EDGAR v5.0: a tool to evaluate the influence of technology incorporation and regulatory frameworks on global greenhouse gases and air pollutant emissions.

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During the last 30 years, the global energy sector has undergone through significant transformation, delivering a considerably larger electricity output whilst attempting to reduce air pollutant and greenhouse gas emissions. The international community has tackled this challenging dilemma by implementing different kind of policies and by encouraging several types of technological changes; including the partial replacement of coal and liquid fossil fuels by low carbon energy vectors (natural gas and renewable sources), the incorporation of more efficient power trains (natural gas fired combined cycles and supercritical coal fired plants) and the deployment of primary and secondary treatment processes for limiting air pollutant concentration in flue gases.

EDGAR is a unique global emission database due to its high sectorial, technological and geographical coverage; reporting greenhouse and air pollutant emission time series (1970-nowadays) in a very detailed way. Research is currently being conducted, aimed at updating the energy conversion and end of pipe processes so that the quantified emissions can better reflect the latest global and regional changes. By using EDGAR new data, it is possible to evaluate the impact of technology and regulatory frameworks on air pollutant emissions as well as to identify possible co-benefits and trade off associated with climate change mitigation policies for the energy industries.

This work is intended to study the drivers for greenhouse and air pollutant emission trends within this sector - both in large emitting developed and developing economies; by focusing on the role of demand increase, on the penetration of non-fossil sources and specially on the incorporation of more efficient power islands, combustion and air pollutant abatement units.