Spain’s legal framework for RES and energy efficiency: successes & barriers

8th Global Environmental Taxation Conference, Munich, October 2007

Javier de Cendra
1. The legal framework for RES
2. Targets and degree of compliance so far
3. The new climate change strategy
4. Actions and remaining barriers
   4.1. Legal barriers
      4.1.1. Generation
      4.1.2. Consumption
   4.2. Administrative barriers
   4.3. Structural barriers
      4.3.1. Generation
      4.3.2. Transport
      4.3.3. Retail and consumption
5. Conclusions
1. The Legal Framework

1. Competences for RES in the Constitution
   - State
   - AACC
   - Local Authorities

2. Law 54/1997, The Electricity Act
   - Liberalization of electricity market
   - Basic regulation of special regime
   - Plans for promotion of RES
2. Targets and degree of compliance so far
Structure and evolution of installed capacity of RES (MW)

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>% 06/05</th>
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</thead>
<tbody>
<tr>
<td>Renovables</td>
<td>7.065</td>
<td>8.481</td>
<td>10.956</td>
<td>12.605</td>
<td>14.039</td>
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<tr>
<td>Hidráulica</td>
<td>1.489</td>
<td>1.559</td>
<td>1.636</td>
<td>1.767</td>
<td>1.809</td>
<td>2.4</td>
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<td>Otras renovables</td>
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<td>702</td>
<td>879</td>
<td>948</td>
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<td>Biomasa</td>
<td>373</td>
<td>409</td>
<td>471</td>
<td>513</td>
<td>548</td>
<td>6.7</td>
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<td>R.S. Industriales</td>
<td>168</td>
<td>170</td>
<td>178</td>
<td>178</td>
<td>195</td>
<td>9.7</td>
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<tr>
<td>R.S. Urbanos</td>
<td>79</td>
<td>114</td>
<td>213</td>
<td>224</td>
<td>249</td>
<td>11.2</td>
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<tr>
<td>Solar</td>
<td>5</td>
<td>9</td>
<td>16</td>
<td>33</td>
<td>100</td>
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<tr>
<td>Calor residual</td>
<td>59</td>
<td>69</td>
<td>89</td>
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<td>Carbón</td>
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<tr>
<td>Fuel-gasoil</td>
<td>1.321</td>
<td>1.323</td>
<td>1.325</td>
<td>1.325</td>
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<td>Gas de refinería</td>
<td>210</td>
<td>210</td>
<td>210</td>
<td>210</td>
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<tr>
<td>Gas natural</td>
<td>4.484</td>
<td>4.695</td>
<td>4.799</td>
<td>4.964</td>
<td>5.078</td>
<td>2.3</td>
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Degree of compliance with targets

Seguimiento Plan de Fomento de las Energías Renovables
Evolución Datos Energéticos (1999-2004)

Sobre objetivos a 2010

<table>
<thead>
<tr>
<th>Objetivos de incremento por áreas en 2010 (ktep)</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
<th>110%</th>
<th>120%</th>
<th>130%</th>
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<tbody>
<tr>
<td>Mini hidroeléctrica (&lt;10 MW): 192</td>
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<tr>
<td>Hidroeléctrica (10-50 MW): 60</td>
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<tr>
<td>Eólica: 1,690</td>
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<td>Biomasa: 6,000</td>
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<td>Bioenergéticas: 500</td>
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<tr>
<td>Biogás: 150</td>
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<td></td>
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<tr>
<td>Solar fotovoltaico: 17</td>
<td></td>
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<td></td>
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<tr>
<td>Solar térmica B.T.: 399</td>
<td></td>
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<tr>
<td>Residuos sólidos: 436</td>
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<td></td>
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<td></td>
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<td>TOTAL: 9,524</td>
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</tbody>
</table>

Degree of compliance with targets

<table>
<thead>
<tr>
<th>Source Type</th>
<th>1998 Power (MW)</th>
<th>2006 Power (MW)</th>
<th>2010 Power (MW)</th>
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<tbody>
<tr>
<td>Biomasa y Biogas</td>
<td>69</td>
<td>527</td>
<td>2,274</td>
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<tr>
<td>Eólica</td>
<td>884</td>
<td>11,100</td>
<td>20,155</td>
</tr>
<tr>
<td>Solar: fotovoltaica</td>
<td>1</td>
<td>77</td>
<td>371</td>
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<tr>
<td>Solar: térmoelectrica</td>
<td>0</td>
<td>0</td>
<td>500</td>
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<tr>
<td>Hydro &lt; 50 MW</td>
<td>1.249</td>
<td>1.740</td>
<td>2.200</td>
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<tr>
<td>Residuos Sol. Urb.</td>
<td>104</td>
<td>261</td>
<td>261</td>
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<tr>
<td>Cogeneración</td>
<td>3.674</td>
<td>5.869</td>
<td>7.500</td>
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</table>
Setting targets in context…
Evolution of consumption of primary energy 1975-2003
Setting targets in context…
primary intensity in Spain and in the EU
Setting targets in context...

