



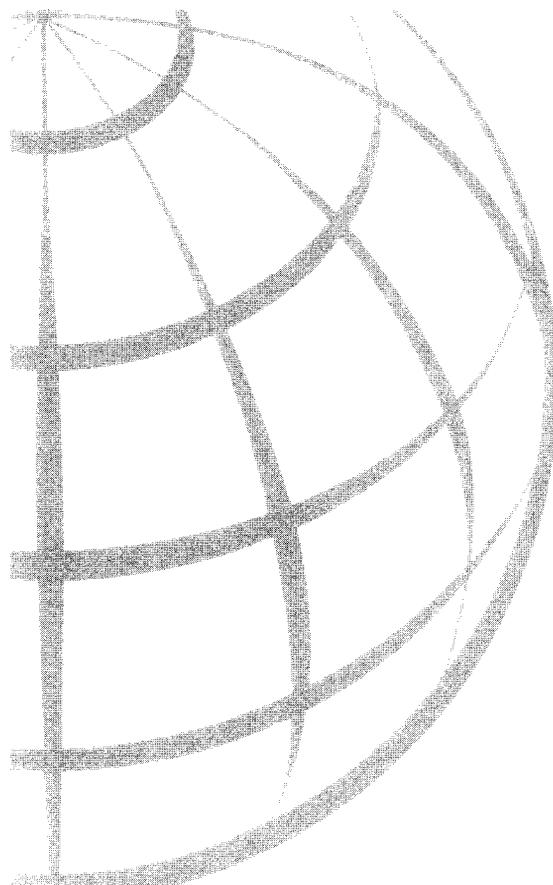
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Governance and Regulation of Power Pools and System Operators

An International Comparison



*James Barker, Jr.
Bernard Tenenbaum
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Governance and Regulation of Power Pools and System Operators

An International Comparison

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*The World Bank
Washington, D.C.*

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FOREWORD

In the last several years, discussions of power sector reforms have moved beyond first level questions such as: Should there be private sector involvement? What should be the structure of the reformed sector? How should it be regulated? Many countries have made these basic decisions and are now turning to second and third level implementation issues. For a significant number of countries, the key implementation issues relate to how to introduce and sustain competition in the reformed power sector. For example, at last count, more than 15 countries have established or are trying to establish power pools and independent system operators as key elements of their reforms.

The World Bank has been actively supporting reforms that lead to increased competition and efficiency in the power sector. The Bank's support increased substantially following the issuance of its 1993 guiding principles which are pre-conditions to lending to countries reforming their power sectors. I foresee that many developing countries will seek to follow the example of other developed and developing countries and create their own power pools with appropriate governance and regulatory systems. This report provides a detailed description of the practical lessons learned by four countries in designing and operating such systems. It has been prepared to assist government and power sector officials in pursuing these fundamental power sector reforms.

James Bond
Director
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Governance and regulatory systems are human institutions. And like many human institutions, they are not always easy to describe. This is especially true for regulatory and governance systems operating in countries where the power sector is undergoing major changes. In such situations, there is often a gap between what is written and what is practiced. Many individuals in England, Canada, Australia, Scandinavia and the United States helped us to close this gap by giving freely of their time and knowledge. This paper simply could not have been written without their willingness to tell us “how things really work.” We are particularly indebted to Guy Bridgman, Ross Cartey, Andrew Claxton, Manuel Dussan, Jane Eccles, Cathy England, Knut Fossdal, Ian George, Michael Klein, Magnus Kober, Donald Lester, Dan McNamara, Jan Moen, David Porter, Richard Powis, Mark Rossi, Paul Stacey, Steven Stoft, Greg Thorpe, Richard Way, Roger Witcomb, Lorry Wilson and Dennis Worth. We would also like to thank Marie-Beth Hall for skillful and diligent editing. Ms. Woolf and Mr. Barker wish to express their appreciation to Peter Cordukes and Karl Jechoutek of the World Bank’s Industry and Energy Department for providing financial support for this study. Mr. Tenenbaum would like to thank the Federal Energy Regulatory Commission for providing him with the time to work on the study. The authors are solely responsible for all views expressed, all conclusions reached and any errors of fact and interpretation that still remain.

Governance and Regulation of Power Pools and System Operators An International Comparison

James Barker, Jr., Bernard Tenenbaum and Fiona Woolf

Abstract

This paper compares and contrasts the governance and regulatory arrangements of four power pools that operate in England and Wales, Victoria (Australia), Alberta (Canada) and Scandinavia. Governance is the process by which decisions get made, implemented and enforced within the pools. Regulation is how governments review and change the decisions of the pool. These are “new style” power pools that were created to maximize competition in generation, to compete on price and to be open to all market participants (generators, transmitters, marketers, suppliers and distributors).

Initially, collective governance through a multi-class stakeholder board is the most common mode of governance. It helps to create political support for the general power sector reforms and is perceived as “fair” because all stakeholders have a voice in governance. The disadvantages of collective governance are that it tends to produce large and unwieldy boards, may fail to achieve independence for the pool or grid operator and can lead to deadlocks that lock the pool into rules that produce inefficient outcomes. An alternative approach is two-tier governance in which a stakeholder group reports to an independent non-stakeholder with final decision-making authority, a variant of this exists in Victoria. It is also emerging in several regions of the United States.

The paper describes the elements of a successful regulatory backstop. It concludes that governance and regulation, by themselves, cannot produce competitive markets. Governance and regulatory systems may succeed in establishing pool and system operators that are totally independent of market participants, but still may fail to establish competitive markets if the underlying structure does not support competition or the pool and grid operators lack necessary operational control and enforcement powers.

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Executive Summary

This paper focuses on the governance and regulation of power pools outside the United States. Governance is the process by which decisions get made, implemented and enforced—it is internal to the pools. In contrast, regulation is how governments review and change the decisions of pools—it is external to the pools. The paper compares and contrasts the governance and regulatory arrangements for four pools. The lessons learned would probably apply equally well to system or grid operators. In fact, in all four cases the pool operator is also the real-time system operator, either directly or indirectly through an affiliate or a hired agent.

The four pools are in England and Wales, Victoria (Australia), Alberta (Canada) and Scandinavia (Norway and Sweden). The pools are organized markets for trading in electricity commodities and services. These are “new style” power pools. They were created to maximize competition in generation, to compete on price, not cost, and to be open to all market participants (generators, transmitters, marketers, suppliers and distributors). They differ from the “old style” tight power pools that have operated for many years in the United States. The old style U.S. pools were created to improve reliability, to minimize operating costs through cost-based dispatch and to facilitate control of decision making by large, vertically integrated power companies. At least ten other countries are operating or plan to operate new style power pools.

Basic Governance Models

Four basic decision-making models dominate discussions of power pool governance.

Model 1. A Multi-Class Stakeholder Board

A multi-class stakeholder board is the club or legislative approach to governance. In its governance structure, most or all classes of users and owners are represented on the governing board. It is designed for collective, self-governance by all who participate in the market. Collective governance tries to achieve independence through voting allocations and rules that attempt to balance the often conflicting interests of different classes. It has been described as “independence by diffusion,” but will fail to achieve independence if one company or one class has the voting power to block actions that everyone else supports.

Model 2. A Non-Stakeholder Board

A non-stakeholder board tries to achieve independence directly. The board is not meant to be a representative board. Board members are explicitly prohibited from having current or future financial interests in any market participants. The goal is to create a board that will represent the broader “public interest,” not the commercial interests of any particular market participant. Board members are usually required to have professional

qualifications and experience that are relevant to the activities of the pool. The principal danger of a non-stakeholder board is that it can become isolated and politicized. To minimize this problem, Victoria combines Models 1 and 2 in a two-tier approach to governance (see below).

Model 3. A Single Class Board

In a single class board, one class controls decision making. This has been the historic model for most of the old style tight power pools that have operated in the United States. It is also the current approach in Chile where the largest pool is effectively a club of large generators. Single class domination can be achieved directly by simply limiting voting membership to a one class. It can also be achieved indirectly by giving independent decision-making authority to committees dominated by one class or by allowing the favored class to select “independent” board members who are not really independent.

Model 4. A Single For-Profit Corporation Not Affiliated With Market Participants

Most power pools around the world are organized as non-profit associations or corporations owned or controlled by some or all market participants. An alternative is to create a single for-profit corporation not affiliated with any market participants. If this approach is adopted, governance becomes an internal corporate matter for the profit-making corporation. The Nord Pool comes closest to this approach. It is a for-profit corporation that is indirectly owned by the governments of Norway and Sweden. Thus, it is probably not a good example of the for-profit governance model because government policies are likely to affect corporate decisions directly.

Governance Experience

Collective governance by market stakeholders (Model 1) is currently the most common mode of governance.

Collective governance seems to be the typical mode of governance, at least in the early stages of power sector reform. Several near-term political and practical considerations seem to drive the decision to start with collective governance. First, collective governance helps create political support for (or at least reduce opposition to) the general power sector reforms. Second, it is widely perceived as “fair” to give all stakeholders a voice in governance. Third, it ensures direct participation by generators and distributors who have the experience and expertise to assess the physical consequences of different pool rules.

The disadvantages of pure collective governance usually become more apparent after it is adopted. Its principal disadvantage is that it tends to produce large and unwieldy boards. When all stakeholders are represented, the board is not likely to be effective as a decision-making body. In addition, it may fail to achieve independence for the pool or grid operator if the voting rules

and allocations are flawed; it can produce deadlocks that lock the pool into rules that produce inefficient operation; and its assessments of rule changes may be colored by self-interest. While collective governance is widely perceived as fair, it may be inefficient because it often is costly to operate and difficult to change once in place.

Collectively governed pools have experienced various problems.

One class vetoes. The voting rules of the three collectively governed pools (Alberta, Victoria, and England and Wales) allow single classes to block pool rule changes sought by other classes. Individual classes can block rule changes that would hurt their commercial interests even if the change would enhance the pool's overall efficiency. This is a problem in the British pool, which has been unable to make significant improvements in demand side bidding and reactive power pricing because its voting rules were "designed for deadlock." One class vetoes make reform difficult unless a regulator or some other outside entity has the authority to overrule the veto.

Establishing relevant classes. Collective governance seems to work best when the market participants fit into well-defined classes. When a single entity performs multiple functions (e.g., generation and distribution) and therefore fits into different classes, governance becomes more difficult. One option is to require participants to be represented by a single class. Another option is to allow participants to split their votes. Choosing the first option discourages vertical integration. Choosing the second option encourages or accommodates vertical integration.

Weighted voting. In the British pool the weighted votes are split 50-50 between those who generate and those who supply wholesale and retail customers. The weights are adjusted quarterly. They are also capped to place some limits on the votes of large or affiliated companies. Nevertheless, the underlying premise is that larger entities should have a larger voice than smaller entities. We see no compelling public policy reason why larger entities should have more of a "say" than smaller entities in designing rules to create and operate a competitive power market. The danger of weighted voting is that larger entities may manipulate the governance process to bolster their market power. The "one person, one vote" systems used in Alberta and Victoria are preferable because they prevent domination by larger entities and are easier to implement.

A board without authority. The full membership votes on most major decisions in the British pool even though there is an Executive Committee. This lack of authority, combined with a cumbersome six step process, slows down decision making. While probably intentional, it increases the cost of governance. In the other three pools, members have delegated full decision-making authority to the boards.

Flaws in collective governance will not be solved by requiring stakeholder board members to represent the “public interest.”

All three collectively governed pools have rules that require members of their stakeholder boards to represent the “public interest.” In theory, board members must give greater weight to the general interest than to the interests of those who put them on the board. If interests conflict, board members are supposed to ignore the economic interests of the stakeholders they represent for the greater good. This requirement is unenforceable because board members can always produce creative explanations as to why the public interest coincides with the economic well-being of their company or constituency. Any governance scheme that requires decision makers to act against their own economic interests is not workable.

Backstops to governance are inevitable.

It is unrealistic to expect governments to allow pools to operate without oversight. This is true regardless of whether a pool is collectively or corporately governed. Successful oversight has two key elements: first, it is used infrequently and second, the oversight body can initiate and review all governance decisions. A basic design question is: Should oversight be performed by an independent board, a regulator or some combination of the two?

A two-tier approach to governance is probably preferable to pure collective governance.

An emerging form of governance is two-tier governance. It exists in Victoria and variants have been proposed in several regions of the United States. Under this approach, a stakeholder group (Model 1) reports to an independent non-stakeholder board (Model 2), which has final decision-making authority. All decisions made by the stakeholder group are essentially advisory. The independent board does *not* need to review each and every decision. Instead, it decides when and how it will get involved. If stakeholders can reach a satisfactory agreement, the independent board will simply accept their decision. If the stakeholders are deadlocked or their decision is unsatisfactory, the board has the authority to step in and make a binding decision.

The principal advantage of two-tier governance is that it melds independence with a working knowledge of the grid. It also reduces the chances of the pool getting locked into an impasse because of conflicting commercial interests. It could be argued that such a board is unnecessary because it simply replicates the job of regulator. But an independent non-stakeholder board should be able to make faster decisions because it will have more flexibility on process. It may also make better policy decisions because it will have specialized expertise that is often difficult to acquire and maintain in a regulatory body. Moreover, market participants will be able to appeal a board decision to the regulator. This may seem inefficient—a backstop to the backstop—but the regulatory backstop probably will not be used often if the board is independent, efficient and knowledgeable. This has been the experience in Victoria. Very few decisions have been appealed to the regulator.

A successful two-tier approach to governance requires that:

- a. The non-stakeholder board must have a mix of skills and backgrounds that are related to power pool and system grid operation. At least one board member should have working experience in daily grid operations.
- b. The independent directors must be given protection from liabilities associated with the performance of their board duties.
- c. The stakeholder committees must be clearly subordinate to the non-stakeholder governing board. If an existing pool or system operator is being replaced or reformed, its governing board must be clearly subordinate to the new non-stakeholder board.
- d. The stakeholder committees must be broadly representative (or alternatively, no one is excluded from a committee who wants to be on the committee).
- e. The board must have the power to ensure that disputes do not get “bottled up” in a committee because of either fundamental disagreements or inefficient operation.
- f. The board must have formal and informal channels for acquiring information from stakeholders. Its independence must not lead to isolation.
- g. The board’s oversight function must not slow down the pool’s ability to fine tune the pool rules.
- h. Regulators or other government officials should not be voting members of the board.
- i. Stakeholders rather than government officials should choose the non-stakeholder board subject to arbitration if the stakeholders cannot agree.
- j. The board should be required to assess periodically whether the underlying sector structure is consistent with efficient and fair pool and grid operation.

A one-tier approach to governance may also be workable.

The principal alternative to two-tier governance is a single governing board with stakeholder and independent members. Under this one-tier approach, the independents would be a voting majority. It has the advantage of eliminating one level of governance. Stakeholders would interact directly with the independents in the course of board meetings. However, decision making may be difficult on a board where some members represent the public interest and some members represent private economic interests. At this time, there is simply not enough worldwide experience to judge whether the one- or two-tier approach is superior.

Regulatory Experience

Collective self-governance can substitute for external government regulation.

Self-governance should be encouraged if it can lead to faster decisions, at lower cost and does not open the door to monopoly abuse. All four countries have combined self-governance with regulatory backstops in rule changes, dispute resolution and market surveillance.

Rule changes. In two of the four cases (Norway and Alberta), changes in pool rules do not require formal approval by the regulator before they go into effect. This allows the pool to make rule changes quickly and efficiently. The danger is that it could invite monopoly abuse if the pool's governance system is flawed (e.g., control by one entity or class). Pool members are protected against possible abuses by two backstops: the right to appeal any rule change to the regulator at any time (Victoria and Norway) and the ability of the regulator to mandate changes in pool rules without waiting for an appeal (Victoria, Alberta and Norway). In England, the regulator runs the risk of being "conflicted out" if he formally raises an issue with the pool and proposes a possible solution. Therefore, he is forced to go through a "delicate dance" of suggesting but not formally proposing rule changes to the pool to avoid being prohibited from reviewing the pool's solution.

Dispute resolution. All three collectively governed pools have created mandatory internal dispute resolution systems, which are generally limited to resolving disputes over application or interpretation of existing rules. The systems are not used to resolve disagreements over proposed rule changes. The systems seem to work reasonably well because the rules are generally well-defined and the underlying responsibilities of each participant are clearly set forth in detailed licenses issued by the regulator or government. Outside the United States, panels of industry experts are preferred to panels of professional arbitrators. The experts may be drawn from inside or outside the pool. A panel may be used to make factual determinations or to issue binding decisions. If it is the latter, the decision-making process is usually less formal than that required by the country's national arbitration law. The general view is that expert panels can produce faster, cheaper and more informed decisions.

Market surveillance. The four pools have limited experience with formal market surveillance. Alberta's program is the most developed. The Alberta experience suggests that an effective market surveillance program would have the following features:

- a. Outside individuals or organizations with no financial ties to market participants should perform the market surveillance.
- b. Individuals and organizations performing market surveillance activities should be protected from liabilities associated with the performance of these activities.
- c. The surveillance program should have two components: an ongoing monitoring program and investigation of specific complaints.

- d. The market monitor should have access to commercially sensitive information on the condition that confidentiality is maintained.
- e. The market monitor should have the authority to assess both market behavior and market structure.
- f. If there are independent board members, the market monitor should report to them and not to stakeholder members.
- g. If the market monitor finds a violation of pool rules or abuse of market power, it should be required to recommend remedies to the governing board (e.g., fines, loss of trading privileges, referral to the regulator or referral to antitrust authorities).
- h. The regulator should automatically receive reports and recommendations of the market monitor.
- i. The regulator should have the authority to order the market monitor to perform specific studies.
- j. The regulator must approve the design and operation of the program.
- k. The pool should finance market monitoring but the regulator must approve the budget.

An effective regulatory backstop must satisfy certain conditions.

If the regulator is to be an effective backstop, the following conditions must be satisfied:

- a. The regulator must have access to good information about the pool. He should be aware of disagreements before they become formal disputes. His knowledge of pool operations and disputes should not be limited to what is written in formal legal documents. The regulator or his representatives should be able to attend all pool meetings as a non-voting observer.
- b. The regulator must have the authority to make changes in pool rules on his own initiative. He should not have to wait for a formal appeal.
- c. When the regulator receives an appeal of a pool rule change, he should not be limited to accepting or rejecting the proposed rule change. He must have the authority to modify the proposed rule if he thinks that it will improve the operation of the pool.
- d. The regulator should have the authority to raise an issue and propose a possible

solution without being “conflicted out” (i.e., prohibited from making a final decision).

- e. The decisions of the regulator should be appealable to a court of law.

In large countries, regulation must be split between national and sub-national (e.g., state or provincial) regulatory authorities.

The split in regulatory responsibilities that seems to be emerging in large countries has the following features. The national regulatory entity has primary responsibility for national and regional power markets. It can review and approve grid codes, pool rules, terms and conditions of transmission service and certification of the need for new transmission facilities. The provincial or state regulator is responsible for awarding licenses or concessions to distribution entities, establishing quality and reliability standards for supply and distribution service and setting the price level and structure of the distribution and retail components of final tariffs. The split in the United States is different from this split in one important respect. The United States appears to be the only large country in the world where state regulators pass judgment on the economic “need” for new high voltage transmission lines even if the proposed line clearly affects interstate trading.

The current approach to regulating Nord Pool—national regulation of an international pool—probably will not work for most other international pools.

It is not natural for pools to stay within political boundaries. The incentive always exists for pools to expand beyond state and national boundaries when there are opportunities for profitable trading. The principal impediment to international pools is political, not commercial. The Nord Pool approach—regulation of an international pool by the regulator of one country—is probably not viable for most regions of the world. The traditional regulatory approach for international power sales is regulation by treaty—a multinational agreement backstopped by international arbitration. While this has worked for long-term bilateral sales between state owned power enterprises in neighboring countries, it is likely to be cumbersome and ineffective for new multinational pools. An alternative approach is a multinational regional regulatory commission such as the one proposed in the recently signed Central American Electricity Market Treaty.

Governance, Regulation and Sector Structure

You cannot be a true believer in competition and remain an agnostic about sector structure.

Sector structure is defined by who owns what and who does what. Sector structure is important because it limits what governance and regulation can accomplish. Governance and regulation, by themselves, cannot produce competitive markets. Governance and regulatory

systems may succeed in establishing pool and system operators that are totally independent of market participants. However, they still may fail to establish competitive markets if the underlying structure does not support competition or the pool and grid operators lack necessary operational control and enforcement powers. This is the fundamental problem in continental Europe and in countries such as Canada and the United States that are trying to graft competition onto a vertically integrated sector structure where generators own transmission. In countries with such structures, the regulator or pool operator may prohibit certain actions. If the prohibition goes against the market participant's basic economic incentives, the participant will simply pursue a slightly different variant of the prohibited behavior until that variant is discovered and prohibited. It is somewhat analogous to "the prohibition of the sale and use of alcoholic beverages [in the United States during the 1930s] which generally made 'drinking' more secretive, possibly more expensive, and more ingeniously devised, but did not stop it."¹ When structure is not conducive to competition, the regulator and pool operator will find themselves unsuccessfully "chasing after conduct." The solution is not a better rule, but a change in structure.

How do you know when it is not working?

Those who have worked on power sector reform in different countries describe the experience as similar to being in the Army: "You wait and wait and then you rush like crazy." Once political authorities give the green light, the actual rules and documents are almost always produced under impossibly tight deadlines. Inevitably, mistakes are made that need to be corrected. Moreover, the agreements reached on specific rules and splits of functions are often compromises that fall short of anyone's ideal. Except for England, the regulators in the four case studies have substantial authority to correct flaws in pool rules. In addition, all four regulators can monitor the pool markets for market abuses. But if they find a problem, their authority to order structural changes is limited or non-existent. This power is usually held by the legislature, prime minister or some combination of the two.

A non-stakeholder board, a regulator or some other independent entity **should be required** to report at regular intervals to these political authorities on whether the pool, the split of functions, the trading rules and the existing sector structure are producing the desired results. In the absence of a formal mechanism for reassessment, industry participants and regulators will waste time and resources pursuing governance and regulatory "fixes" for inherently structural problems. There is, of course, no guarantee that political authorities will take any action. But if the assessments are public and periodic, they will be difficult to ignore.

¹Joe S. Bain, *Industrial Organization*, John Wiley and Sons, 2nd Edition, 1968, p. 553.

Introduction

“The truth is rarely simple and never pure.” Oscar Wilde

This paper focuses on the governance and regulation of power pools outside the United States. Governance simply means how decisions are made and implemented within these organizations. Regulation is how governments review and change the decisions of the pools. Governance is a process that is internal to the pools while regulation is external. The paper compares and contrasts the current governance and regulatory arrangements for four power pools as developed in pool documents and government regulations and laws.¹ The emphasis is on lessons that can be learned from their experiences.

The four power pools, located in England and Wales, Victoria (Australia), Alberta (Canada) and Scandinavia (Norway and Sweden), were selected for several reasons. First, they cover a wide range of governance and regulatory techniques. Second, while all the pools are charged with promoting competition, the structures of the power sectors (e.g., who owns what assets and who performs what functions) are quite different. Third, two of the authors, Barker and Woolf, have had first hand experience with these four pools through their work as consultants to government and power sector officials. While this experience provides some additional knowledge as to how decisions are made, we have also been careful not to breach any confidentiality commitments. Everything discussed in this paper appears in public documents or has been widely and openly debated among pool members.

