

Nice Workshop – 18 & 19 June 2007

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## **Achieving electricity competitive reforms as a long term Governance Structure problem**

### **Introduction**

The reform of network industries represents one of the great structural transformations of the economy in the past twenty years. Vast in its scope (covering aviation, telecom, gas, electricity, railways, postal services, etc.), the reform of network industries is also exemplary in its economic content (Newbery, 2000).

Previously, the unique characteristics of network industries appeared to set them apart from most other industries, deemed “competitive” (Kahn, 1970–71). These network industries notably feature: significant economies of scale or scope (extending to natural monopolies); far-reaching externalities (positive or negative) in production or consumption; and extensive vertical and horizontal integration (either under a single corporate umbrella or in the form of long-term *ad hoc* contracts). Within this very specific framework, the successful introduction of competitive mechanisms, substituting for administered regulation or internal corporate management hierarchies, along with the creation of open markets either up- or downstream of the formerly integrated networks, created disruptions and innovations in equal measure (Joskow and Schmalensee, 1983; Baumol and Sidak, 1994).

Neo-institutional economics suggests an analytical framework that differs from, and complements, standard economic theory (Brousseau and Glachant, 2002). First, new institutional economics construes market equilibria and prices as the result of an “institutional process for framing transactions” and fashions its analysis from the notions of *transaction costs* and *property*

*rights*. The operation of the price mechanism is neither costless, nor instantaneous, so economic agents cannot benefit from its effects without becoming actively involved in the economic relationships that generate these market prices. Rather than rely on the “wisdom” of the economic calculus of government bureaucracies, the pioneers of new institutional economics proposed creating markets by dismantling the public ownership of network industries [auctioning off property rights for radio bandwidth (Coase, 1959)] or replacing public agencies overseeing network monopolies with competitive mechanisms for allocating concessions [franchise bidding (Demsetz, 1969)]. However, competitive mechanisms and market institutions are not the only efficient method for framing transactions. Indeed, a whole spectrum of effective alternative arrangements exists, including private agreements and public regulation (Williamson, 1975 & 1985; Coase, 1960 & 1988). The efficiency of any conceivable arrangement in network industries should thus not be seen in absolute terms. It remains conditional, and notably depends on the characteristics of the transactions in question.

The competitive reform of network industries has recently experienced a surge of expansion worldwide, with over 200 new instances of sectorial deregulation between 1990 and 2005 (World Bank, 2006). Nonetheless, subsequent to the California electricity crisis (2000–2001), there has been a burgeoning dissatisfaction with regard to the limitations, and in some cases failures,<sup>1</sup> of these new ways of framing network industries (Kessides, 2004). We are witnessing a slowdown or, in some cases, and blocking of the reforms, as if the progression of competition policy in network industries had a cyclical component. This brings us to a deeper reflection on the nature of these processes.

The purpose of this paper is to propose tools for analyzing the process of the competitive transformation of network industries and to shed light on the difficulties encountered. The paper is divided around three main sections. In Section 2, we demonstrate that the launch of a competitive reform will not result in a credible industrial structure without the creation of a governance structure adapted to the new hybrid nature of the transactions. Thus, “introduce competition only where this is readily feasible” is not a simple recipe for successful competitive

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<sup>1</sup> Like: financial crisis, corporate scandals (like ENRON), stock market collapses, California electricity crisis, numerous electricity blackouts around the world, and severe alerts coming from antitrust authorities (including one from the European Union).

reform. The borders between regulated and competitive activities are not always natural: They may originate from contingent decisions reflecting the “modular” nature of network industries. In this unique context, the sequential character of decisions and interaction effects make it difficult, *ex ante*, to define a governance structure that is truly “adept” at providing prolonged guidance to a lengthy process of competitive reform. Thus, Section 3 will examine how to build governance structures *ex ante* that will remain adaptable *ex post* to allow imperfections and failures in the competitive reforms to be corrected. Theoretically and empirically, the enormous requirement for successive “coordinated adaptations” of the competitive reforms of network industries creates a recurring problem of multilateral bargaining to periodically redefine existing property rights. Thus, there exist “veto players” in all institutional and industrial arrangements for piloting these competitive reforms. These veto players are agents with veto power over any subsequent changes to the reforms. Subsequently, Section 4 reinserts the long-term evolution of competitive reforms into the framework of structural constraints of an institutional nature. Institutional environments, finally, comprise the ultimate constraints—with varying degrees of rigidity—to the long-term adaptation of the competitive reforms of network industries. It would be very bold to assume ultimate convergence to similar models of competitive functioning, since the reforms are starting from such widely divergent institutional environments.

## ***II. Why building an appropriate Governance Structure is still problematic?***

The idea common to all economic analyses in favor of the competitive reforms is that the creation of markets within network industries presupposes preliminary acts of “industrial surgery.” Prior to creating these markets or seeing them appear spontaneously, it is necessary to end the traditional vertical and horizontal integration of the incumbent monopolies. Thus, those links that will permanently be monopolistic must be separated from those with competitive potential with as much precision as possible. This cannot be accomplished overnight—it requires incremental experimentation with new procedures for segregating activities that have been integrated for decades. Thus, there is a transition period during which the new markets are weak and the incumbent monopolies remain quite strong. Consequently, a governance structure reflecting the competitive reform throughout this transition period is useful, even indispensable.

