



# European Perspectives on the Challenges of Financing Low Carbon Investment: Spain

Susan Davies and Ingrid Holmes

September 2011

## 1. Background

Spain is the second largest country by area in Western Europe after France. Composed of 17 autonomous communities and two autonomous cities, it is also a highly decentralised economy with strong regional identities. These communities have wide legislative and executive autonomy, with their own parliaments and regional governments. While the Spanish Government provides overarching regulation and policy, the regions are active in implementing low carbon policies – for example they develop regional policies and set regional targets and authorise planning consents.

Spain joined the European Union (EU) in 1986 and the Euro in 2002. Spain had the twelfth highest GDP in the world in 2010 and the fifth highest in the EU after Germany, France, the UK and Italy<sup>1</sup>. However, this is primarily because of the size of the country. In terms of GDP per capita in 2010 it ranked 27<sup>th</sup> in the world and only thirteenth in the EU<sup>2</sup>. GDP per capita has however been rising – in 1995 it was only 92 percent of the EU average<sup>3</sup>, whereas by 2008 it had risen to 4 percent above the EU average measured by purchasing power<sup>4</sup>. In absolute terms however, by 2010, GDP per capita had reached only 94 percent of the EU average<sup>5</sup>. In 2010 Spain was ranked by the World Bank as 49<sup>th</sup> out of 183 countries in terms of ‘ease of doing business’<sup>6</sup>.

Spain is an Annex I country under the UNFCCC, meaning it must make emissions cuts. Under the EU’s burden sharing agreement, however, its emissions were allowed to rise, although

>

<sup>1</sup> International Monetary Fund, World Economic Outlook Database, April 2011, GDP in US dollars, constant prices.

<sup>2</sup> International Monetary Fund, World Economic Outlook Database, April 2011, GDP in US dollars, current prices

<sup>3</sup> European Cohesion Policy in Spain, 2009

<sup>4</sup> Eurostat Yearbook 2010, GDP per capita – current market prices

<sup>5</sup> E3G analysis of IMF Data from World Economic Outlook Database, April 2011

<sup>6</sup> World Bank Group, accessed May 2011,

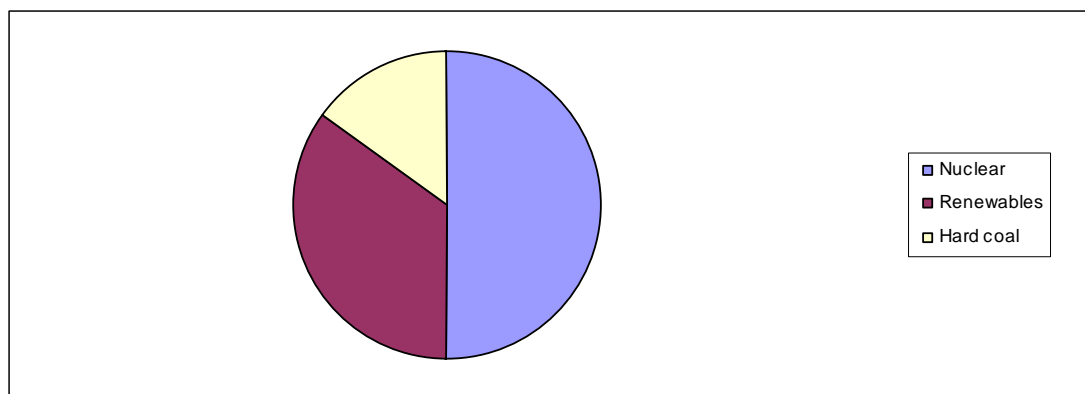
<http://data.worldbank.org/indicator/IC.BUS.EASE.XQ/countries>

limited to an increase of 15 percent over 1990 values between 2008 and 2012. However by 2009, Spain's emissions had actually risen by 29.8 percent (excluding LULUCF)<sup>7</sup>: this has been attributed to rising levels of wealth linked to the increasing GDP.

Energy use per capita is below the EU average, whereas final electricity consumption is slightly higher than the EU average<sup>8</sup>. Spain's energy intensity is 5 percent above the European average<sup>9</sup>, and emissions per capita are the sixteenth largest in the EU at 9.12 tCO<sub>2</sub>e<sup>10</sup>. Over the last 20 years of the 20<sup>th</sup> century, energy intensity rose in Spain on account of transport, the construction boom and the rising wealth of households, which brought consumption patterns closer to EU average levels. During 2003–2008, however, intensity fell by around 10 percent.

In Spain electricity is the dominant energy source. Spain has a relatively low consumption of gas for heating in part because it has milder winters, but gas-fired generation is used as a backup for intermittent wind power generation. Spain's primary energy production in 2008 was 50 percent nuclear; 35 percent renewables; and 14 percent hard coal – see Figure 1.

**Figure 1. Primary energy production 2008.**



Of gross inland consumption, 48 percent came from oil; 25 percent gas; 11 percent nuclear; 10 percent hard coal; and 8 percent renewables – see Figure 2<sup>11</sup>.

<sup>7</sup> Annual European Union greenhouse gas inventory 1990–2009 and inventory report 2011, European Environment Agency, 31 May 2011

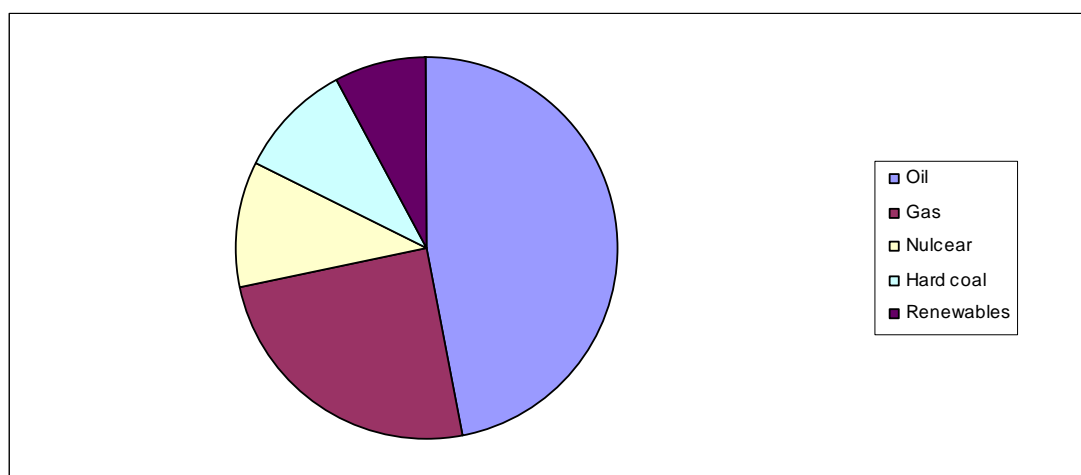
<sup>8</sup> Spanish energy use is 3.13 toe compared to an EU average of 3.62 toe. Final electricity consumption is 5,860 kWh per capita compared to an EU average of 5,738 kWh. From Energy, transport and environment indicators, Eurostat, 2010 edition, February 2011

