Spain´s renewable energy regime: Challenges and uncertainties

Arturo Rojas and Belén Tubío[1]

Recent regulatory changes affecting the renewable energy sector have radically changed remuneration for generation of power from these energy sources, significantly eroding the profitability of most renewable energy facilities.

The legal certainty and revenue visibility afforded by the old remuneration regime prompted a boom in renewable energy development in Spain, with these sources accounting for 42.8% of total output in 2014, according to Red Eléctrica de España (Spain's grid operator). According to the International Renewable Energy Agency (IRENA), this ranks Spain fourth worldwide in terms of installed wind capacity and number one in terms of installed Concentrating Solar Power (CSP). Under the new renewable energy remuneration regime, power produced from renewable sources no longer benefits from a pre-established long-term tariff, as premiums are now subject to review every six years. Changes in remuneration will now be shaped by potential mismatches between the system's regulated income and costs. The introduction of uncertainty in renewable remuneration has had a negative impact on the sector´s profitability, and as a consequence increased the level of returns demanded by investors in this sector.

Electricity system imbalances

The boom in renewable energy drove electricity system costs higher, exacerbating pressure on the system's structural revenue shortfall, the so-called tariff deficit. The Ministry of Industry, Energy and Tourism (hereinafter, the Ministry of Industry) transferred some of the increase in system costs through increasing consumer prices, which rose by 63% between 2003 and 2011, and another portion to the regulated system, in the form of cuts to remuneration, including remuneration for producing from renewable sources.

Since 2012, the Ministry of Industry has passed a series of measures designed to reduce sector costs, some of which have affected renewable energy remuneration directly: reduction in the number of equivalent hours of solar photovoltaic (PV) output entitled to premiums, elimination of the 'pool + premium' remuneration option and a moratorium on the incentives for building 'special regime' facilities (RD Law 1/2012).

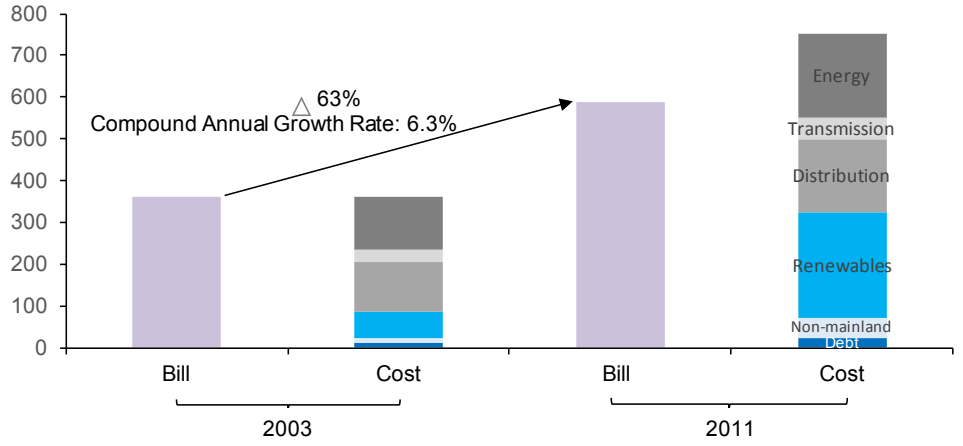
The annual tariff deficit was finally corrected in 2014 under Law 24/2013, which had been designed precisely to make the system financially sustainable. Compared to a tariff deficit of 3.54 billion euros in 2013, the latest data available (Settlement 11/2014 by the energy sector watchdog, hereinafter the CNMC, according to its Spanish acronym) put the 2014 deficit at

[1] A.F.I. - Analistas Financieros Internacionales, S.A.

Exhibit 1

Annual average consumer bill

€/MWh



Source: AFI based on Ministry of Industry data.

Table 1

Energy system costs

Cost	2003	2011	Increase %	Average increase %
Debt	12	24	100	9.1
Non-mainland stranded costs	12	47	292	18.6
Renewable premiums	60	253	322	19.7
Distribution	120	176	47	4.9
Transmission	31	52	68	6.7
Energy	125	199	59	6.0
Total	**360**	**751**	**109**	**9.6**

Source: AFI based on Ministry of Industry data.

369 million euros, due mainly to lower demand than was forecast at the time of calculating the regulated portion of electricity tariffs (tolls).

