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Multi-objective bi-level optimization model for the investment in gas infrastructures

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Abstract-

We propose a multi-objective bi-level optimization model for analyzing the different investment options (in natural gas pipelines and regasification terminals) within the EU framework under a market perspective, considering the different interest of market participants and the multiple criteria that need to be achieved simultaneously (i.e. market integration, security of supply and competition). The model consists of the objectives of the network planner at the upper level optimizing a multi-objective function and a lower level that represents the downstream European gas market. The model is used for the assessment of the optimal infrastructure investment in the North-South Gas Interconnections in Western Europe.

Index Terms- Natural gas market; Multi-objective bi-level optimization problem; Infrastructure investment

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