The duration of this transition period depends on many conditions, including the characteristics specific to each network industry. As early as 1985, O. Williamson foresaw that aviation and roadways would be easier to reform along sustainable competitive lines than railways or electricity. Aviation reorganized itself independently and durably<sup>2</sup> on the “Hub & Spokes” model with large airports and “private” interconnections between the flights of a single company or a pool of affiliated companies. At the same time, the design of the competitive electricity market remained heterogeneous and unstable, made up of many distinct industrial and transactional modules, variously disassembled and reassembled and, sometimes, though not always, associated with competitive mechanisms or true markets. In fact, with regard to electricity reforms, which began in Great Britain in 1990, the architecture of the competitive market design proved to be an unstable hodgepodge of market and non-market mechanisms. In keeping with the principle of separating monopolistic activities from those that are potentially competitive, the industry splintered into several distinct operational and transactional modules. However, the entire chain

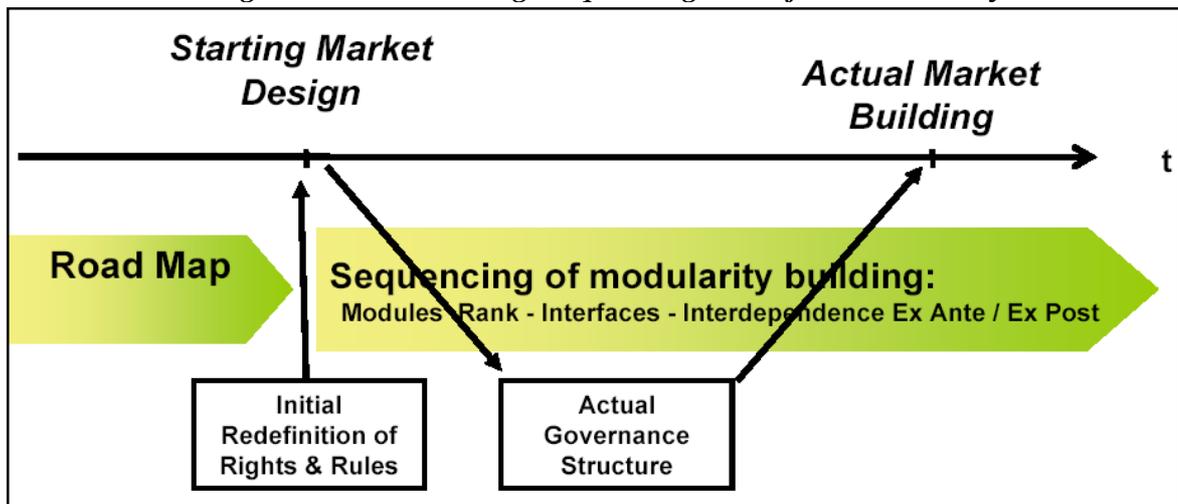
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<sup>2</sup> Until the appearance of low cost airlines.

of all modules often required a more comprehensive and far-reaching governance structure than that provided for by the initial competitive paradigm.<sup>3</sup>

The electrical industry has proven itself unable to present a robust competitive market design that garners universal acceptance or, for that matter, that is capable of instantaneously and simultaneously coping with all the new problems having arisen as of the launch of the competitive process. In practice, electricity reforms were highly sequential, initially accepting imperfect provisional solutions for this or that module and then staggering successive redesigns of the modules over time. For this reason, the creation of competitive electricity markets is much more frequently the result of the governance structure of the reforms than the direct or indirect offshoot of the legal or political actions that initiated the reforms. The following schemata shows this.

*From Market Design to Market Building: Sequencing the Reform Modularity*



The initial market design, introduced by a road map is, in practice, only the first act in the construction of markets. These markets are then built sequentially, module by module, often in a

<sup>3</sup> We here recall the operational difficulties encountered by California's electricity markets between the summer of 2000 and the spring of 2001. We also think of the comprehensive redesign of the English system in 2002, leading to the closing of the Electricity Pool of England and Wales, which was mandatory for all generators and resellers as of the beginning of the reform on April 1, 1990.

different order, or rank, from one country to the next or (in the United States) from one state to the next. These various modules, which are not defined in the same way nor implemented in the same order, are articulated around interfaces that may also be defined differently. It follows that the true nature of the interdependencies between modules varies considerably from one reform to the next, but also from the initial phase of the reform to later stages in its competitive evolution.

The true unfolding of electricity reforms appears much more like the *ex post* sequential construction of modules (*ex post* sequential modularity) than like an activity of *ex ante* market design.

Thus, the building of competitive markets combines three dimensions: (1) the overall separation of potentially competitive activities from inherently network activities (*unbundling*); (2) the segregation of all the operations and transactions of the industry into modules organized around various mechanisms for internal coordination (*modularity*); and (3) the implementation of the various modules in the chain to carry the competitive transactions (*sequentiality*).

### *II-1°- Competition where possible: the Unbundling and its boundaries.*

As emphasized by S. Littlechild (2006b), the first British regulator and inventor of the notion of Price Cap as applied to telecoms, the principle of “*Competition where possible*” is central to the reform of network industries and their transformation into vehicles for competitive markets. This type of division is expected to free competitive forces on one side of the new boundary and concentrate the regulatory activity in the network monopolies on the other side.

For example, in the electrical industry, the high-tension transmission grid and medium- and low-tension distribution lines will find themselves on the side of the regulated monopoly, while the generation and sale of electrical power can easily devolve to wholesale and retail markets. The regulator and the regulation, in turn, are expected to facilitate market activities and not substitute for the agents performing these activities.