Prevailing regulatory framework

Today's renewable remuneration regime pivots around the 'Reasonable Return' concept, which is applied to a theoretical 'Initial Investment' value and calculated from when the facility was commissioned. Each class of technology is assigned a 'Regulatory Useful Life' during which a facility is entitled to a remuneration supplement for investment that is incremental to the revenue obtained by selling electricity in the market at pool prices. This supplement is designed to deliver the targeted Reasonable Return.

For technologies with higher operating costs-essentially solar PV, solar CSP and co-generation the regime also provides for an operating

remuneration supplement designed to cover the portion of a facility's operating costs that cannot be recovered by means of sales at pool prices.

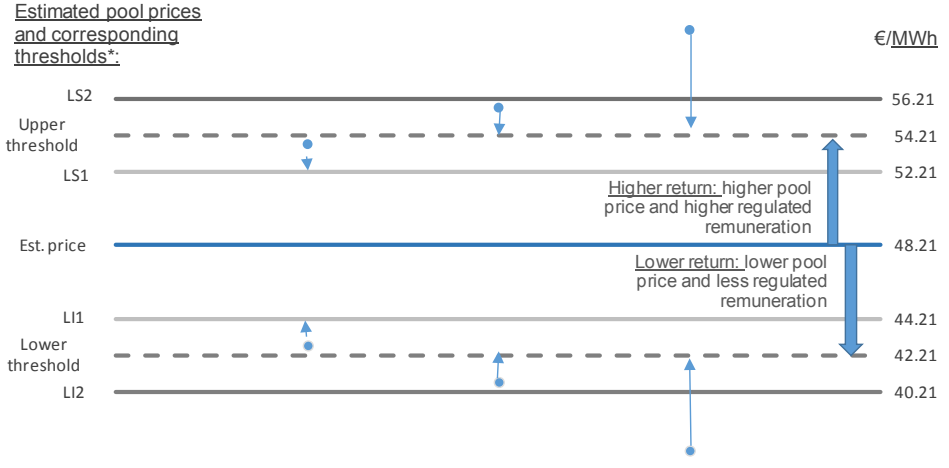
The facilities penalised the most by the regulatory changes with respect to the last sector-special regime (RD 661/2007) are, firstly, the more efficient wind farms, those with the highest output per installed MW, as their Initial Investments are remunerated using the same Reasonable Return criteria, regardless of actual operating hours. Also adversely affected are the oldest wind farms (those commissioned before 2005). Since these facilities have enjoyed more years under the old regime, they do not need the remuneration supplement to deliver the Reasonable Return from their date of commissioning to the end of their Regulatory Useful Lives. These facilities are no longer entitled to remuneration for upfront investments. Their remuneration is generated exclusively by sales of energy at pool prices. These farms have seen their income fall by more than 50% in some instances.

The new regulations introduce another risk in terms of facility returns related to the specific hourly profile of their output. To calculate the amount of regulated investment still to be recouped, or the Net Asset Value, the average pool price is corrected by an "adjusting coefficient", which is unique to each class of technology. The adjusting coefficient reflects the difference between the average pool price and the hourly prices effectively collected by the facilities.

For example, in the case of wind power, this coefficient is less than 1 (0.8889) as these facilities typically produce electricity at times of the day at which the pool price is below the average, in part precisely because of the downward pressure exerted on pool prices by the wind power being produced. However, the real adjusting coefficient does not depend only on the class of technology employed but also on the site. Accordingly, some facilities benefit from the use of a single coefficient, while others are negatively impacted by it, seeing their profitability fall as a result.

