

Enabling long-term investments in low-carbon energy systems in South America through joint interregional energy system planning

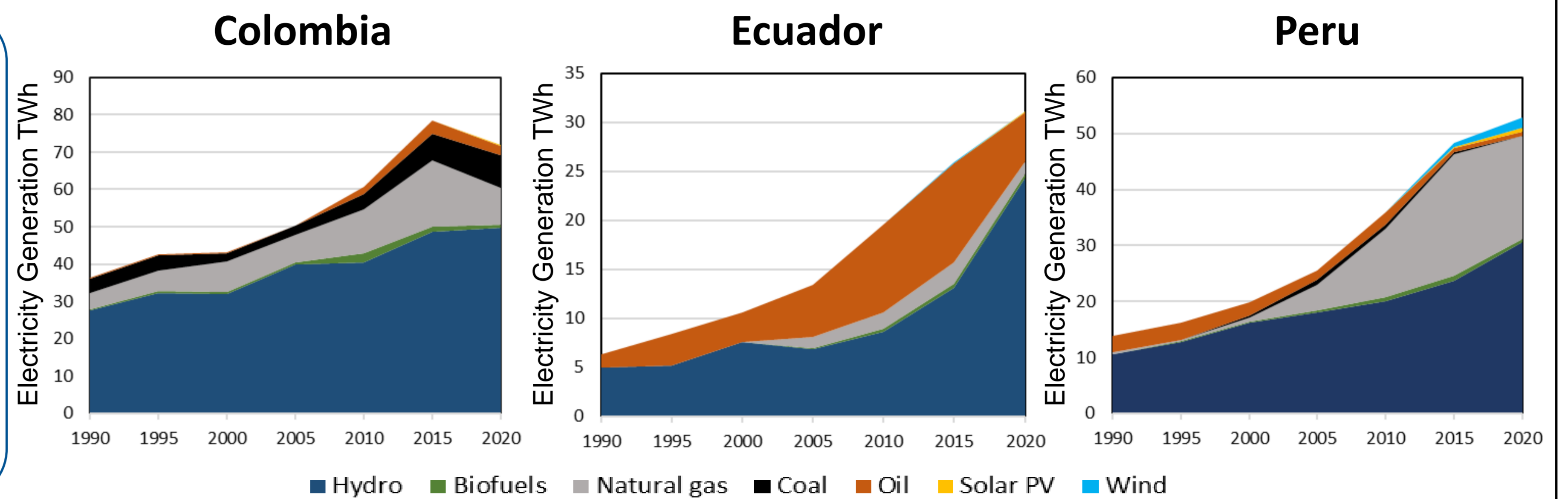
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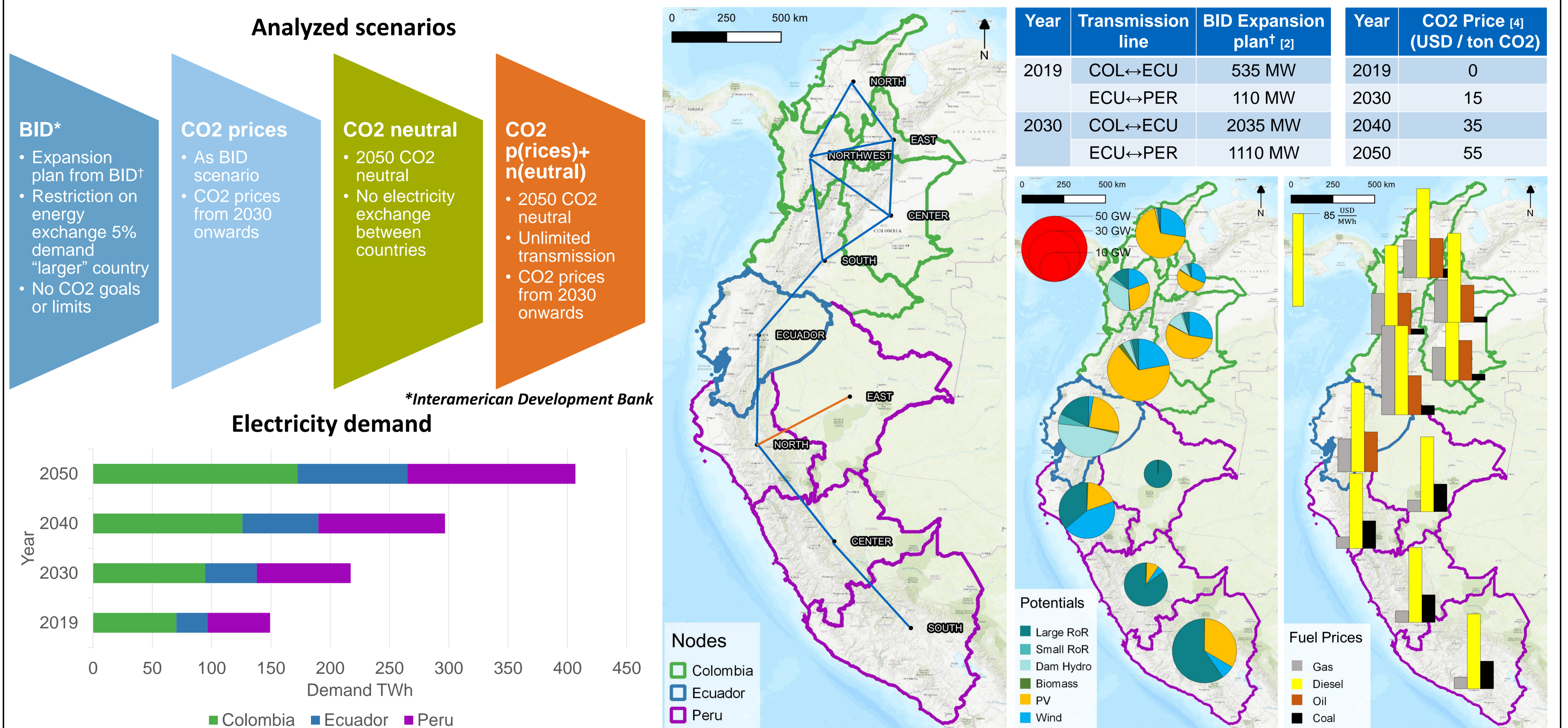
ABSTRACT