<sup>9</sup> At 176 kgoe/1 000 EUR'00 compared to the EU average of 167 kgoe/1 000 EUR'00 in 2008. From Energy, transport and environment indicators, Eurostat, 2010 edition, February 2011

<sup>10</sup> Analysis of United Nations Statistical Division: [http://unstats.un.org/unsd/environment/air\\_greenhouse\\_emissions.htm](http://unstats.un.org/unsd/environment/air_greenhouse_emissions.htm), 2 March 2011

<sup>11</sup> Energy, transport and environment indicators, Eurostat, 2010 edition, February 2011

Figure 2. Gross inland energy consumption 2008.



Three firms dominate the electricity market: Iberdrola, Endesa and Gas Natural Fenós have market shares of 31 percent, 29 percent and 21 percent, respectively<sup>12</sup>. Spain is a net exporter of electricity – primarily to Portugal and Morocco – and has set up a common Iberian electricity market with Portugal (MIBEL). In January 2011, the contract was issued for a new €90 million interconnection with France – deemed a priority project by the EU. The connection is driven by INELFE, a 50:50 joint venture between the Spanish and French grid operators Red Electrica de España, and Réseau de Transport d'Électricité<sup>13</sup>.

Spain has a target for renewables to deliver 40 percent of electricity by 2020 – and had reached 26 percent by 2009. It also has a target for 20 percent of final energy to come from renewables by 2020 and had achieved 13 percent by 2009; in 2009 9.3 percent of primary energy came from renewables<sup>14</sup>. Spain had a target for wind to reach 20 GW by 2020<sup>15</sup> – and has already exceeded this. It has subsequently introduced new more demanding targets for 2020 – the target for wind is now 38 GW (35 GW onshore; 3 GW offshore) by 2020; solar PV 10 GW and ocean 100 MW (as well as an interim target of 10 MW by 2016)<sup>16</sup>. In May 2011, Spain's 2011–2020 National Renewable Energy Action Plan ('PANER') was published. The Plan estimates that renewables will make up 22.7 percent of gross final energy consumption by 2020<sup>17</sup>, with 11.3 percent of the energy consumed by transport. In addition,

<sup>12</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009 (figures from Ministry of Industry Tourism and Trade)

<sup>13</sup> [http://tdworld.com/underground\\_transmission\\_distribution/prysmian-france-spain-contract-20110101/](http://tdworld.com/underground_transmission_distribution/prysmian-france-spain-contract-20110101/)

<sup>14</sup> REN21 (2011) Renewables 2011: Global Status Report

<sup>15</sup> REN21 (2010) Renewables 2010: Global Status Report

<sup>16</sup> REN21 (2011) Renewables 2011: Global Status Report

<sup>17</sup>

[http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992\\_6261695\\_6278959\\_0,00.html](http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261695_6278959_0,00.html)

it estimates that 42.3 percent<sup>18</sup> of gross electricity generation will come from renewable sources. Domestic coal is still used for power generation – but its use has been falling (by 53 percent during 1990–2007 alone) due to declining subsidies<sup>19</sup>.

Energy dependency is high: in 2008 it was 81.4 percent, rising from 74.5 percent in 1998 – substantively above the EU average of 54.8 percent. This is partly due to the fact that Spain has to import almost all (99.8 percent) of its oil<sup>20</sup>. In addition Spain is one of the fastest growing markets for natural gas – it has seen supply more than double since 2000 but is 100 percent dependent on imports<sup>21</sup>. It is working on developing a common gas market with Portugal.

Spain has a world-class Renewable Energy Control Centre (CECRE) as part of the transmission grid which has supported the integration of intermittent power. However, Spain also has innate advantages with respect to balancing the system: high demand for air conditioning arises when solar output is at a peak and lower differential between heating demands in summer and winter compared to colder Member States. The CECRE is also looking into using pumped storage as well as the future integration of electric vehicles (EVs) into the balancing network. The new interconnection with France will help further stabilise electricity supply as well as connecting Spain to the rest of the European network.

Spain has historically had regulated tariffs. While regulated gas prices were mostly phased out in 2008 and 90 percent of gas demand is exposed to free market prices; in 2007, 80 percent of households were still on regulated electricity tariffs, which are lower than the cost of production. This means a large tariff-related deficit has built up<sup>22</sup>.

## 2. Financial overview

Ernst & Young currently ranks Spain as the eighth most attractive country in the world for renewables investment and fifth within the EU. This is down from sixth position in February 2010<sup>23</sup>. In 2010, investment in both new and operating renewables, including smaller distributed capacity, was valued at \$4.9 billion (€3.4 billion). This was less than half the amount invested in 2009, which in turn was half the previous year's amount. The reduction in levels of investment combined with Spain's fall down the rankings were largely

>  
18

[http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992\\_6261695\\_6278959\\_0,00.html](http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261695_6278959_0,00.html)

<sup>19</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009

<sup>20</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009

<sup>21</sup> Energy, transport and environment indicators, Eurostat, 2010 edition, February 2011. Despite Spain having 100% dependency, it has a widely diversified gas supply and no one country provides over 50%<sup>21</sup>. Gas grid connections include connections to Portugal, France, Morocco and Algeria. Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009

<sup>22</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009 (figs from Ministry of Industry Tourism and Trade)

<sup>23</sup> Ernst & Young Renewable Attractiveness Indices: [http://www.ey.com/GL/en/Industries/Oil---Gas/Oil\\_Gas\\_Renewable\\_Energy\\_Attractiveness-Indices](http://www.ey.com/GL/en/Industries/Oil---Gas/Oil_Gas_Renewable_Energy_Attractiveness-Indices)

attributable to retroactive reductions to the feed-in-tariff (FiT) system that supports renewables investment – and which primarily affected investment in solar<sup>24,25</sup>. Despite this recent decline, the 5-year growth rate in investments was still 55 percent – with 62 percent of investment (2005–2010) in solar PV; 33 percent in wind; and 4 percent in biofuels<sup>26</sup>.

