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TRANSMISSION NETWORK INVESTMENTS: AN ANALYSIS OF SITING DIFFICULTIES AND DELAYS IN ITALY

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OVERVIEW

Transmission network as an essential facility is critical to the operation of well-functioning electric power markets, in particular in post-restructuring ones. As a matter of fact, investments in additional capacity generate an increase in the social welfare for a number of effects (greater productive efficiency for the possibility of dispatching more efficient plants; less ability to exert local market power; less network loss; improved security and reliability of whole electrical system; environmental benefits, among the most relevant factors), Nevertheless transmission capacity appears to be lacking in many countries. For instance, in the United States, Léautier and Thelen (2009) report that miles of transmission lines per MW of peak demand had declined by 16% between 1989 and 1997. In Europe, almost 60% of the 32 Projects of European Interest (PEI) in the electric transmission network show a delay in the delivery (for 8 out these 32 projects a delay of more than 10 years)[1]. In Italy, an analysis of the most recent Transmission Network Development Plans, presented each year by Terna SpA (the Italian TSO) shows how the expected delivery dates of the most relevant projects in new lines are systematically postponed by Terna year by year (Table 1).

Table 1. Delivery dates announced by Terna in the Development Plans (DP) (2002 to 2009) for a sample of strategic projects in new transmission lines (Source: own elaboration from Terna data)

New line	DP 2002	DP 2003	DP 2004	DP 2005	DP 2006	DP 2007	DP 2008	DP 2009
Trino-Lacchiarella	Not indicated	Jan-2005	"long-term"	Dec-2008	2011	2011	2011	2012
Voghera-La Casella	Not indicated	Dec-2004	"long-term"	"long-term"	"long-term"	"long-term"	"long-term"	"long-term"
Udine Ovest-Okroglo	NA	Jun-2006	"long-term"	Feb-2009	2010	2011	2013	"long-term"
Udine-Ovest-Redipuglia	Not indicated	Dec-2006	"long-term"	Apr-2009	2011	2010	2010	2012
Calenzano-Colunga	NA	Not indicated	"long-term"	Mar-2010	2011	2010	2012	2013
La Casella-Caorso	NA	NA	"long-term"	Dec-2008	2011	20122010	2010	2012
Foggia-Benevento	NA	Not indicated	"long-term"	Feb-2008	2010	20201309	2010	2012
Sorgente-Rizziconi	Not indicated	NA	"long-term"	Aug-2009	2010	20102012	2012	2013

The consequences of these delays are evident with reference to the evolution of congestion costs in the Italian power market; as showed in the Figure 1 the uplift charge has not decreased in the period 2005 to 2009.

[1] MVV Consulting (2007), Implementation of TEN-E projects (2004-2006), available on the web site http://ec.europa.eu/ten/energy/studies/doc/2007_11_ten_e_evaluation_report_en.pdf