This paper provides no final answers. Instead, it presents an early “snapshot” taken in the late spring of 1997. The Power Pool of England and Wales, which has been in operation the longest, began functioning on April 1, 1990. The Victorian Pool (Vic Pool) started operating in July 1994 and will go out of existence when the Australian National Market, a national pool, begins operating in 1998. The Power Pool of Alberta began operating in January 1996. The Norwegian Electricity Exchange or Nord Pool began functioning as a bi-national pool with equal treatment of Norwegian and Swedish participants on January 1, 1996. Since all four pools are relatively new institutions, it is inevitable that the governance and regulatory arrangements will change as the pools gain more experience, trading rules are changed or they expand geographically. Two of the pools—Alberta and England and Wales—announced major governance changes as this study was being completed. The fact that these changes are being made presumably reflects a consensus that the earlier arrangements were unsatisfactory. We describe these changes and make preliminary assessments as to their likely effect.

We decided to document the experiences of these non-U.S. pools for several reasons. First, they face a common set of governance and regulatory problems but the solutions chosen differ from pool to pool. Some solutions have been successful, while others have not. Second, many of the disputes relate to basic design issues. It seemed important to describe the disputes

¹Appendix A contains a listing of key documents and Internet websites where information is available on the pools.

while they are still fresh in peoples' minds. Third, it seemed useful to report on the experiences of these other countries as similar questions are being actively debated in the United States. However, we do not make specific recommendations for any U.S. pools nor have we discussed any filings pending before the U.S. Federal Energy Regulatory Commission.²

Throughout the paper, when we talk about governance and regulation, our focus is on power pools, which are organized markets for trading in electricity commodities and services. But in almost every instance, the discussion would apply equally well to system or grid operators. In fact, in all four cases the power pool operator is also the real-time system operator, either directly or indirectly through an affiliate or a hired agent. By and large, there were no debates similar to the debate that took place in California about the need to separate the system operator from the pool operator. Outside the United States, it is generally assumed that the pool operator and the system operator should be one and the same or affiliated entities. Consequently, even though most examples are drawn from power pools, the paper is really an examination of governance and regulation for both pools *and* system operators.

Section I describes four basic models of power pool governance and the implementation issues associated with each model. Section II gives an overview of the similarities and differences among the four pools and how these might affect governance. Section III examines how each pool has dealt with a number of basic governance decisions such as: what entities make the decisions, who is represented on the decision-making bodies and what are the voting rules. Section IV looks at how the pools monitor the markets that they have created. Since market surveillance can hurt the economic interests of one or more participants, it can be viewed as a litmus test as to whether the pool is independent and capable of promoting a competitive market. Section V describes different ways in which regulators and other government institutions control pools and how this control is exercised. It also examines how self-governance can replace government regulation. Section VI presents some conclusions and observations.

²Several months after research for this study was initiated, Ms. Woolf and Mr. Barker were hired by the trustee of the California state government to assist in developing system operator and pool exchange proposals for the state. To avoid any appearance of impropriety, Mr. Tenenbaum has recused himself from any involvement in Federal Energy Regulatory Commission review of these proposals.

I. Governance: An Overview

“The challenge is to design a governance system that lubricates day to day operation, facilitates constructive capital investment and channels political energy in a constructive way.”³

A. What Is Governance?

Governance refers to how decisions are made and implemented within an organization. The four key issues in designing any system of governance are: What decisions are made? Who makes them? How are decisions enforced? How are disputes resolved?

The effectiveness of any governance system can be judged only against a set of goals that relate to both outcome and process. Most people would probably agree with the following goals:

- The pool and system operator is not controlled by any single market participant or class of market participants (independence).
- The market is fair (i.e., non-discriminatory access) and efficient.
- The grid achieves targeted reliability levels.
- The decision-making process is transparent.
- The pool and operating rules can be changed in a reasonable period of time.
- The cost of governance is minimized.

B. Two General Observations

Governance Versus Regulation

Internal governance can be a substitute for external regulation.⁴ When pools or system operators are given a monopoly, government is faced with the decision of whether to regulate. When confronted with this decision, most governments have decided that regulation is necessary. This, then, raises the key follow-up question: Should the pool or system operator be regulated directly by government (a regulatory entity, a government ministry or a competition agency),

³James H. Caldwell, “Governance of the New England Wholesale Electricity Market,” March 21, 1996, unpublished paper.

⁴Others have defined governance more broadly to mean a system of institutions, incentives and information that produce economic outcomes. See, for example, Richard P. O’Neill, Charles S. Whitmore and Michelle Veloso, “The Governance of Energy Displacement Network Oligopolies,” presented at the Olin Foundation Conference on Deregulated Markets for Natural Gas, Yale University, October 4, 1996 (paper revised May 1997). In this paper our emphasis is on institutions. Within this narrower focus, we concentrate on two institutions, the pool and the regulator. For a more general discussion of governance in economic systems, see Oliver E. Williamson, *The Mechanisms of Governance*, New York, Oxford University Press, 1996.

indirectly through self-governance or some combination of the two? Most governments have opted for a combination of the two. This probably reflects the recognition that there is a tradeoff between self-governance and regulation: an effective system of self-governance can eliminate the need for extensive government regulation.⁵ The practical issue is where to draw the boundaries between external regulation and internal governance for different activities such as rule changes, dispute resolution and market surveillance (see Section V. B). If an up-front “investment” is made in creating a good governance structure, the potential payoff is less government involvement in future decisions and actions taken by the pool or system operator.

Governance Isn’t Everything.

It is easy to become immersed in the details of designing and operating a new governance system. The danger is that one may be tempted to think that good governance, by itself, can create a competitive market. This is unrealistic. Good governance is a necessary condition but, by itself, does not produce competitive markets. Even if a governance system succeeds in establishing pool and system operators that are totally independent of market participants, it may still fail to achieve effective competition in generation for at least two reasons.

- **The structure won’t support competition.**

Not all industry structures are equally conducive to competition. For example, Alberta and most of the United States are trying to graft competition onto a vertically integrated industry structure. Both countries are trying to do this by establishing system operators that are independent of the existing owners of transmission. It could be argued that Victoria in Australia shows that this can be done. In Victoria, the system operator, the Victorian Power Exchange (VPX), is separate from the transmission owner, PowerNet Victoria. However, the similarity between Victoria and Alberta and the United States breaks down in two important ways. The transmission owner in Victoria does *not* own generation and is currently the *only owner* of the high voltage grid.⁶ In Alberta and the United States, transmission owners typically also own generation and there are multiple owners of the interconnected transmission grid.

It is an open question whether a governance system, no matter how well designed, can overcome a structure that does not readily accommodate competition. U.S. policy makers have generally shied away from recommending structural reforms because it is politically easier to

⁵As the state government in Victoria observed: “The independent accountability and governance of VPX [the power pool in Victoria] provided for in the Electricity Industry Act is designed to maximize VPX’s contribution to the commercial interests of the industry and **minimize the need for regulatory intervention** [emphasis added]. Office of State-Owned Enterprise, *Reforming Victoria’s Electricity Industry*, December 1994, p. 46.

⁶It may not be the only owner of transmission facilities in the future. VPX will be actively encouraging other entities to compete against PowerNet Victoria for the right to construct new transmission facilities. However, these new entities must agree to cede full operational control to VPX and they cannot own generation. These are the same requirements that apply to PowerNet Victoria.

talk about competition than divestiture. But the U.S. approach to power sector reform—mandating competition without requiring changes in ownership—may simply not be feasible even with a well-designed governance system⁷.

- **Insufficient operational control.**

Most discussions of governance emphasize the need to create independent system and pool operators. But independence won't accomplish very much unless the system operator is also given full operational control of "the way the transmission system is used, operated, maintained or expanded."⁸ Transmission maintenance is a case in point. Box 1 shows three possible levels of operational control by an independent system operator. Effective competition is not likely to be achieved unless a contract or lease can be written and enforced that gives the system operator the maximum level of operational control. The system operator needs such control to prevent transmission owners who also own generation capacity from scheduling transmission maintenance to raise generation prices.

In Victoria, for example, VPX, the pool operator, is also the system operator or controller. What this means is that PowerNet Victoria cannot switch on or off individual transmission lines or initiate transmission maintenance without first obtaining approval from a VPX official in the VPX "switching center." This requirement gives VPX a level of operational control that is effectively at the maximum level shown in Box 1.

It has recently been argued that U.S. utilities that own transmission facilities should **not** give full operational control to an independent system operator. The contention is that transmission owners, not the ISO, will ultimately be held politically and legally responsible if the ISO fails to achieve targeted reliability levels. Therefore, transmission owners should "oppose pressure to surrender authority over [reliability] decisions" unless legislative action is taken "to relieve [them] of their traditional reliability responsibilities or liabilities."⁹ Even if this advice is ignored and contracts are written, it may be difficult to enforce these contracts.

⁷A good overview of the pros and cons of different approaches to separating transmission from generation can be found in Anna P. Del Valle, "Separating Transmission from Generation: What's Required and Why," *The Electricity Journal*, March 1997, pp. 83-90.

⁸Del Valle, p. 83. A pool or grid operator usually needs the right of *eminent domain* in order to build new transmission lines. In many places (e.g., Malaysia, India, Pakistan and California), the laws give this right to existing power enterprises and they are prohibited from assigning it to a new entity like a pool or system operator. Without a change in law, it would be difficult to require a pool or system operator to assume the obligation to expand the grid.

⁹Larry E. Ruff, "Governing and Controlling The ISO: Who and What Can Kill The Beast," Harvard Electricity Policy Group, paper presented at the Twelfth Plenary Session, Palm Springs CA, January 6, 1997.

Box 1. Transmission Maintenance: Levels of Control

Maximum Authority: (ISO is responsible for meeting reliability *and* economic criteria for *all* time periods.)

- a. Receives requests for authorization of preferred annual maintenance outage schedules from transmission owners (TOs).
- b. Reviews and tests against reliability criteria and potential for creation of constraints on trading.
 - (1) Directs TOs to reschedule maintenance (TOs resubmit requests), *or*
 - (2) ISO *itself* revises maintenance schedule and *instructs* TOs when to perform maintenance.
- c. Updates maintenance schedules on monthly and weekly basis; *requires* changes to schedules when they will fail to meet reliability criteria or when planned outage might create uneconomic constraints on trading.

Moderate Authority: (ISO is responsible for meeting reliability criteria for all time periods.)

- a. Receives TO requests for authorization of preferred annual maintenance outage schedules.
- b. Reviews and tests against reliability criteria.
 - (1) Directs TOs to reschedule maintenance (TOs resubmit requests), *or*
 - (2) ISO *itself* revises maintenance schedule and *instructs* TOs when to perform maintenance.
- c. Updates maintenance schedules on monthly and weekly basis; *requires* changes to schedules when they will fail to meet reliability criteria

Minimum authority: (TOs establish their own maintenance schedules. ISO may reschedule maintenance to maintain reliability in a limited time period before the actual work is to be performed.)

- a. Receives TO requests for authorization of preferred annual outage maintenance schedules.
 - b. Tests against reliability criteria and potential for creation of constraints on economic trading.
 - (1) Publishes the requested schedules and notes any potential reliability problems, *and*
 - (2) ISO has the right to revise maintenance schedules if a TO fails to correct a potential reliability problem, *or*
 - (3) ISO takes no action.
 - c. Updates and publishes maintenance schedules on a monthly and weekly basis.
-

Some observers have expressed considerable skepticism about the ability of a system operator to assert full operational control over assets that it does not own. The CEO of Statnett, the company that owns and operates most of the Norwegian high voltage grid, when asked for his opinion on the U.S. approach to reform, commented that: "If you own it, you control it" because it is the grid owner, not the system operator who "ha[s] the last finger on the switch-gear."¹⁰ The biggest "unknown," then, in the ongoing efforts to introduce wholesale and retail competition in the U.S. power sector is whether rules and agreements can be written to give full operational control to a system operator and whether they are enforceable. If such rules cannot be written and enforced, then designing a governance system may be an exercise in futility.

C. Basic Governance Models

Four basic decision-making models seem to dominate discussions of power pool and system operator governance.¹¹

Model 1. A Multi-Class Stakeholder Board

This is the club or representative approach to governance. It involves creating a governance structure in which all stakeholders (e.g., generators, buyers and marketers) are represented.¹² It is an attempt to create collective, self-governance by all who participate in the market. When political authorities are involved in setting up a pool or system operator, they often gravitate to this form of governance for several reasons. First, it seems eminently fair that all market participants should have a voice in the governance of the market. Second, it ensures direct participation by those who can best assess "the physical and operating consequences of various operating, financial and network planning rules and procedures" on particular grid

¹⁰ "U.S. ISO Proponents Are On Wrong Track Says Statnett CEO," *Energy Daily*, Deregulation News Extra, February 12 1997, p. 4.

¹¹For an earlier survey of governance arrangements in U.S. and non-U.S. pools and system operators and other industries, see William Hogan, Carrie Cullen Hitt and Janelle Schmidt, *Governance Structures for an Independent System Operator (ISO)*, Background Paper for the Harvard Electricity Policy Group, June 6, 1996. See Charles G. Stalon, *Electric Industry Governance: Reconciling Competitive Power Markets and the Physics of Complex Transmission Interconnections*, unpublished paper, May 3, 1996 draft, for a discussion of why the traditional governance and regulatory arrangements in the U.S. power sector will no longer work in a restructured industry.

¹²One definition of stakeholder is a market participant (someone who is affected by whether pool prices are high or low). The pool or market operator is not a market participant because it is generally unaffected by movements in pool prices. Similarly, an entity that just owns transmission would usually not be affected by changes in market prices. Of the three collectively governed pools, the Victoria pool is the most inclusive. Its Pool Consultative Committee gives voting rights to market participants, the pool operator and the transmission owner.

systems.¹³ Third, it may help to buy political support (or at least reduce opposition) for the larger power sector reforms that lead to the creation of the pool.

While these are appealing characteristics, a multi-class stakeholder model also raises many implementation questions:

- What are the appropriate classes?
- How many votes does each class receive?
- Do board members get equal votes (i.e., one person, one vote)?
- How are the class representatives chosen?
- What are the voting rights of entities that are vertically integrated (i.e., that own generation, transmission and distribution assets)?
- What are the provisions for changing class representation when there are mergers, acquisitions and divestitures?
- Should some issues be voted on only by certain classes?

While a multi-class board may legitimize reforms, it can also lead to inefficiencies. For example, almost everyone will argue that their interests need to be represented by a separate class. Since political authorities are usually inclined to honor such requests, the outcome is often a large board with many classes.¹⁴ This can lead to a slow and contentious decision making.¹⁵ Also, the expertise may be tainted. A participant's economic interests may affect the objectivity of its engineering and operational assessments. Moreover, as the pool gains operating experience, the pool staff can provide the same expertise and is likely to be more objective.

A multi-class board *may or may not* be independent. It will not be independent if one company or one class has the voting power to block actions that everyone else supports. This is currently the case in Alberta. A measure cannot be passed by the Power Pool Council, the pool's governing board, unless it receives at least 75 percent of the votes of Council members. Since the three large vertically integrated utilities, which own the predominance of generation and transmission in the province, control three of the ten votes on the Council, they are effectively

¹³Comments of Professor Paul Joskow (M.I.T.) presented at FERC Technical Conference Concerning ISOs and Power Pools (RM 94-7-000 and RM 95-8-000), January 24, 1996, p. 15.

¹⁴This clearly happened in California. Originally, it was proposed that the two key entities, the Independent System Operator (ISO) and the Pool Exchange (PX), would each have boards of consisting of five classes. This was changed in a law passed by the California Legislature. Under the provisions of this law, 14 classes are now represented on the ISO board and 12 classes on the PX board. This could lead to 25 or more members on each board.

¹⁵Based on their experience in several countries, Barker and Woolf believe that a pool governing board should have a maximum of nine members. If the board exceeds nine, a smaller executive entity will need to be created to ensure timely decision making. See Fiona Woolf and Jim Barker, "Protecting Your Interests: The Decision Making Process In Pools/Exchanges," presentation at a seminar of the Institute of International Research, New York City, July 30, 1996.

able to block any change that the other participants may favor.¹⁶ A similar situation existed in England and Wales where the pool, until recently, had a two-class board consisting of generators and suppliers. The voting rules effectively allowed the generators to block any action the suppliers proposed, and vice versa, in votes of the board and general membership.¹⁷ It is not surprising that one former board member characterized this system as being “designed for deadlock.”

How can a multi-class stakeholder board be made to operate independently of any one class? One technique, used in California for the boards of both the independent system operator (ISO) and pooling exchange (PX), was to establish classes and voting rules that would satisfy two principles: no one class should be able to block or veto an action and no two classes should be able to vote together to form a sufficient majority to make decisions.¹⁸ Another technique is to appoint a sufficient number of non-stakeholder board members so the one class veto is no longer possible. For example, in Alberta the Electric Utilities Act of 1995 gives the Minister of Energy the right to appoint any number of additional members to the Power Pool Council.¹⁹ If the Minister were to exercise this authority by appointing two or more non-stakeholder members to the board, it would presumably eliminate the one class veto power that was described above. Another more controversial approach is to maintain a stakeholder board but to mandate that the board members represent the broader public interest rather than the economic interests of the organization that put them on the board. It appears that such a requirement may be put into place

¹⁶As this study was being finalized in May 1997, the provincial government is expected to appoint two independent members to the Power Pool Council and the Council’s voting rules will be revised to require a 70-percent majority. The bylaws are also expected to be changed so that one of the independent members will always serve as a voting chairman of the Council. If implemented, these changes will eliminate the current one-class veto of the three vertically integrated power enterprises.

¹⁷In theory, this should not happen if a proposed change would increase overall efficiency (i.e., increase the size of the pie). It should be possible to create a “win-win” outcome for all parties through side payments between the different participants. However, this rarely happens because such payments are usually viewed as unethical or the costs of negotiating the necessary multi-party arrangement are too high. Therefore, the deadlock is apt to continue unless some outside entity like the regulator can step in and break the impasse. For an optimistic view on the potential for win-win negotiations, see Roger Fisher and William Ury, *Getting to YES: Negotiating Agreement Without Giving In*, 2d ed., New York: Penguin Books, 1991. For a pessimistic view, see Owen M. Fiss, “Against Settlement.” *Yale Law Journal*, 1984, Volume 93, pp. 1073-1090.

¹⁸U.S. Federal Energy Regulatory Commission, “Order Conditionally Authorizing Establishment Of An Independent System Operator And Power Exchange, Conditionally Authorizing Transfer of Facilities To An Independent System Operator, And Providing Guidance,” Docket Nos. EC96-19-000 and ER96-1663-000, November 26, 1996, p. 8. The current governance arrangements in the Alberta, Victoria and England pools would not satisfy these principles.

¹⁹Section 7(2) of the law states that the provincial government “shall appoint as members of the Power Pool Council such corporations, municipalities, organizations or individuals as may, in the opinion of the Minister, be necessary or desirable to ensure that the membership of the Power Pool council is representative of persons having a material interest in the operation of the power pool.”

in Alberta. Many current board members oppose such a regulation. They argue that it is naive for the government to expect a board member to vote against the economic interests of the organization or class that he or she represents. The controversy surrounding this possible rule change is more fully discussed in Section I.D.

Model 2. A Non-Stakeholder Board

This is sometimes referred to as a “disinterested” or “classless” board. It is designed to be independent rather than representative of stakeholders. This is accomplished by prohibiting board members from having a current or future financial interest in any of the market participants. In addition, board members would be required to have professional qualifications and experience that are relevant to the activities of the pool. The goal is to create a board that will represent the broader “public interest” and not the commercial interests of particular market participants. If the goal is achieved, it should reduce the need for active oversight by a regulator.

The key design questions for a non-stakeholder board are:

- What are the required qualifications for board members?
- How tight are the restrictions on future financial ties to market participants?
- Is the initial set of board members chosen by government (top down) or the industry (bottom up)? How are members selected for later boards?
- Should regulators or other government representatives be allowed to participate as voting members of the board?
- If the independent directors are chosen by industry stakeholders, is unanimous agreement required by all stakeholder classes?
- If stakeholders can't agree on independent directors, how is the deadlock broken?

Pure and hybrid versions. The pure version of a non-stakeholder board contains only independent board members. No stakeholder representatives are allowed on the board. The hybrid version includes both independent and stakeholder members, but with the independent members in a voting majority. The obvious advantage of a hybrid board is that the independent members have direct access to fellow board members who have direct first hand knowledge of how the grid operates. The disadvantage of a hybrid board is that it raises many of the same design issues (e.g., how many classes, how is representation changed when sector structure changes, etc.) that arise for a full stakeholder board.

The Board of Directors for the Victorian Power Exchange in Australia is a hybrid board. It has nine members: five are independent and four are stakeholders (two representing generators and two representing power distributors and consumers). Alberta currently has a pure stakeholder board. However, it may become a hybrid board if the provincial government chooses to exercise its legal right to appoint non-stakeholder members to the Power Pool Council. If this happens, it seems unlikely that non-stakeholders will become a voting majority. Instead, the more likely outcome is a stakeholder board with a minority of non-stakeholders. The non-stakeholder members would, in effect, rectify the mistake of allowing one class to dominate

the board. However, this raises the more general question of whether it makes sense to have stakeholders and non-stakeholders together as voting members of the same governing board? This might be referred to as the one-tier approach.

A two-tier alternative? The two biggest dangers of a pure independent board are that it may not have enough information or experience to make informed decisions and it may slow down the decision-making process. (These problems also arise when there is regulatory review of pool actions or decisions, see Section V.) One way to avoid both of these problems is to create a two-tier governance structure with a non-stakeholder governing board at the top and subordinate stakeholder committees below the board. Something like this arrangement currently exists in Victoria and variants of the scheme now seem to be emerging in the New England and Pacific Northwest regions of the United States.²⁰

The success of a two-tier approach will depend on satisfying ten rules:

1. The non-stakeholder board must have a mix of skills and backgrounds that relate to power pool and system grid operation. At least one board member should have operational experience with daily grid operations.
2. The independent directors must be given protection from liabilities associated with the performance of their board duties.
3. The stakeholder committees must be clearly subordinate to the non-stakeholder governing board. If there is an existing pool or system operator that is being replaced or reformed, its governing board must be clearly subordinate to the new non-stakeholder board.
4. The stakeholder committees must be broadly representative (or, alternatively, no one is excluded from a committee who wants to be on the committee).
5. The board must have the power to ensure that disputes do not get “bottled up” in a committee because of either fundamental disagreements or inefficient operation.
6. The board must have formal and informal channels for getting information from stakeholders. Its independence must not lead to isolation.
7. The board’s oversight function must not slow down the pool’s ability to fine tune the pool rules.

²⁰See Proposed New England Power Pool Agreement filed at FERC on December 31, 1996 and “Recommended IndeGo Governance Features” for the Pacific Northwest (available on the Internet at <http://www.idahopower.com/ipindego.htm>).

8. Regulators or other government officials should not be voting members of the board.
9. Stakeholders rather than government should choose the non-stakeholder board subject to arbitration if the stakeholders cannot agree.
10. The board should be required to assess periodically whether the underlying sector structure is consistent with efficient and fair pool and grid operation.