At the end of 2010, Spain's overall renewable electricity capacity in Spain was 26 GW (excluding hydro of 16 GW). Spain is fourth in the world by this measure behind the USA, China and Germany<sup>27</sup>. Assets include:

- > Wind – with 20.7 GW installed Spain has the fourth highest capacity in the world after China, the USA and Germany. 1.8 GW was added in 2010 – the third highest addition and ahead of Germany. In 2009 windpower overtook coal-based power generation for the first time<sup>28</sup>.
- > Solar PV – with 3.8 GW installed Spain lies second in terms of solar PV capacity – albeit a long way behind Germany, which has 17.3 GW. It accounts for 10 percent of the global PV capacity. However, recent years have seen a severe slowdown in new capacity added. Only 370 MW was added in 2010. Despite being more than twice the amount added in 2009 (145 MW) this is a long way below the peak of 2.6 GW added in 2008.
- > Concentrated solar thermal power (CSP) – Spain now leads the world on CSP, with 0.6 GW installed. It has just overtaken the only other significant player – the USA, which has 0.5 GW installed. Spain is also pioneering new technologies in new solar storage technologies. In 2009, the Andosol I and II solar trough plants stored 7 hours of thermal energy, which allowed them to continue to deliver output overnight<sup>29</sup>.
- > Biomass (power generation) – 0.5 GW have been installed.
- > Hydropower – 16 GW have been installed.
- > Biofuels – 1.7 GW have been installed. Spain is the seventh largest global producer of biofuels and third in Europe behind Germany and France.

### Government support

The Spanish Government has provided strong support for renewables – primarily through the introduction of attractive FiTs that were first introduced in 1994. They were revised upwards in 1997, which led to a boom in solar PV and wind turbine deployment. FiTs are also used to provide attractive support for combined heat and power (CHP) and biomass projects.

> \_\_\_\_\_  
<sup>24</sup> Global Trends in Renewable Energy Investment 2011, Bloomberg New Energy Finance, July 2011

<sup>25</sup> Renewable Energy Country Attractiveness Indices, Issue 29, May 2011

<sup>26</sup> Who's winning the clean energy race? 2010 edition, Pew Charitable Trusts

<sup>27</sup> REN21 (2011) Renewables 2011: Global Status Report – all figures in this section except where marked as 2010 report

<sup>28</sup> REN21 (2010) Renewables 2010: Global Status Report

<sup>29</sup> REN21 (2010) Renewables 2010: Global Status Report

FiTs have been amended several times since 1997. Progress was always due to be reviewed every 4 years, but by the end of 2008 the 2010 targets for PV had been exceeded eightfold with ~4 GW installed compared to a target of 500 MW. In November 2010 the Government introduced a Royal Decree that reduced the solar PV tariff by 45 percent for ground-mounted projects, 25 percent for 21 kW–100 kW medium-sized roof installations and 5 percent for smaller household sized installations. A Royal Decree followed at the end of 2010 that cut tariffs for windpower by 35 percent from early 2011. In addition it introduced caps for solar thermal electricity and wind generation hours above which no FiTs will be paid out – and electricity generated above the caps will be sold at the wholesale price. The new caps are expressed as a ratio of net annual production in KWh and the nominal capacity of the plant in KW. For example, for onshore wind limits will not apply unless the average number of annual hours of operation of all plants exceed 2,350 hours<sup>30</sup>. However, support was also extended from 25 to 28 years to offset some of the financial impacts of these reductions<sup>31</sup>.

In addition to using FiTs, the Spanish Government supports renewables deployment through capital subsidies, grants and tax incentives. The Spanish regions and municipalities also set their own targets, which have further boosted investment. For example Madrid has a target to reduce fossil fuel use by 20 percent by 2020.

The boom in Spanish property development and construction also helped boost the renewables sector: the 2006 building code set new regulations requiring minimum levels of new solar hot water for certain new developments. Municipalities have also been a driving force behind such regulations. Many had similar regulations in place prior to the introduction of national requirements – for example Barcelona was the first Spanish city to introduce such a requirement in 2000 and it now requires 60 percent of energy for water heating to come from solar<sup>32</sup>.

The Government has also been funding research into carbon capture and storage (CCS) and nuclear power<sup>33</sup>. When Spain's current national Government came to power it was openly opposed to nuclear and against any new construction. This position appeared to be gradually weakening and in February 2011, the Government removed the legal provision that prevented nuclear plants operating beyond 40 years and stated that most nuclear power plants would continue operating until 2021. In addition the Minister of Industry Tourism and Commerce has linked the deployment of EVs to ongoing nuclear power generation<sup>34</sup><sup>35</sup>. The Government is hoping to have 1 million EVs on the road by 2014 and has allocated €72 million to provide a subsidy worth up to €6,000 of (or 25 percent of the pre-

> \_\_\_\_\_  
<sup>30</sup> For more information on the new tariffs/caps see: Clifford Chance Client Briefing December 2010: [http://www.cliffordchance.com/publicationviews/publications/2010/12/new\\_royal\\_decree16142010\\_dated7december.html](http://www.cliffordchance.com/publicationviews/publications/2010/12/new_royal_decree16142010_dated7december.html)

<sup>31</sup> International Energy Agency, Global Renewable Energy: Policies and Measures database, accessed August 2011: <http://www.iea.org/textbase/pm/index.html>

<sup>32</sup> REN21 (2010) Renewables 2010: Global Status Report

<sup>33</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009

<sup>34</sup> [http://www.world-nuclear-news.org/NP-This\\_government\\_is\\_not\\_anti\\_nuclear-2802114.html](http://www.world-nuclear-news.org/NP-This_government_is_not_anti_nuclear-2802114.html)

<sup>35</sup> <http://www.world-nuclear.org/info/inf85.html>

tax value of the EV) for consumers<sup>36</sup>. Since the Fukushima disaster, however, there have been calls to shut down two of Spain's nuclear plants that were of the same design, although no firm actions have yet been taken<sup>37</sup>.

One of the key institutions driving renewables targets is the state-owned Instituto para la Diversificación y Ahorro de la Energía (Institute for Diversification and Saving of Energy, or IDAE), which is also the main coordinator of energy efficiency policy. IDAE reports to the Ministry of Industry, Tourism and Trade through the State Secretary for Energy and helps develop plans for renewables and energy efficiency along with the autonomous regions. It also provides support, including project finance and incentives for energy efficiency and renewables projects. It has specific programmes aimed at boosting deployment of biomass and geothermal for water heating; solar thermal; and a programme that aims to pilot 2,000 EVs. The Spanish Government has, primarily through IDAE, developed an Energy Saving and Efficiency Action Plan for 2008–2012 along with a Plan to Activate Energy Savings 2008–2011<sup>38</sup>. The former defines a national target of 11 percent energy savings by 2012, whereas the latter is a promotional campaign to encourage consumers to reduce energy equivalent to 10 percent of annual oil imports. IDAE is the main promoter for both and is involved in managing some of the funding for energy efficiency investment and the building of public-private partnerships to develop renewables. IDAE's budget was doubled to €120 million to support strategic projects by large companies and industrial groups as part of the new plans.