However, the principle of unbundling assumes that there exists a “natural” demarcation, clear and robust—by nature almost technical, or at least technico-economic—between these two universes: the market for services and infrastructure monopolies. Sometimes this is true. Roads and highways are infrastructures that can easily be differentiated from taxis, busses, and trucks. This remains the case, though a little less unambiguously, in aviation. Flight corridors and airport runways are clearly distinct from the airplanes chartered by airlines. However, it is also necessary to prescribe how these air routes and runways are to be allotted to the various users when the sum of all possible usage slots is less than the airlines’ demand, in particular in the case of new entrants, and especially when these new entrants are low cost. Are the airlines’ large hubs private infrastructures with strictly controlled access, or are they private empires built on essential infrastructures freely accessible to all? A similar question arises with reference to telecoms. However, we generally consider that competitors to incumbent telecom operators have no difficulty duplicating their infrastructures and creating their own private grid, at least outside the local terrestrial loop.<sup>4</sup>

The same question is quite prickly in the case of electricity, because the service rendered is not storable<sup>5</sup> and there are no waiting lines. Furthermore, the entire supply-demand equilibrium is a global phenomenon, common to the entire industry and extending beyond the ownership boundaries of dozens of different generators or sellers of electricity.<sup>6</sup> In practice, it is not difficult to see why this issue of global equilibrium in electricity must be ensured by a third party with decision authority over all immediate and very short-term time horizons (from “*real time*” to one or three hours before real time). Thus, the transmission grid must directly administer very short-term imbalances between the consumption and generation of power (*balancing*) and between the flows of current and line capacity (*congestion*). We here observe that activities specific to the network monopoly are very strongly enmeshed with, and weakly separable from, all activities that are characteristic of the competitive links. The very precise allocation of tasks and decision-making rights between competitive and monopolistic modules, as well as the detailed design of the interface mechanisms connecting these two module types, here continue to be central and

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<sup>4</sup> Except for the local landline grid for which it must provide free access to competitors.

<sup>5</sup> As in aviation.

<sup>6</sup> It is as if all airlines operating in the same control space were obligated to continually equate the number of seats on all their airplanes to the exact number of passengers having boarded them!

decisive questions about the real nature of the competitive reforms. “*Where are the boundaries and who sets them?*”.

## *II-2°- Boundaries are set by “modularity” decisions*

Boundaries between monopolistic activities and potentially competitive activities, like the boundaries between the firms themselves, between their respective tasks, and between their real or potential transactions and the corresponding markets, are thus not given once and for all prior to the launch of the competitive reform. Quite the opposite, these boundaries are primarily defined over the course of the long process of creating the reform. They are the result of segregating the industry into new operational modules. The competitive reform is thus a giant “*modularization*” of the network industry, a giant industrial and transactional “Lego set.”

According to the most famous analysts of industrial modularity, Baldwin & Clark (2000): “*Modularity is a particular design structure, in which parameters and tasks are interdependent within modules and independent across them*”. This technical definition of modularity is well suited to the new modularity of network industries. It nicely complements the work of Williamson and Joskow on “*technological separability*” that distinguishes between the hold technological constraints have within non-separable clusters of tasks and a strong institutional constraint on the design of interfaces connecting task clusters that are technologically separable.<sup>7</sup> To Baldwin and Clark: “*The ideal of perfect modularity is full ‘plug and play’ flexibility.*” They then add, “*but in a complex design, there are often many levels of visible and hidden information*”. Perfect modularity is thus not universal.

In the competitive reforms of network industries, the ideal of “*perfect modularity*,” the hermetic separation of task clusters having different natures, is far from universally implemented. The boundaries between modules split up by the competitive reforms remain porous to many leaks. Some modules retain an interdependence between each other in their operational functioning, even if, of course, the interdependencies are stronger and more frequent within the modules than

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<sup>7</sup> In other words, transactions arose in specific locations because designers created technologically separable interfaces that made transactions cost-effective at those points (Lenfle and Baldwin, 2007).

between them. Thus, it is useful to bear in mind, as a sort of benchmark, how perfect modularity operating within a perfectly designed competitive reorganization of the chain of tasks within a network industry would look.

Perfect modularity would define “*independent task blocks*,” build “*clean impermeable interfaces*,” and separate “*hidden and visible information*.” Three invaluable characteristics would result for the process of performing these tasks. First, perfect modularity would increase the potential for managing complex chains of operations. Second, perfect modularity would allow the various modules of a complex chain to operate in parallel with a certain degree of autonomy. Third, and finally, perfect modularity would make it easier to react to uncertainty, provided the uncertainty was confined to a single module.

We here recognize the motivation for separating the professions and tasks in the initial implementations of competitive reforms. However, we must acknowledge that market building often fails to reach that degree of perfect modularity in the competitive reforms. The actual modularity of the competitive reforms of network industries frequently consists of nothing other than a flawed chain of imperfect modules and faulty interfaces. Porous borders and nonexclusive interfaces have been inserted between the monopolistic and competitive module clusters, as well as between the specific modules. At the same time, incomplete rules of operation have been imposed within the various modules. It follows that all of this modularity remains flawed, notably with numerous operational “*leaks*” across modules. Thus, many direct dependencies persist in the operational functioning of a number of these modules, which are designated, in the jargon of economics, as externalities, on the one hand, and incompleteness, on the other.

Let us look at three aspects of this issue of “*imperfect*” or “*weak*” modularity in network industries. The first is the coexistence of fundamentally divergent alternatives in terms of how to create competitive wholesale markets. Chao and Peck (1996), Oren (1998), and Wilson (2002) have demonstrated that there are three different solutions to the structure of these electricity markets: compulsory organized multilateral markets (*mandatory pools*), voluntary organized multilateral markets (*voluntary exchanges*), or markets that are uniquely bilateral (“*OTC*” *markets*).

*An example of sub-modularity within the module “monopoly transmission network”*

<p><b>English Transport System Operator (TSO)</b></p> <ul style="list-style-type: none"> <li>● Owns the assets and is a “for profit” company</li> <li>● Plans &amp; builds new lines</li> <li>● Manages internal congestion with physical redispatching</li> <li>● Manages connections with other TSOs as boundary</li> <li>● Prices access with regional ‘postal stamp’</li> <li>● Charges new generator connection with shallow costs</li> </ul>
<p><b>American Independent System Operator (ISO)</b></p> <ul style="list-style-type: none"> <li>● Doesn’t own the assets and is a “not for profit” entity</li> <li>● Doesn’t plan or build new lines</li> <li>● Manages internal congestion with nodal pricing</li> <li>● Manages connections with other ISOs as new nodes</li> <li>● Prices access by calculating prices at each node</li> <li>● Charges new generator connection with deep costs</li> </ul>

*Following V. Rious (2005)*

A second example is the organization of task modules pertaining to monopolistic transmission activities, as the table above shows.

