



Transmission planning for wind energy in the United States and Europe: status and prospects

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This paper provides an overview of major transmission planning activities related to wind integration studies in the United States and Europe. Transmission planning for energy resources is different from planning for capacity resources. Those differences are explained, and illustrated with examples from several regions of the United States and Europe. Transmission planning for wind is becoming an iterative process consisting of generation expansion planning, economic-based transmission planning, system reliability analysis, and wind integration studies. A brief look at the policy environment in which this activity is taking place is provided. A set of coherent and collaborative transmission planning, siting, and permitting policies and cost allocation method must be developed to achieve the intended objectives. The scale of transmission development envisioned for this purpose will require unprecedented cooperation across multiple jurisdictional boundaries. © 2012 John Wiley & Sons, Ltd.

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INTRODUCTION

At the beginning of 2011, nameplate wind capacity in the United States had exceeded 40 GW,¹

whereas that in Europe had risen to 86 GW.² More than 35 GW of wind capacity were added globally in 2010, and in spite of the continuing global economic slowdown, the prospects for continued development remain bright. However, one cloud on the horizon is the lack of sufficient transmission capacity to move the wind energy from the best wind resource areas, most of which are remote to the distant load centers. A critical conundrum has been recognized in the transmission planning area, and is being dealt with at the regional, national, and international levels.³ This is the situation wherein it may take 5–10 years to plan, permit, and construct a transmission line, whereas a wind project can be planned, permitted, and constructed in 2–3 years. A remote wind project cannot be financed until the transmission access is provided, and the transmission line cannot be built with cost recovery certainty until the need for service from the wind plant is shown, thus setting up a scheduling conflict that cannot be resolved. At the regional level in the United States, Texas has broken the logjam with the establishment of a Competitive Renewable Energy

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