The last four principles require some elaboration. The seventh principle deals with oversight. There are two basic approaches to oversight by an outside board. One option is that the outside board *must* review and approve every proposed change in pool rules before the change can go into effect. The problem with this approach is that it is likely to slow down the pool's ability to introduce even non-controversial rule changes because outside boards are harder to convene and board members may often need to be educated since they will not be involved in pool operation on a day-to-day basis. Another option is to provide the board with the ability to review every rule change but give it the discretion to decide which changes it will review. In effect, the board is held "in reserve" for major issues. It has no obligation to review and take formal action on every proposed rule change. Victoria has chosen this second option. The essential distinction between the two options is that the first option *requires* the board to review every rule change while the second option *gives it the opportunity* to review rule changes but does not mandate such a review. The second option allows the board to act like a corporate board: it decides when and how it will get involved. We think this second option is the better approach. (Similar choices must be made in deciding when an outside regulator should review pool actions, see Section V.)

The eighth principle stands for the proposition that regulators (or other government officials) should not be voting members of the board. A regulator who is a voting member of a governing board is put in the untenable position of participating in a decision and then later possibly being forced to review the same decision. This could happen, for example, if a system operator's board decides that a grid expansion is needed. Depending on the system operator's authority, it could pursue the expansion on its own or by ordering an existing transmission owner to make the necessary investment. After the board makes the decision, it is quite possible that someone who opposes the decision may appeal it to the regulator. The regulator would then be forced to pass judgement on his own earlier decision. The same conflict would arise if the board voted to make a change in pool rules, and some member appealed the change to the regulator.

Another practical reason for excluding regulators and other government officials is that their participation can easily lead to large and unwieldy boards. This is especially likely if the pool is a national or regional pool. Once a single government representative is allowed on a pool board, every other state or province will understandably want its own representative on the board. Given these two problems, we think that it is better to exclude regulators and other government appointed individuals as voting members of pool or system operator boards. This does not preclude government officials or regulators from serving as *ex officio* (non-voting)

members of a board. It is important for government officials to be aware of pool problems and controversies before they become formal complaints. However, the number of *ex officio* seats reserved for government representatives should be limited to one or two. This encourages the government officials to take a regional rather than a state or provincial perspective.

This still leaves open the question of whether regulators or other government officials should have the power to select individuals to serve on the board even if they themselves are excluded from board membership. The obvious danger of letting government officials choose board members is that it may politicize the board. It could lead to delays if the governments of several provinces or states are unable to agree on the selection of board members. This could easily happen if the selection of the board gets embroiled in other ongoing but unrelated disputes between two neighboring jurisdictions.

The better approach, in our view, is to let the market participants choose a non-stakeholder board. This requires that all market participants including consumers participate in the selection process. The process should be structured so that no one class can force acceptance of its slate of independent directors on the other classes. If the stakeholder classes cannot agree on a common set of independent directors, then arbitration should be the backstop to break the deadlock (the ninth principle). The arbitrator would be instructed to choose the slate of candidates that best meets two criteria: no conflicts of interest (i.e., board members are not tied to the economic interests of any participants) and with a mix of experience and skills that are relevant to the decisions that the board will need to make. The arbitrators would be selected to choose one of the two slates; they would not be allowed to “mix and match.”²¹ In our view, this approach is more likely to produce a board that is independent and knowledgeable than one which is selected by political officials.

The tenth principle would require the board to report periodically on whether the sector structure (i.e., who owns what assets, who performs what functions) is consistent with efficient and fair pool and grid operation. If the board concludes that the structure is not workable, then it should make recommendations for structural changes.²² This assessment is important because sector structure is the single most important determinant of whether the pool will produce efficient outcomes. It makes no sense for an independent board or regulators to “spin their

²¹In the United States, this form of arbitration is sometimes referred to as “baseball arbitration” because it is often used to settle salary disputes for major league baseball players. In Great Britain, it is known as “pendulum arbitration.”

²²In the absence of an independent board, an alternative is to assign this reporting function to the regulator or some other government entity. This approach has been taken in Europe. The European Commission is required to report to the European Parliament and the Council of the European Union on the electricity market reforms adopted in 1996. See Council of the European Union, *Common Position (EC) No 56/96*, July 25, 1996, Article 26. A similar reporting requirement would be imposed on the new multinational electricity regulator for Central America. See *Central American Electricity Market Treaty*, Guatemala City, Guatemala, December 1996, Article 23 (m). The proposed Central American regulatory scheme is discussed more fully in Section V.C.

wheels” pursuing governance and regulatory “fixes” if the underlying problem is structural in nature. A non-stakeholder board is in a unique position to make such an assessment because of its independence and knowledge. There is, of course, no guarantee that political authorities will respond to the board’s assessment and recommendations. But if the assessments are public and periodic, they are difficult to ignore.

Model 3. A Single Class Board ²³

This simply means that the decision-making process is controlled by one class. For example, in Norway membership in the pool was limited to generators until 1991. It has also been the historic model for most of the old style tight pools that have operated in the United States. (The differences between “old style” and “new style” pools are discussed below in Section II.A.) Even in a tight pool with relatively open membership such as the New England Power Pool (NEPOOL), the voting rules were clearly designed to ensure control by the large integrated generation and transmission owning utilities.

It is less common to see one class domination in the new style pools that have developed elsewhere in the world. One exception is Chile. Voting membership in SIC, the largest pool, is limited to large generators. Consequently, the pool is a “generators’ club.”²⁴ Other, more subtle, techniques can achieve the same result. One way is through committees. If a pool’s committees have independent decision-making authority (i.e., their decisions are not reviewable by the governing board) and the committees are dominated by a single class, then the fact that the governing board may be open and not controlled by a single class is largely irrelevant. The true decisionmaking power will be in the committees, not the governing board.²⁵ Another technique is to put “independent” members on a governing board who are not really independent. This can

²³We use the term “board” because a governing board is the decision-making body for most power pools. The power pool in England and Wales is an exception to this general rule. Here major decisions are almost always made by a vote of the general membership.

²⁴Chile has two separate pools that also perform system operation functions (e.g., dispatch and reliability). In both instances, ownership and trading is limited to large generators. The Chilean regulator has proposed that ownership in the pools be expanded to include small generators and transmission companies. See Hugh Rudnick, Ruy Varela and William Hogan, “Evaluation of Alternatives for Power System Coordination and Pooling in a Competitive Environment,” paper presented at the 1996 IEEE/PES Winter Meeting, January 21-25, 1996, Baltimore, MD. The control of the pool by the large generators has raised concerns that they are able to game the pool to their economic advantage. See R. Peter Labor and Hernan Garcia, “Reshaping Power Markets: Lessons from South America,” *The Electricity Journal*, March 1996, pp. 63-71, ff. 12.

²⁵This is one of the reasons why the FERC rejected an application from the Pennsylvania-New Jersey-Maryland (PJM) power pool. See Order Directing Amendments to Proposals to Restructure the Pennsylvania-New Jersey-Maryland Interconnection and Providing Guidance (PJM Order), November 13, 1996, p. 38.

easily happen if one class of existing stakeholders dominates the selection of “independent” members.²⁶

Model 4. A Single For-Profit Corporation Not Affiliated with Market Participants

Most power pools around the world are usually organized as non-profit associations or corporations that are owned or controlled by some or all of the market participants. There seems to be a widespread presumption that it is inappropriate to hand over pool ownership and operation to a profit making corporation not affiliated with any of the participants. However, if this option were selected, governance would drop away as a public policy issue. Governance would still matter but it would become an internal corporate matter for the profit-making entity that operates the pool or grid.

Profit making corporations perform pooling and grid operations function in at least two countries. In Norway, Statnett and Nord Pool S. A., a partially owned subsidiary, perform these two functions. Since Statnett is owned by the Norwegian government, it is likely to be subject to direct political pressures that a privately owned, profit making corporation would not face. The National Grid Company (NGC) in England and Wales builds, owns, operates and maintains the grid system on a for-profit basis. Initially, NGC was owned by the 12 distribution companies in England and Wales. In 1995, the distribution companies sold off their ownership interests and NGC became a publicly owned corporation with shares traded on the London Stock Exchange. Its board of directors consists of top level company managers and outside directors from general industry. NGC’s articles of association prohibit individuals affiliated with generators and distributors from serving on its board. NGC’s investment and operating incentives are established by general and specific incentive regulatory schemes imposed by the regulator, the Director-General of Electricity Supply. In addition to being the grid owner and operator, NGC and its subsidiaries have been hired by the Power Pool of England and Wales to manage pool trading activities and perform settlement functions. This arrangement—a non-profit pooling association hiring a for-profit company as an agent—to perform some or all of the pooling and system operations functions is likely to be a common arrangement in the United States and other countries.

D. The Independence Issue

The “Why” and “How” of Independence

There seems to be almost universal agreement that power pool and system operators should be “really independent,” “genuinely independent,” and “truly independent.” This raises the threshold question: independent from whom? Usually, independence is interpreted to mean that the entity that operates the pool or grid should be not be controlled by any participant in the

²⁶This was another FERC criticism of a proposed governance scheme for the PJM power pool. See PJM Order, p. 38.

market. Or, in the words of one independent power producer in the United States, the system operator “should operate as an independent police force not as someone’s private army.”²⁷ Independence is a means to an end. The goal is to create one or more entities to operate the pool, dispatch generating units and control the grid in a non-discriminatory manner.

How can this be done? Box 2 lists some frequently mentioned conditions for independence. There is universal agreement that employees of a pool and system operator should not have financial interests in the market or in any entities that use the market or the grid. Similarly, it is generally agreed that the same prohibitions should also apply to pool and system operator organizations. These prohibitions are designed to deal with the direct and obvious conflicts of interest. However, they may not be effective against some of the more subtle conflicts. For example, suppose that a representative of Company A is chairman of the committee that makes recommendations on compensation for the pool’s executive director. In such circumstances, the executive director may be reluctant to order actions that are good for the pool or grid but which would hurt Company A’s profits. Those who support an independent, non-stakeholder board argue that it is virtually impossible eliminate these hidden conflicts if the governing board and its committees consist of stakeholders.

Board Members: Who Do They Represent?

For non-stakeholder boards (Model 2), this is not an issue. Members of such boards are specifically required to represent the “public interest” and, to ensure their independence, are prohibited from having financial ties to any of the market participants. It is a very different situation for members of stakeholder boards (Model 1), who are put on the board by their companies or classes. They are almost always high level executives of their company or trade association. The question then is: who do they represent once they are on the board?

This question is really triggered by the underlying issue of how to achieve independence for a multi-class stakeholder board. One school of thought is that independence can be achieved if the composition and voting rules of a governing board are structured so that no single class dominates the board and no two classes voting together are able to form a sufficient majority to make decisions. Under this design, board members are allowed to represent the economic interests of their organizations or constituencies directly and openly. It is argued that independence will still be achieved, even if board members are allowed to represent freely the economic interests of their organizations, because no one single entity or class can dominate board outcomes. This has been described as “independence through diffusion.”

²⁷Here and in several other places in this study, we quote from individuals who provided comments on an “off the record” basis.

Box 2. Operationalizing Independence

1. The pool/system operator and its key employees should not have any financial interests in any of the market participants (generators, distributors, marketers, brokers and suppliers).
 2. The pool/system operator should not have any financial interest in the market.
 - Should be indifferent as to whether pool prices are high or low. But it should have an incentive to keep the prices of ancillary services as low as possible. (The pool or system operator may not be totally indifferent to pool prices if they affect the cost of acquiring certain ancillary services, such as spinning reserves.)
 - Should have an incentive to minimize the spread between buy and sell offers.
 3. The pool/system operator should not have any financial interests in the equipment used to provide its own services.
 4. The voting of the pool/system operator's decision-making body should not be controlled by any single participant or class of participants. (Stakeholder boards)
 5. The pool/system operator should have the power to enforce any rules that it establishes.
 6. Decision making should be transparent.
-

A second school of thought takes the position that a balanced stakeholder board with rules to block one class dominance is *not* enough to produce independence. It is argued that additional safeguards are required. For example, in Alberta some industry participants have contended that all board members, regardless of their affiliations, should be legally obligated to vote in the “public interest.”²⁸ If this position were adopted, it would mean, in effect, that any individual who serves on the pool board “must hang his private interest hat at the door and put on

²⁸The dispute was triggered by the need to choose a new “transmission administrator” for the provincial high voltage grid and the concern of some pool members that the larger, vertically integrated power enterprises, who are also the major owners of transmission, would select themselves. There were also disagreements as to whether these four entities were prohibited from voting on this decision by common law and pool specific “conflict of interest” standards.

his public interest hat when discussing and voting on board business.”²⁹ This debate takes place against the backdrop of a law that grants seats on the Power Pool Council, the pool’s governing board, to ten specific stakeholder organizations. Moreover, the provincial deputy minister of energy has stated that the ten board members are on the board because of their expertise and knowledge and not to represent the economic interests of the organization that the put them on the Council. The possibility that the Alberta government might issue a new regulation that would mandate this interpretation generated considerable controversy within the pool.

The controversy in Alberta warrants two observations. First, there is the practical question of whether such a regulation, if issued, could be enforced. Since “public interest” is a very general term, it seems likely that most board members would continue to vote for the interests of the organizations that put them on the board and, if pressed, justify their votes with creative interpretations of the public interest. In England, one industry official has observed that: “Many issues are presented as being for the ‘good of the market’ but their prime drivers are usually far from being altruistic.” Second, such a regulation probably reflects an attempt to treat the symptoms rather than the underlying problem. As discussed above, the current composition of the Alberta pool board allows the large integrated entities to block any action of the board. It would seem that a more direct solution would be to change the composition of the board or its voting rules to eliminate one class dominance.

The issue of who do stakeholder board members represent has also arisen in Victoria. The “Company Code” in Australia, as in most countries, requires that a company board member must give his highest allegiance to the interests of the company. Compliance with this legal requirement is not a problem for the five independent members of the Board of Directors of VPX, the company that runs the pool. But it does raise a basic conflict for the two generator and two distributor members of the board. Victoria’s solution is different from the one proposed in Alberta. No attempt was made to require that the stakeholder directors always represent the pool’s interests to the detriment of their own concerns. Instead, the directors were instructed that they “have a responsibility to VPX as a whole” but that they are “also able to promote a sectoral view providing that they declare an interest.”³⁰

²⁹Arguably, Section 23 of the Pooling and Settlement Agreement in England and Wales imposes a similar requirement. Executive Committee members are instructed to give primary responsibility to the efficient operation of the pool. They are instructed that their responsibility to the pool participants that they represent is subordinate to their overall responsibility to the objectives of the pool. No evidence exists, however, that meaningful attempts have been made to enforce this provision.

³⁰Communication from Greg Thorpe, Victorian Power Exchange, January 28, 1997.

II. The Four Cases

A. What is Similar?

A Mandated Centralized Pool.

All four cases have opted for competition in generation through organized and centralized spot market power pools. These pools typically involve bids for day ahead and immediate (30 to 60 minutes) power supplies. In three cases (England, Victoria and Alberta), all transactions that might affect the physical flow of electricity must be conducted through the pool. In other words, all electricity produced by generators above a specified size must be sold through the pool. In one case (the Nord Pool), the pool does not have an exclusive monopoly on arranging the transactions that lead to scheduling and dispatch decisions. It competes against other market makers in a bilateral market that operates outside the pool.

The term “power pool” has different meanings in different places and at different times. In the United States, “pooling” has historically meant some form of coordination in operations and planning among separate power enterprises. The U.S. pools have often been categorized as “tight” and “loose.” The designation, tight pool, is usually reserved for pools with centralized dispatch based on audited estimates of unit marginal costs and with specified capacity and operating reserve requirements that trigger financial penalties for non-compliance. The term, loose pool, has meant a pool with some coordination of operations and planning but with no central dispatch and usually no specific reserve obligations.³¹

The U.S. power pools (at least as currently structured) are very different from the pools in the four case studies. The traditional U.S. tight pools might be characterized as “old style pools” while the pools in our four case studies could be described as “new style pools.” (They are also sometimes referred to as “power exchanges.”) The old style pools were created to improve reliability, to minimize operating costs through cost-based dispatch and to accommodate control of decision making by the vertically integrated, large participants.³² In contrast, the new style pools were created to maximize competition in generation (subject to accepted reliability standards), to compete on price, not cost and to be open to all market participants (see Table 1). However, this does not mean that all new style pools are the same.

³¹Federal Energy Regulatory Commission, *Power Pooling In The United States* (Washington, D.C., December 1981), pp. 6-9.

³²For an excellent discussion of the basic design issues of old style pools, see U.S. Department of Energy, Energy Regulatory Administration, DOE/ERA/6385-1, *Power Pooling: Issues and Approaches* (Washington, D.C., January 1980). Old style pools are likely to be more relevant to countries and regions that are pursuing an incremental approach to power sector reform. This would probably include China, India, Central America, Southern Africa and the Mekong Delta region.

Table 1. Power Pools: One Term, Two Meanings

Old Style Pools	New Style Pools
Dispatch is typically based on audited or unaudited estimates of variable operating costs (i.e., cost based dispatch).	Dispatch is typically based on bid prices (i.e., bid price dispatch)
Often a closed club among vertically integrated power enterprises. ¹	Usually an open club among integrated and non-integrated power enterprises (generators, transmitters, marketers, suppliers and distributors).
Pool members are required to be self-sufficient suppliers through either ownership of generating units or long-term power purchase agreements.	Pool members with retail or franchise load responsibilities may or may not be required to be self-sufficient suppliers through ownership of generating units or long-term power purchase agreements.
Initially, trading was a secondary concern. In most cases, the principal motivation was to provide emergency support and to share operating and installed reserves to achieve targeted reliability levels at lower cost.	Trading is the primary concern. Initial motivation is to create a competitive generation market.
Minimal incentives to trade because of assured recovery of fixed and variable costs from captive retail customers.	Strong incentives to trade because generators are not guaranteed cost recovery and all enterprises are (often) required to buy and sell from the pool.
Trading is for different products with different durations and degrees of firmness. Trading in capacity rights among pool members may take place outside of the pool agreement.	Trading in the pool is usually for 1-4 products with a high degree of firmness. Non-pool trading is usually in financial hedging instruments that allow buyers and sellers to insure against price fluctuations.
Transmission service is contractually available usually only for specified power sales. No generalized "open access."	Pool operation is accompanied by generalized "open access" (at least at the wholesale level).

¹There are exceptions to this general rule. For example, the New England Power Pool (NEPOOL) has expanded membership to include many non-vertically integrated entities. However, the voting rules ensured control by the two large vertically integrated members.

Trading and pricing arrangements differ significantly among new style pools.³³ Nevertheless, the governance and regulatory issues are generally the same, even if the markets in the new style pools operate somewhat differently.³⁴ In addition to the four pools in this study, new style pools operate or are planned for operation in Argentina, Bolivia, Chile, Colombia, Finland, New South Wales (Australia), New Zealand, Peru, the Ukraine and the United States.

Governance is more difficult in the new style pools. The boards of the new style pools are not like corporate boards of directors. In a traditional corporate board, all directors are, at least in theory, pursuing the same goal: the short and long-term maximization of shareholder value. This is not the case for the directors of the new style pools that opt for collective stakeholder governance (Model 1). Members of such a board are likely to represent entities with widely divergent and conflicting economic interests. They will often be directly competing against each other for generation sales and for wholesale and retail customers. In contrast, the rivalry in the old style U.S. pools was usually limited to competition “around the edges.” Until recently, it consisted mostly of competition for the acquisition of short and intermediate term generation supplies by vertically integrated utilities. It was competition for input supplies rather than competition for revenue producing customers. In short, it was “safe” competition.

The Pool Operator Is Also the System Operator.

In each of the four cases, the entity that operates the pool is also responsible for system operation. At a minimum, this usually means that the pool operator or an agent that it hires or supervises:

- Maintains an instantaneous real time balance between demand and supply on the interconnected grid.
- Responds to system emergencies.
- Schedules some or all generating units on a day ahead and 30 to 60 minute basis
- Acquires ancillary services and then arranges for settlement and billing of ancillary services and energy imbalances.
- Dispatches some or all generating units
- Manages congestion on the grid.³⁵

³³See Appendix B for a listing of key market design questions for new style pools. For discussions of how different non-U.S. pools have dealt with market design questions, see James V. Barker, Jr., William Dunn, Jr. and Mark Rossi, “Analogues For Industry Change: Electricity Market Restructuring Outside The United States,” *Risk Publications*, July 1997 and Carolyn Berry and Karen Palmer, “The New Electricity Power Pools: An International Comparison,” Office of Economic Policy Draft Discussion Paper, Federal Energy Regulatory Commission, Fall 1997.

³⁴In 1996, independent system operators and power exchanges created a new international organization, the Association of Power Exchanges (APEX), to facilitate the exchange of ideas and experiences. The association’s first meeting took place in Norway and the second in Victoria.

³⁵A more complete listing of system and market functions in a disaggregated power sector can be found in Appendix C.

The pool operator may perform these functions directly (Victoria), through an agent that it hires (Alberta and England) or through an affiliated company (Norway). The entity that performs these functions is usually referred to as a system operator, grid operator, network operator or system controller. Since these terms are defined differently in different countries, it always best to look at the functions that the entity performs rather than what it calls itself.

Collective Governance Is the Dominant Governance Model.

Collective decision making through a multi-class stakeholder board (Model 1) seems to be the dominant governance model. It is the current decision-making model for the British and Alberta pools. In contrast, the Nord Pool relies on corporate (i.e., stockholder) governance. Yet it is not pure corporate governance because it contains elements of customer representation. This probably reflects the fact that the pool is jointly owned by Swedish and Norwegian government owned corporations. We are not aware of any privately owned companies that operate pools on a for profit basis. However, this does not preclude a non-profit pool from hiring a for-profit company to run the pool. For example, the British pool has hired the National Grid Company, the grid owner and operator, to run the pool and the settlement system.

The most commonly considered alternative to pure collective decision making is the two-tier arrangement described earlier (Section I.C). This currently exists in Victoria. It combines a mostly stakeholder group (the Pool Consultative Committee) with a mostly non-stakeholder board. On a de facto basis, most decisions are made by the stakeholder group. However, the independent board, controlled by a majority of non-stakeholders, can step in if there is a deadlock or if it does not like the decision reached by the stakeholders. This means that the board has the ultimate decision-making authority and the collective stakeholder group performs an advisory role to the independent board.³⁶

Interest in the two-tier approach seems to be growing in the United States. There are two significant differences between various U.S. proposals and the Victorian arrangement. First, the non-stakeholder boards in the U.S. proposals would be selected by stakeholders (backed up by arbitration if the stakeholders fail to reach agreement) with little or no government involvement. In Victoria, the government selects the board in consultation with the industry. Second, there would be no stakeholders on the U.S. boards. In Victoria, stakeholders are allowed on the board though they are in a minority.

³⁶Initially, the board had very little power when the pool was created in 1994. Board members pointed out that they could not be held responsible for VPX's performance if they lacked the authority to make "strategic policy decisions." The government agreed and in 1996 VPX's license was amended to expand the powers of the board.

B. What Is Different?

Does It Cross Political Boundaries?

