CONTRE-EXPERTISE DE JUDAH ROSE

Canada
Province of Quebec
District of Montreal
No.: R-3669-2008-Phase 2

Rebuttal Testimony
Of
Judah Rose

On Behalf of

TransEnergie

Submitted to:

The Régie de l'énergie du Québec

July 3rd, 2009

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I. INTRODUCTION AND BACKGROUND

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is Judah L. Rose. I am a Managing Director of ICF International ("ICF"). My business address is 9300 Lee Highway, Fairfax, Virginia 22031.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of TransEnergie.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.

A. After receiving a degree in economics from the Massachusetts Institute of Technology and a Masters Degree in Public Policy from the John F. Kennedy School of Government at Harvard University, I joined ICF in 1982. I have worked at ICF for over 27 years and am Managing Director of ICF's wholesale power practice. I also have been a member of the Board of Directors of ICF International and am one of three people (in a consulting firm of more than 3,000 people) to have been given ICF's honorary title of Distinguished Consultant.

Q. DOES ICF HAVE PUBLIC SECTOR CLIENTS?

A. Yes. In the U.S., ICF has been the principal power consultant to the U.S. Environmental Protection Agency ("EPA") continuously for over 30 years, specializing in the analysis of the impact of air emission programs, especially cap and trade programs. We also have worked with the Federal Energy Regulatory Commission ("FERC") on transmission issues, and the U.S. Department of

Energy ("DOE"), We also have worked with state regulators and state energy agencies, including those in California, Connecticut, Kentucky, New Jersey, New York, Ohio, Texas, and Michigan. In Canada, ICF has also worked for Environment Canada, Natural Resources Canada, Transport Canada, Ontario Energy Board, Ontario Power Authority, Ontario Environment Ministry, Alberta Environment, and Alberta Infrastructure. We have also worked with numerous foreign overseas governments.

Q. DOES ICF HAVE UTILITY CLIENTS?

A. Yes. For over 35 years, ICF has provided forecasts and other consulting service to major U.S. and Canadian electric utilities. In Canada, ICF has worked with Manitoba Power, Nova Scotia Power, Ontario Power Generation, Hydro One, Bruce Power, TransAlta, ATCO, Saskpower, Gaz Metro, Union Gas, Spectra, Centra Gas, Enbridge Gas, and TransCanada. In the U.S., ICF has worked with utilities such as American Electric Power, Allegheny, Dominion Power, Delmarva Power & Light, Duke Energy, FirstEnergy, Entergy, Florida Power & Light , Southern California Edison, Sempra, PacifiCorp, Public Service Electric and Gas, Nevada Power, and Tucson Electric. ICF also works with Regional Transmission Organizations (RTOs) and similar organizations including the Midwest Independent Transmission System Operator (MISO), the Electric Reliability Council of Texas (ERCOT), and the Florida Regional Coordinating Council.

Q. WHAT TYPE OF WORK DO YOU TYPICALLY PERFORM?

A. I have extensive experience in assessing transmission and wholesale electric power issues including regulatory developments, potential transmission

investments, transmission congestion, power pricing, and costs and benefits of transmission rule changes. I also have extensive experience assessing prices and supply and demand conditions in wholesale power markets as well as valuing power plants.

Q. DO YOU HAVE OTHER RELEVANT EXPERIENCE?

A. Yes. I have testified in many legal proceedings. For example, I have testified on behalf of a range of companies including utilities, IPPs, independent transmission system operators and companies, government agencies and other companies.

Q. HAVE YOU TESTIFIED BEFORE THE QUEBEC REGIE DE L'ENERGIE?

A. No.

Q. WHAT SPECIFIC EXPERT TESTIMONY EXPERIENCE IN THE POWER SECTOR DO YOU HAVE?

A. I have testified before or made presentations to the U.S. Federal Energy Regulatory Commission, an international arbitration tribunal, federal courts, arbitration panels, and to state regulators and legislators in nineteen U.S. states: Arizona, Arkansas, California, Florida, Indiana, Kentucky, Louisiana, Massachusetts, Minnesota, Missouri, New Jersey, Nevada, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, and Texas. I have testified extensively on utility planning and the development of new generation resources. In addition, I have authored numerous articles in industry journals

and spoken at scores of industry conferences. For specific details, please see my resume, attached hereto as **Rose Schedule** A.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to rebut selected aspects of the testimony of: (1) Dr. Robert Sinclair made on behalf of Newfoundland and Labrador Hydro, (2) William Marshall on behalf of Brookfield Energy Marketing, and (3) Phillip Raphals on behalf of RNCREQ and UC. My rebuttal testimony focuses on the U.S. FERC Order 890 which requires that jurisdictional U.S. Transmission Providers provide a description of their coordinated, open and transparent transmission planning process as an attachment (Attachment K) to their Open Access Transmission Tariff (OATT). Specifically, my testimony: (1) explains the motivation for U.S. Federal Energy Regulatory Commission's Order 890 Attachment K including the importance FERC placed on resolving U.S. transmission system deficiencies, and (2) describes selected differences between TransEnergie's situation and that of typical U.S. Transmission Providers.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into seven sections. The first section (this section) introduces my testimony. The second section summarizes my testimony. The third section briefly describes the Attachment K requirement for jurisdictional utilities and the response of Canadian utilities to changes in FERC planning requirements. The fourth section discusses the portions of testimony I am

rebutting. The fifth section discusses the reasons for Attachment K and the conditions in the U.S. that motivated this requirement. The sixth section briefly compares the U.S. situation with that of TransEnergie. The seventh section briefly presents my conclusions.

II. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Attachment K is part of the amended pro forma Open Access Transmission Tariff (OATT) specified in the U.S. Federal Energy Regulatory Commission's (FERC) Order 890. Attachment K contains transmission planning requirements for U.S. transmission providers subject to FERC jurisdiction. Canadian transmission providers are not required to file Attachment K with FERC and none have. Canadian utilities have planning processes filed with their own regulators. In the case of British Columbia, its open access tariff filed with its regulator has planning directly related to Attachment K.

TransEnergie is not regulated by the U.S. FERC; it is regulated by the Quebec Régie de l'énergie ("Régie"). However, TransEnergie must provide transmission access equal to or superior to transmission access its affiliated entities receive in the U.S. if TransEnergie and its affiliates want to use open access transmission systems in the U.S.; this is referred to as the reciprocity requirement. It is my understanding that transmission planning with Attachment K is not part of the reciprocity requirements for non-jurisdictional utilities not owning transmission assets in the U.S.

The testimonies of Dr. Sinclair, Mr. Marshall, and Mr. Raphals address in part the motivation of FERC to require new transmission planning rules. Their testimony is inadequate or incorrect in describing the U.S. transmission problems that

motivated FERC's Attachment K requirements. These witnesses disagree with TransEnergie's view that U.S. transmission problems were the main motivation for Attachment K. I believe transmission problems were the main motivation and there is ample evidence to support this conclusion. This can be important in considering TransEnergie's specific transmission planning approach.

There were two motivations for Attachment K. First, FERC was concerned about acute U.S. transmission system deficiencies, namely: (1) the lack of transmission investment by transmission providers, (2) the existence of significant congestion on the transmission system, (3) the existence of reliability problems, and (4) the lack of coordination among components of the interconnection transmission system. This concern about the ability of the U.S. grid to function is evident in the order, but even more so in: (1) the statements of the Commissioners as to why they supported the order, (2) by reference to the overall historical context of the order, and (3) in light of the extremity of the problems in the U.S. For example, investment in U.S. transmission declined 69 percent on a per kW of load basis between 1980 and 1998, i.e., by more than two thirds[1]. Relative to 1975 the decrease was even greater. Not only did this cause significant congestion, it also helped cause the massive 2003 blackout which severely affected both the U.S. and Canada. Attachment K is clearly one of several U.S. responses to the 2003 blackout and the acute problems on the grid.

[1] Source: The Case for a 21st Century Electricity Transmission System, March 5, 2009, Democratic Policy Committee from Edison Electric Institute, Business Information Group and NERC ES&D

Second, FERC was concerned that U.S. transmission providers would use transmission planning to discriminate against unaffiliated companies. One consequence of the discrimination would be lack of transmission and the other problems identified above. Another consequence would be higher prices for power.

FERC's Attachment K is also part of a direct response to two factors adversely affecting planning. First, there is an acute lack of transmission coordination in the U.S. Most of the U.S. is part of the world's largest synchronous grid (a synchronous grid is also referred to as an Interconnection) known as the Eastern Interconnection (see Exhibit JLR-1). There is essentially no planning on the Eastern Interconnection level in the U.S.; each region or utility works largely on its own. The Eastern Interconnection has no full time employees, much less a planning department.

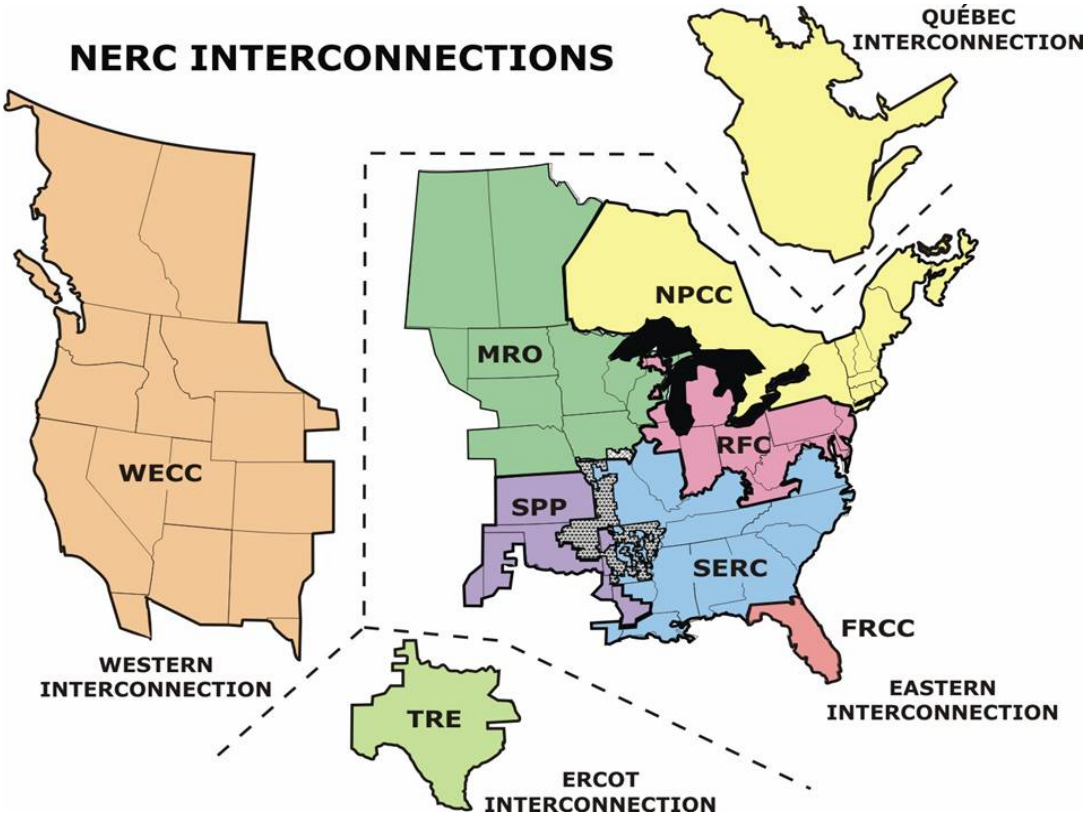
Second, the size of the U.S. transmission regulatory management and coordination problems are huge involving (see Exhibit JLR-2):

- 43 state and provincial regulatory authorities with responsibility for transmission planning in the Eastern Interconnection alone in addition to FERC, NERC, and the regional planning councils,
- More than 3,000[2] U.S. utilities,
- 500 transmission owners[3] , and

[2] There were 3,159 utilities in the U.S. in 2006. Source: Keeping the Lights On in a New World, January 2009, The Electric Advisory Committee and EIA Electric Power Annual.

