the area of Solar Photovoltaic energy during the period 2005 to 2008 in connection with each of the measures contained in the Renewable Energy Plan.

PHOTOVOLTAIC AREA

Measures	By	Term	Actions Period 2005 to 2008
Maintenance of bonuses provided for in the RD 436/2004 (1).	Ministry of Industry, Tourism and Trade	2007	Meetings between the IDAE, the Ministry of Industry, Tourism and Trade, and sector associations on the revision of tariffs, bonuses and incentives initiated during 2006 were extended to the first months of 2007. The outcome of the meetings, studies and analysis performed was the RD 661/2007 of 25 May on the special regime.
Modification of the IDAE Line of support.	IDAE and Autonomous Communities	2005-2010	Collaboration has been ongoing with the autonomous regions, drawing up the agreements governing the release of funds since 2006 to help non grid-connected photovoltaic and wind/photovoltaic installations. During 2007 and 2008 lines of finance have also been enabled for non grid-connected photovoltaic installations.
Supporting innovation.	IDAE and Ministry of Industry, Tourism and Trade	2005-2010	Together with industry associations and institutions of the sector the main innovative trends in solar photovoltaic energy have been identified. IDAE has been involved in the development of innovative projects: concentration, architectural integration, or new materials.

Modify the installed capacity target for the revision of tariffs from 150 MW (established in RD 436/2004) to 400 MW	Ministry of Industry, Tourism and Trade	2006	Modification made in the Royal Decree 661/2007 establishing a new target of 371 MW installed power, resulting from the deduction of 29 MW for isolated photovoltaic installations from the total of 400 MW.
Coordination between different Autonomous Communities	IDAE and Autonomous Communities	2005-2010	Meetings were held with the Autonomous Communities analysing the best form of coordination between different bodies.

(1) On 26 May 2007 the Royal Decree 661/2007 of 25 May was published in the B.O.E. No. 126, which regulates the activity of production of electrical energy under special regime .

In September 2007 85% of the target for the solar photovoltaic area established in Royal Decree 661/2007 was reac hed. Once achieved, a term of one year was established so that all those facilities granted final registration in the Special Regime Register of the Ministry of Industry, Tourism and Trade could benefit from the tariffs defined in the Royal Decree 661/2007 . This has been an acceleration in the pace of installation, stimulating an increment in installed photovoltaic capacity of 2 641 MW in Spain in 2008, becoming the first world market.

From September 2008 Royal Decree 1578/2008 came into force which regulates remuneration for solar photovoltaic installations after the deadline for remuneration under Royal Decree 661/2007 for such technology.

Royal Decree 1578/2008 has established a system of increasing quotas and decreasing tariffs so that once the commerc ial phase of the solar photovoltaic sector is consolidated, the decline in cost of electricity production with this technology increases.

With regard to **public aid for the investment**, the REP provided between 2006 and 2010 investment aid for non grid -connected Photovoltaic projects through the Autonomous Communities and aid for development through regulated tariffs, bonuses, and incentives for grid -connected photovoltaic projects.

Regarding **public aid for development,** the existing legislation in 2008 relative to electricity production from facilities using renewable resources (Royal Decree 661/2007) establishes a system of incentives to internalise

their environmental benefits and facilitate their competitive positioning in a free market.

3.6. *Biomass Area*

The period between 2005 and 2008 has been a time of transition and drive in the takeoff of the biomass sector. Although during these years development expectations have been greater than the results achieved, the introduction of regulations that better reflect the realities of the sector and the development of lines of support and specific finance have meant the restructuring of the companies and associations of the sector, which are now prepared for the biomass market to reach maturity and full development.

More specifically, the biomass electricity area improved its remuneration with the publication of Royal Decree 661/2007. After some doubts, adjustments and clarifications on bonuses and tariffs, the area is now awaiting two key points for the definition of projects: the biomass certification process and a clear definition of energy crops.

The development of co-combustion has been delayed due to the late publication of the previously mentioned Royal Decree because of the need for detailed studies of the technology and availability of biomass, plus the long period of negotiations to establish the bonus values for this technology. However, these activities are coming to an end and it is expected that development will commence on the first commercial plants during 2009 and early 2010. In any case, the activities undertaken in the years 2005 to 2008 and particularly during 2008 have resulted in the first pilot installations in coal power plants that are producing positive results with high expectations for the future.