Sub-national boundaries. Electrons do not know when they have crossed a state or provincial boundary. Governance and regulation is harder when a pool or an ISO crosses political boundaries because it becomes necessary to accommodate the sometimes conflicting preferences of different political authorities. Currently, this is not a problem for the Alberta, England and Wales and Victoria pools. All three operate at the sub-national level and are mostly under the jurisdiction of a single level of government. However, it may become a concern in Australia when the Victoria pool is replaced by an Australian national pool.

Regulation is likely to be more successful when the regulatory “splits” are clear and functional. This is especially important in large countries where a decision has to be made about the “vertical” split in regulation between national and provincial or state governments.³⁷ The split is easiest to accomplish, at least legally (though not always politically), if the law gives primary regulatory responsibility over the power sector to the national government. This is the case in both China and Brazil.³⁸ In this situation, the national regulatory entity may decide to regulate the pool or ISO on its own or delegate some of its responsibilities to provincial or state regulatory entities. If it delegates to a lower level regulator, it always has the legal option of taking it back if it does not like what the lower level entity is doing.

At the other end of the legal spectrum are large countries where regulatory authority over the power sector is split by law between national and sub-national governments. India and the United States are in this category. The Indian constitution specifies that government authority over the power sector is a “concurrent subject”—it is shared in some unspecified way between the national government and the various state governments. The legal standard is somewhat clearer in the United States. The law gives primary responsibility over interstate transmission service and interstate power sales to the Federal Energy Regulatory Commission (FERC), the national regulator.³⁹ As a consequence, FERC has primary regulatory responsibility over all

³⁷Many countries are currently considering how to divide regulatory responsibility over power pools and system operators. These include Russia, China, India, Brazil, Australia, Argentina and the United States.

³⁸See World Bank Discussion Paper No. 361, *Power Sector Regulation in a Socialist Market Economy*, edited by Shao Shiwei, Lu Zhengyong, Noureddine Berrah, Bernard Tenenbaum and Zhao Jianping, April 1997. The national constitution in Brazil specifies that regulation of the power sector is a “federal competency.”

³⁹As the U.S. power sector restructures, this 60-year-old standard will need to be applied to new situations. Jurisdictional issues that need to be clarified include: Do state regulatory commissions have the authority to order unbundled retail wheeling within their borders? Does FERC have the authority to order interstate transmission necessary to implement state-ordered retail competition? Does it have the authority to set transmission rates for wheeling service required to implement this competition? Does FERC have the authority to draw the line between federally regulated transmission service and state

pools and system operators. However, state regulators in the United States determine the economic “need” for new high voltage transmission lines even though a line clearly may affect interstate trading. In most other large countries, national regulatory bodies perform this function.

Apart from this U.S. exception, the *de facto* split of regulatory tasks in large countries around the world seems to be similar. The national regulatory entity is given primary responsibility for national and regional power markets. This translates into review and approval authority for grid codes, pool rules, terms and conditions of transmission service, and certification of new transmission lines. The provincial or state regulator is then responsible for awarding licenses or concessions for distribution entities, establishing quality and reliability standards for retail and distribution service and fixing the price level and structure of the *distribution and retail components of the final tariff*.

National boundaries. The hardest boundary to cross is a national boundary. When a pool crosses a national border, issues of national sovereignty immediately arise. Solutions are difficult because regulatory responsibility has to be divided horizontally among equals rather than vertically among higher and lower level government authorities. This probably explains why multi-country new style pools are not common. The Nord Pool may be the only current example. Regulation of the Nord Pool has been relatively smooth. The reason, as discussed below (Section V.C), is that the Nord Pool is largely regulated by the Norwegian regulator even though it is an international pool. Though the Scandinavian countries have a tradition of joint economic ventures (e.g., the SAS airline company), it is questionable whether the current regulatory arrangement would be sustainable if the pool were to be expanded to include Finland, Denmark and the Baltic countries. Also, it seems quite unlikely that the Nord Pool approach—national regulation of an international pool—would work other parts of the world that lack Scandinavia’s history of economic cooperation. The new regional electricity regulator, recently proposed for Central America, would probably be a better model (see Section V.C).

Sector Structure: What Are the Splits?

Sector structure can be described by answering two basic questions: Who owns what assets? Who performs what functions? Or stated differently, what are the “splits” in ownership and functions? Table 2 summarizes some of the key splits in the power sectors in which the four pools operate. An efficient split helps to achieve an “efficient and effective” competitive power market. Since power sector reform is a relatively new worldwide phenomenon, it is not always clear which splits are efficient and which ones are not.⁴⁰

regulated distribution service? Ideally, these issues should be clarified in a new electricity law to avoid “time-consuming litigation and protracted uncertainty over restructuring’s ‘rules of the road’.” See Commissioner Donald F. Santa, “Is Federal Legislation Needed To Achieve Competitive Power?” *Private Power Executive*, March-April 1997, pp. 3-4.

⁴⁰For a discussion of the advantages and disadvantages of different splits of functions, see Fiona Woolf, “The Unbundling and Rebundling of Transmission and Market Related Functions,” *Electricity Journal*, December 1996, pp. 44-51.

Table 2. What Are the Splits?

	England and Wales	Victoria (Australia)	Alberta (Canada)	Norway
Do generators own transmission facilities?	No	No	Yes	Minimal
Is the pool operator also the system operator? ¹	Yes	Yes	Yes	Yes through affiliate connections
Is the system operator also the grid owner?	Yes	No	No ²	Yes
Does the system operator make and implement grid expansion decisions?	Yes	Yes	No	Yes
Does the pool operator have a monopoly on physical transactions? ³	Yes	Yes	Yes	No

¹The functions usually performed by a system operator are described in Section II.A.

²Alberta has a further split. Another entity called the "transmission administrator" is responsible for providing non-discriminatory transmission service. In the United States, both functions, system operation and transmission service, will probably be provided by one entity, the independent system operator (ISO).

³Physical transactions are transactions that lead to a scheduling action.

Sources: Pool documents and interviews.

It seems to be generally accepted that splitting transmission operation from ownership is necessary and efficient when the transmission owner also owns generation. The current debate in the United States is whether this can be done by contract (functional or operational separation) or whether it requires divestiture (structural separation of generation and transmission assets). Other splits have also been debated. For example, considerable controversy has surrounded two proposed splits in the planned California electricity restructuring. The first is the split in physical markets. Unlike Victoria, Alberta and England, the California pool will not have a monopoly in arranging all transactions that affect the physical flow of electricity.⁴¹ The actual pattern of dispatch will depend on both pool transactions and bilateral physical transactions arranged outside of the pool.⁴² The second is the planned separation between the pool operator and the

⁴¹In the United States, the debate over this issue is known as the "bilateral versus poolco" controversy. See Charles G. Stalon and Eric Woychik, "What Model for Restructuring? The Debate in the Competitive Power Market Working Group," *The Electricity Journal*, July 1995, pp. 63-73.

⁴²A bilateral physical transaction is a transaction that produces physical scheduling of a generating unit that did *not* bid in the pool market. Bilateral physical transactions also exist in Norway. The proposed system for bilateral physical transactions in California seems to be more complicated than the system that exists in Norway.

grid operator. These will be two non-affiliated organizations.⁴³ In our four cases, these two functions are performed by the same entity or two affiliated entities.

Those who oppose these splits argue that they will increase transactions costs and lead to unnecessary inefficiencies. They assert that the splits force the system operator to deal with “‘reliability’ without regard to ‘economics.’”⁴⁴ Those who support the splits argue that they will enhance competition. They claim that the splits are necessary to get open and non-discriminatory access to the transmission grid when transmission facilities are still owned by generators. If the California arrangements are approved and implemented, they will provide a real world test of whether these two splits are workable.

⁴³This seems to be the trend in the United States. At the time of this writing, the system operator is not expected to be a pool operator in Texas, California, New York, the Midwest and the Pacific Northwest. This will occur if there is no pool in the area or the pool is operated by an entity that is not affiliated with or controlled by the system operator. The system operator will be a pool operator in New England and the Middle Atlantic states. In these latter regions, the system operator will be developed from an existing “tight” pool.

⁴⁴Larry Ruff, *Electricity and Gas Markets: Design and Implementation*, World Bank Training Course slide, Washington, D.C., April 22, 1997.

III. Governance in Practice: Who Makes the Decisions?

The simple answer to this question is that the major decisions in most pools are made by a governing board. While this is true, it is also not very revealing. A more complete answer requires looking at who is on the board, how many votes they have and what the voting rules are. It also requires examining how the pool deals with disputes over the application and meaning of existing rules and procedures as well as proposed changes to pool rules. In this section, we look at how the three collectively governed pools—Victoria, Alberta and England and Wales—deal with these basic design issues. The Nord Pool is discussed separately in Section E since its governance system has both corporate and collective features. The key elements of each pool’s decision-making structure discussed in this section are summarized in Table 3.

A. Governing Board Versus General Membership Versus Outside Board

Each of the three collectively governed pools has a governing or executive board. The board can be convened more frequently and at lower cost than a meeting of all members, potentially speeding up the decision-making process. It is also easier to reach a decision when discussion takes place in a smaller group. However, these benefits will be realized only if pool members delegate genuine decision-making authority to the board. The board must be able to make major decisions without going back to the general membership for further approval. This has been done in Victoria and Alberta, but not in England and Wales. Any member of the English pool has the right to request a vote by the general membership of any decision made by the Pool Executive Committee. As a consequence, in England almost all major decisions go to the general membership for a vote.

Moreover, the current pool agreement in England and Wales specifies a somewhat cumbersome six-step decision-making process. The six steps are: a majority vote based on a showing of hands at the Pool Executive Committee meeting; the right of appeal within 5 days of the Executive Committee vote; a “postal polling” of the general membership where each member votes its weighted votes; the right of appeal within 5 days of this weighted vote to a vote by all members at the next general membership meeting; an unweighted vote of all pool members at the next general membership meeting; and a final weighted vote by all pool members at the general membership meeting. Pool rules prohibit appeals to the regulator until after the final weighted vote of all members. Since the general membership meeting usually takes place about once every 3 months, several months can pass before a disputed issue is brought to the regulator.⁴⁵

⁴⁵A recent proposal to streamline the process would have allowed the pool’s chief executive officer to decide that a disputed issue could be appealed directly to the regulator after a “postal polling” of pool members rather than a weighted vote at a general membership meeting. However, the proposal was withdrawn for lack of sufficient support.

Table 3. Decision-Making Structure: Key Elements

	England and Wales	Victoria (Australia)	Alberta (Canada)	Norway & Sweden
Pool Name	Electricity Pool of England and Wales ¹	Victorian Power Exchange ² (VPX)	Power Pool of Alberta ³	Nord Pool ASA
Type of Entity	Unincorporated, non-profit private association	Non-profit, gov't owned corp.	Non-profit corp.	A for-profit company owned by the Norw. and Swed. gov't-owned grid companies (50/50).
Established	April 1, 1990	October 1994	January 1996	January 1993-Norway January 1996-Norway & Sweden
Number of Participants	55	20	35	120
Governing Board	Pool Executive Committee(PEC)	Pool Consultative Committee (PCC)	Power Pool Council (PPC)	Company board
Chairman	2-year term. Salaried. No vote Selected by all members.	Selected by gov't appointed Board of Directors	Elected by PPC 2-year term	1-year term. Rotated between the Swed. and Norw. members
Composition of Governing Board	Generators = 5 Suppliers = 5 Total = 10	Chairman = 1 Generators = 3 Distributors = 1 Retailers/Cust = 3 Transmission Co = 1 Pool Mgr = 1 Sys Security Mgr = 1 Total = 11	Vert Integr Util =3 Distributors =4 Rural Elec Assoc =1 IPPs =1 Lrg Ind Customers =1 Minister's Appointments =0 Total =10	Norwegian owners =2 Swedish owners =2 Independents =4 Employees =1 Total =9
Role of Committees	Advises board. Some delegated authority, but PEC can review all actions.	Reports to PCC. PCC creates temporary committees to deal with specific issues.	6 standing committees that report to the PPC	8 member Mkt. Council Advises Board.

Table 3. Decision-Making Structure: Key Elements (Continued)

	England and Wales	Victoria (Australia)	Alberta (Canada)	Norway & Sweden
Board Voting Rules	Unweighted simple majority or 65% weighted votes. ⁴ Cap on weights to avoid dominance by large participants	Unweighted Voting (1 person, 1 vote) 9 of 11 votes	Unweighted voting (1 person, 1 vote) 75 % of the votes	Unweighted voting 5 out of 9
Voting Restrictions On Vert. Integrated Utilities	Yes	No vertically integrated enterprises	No	Not relevant
Single Class Veto	Yes	Yes	Yes unless govt expands membership	Not relevant
Differentiated Voting By Type of Issue	Yes—85% to change settlement adminis.	No	No	No
Mechanism for Changing Voting Alloc. & Voting Rules	Pre-established formula in the pooling and settlement agreement	Acceptance by regulator	Law, ministerial discretion or PPC decision	Internal board decision
Appeals	To members within 5 days To regulator within 10 days	Mandatory referral to regulator of resolutions that received 6, 7 or 8 votes if they have not been referred to VPX board	To the regulator after mandatory dispute resolution	Complaints can be taken to regulator.

¹This describes the governance structure that existed between 1990 and 1997. The text describes several major changes in pool governance made in February 1997.

²This describes the governance structure that existed between 1994 and May 1997. This governance system changed in May 1997 when the Victoria and New South Wales pools were “harmonized” in a new pool called NEM1. The governance arrangements will change again in 1998 when a new national pool is created and NEM1 goes out of existence.

³It is expected that two changes will be made in the summer of 1997: two independent members will be added to the Power Pool Council and the voting rules will be revised from a 75-percent to a 70-percent majority.

⁴A weighted 65-percent vote of all members must approve certain issues such as major changes in trading rules. Other “constitutional changes” (e.g., size of the PEC, change in settlement administrator and voting caps) require an 85-percent weighted vote of all members.

Sources: Pool documents and interviews.

Victoria presents a different situation. The Victorian pool is governed by two entities: a Board of Directors and a Pool Consultative Committee. The Board of Directors is a hybrid board with five outside members and four stakeholder members. The Pool Consultative Committee is essentially a stakeholder board. This raises the question: Who has the real decision-making authority?

The short answer is that the Board has the ultimate decision-making authority. But this does *not* mean that every proposed change in pool rules is automatically brought to the Board for a decision. Instead, Victoria's governance scheme holds the Board in reserve for "strategic policy decisions." Between 1994 and 1996, the Board was called on to make a decision on only a few of the more than 25 pool rule changes that were adopted. For example, the Board set a price cap of USD \$ 4,000 per MWh in certain circumstances.⁴⁶ It also established "prudential" standards (i.e., financial requirements) to participate in the pool.

All other decisions were made by the Pool Consultative Committee which usually met every 2 weeks and sometimes as frequently as every week. The Committee made numerous non-controversial rule changes. Any of these many rule changes could have been appealed by any pool member to the Board or the regulator. By most accounts, this two-tier system—an outside board serving as a backstop to a stakeholder board—seems to have worked quite well. It has allowed those with day-to-day working knowledge to make most decisions. But it is backstopped by the fact that a pool participant can easily appeal any Committee decision to either the Board or the regulator and that both the Board and the regulator have full authority to overrule decisions of the Consultative Committee.

B. Composition of the Governing Board

Classes?

The boards of two of the three pools (Victoria and England and Wales) are "class" boards. In both cases, the governing documents establish the classes and specify the number of seats that will be given to each class. The classes are supposed to represent the major stakeholder interests. They, not the government, choose the individuals that represent them.

Alberta has opted for a different approach. The Electric Utilities Act (1995) names 10 specific companies or organizations that, absent a change in the law, have a permanent seat on the Pool Power Council. The designations shown in Table 3 (vertically integrated utilities, distributors, etc.) are our characterizations of these entities and not designations that appear in the

⁴⁶The cap applies only when all available generating resources have been dispatched and loads are being shed involuntarily. Generators can bid higher prices if either of these two conditions is not present. A similar capping mechanism exists in the Alberta pool and the cap is currently at USD \$715 per MWh.

law or any other document. Thus, the class representation in Alberta is implicit rather than explicit. The obvious disadvantage of the Alberta approach is that it “locks in” seats for specific entities. Therefore, whatever implicit balance the government accomplished by giving seats to these 10 entities in 1995 will inevitably be lost if there are future mergers and divestitures. The government has some ability to make “corrections” by appointing new members to the Council. However, old members cannot be removed from the Council unless the law is amended.

Until recently, the England and Wales pool had only two classes—generators and suppliers,⁴⁷ each with five votes on the Executive Committee. Each class had 50 percent of the weighted votes when an issue went to the general membership for decision. This arrangement was criticized on several grounds. First, the allocation of votes was a perfect balance. Since both classes had exactly the same number of votes, there were often deadlocks. Second, the board was criticized for having only two classes. (Victoria has four and Alberta has five.) In particular, consumers were not directly represented on the board.⁴⁸ In theory, consumers were represented by the distribution companies who controlled four of the five supplier seats. But some have argued that this did not work in practice. They point to the fact that the distribution companies in England and Wales earn most of their profits from their distribution business (i.e., the physical movement of electricity from the transmission network over distribution lines to the customer’s premises). The distribution companies earn relatively little from their marketing or supply business. Consequently, the distribution companies may not have been very concerned about pool rules that raise the electricity price to final customers since their profits would be largely unaffected. Third, there was growing divergence of economic interests among companies that were put in the same voting group for purposes of selecting an Executive Committee representative. When the pool was created in 1990, the 12 distribution companies were placed into 4 groups. As the distribution companies pursued different corporate strategies, it was sometimes difficult for the representative of the group to reflect these divergent interests.

In February 1997, the governance arrangements in the English pool were changed. There

⁴⁷A supplier is any entity that engages in the acquisition and sale of electricity on an unbundled basis to retail or end-use customers. It is the sales or marketing dimension of distribution. In Britain, the regional electricity companies (RECs) do not have an exclusive franchise on supply business within their territories. By 1998, other RECs, brokers or generators will be able to compete to sell electricity to all electricity customers anywhere in England and Wales (i.e., full retail competition). In the United States, the term, supplier has traditionally meant an integrated or non-integrated company that sells electricity in the wholesale market.

⁴⁸The pool recently agreed to add one non-voting consumer representative to the Executive Committee. See “Electricity Consumers’ Committees To Represent Customers In The Electricity Pool,” Press Release of the Electricity Consumers’ Committees Chairman’s Group, March 18, 1997. This has been characterized as a “voice without a vote.” California is at the other end of the spectrum. AB 1890, a state law enacted in September 1996, requires that a voting majority of the members of the system operator board not be affiliated with generation, transmission and distribution companies. As a consequence, the board has now been expanded to include 13 individuals who represent various customer groups and public interest organizations.

are no longer pre-established classes. Under the new system, pool members get to vote for 10 individuals to be members of the executive committee. (Two other seats will continue to be reserved for small generators and small suppliers.) Once the 10 members of the board have been selected, each pool member (currently there are 55 members) will be able to designate one of the 10 individuals as its representative. It is anticipated that participants with similar economic interests will choose the same representative. However, if a pool member decides that its chosen representative does not adequately represent its interests, it can switch to another representative twice a year.

While it is still too early to assess these changes, several observations seem warranted. First, the Executive Committee will still be a “class” rather than a “classless” board. The difference is that the class structure will be fluid rather than fixed. Second, decisions on major disputed issues will continue to be made at general membership meetings where members will vote on an individual basis rather than through their Executive Committee representative. Third, the three large generators, even though they may not be formally designated as a class, will still have a sufficient number of weighted votes to be able to block any rule changes that they dislike (subject to some limited regulatory review as described in Section V.B).

Public or Non-Stakeholder Members: How Many? At What Level?

An alternative to a pure stakeholder board (Model 1) is a hybrid board. In a hybrid board, a certain number of seats are set aside for public or non-stakeholder members who are hopefully selected for their independence and expertise. The non-stakeholder members could be outside experts or inside experts (e.g., high level pool officials). Independent experts are brought in to ensure that the “public interest” is directly represented in any initial decision making. A key design question is whether the “independents” or non-stakeholders will be a majority or minority of the voting members.

Victoria’s Pool Consultative Committee (PCC) is a hybrid entity.⁴⁹ Of the 11 seats on the PCC, the chairman is appointed by the VPX Board and 2 other seats are reserved for VPX executives—the pool manager and the system security manager. In England and Wales, the counterparts of these individuals also sit in on governing board meetings. However, there is a difference: in Victoria they vote; in England, they advise. The two pool executives in Victoria do not have the luxury of being neutral—they must use their best judgment as to how their votes on particular issues will help or hinder the overall objectives of the pool.

Alberta does not have a hybrid board but it could if the provincial government exercises its right to appoint additional members to the board.⁵⁰ So far, the government has not done so.

⁴⁹As discussed earlier, the Board of Directors for VPX, the company that operates the pool, is also a hybrid board. VPX’s Board and the regulator can review all PCC decisions.

⁵⁰The 1995 Electric Utilities Act gives the Lieutenant-Governor the right to appoint new members to the Council, after consultation with the provincial Minister of Energy, “to ensure that the

The Power Pool Council currently has 10 stakeholder members. Since the Council's voting rules require 8 out of 10 votes to obtain the required 75 percent supermajority, the vertically integrated utilities (3 votes) or the distributors (4 votes) are both in a position to block changes in pool rules. This may change, however, if the government increases the Council size by appointing several non-stakeholder members or lowers the number of votes required to make a rule change.

Is it generally a good idea to have non-stakeholder members on what would otherwise be a pure stakeholder board?⁵¹ We see the value of having one or two pool officials on a governing board since they bring knowledge of the pool's day-to-day operations to any board deliberations. We also understand why a non-stakeholders may be needed on the Alberta board to break the effective one class veto that currently exists. However, the dynamics of decision making could become complicated if there is a single board with some members representing the public interest and others representing commercial interests of particular members. The potential conflict would presumably disappear if the independents are a voting majority and they all think alike. If this were to happen, the independents would simply outvote any opposing stakeholders. The alternative to a hybrid board with a minority or majority of independent members is to put all the independent members on a separate higher board. An advantage of this two-tier approach (discussed in Section I.C) is that it ensures that non-stakeholders can be used as a backstop to collective stakeholder governance. Presumably, it is easier to serve as an objective arbiter or decision maker if you have not committed to a particular position in earlier votes.

C. Voting Rules

There are two general rules. First, the more grave and important the questions discussed, the nearer should be the unanimity. Second, the more the matter in hand calls for speed, the smaller the prescribed difference in the number of votes may be allowed to become; when an immediate decision has to be reached, a majority of one should suffice.

Jean-Jacques Rousseau⁵²

Basic Voting Rules

What is the optimal voting rule? There is no clear-cut answer. The three collectively governed pools in this study have opted for supermajority voting rules. This means that a vote to make a change in pool rules requires more than a simple majority and less than a unanimous

membership of the Power Pool council is representative of persons having a material interest in the operation of the power pool.”

⁵¹The 1934 Securities Exchange Act requires that U.S. stock exchanges have a minimum of one “public representative” on their governing boards. In 1996, NASD, Inc., the company that owns and operates Nasdaq, the second largest exchange in the world, decided to go beyond the Act's requirements by changing its charter to require that its board contain “a majority of non-industry governors.”

