

Spain's Energy Policy: Impact of the Debt Crisis in its Renewable Energy Sector Reaching the EU 2020 Goals

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Abstract

Spain's debt overhang has changed the scene of its renewable energy sector, affecting the realization of the country's 2020 renewable energy objectives. By analyzing Spain's i) legal framework, ii) financial approach, iii) energy impact, and iv) social and environmental conditions, both before and after the 2008 financial crisis, this study seeks to establish what directly and negatively affected the Spanish energy sector and its prospective development. This follows (and is inspired by) readings, both rhetorical and empirical, regarding renewable energy sector growth in Spain and the country's susceptibility to fail in accomplishing its renewable energy objectives.

Renewable energies, sustainable development, policies for development, Spain

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In 2010, leading members of the European Union (EU) signed a strategic plan called “Europe 2020.” It set a number of targets for its member countries to reach by 2020. One of them was for each country to achieve 20% final energy consumption from renewable energy (RE) sources. However, the financial crisis since 2008 has tightened investment in RE projects, and has led to changes in RE policies that stimulated investment in the sector. Both endanger the sector's growth and the realization of the EU's aforesaid target.

According to Eurostat data, The Kingdom of Spain (henceforth, ES) received 14.3% of its energy from renewable sources in 2012, a 0.5% increase since 2010, representing a 8% advance in the goals and an elapse time of 20%. The austerity measures imposed by ES's government on the RE sector created a 68% contraction of investment in the sector in 2013 compared to the previous year. These measures have cut payments and subsidies, have suspended financial aid of new projects since 2012, and have imposed new taxes on the sector (discouraging investment in it).

ES's economic distress is linked partly to the 2007-2008 global financial crisis, partly to the 2010 European debt crisis, and partly to internal economic problems specific to ES (caused by the the former two crises). Beyond stopping subsidizing new RE projects, ES's feed-in tariff cuts, meant to manage its debt crisis, endangered the sustainability of the sector and the likelihood of fulfilling the EU 2020 targets for RE.

The objective of this paper is to identify how ES's external debt crisis is affecting the RE sector and its progress in meeting the EU's directive of receiving at least 20% its final energy consumption from RE sources. I hypothesize that ES's debt crisis caused ES to change its policies on investment in RE projects.

And in so doing endangered the realization of the EU 2020 goals.

The analysis itself contains four sections. The first provides theoretical plausibility to the claim that debt crises can threaten future investment in the RE sector *as well as* threaten governmental incentives to develop that sector. Its inductive approach attends to the role that high debt levels have on influencing investment.

The second section demonstrates that changes in ES's RE policy occurred *after* facing financial constraints from 2007 to today. It draws an inductive sketch of RE sector norms that are counterproductive to meeting the EU 2020 goals.

The third section presents ES's case study, stating ES's status in reaching the EU 2020 goal – projecting 20.8% RE energy consumption by 2020 – and tracing modifications in ES's RE policy from 2007 to 2013. It examines ES's legal framework, financial approach, energy impact, and social and environmental conditions.

The fourth and final section recommends policies in light of results from the prior three.

Literature Review

Debt overhang generates macroeconomic instability, political instability, higher interest rates, capital flight, less investment, higher inflation, lower demand, and lower productivity. All of these affect economic growth generally and increase the barriers to investment in any sector. What lies first and most specifically for the RE sector is to link energy to economic growth, and then to relate external debt to economic growth.

Energy consumption is part and parcel of all economic activity. Economic activities need energy to transform inputs into final products (Stern & Cleveland, 2004, p. 4), showing that energy is indispensable to production. On the demand side, humans (often must) consume products that use energy to continue their lives. Energy provides heating, light, electricity, and more, and all of these are needed to perpetuate any modern society. GDP growth and consumption are causally connected, so higher demand in a country's GDP will lead to higher demand for energy there (Chontanamat, Hunt, & Pierse, 2006) and we can infer from this that slower or negative GDP growth lowers demand for energy, assuming static energy efficiency. ES has a high level of energy use per capita. According to Yeager, Dayo, *et al.* (2012, p. 396), "the state of economic development and the standard of living in a given region strongly influence the link between economic growth and energy demand."

Background: Debt Crisis

The financial crisis of 2007 in the United States contaminated the European financial sector and compromised substantial public resources, forcing the state to intervene. The financial crisis led to sizable losses among financial institutions and private enterprises. The economic crunch also produced housing problems in Europe that exacerbated the crisis. Europe's economic recession, and its corollary high deficit and debt levels, evolved into to a debt crisis. ES was among the countries affected by the recession. This loss of state income led to an additional tax burden, since ES's government had to increase taxes or borrow resources to balance its budget in the fiscal year (Petrakis, 2012).