The Spanish Government and regions aimed to provide €2.4 billion towards funding the Action Plan with the regions contributing ~25 percent of the funding. The expectation was that this would leverage an additional €7.9 billion in private sector investment towards supporting a range of 31 measures including support for the development of energy service companies (ESCOs), education and outreach, incentives/subsidies and grants; third-party finance; public investment and procurement; infrastructure investment; research, development and deployment (RD&D); demonstration projects, support for biofuels and EVs; and distribution of low energy lightbulbs<sup>39</sup>.

Amongst other key policies are those aimed at 'removing hurdles' via awareness campaigns and support for ESCOs together with soft loans and grants provided in conjunction with Spain's public bank ICO. These loans are primarily targeted at industrial and large-scale commercial energy efficiency projects. There are also plans to renovate 330 government

<sup>36</sup> <http://translate.google.co.uk/translate?js=n&prev=t&hl=en&ie=UTF-8&layout=2&eotf=1&sl=es&tl=en&u=http%3A%2F%2Fwww.idae.es%2F> In Spain, transport accounts for 38% of final energy consumption and the Government is keen to reduce emissions from this sector. In 2009 it introduced proposals to develop congestion charging as well as the subsidies to promote EVs. These subsidies would be disbursed by IDAE.

<sup>37</sup> <http://www.world-nuclear.org/info/inf85.html>

<sup>38</sup> The Plan will expire at the end of 2011. A new Plan covering 2011–2020 was published in July 2011 see

[http://www.idae.es/index.php/mod.documentos/mem.descarga?file=/documentos\\_Plan\\_de\\_Accion\\_2011-2020\\_29072011\\_Version\\_Definitiva\\_4c46f595.pdf](http://www.idae.es/index.php/mod.documentos/mem.descarga?file=/documentos_Plan_de_Accion_2011-2020_29072011_Version_Definitiva_4c46f595.pdf)

<sup>39</sup> International Energy Agency, Global Renewable Energy: Policies and Measures database, accessed August 2011: <http://www.iea.org/textbase/pm/?mode=re&id=4182&action=detail>

buildings – expanded to 2000 more under the ‘Plan 2000ESE’ which targets 1,000 national government and 1,000 autonomous community and local government buildings to reduce energy usage by 20 percent as a means of boosting ESCOs<sup>40</sup>.

The Government has also allocated €1 billion for energy efficiency retrofits in buildings (worth up to 35 percent of the value of investments) as well as €370 million in public funds aimed at leveraging private capital to finance energy efficient investment in industry and providing subsidised energy audits. The Renove programme has also subsidised the replacement of over 1.8 million appliances since 2006<sup>41</sup>.

Despite the strong growth in renewables, the Government is not confident that Spain’s domestic greenhouse gas reduction targets can be achieved. Since 2005, therefore, it has purchased Kyoto-compliant emissions reduction credits through funds investing in the CDM and JI offset markets and through the purchase of emissions reduction credits directly from sovereign providers. It has entered into bilateral agreements with a number of countries, particularly in Latin America, and is investing in several multilateral carbon funds, including the Spanish Carbon Fund administered by the World Bank on behalf of the Spanish Government – which is aiming to purchase 34 MtCO<sub>2</sub>e. Other funds include the Community Development Carbon Fund and Bio-Carbon Fund. Spain is also participating in the European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD) Multilateral Carbon Credit Fund and Green Fund, as well as the Asian Development Bank’s Asia-Pacific Carbon Fund.

## EU funding

Spain has been allocated €35 billion of Cohesion Funds for the period 2007–2013. The largest portion of this (€12 billion or 35 percent) will be allocated to R&D, innovation, entrepreneurship, transport and environmental projects. A further €461 million will be allocated to energy efficiency and alternative sources of energy. €7.5 billion will be spent on transport infrastructure. Efficient use of water is also critical goal for the region and is increasing in importance as the impacts of climate change increase – and has been allocated an additional €4 billion. This will be spent on the management and distribution of water resources as well as waste water treatment. Due to high levels of unemployment and the comparatively low income status of some Spanish regions, the remaining funds are primarily targeted at broader social policy including measures including increasing employment, social inclusion and reducing poverty.

> \_\_\_\_\_  
<sup>40</sup> Financing Energy Efficient Retrofits, Peter Sweatman, Katrina Managan, Climate Strategy & Partners, 2011

<sup>41</sup> Energy Policies of IEA Countries: Spain 2009 Review, International Energy Agency, 2009

## Spain's banking sector

As part of Spain's transition to a democracy, which began in 1975, three main types of bank developed: private banks, savings banks and official credit institutions.

### Commercial banks

The commercial banking sector grew rapidly so that by the 1980s there were over 100 in existence. Regulated by the Bank of Spain, these banks provided a wide range of financial services, including financing industrial development. In addition, in the absence of a strong pension system 5 million retail investors put their savings into the banks – the highest proportion in Europe. Over time the market has consolidated and levels of foreign ownership have increased. The largest – including Grupo Santander and Grupo Banco Bilbao Vizcaya Argentaria (BBVA) – are now international brands<sup>42</sup>.

Many of these large commercial banks have also been heavily involved in providing project finance and refinancing for renewables. The two largest players, BBVA and Santander, have both been involved in 121 deals to date, valued at €10.6 billion and €9.2 billion, respectively. The third largest amount of deal activity in Spain was undertaken by Caja de Ahorros y Monte de Piedad de Madrid (74 deals valued at €4 billion to date)<sup>43</sup>. As more specific examples, Santander, BBVA and Banco Espirito Santo were all involved in financing the \$1203 million (€835 million) Acciona Palma & Maja das STEG Portfolio and both Santander and BBVA were involved in the acquisition of the \$332 million (€231 million) Gamesa Galicia and Cataluna Wind Farm Portfolio<sup>44</sup>. Spanish banks and asset managers<sup>45</sup> are also investing heavily in carbon funds. For example, Caixa Geral de Depositos, Caja Madrid and Unicaja are all investors in the European Carbon Fund and Santander cosponsors the FC2E Carbon Fund for Spanish Companies with ICO.

