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REPORT PURSUANT TO ARTICLE 4(3) OF DIRECTIVE 2009/28/EC OF 23 APRIL 2009 ON THE PROMOTION OF THE USE OF ENERGY FROM RENEWABLE SOURCES

1.- BACKGROUND

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC sets mandatory targets for energy from renewable sources to be achieved by the EU and each Member State by 2020, and provides that the Member States shall establish national renewable energy action plans for achieving these targets and notify these to the Commission by 30 June 2010.

The template for National Renewable Energy Action Plans was approved by means of Commission Decision C(2009) 5174 final of 30 June 2009, Article 4(3) of which provides that:

Each Member State shall publish and notify to the Commission, six months before its national renewable energy action plan is due, a forecast document indicating:

- a) its estimated excess production of energy from renewable sources compared to the indicative trajectory which could be transferred to other Member States in accordance with Articles 6 to 11, as well as its estimated potential for joint projects, until 2020; and*
- b) its estimated demand for energy from renewable sources to be satisfied by means other than domestic production until 2020.*



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*That information may include elements relating to cost and benefits and financing.
That forecast shall be updated in the reports of the Member States as set out in
Article 22(1)(l) and (m).*

2.- SCENARIO ASSUMED UP TO 2020

The following are among the key factors which have shaped energy consumption trends in Spain since 2005:

- substantial intensification of the plans and programmes designed to improve energy efficiency, with the allocation of unprecedented levels of resources to such programmes, resulting in an improvement of more than 10% in energy intensity over the past four years;
- a significant rise in oil prices compared to the prices recorded at the start of the 1990s;
- the international economic crisis since 2008.

Taking the above factors into consideration, in drawing up this report the following scenario up to 2020 has been assumed:

- **Economic scenario:** positive growth in GDP for 2011 (+1.8%), with subsequent annual increases of 2.7% up to 2020.
- **Population scenario:** compared with the huge surges in population in this present decade (i.e. 2000-2009), resulting from immigration, a much more gradual rate of growth is anticipated over the years ahead, bringing the population from just under 46 million in 2009 to 47 million in 2020.
- **Efficiency scenario:** the forecasts are for an annual 2% reduction in final energy intensity and an annual 0.6% reduction in electricity intensity — the relationship between final electricity consumption and GDP.



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Based on this scenario, the Annex sets out the trend forecasts for final consumption of energy — by sector and energy source — and for energy intensity.

3.- FORECAST SHARE OF ENERGY FROM RENEWABLE SOURCES IN SPAIN'S GROSS FINAL CONSUMPTION OF ENERGY IN 2020

The National Renewable Energy Action Plan is still on the drawing board, therefore the energy scenario up to 2020 and the growth targets for each of the renewable technologies during this period may be subject to change.

Nevertheless, an **initial estimate** of the foreseeable trend in renewable energies in Spain up to 2020, made for the purposes of this report, is that the share of energy from renewable sources in Spain's gross final consumption of energy will rise from **10.5% in 2008 to 22.7% in 2020, compared with a target of 20% for Spain in 2020.**¹

As an intermediate estimate, it is forecast that the share of energy from renewable sources will be 15.5% in 2012 (compared with the guideline figure of 11.0% predicted in the indicative trajectory) and 18.8% in 2016 (compared with the 13.8% predicted in the indicative trajectory).

Renewable energy / Final energy (European Commission methodology)

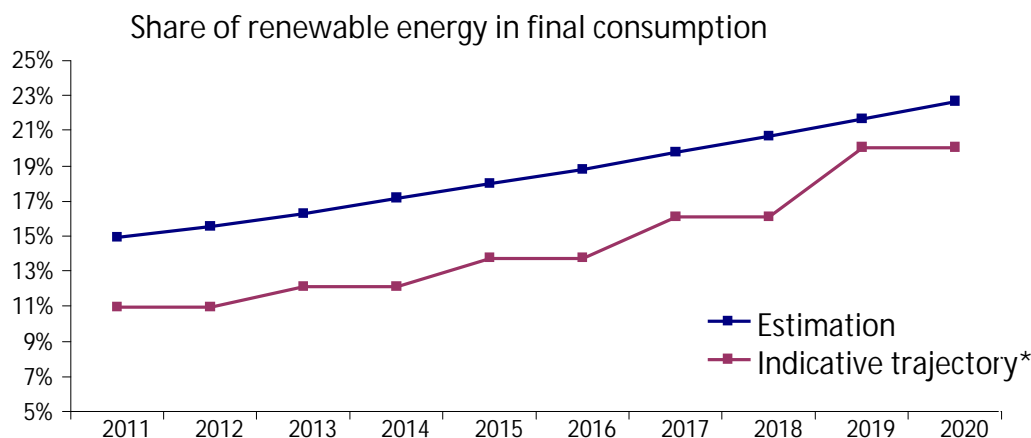
A - FINAL CONSUMPTION OF RENEWABLE ENERGY (ktoe)				
	2008	2012	2016	2020
Renewable energy for electricity generation (Art. 5.1.A) (ktoe)	5.342	8.477	10.682	13.495
Renewable energy for heating/cooling (Art. 5.1.B) (ktoe)	3.633	3.955	4.740	5.618
Renewable energy in transport (Art. 5.1.C) (ktoe)	601	2.073	2.786	3.500
TOTAL RENEWABLES (ktoe)	9.576	14.504	18.208	22.613
TOTAL RENEWABLES, CORRECTED AS PER DIRECTIVE (ktoe)	10.687	14.505	17.983	22.382
B - FINAL CONSUMPTION OF ENERGY (ktoe)				
	2008	2012	2016	2020
Gross final consumption of energy (Art. 5.6)	101.918	93.321	95.826	98.677
% FINAL RE / FINAL E	10,5%	15,5%	18,8%	22,7%