The pivotal architecture of electrical networks is the transmission grid, since this transports the energy generated by power plants over long distances and on a huge scale. This component also underlies the spectacular “black outs” that have shaken up this industry on several occasions since the beginning of the 21st century (USA and Canada, Italy, Denmark, Germany and France, etc.). Comparing the typical organization of transmission in the competitive reforms of the United States (the *Independent System Operator*, or ISO) with its European analog (the *Transmission System Operator*, or TSO) immediately reveals the diversity of the "Transmission" modules put into place.<sup>8</sup>

In England, the transmitter is a private firm that is listed on the stock exchange, owns its own transmission facilities, and plans and finances investments in the grid. It manages congestions with the physical method known as “*redispatching*.” However, it does not transmit a direct price signal to the users of the grid who are liable to be at the source of this congestion. The cost of

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<sup>8</sup> Littlechild (2006b) brings two aspects to the debate: he shows that, in Australia, merchant transmission companies have been allowed to compete with incumbent transmission monopolies for the building of new lines; while in Argentina transmission line expansion decisions have to be proposed, approved and paid for by market participants and not by the regulator or the regulated transmission company.

congestion is socialized across all grid users during periods of congestion (via a half-hourly “*postage stamp*”). A direct consequence of this method for managing congestion is the existence of a real border, both physical and price-based, that completely surrounds the zone administered by the transmitter. Furthermore, the transmitter charges the costs of transmission (especially the costs of infrastructures) in fees that are socialized across a regional grid, with a dozen or more “postage stamps” for generators and a similar number of other “postage stamps” for consumers. Finally, the cost of new connections to the grid are also largely socialized, since the hook-up fee does not account for the cost of adapting the network upstream from the point of connection. This method of pricing connections is called “*shallow cost*.”

In the United States, most typically in the PJM zone (Pennsylvania, New Jersey, Maryland, etc.), the transmitter is comprised of a club of electricity professionals. Thus, it functions as a cooperative, making no profits and distributing no dividends. This club does not own the transmission grid facilities, which remain the property of the incumbent operators. It is, however, their only operator. It is the System Operator, and is distinct from the proprietor of the network, the Transmission Owner (TO). From the point of view of ownership of the network equipment, this System Operator is designed to be independent of the incumbents, making it an “*Independent SO*,” or ISO. This ISO neither plans nor finances investments on its grid. The users, generators and distributors, take the initiative of requesting modifications or extensions to the transmission grid, and then pay for them fully. This ISO manages congestion with an economic method known as “*nodal pricing*,” transmitting a direct and individualized price signal to each grid user liable to have an impact on congestion (by creating, exacerbating, or easing it). The cost of congestion is thus only borne by those who directly contribute to it, and only for as long as they do so, being calculated in very short time frames that are recomputed every ten minutes. Each of the thousands of nodes in the grid is handled independently, with a vast technical and economic program of costing congestion for each entry and exit node on the transmission system. That is why this pricing is called “*nodal*.” A direct consequence of this method for managing congestion is that no real border exists, either physical or price-based, around the zone administered by the transmitter. Its zone is nothing other than a collection of computation nodes. To the extent that adjacent transmitters practice the same nodal method of pricing and collaborate in its application, there are no real borders between neighboring

transmission zones. This ISO does not charge users the other costs associated with transmission (notably the cost of infrastructures)—they are recovered through fees that are socialized across a local grid and administered by state Public Utilities Commissions, or PUCs. Finally, the costs of new connections to the transmission grid are not socialized. The hook-up fee imposes all the costs created by this connection in terms of upstream development on the new user (called “*Deep Cost*” pricing).<sup>9</sup>

A third, and final, example of the “weak” nature of the organization of the modules in the competitive reforms of the electrical industry is found in the allocation of responsibilities and decision making power in the regulatory functions (World Bank, 2006; Castalia Strategic Advisor, 2005; EDRD, 2004; Green et alii, 2006; Ocana, 2002; I.E.A., 2001). Nearly every conceivable variant on the definition and allocation of regulatory functions has already been tried somewhere: sharing between a federal and local regulators (United States, Belgium); sharing between the federal executive power, the association of local regulators, and representatives from local governments in a formula called “*Comitology*” (European Union); sharing between stakeholders who administer a mandatory pool and a strong regulator (England-Wales); sharing between transmitters who own a voluntary exchange, stakeholders, and ministers from local governments (the Nord Pool of the four Scandinavian countries); sharing between stakeholders<sup>10</sup> administering the ISO and a strong local regulator (Texas); sharing between a weak or semi-weak regulator and the minister of energy (Spain and France); sharing between a weak regulator and the transmitter (Sweden); self-regulation<sup>11</sup> by a national committee of stakeholders overseen by the competition watchdog and the courts (Germany). This veritable patchwork of formulas has been characterized as “*regulatory modularization*” by A. Midtun (2005). It is noteworthy that not one of these structures has proven able to provide adequate *ex ante* guarantees to

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<sup>9</sup> For a discussion of the economic consequences of the various methods of recovering connection costs in the electrical industry, see Hiroux (2004).

<sup>10</sup> Another example is provided by Littlechild (2006b) and the settlement of disputes organized in Florida: Instead of a traditional litigated process, settlements are often reached between utilities and the Public Council and/or users, and are typically approved by regulator.