Exhibit 2

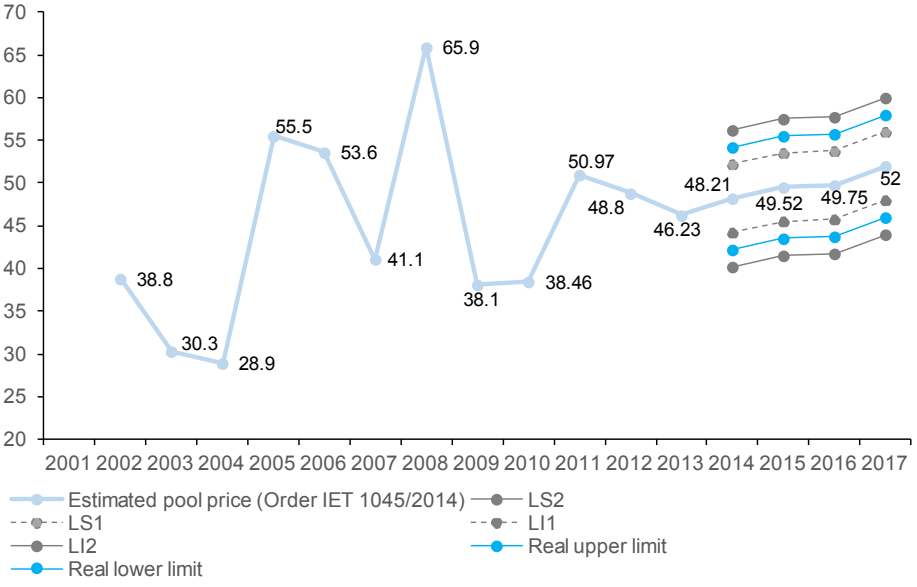
Price adjustment mechanism



*Note: *Defined for each regulatory stub period.*
Source: AFI based on RD 413/2014.

Exhibit 3

Historical average price in the daily and intra-day market: Estimated pool prices and thresholds defined in Ministerial Order IET/1045/2014



Source: AFI based on OMEI quotes and Ministerial Order 1045/2014.

Regulated remuneration will be revised every three years to reflect estimated revenue from energy sales valued at the average annual daily and intraday market price as a function of the trend in market prices and forecast operating hours. The higher the estimated pool price, the lower the regulated remuneration the renewable energy facilities will receive, as higher pool prices reduce the portion of investment costs that the facilities cannot recoup by means of market sales.

In the short term, renewable energy facilities' liquidity situation will be affected by fluctuations in pool prices.

Some of the ex-post difference between the estimated pool price and actual prices will be made up for by means of future remuneration parameters. To quantify this adjustment, the Ministry of Industry has established upper (LS1 and LS2) and lower (LI1 and LI2) limits or thresholds on either side of the estimated price. If the actual price falls outside the narrower limits (LS1 and LI1) on either side, an adjustment is triggered that will be compensated by means of the facility's remuneration over the rest of its Regulatory Useful Life, as shown in the Exhibit 2.

In keeping with the estimated price and limits set for 2014 - 2016, the facilities' exposure to price fluctuation risk is limited to a maximum of 12% above or below the estimated price. However, the adjustment for deviations in excess of or less than 12% is asymmetric in terms of liquidity as the adjustment is staggered over the entire remaining Regulatory Useful Life. If the pool price is higher than estimated, the facility will receive the full market value of its output and the adjustment will translate into a lower regulated investment value pending recovery (Net Asset Value). If, on the other hand, the market price is lower than estimated, the facilities will receive lower income, although they will benefit from a higher investment value

with respect to the remuneration not received via the market, outside of the 12% exemption band.

While the last set of sector regulations protected renewable facilities from variation in pool prices, the new regulations expose them to price trends. For example, in 2014, the average price in the daily market was 42.13 euros /MWh, which is 6.38 euros/MWh below the price estimated by the CNMC for 2014, reducing forecast revenue in the short term and placing a strain on liquidity. The corresponding remuneration adjustment will be applied from the beginning of the next regulatory stub period (which begins in 2017) until the end of the facilities' Regulatory Useful Lives. Estimated prices are in line with average pool prices in recent years.

Stagnation in capacity additions

RD 1/2012 had the effect of suppressing the financial incentives for new power generation facilities using renewable sources, co-generation and waste and of suspending the pre-allocation registration process. The result was a sudden end to the boom in investment in new capacity using these technologies, which posted average annual growth since 2004 of 14%.