- Close to 1,700[4] Independent Power Producers (IPPs). In 2006, IPPs represented 43 percent of the U.S. power generation industry capacity, or approximately 466 GW [5].

EXHIBIT JLR-1
The Four North American Interconnections



Source: NERC
http://www.nerc.com/fileUploads/File/AboutNERC/maps/NERC_Interconnections_color.jpg.
Interconnection is a synchronous grid. Ties between Interconnections are DC (Cirect Current) not AC.

[3] Source: Keeping the Lights On in a New World, January 2009, The Electric Advisory Committee

[4] Source: EIA Electric Power Annual

[5] Source: Keeping the Lights On in a New World, January 2009, The Electric Advisory Committee and EIA Electric Power Annual

EXHIBIT JLR-2
U.S. Utilities

Utilities and Non-Utilities in the U.S.		
Type	**Number of Companies**	**Nameplate Capacity (GW)**
Utilities		
Investor Owned Utilities[1]	220	557
Rural Electric Cooperatives[1]	930	
Public Power Systems[1]	2,000	
Federal Utilities[2]	9	73
Non-Utilities		
Independent Power Producers[3]	1,034	388
Other Non-Utilities[4]	628	78
Total	**4,821**	**1,096**

[1] Source: Keeping the Lights On in a New World, January 2009. The Electric Advisory Committee.

[2] Source: Number of federal utilities from 2007 EIA Form 861. Capacity of federal utilities from Keeping the Lights on in a New World, January 2009. The Electric Advisory Committee.

[3] Source: EIA Form 906. Of the 1,045 total, there are 832 non-cogen IPPs. A total of 7,509 units of IPP and other IPPs was reported in the Ventyx database.

[4] Source: EIA Form 906. Other Non-Utilities include industrial cogens and non-cogens, and commercial cogens and non-cogens.

There are major differences between the situation of U.S. utilities and TransEnergie, and also between TransEnergie and other Canadian transmission providers. Witnesses Sinclair, Marshall, and Raphals do not sufficiently address the advantages of TransEnergie's planning situation relative to the U.S. situation. These include:

- **Separate Interconnection** - The TransEnergie system is an asynchronous power grid or Interconnection[6], one of only four major asynchronous grids in North America. It is the only major Canadian electrical transmission system not interconnected via Alternating Current (AC) connections with U.S. utilities or other Canadian utilities.[7] Power

[6] Interconnection is capitalized to distinguish it from an interconnection between two utilities within a synchronous grid.

[7] Newfoundland is not AC interconnected, but is relatively small.

flows between TransEnergie and other areas in the U.S. and Canada occur via conversion of AC power to Direct Current (DC) power which is then converted back to AC, and hence, power flows are highly controlled compared to AC interconnections which frequently have inadvertent "loop flows" with other systems in the Interconnection. TransEnergie's special interface with the rest of North America decreases the need for transmission coordination, all else equal, and represents a superior element of the overall planning situation compared to U.S. conditions.

- **Interconnection Planning** – TransEnergie performs Interconnection planning for the Quebec Interconnection. As noted, in the U.S., there is no Interconnection wide planning for the Eastern Interconnection, the country's largest grid; it has no employees, and hence, no one at the Interconnection for FERC or anyone else to directly regulate. The fact that there is someone to regulate in the case of Quebec is a key superior element to the TransEnergie transmission planning process.
- **Number of Key Regulators** - TransEnergie is primarily regulated by the Régie. In contrast, the Eastern Interconnection has 43 state and provincial regulators in addition to FERC and NERC.[8] This is a superior element in planning coordination compared to U.S. conditions.
- **Number of Transmission Providers** - The TransEnergie Interconnection has only one major transmission provider. In contrast, in the neighboring Eastern Interconnection, there are hundreds of transmission owners. This is a superior element in planning coordination vis~a~vis the U.S.

[8] NERC, the North American Electric Reliability Corporation (NERC), was recently named by FERC the U.S. Electric Reliability Organization (ERO). NERC also has regional affiliates.

- **Number of IPPs** – It is not possible for Quebec, which is approximately 4 percent the size of the U.S., to have as many IPPs as the U.S. Also, it is my understanding that the TransEnergie system has less IPP capacity on a percentage basis. This facilitates planning for transmission access by the Interconnection regulator and transmission provider, all else equal, and is a superior element in transmission planning. More information is available from TransEnergie witnesses on this issue.
- **Transmission Investment** - I have not conducted a detailed review of the TransEnergie system. However, it is my understanding that the TransEnergie system has a higher $/kW of load of investment in transmission compared to the U.S. This appears to be a superior element compared to the U.S. More information is available from TransEnergie witnesses.
- **Transmission Congestion** – I have not conducted a detailed review of congestion in Quebec. Studies of congestion I have reviewed have not identified TransEnergie as having major internal congestion compared to the U.S. More information is available from TransEnergie witnesses.

My familiarity with the existing TransEnergie planning process is limited and I have not conducted a detailed review of the process. However, I am familiar with Attachment K and I note that selected aspects of the Attachment K requirements already appear to have been met at least in part by virtue of the openness to participation by and coordination with neighboring transmission providers, and transmission customers.

In conclusion, it does not appear necessary to add an Attachment K to the *Hydro-Québec OATT* to achieve a well functioning planning system, to improve the existing process or to meet the requirements for reciprocity.

III. INTRODUCTION TO ATTACHMENT K

Q. WHAT IS ATTACHMENT K?

A. FERC Order 890 provides clarifications and modifications to Orders 888 and 889. Orders 888 and 889 established the requirements for FERC jurisdictional utilities to file Open Access Transmission Tariffs (OATT). One of the clarifications of Order 890 is the requirement that jurisdictional transmission providers, or jurisdictional RTOs on their behalf, file Attachment K, an attachment to FERC's amended pro forma OATT that addresses transmission planning.

Q. HOW RECENT IS ATTACHMENT K?

A. The origins of Order 890 extend back several years (see Exhibit JLR-3). FERC initiated the Order 890 process on September 16, 2005 by soliciting comments through a Notice of Inquiry (NOI)[9]. On May 19, 2006 FERC issued a Notice of Proposed Rulemaking (NOPR)[10]. On February 16, 2007, FERC issued Order 890[11]. Transmission providers subject to FERC jurisdiction were required to file Attachment K in part by December 7, 2007[12]. On May 15, 2008, FERC approved filings with Attachment K for the first time[13]. Rehearing order of the pro forma

[9] Preventing Undue Discrimination and Preference in Transmission Services (NOI), RM05-25-000, http://www.ferc.gov/whats-new/comm-meet/091505/E-1.pdf

[10] Market-Based Rates for Wholesale Sales of Electric Energy, Capacity and Ancillary Services by Public Utilities (NOPR), RM04-7-000, http://www.ferc.gov/whats-new/comm-meet/051806/E-2.pdf

[11] Preventing Undue Discrimination and Preference in Transmission Service (Final Rule), RM05-17-000 & RM05-25-000, http://www.ferc.gov/whats-new/comm-meet/2007/021507/E-1.pdf

[12] Preventing Undue Discrimination and Preference in Transmission Service (Final Rule), RM05-17-000 & RM05-25-000, http://www.ferc.gov/industries/electric/indus-act/oatt-reform/order-890/Ext-Attachment-K.pdf

[13] Filings approved were by MidAmerican Energy Company (OA08-41-000), ISO New England Inc (OA08-58-000), Maine Public Service Company (OA08-21-000), PJM Interconnection LLC (OA08-32-000),

OATT adopted in Order 890-A was issued on December 27, 2007 and became effective March 17, 2008[14]. Rehearing order of the pro forma OATT adopted in order 890-B[15] became effective September 8, 2008.

EXHIBIT JLR-3
Timeline of Events Order 890

Date	Event
4/14/1996	Order Nos. 888 and 889 issued, requiring public utilities to provide open access transmission service & establishing rules governing OASIS
9/16/2005	Commission sought comment by Notice of Inquiry regarding whether *pro forma* OATT needed to be reformed
5/19/2006	Notice of Proposed Rulemaking to reform OATT issued
2/16/2007	Order No. 890 issued
7/27/2007	Order extending filing date for Attachment K
10/11/2007	Original date for required filing of Attachment K
12/7/2007	New date for required filing of Attachment K
12/27/2007	Order No. 890-A issued
3/17/2008	Order 890-A becomes effective
5/15/2008	Kelliher's statement on OATT planning compliance filings released. Six Orders issued accepting six Attachment K compliance filings (filed on or before 12/7/2007) subject to some directed revisions
6/23/2008	Order 890-B issued
9/8/2008	Order 890-B becomes effective
3/19/2009	Order 890-C issued
3/25/2009	Order 890-C becomes effective

Source: Open Access Transmission tariff (OATT) Reform, http://www.ferc.gov/industries/electric/indus-act/oatt-reform.asp

Q. WHAT DOES ATTACHMENT K SPECIFICALLY REQUIRE?

A. Attachment K requires that FERC jurisdictional utilities:

> *"The Transmission Provider shall establish a coordinated, open and transparent planning process with its Network and Firm Point-to-*

Midwest Independent Transmission System Operator, Inc (OA08-53-000), and American Transmission Company LLC and Midwest Independent Transmission System Operator, Inc (OA08-42-000)

[14] Preventing Undue Discrimination in Transmission Service (Order on Rehearing and Clarification), RM05-17-001, 002, and RM05-25-001, 002, http://www.ferc.gov/whats-new/comm-meet/2007/122007/E-1.pdf

[15] Preventing Undue Discrimination in Transmission Service (Order on Rehearing and Clarification), RM05-17-003 and RM05-25-003, http://www.ferc.gov/whats-new/comm-meet/2008/061908/E-1.pdf

Point Transmission Customers and other interested parties, including the coordination of such planning with interconnected systems within its region, to ensure that the Transmission System is planned to meet the needs of both the Transmission Provider and its Network and Firm Point-to-Point Transmission Customers on a comparable and nondiscriminatory basis."[16]

In Order 890, Attachment K, FERC requires that the Transmission Provider's (TPs) planning process must satisfy nine principles[17]:

- **Coordination** – TPs must meet with all of their transmission customers and interconnection neighbors in the course of developing their transmission plans.
- **Openness** – Meetings must be open to all affected parties including customers, state authorities and other stakeholders. The notice procedures and anticipated frequency of meetings should be identified.
- **Transparency** – TPs must provide in writing the methodology, criteria, and processes used to develop the plan including treatment of native load.
- **Information Exchange** – Network[18] customers are required to provide sufficient information for the transmission providers to properly plan.
- **Comparability** – Planning must treat comparably situated customers comparably in transmission system planning.
- **Dispute Resolution** – The dispute resolution process needs to be identified.

[16] Attachment K

[17] Notice of White Paper, FERC, August 2, 2007. Note also that FERC found simply filing FERC Forms 714 and 715 were not adequate.

[18] Network service is for serving loads and point-to-point service is for moving power in specific quantities to and from specific locations.

