

Impact of new electricity generation capacity in the power sector of El Salvador

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Abstract—The Plan for the Expansion of Power Generation 2014-2024 of the Republic of El Salvador [1], by the Consejo Nacional de la Energía (CNE), proposes the diversification of the power generation mix of El Salvador. We have developed a model of the power sector of El Salvador and use it to analyze the implications of this plan in terms of sustainability, generation costs and energy security. The plan, considering reference conditions for factors such as the evolution of the electricity demand and fossil fuel prices, will have positive effects on generation costs (reduced by 20%), sustainability (CO₂ emissions decreased by 32%) and energy security (less volatility of costs).

Keywords—power sector, El Salvador, energy scenarios, LEAP

1. OVERVIEW

The Plan for the Expansion of power Generation 2014-2024 of the Republic of El Salvador [1], by the Consejo Nacional de la Energía (CNE), proposes the diversification of the power generation mix of El Salvador, currently based mainly on oil products. As it can be observed in **Figure 1**, the share of electricity from oil sources in El Salvador is one of the highest among the Latin American countries. In year 2013, 39% of the electricity generation in El Salvador came from oil sources. This high dependency on oil products makes the power sector highly vulnerable to the volatility of oil prices.

The plan analyzed in this work foresees the installation of a 380 MW gas combined cycle, the expansion of the existing renewable energies (geothermal and hydroelectric) and the introduction of other renewables energies, such as wind and solar photovoltaic. The new combined cycle is expected to be operational by the end of 2017. Since the installed power in El Salvador is currently 1536 MW, the impact of this new combined cycle is expected to be significant. The aim of this paper is the analysis of the consequences, in terms of cost, sustainability and

energy security, of the above plan for the power system of El Salvador.

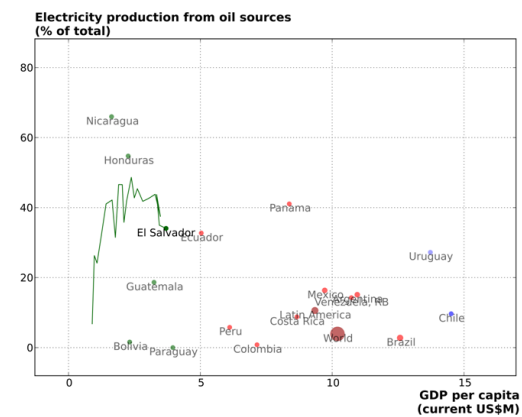


Figure 1. Electricity production from oil sources in several Latin American countries

2. METHODOLOGY

A detailed model of the power sector of El Salvador has been built using the framework of the LEAP software (Long-range Energy Alternatives Planning System) [2], a widely used system for this kind of studies. The model is structured in the following parts: electricity demand, supply and resources. In each part, appropriate sub-models have been introduced to characterize the performance of the power system of El Salvador. Once the overall model has been implemented, energy scenarios have been built to analyze the implications of the Plan for the Expansion of Power Generation 2014-2024 and the influence of relevant factors such as, the price of energy resources (mainly, oil and gas) or the installation of the new gas combined cycle.