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The geopolitics of cross-border electricity grids: The Israeli-Arab case

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HIGHLIGHTS

- A first attempt to identify the geopolitical dimension of cross-border electricity grids.
- Examining the negotiations on ten grid connections between Israel and its Arab neighbors.
- Electricity grids have been used both as a platform for deeper international cooperation and as a stick.
- The geopolitical dimension of electricity network is attributed their package nature.

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ABSTRACT

Countries often attempt to establish regional electricity grids. However, whereas research on natural resources frequently seeks to understand policy outcome through a geopolitical prism, when it comes to electricity studies the prism is always economic or technical. Hence, this study is a first attempt to identify the geopolitical dimension of cross-border electricity grids. The study argues that success in establishing electricity grids requires identifying how the geopolitical dimension interplays with the physical dimension. To examine the role of these geopolitical bottlenecks, the study examines negotiation protocols, spanning over 15 years, on establishing ten grid connections between Israel and its Arab neighbors. It finds that electricity geopolitics has been used both as a platform for deeper international cooperation and as a stick against neighboring states. When policies are driven by a peace dividend, proposals for grid connection appear to evolve and overcome the dependency and the security-economy bottlenecks. When relations deteriorate, proposals for grid connections appear to undergo reconsideration and to be held hostage by higher politics. If, when and how electricity grids materialize is a function of the nature of the electricity network as a twofold package and of the ability of the planning process to accommodate geopolitical uncertainty.

1. Introduction

Growing demand for energy (IEA, 2015) in tandem with peak oil rhetoric (e.g., Bridge, 2013) has driven many countries into a frenzied search for energy solutions that can support economic development. One common solution adopted by many countries is supply diversification (Downs, 2004), which includes not only developing alternative energy sources to hydrocarbons, but also searching for new energy sources beyond national boundaries. This transboundary approach to energy often includes attempts to develop an integrated approach to energy transmission across boundaries, specifically by building international power grid interconnections (World Energy Council, 2008). Bodies that endorse international power grid interconnections include the European Union (Puka and Szulecki, 2014), World Energy Council (2008) and World Bank (2013).

Economic, social and environmental considerations are stressed by the literature as the drivers of transboundary integration of electricity grids (e.g., Nakayama and Maekawa, 2013). These gains have promoted a variety of international transmission projects which are being pursued across the globe. Several projects have already been completed, such as the Nord Pool grid interconnection (Amundsen and Bergman, 2007), while others are either at initial stages or under examination.

Despite consensus around the benefits of expanding power interconnections across borders, many projects are subject to

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considerable delays and have not advanced beyond the conceptual level (APERC, 2000). Delays in many electricity interconnection projects in EU member states have so far prevented the EU from meeting its power exchange capacity benchmark (Puka and Szulecki, 2014). Similarly, despite projected gains from electricity trade, attempts by Andean Community countries to integrate their national energy systems have been discouraged (World Energy Council, 2008).

While the literature on international grid interconnections focuses on technical and economic aspects (e.g., De Nooij, 2011; Malaguzzi Valeri, 2009), it neglects the political dimensions of such interconnections (Puka and Szulecki, 2014; RECI Working Group, 2000). Hence, this study represents the first attempt to identify and investigate the geopolitical dimension of international electricity grids and to examine how this geopolitical dimension impacts the likelihood for cooperation.

This paper first presents the expected benefits of cross-border international electricity grids. It then forwards four possible geopolitical bottlenecks explaining why many of the benefits of international electricity grids have not fully materialized. Subsequently, it draws on Israel-Arab countries case studies to examine the role of these and other bottlenecks in hindering cross-border grid connections. Finally, it identifies the nature of grids as packages and their role in hindering or incentivizing cooperation.

2. The expected benefits of grid interconnection

The benefits of cross-border grid interconnections include economic, environmental and societal gains. From an economic standpoint, electricity grid interconnections can reduce capital expenditures, lower electricity supply costs and enhance system reliability, as has been suggested in the case of West African countries (Green et al., 2015; Hancock, 2015).