South America is a fossil fuel producer and global supplier of gas, coal, and petroleum, making economies highly dependent on the fiscal revenues of exports [1]. This study is centred around the electric systems of Colombia, Ecuador, and Peru, with a limited electricity trade as they secure their electricity needs internally [2]. There is an abundance of solar, wind and hydro resources but the cheap local fossil fuels makes the renewable transition hard. This study applies the LP cost-optimization model *urbs* [3] to evaluate long-term investment for renewable power generation. The model explores future energy system configurations for the planning horizon 2019-2050, with an hourly resolution. The objective is to assess future investment trajectories with different levels of cooperation between the countries for Colombia, Ecuador and Peru by minimizing the net total costs of the investment and operating costs of the entire energy system.

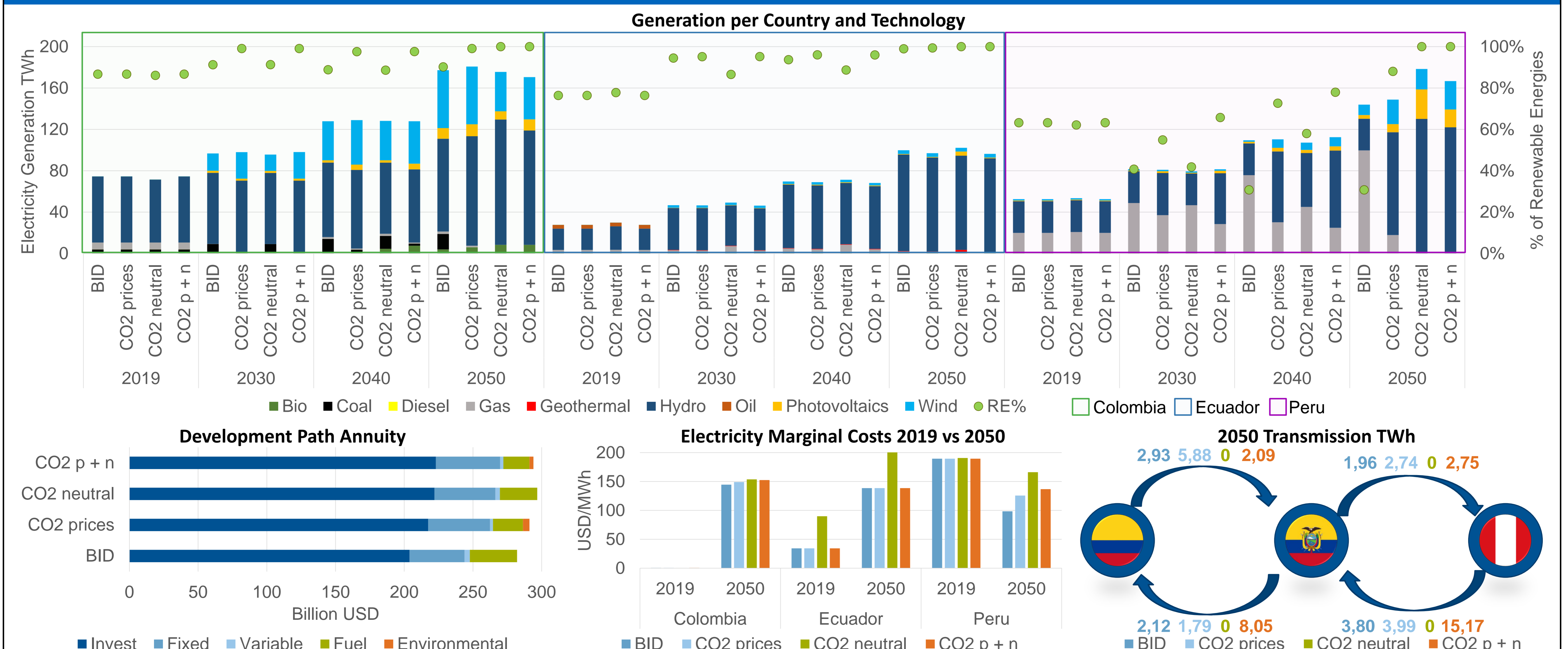
ELECTRICITY MIXES



ENERGY SYSTEM MODEL AND DATA



RESULTS



References:

- [1] Koop Fermin, "Latin America Continues to Back Fossil Fuels despite Climate Change," *Diálogo Chino*. June 8, 2021. <https://dialogochino.net/en/climate-energy/43661-latin-america-continues-expansion-of-fossil-fuels-despite-climate-change/>.
- [2] Tissot Roger, "Latin America's Energy Future", Inter-American Development Bank Publications, 2012. <https://publications.iadb.org/publications/english/document/Latin-America-Energy-Future.pdf>
- [3] Johannes Dorfner, Konrad Schönleber, Magdalena Dorfner, Soner Candas, Leonhard Odersky, Kais Siala, et al. (2019). *tum-ens/urbs: urbs v1.0.1 (1.0.1)*. Zenodo. <https://doi.org/10.5281/zenodo.3265960>
- [4] IEA (2021), *World Energy Outlook 2021*, IEA, Paris <https://www.iea.org/reports/world-energy-outlook-2021>