### Savings banks

Spain also has a network of savings banks known as Cajas. These originally developed in rural areas where the private banks were absent. They too are now regulated by the Bank of Spain. Legally the savings banks were non-for-profit – but in reality they were self-financed and highly profitable private financial institutions whose profits were divided between local investments and social works<sup>45</sup>. The Cajas have suffered severe losses after the collapse of Spain's housing and construction boom and the sector is undergoing consolidation. For example, in 2010 Caja Madrid merged with Bancaja and five other savings banks to form

<sup>42</sup> Federal Research Division, Library of Congress. Country Studies (1986-98). Now online see: <http://countrystudies.us/> see link under Spain/Banking

<sup>43</sup> Bloomberg New Energy Finance

<sup>44</sup> Clean Energy League Tables, Bloomberg New Energy Finance, March 2010

<sup>45</sup> Federal Research Division, Library of Congress. Country Studies (1986-98). Now online see: <http://countrystudies.us/> see link under Spain/Banking

Bankia. Bankia was publicly listed in July 2011 to avoid part nationalisation<sup>46</sup>. This was seen as a key step in the Government's attempts to restructure Spain's financial system and further public listings of Cajas are expected<sup>47</sup>.

Like the investment banks, some of the Cajas have also played a key role in financing the expansion of renewables in Spain. Caja de Ahorros y Monte de Piedad de Madrid is the third largest provider of project finance for renewables in Spain (74 deals valued at €4 billion to date) followed by Caja de Ahorros y Pensiones de Barcelona (ranked fifth in Spain with 69 deals cumulatively worth €3.1 billion)<sup>48</sup>.

## Public banks

Spain originally had a network of official credit institutions (OCI) controlled by the Directorate General for State Assets and supervised by ICO. ICO received state funds which it on-lent to these OCIs. Each OCI specialised in a particular area: Banco de Credito Industrial provided industrial loans; Banco Hipotecario de Espana provided mortgage loans; Banco de Credito Agricola provided credit for agricultural sectors; and Banco de Credito Local supported provincial and municipal bodies. The overseas trade bank Banco Exterior de Espana was also partially under ICOs control and focused on exports. After the 1991 State banking reforms these the banks became subsidiaries of ICO<sup>49</sup>.

## Instituto de Crédito Oficial (ICO)

**Overview of structure** – ICO is Spain's State-owned public bank. It was created in 1971 and its statutes, approved in 1999 by Royal Decree, set out that it would be the institution responsible for the coordination and control of Spain's state-owned banks (OCIs)<sup>50</sup>. After the 1991 State banking reform it assumed its current functions which are twofold:

- > To act as a specialised credit institution to support Spanish enterprises by direct investment or via intermediaries such as other banks and savings institutions.
- > To act as the State's Financial Agency to support the growth of the economy and distribution of wealth. This includes providing finance during economic crises or following natural disasters. The State takes any losses in this instance. It also supports export and development.

>

<sup>46</sup> <http://www.bloomberg.com/news/2011-07-18/bankia-offers-ipo-at-32-less-than-peers-amid-spain-debt-crisis.html>

<sup>47</sup> FT (12 July 2011) EU Debt Crisis threatens Spain bank IPOs. <http://www.ft.com/cms/s/0/cc66ceee-ac94-11e0-a2f3-00144feabdc0.html#axzz1TljiW8mg>

<sup>48</sup> Bloomberg New Energy Finance

<sup>49</sup> Federal Research Division, Library of Congress. Country Studies (1986-98). Now online - see: <http://countrystudies.us/> see link under Spain/Banking"

<sup>50</sup> Royal Decree-Act 706/1999: Statutes of Instituto de Crédito Oficial, Official State Gazette (BOE) no.114, May 13 1999

ICO is a corporate entity reporting to the Ministry of Economy and Finance through the Secretary of State for the Economy and benefits from an explicit, irrevocable, unconditional and direct state guarantee established by Royal Decree<sup>51</sup>. Any modification to this would need to be passed by Law. ICO operates independently from Government; the Chief Executive Officer is also fully independent from Government. The Governing Council is ICO's highest governing and administrative body, while the Operations Committee is responsible for day-to-day management. While ICO is independent it has entered into a number of 'domestic agreements of cooperation' with government departments to support specific policies. For example it has two separate agreements with the Ministry of Industry, Tourism and Trade to encourage the use of new ICTs and eco-friendly vehicles.

The Bank of Spain supervises ICO and is subject to Spanish commercial and banking law and regulatory capital requirements. The State has committed under law to maintain ICO's capital ratio at a minimum of 9.5 percent under Basel II.

Although ICO is based in Madrid, it has a nationwide presence via intermediary banks and has a number of subsidiaries and shareholdings. Subsidiaries include:

- > Axis Participaciones Empresariales – founded in 1986 as a State Bank, Axis has been 100 percent owned by ICO since 1993. It focuses on venture capital and manages various funds. It has invested over €200 million in 100 projects mostly in innovative businesses and by the end of 2009 held €83.19 million of equity investments and loans equity in 28 companies. Axis played a key role during the financial crisis (discussed later).
- > Compañía Española de Reafianzamiento (CERSA) – ICO has a 23.81 percent stake in CERSA, which provides refinancing and guarantees to SMEs and reports to the Ministry of Industry Tourism and Trade through the Directorate General of SME policy.
- > Compañía Española de Financiación del Desarrollo (COFIDES) – ICO has a 25.25 percent stake in COFIDES, a public-private company that provides support for Spanish enterprises in developing countries. COFIDES manages State funds for this purpose and co-financing along with Multilateral Financial Institutions (MFIs). It provides medium and long-term loans as well as minority equity stakes, usually in the range of €0.25 million to €25 million per project. Other stakeholders include Spanish banks, including Santander and BBVA, and the Spanish Foreign Trade Institute (ICEX).

ICO itself provides liquidity to corporates and collectives that otherwise would not be able to access to finance. Around 62 percent of its lending is provided via an onlending model through intermediaries including private banks and savings banks (Caja). Credit risk is borne by the intermediaries not ICO. The remaining 36 percent of its lending is domestic loans. ICO is able to offer attractive interest rates due to its quasi-sovereign rating and because it has a public interest mandate (i.e. profit maximisation is not ICO's main goal). Priority areas are set by the Government and include: small and medium-sized enterprises (SMEs) and other Spanish enterprises; regional development; renewable energy and energy efficiency; R&D;

> \_\_\_\_\_  
<sup>51</sup> Act 12/1995 (sixth additional provision) and as extended by Royal Decree 706/1999

telecommunications and other infrastructure; and social housing. In addition, ICO supports Spanish exports and enterprises wishing to expand overseas as well as the Spanish film industry. Other areas of activity include information technology, tourism, transport and education.

