



# Energy reform in Mexico: Imperfect unbundling in the electricity sector<sup>☆</sup>



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## ABSTRACT

Mexico is in the midst of enacting new energy market reform. After one year of presidential proposals, 21 laws were enacted in August, 2014. The analysis shows inconsistencies and lacunae in defining an open electricity market. According to the proposed reform, incumbent Comisión Federal de Electricidad (CFE) will keep transmission and distribution vertically integrated with newly created subsidiaries subject to third-party subcontracting, while private generation participants will compete in a wholesale market operated by Centro Nacional de Control de Energía (CENACE). Following an institutional economics approach and a framework to account for transition and coordination issues, the problem of misaligned incentives is analyzed along two governance dimensions: regulatory failure and market foreclosure. The research predicts negative effects of energy reform on grid investments and government coordination in Mexico.

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## 1. Introduction

Reform in the electricity sector has pursued structural separation of formerly integrated utilities and unbundling of generation, transmission, and distribution services along with the launch of independent systems operators (ISO) to promote efficiency and sector growth. However, a substantial debate centered on coordination problems among various levels of government reveals two opposing positions: vertical integration of transmission and distribution versus unbundling of these functions to free up expansion projects.

This study considers these issues for Mexico at a time of

sweeping energy reform. [Jamasp and Pollitt \(2005, 2012\)](#) provide a theoretical framework derived from institutional economics and incentives, to analyze the “minimum functions” of an ISO and how it functions as a wholesale market clearing institution. We extend this theoretical framework and apply it to a medium-sized country with pending infrastructure expansion. First, we suggest that the imperfect unbundling<sup>1</sup> of transmission and distribution from the incumbent utility (keeping them structurally integrated) could condition grid expansion, block third parties from infrastructure access, or allow the utility operator to extract congestion rents. Second, we find that a transitional market can be characterized by excessive policy and regulatory presence, where superimposition of government actions could create regulatory failure and coordination lacunae. Such is the case for the Mexican transitional market. We also present a comparative analysis of Mexico's energy package and its theoretically framed characteristics with two neighboring

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<sup>1</sup> Imperfect here is a concept derived from the industrial organization literature and from game theory, that stresses the incentive problem that arises from insufficient separation or ill-designed regulation.

electricity systems in the US: ERCOT in most of Texas, and CAISO in California. This research contributes to the debate on imperfect unbundling, and adds to the theoretical and applied literature, by extending proposed theoretical positions by Pollitt and other proponents of governance and strategic regulatory frameworks of transition deregulated and unbundled electricity markets, and cases outside developed economies, such as Mexico, in the present regulatory reform of 2013–2015.

Many countries and regions have experimented with energy market reform (ER) where asset and operational unbundling are key ingredients of the institutional and legal changes. Noted cases exist in Europe (the EU 3rd Package, 2009) and also in regional markets in the United States (from the time Order 888 was passed in 1996 by the Federal Energy Regulatory Commission or FERC). In 1999, FERC Order 2000 established that each public utility company that owned interstate transmission facilities should make specific (unbundling) arrangements if it wanted to participate in Regional Transmission Organizations (RTOs).

In Mexico, the administration of President Peña Nieto (2012–2018) has embarked on a revolutionary set of market reforms since his election. Energy reform seems to have become the deepest, covering the state-owned enterprise *Petróleos Mexicanos* (PEMEX) in the oil industry, the *Comisión Federal de Electricidad* (CFE) in the electric sector, and natural gas transport and distribution. Most important in the reform is the separation from CFE of the former division *Centro Nacional de Control de Energía* (CENACE) to become an independently-regulated systems operator (ISO) that will operate a newly created wholesale market (see *Presidencia de la República, 2013, 2014*; and *Senado de la República, 2014*). Additionally the reform specifies that qualified users in this market will participate both as supply permit holders, and load and demand entities.<sup>2</sup>

The incumbent utility CFE, as presented above, has maintained vertically integrated transmission and distribution with legal but not structural asset separation and is able to subcontract to third parties, called distributors (state-owned entities providing distribution, or subcontractors) and transporters (state-owned transmission or TOs or third party subcontractors). CENACE has been designed to become the crux of the new system as the market clearing ISO.