Environmental gains are concentrated around improved and more efficient resource allocation and power production (Yun and Zhang, 2006). Many investments involving interconnection lines are argued to contribute to mitigating CO_2 emissions from the power system or facilitating the development of renewable energy (RECI Working Group, 2000). Indeed, it has been asserted that a cross-border grid interconnection stretching from China to Australia will result in slower growth of carbon emissions as compared to the normal growth rate, mainly due to the extensive use of renewable energy sources (Taggart et al., 2012).

International grid interconnections improve energy security and as a consequence also increase societal gains. Cross-border grids provide greater availability, affordability and reliability of electricity for households and commercial users. These gains increase particularly when electricity costs are high, as in the case of Central America (IDB, 2013). Societal benefits may also extend to the positive externalities of peace and stability (World Energy Council, 2008). These expected gains are based on the premise that infrastructure collaboration will spillover to cooperation in other spheres. This peace rationale has been often promoted in cross-border grid interconnection projects in many turmoil areas, such as the ASEAN Power Grid (Srisuping, 2013) and the proposed Gambia River Basin Organization (OMVG) interconnection (World Bank, 2015). Regardless of its eventual success in bringing about peace dividends, this peace framing mechanism is a recurrent phenomenon among decision-makers assuming that technical cooperation between former enemies can lead to greater peace (Unruh and Shalaby, 2012).

3. The geopolitical bottlenecks for grid interconnection

This section outlines four possible geopolitical bottlenecks hindering grid interconnection, and provides anecdotal examples of their relevance to grid connections.

3.1. Zero-sum game

In game theory, a zero-sum game is a relative situation where one actor's gain is equivalent to the loss of another actor, bringing the collective payoffs to a sum of zero. Zero-sum situations, regardless of the number of actors involved, are *pareto optimal* in the sense that no actor can be better off without worsening the utility of at least one other actor (Bowles, 2004). Zero-sum games are typical of a wider set of relative games, where actors view gains and losses as offsetting each other, though not necessarily in equivalent manner (Powell, 1991). Relative gains situations limit cooperation between stakeholders even when cooperative behavior can benefit all actors involved (Waltz, 2010). Relative gains and zero-sum thinking are common to the governance of energy resources, such as oil and gas (Barnes et al., 2006). In these cases, negotiations focus on preserving sovereignty and maintaining existing resource allocation, rather than opting for cooperation strategies that will increase the sum of net benefits (Newnham, 2011). Hence, despite the potential increase in the gains of a country from cross-border grid interconnection, cooperation may fail due to the other country's perception of these gains as its own losses. Russia, for example, is widely viewed as pursuing a zero-sum game with regard to grid interconnection with Norway because it is averse to Norway's industrial growth (Barnes et al., 2006).

3.2. Grid dependency aversion

Cross-border electricity interconnection may be discouraged for fear that it will create and institutionalize relationships based on asymmetric dependence, which can then be used by one partner against another. A certain degree of asymmetry is almost an inherent feature of any energy trade relations, whereby differences between countries in their natural energy resources endowments (Meisen and Mohammadi, 2010) or energy generation capacities motivate trade. As dependency rises, the less dependent party can extract gains from the dependent party drawing on the asymmetry of dependence. These gains, which go beyond the specific energy relations, may include political, security, trade and other gains, and can be achieved by the partial or complete disruption of electricity flow (Waltz, 2010; Department of Economic and Social Affairs, 2006). A case in point is the cross-border integration of electricity grids in the Mekong Basin. Further integration in the Mekong is suppressed by the fear that China will attempt to use interconnection as a means to extract political concessions from other partner countries, such as Vietnam and the Philippines, on the disputed offshore energy exploration in the South China Sea (Richardson, 2014).

3.3. Political relations and trust

Lack of trust due to ongoing or past unstable and bitter political relations is a stumbling block for energy interconnection projects, particularly at a regional level (APERC, 2000). Armed conflicts, religious or tribal rivalries and unresolved territorial or refugee disputes may destabilize relations and create mistrust among countries. The more mistrust, the greater the likelihood that international grid interconnection initiatives will be held back, challenging the success prospects of negotiations and investments (Department of Economic and Social Affairs, 2006). Lack of trust may also result from adverse domestic political circumstances affecting interstate relations. These circumstances include civil wars, social unrest and internal political instability, creating a less favorable and uncertain environment for investors (World Energy