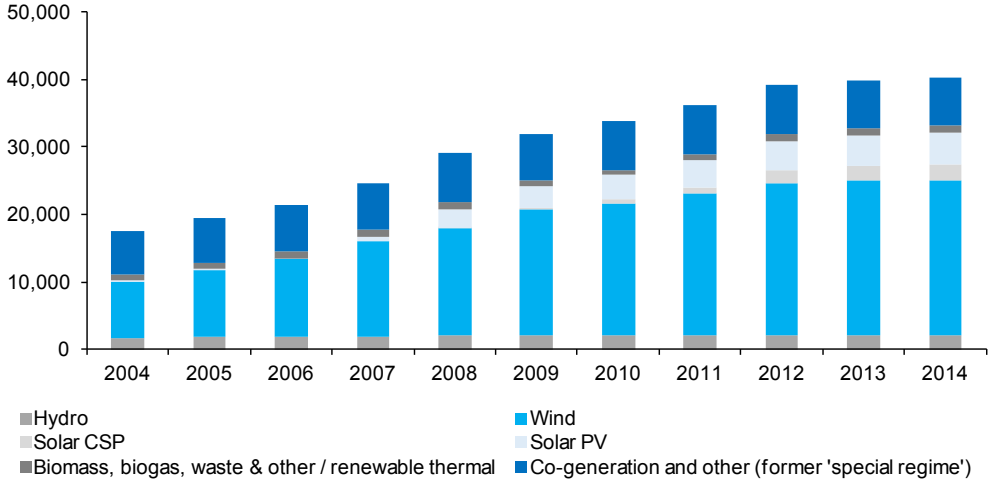
Going forward, the adjudication of the current specific remuneration regime will take the form of competitive tenders (RD 413/2014 and Law 24/2013). However, current legislation provides for certain exceptions: (i) a quota of 120 MW for facilities that are neither wind nor solar powered (mainly co-generation); and (ii) a tender for wind farms with aggregate capacity of 450 MW in the Canary Islands.

Future financial investments for renewable energy facilities will be awarded on the basis of competitive tenders with a view to reducing generation costs.

In order to meet the energy targets laid down in the Energy Efficiency Directive (2012/27/EU) by 2020, Spain needs to install between 6,600 MW

Exhibit 4

Trend in installed renewable power generation and co-generation capacity



Source: AFI based on Red Eléctrica de España (Annual Report).

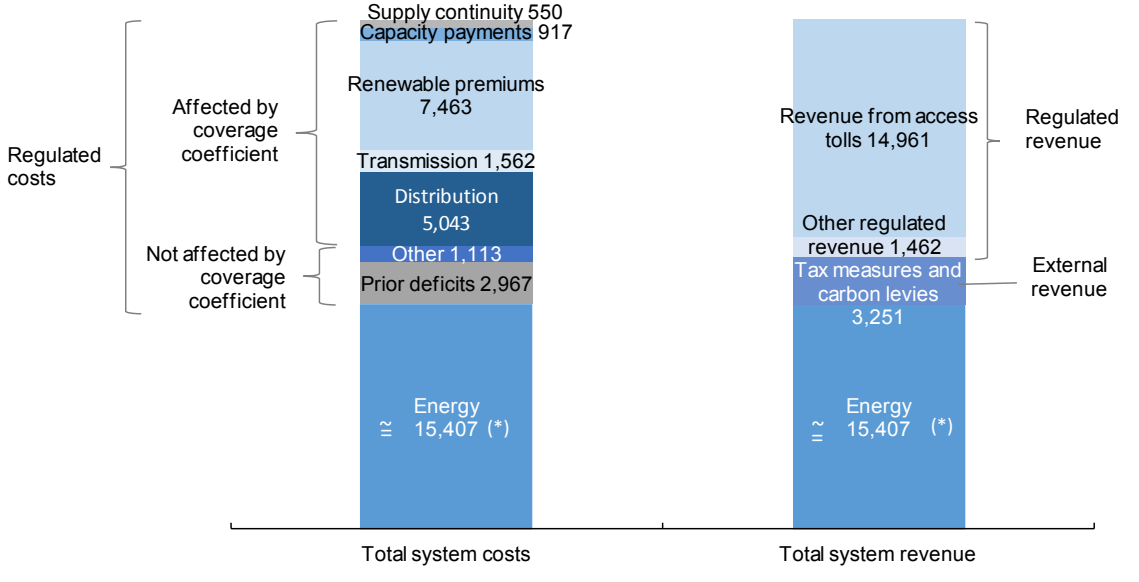
and 8,500 MW of renewable energy capacity (76% wind and 16% solar PV) which, coupled with other energy efficiency measures, would reduce final energy intensity by 1.6%, according to the Ministry of Industry's 2015-2020 plan for development of the electricity transmission grid, dated November 2014.

