

## Framework to assess robustness and consistency of integrated energy policy analysis models

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For any model, validation and establishing credibility among the user community is always difficult. This paper explores different ways to validate a model and ascertain the model performance from an end-users' perspective.

E3-India is a multi-sectoral economic model based on a coupled input-output econometric approach, envisioned as a tool for energy-related policy analysis. It is the first model in the Indian context that operates at the state level, covering 28 states and 4 union territories. It explores the linkage between energy, economics, and environment. The multi-disciplinary and multi-regional approach makes the model considerably more complex compared to other models at the national level.

The model is conceptualized as an end-user tool to enable decision-makers to quickly estimate the impact of alternative policy decisions. The target user group may not be well-trained in the art of model development, calibration, and assessment. They may not be able to go 'under the hood' of the model to understand or edit the code and will often take the predictions at face value. This puts extra demand on the model's robustness, consistency, and trustworthiness.

This work-in-progress paper aims to make a methodological contribution to the field of model validation in the context of integrated models by proposing methods to assess robustness, consistency, and sensitivity. The methods will be applied to the E3-India model. The outcome will be used to provide feedback to the modelling team and help the potential user group to assess the credibility of model outcomes.