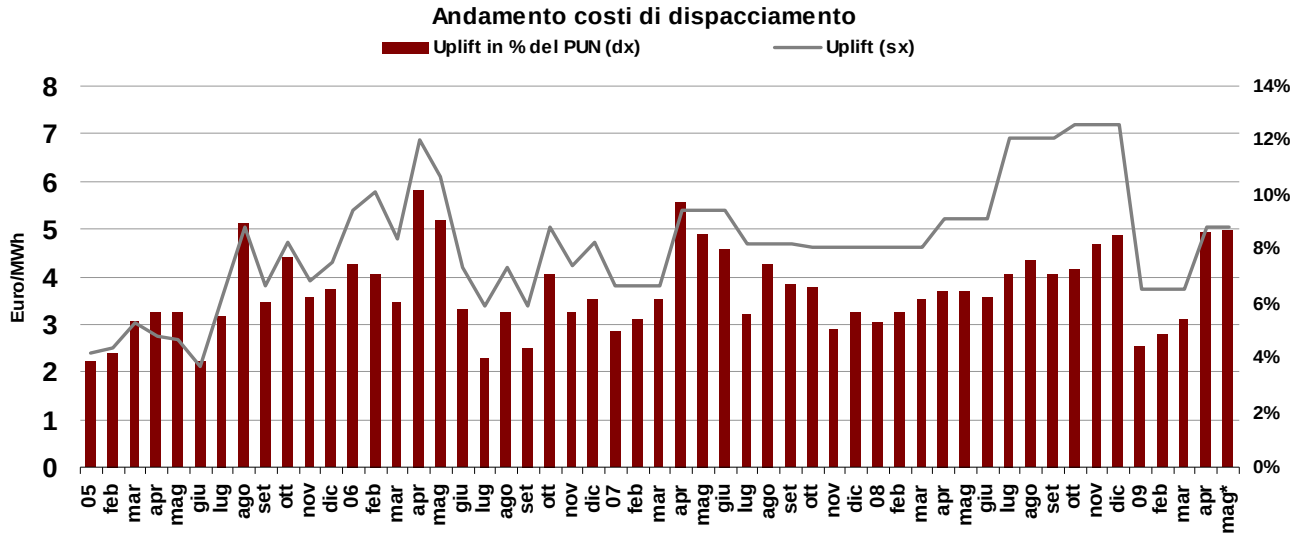

Fig. 1. Evolution of dispatching costs in the Italian power market (Source: Groppi and Pellini, 2009[2])

The present work aims at understanding and analyzing the causes of these difficulties in building new transmission lines. Following Léautier and Thelen (2009), different factors may conspire to produce such a weak performance and, *in primis*, institutional arrangement in terms of both degree of vertical unbundling and steepness of incentives for transmission expansion set by the Regulator. In Italy an Independent Transmission System Owner and Operator (ITSO) model applies and incentives for transmission expansion exist (the Italian regulatory Authority for electricity and gas has provided for an over-remuneration of pre-tax weighted average cost of capital for new infrastructures which increase the transfer capacities and remove congestions). Thus, our analysis focuses upon other potential detrimental factors related to environmental concerns and NIMBY effects, siting process difficulties, which may also contribute to this problem.

METHODS

We first propose a model for describing the siting process in force in Italy for the investments in new transmission lines, in order to identify the main steps of the process, but also the involved decision-makers and the affected stakeholders. An analysis of a sample of strategic projects in new lines planned by Terna has allowed us to identify the main bottlenecks and to obtain the average time necessary to complete each step of the siting process (overall 7 years). The misalignment between this time and that one necessary to build a power plant (7 vs. 5 years[3]) suggests to propose a proactive approach on the part of the TSO, as indicated in the literature (for instance Budhraja et al. 2009; Meyer and Sedano 2002). With the aim to appraise such an approach for the Italian context, we apply the probabilistic model proposed by Rious et al. (2010) for evaluating when a proactive TSO that anticipates the connection of new generators is more efficient than a reactive TSO that does not make any anticipation. Anticipating the administrative procedures is costly and exposes the TSO to the uncertainty of

[2] Groppi A., Pellini E. (2009). Analisi del costo del mancato adeguamento della rete di trasmissione elettrica nazionale. REF working paper.

[3] Groppi (2007). Secondo rapporto di informazione semestrale ONIPE. Progetti di investimento in centrali elettriche: un'analisi su tempi e contenzioso, ruolo investitori e coinvolgimento Enti e comunità locali, Milano, Politecnico di Milano e Ref, Rapporti ONIPE.

the generation connection; in turn, the system will face higher congestion if the network is being reinforced with a delay.

RESULTS

First of all, our analysis about the siting process has allowed us to identify the preliminary step (before the formal siting application presented by Terna) as the most problematic phase, in terms of delays and siting difficulties. This is due to the necessity to identify exactly the line path and to negotiate with local the Municipalities, directly affected by the projects: local authorities are normally extremely concerned by the associated environmental externalities and resistant to accept the lines. Moreover, preliminary results seem to confirm that in particular in the Italian context a proactive TSO might be in several cases more efficient than a reactive TSO.

CONCLUSIONS

We think that the forecasts made by Terna about the time needed to reinforce the network need to become more reliable and bring clearer evidence about the main bottlenecks in the siting process; in addition evidence should also be available about who, among the stakeholders is mainly responsible for delaying an investment. To this end, a set of suitable indicators might be associated to each relevant project and included as an additional information in the Development Plan presented by Terna. In particular, we propose four sub-sets of indicators: economic ones in order to evaluate the effect on social welfare, environmental ones aimed at quantifying the environmental benefits, location ones to identify potential local oppositions, and administrative ones aimed at characterizing the state of siting process. These indicators, to be updated each year by the TSO, will identify the projects that are more critical in terms of potential siting difficulties and/or more relevant in terms of benefits on social welfare. In our opinion this transparent information can contribute to reduce delays and thus the misalignment between the time needed to build a power plant and the time necessary to reinforce the network; nevertheless, a stronger policy intervention should also be considered such as the enforcement of a proactive behavior on the part of a TSO.

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