For what legally constitutes a public service under state control, and private services, the new ER identifies three types of suppliers: a state-owned provider of basic services for regulated retail household tariffs; a private qualified provider of user services; and a last resource supplier that operates through the wholesale market. The incentive to discriminate or under-invest arguably could not be totally controlled by a strong regulator due to coordination problems at two levels: CFE *vis a vis* private market participants and government ministries *vis a vis* the regulator and CENACE.

The paper is organized as follows. Section 2 describes the theoretical framework and reviews the main contributions to the literature. Section 3 uses the stakeholder and governance approach within the theoretical framework to spell out the characteristics and functions of the players in Mexico's enacted ER. Section 4 draws comparisons between Mexico's ER and lessons derived from partial or total unbundling in ERCOT (Texas), and CAISO-WECC (California), and the roles of regulators; Section 5 analyzes the aims of Mexico's reform design, along with operational, accounting, or administrative partial unbundling, in order to derive lessons regarding the problem of coordination, and the critical role of CENACE and

oversight of government players such as the regulator *Comisión Reguladora de Energía* (CRE) and the energy secretary, or *Secretaría de Energía* (SENER). Section 6 concludes.

## 2. Theoretical framework and review of the literature

A main concern in restructured and liberalized electricity markets with unbundling is whether the ISO and infrastructure (TO/DOs) are structurally separated from incumbent utilities, or whether these functions remain within a vertically integrated incumbent, subject to new regulatory capacities and responsibilities. An extension of the ISO minimum functions formulated by Pollitt (2008, 2012) and Jamasb and Pollitt (2005) frames Mexico's ER: 1) tariff administration and design (wholesale under market rules, while basic retail tariffs are regulated); 2) congestion management; 3) parallel path flow to guarantee network security; 4) ancillary service management; 5) non-discriminatory open access to the transmission and distribution system under strong versus weak regulation; 6) market monitoring to avoid market abuse and foreclosure strategies; 7) planning and expansion of the grid (long-term investments) from both the incumbent and private third-party firms under different unbundling concepts; and 8) interregional coordination of nodes and control areas, including international connections. The two additional dimensions for the transitional case in Mexico are 9) vertically integrated TO/DOs that could condition access, third-party investment participation in grid expansion, and congestion rent extraction (incentives for market foreclosure); and 10) over-presence in the transition of various levels of government in both regulation and policy, which could create coordination problems and regulatory failure in an economy with immature institutions.

These minimum functions would enable efficiency via attributes of the ISO. They are more or less present in a transitional market along with regulated TO/DOs, because they are considered public-interest oriented. However, there are conditions for market concentration and asymmetric incentives among the public incumbent and private players in a wholesale market.<sup>3</sup> Referring to TO/DOs, Hogan (1992) studied incentives for transmission expansion while Joskow and Tirole (2000) showed that transmission rights allow market power to be exercised by the grid controller or TO against third-party open access. Moreover, even in the presence of a strong regulator, incentives to under-invest and condition access could prevail (Laffont and Martimort, 2002). Addressing transmission expansion rather than operating market power, Joskow (2005), and Hogan et al. (2010) suggested that regulation should be complemented with a merchant mechanism overseen by the regulator. However, transmission rent extraction could prevail (Leautier, 2001). According to Rosellón et al. (2011), the ISO should be placed in the center of the new markets so that efficiency objectives are pursued with many players. Kwoka (2008) discussed cost structures of ISOs under restructuring, with passive and active regulators.

An important key to understanding restructured electricity markets is the issue of coordination. Grossman and Hart (1986) argued that given the transaction costs of incomplete contracts, nonintegrated relationships could become inferior to complete contract vertical relationships in TO/Dos. Another consideration is that an upstream firm with market power cannot exploit that power fully if it is not involved in some foreclosure or access

<sup>2</sup> Qualified users are defined by the enacted laws, as registered non-household competitive users of larger than 3 MW capacity in the first year of reforms, 2 MW in the second year, and 1 MW in the third.

<sup>3</sup> Literature on asymmetric incentives amongst generation and TO/DO with minimum regulation can be summarized by contributions by Cave and Stern (2013), Hogan (2002); Hogan et al. (2010); Joskow (2008); Laffont and Tirole (1991); Rosellón and Weigt (2011, 2009).

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