The addition of this new capacity should not imply as substantial an increase as in the past in system costs, insofar as the levelized cost of energy of most renewable energy sources has fallen, particularly in the last four years, to far more competitive levels, approaching grid parity. According to the Renewable Energy Generation Costs report prepared by IRENA in January 2015, the large-scale development of the various renewable technologies has helped to significantly reduce their generation costs between 2010 and 2014.

With installed worldwide capacity of over 179 GW, the cost of large-scale solar PV energy has fallen by half since 2009 to 100-255 euros/MWh (depending on location, using an exchange rate of USD/EUR of 1.1), thanks to a 75% drop in module costs and also lower installation costs. With installed worldwide capacity of over 350 GW, wind power generation costs have fallen by between 7% and 12% to 55-82 euros/MWh. Solar CSP technology development is less advanced than the other technologies, with worldwide installed capacity standing at 5 GW. As seen in the wind and solar PV segments, solar CSP generation costs are expected to continue to fall as development of this technology accelerates.

Exhibit 5

Regulated electricity system revenue and costs, 2014
(million €)



Note: (*) Using the final price according to OMEI of €57.7/MWh (source: OMEI) and power generation of 267,012 GWh (source: REE), 2014.

Sources: AFI based on CNMC Settlement Forecasts for 2014, OMEI and REE.

Electricity system sustainability: Balance between system income and costs

The continuity of the current remuneration model depends to a large degree on sustained system equilibrium. The system's sources of revenue are the electricity tariff and external sources (tax mechanisms supporting system income). This revenue has to be sufficient to cover the system's costs (cost of energy and regulated costs).

The current regulations include mechanisms for balancing system deviations that will affect renewable energy remuneration:

Coverage coefficient: One of the most important novelties introduced under the new Electricity Sector Act (Law 24/2013) is the elimination of the distinction between the special regime and the ordinary regime applied to legacy utilities. The special or renewable regime has lost its entitlement to revenue protection and the former exemption from having to finance the tariff deficit, although it retains its dispatch priority status (the order of priority with which the various technologies' output is uploaded into the grid).

When regulated revenue is not sufficient to cover all system costs, a 'coverage coefficient' comes into play, defined as the ratio between regulated system costs and revenue.

This coverage coefficient is used to lower the amount of regulated revenue collected (including renewable energy remuneration earned). These deviations may be ad-hoc or may persist until the end of a given year. If they persist at year-end, producers become entitled to claims that will be collected over the next five years. As a mitigating measure, there is a limit to the amount of the potential deficit that can be financed by the system players. It may not exceed 2% of annual remuneration and the debt generated may not exceed 5% of estimated system revenue for the year in question. In the event that these limits are breached, tolls and charges must be revised to cover at least the amount by which these thresholds have been surpassed. The revenue erosion implied by application of the coverage coefficient is another source of liquidity stress for the renewable energy generators, which cannot be financed as they lack the certification confirming related receivables.

Modification of renewable energy remuneration parameters: The Ministry of Industry can adjust renewable remuneration in accordance with the "cyclical state of the economy, demand for electricity and appropriate remuneration for these business activities (article 14.4 of Law 24/2013)," to which end it has the power to amend all remuneration parameters except for the Initial Investment and Useful Life values.

The Reasonable Return for facilities entitled to premium remuneration currently stands at 7.389% pre-tax. This figure is the result of adding 300bp to the yield on 10-year Spanish sovereign bonds. The Reasonable Return can be revised every six-year regulatory period based on the yield on the benchmark government bonds during the 24 months prior to the May before the start of the new regulatory period.

For the next regulatory period, if the 300bp spread were left intact, the Reasonable Return could fall to 5.2%, judging by the forward rates for 10-year government bonds (the forward curve implies a yield of 2.2% at the start of the regulatory period beginning in 2020 and of 2.7% at the start of the regulatory period beginning in 2026).

Renewable energy remuneration risks

Pool price fluctuation risk: An increase in pool prices above the estimates used to calculate regulated remuneration (49.5 euros/MWh in 2015) would imply a direct increase in renewable facilities' revenue. Part of such an increase (at least the portion of the increase in excess of 12%

of the estimate) would be offset in the future by means of a reduction in Net Asset Values.