- **Regional Participation** – TPs are required to coordinate with interconnection systems to share plans to ensure they are simultaneously feasible and identify enhancements to relieve congestion or integrate new resources.
- **Economic Planning Studies** – TPs are required to account for the need for economic as well as reliability related upgrades in the planning process.
- **Cost Allocation For New Projects** – The allocation of costs must be addressed for new facilities that do not fit under existing rate structures. New facilities might include regional projects involving multiple owners or economic projects identified through the study process. The cost allocation should be fair in assigning cost to those that cause them and those that benefit. Also, the cost allocation process should create incentives for new transmission construction.

FERC allows jurisdictional utilities flexibility with respect to numerous Attachment K issues. For example, a single cost allocation approach is not required. Similarly, flexibility is allowed in the conduct of economic planning, dispute resolution, and other matters. FERC can be expected also to show even more flexibility when reviewing provision of transmission services in a foreign country because local circumstances are likely to be even more diverse.

Q. HOW DOES RECIPROCITY FIT IN?

A. TransEnergie is not a jurisdictional utility. It is not regulated by FERC. There is no requirement for a filing of Attachment K. However, there must be an open access tariff in place in order for TransEnergie and its affiliates to participate in open access in the U.S. It is my understanding that Attachment K transmission planning is not part of the reciprocity requirements for non-jurisdictional utilities not owning transmission assets in the U.S.

Q. WHAT HAS BEEN THE RESPONSE OF CANADIAN UTILITIES TO ATTACHMENT K?

A. No Canadian utility has filed an Attachment K. New Brunswick has filed a brief Attachment K that at best addresses one area; I do not believe it is even close to being in compliance with Attachment K (see Exhibit JLR-4).

Q. ARE THERE DIFFERENCES BETWEEN TRANSENERGIE AND OTHER CANADIAN SYSTEMS?

A. Yes, and I would like to highlight two. First, all other Canadian systems are AC Interconnected to U.S. and Canadian transmission systems with exception of Newfoundland. Therefore, transmission planning of other Canadian utilities has additional issues to be addressed in coordination with U.S. utilities. Thus, even if others filed Attachment K with their regulators, it might reflect their degree of physical integration with U.S. systems. Second, British Columbia owns transmission facilities in the U.S. while other Canadian utilities do not. It should

be noted that British Columbia is filing to its regulator, a revised planning process closely patterned after Attachment K.[19]

EXHIBIT JLR-4
Canadian Utilities – Attachment K Filings and AC Interconnections With Other Providers

Province	Filed Attachment K with FERC	AC Interconnection with Other Transmission Providers
Quebec	No	No
New Brunswick	No (see Text)	Yes
Ontario	No	Yes
Manitoba	No	Yes
Saskatchewan	No	Yes
Alberta	No	Yes
BC	No	Yes
Nova Scotia	No	Yes
Newfoundland	No	Partly[1]

[1] Labrador part of system AC Interconnected

[19] The Montana Alberta Tie Ltd, a Calgary based company with assets under construction in the US, has filed Attachment K at FERC.

IV. TESTIMONY OF DR. SINCLAIR, MR. MARSHALL, AND MR. RAPHALS

Q. WHAT ARE YOU REBUTTING WITH REGARD TO DR. SINCLAIR'S TESTIMONY IN THIS PROCEEDING?

A. I am rebutting the lack of balance and perspective with respect to his testimony on transmission planning and Attachment K. On pages 12 and 13 of his testimony, Dr. Sinclair states the rationale for the reform of transmission planning under Order 890. The rationale is incomplete because it fails to mention: (1) the lack of transmission investment in the U.S., (2) the transmission congestion in the U.S., (3) the reliability problems in the U.S., (4) the lack of coordinated planning among system components, and (5) the acuteness of the situation. It also provides no description of U.S. conditions and fails to identify clear superior elements of the TransEnergie planning process.

While Dr. Sinclair does admit on page 15 that "part of the motivation for reform of the planning process under Order 890 is to accelerate investment…." He also believes "HQT's claim that the Order 890[20] is primarily aimed at infrastructure investment is misleading." And "reliability …is not a relevant consideration as to whether or not HQT meets the transmission planning reform under Order 890."[21]

As discussed in the next section, it is not misleading to believe that the lack of infrastructure investment and the need to solve problems on the grid were the

[20] Page 16

[21] Page 17

primary, though not exclusive aim of the reform of the transmission planning process. Indeed, there is ample evidence supporting this conclusion. Further, to the extent transmission investment by TransEnergie has been sufficient, this supports the view that elements of the planning process in Quebec are superior to those in the U.S., a point he fails to make.

The claim that reliability "is not a relevant consideration as to whether or not HQT meets the transmission planning reform under 890" is incorrect. Lack of reliability can be evidence of a failed process, lack of investment and coordination, and prevention of reliability problems was a clear motivating force behind the FERC action as discussed in the next section.

Q. WHAT ARE YOU REBUTTING WITH REGARD TO MR. MARSHALL'S TESTIMONY IN THIS PROCEEDING?

A. On page 12 of his testimony, Mr. Marshall states, "The writer disagrees with the position of HQT for two main reasons." Specifically, he disagrees with HQT's focus on "FERC's requirement for a coordinated, open and transparent planning process as a fix for the physical ills of congestion and the need for new investments. They [HQT] completely ignore the concept of providing reciprocal and comparable open access to all customers."

As Dr. Sinclair points out on page 17 of his testimony, HQT does not completely ignore the concept of providing comparable access to all customers.

"Q. Does HQT's filing address discrimination?

A. Yes."

Dr. Sinclair goes on to refer to HQT's statement that the TransEnergie regulatory framework is "making sure that there is no undue discrimination towards HQT clients."

Q. WHAT ARE YOU REBUTTING WITH REGARD TO MR. RAPHALS' TESTIMONY IN THIS PROCEEDING?

A. He states on page 3 of the translation of Mr. Raphals' testimony that: "This, in our view, is a wrongful interpretation of Order 890". Mr. Raphals is referring, in part, to "The Transmission Provider's interpretation is thus that FERC's main concern is that in situations where "many transmission providers in an interconnection characterized by congestion and zones with variable prices," [and] "those benefiting from congestion can be interested in seeing transmission investment projects fail."[22]

Q. WHAT IS YOUR RESPONSE?

A. My response to Mr. Raphals is similar to my response to Dr. Sinclair in that I disagree with the view that acute problems in the U.S. transmission system, including congestion, were not the main motivating factors; they were in my opinion. There is certainly ample evidence they were the main factors as discussed in the next section.

[22] See pages 2 and 3 of the English translation of Mr. Raphals' testimony, Section 9 Planning Process.

V. NEED FOR ATTACHMENT K IN THE U.S.

V.1 FERC Motivations

Q. WHY DID FERC BELIEVE THERE TO BE A NEED FOR ATTACHMENT K IN THE U.S.?

A. FERC believed there was a need for additional transmission planning requirements in the U.S. for two reasons. The first, and in my opinion, the primary reason was that acute U.S. transmission problems could, in part, be solved by improved planning. The problems included: (1) insufficient transmission investment, (2) excessive transmission congestion, (3) reliability problems, and (4) lack of coordination. The second reason was FERC's view that inadequate planning might facilitate discrimination by transmission providers. As a consequence, prices could rise and grid infrastructure investment could be too low.

Q. DOES ORDER 890 SPECIFICALLY INDICATE THAT CONCERN OVER LACK OF TRANSMISSION INVESTMENT AND CONGESTION IS A REASON FOR ATTACHMENT K?

A. Yes. In *FERC Order 890 pg. 43-44 (Commission Determination)*, it states:

> *"The decline in transmission investment and increase in transmission congestion underscore our concerns over inadequate planning provisions of the existing pro forma OATT. The existing pro forma OATT, as indicated above, contains very little specificity regarding how transmission planning should be conducted, how customers' needs are incorporated into that process, and what information is publicly available regarding the transmission providers' assumptions, criteria and data used in the planning process. These inadequacies are sufficiently severe, standing*

alone, to merit reform of the OATT. However, they are of even greater concern given the current state of the transmission grid.

In *FERC Order 890 pg. 238,* it states:

"We do not believe that the existing pro forma OATT is sufficient in an era of increasing transmission congestion and the need for significant new transmission investment."

Q. WHERE ELSE DID FERC EXPLICITLY HIGHLIGHT THE IMPORTANCE OF U.S. GRID CONDITIONS AS A CAUSE OF ORDERING ATTACHMENT K FILINGS?

A. The statements of FERC Commissioners strongly emphasize the importance of solving U.S. transmission problems as very important causes for ordering the filing of Attachment K. On December 20, 2007, the FERC Chairman, Joseph Kelliher, stated on the occasion of the rehearing on Order 890[23]:

"Third, we seek to strengthen the interstate power grid. In particular, the regional transmission planning provisions should help strengthen the transmission system. We require regional transmission planning because our power grid is regional in nature and planning should reflect that reality. I am hopeful that improved regional planning will make it easier to resolve difficult cost allocation issues and spur increased grid investment.

However, it is not enough to have perfect access to a constrained transmission grid. We need to secure greater levels of investment in the power grid – and sustain those investment levels. Transmission investment has increased significantly, roughly doubling since 2002. Our policies have played a major role in encouraging higher investment levels. While investment trends are in the right direction, they are still not at the level we need to assure reliability of the bulk power system and support competitive markets."

[23] "Chairman Joseph T. Kelliher's statement on preventing undue discrimination and prefence in transmission service" RM05-17-001 http://www.ferc.gov/news/statements-speeches/kelliher/2007/12-20-07-kelliher-E-1.asp

Commissioner Moeller stated on the same day[24]:

> *"As I said last February, Order No. 890 embodies my guiding principles of: (1) promoting reliability; (2) sending accurate market signals; and (3) encouraging the development of needed energy infrastructure. Today's order on rehearing on Order No. 890 continues to support those principles, allowing the Commission to continue moving in the direction of fully open, competitive, and reliable wholesale markets."*

FERC Chairman Kelliher made a similar statement on February 15, 2007 when Order 890 was first issued.[25] Under the heading "Strengthening the Transmission Grid" he stated,

> *"The OATT reform rule will also strengthen the interstate power grid. The reality is that we do not have a national grid, but a series of regional grids. At the same time, ownership of the transmission grid in the United States is highly disaggregated. The solution we advance is strengthening regional transmission planning.* Page 2 of 3.

At the time of receiving the first planning filings in compliance with Order 890 on May 15, 2008 Chairman Kelliher stated: [26]

> *The principal duty of the Commission in the area of economic regulation is to guard the consumer from exploitation. One of my early goals as FERC Chairman was to reform the open access transmission tariff and reduce the potential for undue discrimination and preference and the opportunity for vertical market power exercise. That resulted in the landmark rule, Order No. 890.*

[24] "Commissioner Moeller's statement on preventing undue discrimination and prefence in transmission service" RM05-17-001 http://www.ferc.gov/news/statements-speeches/moeller/2007/12-20-07-moeller-E-1.asp

[25] Item E-1: Preventing undue Discrimination and Preference in Transmission Service CRM 05-17-100, CRM 05-25-000.

[26] Statement: May 15, 2008 Docket Nos: OA08-32-000, OA08-53-000, OA08-42-000, OA0841-000, OA08-58-000 and OA08-21-000

But Order No. 890 had other policy objectives beyond reducing the potential for undue discrimination and preference. One was to promote effective competition in wholesale power markets, by providing for more perfect open access.