The thermal use of biomass has been highly favoured during these years with the development of numerous regulations in the domestic sector. The inclusion of biomass installations in the Regulation of Thermal Installations in Buildings (RITE), the possibility of replacing the solar contribution by biomass established in the Building Technical Code, and the emergence of biomass as the technology most likely to achieve the energy rating A for buildings have been a major boost for the sector. Because of this impetus the development of domestic thermal biomass has been greater than that experienced by the industrial thermal biomass, although the latter has seen a new business opportunity incorporating biomass cogeneration systems.

Due to the increasing interest in domestic thermal biomass a large number of pellet production plants have been developed, so that in the last three years the production capacity has been multiplied tenfold, from about 60 0000 tonnes/year to some 600 000 tonnes/year. Three facts should be highlighted that have slowed this dramatic growth:

- The warm winter of 2007/08 that affected the entire heating sector because of lower fuel demand.

- The financial crisis that has affected the plants that were being promoted and developed during 2 008.

- The drop in fuel prices experienced in 2008 that has detracted from the profitability of these facilities.

The biomass installations for electricity production only received assistance through the bonus scheme of the special regime regulated by RD 6 61/2007. In the case of biomass, the amount received per kWh generated varies depending on the type of biomass used, being adapted to the characteristics of each installation.

3.7. Biogas Area

During this period, the generation of biogas has been mainly by the degassing of landfills, although the emergence of Royal Decree 661/2007 in 2007 has substantially increased interest in biogas generation from agribusiness waste digesters. The economic framework for production of electricity from biogas generated in these digesters improved considerably compared to that in Royal Decree 436/2004, giving rise to the appearance of numerous companies with experience in other European Union countries and the number of projects under study has grown exponentially. As evidence of this, and like 2007, two plants for co-digestion of livestock waste with other agro-industrial waste became operational in 2008, while at least three other such facilities are also under construction during 2008 (and with their launch planned for 2009).

The biogas installations for electricity production receive assistance through the bonus scheme of the special regime regulated by RD 661/2007. As a complement to this, in 2008 and 2009 there is the possibility in some Autonomous Communities for low-power facilities to benefit from grants from the funds of the Renewable Energy Plan by the General State Administration and by some Autonomous Communities.

4. DEGREE OF COMPLIANCE WITH THE RENEWABLE ELECTRICITY OBJECTIVES: SITUATION IN 2008

The 2005 to 2010 Renewable Energy Plan is the most relevant planning action undertaken in Spain for the promotion of renewable energy in recent years and in this Plan the three major national targets of renewable energy for 2010 are set out.

With regard to the production of electricity from renewable sources, the Plan assumes the minimum indicative target of 29.4% of the gross electricity consumption in 2010, set for Spain by Directive 2001/77 /EC.

The following table shows electricity production between the years 2005 and 2008 broken down by sources, conventional and renewable, and the gross electricity consumption.

Generation and gross electricity consumption in Spain				
	Real production data			
GWh	2005	2006	2007	2008
Coal	81 458	69 850	75 505	50 118
Nuclear	57 539	60 126	55 102	58 971
Natural Gas (1)	83 818	95 258	98 992	123 375
Petroleum products	23 211	21 075	19 362	19 049
Renewable Energy	**44 084**	**52 989**	**60 024**	**62 555**
- Hydroelectric (2)	18 891	25 820	27 229	23 271
- Wind	21 269	23 377	27 754	31 802
- Photovoltaic	78	107	490	2 512
- Thermoelectric		0	8	15
- Biomass, biogas, Urban Solid Waste & others (3)	3 846	3 686	4 543	4 955
Hydropower generation from pumping (not renewable)	3 470	3 683	3 289	2 817
Total gross generation	**293 580**	**302 982**	**312 273**	**316 884**
Balance of trade (Imp-Exp)	-1 344	-3 279	-5 751	-11 039
Gross consumption	**292 237**	**299 703**	**306 522**	**305 845**
Renewable / Gross consumption (%) (actual production dates this year)	***15.1%***	***17.7%***	***19.6%***	***20.5%***
Renewable / Gross consumption (%) (methodology directive)	***19.5%***	***19.9%***	***21.3%***	***23.7%***

Source: Ministry of Industry, Tourism and Trade; National Energy Commission (CNE) and IDAE

(1): Includes generation from non-renewable waste.