⁵²Quoted in Dennis C. Mueller, *Public Choice II*, Cambridge: Cambridge University Press, 1989, p. 43. The Mueller book provides a comprehensive survey of the academic literature on voting rules.

vote. The required percentages range from 65 percent in England and Wales to 82 percent (i.e., 9 of 11 votes) in Victoria. The dominance of supermajority voting rules probably reflects the widely held view that it is “too easy” to make changes with a simple majority rule and it would be too hard to make changes with a unanimous voting rule.

Even though none of the boards allows a single participant to block rule changes, all three permit “single class vetoes.” For example, in Victoria the generators or retailers can stop a Pool Consultative Committee action if they vote as a block.⁵³ Similar situations exist in England and Alberta. This is quite different from the voting system adopted in California for the ISO (independent system operator) and PX (pool exchange). The voting rules for both of these organizations were designed to prevent any one class from blocking rule changes sought by other participants. Thus, all three of the collectively governed pools in this study would fail to meet the California standard.

In contrast to the collectively governed pools, Norway, a corporately governed pool, uses a simple majority voting rule. Simple majority voting rules are generally the norm for the boards of most for-profit corporations. Simple majority voting rules have also been proposed for several of the independent non-stakeholder boards in the new U.S. pool and system operator organizations even though they are not currently planned as for-profit corporations. The justification for adopting simple majority voting rules is that the independent members of a non-stakeholder board can be “trusted” to represent the general public interest. A simple majority vote is assumed to produce good outcomes. In contrast, it is usually presumed that members of a stakeholder board will vote for their own economic interests and the public interest will be protected only if board decisions require a larger number of votes (i.e., a supermajority). However, the danger of a supermajority voting rule, as seen in the three collectively governed pools, is that it is frequently associated with one class vetoes that can lead to deadlocks unless the regulator or someone else can step in.

Weighted Versus Unweighted Voting

Another key decision relates to how many votes each voting member has. There are two basic options: one person, one vote or a system of weighted votes. Alberta, Victoria and California have chosen the one person, one vote option. England has opted for a system of weighted voting, which we will describe in more detail since it so different from the other three cases.

Between 1990 and 1997, the two designated classes in the English pool, generators and suppliers, were each given 50 percent of the total votes. Within each class, individual companies

⁵³This will occur only if the all members of a class vote together. However, this does not always happen since economic interests can differ even within a class. For example, when the Victorian Power Exchange had to decide on a cap on pool prices that applies in certain situations, those who owned peaking units wanted a high value and those who owned baseload units sought a low value. The pool’s board, where independents are in a majority, ultimately made the decision.

were allocated votes based on a quarterly calculation of total gigawatt-hours generated for the generators and total megawatt-hours sold for the suppliers. Thus, a company that operated as a generator and supplier could get separate voting allocations for both of these functions. Certain caps were imposed to prevent domination by large companies. For example, no one company and its affiliates was allowed to control more than 27 percent of the total weighted votes for all generators and suppliers. In addition, the two large generators National Power and PowerGen, were subject to caps of 10 percent on the votes allocated to them in their role as suppliers. Though numerous changes were made in February 1997, the basic approach of a weighted voting system was retained.⁵⁴

There seem to be two basic rationales for a weighted voting system. The first is the belief that larger entities should have a bigger “voice” in pool decisions. The second is that weighted voting helps companies or groups of affiliated companies that perform multiple functions and which, therefore, may have different interests in particular votes. In order to accommodate these different interests, the weighted voting system has to be combined with provisions for vote splitting that would allow two parts of one company or two affiliated companies to vote on the opposite side of the same issue.⁵⁵

It is not obvious to us why bigger companies should have a larger voice in the operation of a pool which is trying to create a competitive market. While weighted voting was common in several old style U.S. pools (e.g., NEPOOL and PJM), these pools were not established to create a competitive generation market. Giving a big company more influence on key decisions in new style pools would seem to open the door to the exercise of monopoly power through the decision-making process.

The desirability of giving separate votes to affiliated companies that operate as generators and distributors can only be assessed against the more fundamental issue of whether pool participants should be vertically integrated. This basic question of sector structure is beyond the scope of this paper. However, it is clear that voting rules can affect a company’s incentives to perform multiple functions. In California, for example, all companies are required to choose one class for the purpose of voting on pool and system operator decisions. Similarly, the four integrated power enterprises in Alberta each get one vote and the vote cannot be split. Presumably, this requirement creates some incentives to choose one business. In England, there is no such requirement; a company or a group of affiliated companies can get votes as both generators and suppliers. This accommodates vertical integration.

⁵⁴After February 1997, a single 15-percent cap will be imposed on any pool participant and affiliated companies.

⁵⁵The British pool allows for vote splitting on some votes but not on others. Affiliated companies cannot split their votes when selecting a representative for the pool Executive Committee. The affiliated companies can split their votes when voting on an issue that has gone to a general membership meeting. Since most disputed issues are decided by a vote of the general membership rather than the Executive Committee, the right to split votes in general membership meetings is probably more important to affiliated companies that have conflicting interests on a particular vote.

D. The Nord Pool: Corporate Governance?

The Nord Pool is different from the other pools in at least three important ways. First, it is an international pool. The other three pools are national or subnational. Second, the Nord Pool does not have a legal monopoly on arranging transactions. It competes against a non-centralized bilateral market. About 60 to 65 percent of the electricity generated in Norway is produced under bilateral contracts negotiated outside the pool.⁵⁶ Third, the pool is owned by a profit-making corporation rather than a non-profit corporation or association, which is the case for the other three pools.

This last characteristic raises an obvious question: how does governance change when a pool is owned and operated by a profit making corporation? Unfortunately, the Nord Pool, as a government-owned corporation, does not provide a clear-cut answer. Statnett and Svenska Kraftnät, the main grid companies, are owned by the governments of Norway and Sweden respectively. They, in turn, each own 50 percent of Nord Pool, S.A., the pool operator.⁵⁷

The fact that Nord Pool is publicly rather than privately owned probably affects the way it is governed. In particular, encouraging formal participation by market participants (i.e., customers) may be emphasized more than if Nord Pool were privately owned. Four of the nine seats on the Nord Pool board have been set aside for market participants. In addition, the company has created a Market Council of users that provides advice to the board. The board has also provided for the head of the Market Council to sit in on board meetings when the board is discussing issues that are of direct relevance to the users.

Despite the involvement of market users, it is the owners who make the final decision if there is dispute between owners and users because they are likely to control five of the nine votes. The two parent companies each appoint two members to the board. These four owner members, plus an employee member, constitute a potential voting block. The pool board can reach a decision with a simple majority (five of the nine votes.)

The Nord Pool, therefore, represents a mixed case that combines collective and corporate governance. On paper the owners, the national grid companies, appear to have the ultimate decision-making authority. With no major disputes to date, this authority has not been tested.

⁵⁶Many of these contracts existed before the pool came into existence in its present form. As they expire, it appears that many bilateral physical contracts are being replaced by a combination of spot transactions and financial hedging contracts. Personal communication with Mr. Odd Hoelsaeter, Chairman of Statnett, April 1997.

⁵⁷Discussions are scheduled to take place in 1997 that would allow Denmark and Finland to become owners of the pool.

IV. Market Surveillance

A. Why Is It Needed?

Market surveillance is a litmus test of pool independence. The purpose of market surveillance is to look for things that are not working. This may happen because the sector structure is not functional, an obvious mistake was made in the rules or one or more pool participants are able to exercise market power. It is the last possibility that generates the most controversy. An effective market monitoring mechanism needs to continually look for evidence of market power. (Box 3 lists some possible signs of market power problems.) If the pool monitors itself, those who actually perform the activity must have clear authority to get the data that they need and the resources and expertise to analyze the collected data. They must also have the independence to make recommendations that could hurt the economic interests of one or more pool participants or possibly even subject them to civil or criminal penalties. The issue is how can this be accomplished, especially in pools that are collectively governed.

Box 3. Possible Signs of Market Power

- Significant and sustained departures of market clearing prices from estimates of long run and short-run marginal costs.
 - Capacity withholding.
 - Unexpected low plant availability.
 - Significantly different bids by generators of similar technology.
 - Scheduling of transmission line maintenance at times of high pool prices.
 - High bid prices by generating units that “must run” for reliability reasons.
 - New and unexpected congestion on transmission lines.
 - Opposition by one or more generators to transmission investments that would relieve congestion.
-

B. Who Does the Monitoring?

Market surveillance can be pursued in several different ways. First, market participants can file complaints with the regulator; this may capture only the most egregious abuses. Moreover, participants may be unwilling to come forth if they fear retaliation for going to the regulator. Second, the regulator monitors the market on his own initiative, with his own resources. This has been done in England and Wales.⁵⁸ In February 1994, the Director-General

⁵⁸A recent econometric study of bidding behavior in England and Wales suggests that the two large generators seemed to hold back in exercising their market power during periods when the regulator was active in monitoring market behavior. See Catherine Wolfram, “Measuring Duopoly Power In The British Electricity Spot Market,” MIT Department of Economics, November 1995, p. 27.

of Electricity concluded that the two largest generators were probably manipulating the market. He reached an agreement with the companies that imposed a price cap on their bids and also required that they divest themselves of specified amounts of generating capacity. To be successful, this second option requires that the regulator has the money and the expertise to monitor the market. In times of tight government budgets, this may not be very likely. Third, the pool can monitor itself. This could happen if the regulator decides that the pool is in a better position to monitor the market (Victoria)⁵⁹ or the law requires that the pool monitor itself (Alberta). Self-surveillance naturally raises suspicions because it seems like a contradiction in terms. Therefore, it is worth taking a closer look at the self-monitoring system that was recently established in Alberta since it seems to be the most developed of the four pools.

C. The Alberta System

Active market surveillance is mandated by law in Alberta. The 1995 Electric Utilities Act requires that: "The Power Pool Council shall monitor the performance of the power pool and change the rules of the power pool, if necessary, to promote an efficient, fair and openly competitive market for electricity." [Section 9(1)(d).] Arguably, the need for market surveillance is quite high in Alberta since the largest generator owns almost 60 percent of installed generating capacity, while the top three generators own or control about 97 percent.⁶⁰ When the provincial government decided to go ahead with power sector reform, it apparently was unable or unwilling to mandate structural changes that would have made the generation sector more competitive.⁶¹ In

⁵⁹The regulator in Victoria has assigned his monitoring responsibilities to the pool by modifying the pool's license to include this new function. However, it is a partial delegation since the pool does not have the authority to judge or penalize behavior. These functions remain with the regulator. In 1998, when the National Electricity Market begins operation, the market monitoring responsibility will be transferred to the Australian Competition and Consumer Commission (ACCC), the national competition agency. It is conceivable that the ACCC may follow the approach of the Victorian regulator and delegate its monitoring responsibilities to the national pool organization .

⁶⁰Alberta Department of Energy, *Moving To Competition, A Guide to Alberta's New Electricity Industry Structure*, 1994.

⁶¹This is different from the United States where at least two States (Massachusetts and California) have required, either formally or informally, substantial divestiture of generation assets. Also, provincial governments in Canada can grant market based pricing for intra-provincial wholesale power sales. In the United States, only FERC, the national regulatory entity, has this authority for wholesale sales, even where both the buyer and seller are located within one state. FERC is unlikely to give market based pricing in a situation like Alberta's where a single company heavily dominates the generation market. Despite the fact that pool prices have been deregulated, a complicated entitlements scheme currently protects the six distribution companies in Alberta pool from high pool prices. They are guaranteed cost based rates on purchases from existing generating capacity. However, entities like industrial users that buy directly from the pool do not have this protection.

particular, it did not try to mandate divestiture of generating assets. Instead, it imposed a general requirement of “financial” unbundling on the enterprises that continued to be vertically integrated.⁶²

The Outside Market Surveillance Task Force

The heart of the Alberta approach is an independent Market Surveillance Task Force.⁶³ It consists of three outside consultants who are not affiliated with any of the market participants. The task force is currently headed by a non-Canadian pooling expert. The two other task force members are an economist and a lawyer. The pool’s Market Surveillance Committee, a standing committee of the Power Pool Council, selected the task force. This, of course, raises the possibility that the committee, which is composed of three pool members, could compromise the independence of the outside task force.

This system was designed with several features to protect the independence of the task force. First, the task force has a broad mandate to examine a wide range of possible market imperfections (see Box 4). In addition to its investigative role, the task force also must make recommendations to the Power Pool Council to correct any problems that it encounters. Second, the task force has the authority to obtain information from the participants, allowing it to perform its investigative functions while maintaining the confidentiality of commercially sensitive information. This means, for example, that the task force is not allowed to share confidential information with the Market Surveillance Committee even though the task force reports to the committee. Third, the task force has been given a separate budget allocation by the Power Pool Council, initially, about USD \$115,000. Fourth, the task force’s findings and recommendations go directly to the Power Pool Council, not through the Market Surveillance Committee.

⁶²See Section 48(1) of the Alberta Electric Utilities Act of 1995. When there is an inability or unwillingness to mandate divestiture, regulatory commissions sometimes require “financial” or “functional” unbundling. Financial unbundling is the weaker of the two. It simply means that the regulated entity is required to report the costs and revenues of certain functional activities (e.g., generation, transmission and distribution) as if these activities were being performed separately. However, the parts of the company are not required to operate separately, on a day-to-day. Intra-company communications and coordination of activities are not restricted. Functional unbundling imposes an additional requirement—the activities be conducted as if they were being performed by separate non-affiliated companies. It remains to be seen whether functional unbundling is a realistic substitute for divestiture.

⁶³A fuller description of the rationale for the current system can be found in two briefings that were made to the Power Pool Council. See Mark Rossi (Barker, Dunn and Rossi, Inc.), *Market Surveillance for Power Pool of Alberta*, April 22, 1996 and *Market Surveillance Update*, November 7, 1996.

Box 4. Functions of Market Surveillance Task Force (Alberta)

The Task Force is required to investigate any:

- Complaint made by Pool participants to the PPA or the Chairman of the Power Pool Council.
- Possible causes of unusually high or low Pool prices.
- Trends or patterns of unusual trades which suggest gaming.
- Actions, trades or circumstances which suggest that anticompetitive behavior has occurred.
- Unusual circumstances or patterns where generators are not offered into the Pool or are restated.
- Unusual activity or circumstances involving import/export ties between Alberta and others which could influence the market.
- Misuse or misappropriation of confidential information or circumstances where participants are not getting equal access to relevant information.
- Other acts or behavior which amount to "gaming" or a breach of the spirit and intent of the Act and Pool Rules.

Source: Charter of the Market Surveillance Committee, June 25, 1996.

Rejected Options

The pool considered, but rejected, other institutional options. One alternative was to assign the market surveillance role to the Pool Administrator, an employee of the Council. This was rejected because the Administrator would be put in the untenable position of being both a facilitator and a policeman. It was decided that the Administrator's market monitoring role should be limited, as provided in Section 7 of the pool rules, to notifying the Power Pool Council of clear and major breaches of pool rules. Another option considered was to assign market surveillance functions to the Pool Technical Committee, a standing committee of the Power Pool Council. This, too, was rejected as being unworkable. Objective and independent surveillance of market operations from a stakeholder committee whose members might themselves be engaged in questionable behavior would be difficult or impossible. Maintaining confidentiality of information would also be a problem. Ultimately, it was decided that a group of non-stakeholder experts who would be institutionally insulated from the market participants would perform the bulk of the market surveillance.

Role of the Government

The government's up-front involvement in this surveillance process is very limited. However, it does have a backup role. If the task force finds a problem, its findings and

recommendations go to the Power Pool Council. Although the current composition of the Council makes it possible for the vertically integrated utilities to block any recommendations of the task force, any pool member can appeal decisions of the Power Pool Council to the regulator, the Alberta Energy and Utilities Board.

Unlike the British Director General of Electricity Supply, the Board has substantial authority to modify pool rules on its own initiative. The Electric Utilities Act gives it the power “to make any order respecting the operation of the power pool that it considers just and reasonable” and to “disallow or change, as it considers necessary, any of the rules of the pool that in its opinion are unjust, unreasonable, unduly preferential.”⁶⁴ Despite the Board’s considerable authority, it may not be able to accomplish very much by changing pool rules. Some have argued that the Board could “change rules from now until doomsday” without any real effect because the basic problem is the sector structure (i.e., too much concentration in generation) not the pool rules.

There are two backstops to the regulator. First, the provincial legislature could mandate further structural changes in the sector by passing a new law. Second, some aggrieved party could file a complaint with the federal Competition Bureau in Ottawa. These have been described as “bringing out the big guns.” However, if all else fails, they may be the only available options. Generally, if the underlying problem is “structural,” it will not be solved by regulatory “fixes” (i.e., changes to pool rules). This suggests the market surveillance mandate should be defined broadly. The market surveillance entity should have the authority to recommend structural changes (e.g., divestiture, merger of a pool operator with a system operator) if it concludes that changes in pool rules will not eliminate the underlying problem.

Monitoring Actions To Date

Alberta’s Market Surveillance Task Force is currently pursuing a two-part monitoring strategy. The first part consists of monitoring pool operations on an ongoing basis in an attempt to detect fundamental and continuing problems. The Task Force will propose an ongoing monitoring system that relies heavily on data that the pool would collect in the course of its normal operations. It is expected that the task force’s proposal will be presented to the Power Pool Council in early 1997. The second part will involve investigations of specific incidents. Such investigations may be triggered by either a specific complaint to the task force or a self-initiated action by the task force. In two recently released “summary reports,” the task force notified the Power Pool Council that it was investigating two potential market power issues.⁶⁵

The first issue is described as “Impacts of Generation and Transmission Maintenance.”

⁶⁴Electric Utilities Act of 1995, Sections 16(1)(b) and (d).

⁶⁵The procedures for filing a complaint are found in “Launch of Market Surveillance Committee Announced,” a press release posted on the pool’s Internet WebSite (www.powerpool.ab.ca) on December 4, 1996. Copies of the summary reports are posted on the Internet WebSite.

This investigation appears to have been triggered by large upward jump in pool prices in October 1996. Early indications suggest that the spikes may have been caused by maintenance being scheduled on several major generating units at the same time that a major transmission interconnection to British Columbia was taken out for service. If this was the underlying cause, it points to a basic issue faced by power pools around the world: who should be in charge of scheduling maintenance on transmission lines and generating units? As a general rule, whenever control of one or more facilities (e.g., transmission lines or generating units) conveys market power, it would seem necessary for the pool or system operator to assume full operational control of the facility, either directly or through a long-term contract.⁶⁶

The second issue is described as “Volume Restatements.” Under pool rules, generators who bid in the day-ahead market are required to make price and volume bids. They can bid different prices for different “operating blocks” of a particular generating unit. Once they make their initial bids, they are not allowed to change the price bids. However, they can change the volume bid as often as they want before the market closes. It appears that some generators may have been able to push the pool price up by withdrawing certain operating blocks that were associated with lower bid prices. On January 21, 1997, the Power Pool Council adopted several Task Force recommendations that were designed to prevent a generator from using redeclarations of a unit’s availability to push up the pool price.

Two Possible Changes

As this study was being finalized, the pool was seriously considering two changes to bolster its market surveillance system. The first change would eliminate stakeholder supervision of the outside consultants. This proposed change seems to be driven by two concerns. First, it seems unrealistic to expect that stakeholders can be objective in supervising independent consultants when the conclusions reached by the consultants may very well affect the stakeholders’ own economic interests. The second concern is administrative. A stakeholder committee cannot be held responsible for supervising outside consultants if confidentiality requirements preclude the committee from knowing what investigations the consultants are pursuing. One proposed solution is to designate one of the two new independent council members as the chairman of the Market Surveillance Committee, remove all stakeholders from the committee and replace them with the independent outside consultants. As a further strengthening, the committee might also report directly to the provincial Deputy Minister of Energy.

Another action being considered is for the pool to recommend that the government amend the Electric Utilities Act of 1995 to protect the council and its agents explicitly from lawsuits triggered by actions that they take in good faith performance of their pool responsibilities. This protection is particularly important for the independent market surveillance consultants since they are working in a very sensitive area. Even though the Market Surveillance Committee has

⁶⁶See Box 1 for a description for different levels of operational control by a system operator for maintenance on transmission lines owned by others.

no formal responsibility for enforcing Canada's competition laws, its public reports could conceivably be used as the starting point for complaints filed with the federal Competition Bureau. Pool members whose actions were investigated might try to sue the consultants. If the consultants are to do their job with objectivity and diligence, they cannot be afraid that they will be the target of expensive lawsuits brought by pool members that are the subject of a market surveillance investigation. An amendment that gives them explicit liability protection should eliminate this concern.

V. Role of Government and the Regulator

“We emphasize...that the organization of the pool and its trading arrangements are not the private concern of the Pool members but are matters of public interest.”

Energy Committee, House of Commons (Great Britain)⁶⁷

“I would like the regulators to make a very few, very important, very basic policy vectors and not try to run the whole rest of the world ...”

John Rowe, CEO, New England Electric System⁶⁸

A. The Basic Questions

Why Regulate?

Traditionally, regulation has meant government control of prices. But government regulation in the power sector often goes beyond simply controlling prices. Therefore, any discussion of regulation needs to recognize this reality and define government regulation more broadly to include any direct or indirect controls on the actions and decisions of enterprises. Government controls can be undertaken openly and formally through separate regulatory institutions or “behind the scenes” by presidents, governors and legislators. Government intervention can occur before and after a sector has been restructured. It is useful to deal with each phase separately since the reasons for possible government involvement are different.

Pre-restructuring. Though power sector restructuring can take many different forms, the introduction of competition has been the common element in most recent restructurings. The argument for government involvement is based on the premise that competition is not in the natural order of things.⁶⁹ Existing power enterprises are likely to have market power and they will not willingly give it up. The interventionist view is that any negotiations to create competitive power markets in a restructured sector will not succeed unless the prime minister or governor is willing and able to make basic policy “calls” that set boundaries for negotiations among current and future market players. Moreover, it is not enough for high level political authorities to state basic policy preferences and then walk away from the process. Once the basic decisions have been made, someone in government with clearly recognized authority must be able to step in quickly to resolve the inevitable disputes over second and third level implementation issues.⁷⁰ The non-interventionist view is that markets will form on their own and that any government involvement will simply distort the process and produce inefficient

⁶⁷House of Commons, Energy Committee, *Consequences of Electricity Privatization, Second Report*, Volume 1, February 26, 1992, p. xvi.

⁶⁸As quoted in Special Supplement, *The Electricity Journal*, January-February, 1997, p. 30.

⁶⁹Charles G. Stalon, “To Pool or Not To Pool? Toward a New System of Governance,” *Public Utilities Fortnightly*, March 1, 1996, pp. 16-20.

⁷⁰ See Larry Ruff, “An Efficient, Competitive Electricity Industry: Can The Vision Become Reality?” *The Electricity Journal*, January/February 1997, pp. 8-16.

outcomes.⁷¹ Proponents of this view sometimes rely on a theorem developed by Ronald Coase, a Nobel Prize winning economist at the University of Chicago. Coase's Theorem is that voluntary negotiations among affected parties can, in some circumstances, lead to efficient outcomes without government involvement.