Another policy goal was to strengthen the grid itself. Perfect access to a constrained grid does not adequately promote effective wholesale competition or assure reliability of the bulk power system. There is a need to strengthen the interstate power grid. We have pursued that goal through a number of actions, including encouraging greater grid investments, making difficult cost allocation decisions in a number of regions, and establishing rules governing exercise of our limited authority to site transmission facilities.

Order No. 890 also included provisions to strengthen the power grid, by requiring regional transmission planning. The United States does not have a national power grid; we have a series of 8 or 10 regional power grids.

But ownership of the U.S. interstate transmission system is highly disaggregated, with more than 500 owners. Before Order No. 890, transmission planning was done by individual transmission owners, as if we had 500 distinct power grids. Order No. 890 required regional transmission planning because that reflects the true nature of the U.S. power grid.

In the orders we approve today, we uphold the planning principles in Order No. 890 and require certain modifications to conform to those principles. In that way, we strengthen regional planning and establish greater consistency in planning.

On May 15, 2008, Commissioner Spitzer stated: [27]

"One of the core components of Order No. 890 is "Attachment K" of the pro forma tariff – the establishment of a coordinated, open and transparent planning process. Transmission congestion imposes reliability and economic burdens upon consumers and requires enhanced transmission investment. This Commission therefore mandates that transmission providers establish a planning process through which they coordinate with customers, neighboring transmission providers, state authorities and other stakeholders." [underline added]

[27] Statement: May 15, 2008 Docket Nos: OA08-32-000, OA08-53-000, OA08-42-000, OA0841-000, OA08-58-000 and OA08-21-000

Also, on May 15, 2008, upon approving the first Order 890 filings, FERC Commissioner Phillip Moeller stated:[28]

> *"With the passage of more than ten years since the Commission undertook the effort to promote wholesale competition through open access transmission service, it was time for us to revisit Order No. 888 and determine if any changes were due. During this intervening decade, the transmission grid has experienced unprecedented challenges as the demand for energy has grown at a pace that far exceeds the grid's available transmission capacity and the current rate of transmission investment. [underline added] With these facts, it should come as no surprise that if changes are not made to make better use of the transmission system, the public will bear the cost of transmission congestion through increased utility bills, to say nothing of the looming possibility of power outages in many of the nation's more congested urban areas. Also, the passage of the Energy Policy Act of 2005, which recognized the need for additional transmission infrastructure development and its role in facilitating the development of competitive wholesale markets, has influenced the policies in our Final Rule." "[underline added]*

Also, in February 2007, FERC Commissioner Marc Spitzer stated under the heading: I. Infrastructure and Reliability[29]*:*

> *"American consumers place a high value on the reliable delivery of electricity. Yet, net investment in transmission has declined in real terms over the past twenty years. [underline added] Moreover, the transmission siting process is difficult because opponents of new transmission projects typically argue the absence of need…… the regional planning provisions of Order No. 890 will promote a public dialogue that I am hopeful will result in new transmission investment where it is needed. In the West, for example, regional planning processes have identified constraints, determined appropriate transmission corridors and galvanized the public and*

[28] Statement: May 15, 2008 Docket Nos: OA08-32-000, OA08-53-000, OA08-42-000, OA0841-000, OA08-58-000 and OA08-21-000

[29] "Statement of Commissioner Marc Spitzer, RM05-17-000, RM05-25-000, http://www.ferc.gov/news/statements-speeches/spitzer/2007/02-15-07-spitzer-E-1.pdf

decision-makers to address the reliability, economic and environmental imperatives of transmission projects.

Q. WHAT IS THE RELATIONSHIP BETWEEN THE 2003 BLACKOUT AND ORDER 890?

A. The 2003 Blackout was a galvanizing event in the history of the U.S. power industry. The Order 890 process formally began on September 16, 2005, two years after the 2003 blackout, when FERC issued a Notice of Inquiry. Of course, internal FERC planning for the Notice of Inquiry began earlier. At roughly the same time, the U.S. Energy Policy Act of 2005 was being enacted in large part in response to the 2003 Blackout. More generally, Order 890 was part of a multi-pronged effort to resolve U.S. transmission problems in light of the 2003 Blackout. I highlight five notable other efforts. First, the Energy Policy Act of 2005 led to the creation of an Electric Reliability Organization (ERO) with enforceable reliability standards. FERC named NERC as ERO. Second, FERC initiated and continued policies that favored the creation of Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) facilitating greater planning across larger geographic areas within large AC systems, both to minimize costs and to increase reliability. RTOs/ISOs have helped but not solved the transmission planning problem. Each state is still responsible for approving and siting transmission within it borders. Further, there is still not a single full time employee of the Eastern Interconnection much less a planning department. Third, the Energy Policy Act of 2005 also tried to address the transmission investment shortfall through its “backstop” eminent domain provisions in national interest corridors, but thus far this authority has not been

used. Fourth, FERC has provided incentives for new transmission investment including higher rates of return. Fifth, the U.S. and Canada established the bilateral Electric Reliability Oversight Group or Bilateral Group in July 2005.

V.2 FERC Motivations and U.S. Transmission Investment

Q. WHAT HAS BEEN THE SITUATION REGARDING U.S. TRANSMISSION INVESTMENT?

A. The U.S. has 400,000 miles of transmission lines.[30] Nonetheless, U.S. transmission investment was highly inadequate over a long period, especially in the period leading up to the issuance of Order 890 in February 2007. On an inflation adjusted basis, U.S. transmission investment was below 1980 levels, every year from 1981 until 2004. 2004 was the last year historical data was available to FERC when Order 890 was issued in February 2007 (see Exhibits JLR-5 and JLR-6). Between 1980 and 1998, U.S. transmission investment fell more than 53 percent relative to 1980 levels in real terms[31]. U.S. transmission investment also fell between 1975 and 1980.[32] This downward trend was even more serious given the growth in U.S. electricity demand. Between 1980 and 1998, U.S. electricity demand[33] increased 54 percent. Thus, on a per unit of peak power sold, transmission investment declined 69 percent between 1980

[30] Source: EPRI, 2008. Transmission refers to power lines at or above 69,000 volts. The U.S. also has 5 million miles of distribution lines at lower voltages. 164,000 miles are at 230 kV or greater. Source: Reading the Lights in a New World.

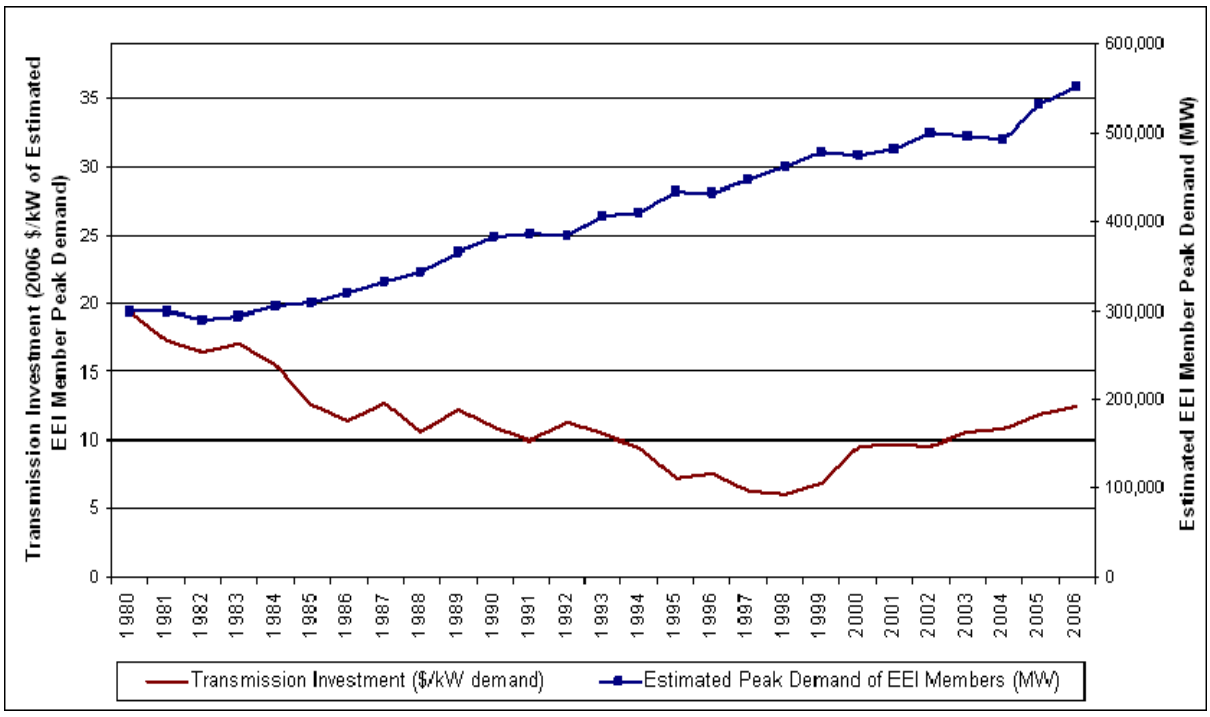
[31] Source: The Case for a 21st Century Electricity Transmission System, March 5, 2009, Democratic Policy Committee from Edison Electric Institute, Business Information Group.

[32] Source: E. Hirst and B. Kirby. 2001. *Transmission Planning for a Restructured U.S. Electricity Industry*. Edison Electric Institue and "National Transmission Grid Study"; US Department of Energy; May 2002; Pg 7

[33] Source: NERC ES&D.

and 1998 or from $19.5/KW of load to $6.0/kW of load[34]. Between 1980 and 2004, the decrease was 45 percent[35] to $10.8/kW of load.

EXHIBIT JLR-5
Transmission Investment



[1] Source: Edison Electric Institute, Business Information Group. Table sent directly from EEI transmission investment analyst. 2006 is the last year of actual historical data currently available.
[2] Peak Demand is based on NERC ES&D. EEI members serve 70% of all the customers in the electrical industry. Estimated EEI member peak demand is calculated by multiplying 70% by total U.S. peak demand (NERC ES&D data).
[3] Transmission investment per kW of member peak demand is calculated by dividing transmission investment by estimated EEI member peak demand, and then dividing by 1,000 to convert to $/kW.

[34] Source: The Case for a 21st Century Electricity Transmission System, March 5, 2009, Democratic Policy Committee from Edison Electric Institute, Business Information Group and NERC ES&D

[35] Source: The Case for a 21st Century Electricity Transmission System, March 5, 2009, Democratic Policy Committee & Transforming America's Power Industry: The Investment Challenge 2010-2030, November 2008, The Brattle Group, both from Edison Electric Institute, Business Information Group and NERC ES&D.

EXHIBIT JLR-6
U.S. Transmission Investment

Transmission Investment and Electricity Demand in the U.S.				
Year	**Transmission Investment (Millions 2006$)[1]**	**Peak Demand (MW)[2]**	**Estimated Peak Demand of EEI Members (MW)[3]**	**Transmission Investment (2006 $/kW of Estimated EEI Member Peak Demand)[4]**
1980	5,817	427,058	298,941	19.46
1981	5,188	428,295	299,807	17.31
1982	4,784	414,489	290,142	16.49
1983	5,014	420,408	294,286	17.04
1984	4,719	434,534	304,174	15.51
1985	3,866	439,916	307,941	12.56
1986	3,625	455,911	319,138	11.36
1987	4,232	474,043	331,830	12.75
1988	3,622	489,396	342,577	10.57
1989	4,463	523,432	366,402	12.18
1990	4,181	545,537	381,876	10.95
1991	3,859	551,320	385,924	10.00
1992	4,354	548,707	384,095	11.34
1993	4,254	580,753	406,527	10.46
1994	3,886	585,320	409,724	9.49
1995	3,137	620,249	434,174	7.22
1996	3,283	616,790	431,753	7.60
1997	2,800	637,677	446,374	6.27
1998	2,763	660,293	462,205	5.98
1999	3,274	682,122	477,485	6.86
2000	4,580	678,413	474,889	9.64
2001	4,696	687,812	481,468	9.75
2002	4,812	714,565	500,196	9.62
2003	5,232	709,375	496,563	10.54
2004	5,319	704,459	493,121	10.79
2005	6,308	758,876	531,213	11.88
2006	6,909	789,475	552,633	12.50

[1] Source: Edison Electric Institute, Business Information Group. Table sent directly from EEI transmission investment analyst.