(2): Excludes generation from pumped

(3): Includes 100% Solid Urban Waste

As shown, the production of electricity from renewable sources in 2008, (according to actual data in a bad year for hydroelectric production), stood at 20.5% with respect to gross electricity consumption. Note the variability of

this percentage due mainly to the hydroelectric resource, so it is more representative to use average production values. Thus, applying the methodology of Directive 2009/28, the contribution of renewable electricity in 2008 was 23.7%, compared to the 19.5% it represented in 2005.

If we also take into account the strong growth in 2008 for the installed capacity of solar photovoltaic energy (and much of it was operational for only a few months), the generation of this area in 2009 will be substantially larger.

Between January and September 2009, the total electricity generation from renewable sources increased its contribution by more than three percentage points over the same period in 2008.

In the sections that follow, the fulfilment of objectives will be reviewed by areas in terms of installed power and, in summary, the barriers or actions planned for 2009 with a view to overcoming obstacles to increased penetration of renewable energy in the overall balance.

In the table presented in the appendix below, the degree of development until the end of 2008 is detailed for the different renewable energies for electricity generation according to energy data, and the degree of compliance with respect to the objectives set for 2010.

Overall, it can be said that the growth of electricity generation facilities has been successful during these years (except for biomass), greater than is reflected in the previous table for electricity production.

The table in the appendix regarding the degree of development of electricity generation facilities using renewable power sources according to energy data summarises the monitoring data for REP 2005 to 2010 between the years 2005 and 2008, in terms of installed power for electricity areas, and the goals established in the different areas for the year under review and for the whole period 2005 to 2010, plus the degree of development attained in accordance with these objectives. As shown in the table, the development of the REP for 2008 has been higher than expected for the areas of power generation.

By groups, the areas of electricity generation with 4 527 MW installed during 2008, have achieved 154.0% of the target for new power established in the Plan for that year, and the new power gained during the first four years of the REP (2005 to 2008) of around 12 003 MW, represents 77.6% of the target until the end of the Plan in 2010.

The following is an analysis of the continuing evolution by areas:

a) Wind

At the end of 2008, there were about 16 546 MW (provisional figure) in operation in Spain, placing our country as the third largest global wind u ser and second in Europe in terms of installed wind power, after the United States and Germany with 25 175 MW and 23 900 MW respectively.

The 8 229 MW installed in the 2005 to 2008 period show that during the first four years of the REP, 68.6% of the objective was reached for the growth of wind power planned for the entire 2005 to 2010 period (12 000 MW).

As shown in the table above, all wind energy facilities placed in service during 2008 have a total global power of 1 725 MW, representing a 78.4% fulfilment of the objectives set for it.

The pace of wind sector growth during the first years of the Plan is in line with the achievement of the objectives set for 2010.

b) Hydroelectric

During 2008, another 76.3 MW in the hydroelectric area were put into operation in Spain, representing a 46% fulfilment of the overall goal set for the year.

In the first four years of the REP for 2005 to 2010, the level of compliance was 36% against the overall target set in the Plan for this area. Differentiating the two groups of hydroelectric plants: mini-hydraulic area (with power plants up to 10 MW) has a lower target advancement reaching almost 29% of its objectives, compared to 44.7% for the group of power plants between 10 and 50 MW.

Therefore, to achieve the goals set in the REP 2005 to 2010, the proposals to make use of the technically and environmentally viable hydroelectric potential that is available will proceed through the promotion of public tenders for the operation of hydroelectric plants from reservoir dams and canals built wholly or partly with state or private funds, the use of ecological or environmental flows from large dams, and to enhance and streamline the administrative procedure for processing ongoing and new hydroelectric concessions that may be presented in the period.

c) Solar Thermoelectric

In December 2008, the Andasol 1 plant of 49.5 MW was put into operation. The evolution of the installed capacity is lower than expected in the REP, although the plants under construction in late 2008 will allow the objective set for 2010 to be reached or even exceeded.

d) Solar Photovoltaic

The Renewable Energy Plan expected 363 MWp of solar photovoltaic energy to be installed during the period 2005 to 2010 (multiplying by 10 the installed power in December 2004) to reach a total installed capacity of about 400 MW in late 2010.

During 2008, 2 641 MW of grid-connected photovoltaic systems were put into operation in Spain, a figure much higher than the value projected by the 2005 to 2010 REP of 71.5 MWp for the fourth year. It is necessary to clarify that the REP considers the peak power facilities, while the data used for this record of 2008 considers nominal power. Normally the peak power of an installation is between 5% and 15% of its nominal power, so these nominal 2 647 MW could correspond to between 2 779 MWp and more than 3 000 MWp.

