A Top-Down Approach to Evaluating Cross-Border Natural Gas Infrastructure Projects in Europe

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Executive summary

There is an ongoing policy debate in Europe about how to select natural gas infrastructure projects for an EU-wide investment support scheme. In this paper, we contribute to the policy debate by providing a model-based project evaluation method for the natural gas sector and demonstrate its use on a set of currently shortlisted PCIs in Central and South Eastern Europe (CSEE). Our main tool is the European Gas Market Model (EGMM), a competitive short-run equilibrium model for the natural gas market in Europe.

The current method for identifying projects for PCI status has been developed by the European Network of Transmission System Operators for Gas (ENTSOG), tested in two PCI selection rounds in 2013 and 2015, and is subject to continuous fine tuning. However, prevailing shortcomings of the ENTSOG methodology are — among others — (1) not providing impact estimates on stakeholders other than consumers and producers; (2) not breaking down benefits by EU member states; (3) not including non-EU members; (4) failing to adequately identify complementary and competing projects; and (5) over-simplifying transportation costs. The market-based evaluation method we propose in this paper addresses all of the above issues.

Our project evaluation mechanism unfolds in three steps. First, we establish baseline scenarios that account for expected demand, supply, and long-term contractual positions, as well as infrastructure elements (pipelines, storage units, LNG terminals) that are likely to be operational by 2020 (the year of analysis). The model is detailed enough to provide equilibrium surplus estimates for all market participants in each EU and non-EU country included. Second, we simulate market outcomes by adding all possible combinations of shortlisted PCIs in our sample to the baseline case. Third, we compare the gain in regional welfare for each pipeline combination against the joint investment costs, and provide a ranking of project *sets* based on our annual net social benefit measure. By considering every feasible PCI configuration, rather than single projects in a selected order, our ranking method allows for an endogenous determination of which projects are competing and which ones are complementary.

The final outcome is an illustrative set of proposed PCIs under each baseline scenario. Even though the analysis presented in this paper is not exhaustive, we can still draw some general lessons from the exercise. All baseline scenarios suggest that the central region of South Eastern

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Europe (roughly around the core of Serbia) is most in need of pipeline investments. In the reference case, connecting Serbia and Greece through Bulgaria (southern supply direction) brings the highest net benefits for the region. The construction of a long-planned LNG terminal on the coast of Croatia would, however, make it more beneficial to build pipelines from Croatia to Serbia and to Hungary (western supply direction). Regardless of which baseline is considered, it is never optimal to build all, or even a majority of the proposed projects. This conclusion has important policy implications: supporting too many proposals would lead to underutilized infrastructure that would have to be ultimately financed by consumers through higher regulated tariffs.