We support the first view (recognizing that we may be viewed as less than impartial since we make our living from regulation). Our preferred end point is "light handed regulation" and reliance on competition whenever possible. But our working experience in more than 30 countries convinces us that it is impossible to achieve these outcomes without government intervention. Governments must establish basic policy goals and then stay actively involved in the restructuring and market creation process. The Coase Theorem could apply in situations "where property rights are well defined and where there are a few affected parties who can get together and negotiate an efficient solution."⁷² But neither condition is apt to exist in a power sector that is being restructured. There are too many players with uncertain future property rights to expect that efficient power markets will emerge without active government involvement.

Post-restructuring. Once the basic restructuring has occurred, should there be continued government involvement through regulation? The traditional economic justification for economic regulation is that one or more economic activities have natural monopoly characteristics. Intuitively, this means that it is more efficient (i.e., less costly) to have certain services or commodities supplied by a single entity. Grid or system operation has clear natural monopoly characteristics. An interconnected grid is also filled with "externalities"—"actions by anyone anywhere can directly and immediately affect everybody everywhere."⁷³ Given these cost and physical conditions, it is hard too imagine how grid operation—real time balancing of loads and resources and real time responses to emergency situations—can be performed more efficiently by multiple entities on a single interconnected high voltage grid. Therefore, grid operation to achieve a reliable system would seem to be the core monopoly task that needs to be subject to continued regulation, either by government, grid users or a combination of the two.

In contrast, it has been argued (particularly in the United States) that pooling—an organized central market for one or more electricity commodities—is not a monopoly function. Those who support this view contend that it would be a mistake to give power pools a legal monopoly. Instead, pools should be forced to compete against marketers and others who may be buying and selling the same services in decentralized markets. It is argued that there is no theoretical or empirical evidence that proves that an organized market like a pool is necessarily

⁷¹See Jerry Taylor, "Electric Utility Reform," *Regulation—The Cato Review of Business & Government*, 1996, Number 3.

⁷²Paul Samuelson and William Nordhaus, *Economics*, 14th Edition (New York: Mc-Graw-Hill Company, 1992), p. 315. Also, see Robert Cooter and Thomas Ulen, *Law and Economics* (Glenview, Illinois: Scott, Foresman and Company), 1988, p. 5.

⁷³Larry E. Ruff, *Electricity and Gas Markets: Design and Implementation*, World Bank Training Course slide, Washington, D.C., April 22, 1997.

more efficient than a decentralized market. Therefore, the competing market institutions should be allowed to compete for the right to make a market. In other words, there should be competition “for the market” as well as “in the market.”

Our four case studies do not shed much light on this debate. Three of the four pools have a government granted monopoly on all power transactions that produce actual scheduling decisions. The Nord Pool is the exception. Many scheduling actions are the result of bilateral contracts that pre-date the 1993 industry restructuring in Norway. While there is some evidence that a growing proportion of the bilateral physical transactions are moving to the pool as the contracts expire, it is still early to make a judgment about the relative merits two types of trading mechanisms. In all likelihood, the United States will provide the first major test of whether it is efficient to have competing market institutions operating on the same interconnected grid. If present trends continue, most regions in the United States will either have no organized power pool or a power pool that competes against decentralized market makers.

This, then, raises a threshold question: if there is effective competition among market making institutions, do these institutions still need to be regulated? The United States has already moved towards administrative deregulation of individual transactions through its acceptance of market based pricing. Could this policy also be extended to the market making institutions as well? While the argument is appealing in theory, it is based on two premises that require closer examination.

The first is that there will be genuine and effective competition among different types of market making institutions. Some have argued that the initial experience in the United States suggests that this may not happen. They point to the proposed system of “scheduling coordinators” planned for California. In their view, this is an inefficient and potentially costly way to run a decentralized market; other potentially less costly forms of decentralized trading may have been precluded from competing.⁷⁴ If this is true and it becomes the norm in the United States, it would imply that competition between competing forms of decentralized market systems will be limited or nonexistent. In contrast, it has been estimated that there are now more than 20 equity trading systems in the United States that provide alternatives to the traditional stock exchanges.⁷⁵

The second premise is that the market making institutions will compete on their merits and the better system will ultimately prevail because it provides a market making service at lower cost than any alternatives. This presumes that all competition between market makers

⁷⁴See Paul L. Joskow, “Restructuring To Promote Competition In Electricity: In General and Regarding The Poolco Vs. Bilateral Contracts Debate,” *Discussion Draft*, Department of Economics, Massachusetts Institute of Technology, December 21, 1995, pp. 32-34, 42.

⁷⁵The U.S. Securities and Exchange Commission is reviewing how it should change its regulation of traditional and alternative trading systems in light of this growing competition. See Richard R. Lindsay, Director of Market Regulation, “Concept Release On Exchange Regulation And Foreign Market Access To The United States,” May 23, 1997. (Available on the Internet at <http://www.sec.gov/news/speeches>.)

takes place in the marketplace. But this may not be true especially in countries like the United States that may be vulnerable to “competition through regulation.” This refers to the use of the political and regulatory systems by a company to impose market rules on a competitor that raise the competitor’s costs. It has been argued that power marketers in the United States and elsewhere have an incentive to use the regulatory and political systems to try to create rules for organized pools that put the pools at a competitive disadvantage.⁷⁶ If this happens, it would create inefficiencies in pool operation that would enable marketers to capture a larger share of the market for themselves. Moreover, collective governance would probably exacerbate non-market competition. Under collective governance, the actions of the pool or system operator will be governed by an open decision-making process while their competitors will have the advantage of taking competitive actions with little or no oversight. This, then, raises the possibility that the ultimate “market” outcome could be determined more by manipulation of the political, regulatory and governance systems and less by the relative efficiencies of the two market mechanisms. Until these issues are sorted out, we would urge caution in deregulating market making institutions.

What Is Regulated?

Regulation of pools is different from traditional price regulation. Traditional price regulation means controlling the prices charged by monopolists. In the four new style pools, prices are normally not regulated.⁷⁷ Instead, the regulatory focus is on promoting competition. This requires assessing the competitive effect of pool rules and monitoring the behavior of participants who may be able to manipulate the pool prices. The job of the regulator is to try to ensure that the market reaches its competitive potential.

Less attention needs to be paid to the fees charged by the pool operator for operating the pool. These fees are typically a small percentage of the pool price, and pool participants usually monitor them. In the Nord Pool, the trading fees are \$.092 (about 1.2 percent of the average 1996 pool price). In Victoria, the equivalent number is about 1 percent of the average pool. In England, the regulator has no direct authority over pool expenses. In Alberta, the regulatory commission can examine the reasonableness of pool expenses if it receives a complaint. In the absence of a complaint, its focus is more on whether expenses incurred by the pool were limited

⁷⁶See Steven Stoft, “What Should a Power Marketer Want?,” *The Electricity Journal*, June 1997, pp. 34-45. A marketer buys and resells power and usually does not own generation. By the end of 1996, close to 300 marketers have registered with FERC. Their sales grew from 26.5 million MWh in 1995 to 230 million in 1996. See Edison Electric Institute, *Power Marketers Yearbook 1996: Sales, Purchases and Profiles*, Washington, D.C., May 1997.

⁷⁷At first glance, Argentina appears to be an exception. The electricity law requires generators to bid costs not prices. The cost measure was initially limited to a normalized measure of variable fuel costs. In 1995, the government issued a regulation that expanded the cost definition to include other non-fuel variable costs. But “cost-based regulation” is more appearance than reality. Generators are effectively able to bid prices rather than costs since the cap is high and each generator’s costs are not audited after the fact.

to activities permitted in the pool license. In Norway, the fees charged by Nord Pool for operating the futures market are not regulated. This reflects that the fact that pool has no monopoly on futures trading. In other words, there is effective competition “for the market.”

It seems to be almost universal that regulators do not make the basic decisions on sector structure. These decisions are usually made before the regulatory body comes into existence. The regulator may later suggest changes to the structure, but the highest political authority (the president, prime minister or governors) with approval by the legislature usually make any final decisions about structural changes. When political authorities sense that regulators are encroaching on their territory, the reaction is usually strong and negative: “Did anyone believe we were going to leave electric restructuring entirely to the PUC? Did you think we were going to default these decisions to the PUC or FERC or the private process? If you did, get over it.”⁷⁸

Who Does It?

The norm in most countries pursuing power sector reform (Argentina, Chile, Colombia, Norway, England and the Ukraine) is an electricity or energy sector regulator.⁷⁹ However, this is not the case in New Zealand and Australia, which rely on their competition laws as the principal “regulatory” statutes. This seems to go hand-in-hand with substantial information disclosure and detailed pool and grid codes.⁸⁰ Enforcement is generally left up to the courts or a competition agency.⁸¹ This approach is motivated by a philosophy of “light handed regulation” and a desire to avoid creating a large regulatory bureaucracy.

It is still too early to tell whether this approach will be workable. Some suggest that a

⁷⁸Remarks attributed to California State Senator Peace as reported in “Changes to utility industry in offing,” *San Jose Mercury News*, August 19, 1996.

⁷⁹Argentina has a national electricity regulator called ENRE. But ENRE has little or no regulatory authority over CAMMESA, the national pool. The Argentine Secretary of Energy mandates virtually all pool rule changes even though the pool is mostly privately owned by stakeholders. The government also appoints the pool’s two highest executives. In effect, CAMMESA has a one class governance system (Model 3) and the one class is the government. See Martín Rodrigues Pardina and Antonio Estache, “Exploring Market-Based Options for a Reformed Brazilian Electricity Sector,” *Economic Notes*, Number 12, The World Bank, Latin America and Caribbean Region, Country Department I, August 1996, p. 36.

⁸⁰A grid code is a document that specifies the technical obligations of the grid operator and any entities that are connected to the grid. It establishes mandatory operating protocols. The closest analogy in the United States would be the planning and operation documents prepared by the North American Reliability Council (NERC), regional reliability councils, power pools and individual utilities. These documents were generally designed for a vertically integrated power sector. They will have to be rewritten as the U.S. power sector moves towards open access and restructuring.

⁸¹We are referring to regulation of the pool and grid operator. Separate electricity regulators will exist in Australia at the state level. They will have responsibility for regulating the wires function of distribution companies and sales to any remaining captive customers.

national or region-wide electricity pool requires a specialized regulator. They predict that the functional equivalent of a sector specific regulator will inevitably emerge even if it happens to be located in a national competition agency. Others have argued that relying exclusively on a competition authority is fundamentally flawed because “a competition authority ...is not competent or authorized to do anything more than to react to proven anticompetitive behavior, i.e., it can try to punish ‘bad’ behavior but cannot define ‘good’ behavior.”⁸²

B. Regulatory-Governance Tradeoff: Some Examples

Even if it is accepted that the pool and system operators have monopolies and need to be controlled, the question of how to control them is still open. Government regulation and self-governance are substitutes. We think that it makes sense to encourage self-governance if it can lead to faster decisions, at lower cost and does not open the door to monopoly abuse. All four countries have combined self-governance with regulatory backstops, but the backstops are not the same. How and when the different regulators are involved vary considerably (see Table 4). This section examines how the regulators get information and how they delegate *de facto* regulatory responsibility for rule changes, dispute resolution and market surveillance to the pools.

How Does the Regulator Know?

The regulator cannot provide an effective backstop to pool self-governance unless he knows what is happening in the pool. In England, the regulator has the right to send a non-voting representative to all meetings of the Pool Executive Committee, the pool’s subcommittees and its working groups. Moreover, he has access to all documents received by committee members. Thus, if there is a dispute about a proposed rule change, the regulator will know about it and the positions of the different parties long before a formal appeal is filed with him. Similar arrangements exist in Victoria and Alberta. In Victoria, the regulator has two additional channels for keeping informed about the pool’s operation. First, the pool’s chief executive officer conducts an informal monthly briefing on pool developments and disputes. Second, the Pool Consultative Committee Chairman must notify the regulator of any proposed amendment to a major pool document that receives six to eight votes and the position taken by each pool member relative to the amendment.⁸³ (Passage requires nine votes.)

⁸²Personal communication with Larry Ruff, February 1997.

⁸³Operating Procedures, Section 5.2.2.

Table 4. Powers of Regulator and Government

	England and Wales	Victoria (Australia)	Alberta (Canada)	Norway
Regulator	Director General of Electricity Supply	Office of the Regulator-General ¹	Alberta Energy and Utilities Board	Norwegian Water Resources and Energy Administration (NVE) ²
Pool Rule Changes				
Must approve all proposed changes before they become effective even if no one appeals	Yes for most important rule changes	Yes if made as a "recommendation." No if made under "delegation."	No	Notified of proposed changes
Prerequisites for appeal/complaint to regulator	After a vote of all members	None	Must go through a mandatory dispute resolution process	None
Can unilaterally make changes	No. Can propose changes to Pool Executive Comm.	Yes	Yes	Yes
Regulators' decisions appealable	Yes to court ³	Yes to court	Yes to court	Yes to Ministry of Industry & Energy
Board Composition				
Approves appointments	No, except for reserved seats for small generators & suppliers.	PCC (By Reg) No	Board. (By Gov't) Yes	No
Makes appointments	Generally no	No	Yes	Gov't can make additional appts
Can change voting rules & allocations	Voting rules—no Voting alloc.—yes	Yes	Yes	Voting rules—yes Voting alloc.—yes (through new appts.)
				Regulator--No Government--Yes
				Regulator--No Government--Yes
				No

Table 4. Powers of Regulator and Government (Continued)

	England and Wales	Victoria (Australia)	Alberta (Canada)	Norway
Pool prices	Only indirectly under threat of referral to Monopolies & Mergers Commission	No	No but can be reviewed upon complaint	No but can refer to Competition Agency
Market Surveillance				
Formal market surveillance group operated by regulator or pool	No	No but pool informally monitors market under delegated authority from regulator.	Yes, independent outside experts hired by pool. Reports to the PPC but analyses and recomm. will also go to regulator.	No
Regulator's access to information	Indirectly through grid operator's license & RECs economical purchasing obligation	Substantial	Considerable authority	Very substantial

¹The regulatory system will change substantially when a national Australian pool is established in 1998 and the Victorian pool goes out of existence.

² The Nord Pool, which is registered as a Norwegian company, is regulated under a license issued by NVE, the Norwegian regulator. However, regulation of the Svenska Kraftnät, the Swedish owner and Sweden operator, is the responsibility of the Swedish government. See text for further discussion.

³The regulator's decisions can be appealed on the grounds that he did not follow "due process." The substance of his decisions are not appealable to a court. In contrast, courts in the United States will often review the reasonableness of regulatory commission decisions.

Sources: Regulatory laws and interviews.

U.S. regulators have traditionally been forced to take a very different approach to getting information. By and large, the FERC and other American regulators have had to rely almost exclusively on formal channels to keep informed. Under the current system, the FERC may not know about a dispute until a formal complaint is filed with it.

Learning about pool problems through legal briefs is somewhat akin to learning about the outside world by viewing shadows on the wall of a cave.⁸⁴ This more formal approach reflects the fact that the U.S. regulatory system is more judicial in character than the newer systems created in England, Norway and Victoria.⁸⁵ U.S. regulators tend to be treated like judges. For example, in most U.S. jurisdictions, it is illegal for disputing parties to communicate with regulators about a dispute outside of the formal regulatory process (the *ex parte* doctrine).

Other countries tend to view their regulators more as experts or legislators than judges. As experts, they are given considerable discretion in deciding what information they need, how to obtain this information and the process by which they reach a decision. As a consequence, they use both formal and informal channels for obtaining information. In contrast, the U.S. system imposes a high degree of transparency and formalism on the regulatory process to prevent the regulators from being “captured” by the companies that they regulate.⁸⁶ It remains to be seen whether the structural changes in the U.S. power sector will also trigger parallel reforms in the process by which U.S. regulators obtain information and make decisions.⁸⁷

⁸⁴While Plato did not write about power pools, he did anticipate the different approaches that would be used by regulators in obtaining information about pools. See the “Allegory of the Cave” in *The Republic*, New York, Oxford University Press, 1994, p. 240.

⁸⁵This probably reflects the fact that lawyers tend to dominate the U.S. regulatory process. A survey performed in the early 1990s found that of 210 U.S. state regulators with responsibility for electricity regulation, 121 were lawyers. See William H. Smith, “State Commissioners: Where Do They Come From?” *Natural Gas*, June 1991, p. 28. About 100 of the 400 staffers that work on electricity regulation at the Federal Energy Regulatory Commission are lawyers.

⁸⁶However, there are significant differences even among U.S. regulatory agencies. For example, the staff of the U.S. Securities and Exchange Commission routinely holds non-public meetings with stock exchanges even after the exchanges have formally filed proposed rule changes with the commission. The process is viewed by the SEC as an “informal adjudication” under U.S. administrative law. This gives the commission more flexibility in decision making than if the rule changes were categorized as a “formal adjudication.” It is unclear whether the FERC would have similar flexibility for rule changes proposed by power pools.

⁸⁷Since the membership in the pool and attendance at pool meetings will be open to all market participants, this might allay fears that some parties will have favored access to the regulator or his representatives. For a discussion of possible changes to the U.S. regulatory process, see “Harvard Electricity Policy Group: Regulatory Decisionmaking Forum,” *Administrative Law Journal of American University*, Volume 8, Winter 1995, pp. 789-911.

Pool Rule Changes

In two of the four cases (Norway and Alberta), changes in pool rules do *not* need to be brought to the regulator for formal approval before they go into effect.⁸⁸ (See Table 4, Pool Rule Changes.) The obvious advantage of this approach is that it allows pools to make rule changes quickly and efficiently. This is important because pools are new institutions, often established under tight political deadlines. They inevitably need to make corrections and adjustments to the initial set of rules. For example, in Victoria more than 25 rule changes (including several that were multi-dimensional) were made in the first 2½ years of operation. In England and Wales, there have been 17 major changes since the pool's creation in 1990.⁸⁹ The obvious danger of allowing rule changes to go into effect without up-front regulatory review is that it can be an invitation to monopoly abuse if the pool's decision-making system is flawed (e.g., control by one entity or one class).⁹⁰ Therefore, if rules are allowed to go into effect without prior regulatory approval, backstops are needed to ensure that this does not produce abuses. Three possible backstops are discussed below.

Backstop # 1. The first backstop is that pool members have the right to appeal any rule change to the regulator. In Victoria and Norway, an appeal can be made at any time. Of the more than 25 rule changes made in Victoria, only one has been appealed to the regulator. In

⁸⁸In Victoria, pool rule changes must be brought to the regulator even though this was not the original intent. It was originally planned that the regulator would delegate this authority to the pool while retaining the right to review any change. This was not implemented because of an unanticipated problem in the original legislation (later corrected) and then a concern that the individuals serving on the Pool Consultative Committee might be liable for legal expenses if they were sued for a decision that they made under the delegated authority. This second obstacle disappeared when it was determined that VPX's insurance would cover the legal expenses of PCC members. It is likely that "delegation" will not be implemented because the pool will be going out of existence in 1998. Changes to rules are more complicated because the Victorian pool is now linked to the adjoining pool in New South Wales, and the alternative approach of making recommendations to the regulator has worked reasonably well.

⁸⁹The regulator's approval is required for those changes dealing with trading and settlement rules (Schedule 9). These are referred to as "pool rules" even though they constitute only one part of the larger Pooling and Settlement Agreement (PSA). The regulator also has certain "entrenched rights" for other important changes to the PSA. For example, his approval is required to appoint a new settlement administrator or to change the governance arrangements. Other changes to the PSA do not require his prior approval though they can be appealed by a pool member.

⁹⁰In the United States, it is not clear whether the FERC could allow pool rule changes to go into effect without a formal filing (i.e., six copies of the change filed at the Commission's main office, issuance of a public notice by the Commission and then a 30-day period for anyone to file comments with the Commission supporting or opposing the rate change). Over the years, a change in rates has been interpreted to include price and non-price terms and conditions. If the Commission decides to waive formal filing of rule changes in pools that have satisfactory governance arrangements, it is unclear how much discretion it would have under current law. Presumably, some provision would have to be made for the Commission to have the current version of all pool documents even if they have not been formally filed at the Commission.

Alberta, a pool must first go through a mandatory dispute resolution process before it can take a complaint to the regulator. This requirement applies regardless of whether the complaint involves an interpretation of an existing rule or the creation of a new rule. In England and Wales, the appeal can only be made after the pool goes through a multi-step internal decision-making process. Since 1990, there have been nine appeals. The British regulator is more limited than the others in his review authority. He can say “yes” or “no” to the appeal. Unlike the three other regulators, he is prohibited from issuing a decision that would alter the rule change that is being appealed.⁹¹

Backstop # 2. The second possible backstop is that the regulator, on his own initiative, can mandate changes to pool rules, i.e., he can take action without waiting for someone to file a complaint. This authority exists in Victoria, Alberta and Norway.⁹² This authority is usually derived from the fact that the pool operates under a license that has been issued by the regulator. It provides the regulator with the legal authority to determine whether existing or proposed pool rules are consistent with the stated objectives of the licenses.

The British regulator is much more constrained. The British pool, in contrast to the three other pools, does *not* operate under a license issued by the regulator. Instead, it is a private, multi-party contract among the participants. The British regulator may only propose rule changes to the Pool Executive Committee.⁹³ These are known as Section 6.11 referrals. The pool must respond to these proposals but the pool is *not* obligated to adopt them. Moreover, there is a disincentive for the regulator to make such referrals. If the pool adopts a rule change proposed by the regulator under Section 6.11 and the change is appealed, the regulator is precluded from hearing the appeal because he is no longer considered objective. He has been “conflicted out.” This creates an incentive for the regulator to avoid 6.11 referrals. His alternative is to engage in a “delicate dance” of suggesting to the pool that they may wish to consider certain issues without making a formal 6.11 proposal.⁹⁴

⁹¹“I have the power to uphold or not to uphold a Resolution as drafted. I do not have the power to vary any Resolution referred to me.” OFFER, *Decisions On The Appeals Regarding Implementation of Differential Transmission Loss Factors*, July 11, 1996, p. 16.

⁹² For example, in Alberta the law provides that the regulator may “make any order respecting the operation of the power pool that it considers just and reasonable...” Section 16(1)(b), *Electric Utilities Act of 1995*.

⁹³If he believes that a pool rule operates in a manner inconsistent with the public interest, he has the additional option of making a referral to the competition authority, the Monopolies and Mergers Commission. This option is considered to be a “big gun” which should be used only for major disputes.

⁹⁴The regulators will sometimes send “signals” in his written decisions on appeals of proposed rule changes: “I hope that the Pool will give careful thought...” (Decision, December 15, 1993, p. 21), “I hope that the Pool will not dismiss the concerns and suggestions expressed by the customers” (Decision, December 15, 1993, p. 20), “...the Pool should not close its mind on the matter of...” (Decision, December 3, 1996, p. 9).

These limits on the regulator reflect a conscious political decision that was made when the pool and regulatory systems were designed in 1989. It was a widely held view that “the regulator was the enemy” and that it was important to “stitch him out of the process.” The pool has been successful in doing this but with the consequence that little progress has been made in the pool rules for transmission pricing and reactive power payments—two areas that the original Pooling and Settlement Agreement targeted for reform. This experience shows that the combination of limited regulatory oversight and a governance system that allows for one class vetoes will tend to block reforms that would improve pool operation.

