

The Diffusion of Natural Gas in the Presence of Grid Constraints: Some Evidence from Switzerland

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ABSTRACT

A country's natural gas consumption depends on the rate of adoption of natural-gas-fuelled technologies by final consumers, the technical characteristics of the technologies, and on fuel-related supply and demand considerations. Besides, it is strongly influenced by the availability and limitations of the necessary supply infrastructure. For the case of grid-based natural gas supply, the market potential and profitability of the grid extension plan shape the investment strategy of a supply utility, which in turn influences the grid access of potential new adopters of natural gas. The profitability of different grid extension measures (e.g. extension to new areas, densification of the existing grid) varies widely, depending on the spatial density and energy needs of potential new clusters of adopters and the investment costs incurred. This paper, by drawing both on the economics of technological diffusion and economics of network-based industries literature, explores on how cumulative natural gas adoption and consumption evolves over time and space as a function of grid extension and other impact factors. It is also shown how epidemic diffusion models can shed valuable insights into the regularities of the diffusion process. We examine the diffusion of natural gas in Switzerland to illustrate the model proposed.

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