As Moro (2013) put it, "the sovereign debt crisis is a consequence of interactions between sovereign problems and banking problems that caused a severe economic slowdown." ES's economic growth slowed from 4.07% in 2006 to 3.45% in 2007 (in real PPP terms). The first signs of contamination by the US financial crisis were identified in Europe in August 2007. The reason for the slowed economic growth was the contraction of real-estate-sector investment, drops in consumer demand, consumer solvency deterioration, restrictive credit conditions, higher interest rates, risk repricing, increased public debt yields, and substantial increases in international oil and food prices. These conditions had become more restrictive, but tightened significantly after the bankruptcy of Bear Stearns, which aggravated the US financial crisis (Banco de España, 2008, pp. 109-135).

ES's government balance¹ was 2% of the country's GDP, and the debt²-to-GDP ratio decreased to 36.3%. Bond yields increased interest rates slightly, making the government pay more when compared to previous periods. Government spending increased 9.6% and was invested in social spending, infrastructure, education, and research. In 2008, ES's economic growth was below 0.9% (in real PPP terms). Internal constraints in the real-estate sector shrank, and the financial crisis's entrance into the real economy reduced exports and investment further. The Spanish Central Bank explained that the crisis led to higher default ratios among enterprises, less domestic consumption, lower financial-asset and real-estate prices, higher unemployment, tightened financial conditions, crises of confidence, decreased wealth, a decline in trade flows, and an increased perception of risk (Banco de España, 2009, pp. 3-24).

¹The paper uses the Maastricht definition of government balance

²The paper uses the Maastricht definition of gross government debt

During this year 2008, there was a change ES's government's financial trends due to the rapid stop in activity. The statistics led the government to enact fiscal stimulus measures to counter the effects of the financial crisis. Automatic stabilizers, like unemployment benefits and a decline in tax revenue, progressively reduced disposable household incomes. The economic downturn saw an increase in the debt-to-GDP ratio and a negative budget balance. By the end of the year, ES's debt-to-GDP ratio was 40.2% and the government-budget-to-GDP was -4.5%. The economy contracted 3.8% in 2009, mainly from housing-sector problems and the financial crisis. The public-revenue-to-GDP ratio fell 6.7% from its 2007 level, unemployment increased 6.7%, real-estate sector prices dropped, and the productive sector suddenly stopped (Banco de España, 2010, pp. 21-36).

The Bank of Spain bailout, a regional lender Caja Castilla-La Mancha, and ES's government created a bank bailout fund worth 99 billion euros, forcing financial restructuring and mergers. The interest rate paid on ES's bonds decreased due to the search for safety from the US financial crisis and a drop in ES's main central banks' interest rates to counter the crisis. ES's primary balance deficit increased 144%, while external debt rose by more than 34%. The debt-to-GDP ratio exceeded 54%, and the primary-balance-to-GDP ratio was 11.1%. ES's economy contracted 0.2% in 2010. The financial crisis further tightened the financial system that affected lending standards and the perception of risk regarding ES's banking system. These matters increased interest rates and bond yields against the German benchmark. Doubts over the commitment to tackle structural problems, higher unemployment rates, labor market dysfunction, deteriorating public finances, and weaknesses in the European institutional framework raised doubts about the course of public spending. (Banco de España, 2011, pp. 23-42).

Turmoil in the Eurozone's sovereign debt markets substantially increased prices of European debt-bond yields, ES's among them. Tension from the Greek (110 billion euros) and Irish (85 billion euros) financial support packages had a contagious effect on the risk of ES's economy, and so ES's debt bonds were downgraded from AAA status to AA+ by Moody's and Fitch and Standard and Poor's. The country adopted a structural adjustment agenda. This implied, among several things, labor reform: Royal Decree-Law 10/2010. The debt-to-GDP ratio exceeded 61.7%, and the primary-balance-to-GDP ratio was -9.6%.

The negative international environment in the 2011 Eurozone undermined ES's growth, and ES dipped further into its recession. The European debt crisis continued to unfold with a bailout to Portugal (78 billion euros) and a second bailout to Greece (155 billion euros). This affected the risk of ES's bond yields, increasing the interest paid up to that point to record highs. This increased lending cost forced the European Central Bank to buy bonds to cut down borrowing costs and to prevent the spread of the debt crisis (Banco de España, 2012, pp. 13-33).

