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Extended assessment of nuclear and alternative electricity generating technologies based on their impact on national GDP (Cost-to-GDP concept)

The Leveraged Cost of Electricity (LCOE) metric is often used to compare production costs for initial planning to rank options and advocate solutions. The use of this metric may be very misleading as it doesn't tell about the affordability nor accounts for the impact on the national GDP for a particular country.

To account for this complexity, we developed the new Cost-to-GDP extended cost assessment concept to estimate and compare costs of production for various power sources by joining LCOE and econometric methods within one parameter –called ReallCOE. The new method estimates cost share of imports within traditional LCOE comprising of imported fuel, equipment and services, adversely impacting GDP.

The approach makes possible to choose the most affordable option by based not only the absolute LCOE value, but rather the actual cost to GDP for a particular generation technology depending for a country, which helps get the highest multiplier for local economic development. Our research aims:

- To describe the Cost-to-GDP concept;
- To compare generating technologies using the cumulative effects on the national economy
- To estimate impact of supply chain localization on ReallCOE for various generating technologies;
- To illustrate specifics of SMR position at merit order ranking for developing countries

Overall this helps to provide a more balanced approach toward nuclear and fossil technologies compared to renewables alternatives considering, especially important for early stage energy planning for developing markets considering SMR inclusion into energy mix.

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