[2] NERC ES&D.

[3] EEI members serve 70% of all the customers in the electrical industry. For 1980-2006, estimated EEI member peak demand is calculated by multiplying 70% by total U.S. peak demand.

[4] Transmission investment per kW of member peak demand is calculated by dividing transmission investment by estimated EEI member peak demand, and then dividing by 1,000 to convert to $/kW.

V.3 FERC Motivations and U.S. Transmission Congestion

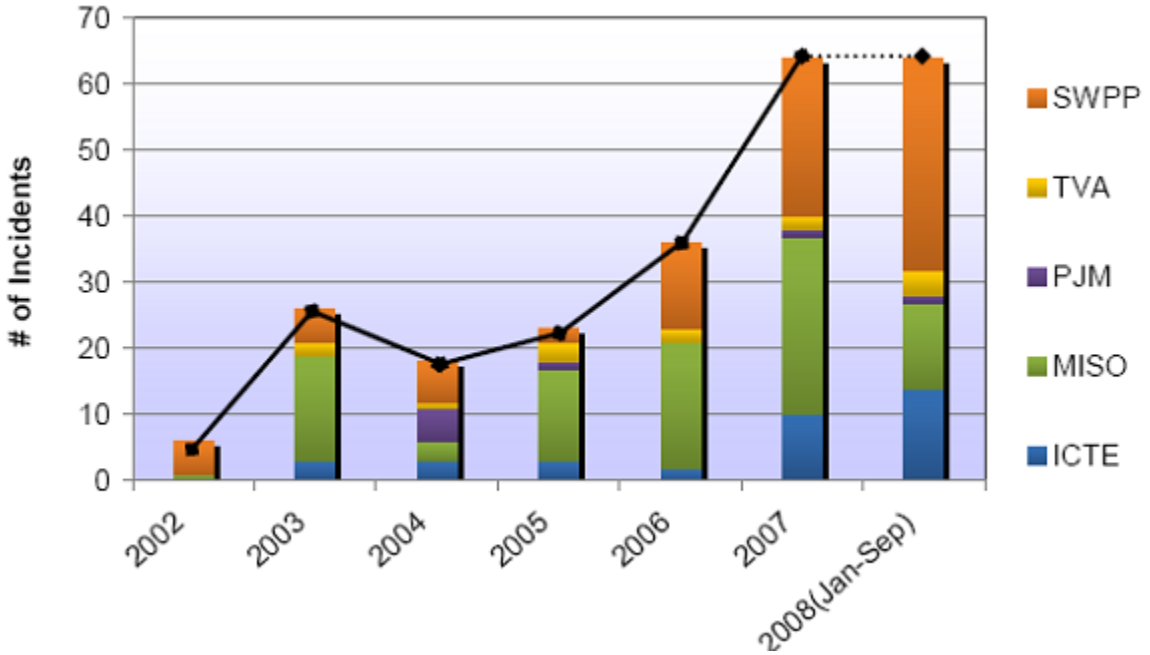
Q. WHAT IS THE U.S. TRANSMISSION CONGESTION SITUATION?

A. There is significant transmission congestion in the U.S. Transmission congestion creates price differentials which can favor transmission owners or prevents transmission of competing sources of power which can also favor transmission owners. It is also a precursor of potential reliability problems and an indicator of potential lack of investment. A recent NERC Study[36] concludes:

> *"One measure of bulk transmission congestion, used in parts of the Eastern Interconnection of North America, is Transmission Loading Relief (TLR) requests, which have increased during the last six years. In some cases, the over-scheduling of electricity transactions requires the issuance of TLRs, which is how system operators maintain system loadings within reliability limits. Reallocation and curtailment of bulk transmission service to meet System operating Limits and Interconnection Reliability Operating Limits are increasing* (see Exhibit JLR-7).

[36] "2008 Long-Term Reliability Assessment 2008-2017", NERC, October 2008.

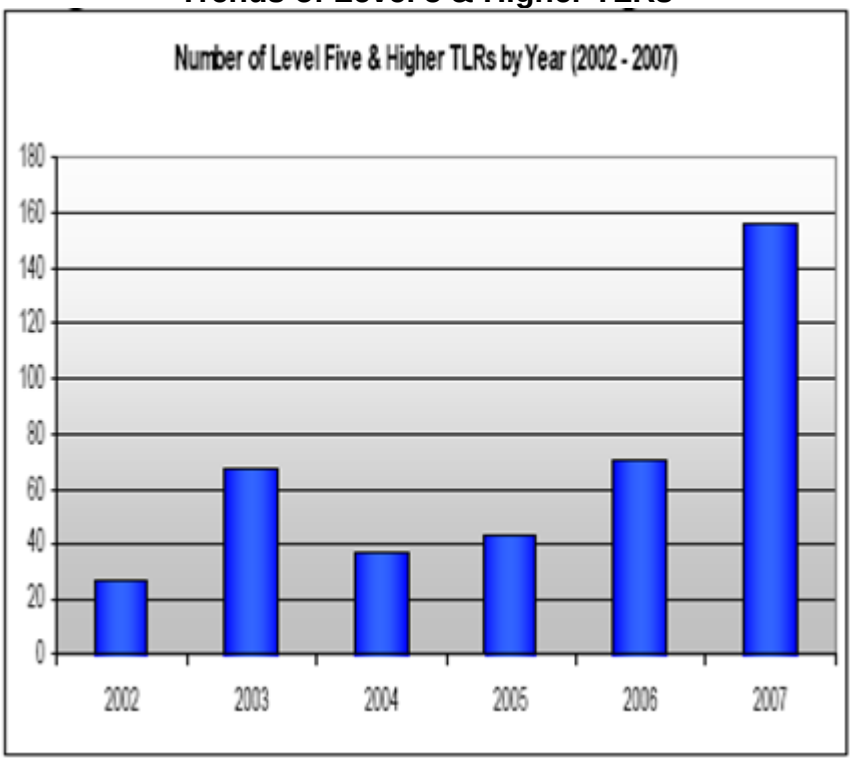
EXHIBIT JLR-7
TLR's Level 5b: 2002 – September 2008



Source: "2008 Long-Term Reliability Assessment 2008-2017"; NERC; Oct. 2008; Pg 23. Level 5b involves curtailment of firm point-to-point service to mitigate congestion. Lower level TLRs do not involve curtailing firm service.

This increase is also reflected in U.S.-wide data (see Exhibit JLR-6).

EXHIBIT JLR-8
Trends of Level 5 & Higher TLRs



Source: "2008 Long-Term Reliability Assessment 2008-2017"; NERC; Oct. 2008; Pg 59. Level 5 includes 5a and 5b. 5a involves reallocation of firm point-to-pint transmission. 5b is curtailment of firm point-to-point service.

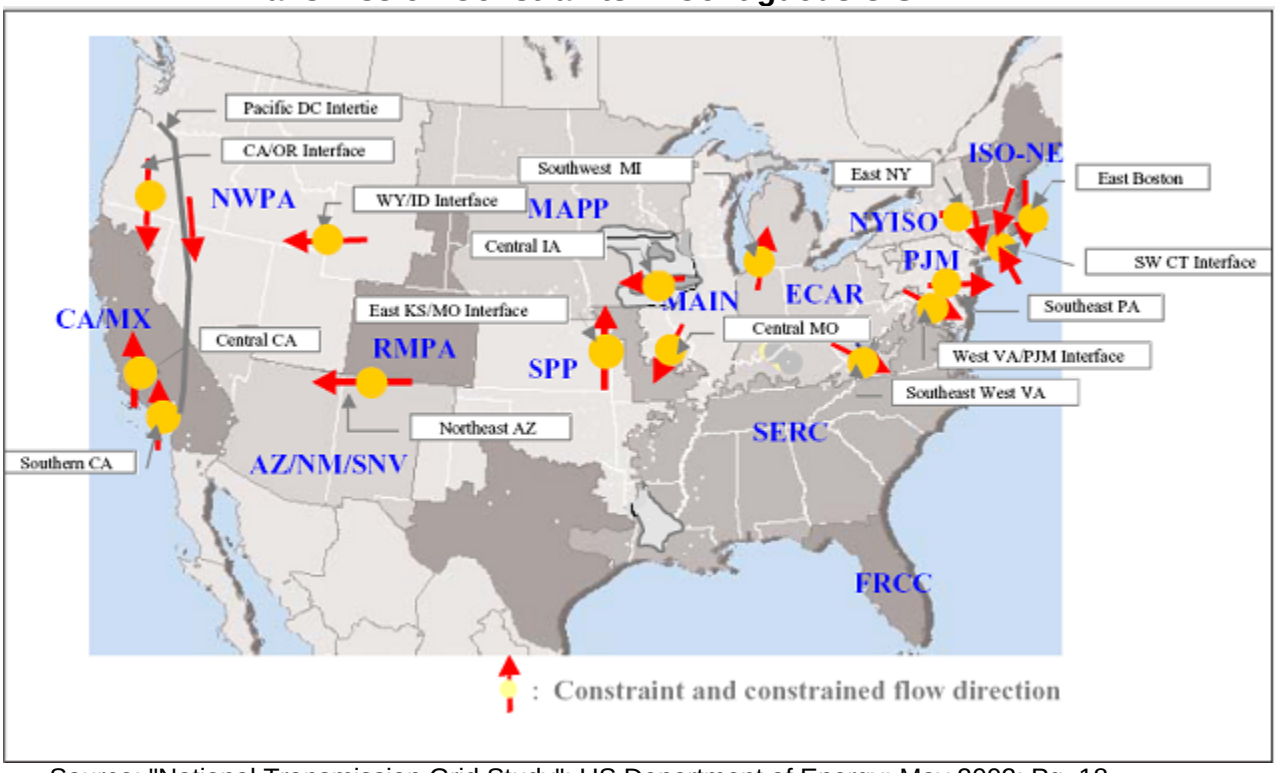
Another study states:

> *"In general, DOE's findings are very similar to historical data on transmission congestion, which also indicate that there is substantial congestion in the Midwest and upper Midwest, and from the Mid-Atlantic to the Northeast.*[37]*"*

[37] "National Transmission Grid Study"; U.S. Department of Energy; May 2002; Pg. 12.

