

# **Monitoring the green transition in the power sector with the electricity generation emissions (EGE) tracker**

J. Portela González; D. Roch Dupré; I.C. Figuerola-Ferretti Garrigues; C. Yéboles García; A. Salazar de Guréndez

## **Abstract-**

**This paper introduces the Electricity Generation Emissions (EGE) tracker as a new indicator for measuring the decarbonization process associated with the electricity generation mix. The EGE is a composite indicator calculated at the cross-country level on the basis of electricity production of different generation technologies weighted by their corresponding life cycle emission factors. In addition, a four-step methodology is proposed to monitor the energy transition rigorously. It combines index construction and decomposition with the application of machine learning and visualization techniques in a cross-country cluster analysis and temporal mapping. EGE tracker provides a benchmark for comparing countries' sustainability performance in the electricity generation process and quantifies the effectiveness of their climate policies. The design of the index offers a novel measurement to analyze the contribution of each technology to emission reduction.**

**The application of EGE tracker and the proposed methodology reveals a highly heterogeneous emissions reduction trend across the OECD, indicating that the process of moving away from fossil fuels varies by country and evidences different effectiveness in their climate policies. Moreover, our study highlights the potential for better utilization of renewables and the optimization of sustainable energy mix combinations, paving the way for a cleaner, greener energy future.**

**Index Terms- Composite indicator; Monitoring; Sustainability; Decarbonization; Green transition**

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