ES's economic growth in 2011 was 0.05%. ES's economy mostly relies on exports to other Eurozone countries, most of which are also undergoing economic adjustments, repressing consumption. Additionally, sluggish domestic demand has resulted from a negative financial outlook regarding ES. This outlook was most fostered by repercussions of the sovereign debt crisis, the restructuring of ES's financial system, increased job destruction, further collapse of the real-estate sector, and spillover effects from government austerity plans. The debt-to-GDP ratio exceeded 70.5%, and the primary-balance-to-GDP ratio was -9.6%. In one austerity measure, ES's Parliament increased the age of retirement.

It also passed a constitutional amendment forcing the government to keep a balanced budget and held early general elections due to political tensions.

In 2012, the Greek government, other Eurozone countries, and the IMF decided to conduct a debt swap of Greek government bonds, explaining that Eurozone government bonds were not risk-free. Cyprus's economic problems followed from considerable losses from investment in Greek bonds. It had to request the Eurozone for a 10-billion-euro bailout. Investors then (and once again) began to request higher-risk premiums for Eurozone government bonds (Gruppe & Lange, 2013 (in Press), pp. 2-3). ES's bond rates rose considerably amid fears of a government bailout of its weak financial institutions, which could lead to another country bailout from the Eurozone (Banco de España, 2013).

ES's government approved another labor market reform, Royal Decree-Law 3/2012, to improve the economy's competitiveness by lowering labor costs. ES's economy then fell into a deeper recession, unemployment grew, and ES had to request 100 billion euros from Eurozone member states to recapitalize its weak financial institutions. This implied loan came with a series of conditions and a new series of structural reforms designed by EU state aid rules and the IMF (IMF, 2012, pp. 5-31). ES's economy shrank by 1.64%. Its debt-to-GDP ratio exceeded 86%, and the primary-balance-to-GDP ratio was -10.6%.

ES's economic growth in 2013 was -1.22%, but officially the third quarter of the year marked the end of its negative economic growth trend. The financial sector assistance program successfully stabilized ES's financial sector. ES's government also continued its adjustment programs in pursuit of a current account surplus (ECB, 2014, p. 69).

ES's general government debt continued to grow. ES's debt-to-GDP ratio exceeded 94.59%, and its primary-balance-to-GDP ratio was -6.77%. Continued revenue contractions, insufficient internal demand, unemployment (27%), and higher social expenditures have led to a persistent macroeconomic imbalance. The government removed regulations that fragmented the domestic market, liberated professional services, cut government jobs, and fostered new regulations for entrepreneurship (IMF, 2013, p. 6).

Methodology: Case Study of Spain

What remains is for us to comprehend how the debt crisis has influenced ES's RE policy. Current economic distress has made ES's government designate fewer resources to its RE sector, putting the EU 2020 goals further from reach. This case provides abundant information on the relative success of RE sector promotion and growth, the current economic climate under debt distress, and the monitoring of RE sector growth to meet the EU 2020 goals.

Utilizing an embedded design, we can focus attention on ES's changes in its legal framework, financial approach, and energy impact, and in the social and environmental conditions ES's energy policy produces. We compare two different time periods: the year before any evident financial distress in ES (2006) and the year following ES's state of financial distress (2013). The conceptual framework utilizes the debt overhang theory. It states that high external debt levels will affect macroeconomic stability, political stability, investment, interest rates, capital flight, poverty, consumption, and productivity. These disincentivize investment in ES's RE sector. We will show how this theory can help us understand the changes that occurred in ES's energy sector.

Impact of the Debt Crisis:

ES's structural adjustment agenda has three pillars: the restructuring of credit institutions, the culmination of an ambitious fiscal consolidation process, and progress in structural reforms (Banco de España, 2012, p. 21). In response, the government has approved measures to cut money designated to the RE industry, since it is financed by debt, not taxes or citizens' electricity bills. This has changed ES's legal framework, macroeconomic outlook, energy outlook, and social and environmental conditions.

Legal Framework

The state regulates the final prices of electricity to homeowners, industries, and the commercial sector. Utilities in ES can raise in any given year. Politicking in this area creates a gap between what utility companies charge their customers and what utility companies pay to produce electricity. The net result is a debt that ES's government assumes as its own. The tariff deficit is an energy debt of 30 billion euros. That debt is still pending payment.

The government obliges the electricity sector to buy electricity from RE projects as a priority. The feed-in tariff system promotes investment in the RE industry. It also establishes a premium option that offers a bonus on top of the prevailing electricity price.

ES is a world leader in RE generation and equipment manufacturing. The country utilizes FITs as an instrument to promote RES-E. FITs are price-based policies which set the price to be paid for every RE-produced kWh generated (in the form of guarantee premium prices), as well as a purchase obligation on utilities (supply companies or grid systems). Costs are borne either by consumers or by the public sector.