<sup>11</sup> The basis of self-regulation is reciprocity: Individuals recognize the benefits they will derive from behaving in accordance with others’ expectations. Such reciprocity may be reflected in individual agreements but, as standards of behaviour, will spread to other members of a group as property rights when the benefits of doing so exceed the costs of defining those rights. The expectation is that such cost savings will be significant where the group is small enough for informal control—generally requiring continuing face-to-face interaction—but also where power is broadly dispersed.

simultaneously manage the classical risk of “*regulatory capture*”<sup>12</sup> and of governmental opportunism (Holburn and Spiller, 2002), along with the need to effectively counter the exercise of market power by the dominant operators (Smeers, 2004).

### *II-3°- Sequencing matters*

The various modules created by the competitive reforms are not perfectly modular: They were neither perfectly designed nor perfectly implemented. They also continue to sequentially interact in the actual functioning of the competitive reforms. When a new module, or a new interface between modules, appears, all of the modules that are already in place may need to react and adapt to the interactions in the new sequence. Thus, the order in which modules appear, or are reconfigured and adapted, is of great practical importance. The sequencing of the decisions in the construction of competitive modular chains is nearly as important as the actual structure of these chains.

This is why D. Newbery (2002) emphasizes the importance of a solid reform strategy, which must include all of: the privatization process, the type of unbundling between monopolistic and competitive activities, the initial market design, the powers and functions of the sectorial regulator, etc. According to D. Newbery: *“the logical sequence of events, some of which can happen simultaneously, is to first create the legislative and regulatory framework and institutions, and to restructure the state-owned ESI. Unbundling and corporatizing the generation companies, national grid, and distribution companies while they are still in public ownership can precede the legislation and setting up the regulatory agencies, but privatisation cannot. Unbundling generation from transmission will require a restructuring of any contractual relationships between the two.”*

Newbery stresses that the sequencing of the reform is critical, since it structures the behavior of the stakeholders by creating new interests and new rights over the various modules of activity and over the transactions that come into play between these modules. One of the most important

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<sup>12</sup> Thus, proponents of the theory of capture demonstrate how repeated exchanges between the regulatory agency and the firms can culminate in collusion between them.

consequences of this type of modularity is that certain models of network industry reform, while working well under some circumstances and in some areas, are not easily transferable elsewhere.

This phenomenon has already been examined in the analysis of institutional change developed by M. Aoki (2001). His analysis sheds a good deal of light on the particular nature of this phenomenon. To Aoki, the explicit modification of formal rules is not the entire story in the matter of institutional change. On one hand, since an institution's influence on economic agents fundamentally relies on their "*shared beliefs*," it can only fully exercise its influence if agents believe in this influence. On the other hand, any particular institution is always party to a variety of interactions with related and complementary institutions.<sup>13</sup> Any creation of institutions occurs in a world that is already "*saturated*"—populated with other institutions. Consequently, the compatibility and complementarity between the new institution and other, pre-existing institutions are fundamental objective characteristics that define the new institution.<sup>14</sup> Aoki (2001) specifically notes that the overlap of existing institutions affects the evolution and combination of their activities. The prior existence of historical institutions may facilitate, hamper, or sidetrack the desired evolution and the actual consequences of the creation of new institutions.<sup>15</sup> This is why, in theory as much as in fact, the *ex ante* choice of a good competitive reform strategy for entire blocks of industry is more difficult than some optimists had prematurely announced. According to Rufin (2003), "*in these industries, the institutional framework plays such a crucial role that it provides an excellent setting for analyzing processes of institutional change.*"

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<sup>13</sup> For a detailed presentation of institutional change see Aoki (2001, chapters 9 and 10). For an overview, see Aoki (2004).

<sup>14</sup> Aoki's central notion is that each institution generates incentives and manages information autonomously, which may make it difficult for economic agents to utilize and understand the enmeshing of complex institutions.

<sup>15</sup> Working from a different analytical framework, Laffont (2005) arrives at the same conclusions regarding the difficulties in transferring regulatory institutions and policies from the developed countries to the developing world.

### **III: Is “Institution building” a remedy to governance failure?**

Building a complete industrial and commercial chain of modules that are sufficiently competitive thus involves long stretches of time, always exceeding one decade. This is why the governance structure of the reform of a network industry is, in and of itself, as important as the initial design of the very first competitive modules (Dinar and Saleth, 2004; World Bank, 1996; Levy and Spiller, 1996). Why, therefore, at the launch of these reforms, are new governance structures not defined that are more suited to their specific nature? They would be more robust and reactive, and thus more conducive to prolonged adaptation of the industry and its chain of modules until it finally reaches the stage of sustainable competitiveness? This new way of thinking focusses on *ex post* guaranteeing the final goal of perfect modularity of network industries by the *ex ante* initial design of a perfect governance structure for the reforms. Unfortunately, this notion of perfect governance is plagued by numerous difficulties, not unlike the previous notion of perfect modularity.

#### *III-1 Is perfect governance possible?*

Building a governance structure for reforms that is perfect in the long term essentially consists of defining and allocating the rights to future implementations of the reforms. This is how the governance structure is able, when the need arises, to define and allocate new rights. These new rights, which would obtain in the future and could be useful for steering the course of the reforms after the start-up period, might combine with pre-existing rights—already defined and allocated and protected by assorted institutional guarantees, such as those studied by Pagano (2002).

The institutional hurdle to implementing this new orientation encountered here is that all rights having existed for a long period are anchored in strong guarantees entrenched in their institutional environments. Thus, the notion of creating a perfect governance structure *ex ante* to steer the reforms over a long time horizon seems contradictory. Over the course of the long implementation of these reforms, the various stakeholders, whether private or public, and the new governance structure, can only sequentially uncover the exact character and relevance of the

existing rights. Therefore, they can only intervene sequentially in the redefinition and reallocation of these rights in order to sequentially adapt the various modules of the industry and the markets<sup>16</sup> (Prosser 2005). This is because, in North's (1990, 2005) view, we only discover the long-term properties of existing rights and institutional changes by a process of trial and error, and sometimes by blind chance. For how could we design *ex ante* a potentially perfect structure that, at some future time during the latter stages of the reform, only allows modification of rights that significantly block adaptations that are truly required? In Williamson's view, private economic agents are unable to create, *ex ante*, a perfect contract to frame their future relationship. And, similarly, according to North, public and private institutional agents are unable to build, *ex ante*, a perfect structure for reconfiguring industry modules and redefining the corresponding rights.

