

OPTIMIZATION PROPOSAL FOR THE RES-E SUPPORT MODEL IN PORTUGAL

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Overview

Of the total primary energy consumed in Portugal, 78% are fossil fuels (EPA, 2011), even though the country has almost no fossil energy resources. As a consequence, the energy consumption growth has been always accompanied by an increase on imports of fossil fuels, leading to a significant dependence on external primary energy sources.

In 2009, Portugal was the sixth country in the European Union (EU-27) with the highest energy imports dependence rate; about 81% of total energy consumption compared to the European average of 53.9% (Eurostat, 2011). The largest percentage of imported energy was oil, also encompassing significant amounts of gas and solid fuel. This context of excessive dependence from abroad puts at stakes the country's energy supply, making it more susceptible to geopolitical tensions that may occur in the exporting countries, while undermining the national competitiveness.

The intensive use of fossil fuels by the Portuguese economy contributes to a loss of competitiveness of companies located on national territory, and also impacts heavily on the countries environmental performance and especially in what regards the emissions of greenhouse gases (GHG). In what comes to the commitments under the Kyoto Protocol, the Country's performance has been insufficient and according to the Portuguese Environmental Agency (EPA), in 2009, the energy sector (mainly energy industry, transport and construction industry and manufacturing) accounted for 73% of GHG emissions.

Under this framework, the Portuguese public authorities are aware that a proper energy policy is crucial to answer to the national and international energy challenges and commitments, and for that reason policies have been adopted to promote investments in renewable energy resources. During the last years, different measures have been implemented to take advantage of the national renewable potential and ambitious internal targets concerning RES-E share in energy supply have also been adopted. Thus, Portuguese government has established RES-E as a central element of the national energy policy, using feed-in tariffs (FIT) as the main support instrument. This strategy has proved effective in encouraging investment in renewable power plants.

Since 2000, the share of RES-E in national energy supply has been increasing, especially after the 2005 policy review. In 2010, 50,1% of domestic gross electricity consumption was generated from renewable resources (EPA, 2011). This figure was not only above the target of 39% previously outlined for 2010 by 2001/77/EC Directive, but also exceeded the 45% objective set by the Resolution of the Council of Ministers No. 1/2008 of 4 January 2008.

RES-E development reflects the Portuguese commitment in using renewable resources, and the effectiveness of feed-in tariffs to increase capacity investment. However, this plan entailed additional burden on electricity consumers. The Energy Services Regulatory Authority (ERSE) reported that, about 44% of standard low voltage tariff refers to General Economic Interest Costs and 35% of these are mainly related to RES-E support (ERSE(a), 2011). Just in 2010 the annual cost of wind power production – the most preeminent RES-E in Portugal – was €97/MWh, while the reference price of the regulated market was €39.2/ MWh (ERSE(b), 2011). Despite that, wind power is one of the renewable with less over costs associated, when compared with photovoltaic or biomass (ERSE(b), 2011).

Methods

In the European context, the debate for RES-E penetration is associated with the discussion over the European single energy market. The European Commission (EC) wishes to hasten the approximation between communitarian goals and national priorities, through cooperation and convergence of solution that have gradually expanded throughout the European Union (EU). Currently, FITs are the most widely implemented support instrument for RES-E. Despite the fact that countries that chose FITs display the most efficient and effective performances, the adoption of this instrument by itself does not guarantee the

success of the support system. RES-E development also depends on the implementation of additional regulatory design characteristics besides the adoption of a specific tariff system.

In this work we aim to discuss the Portuguese feed-in tariff model, inspired by the Spanish and German experience. Our optimization proposal for the Portuguese model arises from the theoretical comparison of the three support models. Through the comparative analysis we identify the key differentiating regulatory design characteristics of Spanish and German models, and how they are determinant for model's performance. The objective is to assess what regulatory characteristics should be introduced in the Portuguese model to improve its performance.

Results

From the theoretic comparative analysis, we construct an optimization proposal that includes feed-in premium option with cap and floor limits, and the application of a degression rate to both feed-in tariffs and feed-in premium options. We also suggest the introduction of peak generation differentiation and forecast obligation for all renewable energy sources. We believe that, with the adoption of these regulatory options, the Portuguese model will be more market oriented and will promote efficiency and equity, without compromising the effectiveness of the model.

Conclusions

The fact that Portugal has no fossil resources, coupled with high fossil fuel dependence to and the growing trend of energy intensity makes the country even more vulnerable to energy constraints. The susceptibility of the Portuguese energy sector is reflected in the trade imbalance, security of supply, and can lead to non-compliance of agreed targets under EU directives and recommendations, and the Kyoto Protocol. This energy context – international and domestic – imposes the need for structural changes that result in a new energy paradigm, which invariably involves the power sector. In order to achieve that, the national strategic pathway has gone through further investment in renewable resources mainly for electricity production, by adopting a feed-in model.

This work aims to contribute to the discussion of the feed-in models addressing the issue from the perspective of cooperation and sharing experiences recommended by the EU.

The conceptualization of our optimization proposal for the Portuguese model is based on the maintenance of feed-in tariffs as the main instrument and the inclusion of new regulatory characteristics. These, enhance robustness of the model in order to meet the new challenges regarding the increasing RES-E share, namely: RES-E integration in the electricity market, the increasing burden to final consumers, and fostering new RES-E installed capacity investment.

At this stage, it is impossible for us to give specific values for certain elements in the optimization proposal of the Portuguese model. In future, it will be interesting to empirically test the proposed model, in order to assess if the results obtained are as expected, and to investigate the real impact on the problem of Portugal's electricity tariff deficit.

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