According to del Río & A. Gual (2007, p. 998), since 1980 to 2003, there has been continuity and stability in legal RES-E promotion, but it has later suffered a reversal after the financial crisis and debt crisis. This can be made apparent with the differences in legislation relevant to renewable electricity.

The International Energy Agency shows that there have been thirty-six (36) normative changes in the RE sector. They consist of laws and ministerial decisions. Between 1999 and 2007, there were thirteen (13) key elements regulating the industry. After 2008, and to the present, there have been twenty-three (23) new regulations introduced that modify previous rules in most cases. These affected the prices offered to RE technology, modifying the profitability of ES's RE industry.

ES's government, due to financial distress, has deemed the FIT allocated to wind power and other incentives to promote RE excessive for its current budget, leading to important savings and making substantial new market structures.

In response to the crisis, the government has passed a number of highly contested measures to rein in costs, including retroactive changes to existing solar contracts (Robinson, 2012). This decision has stirred up protests from the solar industry and from investors worldwide, and a wave of lawsuits are already in the works to counter the government's plans (E3 Analytics, 2011). This reduced investment in the sector by 68% in 2012.

Macroeconomic Impact

ES's economic contraction has meant a fall in consumption of energy due to lower economic activity and foreclosures of businesses and industries.

The U.S. Energy Information Administration's (EIA's) statistics confirm that lower economic activity has generated lower energy demand; from 2007 to 2013, the energy demand has decreased 11.4%. In 2007 ES's total energy consumption was 6.7351 quadrillion BTU. In 2012, it was 5.9665 quadrillion BTU.

RE contributes to the GDP growth, export earnings, net fiscal contributors, investment in R&D, and lower energy prices. In 2012, the sector represented 1% of Spain's GDP, 10.563 trillion euros. Despite receiving subsidies from 2005 to 2012, ES has been a net fiscal contributor. In 2012, ES's (ibid.) RE sector was a net fiscal contributor with 569 million euros. The sector also contributed to a positive trade balance, since it entailed net exports of 724 million euros (APPA, 2013). Another positive contribution of the RE industry comes in resources it invests in R&D, 4.23% of its total contribution to the GDP in 2012 (313 million euros). Its total contribution to the GDP is well above the mean of 1.3% that ES invested in R&D that same year. The production of renewable energies has helped lower the price of MW per hour. This cheapened daily market prices, costing approximately 18 euros per MWh and in total represent a savings of 4.056 billion euros to the economy.

The Energy Impact

RES-E generators could have chosen one of two alternatives before the crisis: a) a fixed premium (on top of the electricity market price) or b) a fixed total price (fixed feed-in). The premium in (a) had been updated annually since 1999, but the government, in line with the variation in the average electricity sale price, applied the total sum of the market price plus the premium.

The choice (b) also adjusted annually, allowed generators to know their revenues would grow regardless of changes in market price.

ES's FITs were successful in promoting wind and solar energy projects. FITs, however, are but one factor influencing the deployment of RES-E. Administrative procedures, grid connections, corruption, and trust also play roles. In 2013, ES represented more than 19% of the total wind energy installed in Europe, 22,959 MW of 117,289 MW. That same year, wind energy installations decreased by 84%. Most wind energy investments are moving abroad. This situation comes in response to the halt in new RE subsidies in ES. This not only threatens jobs and investment in the RE industry, but risks ES's companies no longer being competitive leaders in that sector. ES's share of energy in gross final energy consumption was 14.3% in 2012. A slowdown of this share implies increased energy independence from traditional sources like coal, natural gas, petroleum, and nuclear energy. The energy intensity³ of the economy was 136.4 that same year. The APPA estimates that, from 2000 to 2012, it grew 37.8%, while the demand grew 2.4% (APPA, 2013, p. 121).

Fulfillment of directive 2009/28/EX of the European Parliament asserts that ES has to have at least 20% of its gross final consumption come from renewable sources. The report from Ecofys Consultancy for the European Commission explained that ES's changes in its legal framework from 2010 to 2012 undermined investors' confidence and will affect its RE sector's growth rate. The most optimistic simulation tool shows that ES will not reach the EU 2020 targets and will only reach 17.15% (Ecofys, 2012, p. 66). This report did not consider the latest RE sector reform, Royal Decree-Law 2/2013.

³ Gross inland consumption of energy divided by GDP (Kg of oil equivalent per 1000 Euros)

Which limits increases on the tariff according to the consumer price index and eliminates premiums, aggravating the sector with more regulatory instability.

