Battery performance venezuela

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The accelerated cost reduction and consequent deployment of solar PV, onshore and offshore wind turbines and battery storage technologies are remarkable, and these trends are expected to continue in the next decades. DNV GL (2017) forecasts, that by the year 2050 the share of renewables is expected to account for 85% of the world electricity production.

Companies in the various energy segments, especially in the electricity sector, are reframing their business models and strategies to increase the chances of survival in a new and ever changing business environment. Many of the traditional European electricity companies have changed their business model to include, either as part of their core business or as a separate organization, electricity production based on renewables, mainly solar and wind, and technologies from other sectors (Midttun & Piccini, 2017).

Amid all these changes, it is certain that the business models of today will look very different in the future (Burger & Luke, 2017). It seems then, that the developed world and, to some extent China and India, have decided to have an active role in the energy transition, and are already taking steps towards a new energy future.

Venezuela has the world"s largest oil reserves and holds the 8th place in natural gas reserves (OPEC, 2017). It is also a net energy exporter with crude oil counting for more than 80% of the energy exports. In 2016, the total oil exports reached 89 Mtoe, equivalent to 1,67 million boe/day (IEA, 2018b).

In the case of renewables, a study carried out by the Ministry of Energy and Mines in 2001 (Massabi?, 2008, pp. 209) estimated the renewable energy potential may be equivalent to almost 9 million boe/day; 4,56 million boe/day in the case of Solar PV and 1,41 million boe/day for wind power. This stunning total would represent almost six times the current country"s oil production.

Therefore, it is sensible to argue that the development of renewables could play a central role in the heavily oil-dependent country. However, despite this tremendous potential, the electricity production from both wind and solar is virtually zero.

Amid a decline in oil production which has reached the lowest levels in the last two decades (below 1,3 million bbl/day (Torres, 2019)) and a rampant ever-increasing inflation, the oil price fall put extra pressure on the different subsidy schemes maintained by the Venezuelan government.

In the case of the Venezuelan energy sector, the IEA estimates that in 2017 the total fossil-fuel consumption subsidies in Venezuela rose to become one of the highest in the world at nearly USD 16,3 billion, which corresponds to around 8% of the country"s GDP. Moreover, the fossil-fuel subsidies directed to the electricity production accounted for nearly USD 3,7 billion (IEA, 2018a). In this regard, the current business model of

the state-owned electricity company Corpoelec has not only proven to be unprofitable, but also unfit for the energy transition.

Hence, it is urgent that Corpoelec re-defines its strategy and adapts a business model which accounts for the technological changes in the energy sector and ensures the environmental sustainability of its operations. Before diving into this matter, let"s first explore the current status of the electricity sector in Venezuela and Corpoelec"s current business model.

All the activities related to the generation, transmission, distribution and commercialization of the electricity are under the sole control of the vertically integrated and state-owned Corpoelec. The current total installed electricity generation capacity in Venezuela is 34 GW, but due to a lack of maintenance and investment only nearly 40% (14 GW) of the installed capacity is available or in operation (Millan & Gonzalez, 2017).

Over 60% of the electricity generated in Venezuela is from hydropower and the remaining 40% is produced by gas- and oil-based power plants. In 2016, 67633 GWh were generated by hydropower and 44944 GWh from the combustion of gas and fuel-oil (IEA, 2018b).

The Venezuelan electricity system has been designed so the main hydropower plants are located in the southern part of the country, taking advantage of multiple rivers and water reservoirs. Whereas, the thermal power plants are located throughout the whole country. The map below shows the geographical distribution of the electricity generation plants as per 2015. The blue dots correspond to hydropower and the red to the thermal power plants (Millan & Gonzalez, 2017).