In real institutional change, the long-term governance structure of reforms can only act over the existing endowment of decision-making power and veto power. This endowment is structured by the combination of rights entrenched in the arrangement of the various modules of the reform. Thus, the long-term governance structure of these reforms cannot be immutable throughout the sequential rearrangement of the chain of modules. Any after-the-fact reconfiguration that was not anticipated *ex ante* may yield unexpected configurations of decision-making and veto rights *ex post*. Such undesirable developments can then successfully anchor themselves in strong guarantees that are vigorously protected by the most fundamental elements of the institutional environment (political, executive, and legal). In practice, those who are piloting the competitive reforms cannot do all they would like in the long term to significantly reshuffle rights that have already been acquired, even when major adaptations that were not foreseen at the launch of the competitive reforms become imperative. Institutional environments are inherently rigid, or semi-rigid, provisions that only rarely allow for a forcible redefinition of existing rights.

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<sup>16</sup> Prosser argues that the early legal structures adopted for UK utility regulation did have elements of a regulatory contract. However with the growth of competition and social regulation, a different model, that of a network of stakeholders, has largely replaced it.

### *III-2 The contribution of works operationalizing North's analysis*

The normative content of the competitive reforms thus acts as a set of rules and rights that constrain the behavior of economic agents and allow conflicts arising from such constraints to be addressed. Levy and Spiller (1994) emphasize that the real content of these reforms depends on the functioning of other institutional provisions, such as the legislative, legal, and executive framework specific to each country. Consequently, the institutional endowment of each country constitutes a unique context of guarantees and constraints that must be accounted for in the definition of the nature of the rules and governance structures of the reforms. Differing solutions for the reform may be required in institutional situations that are durably divergent.<sup>17</sup>

There are few comprehensive comparative studies of transformations from old regulatory systems into new, pro-competitive regulatory systems. Guasch and Spiller (1999) make a contribution that is central to network industries by analyzing failures in the legal system and their irrevocability. They present a model that analytically distinguishes between the notions of “*stability*” of the new competitive rules and of “*consistency*” with the nature of the institutional environment that prevailed at the launch of the reforms. In their analysis, the most stable institutional environments are characterized by the presence of numerous veto players, as they embody the principle of checks and balances. These veto powers are bolstered by the existence of administrative procedures that are quite strict and precisely define the procedures for modifying existing rules and rights, while providing for the right to appeal these changes to entirely independent courts of law.<sup>18</sup> The United States typifies that type of institutional environment.<sup>19</sup>

Analytically, we then move on to environments classified as second best in terms of the stability of the competitive commitments. One of these second best arrangements is found in another type of institutional environment, centralization. This is the case in Great Britain. Here, a strong protection of the rights of economic agents is ensured by a special regime of “*professional*

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<sup>17</sup> Levy and Spiller (1994 and 1996) on telecommunications reform, Guasch and Spiller (1999) on reforms in various network industries in Latin America; Spiller and Savedoff (1999) on reforms in water distribution sectors; Spiller and Martorell (1996), Spiller (1998), Holburn and Spiller (2002) on electricity reform.

<sup>18</sup> McCubbins, Noll, and Weingast (1987–1989).

<sup>19</sup> A growing literature is starting to reconsider the assumptions used—like Rufin (2003), who identifies a ‘Presidential Bias’ in the Levy and Spiller framework.

*licenses*” safeguarded by private law and regular courts of law. Of course, this second best cannot provide stability guarantees exactly equal to those in the United States, as it lacks both the credibility of institutional checks and balances and the stability of the strict U.S. administrative procedures.

Here, we recognize that the introduction of a supreme, “*asymmetric*” decision maker, endowed with the power to unilaterally modify existing rights and future rules, does not provide any greater long-term guarantee of the longevity of the reform’s pro-competitive orientation. In the context of this analysis we will ignore rapid, non-modular, and non-sequential initial construction of robust new competitive systems in network industries. Consequently, we will not concern ourselves with the stability of the initial arrangements. Essentially, we assume that the initial arrangements are close enough to an *ex ante* perfect configuration that only minor adaptations will be required *ex post*. However, had we begun from the opposite perspective, we would have needed to postulate the long-run necessity of making major *ex post* adaptations to the reforms, with a poor *ex ante* predictability of their future modalities. Thus, an institutional structure guaranteeing a great deal of stability *ex ante* could ultimately constitute a major obstacle to necessary adaptations to the unexpected, *ex post*.

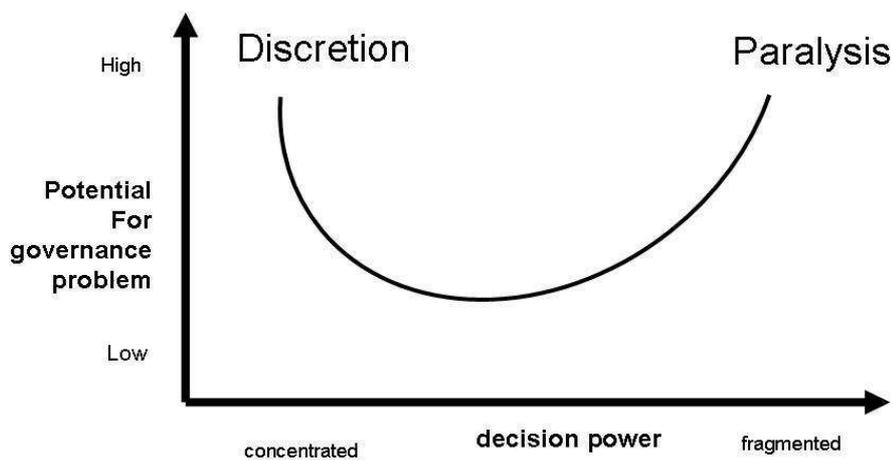
### *III-3 Accounting for the issue of adapting the reforms*