Primary energy intensity/power purchasing parity EU and Spain

INTENSIDAD PRIMARIA — PARIDAD DE PODER DE COMPRA EN ESPAÑA Y LA UNIÓN EUROPEA

![Graph showing energy intensity and power purchasing parity comparison between Spain and the EU from 1985 to 2003.](image)
Setting targets in context...

Growth in electricity consumption in relation to price, economic growth and population

Figura 3.2. Evolución del consumo eléctrico en relación con su precio, la economía y la población
Expected evolution in installed capacity and production of RES electricity

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Eólica</td>
<td>11.233</td>
<td>14.980</td>
<td>22.000</td>
<td>29.000</td>
</tr>
<tr>
<td>Solar</td>
<td>106</td>
<td>530</td>
<td>940</td>
<td>2.000</td>
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<tr>
<td>Resto Renovable</td>
<td>2.808</td>
<td>4.120</td>
<td>5.310</td>
<td>6.180</td>
</tr>
<tr>
<td>Total Renovable</td>
<td>14.147</td>
<td>19.630</td>
<td>28.250</td>
<td>37.180</td>
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<tr>
<td>Cogeneración</td>
<td>6.784</td>
<td>7.000</td>
<td>7.370</td>
<td>7.990</td>
</tr>
<tr>
<td>Total Régimen Especial</td>
<td>20.931</td>
<td>26.630</td>
<td>35.620</td>
<td>45.170</td>
</tr>
</tbody>
</table>

% sobre Potencia instalada total

<table>
<thead>
<tr>
<th>Tecnología (GWh)</th>
<th>2006</th>
<th>2008</th>
<th>2011</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eólica</td>
<td>22.831</td>
<td>31.000</td>
<td>47.000</td>
<td>62.000</td>
</tr>
<tr>
<td>Resto</td>
<td>27.807</td>
<td>34.800</td>
<td>45.500</td>
<td>62.500</td>
</tr>
<tr>
<td>Total Régimen Especial</td>
<td>50.238</td>
<td>65.800</td>
<td>92.500</td>
<td>124.500</td>
</tr>
</tbody>
</table>

% sobre Producción total
3. The new climate change strategy

3.1. Renewable sources of Energy

- Targets: 12 per cent—2010; 20 per cent 2020; 30 per cent electricity
- Measures to promote generation and consumption of RES
  - Incentives to biomass, thermal and photovoltaic solar
  - Small photovoltaic installations (access to grid, connection, and administrative permits)
  - Hydrogen
  - Improve stability of legal framework for special regime
  - Elimination of coal based boilers in 2012
  - Modify tariff system of electricity to increase role of demand
  - Digital measuring equipments
  - Introduction of green certificates
3. The new climate change strategy

3.2. Energy efficiency

- Target: 2007 Target: 4.7 per cent reduction in primary energy consumption + 2 per cent reduction in BAU scenario annually

- Measures (selected):
  - Exploration of possibility of basic energy efficiency law
  - Information campaigns
  - Modifications of tariffs structures
  - Taxation in transport
4. Actions and remaining barriers…
4.1. Legal barriers (1)

1. In the generation market
   1.1. Within the special regime for RES
       1.1.1. Changes in coverage
       1.1.2. Changes in the economic regime
       1.2.3. Rights and obligations of RES producers
   1.2. Compensation of stranded costs
   1.3. The capacity guarantee
4.1. Legal barriers (2)

1.1 Changes in the special regime (RD 667/2006)

1.1.1. Coverage:

- Co-generation, non-consumable RES, waste
  - Many more groups and subgroups
  - New: co-firing
  - New: Co-firing of biomass in cogeneration
  - New: installations with more than 50 MW of installed capacity
  - New: Marine wind parks
  - New: Hybrids for solar (biomass and fossil fuels)
  - New: mineral products with high content in sulphur and ashes
4.1. Legal barriers (3)

1.1.2. Changes in the economic regime of the special regime: still a ‘feed-in-system’, the most efficient according to the European Commission, but…
4.1. Legal barriers (4)

Changes in economic regime (RD 667/2007)

-New: higher premiums to biomass, biogas, wind, thermal solar, and cogeneration

<table>
<thead>
<tr>
<th>Incremento de la retribución a tarifa:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomasa: 6%(res.ind. forest), 56% (res.agrícolas y forestales), 118% (cultivos energéticos)</td>
</tr>
<tr>
<td>Biogas: 16% (biogas vertedero), 40% (biodigestión)</td>
</tr>
<tr>
<td>Eólica: 6%</td>
</tr>
<tr>
<td>Solar: fotovoltaica 0%(&lt; 0,1 MW) y 82% (0,1-10 MW)</td>
</tr>
<tr>
<td>térmoelectrica 17%</td>
</tr>
<tr>
<td>Hydro &lt; 50 MW: 0%</td>
</tr>
<tr>
<td>Residuos Sol. Urb: 0%</td>
</tr>
<tr>
<td>Cogeneracion: 1-10 MW: 26% (gas natural), 57% (gasóleo y GLP), 43% (fuel oil)</td>
</tr>
<tr>
<td>10-25 MW: 74% (gas natural), 121% (gasóleo y GLP), 101% (fuel oil)</td>
</tr>
<tr>
<td>25-50 MW: 81% (gas natural), 135% (gasóleo y GLP), 113% (fuel oil)</td>
</tr>
</tbody>
</table>
-New: System to set premium: ‘floor and ceiling’ system

