



A comparison study of grid impact of photovoltaic installations in Brazil according to Normative Resolution 482 and Federal law 14.300

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ABSTRACT

This work focuses on comparing the Brazilian first distributed energy net-metering policy, instituted by Normative Resolution (NR) n° 482/2012, and the new system, instituted by Federal Law 14,300/2022. A review of the development of international distributed energy regulation is presented, along with a review of the impacts caused to distribution grids because of distributed energy systems. A set of equations is presented to compare the energy billing for consumers under the old and the new Brazilian policies. Using the indication of the amount of energy the consumers are inclined to produce to reduce their bill, the PV energy production scenarios for five different low voltage distribution grids in Brazil are simulated. The simulations indicate that an increase in the power injection into the Brazilian distribution grids could lead to transformer overload and end-of-line over-voltage. The investment cost and loss of revenues from the installation of PV systems are also compared between different regulations scenarios, showing better revenues but also greater investment required for utilities under the new regulation. One of the main conclusions is that new Brazilian policy is reducing the loss of revenue in distributed energy, however, there is a risk for misplaced investments in the distribution grid.