As demonstrated by Macintyre (2003), Tsebellis (2002) and Perez (2002), we can opt for a more general analytical framework. This framework links adaptive governance of the reforms to the concentration of decision-making power, as expressed in the number of veto players in the institutional environment. Two issues with governance are thus identified. The first is the inevitably discretionary behavior of individual veto players. As the literature has amply demonstrated, an *ex ante* irrevocable commitment is necessary to guarantee the stability, and thus the credibility, of the competitive nature of the reforms (Levy and Spiller, 1994 & 1996; Weingast, 1995). But the second issue pertains to the paralysis of structures that are too decentralized with multiple veto players. This arises when accounting for all the *ex post*

adaptation needs of reforms only appearing over a lengthy period of time (Macintyre, 2003; Haggart, 2000).

According to Weingast (1995): “government strong enough to protect property rights is also strong enough to confiscate the wealth of citizens.” Some institutional systems are sufficiently strong *ex ante* to modify all the rules impeding the establishment of new competitive regimes in network industries *ex post*. Consequently, these systems are sufficiently powerful to create robust new governance structures capable of administering a drawn out transition to the new competitive order. However, governments with that much power have little political incentive to curtail the exercise of their own power and enforce a neutral long-term policy of establishing a competitive regime in network industries. Such “strong” governments typically have other political agendas, characterized by another structure of interests in their political systems (cf. France, or ... Russia).

## The Macintyre (2003) introduction to Veto Players problems



At the other extremity of the institutional spectrum, “Fragmentation and dispersal of power stemming from the interplay of constitutional structure and party system leads to policy delay, gridlock, and immobilism” (Tsebelis, 1995 & 2002) (cf. the United States, Germany, and

Belgium). “Weak,” or “relatively weak,” governments are clearly unable to vigorously undertake grandiose reform projects on a vast scale. They prove virtually powerless to correct their course if it later proves that errors were made at inception or if major adaptations to the unforeseen are required *ex post*. This is because veto players can easily block any *ex post* developments to the reforms (cf. the quandary facing local and federal authorities during the California electricity crisis of 2000–2001).

Consequently, to understand how the competitive reforms work out over a long period of time, it is necessary to combine the usual notion of an *ex ante* “institutional endowment,” which provides the static environmental context for the reforms, with an analytical grid of veto players, as in Tsebelis (2002), to provide *ex post* illumination of the evolution and adaptation. A comparative analysis of government policy and the political economy of reforming network industries must thus make room for an approach in terms of veto points and veto players. A number of domains of government policy can be studied in this framework, and the literature addressing it is accumulating rapidly. The most elaborate approach can be found in Georges Tsebelis (1995 & 2002) who, rather than explaining a particular policy, seeks to provide a unified framework for a variety of problems and institutional systems.

Veto players are actors, either individuals or groups, whose agreement is explicitly required for decision making in some fields of public policy. These veto players can be parties, institutions (such as a Parliament or Senate), independent government authorities (such as a sectorial regulator or a competition watchdog), or a self-regulating structure comprised of different sorts of professional groupings<sup>20</sup> (Brousseau and Raynaud, 2006). Application of this analysis to typical institutional environments is the subject of a growing literature. For example, Holburn and Bergh (2004) demonstrate how to influence the decisions made by focusing lobbying efforts at the swing voter closest to one’s particular preferences. Spiller and Liao (2006) assess the determinants of choices between three alternative instruments for influencing government decisions: disbursing funds (with, or without, corruption); revealing or manipulating information (this is lobbying proper); or litigation (*ex ante* or *ex post*). They show that the choice between

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<sup>20</sup> Self-regulation may, therefore, be an appropriate solution where bargaining, at a low cost, can occur between risk-creators and those affected; occupational health and safety provides a familiar example (Rees, 1988; Greif, 1989; Milgrom, North and Weingast 1990; Ogus, 1995 ; Glachant, Dubois and Perez, 2007).

these instruments depends upon their institutional effectiveness, and that this effectiveness is bounded by the structural characteristics of decision making in different institutional environments.<sup>21</sup>

The underlying idea—common to all approaches in terms of veto players—is simple. If certain actors, individuals or groups, have true veto power, and can thus stymie decision making by withholding their consent, they will use this power to advance their own agenda and interests. They will, in fact, block anything counter to their own interests. This is why the institution's receptiveness to competitive reforms that are adaptable in the long run will be a function of three variables: (1) the number of veto players; (2) the objective gap between the ideal preferences of the various veto players; (3) the internal cohesiveness of each collective veto player.

An analysis in terms of veto players thus sheds new light on the implementation of competitive reforms in network industries. Raising the number of veto players tends to increase the stability of policy conducted in a given system, and cannot reduce it. A high level of policy stability reduces the importance of being able to set the decision-making agenda (a power that is typical, for example, of the *European Council* and the *European Commission*), since the individual responsible for setting the agenda will have a relatively small set of significantly different policies from which to select. This high degree of policy stability may also contribute to governmental instability in parliamentary systems, since governments will be less able to impose decisive results on the interest groups that support them. High policy stability may also lead some civil servants and bureaucrats to be much more active, or even activist. This is especially true in the case of independent authorities, such as sectorial regulators and judges, as well as for competition watchdogs, who act with the independence of judges. This situation can arise because of the inability of other institutions to coalesce and stake out strong preferences of their own or to block top bureaucrats from directly expressing their own preferences.

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<sup>21</sup> For example, Congress (House of Representatives and Senate) is the key decision maker in the federal system of the United States, as it is the President in France and the Prime Minister in England.