Backstop # 3. A third possible backstop involves the two-tier approach that exists in Victoria and is being considered in the New England and Northwest regions of the United States (see Section I.C). Under this approach, an independent non-stakeholder board would operate above a stakeholder group. The independent board would make strategic policy decisions that could also be viewed as regulatory decisions. The argument for encouraging this arrangement is that an independent, non-stakeholder board can represent the “public interest” just as well as a regulatory entity. Since it would act like a corporate board of directors but with a public interest mandate, it probably could be expected to make decisions more quickly than a regulatory body that is subject to “due process” requirements.

The best current example of the two-tier approach is in Victoria. The Victorian Power Exchange’s Board of Directors operates above the Pool Consultative Committee. A voting majority of board members are non-stakeholders. The Board is responsible for making strategic policy decisions that might otherwise go to the regulator or to political authorities. For example, it recently set a pool price cap keyed to an estimate of the value of lost load (VOLL) to electricity consumers.⁹⁵ Since any decision of the Board can be appealed to the regulator, the regulator has the “final word.” However, the Board is, in effect, providing a first level review or appellate function when the pool stakeholders cannot reach agreement. To date, none of the Board’s decisions have been appealed to the regulator.

Dispute Resolution⁹⁶

Dispute resolution is another area where regulators can “let go.” This can be done by encouraging pool participants to resolve disputes internally. Sometimes the regulator does not have the staff to handle many disputes. The British regulator, for example, has only three

⁹⁵Non-market estimates of the value of loss of load are used for different purposes in the British and Victoria pools. The VOLL estimate in the British pool is used to set a capacity payment to generators for making generating capacity available to the pool. In Victoria, the VOLL estimate is the basis for a price cap when operating reserves are zero and customers loads are being shed.

⁹⁶In the United States this is often referred to as “alternative dispute resolution.” The historic presumption in the United States is that the norm is dispute resolution by the regulator or the courts. However, this is not the presumption in other countries.

lawyers on his staff.⁹⁷ However, even with the necessary resources, disputes that go to the regulator or to court may cost too much money and take too much time. Also, it is widely perceived that most courts lack the expertise to make an informed decision. Motivated by these concerns, it is not surprising that each pool has established an internal system to resolve disputes about **application or interpretation of existing pool rules**. (See Box 5 for dispute examples.)

Box 5. Examples of Disputes

Application of Existing Rules

- Payments to generators (England and Victoria)
- Payments by buyers (England and Victoria)
- Accuracy of metering (England)
- Updating value of loss of load payments (i.e., payments to generators for having capacity ready for generation) (Victoria).

Establishing New Rules

- Reactive power payments (England)
- Demand side bidding (England)
- Zonal differentiation for transmission prices (England)
- Penalties for generator non-performance (England).

Basic Policies (These disputes were handled by the boards or general membership since they relate to basic policy issues rather than just interpretation of existing rules.)

- Financial requirements to participate in the pool (Victoria)
- Companies eligible to act as grid operator (Alberta)
- Board members: who do they represent? (Alberta, England and Victoria).

Sources: Interviews with pool officials.

Most pools try to make it difficult for anyone who has received an unfavorable decision to appeal the decision to the regulator or a court. The rationale is that it would be unfair and inefficient to allow an aggrieved party to have “a second bite at the apple.”

⁹⁷The Office of Electricity Regulation has about 120 staff members at its headquarters.

Victoria. Six disputes have arisen in the 2 years since the pool was created. The disputes have involved calculation of pool prices, payments to generators and scheduling decisions. The disputes become “formal” when a pool participant, usually a generator, files a complaint against VPX, the pool operator. While the pool rules encourage negotiation, they also create a strong incentive for the complainant to lodge a formal complaint. VPX is not allowed to compensate a pool participant, even if it recognizes that it has erred, unless the dispute goes through the formal pool dispute resolution process.

Disputes are handled by an expert panel called a “case panel.” Each case panel must consist of at least four individuals—a generator representative, a customer representative, a VPX staff representative and a chairman. The chairman, appointed by VPX, is an experienced lawyer with no ties to the pool or any of its participants. For each dispute, new case panels are established with members drawn from 14 members of the pool’s Dispute Resolution Panel, who are appointed by the different stakeholder groups. Case panel decisions are “final and binding.” They cannot be appealed to the regulator though a losing party does have the right to appeal the decision to a court of law. To date, none of the case panel decisions has been appealed to a court and it is generally thought that this is not likely to happen. However, if there were to be a court review, it is expected that the court would limit itself to matters of law.

A typical dispute involves two or three half-day sessions of the case panel. Nevertheless, it may take several weeks for a case panel to issue a decision because it is often difficult to find people to serve on panels and panel members may be unable to meet on consecutive days. To reduce the burden on panels, the pool rules distinguish between two levels of disputes. If the dispute involves a claim of more than USD \$7,900, the complainant has the right to make a personal appearance before the case panels. For disputes involving lesser amounts, everything is done “on paper.” The case panel’s written decision is available to be read by any pool member.

England and Wales. The pool averages about 100 to 120 disputes per year. Most of the disputes have their origin in disputes over settlement system payments to generators (the sellers) and from suppliers (the buyers). The pool may also get involved in bilateral (i.e., non-pool) disputes that affect settlement payments. For example, if a transmission line goes out of service because of a lightning strike and, as a result, a generator is unable to sell into the pool, this may trigger a dispute between the generator and the National Grid Company over who was responsible for the lost revenue. Metering disputes are also common. A typical dispute might involve disagreement over the accuracy of a meter reading by a REC in a situation where an independent supplier is selling to a customer located in the REC’s distribution system.

The pool does not deal with disputes disagreements over license provisions. This is the sole responsibility of the regulator. For example, the regulator handled a dispute between the National Grid Company and a steel company over NGC’s proposed connection and wheeling charges.⁹⁸ The pool also does not get involved in many other bilateral contract disputes such as

⁹⁸The dispute took about 2 years to resolve.

payments made for ancillary services by NGC. The payments for reactive power have been particularly contentious because the pricing rules dealing with this issue are quite general. It has been the subject of a formal arbitration by the Electricity Arbitration Association, a separate organization outside the pool that was created to handle these bilateral contract disputes (see Box 6).

Pool disputes are handled by the Disputes Subcommittee. The subcommittee has eight voting members, four members are appointed by generators and four by suppliers. The chairman of the subcommittee is a pool employee who has no vote. Since many of the disputes involve settlement system payments, a representative of the Settlement System Administrator (currently a subsidiary of the National Grid Company) attends most meetings. The Disputes Subcommittee meets monthly and typically deals with eight to ten disputes. Subcommittee decisions require a majority vote of the members. In fact, most decisions are unanimous. Once the subcommittee makes its decision, the complainant has the right to appeal the decision to the Pool Executive Committee. If the complainant is dissatisfied with the decision of the Pool Executive Committee, it may request arbitration by the Electricity Arbitration Association. So far, no dispute has been appealed to the Association.

Common characteristics. The dispute resolution systems of these collectively governed, non-U.S. pools have several common characteristics: the system is mandatory; it is limited to disputes over application of existing rules; and expert panels are preferred over arbitration.

Pool members almost always are required to use the internal dispute resolution system before going to the regulator or a court. For example, in Alberta the 1995 Electric Utilities Act specifically prohibits the regulator, the Alberta Energy and Utilities Board, from hearing a complaint until the aggrieved party has attempted to negotiate a settlement.⁹⁹ Similar restrictions exist in Victoria and England. It may be more difficult to establish such a restriction in the United States. The U.S. power sector tends to be more litigious. There is also a long history of battles over transmission access and wholesale power sales. As a consequence, U.S. utilities are likely to be more suspicious of giving up any right to sue an opponent in court or to file a complaint with a regulator.

The disputes handled by the pool dispute resolution systems tend to be narrow disputes involving the interpretation of existing rules. They are not disputes over changes to pool rules. Moreover, the existing rules tend to be reasonably well-defined in lengthy and detailed pooling documents. The systems would probably not work if the rules were vague and general. The

⁹⁹The Alberta law also requires that the parties negotiate in good faith. In fact, a dispute cannot be brought to the regulator if the mediator has issued a certificate of "bad faith negotiation." This has been criticized on the grounds that it puts the mediator in the difficult position of both mediating and judging whether the parties were negotiating in good faith. A similar requirement was recently dropped from the bylaws of the Alberta Transmission Council.

Box 6. Great Britain's Electricity Arbitration Association

An Electricity Arbitration Association was created in Great Britain in March 1990 at the same time that the electricity sector was privatized and restructured. The combination of privatization and restructuring led to the development of an estimated 40,000 new contracts. There was a concern that disputes arising from these contracts could overwhelm the courts or the Director-General of Electricity Supply (the regulator). The Association was created to provide a less costly and faster process for resolving contractual disputes. It currently operates with a part time staff consisting principally of a President and a Secretary.

The Association's general budget of about £85,000 per year is financed by the pool. However, the Association is available to handle all contractual disputes, not just those produced by the operation of the pool. Parties to any dispute handled by the Association pay separately for the costs of handling the dispute. Under English common law, the losing party normally pays the total costs of the arbitration process.

The Association's name is something of a misnomer. It also offers mediation and expert panels as alternatives to arbitration. However, to date all of the disputes brought to the Association have been resolved through arbitration. The arbitration process is a formal process. It resembles a civil court proceeding with pleadings, discovery, written briefs and cross-examination. Interest is growing throughout the British economy in using expert panels as an alternative to arbitration. It is thought that such panels may provide a faster and more efficient way of resolving disputes.

Although Section 83 of the pooling agreement provides for unresolved disputes to go to the Association for arbitration, no disputes involving the Pooling and Settlement Agreement have gone to the association for resolution. To date, there has been one completed arbitration involving a bilateral contract dispute that indirectly affects pool operation. Two other bilateral disputes are in the midst of arbitration. The pool's own internal dispute resolution process is a "first line of defense" for disagreements involving existing pool rules. The fact that the many of the disputants are former colleagues who worked together at the government-owned Central Electricity Generating Board has probably also contributed to the amicable settlement of many potential disputes. The pool and the Association handle disputes over rules that are embedded in existing contracts and agreements. In contrast, disagreements over the need to change pool rules go to the regulator if they cannot be resolved within the pool.

The Association is likely to see an increase in its workload when England and Wales move to full retail competition in 1998. It is anticipated that the Association may be called on to handle disputes between small businesses and new power suppliers. The Association is considering creating a faster, less costly arbitration process for disputes involving less than £50,000.

Sources: Interviews with association and sector officials.

dispute systems also benefit from the fact that the different parties' underlying responsibilities are clearly understood. Who is responsible for reliability in Victoria and Britain is set out in statutes and licenses. In the United States, responsibility for reliability is still being sorted out.¹⁰⁰

The non-U.S. pools have a clear preference for expert panels over arbitration.¹⁰¹ These are panels of pool participants rather than panels of independent, outside experts. They resolve the disputes by making specific and enforceable determinations. They do not use formal arbitration techniques. The systems seem to work reasonably well probably because the panels are adjudicating narrow issues under well-defined rules. Also, as one participant in the Victoria pool commented, there is a strong incentive to make the system work because, "Everyone knows that if you don't act reasonably, you will get an external process that will be less informed."

In Britain, the preference for expert panels goes beyond power pool disputes. It is reported that most new contracts in the power sector require expert panels if there is a contract dispute. This reflects a disenchantment with arbitration. Arbitration proceedings resemble a civil court case with discovery, cross-examination and briefs. Consequently, arbitration often is neither cheaper nor quicker than traditional litigation.¹⁰² Moreover, since the arbitrators are usually chosen for their experience in arbitration rather than their experience in the industry, there is concern that their decisions are not informed or knowledgeable. Expert panels have been proposed as a substitute for arbitration (i.e., the panel's decisions are final and binding) or as a first step that could be followed by formal arbitration. The hope is that the decision or determination of the expert panel will avoid the need for arbitration or litigation because its members will be so well respected that parties will settle on the basis of their recommendations or judgments.

Market Surveillance

It has been argued that self-surveillance of a regulated market is a contradiction in terms because "[i]f government regulation of an industry...is considered necessary, how can that responsibility be then returned to those from whom it was taken?"¹⁰³ Yet something akin to this "contradiction" exists in the Alberta and Victoria pools, although there is an important distinction—regulation has not been "returned" to the pool. The regulator has delegated it to the pool and has the full legal authority to take it back or monitor the pool himself if self policing is

¹⁰⁰FERC Commissioner James Hoecker has observed that "it is no longer self-evident who in the future will be responsible to...guarantee security in the face of system contingencies." See "Hoecker Questions Commission's Role In Ensuring Electric Reliability," *Inside F.E.R.C.*, May 12, 1997, p. 3.

¹⁰¹In the United States, the preference seems to be for mediation followed by arbitration. This is the norm for several regional transmission group (RTGs) that were formed in 1994 and 1995. These RTGs may become precursors to regional ISOs.

¹⁰²See John Kendall, *Dispute Resolution: Expert Determination*, London, Financial Times Law and Taxation, 1996.

¹⁰³Douglas C. Michael, *Federal Agency Use Of Audited Self-Regulation As A Regulatory Technique*, Administrative Conference of the United States, November 1993, p. 3.

not working. In both instances, the decision to allow self-monitoring seems to be motivated by the very practical consideration that the resources or the expertise to sustain an ongoing monitoring program would be lacking.

Self-regulation exists in other markets. In the United States, the major securities exchanges have been designated by law as “self-regulatory organizations” (SROs). They are required by law to police themselves for fraud, deception and price manipulation. If they find evidence of these abuses, they can suspend or expel the member or company from their exchange. These self-regulatory programs are under the jurisdiction of the Securities and Exchange Commission (SEC), a federal government regulatory agency, which reviews rule changes proposed by the SROs and has appellate authority over any of their disciplinary decisions.¹⁰⁴ The experience to date with self-regulation has been mixed. In the case of Nasdaq, the second largest exchange in the United States, self-regulation was not working. Several internal and external investigations found evidence of significant abuses. In response to this breakdown in self-regulation, a new organization called NASD, Regulation Inc. was established in April 1996 to strengthen surveillance of Nasdaq (see Box 7). It is too early to assess whether this new organization will be effective.

While stock exchanges and power pools are similar, they are also different. First, governance of stock exchanges has been dominated by brokerage companies who “make the market.” In contrast, marketers, generators and buyers will jointly govern the new style power pools. Second, stock exchanges have a retail focus; usually small buyers are the targets of most abuses. Power pools currently have a wholesale orientation; the buyers are likely to be knowledgeable buyers such as industrial customers and aggregators. However, this may change as retail buying expands. Finally, the stock exchanges make markets in many different stocks. For example, the shares of more than 5,000 companies trade on the Nasdaq exchange. In contrast, the power pools trade in a relatively small number of standardized commodities.

The four pools have limited experience with self-surveillance. Alberta clearly has the most ambitious program (see Section IV). Based on this limited experience, we think that a credible and effective market monitoring program would include the following elements:

1. Outside individuals and organizations that have no financial ties to any of the market participants should perform the surveillance. The pool staff should not conduct market surveillance since this would put them in the untenable position of being both “facilitators” and “policemen.”
2. Individuals and organizations performing market surveillance activities should be protected from liabilities associated with the performance of these activities.

¹⁰⁴The Commission staff prepared a description and assessment of these self-regulatory programs in 1994. See Division of Market Regulation, *Market 2000: An Examination of Current Equity Market Developments*, Securities and Exchange Commission, Washington, D.C., January 1994, Chapter VI.

Box 7. NASD Regulation, Inc.—A Model for Pools?

“Self-regulation works because the industry recognizes it is a **privilege**, not a right.”
NASD, Inc. 1995 Annual Report, p. 25

U.S. law explicitly provides for “self-regulation” by U.S. securities exchanges. The Securities and Exchange Commission (SEC), the government regulatory agency, is “the shotgun behind the door,’ ready to be used but with the hope that it would never have to be used.”¹ In the last several years, it became clear that self-regulation of the Nasdaq stock market, the second largest securities market in the United States, had failed. In 1996, the SEC censured the National Association of Securities Dealers (NASD), the organization that runs the exchange, after finding that it failed to adequately police the Nasdaq market. In the same year, the Justice Department cited 24 brokerage firms for fixing prices on the Nasdaq market.

In April 1996, NASD Regulation Inc. (NASDR) was established to try to create “greater separation between the regulation...and the operation of the Nasdaq market.” NASDR, which is a subsidiary of NASD, is charged with monitoring the Nasdaq market to spot insider trading, price fixing and other market abuses. It also runs a mediation and arbitration service for resolving customer complaints against NASD’s 5,553 member firms, 62,000 branch offices and 535,000 brokers. NASDR is headed by a former SEC commissioner and reports to a board where at least 50 percent of the directors do not come from member firms. Its 1997 budget is \$221.4 million and with an expected staff of more 1,750 people

Of NASDR’s various activities, it is the market surveillance activities that would be of most interest to those who will be monitoring power pool markets. NASDR currently uses two automated market surveillance systems, RADAR and SWAT, to monitor market trading by looking for unusual price and volume movement’s in a stock’s trading. In 1995, these monitoring programs produced 7,859 price and volume alerts. This led to 221 formal investigations and 113 cases referred to the SEC.

¹ William O. Douglas as quoted in Walter Werner, “The SEC As A Market Regulator,” *Virginia Law Review*, Vol. 70, 1984, p. 764.

Sources: Interviews and Nasdaq annual reports.

3. The surveillance program should have two elements: an ongoing monitoring program and investigation of specific complaints.
4. The market monitor should have the authority to obtain any information needed from pool participants providing that it maintains the confidentiality of commercially sensitive information. Whenever possible, its ongoing monitoring program should rely on data the pool operator collects in its normal course of operations.
5. The mandate of the market monitor should be broad. It should identify problems and recommend solutions. Its primary duties are to monitor the market for rules that lead to inefficient outcomes and for evidence of market power. In addition, it should be responsible for periodic assessments of whether the underlying structure and split of functions are conducive to efficient competition. The market monitor should recommend structural changes if it concludes that changes in market rules would be insufficient to eliminate the underlying problem.¹⁰⁵
6. If there are independent board members, the market monitor should report to them and not to stakeholder members.
7. If the market monitor finds a violation of pool rules or abuse of market power, it should be required to recommend remedies to the governing board (e.g., fines, loss of trading privileges, referral to the regulator or referral to antitrust authorities).
8. The regulator should automatically receive reports and recommendations of the market monitor.
9. The regulator should have the authority to order the market monitor to perform specific studies.
10. The regulator should have veto power over the design and operation of the market monitoring program.
11. The pool should finance market monitoring, but the regulator must approve the budget.

¹⁰⁵Market monitoring becomes more complicated when the pool does not have a monopoly as a market maker (i.e., there is a parallel decentralized market). In this situation (which may become the norm in the United States), it would be better for the system operator to perform market monitoring. However, if the system operator is also the pool operator, it may be necessary to hire an outside organization. At some point, it may be more efficient to create a national market monitoring organization to provide this service.

C. The Special Case of an International Pool

The Nord Pool is the only international pool in this study. In fact, it may be the only international “new style pool” (see Table 1) currently in existence anywhere in the world. The Nord Pool began functioning as an international pool on January 1, 1996. Prior to this date, it operated mostly for the benefit of Norwegian power enterprises. Swedish power enterprises were allowed to trade in the pool but they were subject to a border tariff and several pool rules that put them on an unequal footing with Norwegian power enterprises. These impediments to equal access were eliminated when the pool came under bi-national ownership. Nord Pool S.A., the company that operates the pool, is jointly owned on a 50-50 basis by Statnett and Svenska Kraftnät, the two state-owned grid companies in Norway and Sweden respectively.¹⁰⁶

Electricity trade between Norway and Sweden is not a new phenomenon. There has been significant trading between the two countries since 1971. Typical of most international power exchanges, this trading was bilateral and usually conducted under the umbrella of long-term contracts. What distinguishes the Nord Pool from this earlier trading is that the pool is designed to produce “an immediate and competitive transaction between the buyer and the lowest-cost supplier, irrespective of geographic location.”¹⁰⁷ Trading is also anonymous. And the prices are bid prices rather than prices based on marginal costs, profit sharing or avoided cost as is the case for many traditional international bilateral transactions. Nord Pool does not have a monopoly on power trading. It competes against individually negotiated transactions under numerous existing bilateral contracts. In fact, the bilateral contracts account for about 80 percent of the current electricity trade in Norway.

While the pool has bi-national ownership, trading is not limited to Norwegian and Swedish power enterprises. Any power enterprise from any country can trade in the pool if it pays the participant fees, satisfies fiduciary responsibilities and has transmission rights to and from Norway or Sweden. At present, the pool has about 150 participants: 114 are Norwegian power entities, 28 come from the Swedish power sector and the rest are power enterprises from Finland, Denmark and Russia.

When markets meet. It is generally believed that substantial “harmonization” of different legal, regulatory and transmission regimes is a prerequisite to creating a bi- or multi-

¹⁰⁶Discussions are scheduled to take place in 1997 that would allow Denmark and Finland to become owners of the pool. This may be harder to accomplish because Finland has its own pool, the EL-EX Electricity Exchange, which operates differently from the Nord Pool. See Jan Forsborn, “Exchange Viewpoint,” unpublished paper, presented at the Second World Conference on Restructuring and Regulation of the Electricity Market, Vasteras, Sweden, February 3-5, 1997.

¹⁰⁷J.P. Charpentier and K. Schenk, “International Power Interconnections: Moving from Electricity Exchange to Competitive Trade,” in World Bank, Vice President for Finance and Private Sector Development, *Public Policy for the Private Sector*, March 1995. Available on the Internet (<http://www.worldbank.org/html/fpd/notes>).

national pool.¹⁰⁸ However, this did not happen when the Nord Pool was created. While Norway eliminated some obvious impediments such as import tariffs and certain license requirements, there were no other significant efforts to harmonize the regulatory and trading rules of the two countries.¹⁰⁹ In fact, major differences still exist for Swedish and Norwegian pool participants more than a year after the pool began operation. For example, even though both countries apply a postage stamp rate for transmission services, there are variations in the level and structure of transmission prices between the two countries.¹¹⁰ Another example is the deadline for submitting bids in the spot (i.e., day ahead) market. Recognizing that these differences and rules can lead to inequities and inefficiencies, the pool and its parent companies have created working groups to develop recommendations on which differences should be eliminated.

Similarly, there was no attempt to create full harmonization when the operations of the Victorian and New South Wales pools in Australia became coordinated in May 1997. Some rules were made similar but many rules remained different.¹¹¹ This suggests that market integration is generally a two-stage process. The first stage is coordinated operation of two separate pools. At this initial stage, the two markets are not completely integrated. For example, a generator in Victoria cannot sell directly into the New South Wales pool. The pools, not individual participants, conduct trading between regions. The second stage is full integration into a single multi-state or multi-national power pool. This is the structure planned for Australia's national electricity market which is to begin operation in 1998. It may be much harder to achieve this second stage of integration in Scandinavia because the integration will have to occur across several countries.

Regulation. The Norwegian electricity regulator, NVE, regulates the pool. There are two arguments for this arrangement. The legal argument is that the pool is a Norwegian company which is registered and licensed in Norway even though it has bi-national ownership. The pool is like a Norwegian stock exchange. Therefore, any power enterprise, whether Norwegian or foreign, that buys and sells in the pool, should be subject to Norwegian laws for its trading activities. The practical argument is that the pool had been regulated for 3 years by NVE before it became international in 1996. Once Sweden decided that it wanted to join the existing Norwegian pool rather than creating a new national Swedish pool, it seemed practical to let NVE

¹⁰⁸See Charpentier and Schenk (1995).