ICO operates a number of facilities that support key sectors including, entrepreneurs, innovation, the public sector, overseas development, transport, tourism and Spanish enterprises expanding abroad. For example PROINVEX was set up to support large-scale overseas investments and the Development Aid and Micro-Credit Funds focus on aid and development.

ICO aims to be entirely self-financing and in 2010 had a balance sheet of €77.87 billion. Total equity in 2010 was €3.24 billion, giving a leverage (equity:assets) of 1:24<sup>52</sup>. As a wholesale bank, it has only a few customer deposits and these are mostly related to government payments. Instead it sources capital from returns on its investments and the capital markets. Around 85 percent of its external finance comes from medium- and long-term bond issues. In 2010 it aimed to raise between €16 billion and €18 billion this way, having raised €14 billion in 2009.

**Operation and role in the financial crisis** – As mentioned previously, ICO has an explicit role in supporting the Spanish economy during times of crisis. During the recent crisis the Spanish Government created the ‘Spanish Economic and Employment Stimulus Plan’ and ICO was instructed to set up a €20 billion Sustainable Economy Fund (SEF) – €10 billion of which came from ICO. This was split into sub-funds – one of which was a €300 million venture capital fund set aside for SMEs. At the time, Axis managed a €122 million venture capital fund called Fond-ICO. Following the establishment of the SEF, the €300 million venture capital fund was merged with Fond-ICO to create a €422 million fund named ‘FESpyme, FCR’, which matures in 2022. It Spain’s biggest venture capital fund and takes stakes in a wide range of SMEs, apart from financial or real-estate firms, for a maximum of six to seven years. Its remit is to focus on: the environment, including eco-innovation, waste and recycling; knowledge and innovation, including health, biotechnology, energy, climate change, ICT and nanotechnology; and social, including the elderly and vulnerable.

Although the fund was only approved by ICO in September 2009, it was operational by February 2010. In the interim, Axis met with all stakeholders to determine how the funds could be best used and what the most appropriate vehicle was. Through this process it was determined that the key issue for SMEs was a lack of liquidity and long-term funding. So the fund was set up to provide equity-loans: it takes temporary minority stakes in companies usually for around 5 years. Generally funding ranges from €750,000 to €1.5 million, but may be up to €15 million.

During this period, ICO was also called upon, for the first time, to provide working capital to companies.

> \_\_\_\_\_  
<sup>52</sup> Cuentas anuales consolidadas al 31 de diciembre de 2010, Instituto de Crédito Oficial 2011

**ICO and climate change** – ICO’s key programmes include the ‘ICO Sustainable Economy Facility’, which supports entrepreneurs and companies in the environmental, innovation, knowledge and social sectors. In addition, the Large-Scale Investment Programme finances investment in energy infrastructure by large companies. Investments that may be eligible for the latter include energy efficiency in industry, buildings and public lighting; wind energy; biomass; mini-hydro; solar energy; biogas; and waste.

ICO also invests in pan-European funds that support low carbon investments, including:

- > The Marguerite Fund – ICO was one of the founding investors, contributing €100 million.
- > The European Investment Fund – part of the EIB group. ICO’s share is 0.28 percent.
- > The Carbon Fund for Spanish Companies (FC2E) – ICO has a 25 percent stake in this fund which is co-sponsored by Santander Investment and aims to reach €100 million. It will purchase carbon credits from CDM/JI projects and distribute them amongst investors to reduce EU Emissions Trading Scheme (ETS) compliance costs.
- > Fons Mediterrània Capital (FCR) – ICO has a 25.8 percent share of this private equity fund, which invests in Morocco, Tunisia and Algeria in traditional and emerging sectors and to strengthen the international presence of regional companies. Other core participants include the Catalan Institute of Finance (ICF), EIB and financial institutions such as La Caixa and industrial groups such as Telefonica.
- > Post-2012 Carbon Credit Fund – ICO invested €10 million in this fund.

### **European Investment Bank (EIB)**

The EIB has been very active in Spain and in 2010 provided loans worth €9.3 billion, making it the biggest recipient of EIB loans for the seventh year in a row. In 2009, a record year of activity (due to the increase in the EIB’s activities to support the recovery of the European economy from the financial crisis), the EIB provided loans worth €10.4 billion, a significant increase from the €8.5 billion provided in 2008 and €7.1 billion provided in 2007. The focus of its lending was on projects involving the construction and upgrading of transport infrastructure but the EIB also continued to provide support for SMEs, health, education and energy investments.

In 2010 the EIB provided financing totalling €1.5 billion for both high and low carbon energy investments. This included €150 million for the construction of combined heat and power plants in Algeciras; €50 million for investments in PV projects in the Valencia region; a €125 million loan to the Provincial Council of Barcelona for investments to improve energy efficiency in public buildings; €350 million for the expansion of the national power transmission system; but also €100 million for the construction and operation of a delayed coker unit in the existing Petronor refinery in Bilbao; and €60 million for the second phase of the expansion of the Sagunto LNG plant. Overall lending in 2011 lending is expected to be somewhat lower than in 2010, as the general activity of the Bank returns to pre-crisis levels, with a focus on infrastructure projects. In January 2011, the EIB agreed to provide €100

million in finance for small scale renewables and energy efficiency investments with Banco de Sabadell acting as a lending intermediary<sup>53,54</sup>.

## Pensions

The Spanish private pension industry began in the late 1980s with a change in law that introduced regulated voluntary occupational and personal pensions to supplement existing public pensions. By the end of 2007 assets under management amounted to around €86 billion<sup>55</sup>. One of the large Spanish private pension fund providers we spoke to said that while they were happy to invest in energy companies, they would not invest directly in renewable energy projects as such investments were too risky. Policy instability was cited as one of the main barriers to participation in such projects.

## 3. Financial challenges

**The electricity tariff deficit** – In Spain consumer electricity prices are largely regulated and set lower than the costs of production. This has resulted in the accumulation of a €15 billion tariff deficit, which is debt owed by the Spanish Government to the Spanish electricity utilities. This tariff deficit is not solely due to the subsidising of renewable energy costs with FiTs – instead it has resulted from regulation preventing the full cost of electricity production from both high and low carbon sources from being passed onto electricity consumers. In 2009, when the deficit had reached €14 billion, the Government launched a new securitisation vehicle to enable it to repay these existing debts and also those expected to accrue until 2012. Known as Fondo de Titulizacion del Deficit del Sistema Electrico (FADE), the securities offering failed to sell in Q4 2010 but in January 2011 €2 billion worth were sold. While this represents progress, around €15 billion still remains to be sold and there is concern about levels of appetite, particularly as the Eurozone crisis continues and Spain's cost of borrowing increases.

