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A review of gas-to-wire (GtW) projects worldwide: State-of-art and developments

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ABSTRACT

Natural gas use for electricity generation has been increasing worldwide due to reducing greenhouse gas emissions and increasing energy security. While electricity generation by natural gas is cleaner when compared to other fossil fuels, it is also more reliable and efficient than renewables such as wind and solar. For this reason, some countries are adopting the so-called gas-to-wire (GtW) or gas-to-power (GtP) concept to use their natural gas reserves, even though they might lack a transportation and distribution grid. This study reviews eight projects developed in Asia, Africa, and South America to understand their characteristics and impacts. We provide a synthetic view and comparison of those projects, which we discuss and evaluate policy implications. Our review has shown that GtW/GtP concept does not mean building a power plant "on the top of wellheads" since gas can be transported to distances up to 2900 km. Overall, we observed that a GtW/GtP projects are concerned with providing reliable and dedicated supply to the natural gas power plant for a given period. This verticalization of the process, usually controlled by one company or group, ensures that the resources are efficiently used and creates minimal infrastructure and natural gas demand for a given region.