Nevertheless, an intense and protracted increase in pool prices would put pressure on the system –particularly if it is caused by an external shock (and not growth in demand for electricity)– by forcing an increase in end consumer prices. And there is always the risk that politicians will lack the willpower to pass the increase in pool prices on to consumers in full. If this were to happen, two mechanisms would come into play: firstly, the coverage coefficient, designed to allocate the financing of the tariff deficit among all the system players by reducing their revenue by up to 2%; and, secondly, the tariff deficit would force a reduction in system costs, including, in all likelihood, cuts to renewable remuneration premiums.

An increase in prices driven by growth in demand would not necessarily put pressure on tariffs as system revenue would increase by the same token, alleviating the risk of mismatches between revenue and costs.

The best-case scenario for the renewable energy facilities would be a moderate increase in pool prices towards the limits at which the increase in pool prices does not trigger the adjustment mechanism, a level which, moreover, would not put too much pressure on electricity prices.

The most competitive technologies stand to benefit the most from growth in pool prices as their remuneration depends to a greater extent on market prices (leaving them less exposed to the abovementioned regulatory/political risk).

The more competitive technologies, namely wind power, are more exposed to pool price variation, as their revenue depends on pool prices to a relatively greater extent.

In fact, if the increase in pool prices were of sufficient scale, some of these technologies would no longer need additional remuneration as they would be able to cover their operating costs and investments from the revenue obtained from sales in the market. Note that under no circumstances does an increase in market remuneration, even if it means losing entitlement to regulated remuneration, require a facility to return remuneration already received.

In contrast, a drop in pool prices would trigger a direct reduction in facility revenue, causing liquidity stress for the renewable producer, albeit partially offset in the long term by means of entitlement to remuneration with respect to a higher Net Asset Value. The least competitive technologies would

Table 2

Contribution by market revenue *vs.* regulated remuneration to total remuneration (*)

%	Wind		Solar	
Technology	Oldest (up to 2003)	Newest (after 2008)	PV	CSP
Revenue from sale of energy at pool prices	100	<50	13	17
Investment remuneration supplement	0	>50	81	70
Operating remuneration supplement	0	0	6	13
	100	100	100	100

Note: (*) Average percentages based on 2014 remuneration using estimated pool prices.

Sources: AFI based on CNMC Settlement Forecasts for 2014, OMEI and REE.

be better placed in this scenario, as they depend on pool prices to a lesser degree.

Renewable energy facility remuneration is no longer insulated from market developments.

Drop in demand for electricity: The power produced by facilities using renewable sources, co-generation or waste enjoys priority dispatch status, which means that all of the energy produced is sold in the market. However, under the new regulatory framework, the renewable energy facilities are indirectly exposed to demand risk. A drop in demand for electricity would reduce system revenue (tolls and charges), while costs would stay largely constant, generating a deficit. This imbalance would be financed by the system agents in the short term, up to the mentioned limits (of 2% and 5%); beyond these limits, access tolls would have to be modified. In light of possible political reluctance to do so, the sector would again face the threat of renewable remuneration cuts by means of a reduction in the Reasonable Return.

A drop in demand could be accompanied by a decline in pool prices, reducing the facilities' revenue two-fold, as happened in 2014, albeit moderately. In the specific case of 2014, the renewable facilities' revenue was not especially affected as, exceptionally, they had been collecting premiums corresponding to the prior regime (although they have had to return these sums over the course of 2014). This surplus liquidity means that they did not suffer the revenue restrictions caused by the drop in demand and prices in 2014.