Given the need for Spain to substantively cut its public sector debt in order to get the public finances under control, this deficit must be addressed – which will require consumer prices to increase. Until this happens, the tariff deficit is likely to continue to be an issue overshadowing future investment in the Spanish electricity market.

**Renewable energy** – Spain has been hugely successful in driving investment in renewable energy – only Germany has achieved a higher level of installed capacity – and has served as a 'beacon' country for much the rest of Europe in terms of how to successfully create such a market. However, this boom in investment has also seen Spain become, to some extent, a victim of its own success. The scale up of investment in PV in particular was significantly

<sup>53</sup> EIB (2011) the EIB in Spain in 2010

[http://www.eib.org/attachments/country/factsheet\\_spain\\_2010\\_en.pdf](http://www.eib.org/attachments/country/factsheet_spain_2010_en.pdf)

<sup>54</sup> <http://www.eib.org/projects/loans/regions/european-union/es.htm>

<sup>55</sup> Chulia, E. (2010) Private pensions in Spain: Scarce development and meagre public debate

faster and larger than expected, and has contributed to – though of course is not the sole cause of – the tariff deficit.

Against this backdrop, and with the current fiscal constraints – including an average pay cut of 5 percent for public sector workers, funding to the regions cut by €1.2 billion and a €6 billion cut in public sector spending – sustaining generous support for renewables could no longer be justified and the Government introduced the retroactive changes to FiTs outlined above. Almost overnight, Spain achieved pariah status and investment in renewables halved between 2008 and 2009 and fell again by 53 percent in 2010 to \$4.9 billion (€3.4 billion)<sup>56</sup>. Spain has since often been cited as a cause of widespread falling investor confidence in the renewables sector not just at home but everywhere. Some investors voiced fears that following the precedent set by the Spanish Government in not only adjusting FiTs downwards but making these adjustments retroactive, other countries would follow suit. While it appears some of these investors are now returning to the market, confidence is not yet back to its previous levels.

While the political discussion around FiT reductions was clearly handled badly, on closer examination, a much more subtle picture emerges of the actual impact of the FiT changes on existing investments. Although the FiTs were reduced, their duration was also extended from 25 to 28 years. The Spanish Government appears to have researched extensively to tread a fine line between reducing what they perceive to be excessive equity returns while not causing projects to be unable to repay their debt. Hence the adjusted FiTs still allow project finance loans to be repaid and banks have not experienced widespread defaults. (Only one project is believed to have faced financial difficulty<sup>57</sup>.) Instead, the result of the downward adjustments has been that the equity providers will see reduced returns in the first few years of their investments. However, it was felt this was a short-term problem because the longer duration of the FiTs would ultimately provide some compensation to investors, albeit over a slightly longer timescale.

A further subtlety to emerge is that the Government's concerns about the boom in renewables investment were not to do with renewables in the general sense but with solar PV in particular. High FiTs combined with extensive Government media campaigns saw many small community level schemes implemented with the result that take-up was eight-times higher than anticipated. It is for these reasons that the new lower tariff systems with caps were introduced (as discussed previously). As a result of these changes between October and December 2010, only 919 out of 4,354 solar PV plants requested planning approval were approved. While solar PV investment has dropped off as a consequence<sup>58</sup> – wind investment continues to grow in Spain.

> \_\_\_\_\_  
<sup>56</sup> Global Trends in Renewable Energy Investment 2011, Bloomberg New Energy Finance, July 2011

<sup>57</sup> Another driver may be the fact ICO – the state public bank – was involved in many of the deals and so could have lost money as a result of retroactive changes

<sup>58</sup> Renewable Energy Country Attractiveness Indices, Ernst & Young, February 2011, Issue 28

In 2010 Spain ranked third in the world in terms of new capacity added, behind China and the USA<sup>59</sup>. This investment has been mainly driven by larger players such as Iberdrola and Acciona, because of wind's capital intensity, and so the same degree of oversubscription has not occurred. The target for wind investment was also higher than for solar PV, with a target of 21 GW by 2011. By 2010 20 GW had already been installed. This shows that unlike the situation in the solar market, the caps were well set with wind and there has not been the same level of oversubscription and need to reduce growth. The new target of 38 GW for wind by 2020 shows that the Government is keen to continue expanding growth in wind. In addition, the new caps outlined previously, are at present well above existing operating levels and so should not prove a barrier to investment in the near term.

The financiers and investors we spoke to seemed to agree with this in that in the short term they see the rate of solar PV deployment falling, but wind and CSP capacity continuing to expand. In the longer term, it is expected that solar PV deployment Spain will again pick up: solar PV is particularly well suited to the Mediterranean climate as electricity demand from air conditioning coincides with peak solar output and prices have fallen substantively over the past few years. However it is expected that solar PV deployment is not likely to again reach the peak of 2008 when 2.6 GW of solar PV was added<sup>60</sup>. As a result, investors and financiers are looking to newer PV markets overseas– such as the USA, Canada, South America, Australia and India – where FiTs are higher and the PV market is less developed.

Another significant issue for the Spanish market is the higher cost of capital. While the banks we spoke to are still offering long-term debt (of 20 years or longer), costs have increased, as the ratings of some institutions have been downgraded over past months. In countries where consumer prices are not regulated these costs would simply be passed onto consumers. In Spain, with its regulated energy prices, the rising costs of power production will be partially underwritten by the Spanish Government. This will add to increased levels of Government indebtedness to the utilities and then, assuming it can be securitised, to the capital markets. Against the backdrop of austerity this is a continued source of concern: Endesa has forecasts that the debt owed by the Spanish Government to the utilities will amount to €8 billion in 2011 alone<sup>61</sup>.

**Energy efficiency** – Compared to renewables, energy efficiency has a low priority for the Spanish Government. The biggest barriers are the low regulated prices, which reduces the incentive to invest. Despite this, Spain is well placed to expand existing initiatives. The rate of new construction is less than 2 percent which puts the requirement on retrofitting existing buildings. With 25 million homes, renovation rates need to be ~500,000 a year Given that the average Spanish ownership is 29 years (compared to 10 years in the UK). This provides a long time horizon for investments to generate profitable returns to the householder. Owner occupancy is high at 89 percent but the majority (71 percent) live in

<sup>59</sup> REN21 (2010) Renewables 2010: Global Status Report

<sup>60</sup> REN21 (2011) Renewables 2011: Global Status Report

<sup>61</sup> <http://www.bloomberg.com/news/2011-05-18/endesa-forecasts-8-billion-euro-spanish-tariff-deficit-in-2011-cinco-says.html>

multi-unit residencies, which will need coordinated measures<sup>62</sup>. State-owned IDAE has just published a new National Plan for Energy Savings and Energy Efficiency 2011–2020 covering industry, energy, transport, buildings and equipment, the public sector, agriculture and fisheries. But Spanish NGOs have described the plans as insufficient to meet the challenge and have called for the establishment of a national energy efficiency fund<sup>63</sup>.