#### ***IV: Is “Institutional Endowment” the ultimate (hard or soft?) constraint?***

Throughout the world, a large number of very diverse countries have initiated competitive reforms in their network industries. Does the constraint embodied by the initial institutional endowments constitute a strong, or a weak, constraint on the achievement of these reforms?

##### *IV-I The example of the English and German electricity reforms*

The English competitive reform of 1990 featured five main structural traits. They were: (1) the vertical and horizontal unbundling of generation and distribution; (2) the vertical unbundling, and horizontal consolidation, of transmission grid infrastructures and the centre of operation of the grid; (3) the creation of a mandatory centralized wholesale market (the *Power Pool*) and the prohibition of direct bilateral contracts on physical energy; (4) restrictions on the network monopolies and their services by regulation on the conditions of third-party access to the grid; and, finally, (5) the attribution of regulatory powers to a new independent sectorial authority (The Office of Electricity Regulation, or OFFER) (Helm, 2004).

It is altogether noteworthy that not one of these points can be found in the German reform of 1998. Indeed: (1) neither generation nor distribution are vertically unbundled; (2) transmission grids and control centers are not vertically unbundled or horizontally consolidated; (3) there is no mandatory wholesale market, all exchanges being conducted by voluntary pools or bilateral contracts on physical energy; (4) there is no detailed regulatory provision for the terms of third-party access to the grid, these third-party access terms are, rather, negotiated on a case-by-case basis between the parties; and, finally (5) there is no energy-specific regulator (until 2005), the competent independent authority being the competition watchdog (the *Bundeskartellamt*), which essentially intervenes *ex post* in response to complaints received.

These pronounced differences between the German and English modalities of competitive electricity reform did not all appear by chance. Rather, they reflect the differences between their institutional regimes. In England, the government owned all the property rights on every component of the electrical industry; in Germany, the federal government owned none, while

local and regional public authorities possessed a very large share. In England, the government fully controls the progression of the legislative process in parliament, and the government-parliament tandem possess full regulatory power over electricity, to the exclusion of all other public bodies (including the competition authority and judges). In Germany, the government is more reliant on accommodation with the Chamber of Deputies (the *Bundestag*). The federal government-Chamber of Deputies tandem must, in turn, share legislative and regulatory powers over electricity with regional bodies (the *Länder*) and their federal legislative representation (the *Bundesrat*) and with local public authorities. Legislation that is passed by a majority of deputies, but that jeopardizes the rightful powers of regional or local authorities, can be challenged before a constitutional judge. This is why, in the absence of cooperation and compromise between the various levels and instances of public authority, the powers specific to the federal government in the matter of electricity reform would not even be adequate for the creation of a German energy regulator endowed with *ad hoc* powers.

This comparison of the English and German institutional regimes and their electricity reforms clearly reveals the impossibility of the German institutional regime reproducing the strong structural modalities of the English electricity reform. Owing to its more demanding modalities, the English model for competitive electricity reform requires more coordination among the various authorities, executive, legislative, and regulatory, as well as more far-reaching powers for reallocating property rights.

#### *IV-2 The issue of convergence*

The fact that institutional regimes diverge does not necessarily mean that they are intrinsically incapable of converging toward some competitive reform or other (Glachant and Finon, 1999). However, they can only converge to some subset of the possible competitive reform types. Comparing the electrical reforms implemented in England and Germany allows us to explore the potential for institutional convergence. Even though the English and German reforms effectively diverge in important ways, they do not appear to be systematically incompatible. True, the English reform does appear inaccessible to the German institutional regime, but not the converse.

Also, a “German-style” electricity reform has, in fact, been introduced in Scotland, which was under the jurisdiction of the same government and parliament as England at the time of the Electricity Act of 1989.

The institutional path dependency of competitive reforms is greater when veto players are not prepared to willingly negotiate a different orientation for the reform, including bilateral payments between each other, where appropriate. It is characteristic of highly decentralized institutional environments, such as the United States and Germany, that the interplay between decision makers can easily stymie an intensification of competition in network industries. This is particularly true in the electricity sector, which is frequently very local in federal systems, with little federal ownership and in which federal power to induce industrial restructuring is limited.

Centralized forms of government appear relatively better suited for conducting this type of reform. The constraint of institutional dependence is weaker here, where central institutions cannot be blocked by other veto players. However, in Europe we observe that France did not succeed in following the English example, despite the fact that the French government owned the incumbent operators. In fact, these incumbent operators assumed the mantle of veto players. The upshot has been a decision-making duopoly, Government of France-incumbent operators, which continues to be the backbone of a governance that is strongly bilateral, *ex post*, within a market structure remaining highly concentrated with a limited competitive fringe (Glachant and Finon, 2005).

## ***V- Conclusion***

Neo-institutional analysis of the competitive reforms of network industries accounts for the decisive role of an institutional framework adapted to new transactions. Of course it is the political reform process, which defines an initial reorganization of property rights in these industries.

However once this type of reform has been accepted in principle, the crucial issue is the existence of a governance structure adapted to the transactional characteristics of these

industries. We have identified three principal hurdles to the building of this adapted governance structure: where and when to introduce competitive mechanisms; how modularity organizes these various options of segregation and interface between competitive activities and network monopoly; and, finally, the profoundly sequential nature of the implementations of these reforms.

This is why the definition of a perfect governance structure presupposes an improbable perfect coincidence between the definition and allocation of new rights and their correlation with previously existing institutions and rights. The analysis in terms of veto players illuminates the difficulties adapting the initial design of the reforms in an institutional environment that will rarely tolerate several major reorganizations of the rights in effect. Thus, the need to adapt competitive reforms in the long run appears to be central to their analysis. This is revealed by the electricity reforms, for example. In this case, the institutional environment appears as the ultimate constraint on reforms to network industries and on their potential to converge to a sustainable competitive framework.

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