-New: Elimination of incentive to participate in wholesale market

**Previous regime:**

Payment to RES under regulated tariff: \( A+B \)  
\( \text{cEur/kWh} \)  
\( (A=\text{Production costs}; \; B: \text{Premium}) \)

Payment to RES producers in the market: \( A+B+\text{C} \)  
\( \text{(C=incenitive for participating in market)} \)

**Current regime:** \( A+B \Rightarrow \text{C has been eliminated} \)
4.1. Legal barriers (5)

1.1.3. Changes in rights and obligations of RES producers

- **New**: elaboration of program and penalties for deviations
- Exclusion from market for ancillary services
- Non-manageable RES no right to remuneration for guaranteed capacity. Violation Electricity Act!
- Authorization & connection small installations
4.1. Legal barriers (6)

1.2. Compensation scheme for stranded costs
   - Strong distortions in the wholesale market
   - Finally eliminated in 2006

1.3. Payment scheme of the capacity guarantee
   - Strong distortions in the wholesale market
   - Non-manageable RES excluded
4.1. Legal barriers (7)

2. In the consumption side
   2.1. The regime for guarantees of origin
   2.2. The electricity tariff
   2.3. New regulation on measuring equipment
   2.4. Measures to promote energy efficiency
      2.4.2. Transport
         2.4.2.1. Bio-fuels
         2.4.2.2. transport taxes
4.1. Legal barriers (8)

Guarantees of origin
- Supplemental to special regime
- Includes cogeneration
- Link with the electricity bill finally made in 2007
4.1. Legal barriers (9)

Digital measuring equipments
- Introduced in 2007 in all frontier and connection points of the system

- Will allow to introduce into the revision of the electricity tariff the real costs of supply
4.1. Legal barriers (8)

The electricity tariff

Objective: full additivity + efficiency + sufficiency

- Too low

- Not linked to generation costs
4.1. Legal barriers (10)

Measures to promote energy efficiency

Buildings
- Phase-out of coal boilers
- Technical building code and regulation on thermal installations
- Public buildings

Transport
- ‘Plate tax’
4.2. Administrative barriers

4.2.1. Licensing procedures

- EIA
- Number and interaction between permits and institutions

4.2.2. Planning law and conflicts of competences

- Very complex and lengthy process
4.2. Administrative barriers (2)

4.2.3. Regulation of access to network of RES electricity
- Limited to compliance with targets set in law
- Asymmetry between access to transport and distribution grid

4.2.4. Specific regime for marine wind parks
- Scope and competences
- Concession and related problems
- Submission of offers and premium
- Possibility of multiple projects in one area
4.3. Structural barriers

4.3.1. In the generation and transport markets
- The regulation of access to the network
- Barriers to the increase in installed capacity of wind energy
- Barriers related to planning of the network
- Specific barriers for some types of RES

6.2. Lack of competition in the retail market
4.3. Structural barriers (2)

The regulation of access to the network
- Incentives limited to legally binding targets
- Allocation of capacity made by each AACC
- Access regime ‘old’ not in line with Dir 2001/77
- Priority to RES in general and in case of physical limitations in nodes
4.3. Structural barriers (3)

Barriers to the increase in installed capacity of wind energy
- Increase in reserves and pumping capacity
- Interconnections with France and Portugal
4.3. Structural barriers (4)

Barriers related to planning of the network

- Complexity in multi-level planning process => uncertainty
- Uncertainty about firmness of investments
- Competition in nodes between operators for which legal regime did not provide solution
- Use of railway network to evacuate RES electr?
4.3. Structural barriers (5)

Specific barriers for some types of RES

- Raw material => now solved
- Logistics => now solved
- Co-firing was not allowed in RD 436/2004 => solved
- Premiums did not differentiate according to size of plants => no small plants built => solved

Remaining issues: waste and role of AACC
4.3. Structural barriers (6)

- Thermal solar $\Rightarrow$ TBC + Special Regime

- Thermo-electrical solar $\Rightarrow$ Special regime

- Photovoltaic solar $\Rightarrow$ from 400 MW to 1200 MW $\Rightarrow$ German system = premiums lowered 5 per cent yearly
4.3. Structural barriers (7)

Lack of competition in the retail market

Theoretically market fully liberalized since 2003 but...

- Majority of consumers remain under regulated tariff
- High vertical concentration and very few traders in the market
- Consumption not measured continuously

=> Consumers cannot exert power
5. Political barriers

- Enormous concern with ensuring low prices

- Lack of trust in the market
5. Conclusions

1. Starting point dominated by growth in energy consumption

2. Legal barriers
   Problems with the special regime
   Problems in the consumption side

3. Administrative barriers
   Complex and lengthy process to obtain permits
   Lack of simplified procedures for small RES

4. Structural barriers
   4.1. Generation and transport sides
   4.2. Retail market