¹⁰⁹See Jan Moen, "A Common Electricity Market In Norway and Sweden, Prerequisites, Development and Results So Far," unpublished paper, Norwegian Water Resources and Energy Administration, May 16, 1996.

¹¹⁰Knut Fossdal, "The Nordic Power Exchange: An Electricity Trading Exchange Crossing Borders," unpublished paper, Nord Pool SA, January 2, 1997.

¹¹¹No attempt was made to coordinate the different state government policies or regulations for safety, environment, retail competition and transmission charges. However, other rules referred to as "co-extensive rules" can only be changed by agreement of both jurisdictions.

continue to regulate it.¹¹²

Is it generally possible to have a power pool with international participation regulated by only one country? Norway's regulation of the Nord Pool seems to support an affirmative answer. In our view, it is doubtful that this arrangement could be widely applied elsewhere in the world. Even though NVE appears to be the only regulator, its regulatory powers are incomplete. NVE can regulate the pool and the Norwegian system operator (Statnett) through the licenses it has issued to both entities. But it does *not* have direct regulatory authority over Svenska Kraftnät, the system operator in Sweden. If NVE decides that Svenska Kraftnät's actions are interfering with efficient or fair operation of Nord Pool, its only recourse is to inform the Norwegian Ministry of Energy of the problem. The Norwegian Ministry may, in turn, raise the issue with its counterpart in the Swedish government which may or may not order Svenska Kraftnät to make changes in the way it operates. NVE does not have this authority. In other words, NVE lacks "extra-territorial authority." To date, this hasn't been a problem because only two countries are involved and they have a long history of cooperation. However, it seems doubtful that the Nord Pool arrangement—regulation of an international pool by the regulator of one country—would work for pools involving more countries and where there is little history of inter-country electricity trading.

Other regulatory models. What are possible alternative regulatory models for international pools? One approach would be to rotate responsibility for regulating the pool among the different countries whose power enterprises are trading in the pool. The theory behind this approach is that each country would regulate impartially (i.e., not favor its own national interests) out of fear that the regulator in the neighboring country would take retaliatory action when the regulatory mantle was handed to it. An obvious disadvantage is that it would be necessary to synchronize the regulatory systems of the various countries. This requires the different national regulatory entities to have similar legal powers and standards.¹¹³ If there is no uniformity, pool participants would be in the impossible position of having to face dissimilar (and possibly conflicting) regulatory standards in different years. Even if the separate national regulatory rules and standards could be synchronized, it seems inevitable that institutional knowledge would be lost when regulatory authority is transferred from one national regulator to another.

An alternative is to create a multi-national regulatory authority of independent

¹¹²Sweden's power sector reform would probably have been delayed by at least a year if it had tried to create a new pool. The Swedish government was also concerned that large Swedish generators would have too much market power in strictly Swedish pool.

¹¹³This would not have been possible in the Nord Pool case since the Network Authority of NUTEK (the Swedish National Board for Industrial and Technical Development), the Swedish regulator, has limited regulatory authority over Svenska Kraftnät, the Swedish national grid operator.

commissioners.¹¹⁴ While this might be the ideal, it is probably not realistic because most governments have traditionally been unwilling to cede control over power imports and exports to an external regulatory entity. Therefore, the more likely outcome is a regional regulatory agency whose decision-making members are appointed by and reporting to the governments of the region. This seems to be the approach adopted in the Central American Electricity Market Treaty signed by the presidents of the region's six countries in December 1996. The treaty, if ratified by the legislatures of the six countries, would create a regional grid and market operator and a regional regulatory commission. Each country would be entitled to appoint one commissioner to the commission. The commission's regulatory authority over transmission and intraregional wholesale electricity sales would be similar to those of the FERC in the United States. Specifically, it would have the power: to issue regulations governing the operation of the market, to approve rules issued by the new regional system and pool operator, to take actions to stop the abuse of market power, and to set transmission tariffs for the use of the regional grid.¹¹⁵ The major uncertainty is whether the commissioners will choose to act as protectors of their countries' national economic interests or whether they will take a regional perspective even if it hurts their countries' near-term interests. Without additional protections to ensure independent decision making, it is likely to be the former.

Another option is national regulation subject to a regional backstop. This is the approach taken by the European Union (EU). By treaty, the member states of the EU are bound by regulations and directives promulgated through a process involving the European Commission, the European Parliament and the Council of Ministers. There is no separate European electricity regulatory entity. Instead, the EU has adopted the principle of "subsidiarity" which means that initial implementation of the policies in directives is left up to each of the member states. However, if a member state fails to comply with the provisions of a directive, complaints can be filed with the European Commission and the European Court of Justice. Both entities have the power to levy very substantial fines.

The ultimate success of this regulatory system in creating a competitive power market in Europe depends on several factors. The first is the strength of the original directive that the

¹¹⁴The former Chairman of the California Public Utilities Commission has recommended this approach for western North America where electricity trading already occurs among "twelve western states [in the United States], two Canadian provinces and two (soon to be three) Mexican states." See Daniel Fessler, "The Next Steps in the Restructuring of Brazil's Electric Services Industry," *The Journal of Project Finance*, Spring 1997, p. 54.

¹¹⁵See Central American Electricity Market Treaty, Articles 19 to 24. Transmission rates for intra-country wheeling will continue to be set by the country's own government or regulatory agency. This could create distortions when a single transmission line is used for both national and international wheeling. In contrast, in the United States, FERC sets rates for all transmission services regardless of whether the service is used for intrastate or interstate power sales.

member states are required to implement.¹¹⁶ Long years of debate and compromise substantially diluted the electricity directive issued in July 1996. The directive does *not* establish a European power pool. It provides for “negotiated third party access” (a form of limited access to large retail customers that will be phased in over several years) and some requirements for competitive bidding for new generation. Second, it appears that the directive may have two significant loopholes. The provisions dealing with “disapplication” and “public service obligations” may enable a member state to postpone or weaken the pro-competitive provisions. The third is the effectiveness of the European Commission and Court of Justice. It is still uncertain whether they will be able to move strongly and quickly when complaints are brought to them.

¹¹⁶Official Journal of the European Communities, *Common Position Concerning Common Rules for the Internal Market in Electricity*, (EC) No 56/96, October 25, 1996.

VI. Observations and Conclusions

A. Governance

Governance and regulatory systems are two key elements in power sector restructuring because they determine how decisions are made and enforced once the basic reforms are in place. For countries that are trying to create open competitive power markets, collective governance seems to be the favored approach. Collective governance usually is implemented through a multi-class stakeholder board in which most or all market participants are represented. It should not be surprising that political authorities, who usually initiate the reform process, like collective governance. It bears a strong resemblance to the legislative system that many of them live with on a day-to-day basis. Collective governance has several important near-term political and practical advantages. It helps to create support (or at least reduce opposition) to the general power sector reforms. It is widely perceived as “fair” because it gives all stakeholders a voice in governance. It also ensures direct participation by generators and distributors who have the initial expertise and experience to assess the physical consequences of different pool rules. Finally, it seems to have the promise of greatly reducing the need for later government regulation.

But collective governance also has disadvantages. It tends to produce large and unwieldy boards. Such boards are not effective as decision-making bodies. Collective governance also often leads to other problems: it may fail to achieve independence for the pool or grid operator when the voting rules and allocations are flawed; it can produce deadlocks that lock the pool into rules that produce inefficient outcomes; and its assessments of rule changes may be colored by self-interest. While collective governance is perceived as fair, often it is not efficient.

One possible solution to these problems is to impose a requirement that members of stakeholder boards represent the “public interest.” Such rules, which exist in the three collectively governed pools (Alberta, Victoria and England and Wales), require board members to give greater weight to the general interest than to the interests of those who put them on the board. The rules, in effect, require that a board member “must hang his private interest hat at the door and put on his public interest hat when discussing and voting on board business.” In our view, these rules are basically unenforceable because board members can always produce creative explanations as to why the public interest coincides with the economic well-being of their company or constituency. Any governance scheme that requires decision makers to act against their own economic interests is fundamentally unworkable.

We think that a better approach is to adopt a variant of the two-tier system of governance that exists in Victoria. The essential feature is a stakeholder group that reports to an independent non-stakeholder board with final decision-making authority. All decisions made by the stakeholder group are essentially advisory. This does *not* mean that the independent board must review each and every decision. The board has the freedom to decide when and how it will get involved. If stakeholders can reach a satisfactory agreement, the board is likely to accept their decision. If the stakeholders are deadlocked or their decision is unsatisfactory, the board has the

authority to step in and make a binding decision.

Two-tier governance is a middle path between “all stakeholder” and “no stakeholder” governance. Its principal advantage is that it melds independence with a working knowledge of the grid. It reduces the chances of the pool getting locked into an impasse because of conflicting commercial interests. One criticism of the two-tier approach is that a board will simply replicate the job of regulator. This is partially true but we do not view this as a flaw. If the board is truly independent, it should be allowed to make many decisions that might otherwise be made by a regulator. An independent non-stakeholder board should be able to make faster decisions because it will have more flexibility on process. It may often make better policy decisions because it will have specialized expertise that is usually difficult to acquire and maintain in a regulatory body. Under the two-tier approach, market participants will still be protected by the right to appeal a board decision to the regulator. This may seem inefficient—a backstop to the backstop—but the regulatory backstop probably will not be used often if the board is independent, efficient and knowledgeable. We recommend ten specific implementation rules designed to produce a board with these characteristics (see Section I.C).

The members of an independent board do *not* represent any constituency. But there will be continual pressure to set aside board seats for consumers, generators, distributors and other constituencies. This will happen because many people will not believe that the board can be independent or they will view the board as simply another place to lobby for their economic and social interests. Therefore, we propose a selection process that is designed to prevent the independent board from becoming a stakeholder board (Section I.C). Once the board is selected, its members need to be reminded that their one and only *legal* obligation, regardless of any former affiliations, is to ensure that the pool operates a fair and efficient power market. If they ignore this obligation, then the regulator is available as a backstop.

Another general pressure that needs to be resisted is the temptation to use the pool as vehicle for giving subsidies to particular fuels, demand or supply side technologies or customer groups. We recognize that subsidies are as inevitable as taxes and death. But a decision to give a subsidy should be political not a pool decision. If political authorities decide that particular subsidies are necessary and desirable, then they should be delivered, if at all possible, through a mechanism that is outside the pool. The rule should be: respect the market and do not use it as a vehicle for delivering subsidies.

B. Regulation

Almost everyone recognizes that traditional regulation is slow and costly. It is also generally accepted that an effective system of self-governance can reduce the need for external regulation. We think self-regulation should be encouraged if it can lead to faster decisions, at lower cost and not open the door to monopoly abuse. The practical issue then is how to create effective self-governance for the three most important activities: rule changes, dispute resolution and market surveillance.

The three collectively pools provide some useful lessons. For example, the experience of the British pool suggests that weighted voting can quickly become complicated and cumbersome, especially in a power sector that is experiencing continuing structural change. It is also not obvious why bigger companies should have a larger voice in the operation of a pool whose goal is to create a competitive market. Another lesson from several of the pools is that a voting system that allows one class vetoes will block further needed reforms unless a regulator or an independent board has the authority to overrule the veto.

Market surveillance is the key test of whether a pool's governance structure is truly independent of any participant. The early experience from Alberta suggests that the market monitors should not report to stakeholders and the monitors must be protected from lawsuits filed by participants who may be unhappy with their assessments and recommendations. Based on the ongoing experience in Albert, we propose 11 rules for an effective market surveillance system (see Section V.B).

Inevitably, boundaries will have to be redrawn as mistakes are discovered. This requires that the regulator must be ready and able to act as a backstop to the self-governance system. To perform this role, the regulator must be knowledgeable about pool and system operations and be capable of quickly stepping in to take action if problems arise. The experience of the four pools suggests that the regulator will be an effective backstop only if the following conditions are satisfied:

- a. The regulator must have access to good information about the pool. He should be aware of disagreements before they become formal disputes. His knowledge of pool operations and disputes should not be limited to what is written in formal legal documents. The regulator or his representatives should be able to attend all pool meetings as a non-voting observer.
- b. The regulator must have the authority to make changes in pool rules on his own initiative. He should not have to wait for a formal appeal.
- c. When the regulator receives an appeal of a pool rule change, he should not be limited to accepting or rejecting the proposed rule change. He must have the authority to modify the proposed rule if he thinks that it will improve the operation of the pool.
- d. The regulator should have the authority to raise an issue and propose a possible solution without being "conflicted out" (i.e., prohibited from making a final decision).
- e. The decisions of the regulator should be appealable to a court of law.

C. Governance, Regulation and Sector Structure

Sector structure is defined by who owns what and who does what. Sector structure is important because it limits what governance and regulation can accomplish. Governance and regulation, by themselves, cannot produce competitive markets. Governance and regulatory systems may succeed in establishing pool and system operators that are totally independent of market participants. However, they still may fail to establish competitive markets if the underlying structure does not support competition or the pool and grid operators lack necessary operational control and enforcement powers. This is the fundamental problem in continental Europe and in countries such as Canada and the United States that are trying to graft competition onto a vertically integrated sector structure where generators own transmission. In countries with such structures, the regulator or pool operator may prohibit certain actions. If the prohibition goes against the market participant's basic economic incentives, the participant will simply pursue a slightly different variant of the prohibited behavior until that variant is discovered and prohibited. It is somewhat analogous to "the prohibition of the sale and use of alcoholic beverages [in the United States during the 1930s] which generally made 'drinking' more secretive, possibly more expensive, and more ingeniously devised, but did not stop it."¹¹⁷ When structure is not conducive to competition, the regulator and pool operator will find themselves unsuccessfully "chasing after conduct." The solution is not a better rule, but a change in structure.

Those who have worked on power sector reform in different countries describe the experience as similar to being in the Army: "You wait and wait and then you rush like crazy." Once political authorities give the green light, the actual rules and documents are almost always produced under impossibly tight deadlines. Inevitably, mistakes are made that need to be corrected. Moreover, the agreements reached on specific rules and splits of functions are often compromises that fall short of anyone's ideal. Except for England, the regulators in our four case studies have substantial authority to correct flaws in pool rules. In addition, all four regulators can monitor the pool markets for market abuses. But if they find a problem, their authority to order structural changes is limited or non-existent. This power is usually held by the legislature, prime minister or some combination of the two.

A non-stakeholder board, a regulator or some other independent entity **should be required** to report at regular intervals to political authorities on whether the pool, the split of functions, the trading rules and the existing sector structure are producing the desired results. In the absence of a formal mechanism for reassessment, industry participants and regulators will waste time and resources pursuing governance and regulatory "fixes" for inherently structural problems. There is, of course, no guarantee that political authorities will take any action. But if the assessments are public and periodic, they will be difficult to ignore.

¹¹⁷Joe S. Bain, *Industrial Organization*, John Wiley and Sons, 2nd Edition, 1968, p. 553.

Appendix A. Information Sources

England and Wales

World Wide Web Sites

1. Office of the Electricity Supply Regulator (<http://www.gov.uk.offer>)

Major Documents

1. Pooling and Settlement Agreement, modified on October 1996.
2. An Introduction To The Pool Rules
3. OFFER, Decision on a Monopolies and Merger Commission Reference, 1994.
4. OFFER, Report On Constrained-On Plant, October 1992.
5. OFFER, Decisions on the Appeals Regarding Demand Side Bidding (Dec 15, 1993), Reactive Power (January 31, 1996), Transmission Loss Factors (July 11, 1996), Trading Outside The Pool (December 3, 1996) and A Load Management Agency (March 10, 1997).

Victoria (Australia)

World Wide Web Sites

1. Victorian Power Exchange (<http://electricity.net.au/vpx.html>)
2. National Electricity Market Management Company (<http://www.electricity.net.au/nemco.html>)
3. National Electricity Code Administrator (<http://electricity.net.au/neca.html>)
4. Australian Competition & Consumer Comm. (<http://www.accc.gov.au>)

Major Documents

1. Electricity Industry (Amendment) Act 1994.
2. Wholesale Electricity Market License, October 4, 1994.
3. VicPool Rules.
4. Pool Consultative Committee Operating Procedures.
5. Pool Consultative Committee Appointment Procedures.
6. Department of the Treasury, *Reforming Victoria' Electricity Industry, A Competitive Future for Electricity*, December 1994.
7. VPX and TransGrid, *NEMI: Gateway to the National Market*, Implementation Edition, May 1997.

Alberta (Canada)

World Wide Web Sites

1. Power Pool of Alberta (<http://www.powerpool.ab.ca>)
2. Grid Company of Alberta (<http://www.gridco.ab.ca>)
3. Alberta Department of Energy (<http://energy.gov.ab.ca/elec/>)

Major Documents

1. Power Pool of Alberta, Pool Rules, December 18, 1995.
2. Power Pool of Alberta, Bylaws.
3. Province of Alberta, Electric Utilities Act, Chapter E-5.5, May 17, 1995.
4. Alberta Department of Energy, *The Alberta Transmission Administrator Function*, A Discussion Paper, December 18, 1996.
5. Alberta Department of Energy, *Technical Consultant's Report On The Transmission Administrator Function*, prepared by Merrill Schultz & Associates, October 21, 1996.
6. Alberta Department of Energy, *Recommendations & Final Report on the Alberta Transmission Administrator*, March 31, 1997.

Norway

World Wide Web Sites

1. Nord Pool (<http://www.nordpool.no/eng.htm>)
2. Statnett (<http://www.statnett.no>)
3. Swedish Trade Council (<http://www.swedentrade.com>)

Major Documents

1. Jan Moen, "A Common Electricity: Norway and Sweden," May 19, 1996
2. Swedish Trade Council in North America, *Electricity Exchanges In Scandinavia*, Chicago, Illinois, November 1996.

Appendix B. Basic Market Design Issues for New Style Pools

1. What commodities (e.g., day ahead energy, regulating energy, futures contracts and ancillary services) are traded in the pool? Who is allowed to trade?
2. Does the pool allow bidders to make their own unit commitment decisions (self-commit) or are the commitment decisions made by the pool (centralized commitments)?
3. Does the pool have a monopoly on arranging and scheduling all transactions that produce physical flows within the region?
4. Does the pool have a monopoly on imports and exports of power?
5. Who guarantees physical delivery and financial settlement?
6. Are pool members with customer load responsibility required to own or contract for a specified amount of generating capacity or operating reserves?
7. How is transmission service priced? Do transmission rates attempt to reflect congestion costs? Who pays for transmission costs?
8. Who is responsible for scheduling maintenance of transmission lines? Are market participants informed of expected maintenance schedules?
9. Who makes the decision on transmission investments? Is the decision centrally determined (top down) by the pool or system operator or is it made by one or more market participants (bottom up)?
10. Is there a separate payment for generation capacity made available to the pool? How is this capacity payment established?
11. Do generators bid a multi-part bid [\$/MWh and separate prices for no-load fuel (\$/hour) and start-up costs (\$)] or a one part bid [\$/MWh but which can include the generator's estimate of no load fuel and start-up costs]?
12. Do generators bid a single price or a schedule of prices and quantities? Is there a single or multiple rounds of bidding? How many bidding blocks are allowed? How often are bidders allowed to vary the sizes of the bidding blocks? After submitting their initial bid(s), are generators allowed to change the price(s) and/or quantity(ies) bid (i.e., rebidding)? Must bidders submit bids by specific times or can bids be submitted on rolling basis? Are generators allowed to withdraw previously submitted bids? What determines when the bidding is closed?
13. Are pool prices based on actual operation (*ex post* price setting) or anticipated operation

(*ex ante* price setting)? Is there a single market clearing price or do prices vary by zones or nodes?

14. Are there price caps on market prices? What triggers the price caps?
15. What is the method for calculating market clearing price for each settlement period (e.g., weighting of prices by amount of energy supplied or by time duration)?
16. How does the pool pay generators that are “constrained on” or “constrained off”?
17. What actions are taken against generators if they fail to follow dispatch instructions?
18. How are ancillary or grid support services acquired and paid for? Is there competition for the provision of some of these services?
19. Does the pool allow for demand side bidding?
20. What fees are paid for pool and system operation? Who pays these fees?
21. What actual or forecasted information is made available to pool participants? For example, does the pool disseminate information on bid prices, market clearing prices, volume of trade, number of bidders and likely transmission constraints? Does the pool project peak demands, generation capacity availability, and expected load profiles? How often is this information disseminated?
22. Is there market monitoring for inefficiencies and market power abuses? Who performs this function?
23. What actions are taken to eliminate or control general or local market power?
24. Is the pool operator subject to audits of its scheduling and dispatch decisions and its calculation of market prices?
25. Who owns and maintains revenue meters and the associated data collection system?
26. Does the pool have a legal obligation to ensure the availability of sufficient generating capacity? If so, what actions can it take to fulfill this obligation? If the pool is not responsible for ensuring sufficient capacity, does any other entity have this obligation? Are there explicit penalties for failure to meet this responsibility?

Appendix C. System and Market Operation Functions in a Disaggregated Power Sector

A. System Operations and Control

Real-Time Functions

1. Dispatches for some or all generating plants.
2. Maintains system reliability.
3. Balances supply and demand taking account of scheduled and unscheduled inflows and outflows with other control areas.
4. Adjusts for losses.
5. Manages congestion through generation redispatch and/or congestion pricing.

Other Functions (Non-Real-Time)

5. Acquires ancillary or grid support services (e.g., reactive power, operating reserves, spinning reserves, black start capability) through mandated requirements, negotiated contracts and competitive procurements.
6. Establishes and enforces technical criteria for generators that want to connect to the grid.
7. Collects fines and levies.
8. Conducts system studies.
9. Provides information on transmission availability.

B. Transmission System Ownership

1. Owns transmission assets.

C. Transmission System Operation and Maintenance

1. Maintains lines, transformers, switchgear, etc.

D. Transmission System Expansion and Reinforcement

1. Plans transmission system expansion.
2. Implements transmission system expansion.
3. Negotiates and constructs new connections

E. Transmission Pricing and Capacity Allocation

1. Sets prices for transmission service.
2. Sets initial and later capacity allocations when there is no market mechanism.

- F. Power Trading Within the Pool (Centralized Trading)
 - 1. Acquires generation supply bids.
 - 2. Acquires demand side bids.
 - 3. Schedules and reschedules generators and demand side providers to produce lowest cost supply. (Separate scheduling and rescheduling will be required for physical bilateral transactions that occur outside the pool.)

- G. Imports and Exports of Power
 - 1. Negotiates power sales and purchases with entities outside of the control area.

- H. Market Price Information
 - 1. Publishes prices on pool transactions. (Prices may or may not be available for bilateral physical and financial hedging transactions occurring outside the pool.)

- I. Metering and Data Collection
 - 1. Collects information on production and consumption at the bulk supply level.

- J. Settlement System Information
 - 1. Calculates the payments due under pool trading arrangements.

- K. Billing Process
 - 1. Issuance of bills by individual participants or a separate billing agency based on settlement system data.

- L. Administration of Funds
 - 1. Collects and disburses funds to generators, sellers, transmission and distribution owners and ancillary service providers.

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