It is necessary to mention the Building Technical Code in regards to the integration of solar energy in buildings, which is the regulatory framework adopted in 2006, which establishes the requirements to be met by buildings in relation to the basic security and habitability requirements established in the Construction Planning Law.

Section HE5 requires that specific buildings of a certain area (used for hypermarkets, storage warehouses, hotels and hostels, hospitals, etc.) are obliged to affix catchment and solar photovoltaic conversion systems.

e) Biomass

The period between 2005 and 2008 has been a time of transition and drive for the takeoff of the biomass sector with development expectations being better than the results achieved. The area of biomass power after some years of doubt, adjustments and clarifications on bonuses and tariffs which began with the publication of the R.D. 661/2007 is currently pending two essential points for the definition of projects: the biomass certification process and a clear definition of energy crops.

The development of co-combustion has been delayed due to the late publication of the previously mentioned Royal Decree because of the need for detailed studies of the technology and availability of biomass, plus the long period of negotiations to establish the bonus values for this technology.

The thermal use of biomass has been highly favoured during these years with the development of numerous regulations in the domestic sector. The inclusion of biomass installations in the Regulation of Thermal Installations in Buildings (RITE), the possibility of replacing the solar contribution by biomass established in the Building Technical Code, and the emergence of biomass as the technology most likely to achieve the energy rating A for buildings have been a major boost for the sector. Because of this impetus the development of domestic thermal biomass has been greater than that experienced by the industrial thermal biomass, although the latter has seen a new business opportunity incorporating biomass cogeneration systems.

g) Biogas

During this period, the generation of biogas has been mainly by the degassing of landfills, although the emergence of Royal Decree 661/2007 in 2007 has substantially increased interest in biogas generation from agribusiness waste digesters. The 5.4 MW installed in the past year maintain the sector based mainly on the development of landfill biogas projects (10% agroindustrial biogas).

The economic framework for production of electricity from biogas generated in these digesters improved considerably compared to that in Royal Decree 436/2004, giving rise to the appearance of numerous companies with experience in other European Union countries and the number of projects under study has grown exponentially. As evidence of this, and like 2007, two plants for co-digestion of livestock waste with other agro-industrial waste became operational in 2008, while at least three other such facilities are also under construction during 2008 (and with their launch planned for 2009).

5. CONCLUSIONS

In summary, the objectives of the REP 2005 to 2010 can be summarised as the achievement of at least a 12% contribution to primary energy consumption from renewable sources by 2010, **electricity production of this energy type of 29.4% of gross electricity consumption, according to the indicative target for Spain in Directive 2001/77/EC**, and a biofuels contribution of 5.83% to the consumption of petrol and diesel in transportation scheduled for that year.

Since the adoption of the current Renewable Energy Plan in 2005, these sources have experienced strong global development with very important growth of some technologies for electricity generation, including wind and solar photovoltaic power, and laid the basis for the launch of others such as solar thermoelectric power. In 2008, renewable energies accounted for 7.6% of our primary energy consumption [1] (as opposed to 7% in 2007).

With respect to the **generation of electricity from renewable sources, 2008** represented 20.5% of gross electricity consumption (according to real production data showing a bad hydraulic year). Note the variability of this percentage due mainly to the hydroelectric resource. It is therefore more meaningful to assess the generation of electricity from renewable sources for an average year, both hydraulic and wind. Therefore, **applying the methodology of Directive 2009/28/EC, the figure rises to 23.7% in 2008**, compared to 19.5% in 2005 using the same methodology.

If we also take into account the strong growth in 2008 for the installed capacity of solar photovoltaic energy (and much of it was operational for only a few months), the generation in this area in 2009 will be substantially greater.

Between January and September 2009, the total electricity generation from renewable sources increased its contribution by more than three percentage points over the same period in 2008.

[1] Renewable energy as a percentage of primary energy consumption is heavily penalised for accounting discrimination faced by renewable energy for direct electricity generation (without thermal processes), such as wind, photovoltaic and hydroelectric power, all with strong presence in Spain. Directive 2009/28/EC resolves this discrimination.

Measures to highlight during 2007 and 2008 include the approval of **Royal Decree 661/2007 of 25 May 2007** which regulates the activity of electrical energy production under special regime, which aims to facilitate the achievement of the REP objectives for 2010, reviewing the then current Royal Decree 436/2004 of 12 March, and with it the remuneration for renewable energy, expanding the types of generation that can receive aid, increasing the remuneration to the most needed energies, such as different types of biomass, and introducing a new system of upper and lower limits for incentives received for energy production from renewable sources participating in the Spanish electrical energy market, ensuring in any case, a reasonable return for these facilities .