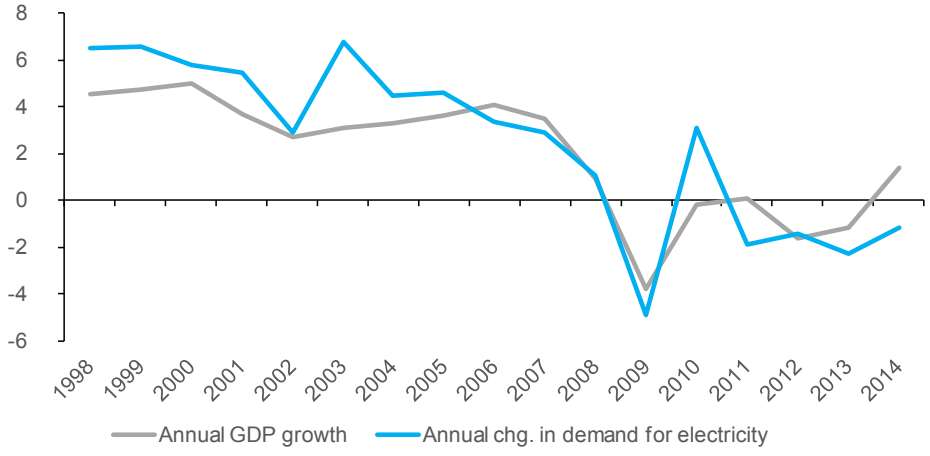
The growth in GDP estimated for 2015 should drive a recovery in demand for electricity. Prior to the crisis of 2008, growth in GDP was accompanied by relatively higher growth in electricity demand (elasticity: >1). Similarly, demand contracted by less than GDP in the ensuing years. In the long term, electricity demand elasticity to GDP may fall below one due to energy efficiency gains and/or a shift in the productive structure towards a less energy intensive mix, *i.e.,* one that is less dependent on industry, construction and transportation and more dependent on services.

In 2014, Spanish GDP rose by 1.4%, whereas demand for electricity narrowed by 1.2% (-0.2%

Exhibit 6

Demand for electricity and GDP

(percentage)



Source: Red Eléctrica de España.

correcting for seasonality and temperatures, according to Red Eléctrica de España). The trend in demand in 2015, a year in which economic momentum is expected to gain strength, will be illustrative in terms of a potential change in the structure of demand. Tellingly, in January 2015, demand rose by 2.8% year-on-year, indicating elasticity of >1 once again.

Investor appetite

The new regulatory framework generates enough uncertainty, albeit ring-fenced, in terms of remuneration as to warrant a return that is higher than the so-called Reasonable Return.

The recent Saeta Yield, S.A. IPO provides a good benchmark for the returns demanded by investors for this class of regulated assets. ACS listed 51% of a company holding a portfolio of 538.5 MW of wind farms and 149.8 MW of solar CSP farms, all operational and all entitled to the current renewable energy regime. At the IPO price, its enterprise value (market value plus net debt) was higher –at 1.96 billion euros– than its valuation for remuneration purposes (NAV: 1.56 billion euros). Assuming continuation of the current regulatory regime, investors are expecting a return on the IPO price of 6.3% plus the return the facility is able to generate by selling its output at pool prices at the end of its Regulatory Useful Life.

Table 3

SAETA IPO and return expectations

Market value	852
Net debt (*)	1,108
Enterprise value (€ m)	1,961
Regulatory value (NAV) (€ m)	1,560
Reasonable Return on regulatory value (%)	7.398
Reasonable Return x NAV/(enterprise value) (%)	5.9
Implied cost of capital (AFI estimate)	
Cost of debt (current average) (%)	4.5
Cost of equity before tax (%)	7.8
Cost of equity after tax (%)	6.3
Weighted average cost of capital before tax (%)	5.9

Note: (*) Factoring in the debt reduction notified to the CNMV on 12/02/15 and the disclosures made in the prospectus dated 30/1/2015.

Source: AFI estimates.

Summary and conclusions

The financial incentives afforded under previous regulatory regimes fuelled a boom in renewable energy development in Spain. Once the facilities producing power from renewable sources started to generate over 40% of the electricity demanded in Spain, it became untenable to continue to protect the sector from broader sector developments for remuneration purposes.

The new remuneration framework has been endowed with several remuneration adjustment mechanisms: the price adjustment mechanism, the financing of potential mismatches by means of the coverage coefficient and the modification of the reasonable return.

New facility financing arrangements can be structured on the basis of current cash flows but will need to factor in debt service coverage ratios and formulae capable of accommodating potential downward revisions to remuneration in the future.

As for existing capacity, the room for manoeuvre is slim beyond the possible integration of facilities in order to achieve economies of scale.

The current low interest rate environment will spark investor appetite in regulated assets that offer a reasonable level of visibility in terms of cash generation and, against the backdrop of electricity sector stability (underpinned by the anticipated recovery in demand for electricity), offer long-term returns on officially-recognised investment levels in excess of 5%.