



Opportunities for deploying CCS – CO₂-EOR in Mexico

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Abstract

This paper aims to provide an overview of the Mexican electricity sector and the opportunities for deploying carbon capture, use, and storage (CCUS) in new future natural gas combined cycle (NGCC) power plants from 2013 to 2028, which would be close to the Gulf of Mexico and to the zones with CO₂ potential storage. The Gulf of Mexico region has been identified because large Mexican oil fields, which are candidates for enhanced oil recovery (EOR) and existing CO₂ emitting industrial and power plants, are there. However, the CO₂ emissions of the new power plants which are presented in this paper have not been published. The focus is on NGCC because this fuel will be the main source of energy in Mexico until 2026. In March 2014, Mexico launched its CCUS technological roadmap outlining the actions to be taken until 2024. Nevertheless, this did not include the evaluation of capture readiness for new power stations. A country, which is considering introducing CCUS, should first define which CCS technologies are suitable.

The annual electricity demand in Mexico is predicted to grow by 72% from 259 to 446 TWh_e between 2011 and 2026. This rising demand for electricity is expected to be met by an increase in the use of both coal and gas with natural gas being the dominant energy source in 2027. The proportion of natural gas used in electricity generation in Mexico increased significantly from 17.1% (32.9 TWh_e) in 2000 to 50.4% (130.6 TWh_e) in 2011. In this context of rapid electrification dominated by natural gas power stations, Mexico intends to effect a parallel reduction of “its greenhouse emissions by 50% below 2000 levels by 2050”. In 2012, the Mexican Congress approved the General Law on Climate Change to reduce greenhouse gas emissions. One of the strategies proposed in order to reach this objective is the application of carbon capture in fossil fuel power stations for the purpose of EOR in the oil industry, which relies on the availability of large amounts of CO₂ in the Gulf of Mexico between 2020 and 2050. According to Lacy et al, (2013), carbon capture projects for the purpose of EOR rather than for storage only is more likely to be developed in Mexico to reduce CO₂ emissions. The main reason for this is the high cost of CCS technology. However, EOR projects could develop experience and infrastructure that would reduce the cost of the technology. In March 2014, Mexico launched its CCUS technological roadmap containing recommendations for actions to be taken at the national level up until 2024 focusing solely on EOR projects.