Also, from September 2008 **Royal Decree 1578/2008** came into force which regulates remuneration for solar photovoltaic installations after the deadline for remuneration under Royal Decree 661/2007 for such technology. The strong growth in the photovoltaic [2] area, well above that expected, brought forward the realisation of the REP 2005 to 2010, and led to this Royal Decree which aims to provide a stable baseline for the development of photovoltaic solar energy, streamlining the growth rate of new capacity and its economic repercussion.

Royal Decree 1578/2008 has established a system of increasing quotas and decreasing tariffs so that once the commercial phase of the solar photovoltaic sector is consolidated, the decline in cost of electricity production with this technology intensifies.

Outside the temporal scope of this report, but of fundamental importance to give coherence and balance to the development of electricity generation facilities from renewable sources, the **Royal Decree-law 6/2009** of April 30, 2009 has been approved. The existing regulation of the special regime did not provide sufficient mechanisms to allow for the planning of facilities for this type of energy, nor the amount and distribution over time of the remuneration bonuses and therefore the impact on costs that are charged to the tariff system. The Royal Decree-law allowed correction of the situation and created a remuneration reassignment Registry for special regime installations in order to monitor the evolution of the installed power, and ensure fulfilment of the requirement that the consumer has energy at a reasonable cost and the technological evolution of these generation sources allows a gradual reduction of their costs and their progressive competition with conventional electricity production technology.

[2] During 2008, Spain experienced an increase in installed photovoltaic power of 2 641 MW, making it world leader in that year.

In the same Royal Decree-law the establishment of a timetable for phased implementation of the registered power was envisaged for those technologies that exceed the target set by the Renewable Energy Plan for 2010 in order to preserve the technical and economic stability of the electricity system. This has been the case for wind and thermoelectric power that will have a preregistered figure of over 6 000 and 2 300 MW, whereas the figures to achieve the installed capacity objectives in 2010 were only 3 700 and 489 MW respectively. Therefore, **the Council of Ministers on 13 November 2009 approved an agreement establishing a plan** for the implementation of more than 1 700 MW annually for wind farm energy until 2012, which means maintaining the installation momentum of recent years. Similarly, annual thermoelectric installations is set at 500 MW annually running through to 2013, i.e. the same amount will be installed each year as was projected in the REP 2005 to 2010 for the combined total in 2010.

Similarly, it is necessary to refer to **Directive 2009/28/EC** of 23 April 2009 although it is outside the temporal scope of analysis of this report, but of vital importance in the development of renewable energy, regarding the promotion of energy use from renewable sources by amending and reforming Directives 2001/77/EC and 2003/30/EC. This Directive sets a target of 20% for the quantity of energy from renewable sources in final energy consumption in 2020 and a target of 10% for energy from renewable sources in transport.

In accordance with this Directive and Royal Decree 661/2007, **Spain is preparing a new Renewable Energy Plan for 2011 to 2020**.

It can be concluded that **renewable energies will continue their consolidation as an increasingly significant energy source in Spain**, especially those involving the generation of electricity, with **expected significant increases in their contribution in the next two years in relation to the current objectives of Directive 2001/77**.

In short, the Spanish Government in this report reiterates its commitment to developing the potential of renewable energies in Spain.