Social and Environmental Conditions

The Flash Eurobarometer 360 of the European Commission published that 81% of Spaniards believed that the future energy options should support renewable energies. Public support for RE should be considered in the elaboration of ES's energy matrix plan (APPA, 2013).

Ecologically speaking, renewables significantly combat climate change. RE technologies are becoming more competitive compared to wholesale electricity prices, but their continued growth hinges on subsidies to facilitate development and drive further cost reductions. The RE sector prevented the importation of 13,480,857 tons of oil (TOE), preventing the emission of 36,745,548 tons of CO₂ into the atmosphere in 2012. This is equivalent to 2,429 million euros in savings on imports. From 2005 to 2012, estimates state that renewables prevented the emission of more than 215.5 million tons of CO₂, equivalent to 3.095 trillion euros in associated savings. It also prevented the emissions of 171,752 tons of NO_x and 322,874 tons of SO₂. ES had a very high unemployment rate in 2013. Its RE sector has also experienced job losses since 2008 (the sector's employment peak). In global terms, the sector's workforce decreased 17% in from 2008 to 2012, from 137,522 to 113,899 people. A report of ES's Renewable Energy Association (citation) stated that 54,938 jobs are created directly by the sector, and 58,961 indirectly. The economic crisis has also reverted the tendency to substitute energy consumption from highly contaminating sources, which are cheaper. ES's coal consumption increased 98.5% from 2010 to 2012.

The consumption went from 15.9295 million short tons in 2010 to 31.635 million short tons in 2012. The reasons behind this increase were the introduction of subsidies to coal and preferential access of the wholesale power market to coal-powered generators (EIA, 2014).

Conclusions

ES's fulfillment of the EU 2020 goals to reach 20% of its final consumption from RE sources was compromised once ES's government adopted measures to reach fiscal and debt sustainability. The legal framework, the macroeconomic outlook, the energy outlook, and the social and environmental situation has been affected by the debt crisis. The present legal changes that regulate the sector have created legal insecurity, weakening investors' confidence and the profitability of existing RE projects. The growth rate of the RE sector faces a bleak future once energy demand increases. The renewable share of total energy consumption will be lower in coming years if changes are not made and re-establish confidence among investors.

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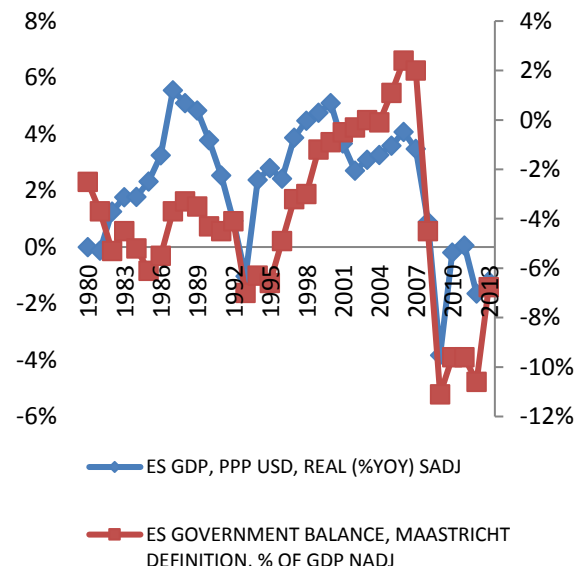
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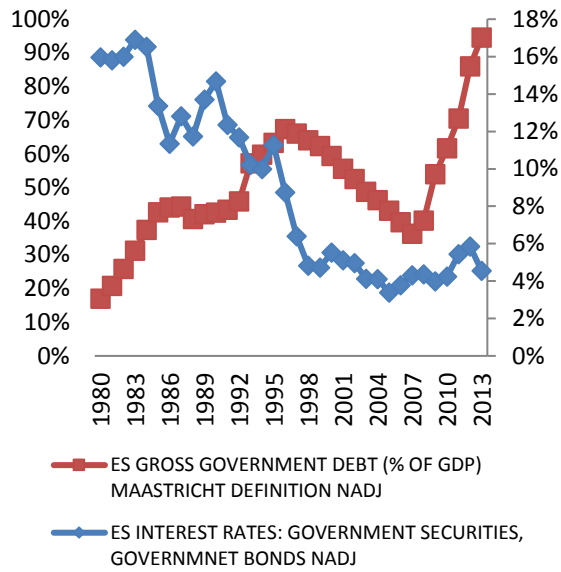
Annex

Annex 1 Spain Economic Growth and Government Budget Balance



Source: (Datastream International, 2014c)

Annex 2 Spain Debt and Bond Yield Interest rates



Source: (Datastream International, 2014d)