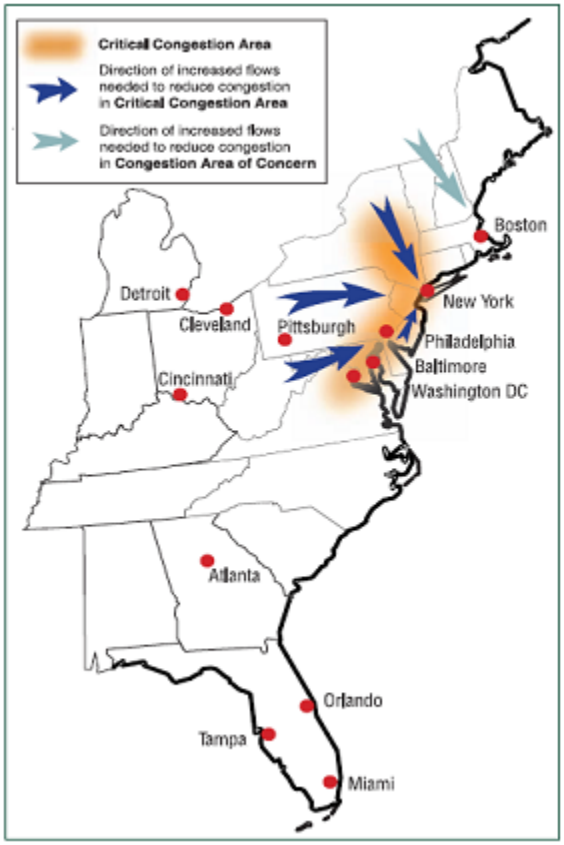
Several areas of congestion are highlighted in Exhibits JLR-9, JLR-10, and JLR-11. These maps are from prominent U.S. studies of transmission congestion, including those of the U.S. DOE.

EXHIBIT JLR-9
Transmission Constraints in Contiguous U.S.



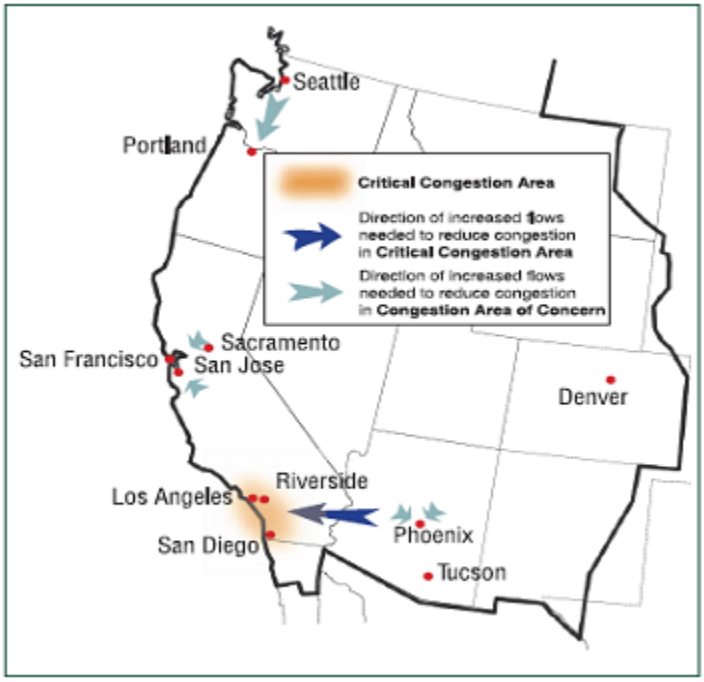
Source: "National Transmission Grid Study"; US Department of Energy; May 2002; Pg. 18

EXHIBIT JLR-10
Critical Congestion Area and Congestion Area of Concern in the Eastern Interconnection



Source: "National Electric Transmission Congestion Study"; US Department of Energy; Aug 2006

EXHIBIT JLR-11
One Critical Congestion Area and Three Congestion Areas of Concern in the Western Interconnection



Source: "National Electric Transmission Congestion Study"; US Department of Energy; Aug 2006

Of particular concern to Canada is the recent conclusion that:[38]

- *Currently, interregional planning within the eastern and western U.S. interconnections is inadequate, but it can be improved.*
- *Lake Effect phenomenon: For example, the "lake effect" phenomenon, a power flow problem around the eastern Great Lakes, particularly Lake Erie, has existed for decades. This phenomenon, which has yet to be resolved, may have been a contributor to the spreading of the 2003 blackout in the eastern United States. Although system controls, procedures, and compliance with mandatory reliability standards were put in place to mitigate the circulating power flows, relatively little coordinated transmission investment has been made. The area surrounding Lake Erie comprises three RTOs in the United States and an independent system operator (ISO) in Ontario, Canada. RTOs (and ISOs) are responsible for transmission planning within their respective footprints, but they are not adequately addressing transmission planning challenges jointly with neighboring regions.*

[38] Keeping the Lights On in a New World: January 2009, The Electricity Advisory Committee

NERC conducted an online survey from July 17, 2007 to August 7, 2007, and surveyed a broad range of utility users, owners, and operators at various levels of leadership and management to find out what they consider the most important issues affecting the reliability of the bulk power system. The survey posed 17 reliability topics for ranking within two areas, business and technical, and one preparedness topic for ranking.[39] Participants were asked: *"What do you believe is the likelihood of occurrence?"* The three most likely events were: (1) aging infrastructure and limited new construction, (2) congestion, and (3) operations closer to load limits (see Exhibit JLR-12).

[39] "Results of the 2007 Survey of Reliability Issues"; NERC; October 2007; Pg. 13.

EXHIBIT JLR-12

Breakdown on Participants' Belief in the Likelihood of Occurrence (%)

#	Question	High	Medium	Low
1	Limited Fuel Availability, Transportation, or Reduced Onsite Supplies	13	55	32
2	System Protection and Controls – Imbalances and Malfunctions	17	36	47
3	Aging Infrastructure and Limited New Construction	65	28	7
4	Lack of Mandatory Standards for Reliable Operation	12	29	59
5	Voltage/Reactive Reserve Availability	15	57	28
6	Lack of Preventative Maintenance	22	45	32
7	Operating closer to load limits	58	32	9
8	Transmission System Congestion	62	29	9
9	Vegetation-Related Transmission Outages	15	40	46
10	Availability of Reliability Analysis Tools for situational Awareness	13	50	36

Source: "Results of the 2007 Survey of Reliability Issues"; NERC; Oct. 2007; Pg 13

V.4 FERC Motivations and Transmission Coordination

Q. WHAT IS THE TRANSMISSION PLANNING COORDINATION ISSUE IN THE U.S.?

A. In the US, there are two main synchronous grids or Interconnections, the Eastern Interconnection and the Western Electric Coordinating Council (WECC) grid (Exhibit JLR-13)[40]. The Eastern Interconnection is by far the larger of the two in terms of demand and supply. TransEnergie is also an Interconnection with DC ties to the Eastern Interconnection portions of Canada and the US.[41] The distinguishing characteristics of the Eastern Interconnection include:

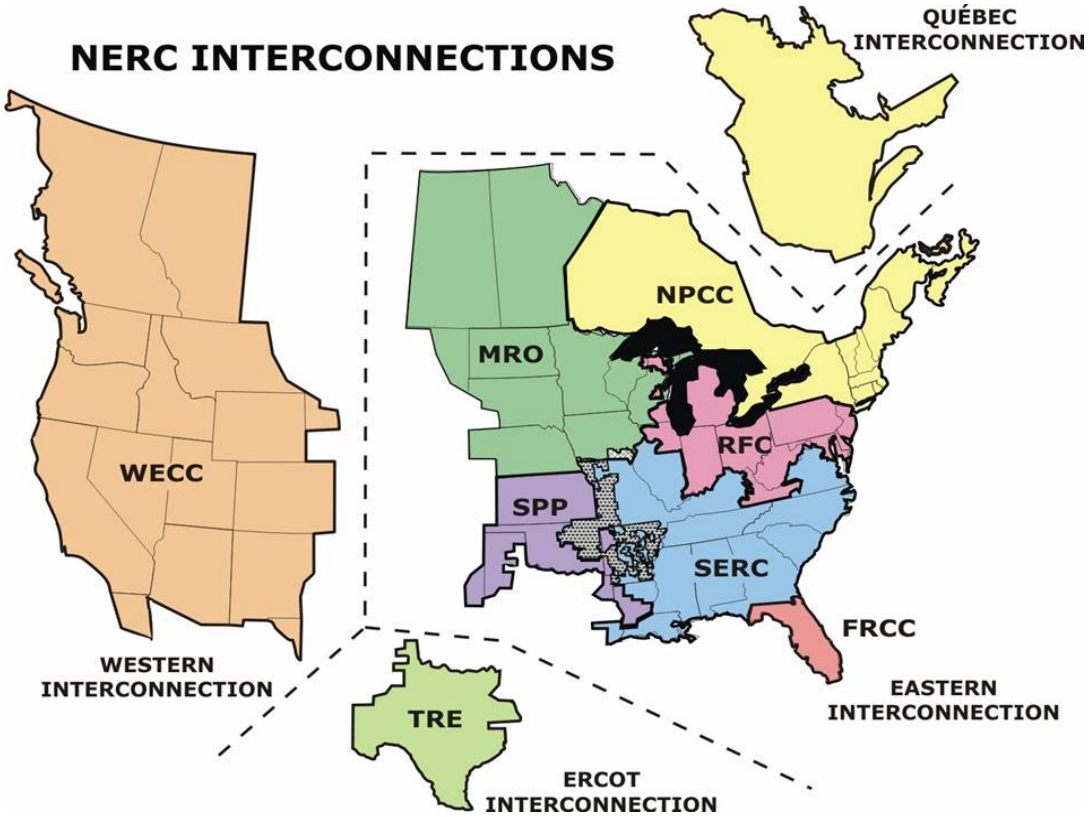
- **Size** – The Eastern Interconnection is the world's largest synchronous grid, with demand approximately 15 times greater than on the TransEnergie system. However, there is no planning or any other staff employed by this Interconnection.[42] Put another way, the world's largest Interconnection conducts no planning on its own.

- **Loop Flows** - The interactions among these transmission providers is due in part to the nature of the AC power systems within Interconnections. Power flows inadvertently between sub-sections, i.e., there are loop flows; this does not happen between Interconnections since they have DC ties that allow for power flow control. Hence, the lack of consistent and

[40] The third is ERCOT covering most of Texas.
[41] Canadian utilities in the Eastern Interconnection include Ontario, Manitoba, Saskatchewan, Nova Scotia, and New Brunswick.
[42] The EI Planning Collaborative, a new entity, has no full time staff.

coordinated Interconnection planning is of particular concern in the U.S. This emphasizes the need for coordination and increases in uniformity of planning requirements.

EXHIBIT JLR-13
The Four North American Interconnections



Source: NERC

http://www.nerc.com/fileUploads/File/AboutNERC/maps/NERC_Interconnections_color.jpg

- **Number of Transmission Providers** - It has a very large number of transmission providers; the majority of the 500 transmission owners in the U.S. are in the Eastern Interconnection. Some have become part of larger planning entities such as RTOs, but many have not. Furthermore, the U.S. has more than 3,000 utilities (see Exhibit JLR-14).

EXHIBIT JLR-14
U.S. Utilities

Utilities and Non-Utilities in the U.S.		
Type	**Number of Companies**	**Nameplate Capacity (GW)**
Utilities		
Investor Owned Utilities[1]	220	557
Rural Electric Cooperatives[1]	930	
Public Power Systems[1]	2,000	
Federal Utilities[2]	9	73
Non-Utilities		
Independent Power Producers[3]	1,034	388
Other Non-Utilities[4]	628	78
Total	**4,821**	**1,096**

[1] Source: Keeping the Lights On in a New World, January 2009. The Electric Advisory Committee.

[2] Source: Number of federal utilities from 2007 EIA Form 861. Capacity of federal utilities from Keeping the Lights on in a New World, January 2009. The Electric Advisory Committee.

[3] Source: EIA Form 906. Of the 1,045 total, there are 832 non-cogen IPPs. A total of 7,509 units of IPPs and other IPPs are reported in the Ventyx database.