APPENDIX: TABLES OF REP 2005-2010 OBJECTIVES AND DEGREE OF DEVELOPMENT TO 2008

OBJECTIVES OF THE PLAN FOR RENEWABLE ENERGY IN SPAIN 2005 -2010

REP Scenario

	Situation in 2004 [year average (1)]			Growth target 2005-2010 (2)			Situation in 2010		
	Power (MW)	Production (GWh)	Production in terms of Primary Energy(ktoe)	Power (MW)	Production (GWh)	Production in terms of Primary Energy (ktoe)	Power (MW)	Production (GWh)	Production in terms of Primary Energy (ktoe)
Electricity generation									
Hydraulic (>50 MW) (3)	13 521	25 014	1 979	0	0	0	13 521	25 014	1 979
Hydraulic (Between 10 y 50 MW)	2 897	5 794	498	360	687	59	3 257	6 480	557
Hydraulic (< 10 MW)	1 749	5 421	466	450	1 271	109	2 199	6 692	575
Biomass	344	2 193	680	1 695	11 823	4 458	2 039	14 015	5 138
Biomass centres	344	2 193	680	973	6 787	2 905	1 317	8 980	3 586
Co-combustion	0	0	0	722	5 036	1 552	722	5 036	1 552
Urban Solid Waste	189	1 233	395	0	0	0	189	1 223	395
Wind	8 155	19 571	1 683	12 000	25 940	2 231	20 155	45 511	3 914
Solar photovoltaic	37	56	5	363	553	48	400	609	52
Biogas	141	825	267	94	592	188	235	1 417	455
Solar thermoelectric	-	-	-	500	1 298	509	500	1 298	509
TOTAL ELECTRICITY AREAS	**27 032**	**60 096**	**5 973**	**15 462**	**42 163**	**7 602**	**42 494**	**102 259**	**13 574**
Thermal uses	**m^2 Solar t low temp**		**(ktoe)**	**m^2 Solar t low temp**		**(ktoe)**	**m^2 Solar t low temp**		**(ktoe)**
Biomass			3 487			583			4 070
Low temperature solar thermal	700 805		51	4 200 000		325	4 900 805		376
TOTAL THERMAL AREAS			**3 538**			**907**			**4 445**
Biofuels (transport)									
TOTAL BIOFUELS			**228**			**1972**			**2 200**
TOTAL RENEWABLE ENERGIES			**9 739**			**10 481**			**20 220**
PRIMARY ENERGY CONSUMPTION (ktoe) (Energy scenario: baseline / REP)			**141 567**						**167 100**
Renewable Energies/Primary Ener gy (%)			**6.9%**						**12.1%**

1): Data for 2004, provisional. For hydropower, wind, solar photovoltaic and solar thermal , production is included for an average year, based on the powers and area in service on 31 December, according to the characteristics of the facilities implemented to that date and not the actual data from 2004. Does not include biogas thermal and geothermal energy, which in 2004 represented 28 and 8 ktoe.

2): In the increased objectives for 2005-2010 the productions are for an average year in accordance with the powers and characteristics of the facilities put in place during that period. For hydraulic and wind energies, only half of the installed power in the last year (2010) has been translated into production in the appropriate columns.

3): Includes production with just pumping.

REP 2005-2010, ELECTRICAL AREAS LEVEL OF DEVELOPMENT UNTIL 2008 ACCORDING TO POWER DATA

		Growth objectives					Achieved					Level of development (%)	
	Unit	2005	2006	2007	2008	2005-2010	2005	2006	2007	2008	Total 2005-2008	2008 as % of 2008 objective	Total to 2008 of 2010 objective
Electricity generation													
HYDRAULIC	MW	127	127	130	166	810	65	94	56	76	292	46.0%	36.0%
Hydraulic (>50MW)	MW	-	-	-	-	-	-	-	-	-	-	-	-
Hydraulic (Between 10 and 50 MW)	MW	57	57	60	86	360	14	64	25	59	161	68.3%	44.7%
Hydraulic (<10MW)	MW	70	70	70	80	450	51	31	31	18	131	22.0%	29.0%
BIOMASS	MW	10	90	220	335	1 695	10	40	8	29	88	8.7%	5.2%
Biomass Centres	MW	10	40	95	210	973	10	40	8	29	88	14.0%	9.0%
Co-combustion	MW	0	50	125	125	722	0	0	0	0	0	0.0%	0.0%
WIND	MW	1 800	2 000	2 200	2 200	12 000	1 601	1 803	3 099	1 726	8 229	78.4%	68.6%
SOLAR PHOTOVOLTAIC	MW	19	27	46	72	363	25	99	537	2 641	3 303	3693.4%	909.8%
Isolated	MW	1.0	1.5	2.0	2.5	15.0	0.8	1.4	0.9	1.3	4.4	52.0%	29.5%
Grid-connected	MW	18	25	44	69	348	25	98	536	2 639	3 298	3825.3%	947.7%
BIOGAS	MW	5	10	12	17	94	12	9	5	5	31	31.8%	33.3%
SOLAR THERMOELECTRIC	MW	0	10	40	150	500	0	11	0	50	61	33.3%	12.2%
Total electric areas	**MW**	**1 961**	**2 264**	**2 648**	**2 940**	**15 462**	**1 713**	**2 057**	**3 705**	**4 527**	**12 003**	**154.0%**	**77.6%**