

# **Towards a comprehensive policy for electricity from renewable energy: an approach for policy design**

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**Abstract—** Energy policy design in Europe is a complex issue involving multiple levels of governance, and heavily influenced by institutional contexts. However policy design in Europe, and model-based analysis even more so, is arguably shaped by the neo-classical school of thought. There is a need to provide a structured approach that would facilitate the incorporating of institutional contexts into Renewable Energy Sources for Electricity (RESE) policy design and analysis. This paper presents a formal approach to RES-E policy design based on Design Theory, the Institutional Analysis and Development (IAD) Framework, and Agent Based Modelling and Simulation. Given a certain frame of analysis, we propose that it is theoretically possible to identify the complete policy design space, a set of design elements. Crucially, this aspect potentially opens up to the policy analyst new avenues for intervention, and allows her systematically explore, given a range of uncertainties, which element(s) of intervention is(are) the most vital to achieve the goals of the community. Its empirical applicability is demonstrated by representing and differentiating between six RES-E schemes from Western Europe in terms of the design elements; a model-based illustration demonstrates the value of this approach to quantitatively analyse the impact of design elements.

**Index Terms—** Institutional analysis; IAD framework; Policy design; Renewable energy policy; RES-E support

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