[4] Source: EIA Form 906. Other Non-Utilities include industrial cogens and non-cogens, and commercial cogens and non-cogens.

- **Regulators** - Not only is there a multiplicity of transmission providers within one AC system, there is also a multiplicity of regulatory authorities since not only does FERC and NERC and regional planning entities have jurisdiction, but so do the individual states. 43 states and provinces are included in the Eastern Interconnection.

Q. WAS THIS A CONCERN IN THE PERIOD BETWEEN THE BLACKOUT OF 2003 AND THE FORMAL START OF THE 890 PROCESS?

A. Yes. For example, in the year after the 2003 blackouts, one major U.S. study concluded:

> *Transmission networks continue to be balkanized and arguments continue about how appropriate transmission investments should be identified, who bears the responsibility for making the investments, and who pays for the associated costs. FERC is*

taking responsibility for a growing share of the economic value of transmission investments while the states retain control over transmission planning and permitting for new facilities.

Along with the growth of merchant generating capacity and wholesale trade, network congestion has increased as existing transmission facilities have been used more intensively and investment in new network facilities (beyond direct interconnection facilities) has stagnated (Hirst). Transmission congestion in PJM, New York, New England California, Texas and the Midwest continues to grow.

Transmission investment has been slow to catch up (Hirst).[43]

Even more recently, one study concluded:

Often, however, there is no mechanism for approval, cost allocation, and /or selection of owners for projects that cross these seams (seams between RTOs and utility control areas).

The permitting of transmission facilities is highly fragmented by the federal government, states, and local authorities. These fragmented processes were not established to develop interstate EHV transmission lines or facilitate access to remote renewable energy resources, nor do they provide proper consideration for crossing federal lands. Currently, local, state, and federal agencies are responsible for siting and permitting transmission lines in their respective jurisdictions. The siting of EHV transmission projects often involves multiple entities with varied processes.[44]

Q. WHAT IS THE COMPARABILITY ISSUE?

A. There are two parts to the comparability issue that I want to highlight. The first is derived from the fact that there is a huge amount of unaffiliated IPPs in the U.S. In 2006, approximately 43% of U.S. generation capacity is IPP (including non-utilities)[45]. This is an extremely large amount of capacity – approximately 466

[43] Transmission Policy in the United States by Paul Joskow: October 7, 2004. Cambridge Working Papers in Economics CWPE 0454.
[44] Source: Keeping the Lights On in a New World, January 2009. The Electric Advisory Committee, Pages 48-49.
[45] Source: EIA Electric Power Annual (Form 906)

GW or more than ten times total Quebec supply[46]. There are approximately 1,662 IPP and non-utilities generators (see Exhibit JLR-14). Second, there are entities that are transmission dependent on one transmission provider – e.g., some municipal and cooperative utilities. This increases the potential number and scope of problems and complicates the regulation of transmission planning. Thus, there is more scope for transmission providers to constrain capacity and/or discriminate. It also makes case-by-case treatment more difficult and creates greater need for detailed and broadly applicable generic rules.

[46] Source: EIA Electric Power Annual (Form 906) and 57-206 Electric Power Generating Stations 2006, Canada Stats

V.5 FERC Motivations – Other Issues

Q. WHAT IS THE TRANSMISSION COST ALLOCATION ISSUE AND HOW DOES IT RELATE TO TRANSMISSION INVESTMENT AND CONGESTION?

A. The allocation of transmission costs of new projects varies widely across the U.S. In some cases, the transmission costs for upgrades and new projects are allocated to all users, e.g., based on the user's share of total load or other methods, unless it involves the interconnection of the plant to nearby grid elements. In other cases, the cost of transmission upgrades is attributed to the incremental generator (especially IPPs) that precipitates the need for that enhancement even though the need is jointly created by their request and those of existing users and benefits are available to multiple users. This can result in huge charges for transmission expansion which discourages investment. To the extent IPPs or other users are unfairly allocated upgrade costs, this could constitute discrimination and/or as noted decrease the amount of construction

Q. WHAT IS THE ECONOMIC PLANNING ISSUE AND HOW DOES IT RELATE TO TRANSMISSION INVESTMENT AND CONGESTION?

A. The economic planning issue is a requirement that transmission investment not be limited to the minimum needed for system reliability. If the system is systematically anticipating the economic need for transmission separate from individual transmission service requests, it is less likely to place all of the cost burden on the unaffiliated entity requesting service, and thus, less likely to discourage transmission investment. Again, this is an example of Attachment K

responding in part to specific U.S. problems that contribute to congestion and lack of investment.

VI. SITUATION OF TRANSENERGIE COMPARED TO TYPICAL U.S. TRANSMISSION PROVIDERS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section is to briefly make some selected comparisons between the TransEnergie system and the situation in the U.S. I note that I have not conducted a detailed review of TransEnergie planning, and hence, I am not addressing the full range differences between the TransEnergie and U.S. systems. Other TransEnergie witnesses will provide information relevant to this comparison.

There are major differences between the situation of U.S. utilities and TransEnergie, and also between TransEnergie and other Canadian transmission providers. These include:

- **Separate Interconnection** - The TransEnergie system is a separate asynchronous power grid also referred to as an Interconnection[47], one of only four major asynchronous grids in North America (the others being the Eastern Interconnection, the WECC, and the Electric Reliability Council of Texas, i.e, ERCOT). It is the only major Canadian electrical transmission system not interconnected via Alternating Current (AC) connections with U.S. utilities or other Canadian utilities. Power flows between TransEnergie and other areas in the U.S. and Canada occur via

[47] Interconnection is capitalized to distinguish it from an interconnection between two utilities within a synchronous grid.

conversion of AC power to Direct Current (DC) which is then converted back to AC, and hence, power flows are highly controlled compared to AC interconnections which frequently have inadvertent "loop flows" with other systems in the Interconnection. TransEnergie's special interface with the rest of North America decreases the need for transmission coordination, all else equal, and represents a superior element compared to U.S. conditions.

- **Interconnection Planning** – TransEnergie performs Interconnection planning. In the U.S., this planning is non-existent. There is no one at the Eastern Interconnection, and hence, no one to directly regulate. This is a key superior element to the transmission planning process.
- **Number of Key Regulators** - TransEnergie is regulated by the Quebec Régie. In the Eastern Interconnection, there are 43 states and provinces with regulatory authority over a portion of the Eastern Interconnection in addition to FERC and NERC.[48] TransEnergie is the only case of a North American Interconnection having a single transmission provider and a single key regulator. This is a superior element in planning coordination compared to U.S. conditions.
- **Number of Transmission Providers** - The TransEnergie Interconnection has only one major transmission provider. It is the only Interconnection in North America without numerous major providers. In contrast, in the neighboring Eastern Interconnection, there are hundreds of transmission

[48] NERC, the North American Electric Reliability Corporation (NERC), was recently named by FERC the U.S. Electric Reliability Organization (ERO). NERC also delegates to regional planning entities some enforcement.

owners. This is a superior element in planning coordination vis~a~vis the U.S.

- **Number of IPPs** – The TransEnergie system is approximately 4 percent of the size of the U.S. It will never have anywhere near the approximately 1,700 IPPs that the U.S. has. Furthermore, it is my understanding that the TransEnergie system has fewer IPPs and others purchasing or seeking to purchase transmission on its grid. On a percentage basis, IPPs in Quebec account for 12 percent of total capacity versus 43 percent in the U.S[49]. This facilitates regulation by the Interconnection regulator since the ratio of IPPs to lead Interconnection regulator is much smaller, all else equal, and is a superior element in transmission planning. TransEnergie witnesses have additional information on this issue.
- **Transmission Investment** - Lack of transmission investment threatens economic performance as well as reliability. I have not conducted a detailed review of transmission investment. However, I note that Quebec TransEnergie will invest $500 million per year on average to increase the transmission capacity of its system.[50] This is $26/kW of load versus $18/kW in the U.S. for average 2006 – 2010 transmission investment[51]. TransEnergie witnesses have additional information on this issue.

[49] Source: Source: Keeping the Lights On in a New World, January 2009. The Electric Advisory Committee, EIA Electric Power Annual (Form 906) and 57-206 Electric Power Generating Stations 2006, Canada Stats

[50] Source: Quebec Strategic Plan 2006-2010 – Adjusted Version September, 2006

[51] Source: Quebec Strategic Plan 2006 – 2010 and Transforming America's Power Industry: The Investment Challenge 2010-2030, November 2008, The Brattle Group, from Edison Electric Institute, Business Information Group and NERC ES&D. Note, no adjustment was made for difference in exchange rates.

- **Transmission Congestion** – I have not conducted a detailed review of transmission congestion in Quebec. Studies I have reviewed have not identified TransEnergie as having major internal congestion compared to the U.S. TransEnergie witnesses have additional information on this issue.

VII. CONCLUSIONS

Q. WHAT ARE YOUR CONCLUSIONS?

A. TransEnergie is not required to file Attachment K under Order 890 at the U.S. FERC. TransEnergie can have a planning process tailored to its unique conditions, many of which are superior in terms of meeting the goals of Attachment K compared to U.S. utilities. Key elements of superiority include: (1) already having planning on the Interconnection level, (2) a single lead regulator, (3) a single major transmission provider, (4) no AC interconnections, and hence, no loop flows, (5) a smaller system to regulate, and (6) higher $/kW of load of investment in transmission. Testimony provided by Dr. Sinclair, Mr. Marshall and Mr. Raphals is inadequate in describing the motivation for Attachment K and the extent to which some aspects of the TransEnergie situation are already better suited to meeting Attachment K goals compared to U.S. conditions.

ROSE SCHEDULE A

JUDAH L. ROSE

EDUCATION

1982 M.P.P., John F. Kennedy School of Government, **Harvard University**

1979 S.B., Economics, **Massachusetts Institute of Technology**

EXPERIENCE

Judah L. Rose joined ICF in 1982 and currently serves as a Managing Director of ICF International. Mr. Rose has more than 27 years of experience in the energy industry, with emphasis on electric power, generation and transmission. Mr. Rose directs ICF International's wholesale power Line of Business (including assistance to electric utilities, financial institutions, law firms, government agencies, fuel companies, and IPPs). Mr. Rose is one of ICF's Distinguished Consultants, an honorary title given to three of ICF's 3,000 employees, and has served on the Board of Directors of ICF International as the Management Shareholder Representative. Mr. Rose co-manages ICF's IPM© (Integrated Power Model). Mr. Rose has supported the financing of tens of billion dollars of new and existing power plants and is a frequent counselor to the financial community on power issues. Mr. Rose has also served as lead negotiator, power plant appraiser, and he frequently provides expert testimony and litigation support in power-related court cases. Mr. Rose received a M.P.P. from the John F. Kennedy School of Government, Harvard University, and an S.B. in Economics from the Massachusetts Institute of Technology.

Mr. Rose has publicly testified in scores of state and other legal proceedings, addressed approximately 100 major energy conferences, authored numerous articles published in Public Utilities Fortnightly, the Electricity Journal, Project Finance International, and written numerous company studies on power, coal, and gas related issues, and managed large consulting projects. Mr. Rose has also appeared in TV interviews. Details are provided below.