¹ This estimate took no account of the flexibility mechanisms envisaged in Articles 6 to 11 of the Directive.

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The scenario described includes a 42.3% contribution of renewable energies to gross electricity generation in 2020. Spain's electricity system has made great efforts in recent years to integrate renewable electricity into the electricity network.² Bearing in mind that around two thirds of electricity generation from renewable energy sources in 2020 will be of an uncontrollable nature, in order to achieve this target for electricity from renewable sources it will be essential to increase the capacity of two basic elements (pumping and the interconnections with the European electricity system) to a level above that currently envisaged.



Source: SEE

The indicative trajectory requires a mean value during each of the two-year periods

4.- USE OF THE FLEXIBILITY MECHANISMS PROVIDED FOR IN THE DIRECTIVE

In view of all the above considerations, Spain is interested in exploiting the opportunities offered by the flexibility mechanisms listed in Articles 6 to 11 of the Directive, especially statistical transfers, because of the relative simplicity of setting them up through bilateral agreements, and joint projects with third countries, within which context we would include development of the Mediterranean Solar Plan.

As regards joint projects between Member States to be developed in Spain, a more in-depth and individualised analysis is required of the likely effects of these projects on

² Drafting of operating procedures, adaptation of wind turbines to new technical requirements, improved wind prediction systems and creation of the Renewable Energies Control Centre (*Centro de Control del Régimen Especial* — CECRE), a global pioneer for managing the integration into the power system of electricity from renewable energy sources and CHP.



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the use of renewable resources, energy transport and distribution networks and, in general, on the technical and economic aspects of the Spanish energy system.

5.- CONCLUSIONS

- According to the estimate made for this report, **the share of energy from renewable sources in Spain's gross final consumption of energy in 2020 will be 22.7%** — compared with a target for Spain of 20% in 2020 —, equivalent to a renewable energy excess of approximately 2.7 million toe.
- The greatest potential for the development of renewable energy sources in Spain lies in the areas of electricity generation, with a **42.3% contribution of renewable energies to gross electricity generation in 2020**.
- To fully exploit the excesses in production of renewable energy through the flexibility mechanisms listed in the Directive, it will be essential to **further develop Spain's electricity interconnections with the European electricity system**.



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ANNEX: TREND FORECASTS FOR FINAL CONSUMPTION OF ENERGY AND ENERGY INTENSITY

Final consumption of energy, by source

ktoe	2008	2012	2016	2020
Coal	2.080	2.180	2.171	2.162
Oil products	52.898	45.096	42.864	40.572
Natural gas	17.133	15.161	16.336	17.602
Electricity	22.211	21.787	23.661	25.696
Renewable energy	4.235	6.028	7.526	9.118
Total energy uses	98.556	90.251	92.558	95.151
Non-energy uses	6.891	6.595	6.815	6.815
Total final uses	105.447	96.846	99.373	101.966

Final consumption of energy, by sector

ktoe	2008	2012	2016	2020
Industry	30.169	27.559	26.696	28.190
Transport	39.320	37.819	41.737	42.787
Residential, services and others	29.066	24.873	24.125	24.174
Total energy uses	98.555	90.251	92.558	95.151
Non-energy uses:	6.891	6.595	6.815	6.815
Total final uses	105.446	96.846	99.373	101.966

Final energy intensity

Final consumption of energy, by unit of GDP and per capita

Toe/million €2000	2008	2012	2016	2020
GDP (*10 ⁹ € at year 2000 prices)	803,4	807,3	898,1	999,0
% mean annual growth in GDP	0,9%	2,7%	2,7%	2,7%
Population (millions)	45,3	46,3	46,7	47,0
Coal/GDP (toe/million €95)	2,6	2,7	2,4	2,2
Oil products/GDP	65,8	55,9	47,7	40,6
Gas/GDP	21,3	18,8	18,2	17,6
Electricity/GDP	27,6	27,0	26,3	25,7
Renewable energy/GDP	5,3	7,5	8,4	9,1
Total final energy/GDP (toe/million €2000)	131,3	120,0	110,7	102,1
Final energy/population (toe per capita)	2,3	2,1	2,1	2,2
Electricity energy/per capita (kWh/per cap.)	5703	5477	5895	6351
% change from the previous year (%)				
	2008	2012	2016	2020
Electricity intensity (Electricity/GDP)	-0,7%	-0,6%	-0,6%	-0,6%
Final intensity (Total final energy/GDP)	-3,1%	-2,0%	-2,0%	-2,0%



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