## 4. Conclusion

Spain rightly deserves its reputation as a leading country for renewables investment. One of the key elements of Spain's success has been a remarkably easy planning consents process compared to other EU countries. This may well be something that is unique to Spain. It can in part be explained by Spain's very large land area (it is the second largest country in the EU): for example large areas such as mountainous regions that are suitable for wind farms are only lightly populated, which means there are fewer people to object to projects. In addition, many of the solar developments were brought forward by communities – who saw direct financial benefits from the projects, which countered any visual blight.

The fact Spanish people are generally supportive of renewables is also in part due to the jobs it has brought. A 2008 report by the UN estimated that Spain had gained 40,000 jobs from windpower; 14,000 from solar PV; 7,000 from solar hot water; 5,000 from biomass power; 7,000 from hydropower; and 1,000 from solar thermal power<sup>64</sup>. However, because of the recent tariff reductions and rising competition from China and other countries some of these jobs are under threat. In December 2010, APPA – the Spanish Renewable Energy Association – reported the results of a study commissioned from Deloitte which found that 20,000 jobs had been lost that year in the renewables sector<sup>65</sup>. China in particular is increasingly a competitor on PV technology, and has distinct advantages in terms of access to raw materials and cheap labour, but Spanish companies continue to maintain a high level of expertise in CSP<sup>66</sup>. Spain has a strong competitive advantage because, along with the USA, it enjoys first mover advantage in the market. The Mediterranean climate is ideally suited to the development of CSP. This competitive advantage, and strong local supply chain, means the technology is also likely to enjoy continued political support in the form of home markets for the technology.

---

<sup>62</sup> Peter Sweatman & Katrina Managan, Climate Strategy & Partner (2011) Financing Energy Efficient Retrofits

<sup>63</sup> Discussion with Ecodes

<sup>64</sup> UNEP report referenced in REN21 (2011) Renewables 2011: Global Status Report

<sup>65</sup>

[http://www.appa.es/descargas/NP\\_ESTUDIO\\_IMPACTO\\_MACROECONOMICO\\_ENERGIAS\\_RENOVABLES.pdf](http://www.appa.es/descargas/NP_ESTUDIO_IMPACTO_MACROECONOMICO_ENERGIAS_RENOVABLES.pdf)

<sup>66</sup> The USA is the only other country that is investing heavily in the sector

Despite these inherent advantages, going forward, Spain faces three principle financial challenges:

- > The need to rebuild confidence in their policy support regime, after the retroactive adjustments were made to the solar PV FiT;
- > Higher costs of borrowing across the Spanish economy, driven by continued concern about Spain's economic health and the ability of the Government to repay its debt<sup>67</sup>, which has had a knock-on effect on the cost of borrowing for Spanish banks in particular; and
- > Related to this last point, in the absence of a strong economic recovery, ongoing energy price regulation may well limit the ability of this market to grow. The Government's continued unwillingness to pass rising costs onto consumers is resulting in greater levels of Government debt being accumulated and an ongoing negative impact on investors' confidence that the Government can cut sovereign debt.

The Spanish story demonstrates that with an attractive policy framework and subsidy regime and a planning system that is conducive to investment the market can deliver quickly scaled up renewables deployment. But it also demonstrates the need to ensure sufficient public funding is available to underwrite such scale up, with funds sourced either from tax payers or from consumers in the form of higher energy bills. The Spanish Government has excelled at the former, but the global financial crisis and its impact on the Spanish economy has seen the Government wobble on that latter. As a result the tariff deficit has caused problems for the utilities: in 2010 Iberdrola had to borrow over €1 billion to cover the Government's unpaid debts<sup>68</sup>. The continuance of this situation may also impact on the ability of utilities to raise sufficient finance for their forward investment programme and points to the fact that regulated consumer energy prices must increase. However, against a backdrop of austerity and high employment it is difficult to see how this can be achieved – particularly with national elections now due in November 2011.

The Spanish Government has also provided a case study in how not to manage the messaging and communication for reductions in support for low carbon technologies. In Germany, for example, announcements were well-managed so that it was clear that existing investments would be protected through 'grandfathering' of rates and early clarity on the nature of reforms was provided. In Spain, by contrast the Government began to engage with key players in the renewables sector around retroactive solutions to address solar PV overbuild in late 2009/early 2010. This coupled with various opaque announcements through 2010 generated significant uncertainty until December 2010, when final details were published. This caused an ongoing media storm and panic in the market. Certainty is critical to investors – and confidence is particularly susceptible to any consideration of retroactive adjustment of policy support, reflecting the fact that investments generally take

> \_\_\_\_\_  
<sup>67</sup> FT (29 July 2011) Zapatero calls early Spanish elections

<sup>68</sup> <http://www.bloomberg.com/news/2010-10-20/iberdrola-borrows-1-1-billion-to-cover-nine-month-spanish-tariff-deficit.html>

15–25 years to deliver a return on capital. The returns are therefore eroded if retroactive changes to support mechanisms are made. While the FiT has traditionally been regarded as a popular form of subsidy among investors globally, this recent uncertainty has seen a shift in opinion among the Spanish financiers and investors we spoke to toward replacement of the tariff system with auctions because of the greater certainty they provide.

While billions of Euros in public money has been required to support the renewables in Spain, it has also brought benefits to the economy. The aforementioned Deloitte study around that the renewable energy sector in Spain had grown 28 percent in the previous year bringing revenues of €8.5 billion and cutting energy bills by €4.8 billion. In contrast government subsidies in the same year only amounted to €4.6 billion, showing that overall it had made a positive contribution to the economy<sup>69</sup>. An over focus on the impact of the tariff deficit loses sight of the large net benefits that renewables scale up have brought to Spain.

In the short-term, against this messy backdrop, the prospects for solar PV expansion look to be limited, although the outlook for wind and CSP expansion is better. But with market caps fast approaching and national elections due in November 2011, there is likely to be limited activity in the renewables market for the time being. Post-election, whatever the Government elected it will need to tread carefully to ensure it fully recovers Spain's image as an attractive place for low carbon investment.

>  
69

[http://www.appa.es/descargas/NP\\_ESTUDIO\\_IMPACTO\\_MACROECONOMICO\\_ENERGIAS\\_RENOVABLES.pdf](http://www.appa.es/descargas/NP_ESTUDIO_IMPACTO_MACROECONOMICO_ENERGIAS_RENOVABLES.pdf)