PRESS INTERVIEWS

TV: "The Most With Allison Stewart," MSNBC, "Blackouts in NY and St. Louis & ongoing Energy Challenges in the Nation," July 25, 2006
CNBC Wake-Up Call, August 15, 2003
Wall Street Journal Report, July 25, 1999
Back to Business, CNBC, September 7, 1999

Journals: Electricity Journal
Energy Buyer Magazine
Public Utilities Fortnightly
Power Markets Week

Magazine: Business Week
Power Economics
Costco Connection

Newspapers: Denver Post
Rocky Mountain News

Financial Times Energy
LA Times
Arkansas Democratic Gazette
Galveston Daily News
The Times-Picayune
Pittsburgh Post-Gazette
Power Markets Week

Wires: Bridge News
Associated Press
Dow Jones Newswires

TESTIMONY

Surrebuttal Testimony – Revenue Requirement of Judah Rose on Behalf of Dogwood Energy, LLC, before the Missouri Public Service Commission, In the Matter of the Application of KCP&L GMO, Inc. d/b/a KCP&L Greater Missouri Operations Company for Approval to Make Certain Changes to its Charges for Electric Service, Case No. ER-2009-0090, April 9, 2009.

Hawaii Structural Ironworkers Pension Trust Fund v. Calpine Corporation, Case No. 1-04-CV-021465, Assessment of Calpine's April 2002 Earnings Projections, March 25, 2009.

Coal Price Report for Harrison Coal Plant, February 6, 2009. Allegheny Energy Supply Company, LLS and Monongahela Power Company versus Wolf Run Mining Company, Anker Coal Group, etc., Civil Action. No. GD-06-30514, In the Court of Common Pleas, Allegheny County, Pennsylvania.

Supplemental Direct Testimony of Judah Rose, on behalf of Southwestern Electric Power Company, In the Matter of the Application of Southwestern Electric Power Company for Authority to Construct a Natural-Gas Fired Combined Cycle Intermediate Generating Facility in the State of Louisiana, Docket No. 06-120-U, December 9, 2008.

Rebuttal Testimony of Judah Rose on behalf of Kelson Transmission Company, LLC re: Application of Kelson Transmission Company, LLC For A Certificate of Convenience and Necessity For the Amended Proposed Canal To Deweyville 345 kV Transmission Line Within Chambers, Hardin, Jasper, Jefferson, Liberty, Newton, And Orange Counties, SOAH Docket No. 473-08-3341, PUCT Docket No. 34611, October 27, 2008.

Testimony of Judah Rose, on behalf of Redbud Energy, LP, in Support of Joint Stipulation and Settlement Agreement, In the Matter of the Application of Oklahoma Gas and Electric Company for an Order of the Commission Granting Pre-Approval of the Purchase of the Redbud Generating Facility and Authorizing a Recovery Rider, Cause No. PUD 200800086, September 3, 2008.

Direct Testimony of Judah L. Rose on behalf of Duke Energy Carolinas, In the Matter of Advance Notice by Duke Energy Carolinas, LLC, of its Intent to Grant Native Load Priority to the City of Orangeburg, South Carolina, and Petition of Duke Energy Carolinas, LLC and City of Orangeburg, South Carolina for Declaratory Ruling With Respect to Rate Treatment of Wholesale Sales of Electric Power at Native Load Priority, Docket No. E-7, SUB 858, August 15, 2008.

Affidavit filed on behalf of Public Service of New Mexico pertaining to the Fuel Costs of Southwest Public Service for Cost-of-Service and Market-Based Customers, August 11, 2008.

Direct Testimony of Judah L. Rose on behalf of Duke Energy Ohio, Inc., Before the Public Utilities Commission of Ohio, In the Matter of the Application of Duke Energy Ohio, Inc. for Approval of an Electric Security Plan, July 31, 2008.

Rebuttal Testimony, Judah L. Rose on Behalf of Duke Energy Carolinas, in re: Application of Duke Energy Carolinas, LLC for Approval of Save-A-Watt Approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, Docket No. E-7, Sub 831, July 21, 2008.

Updated Analysis of SWEPCO Capacity Expansion Options as Requested by Public Utility Commission of Texas, on behalf of SWEPCO, June 27, 2008.

Direct Testimony of Judah L. Rose on Behalf of Nevada Power/Sierra Pacific Electric Power Company, Docket No. 1, Public Utilities Commission of Nevada, Application of Nevada Power/Sierra Pacific for Certificate of Convenience and Necessity Authorization for a Gas-Fired Power Plant in Nevada, May 16, 2008.

Rebuttal Testimony of Judah L. Rose on Behalf of the Advanced Power, Commonwealth of Massachusetts, Before the Energy Facilities Siting Board, Petition of Brockton Power Company, LLC, EFSB 07-7, D.P.U. 07-58 & 07-59, May 16, 2008.

Supplemental Rebuttal Testimony on Commissioner's Issues of Judah L. Rose for Southwestern Electric Power Company, on behalf of Southwestern Electric Power Company, PUC Docket No. 33891, Public Utilities Commission of Texas, May 2008.

Supplemental Direct Testimony on Commissioners' Issues of Judah Rose for Southwestern Electric Power Company, for the Application of Southwestern Electric Power Company for Certificate of Convenience and Necessity Authorization for a Coal-Fired Power Plant in Arkansas, SOAH Docket No. 473-07-1929, PUC Docket No. 33891, Public Utility Commission of Texas, April 22, 2008.

Rebuttal Testimony of Judah Rose, In the Matter of the Application of Tucson Electric Power Company for the Establishment of Just and Reasonable Rates and Charges Designed to Realize A Reasonable Rate of Return on the Fair Value of Its Operations Throughout the State of Arizona, Estimation of Market Value of Fleet of Utility Coal Plants, April 1, 2008.

Rebuttal Report of Judah Rose, Ohio Power Company and AEP Power Marketing Inc. vs. Tractebel Energy Marketing, Inc. and Tractebel S.A. Case No. 03 CIV 6770, 03 CIV 6731 (S.D.N.Y.), January 28, 2008

Proposed New Gas-Fired Plant, on behalf of AEP SWEPCO, 2007

Rebuttal Report, Calpine Cash Flows, on behalf of Unsecured Creditor's Committee, November 21, 2007.

Expert Report. Calpine Cash Flows, on behalf of Unsecured Creditor's Committee, November 19, 2007.

Application of Duke Energy Carolina, LLC for Approval of Energy Efficiency Plan Including an Energy Efficiency Rider and Portfolio of Energy, Docket No. 2007-358-E, Public Service Commission of South Carolina, December 10, 2007.

Independent Transmission, Cause No. PUD200700298, Application of ITC, Public Service of Oklahoma, December 7, 2007.

Verified Petition of Duke Energy Indiana, Inc. Requesting the Indiana Utility Regulatory Commission to Approve an Alternative Regulatory Plan Pursuant to Ind. Code š8-1-2.5-1, et. Seq. for the Offering of Energy Efficiency Conservation, Demand Response, and Demand-Side Management Programs and Associated Rate Treatment Including Incentives Pursuant to a Revised Standard Contract Rider No. 66 in Accordance With Ind. Code šš8-1-2.5-1 et seq. and 8-1-2-42(a); Authority to Defer Program Costs Associated with its Energy Efficiency Portfolio of Programs; Authority to Implement New and Enhanced Energy Efficiency Programs, Including the PowerShare® Program in its Energy Efficiency Portfolio of Programs; and Approval of a Modification of the Fuel Adjustment Cause Earnings and Expense Tests, Indiana Utility Regulatory Commission, Cause No. 43374, October 19, 2007.

Rebuttal Testimony, Docket No. U-30192, Application of Entergy Louisiana, LLC For Approval to Repower the Little Gypsy Unit 3 Electric Generating Facility and for Authority to Commence Construction and for Certain Cost Protection and Cost Recovery, October 4, 2007

Direct Testimony of Judah Rose on Behalf of Tucson Electric Power Company, In the matter of the Application of Tucson Electric Power Company for the Establishment of Just and Reasonable Rates and Charges Designed to Realize a Reasonable Rate of Return on the Fair Value of Its Operations Throughout the State of Arizona, Estimation of Market Value of Fleet of Utility Coal Plants, July 2, 2007.

Portfolio of New Plants, Testimony on behalf of AEP: SWEPCo, before the Arkansas Public Service Commission, In the Matter of Application of SWEPCO for a Certificate of Environmental Compatibility and Public Need for the Construction, Ownership, Operation, and Maintenance of a Coal-Fired Base Load Generating Facility in the Hempstead County, Arkansas, dated June 2007.

Rebuttal Testimony, Causes No. PUD 200500516, 200600030, and 20070001 Consolidated, on behalf of Redbud Energy, before the Corporation Commission of the State of Oklahoma, June 2007.

IGCC Coal Plant, CPCN Rebuttal Testimony on behalf of Duke Energy Indiana, Cause No. 43114 before the Indiana Utility Regulatory Commission, May 2007.

Responsive Testimony, Causes No. PUD 200500516, 200600030, and 200700012 Consolidated, on behalf of Redbud Energy, before the Corporation Commission of the State of Oklahoma, May 2007.

Rebuttal Testimony, FPL – CO_2 Emissions and the Everglades Coal-Fired Power Plant, Docket No. 070098-EL, March 2007

Rebuttal Testimony, Electric Utility Power Hedging, on behalf of Duke Energy Indiana, Cause No. 38707-FAC6851, May 2007.

Direct Testimony for Southwestern Electric Power Company, Before the Louisiana Public Service Commission, Docket No. U-29702, in re: Application of Southwestern Electric Power Company for the Certification of Contracts for the Purchase of Capacity for 2007, 2008, and 2009 and to Purchase, Operate, Own, and Install Peaking, Intermediate and Base Load Coal-Fired Generating Facilities in Accordance with the Commission's General Order Dated September 20, 1983. Consolidated with Docket No. U-28766 Sub Docket B in re: Application of Southwestern Electric Power Company for Certification of Contracts for the Purchase of Capacity in Accordance with the Commission's 'General Order of September 20, 1983, February 2007.

Second Supplemental Testimony on Behalf of Duke Energy Ohio Before the Public Utility Commission of Ohio, Case No. 03-93-EL-ATA, 03-2079, EL-AAM, 03-2081, EL-AAM, 03-2080, EL-ATA, February 28, 2007.

Electric Utility Power Hedging, on behalf of Duke Energy Indiana, Cause No. 38707-FAC6851, February 2007.

CPCN for Cliffside Coal-Fired Plant, on behalf of Duke Carolinas, Docket No. E7, SUB790, December 2006.

Expert Report, Chapter 11, Case No. 01-16034 (AJG) and Adv. Proc. No. 04-2933 (AJG), November 6, 2006.

IGCC Coal Plant, Testimony on behalf of Duke Energy Indiana, Cause No. 43114, October 2006.

Market Power and the PSEG Exelon Merger on Behalf of the NJBPU Staff, NJBPU, BPU Docket No. EM05020106, OAL Docket No. PUC-1874-05, Supplemental Testimony March 20, 2006.

Market Power and the PSEG Exelon Merger on Behalf of the NJBPU Staff, NJBPU, BPU Docket No. EM05020106, OAL Docket No. PUC-1874-05, Surrebuttal Testimony December 27, 2005.

Market Power and the PSEG Exelon Merger on Behalf of the NJBPU Staff, NJBPU, BPU Docket No. EM05020106, OAL Docket No. PUC-1874-05, November 14, 2005.

Brazilian Power Purchase Agreement, confidential international arbitration, October 2005.

Cost of Service and Fuel Clause Issues, Rebuttal Testimony on behalf of Public Service of New Mexico, Docket No. EL05-151, November 2005.

Cost of Service and Peak Demand, FERC, Testimony on behalf of Public Service of New Mexico, September 19, 2005, Docket No. EL05-19.

Cost of Service and Fuel Clause Issues, