

Regional Cooperation Potentials in the European Context: Survey and Case Study Evidence from the Alpine Region

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Executive Summary

The German energiewende is not limited to national borders, but is taking place in the European context of the emerging integrated market, with the neighboring countries being particularly affected. By the very nature of the interconnected European electricity system, the reform process in Germany has effects on the broader European market, such as price effects, cross-border flows, or the sharing of backup capacity; in return, the German electricity sector is affected by developments in the neighboring countries, be they EU-members or not. In particular the non-EU neighbors, Switzerland and Norway, have a high potential impact on the German electricity system.

Coordinating investments in generation, renewables and transmission will be accompanied by the challenge of equitable decision making regarding the distribution of the costs and benefits of these investments. Spillover effects driven by investments in one country can have positive or negative effects on neighboring countries. For example, renewable support in Germany can lead to lower spot market prices that benefit customers outside of Germany. The coordination of electricity market segments between countries or regions potentially could reduce the required investment cost by reducing the total need for infrastructure and allocating resources more efficiently.

Cross-border cooperation can take place at two levels, the European level of the emerging internal energy market under an overarching institutional framework, and the regional level of neighboring countries working together by developing tailor-made

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coordination mechanisms. Traditionally, in the European electricity sector, particular weight has been placed on the European single market² and the integration of national electricity systems from Portugal to the Baltic States, and from Greece to Ireland, Germany being somewhere in the middle. Against this backdrop, discussion of regional cooperation issues has emerged, focusing primarily on the existing system operations as well as investments in cross-border transmission infrastructure and capacity instruments. Regional cooperation can function as an intermediate step towards broader integration, yet it sometimes can lead to a more permanent state of cooperation, such as the Nordic electricity market in Scandinavia.

This paper performs a qualitative analysis of coordination measures in regional cooperation, complemented by quantitative case studies. It discusses emerging patterns of regional cooperation in Europe's electricity sector. Case studies of the Alpine Region focus on investments in renewables, backup capacity and transmission grid as well as on measures in different levels of balancing market integration

This paper summarizes the current discussion of national, regional, and European cooperation, and argues that these are complementary rather than exclusive. A regional approach may represent a compromise and a pragmatic solution to overcome some of the obstacles to electricity reform that cannot be solved by the traditional national and pan-European approaches. We suggest that regional cooperation will play a key role in European decarbonization. We examine three existing regional cooperation initiatives and the reasons for their formation: the Pentalateral Energy Forum, the North Seas Countries' Offshore Grid Initiative (NSCOGI), and the Baltic Energy Market Interconnection Plan.

We provide quantitative evidence of cooperation measures in the Alpine Region (France, Germany, Switzerland, Austria, and Italy), that we see as a very important region for the future decarbonization. Coordination measures in balancing activities as well as in

2 European Commission. 2009. Directive 2009/72/EC. Brussels, and European Commission. 2009. EC Regulation No 714/2009. Brussels.

transmission planning and in (especially renewable) capacity investment appear promising. Cooperation in generation capacities or transmission capacity expansion can – given suitable circumstances – benefit the participating countries. Especially cooperation in renewable capacities seem as interesting cooperation options. Interestingly, we do not find a pareto-optimal scenario set within our investment cooperation scenarios that all countries might want to achieve.

The further integration of balancing markets is already sketched out quite clearly north of the Alps, where the IGCC takes on a coordinating function between the balancing markets of Austria, Belgium, Czech Republic, Denmark, Germany, the Netherlands, and Switzerland. Our quantitative results shows that increased cooperation on secondary and tertiary balancing capacity markets, based on the suggestions of the ENTSO-E's Network Code on Electricity Balancing, leads to an overall cost decrease. At the same time we mostly observe shifts of balancing capacity reservation from Germany to Austria and Switzerland.

We also show a clear link between regional cooperation patterns and the energiewende in Germany. We note that the German electricity system, which supplies a high level of system security to the region, is dependent on neighboring countries to supply power. Our analysis of the real world obstacles to cooperation in Europe's different market segments shows that if cooperation at the operational level is feasible, it will be a challenge when investments are involved. We suggest that the reforms now underway in Germany and the potential for expanded coordination in the Alpine Region need to take place within in a regional framework.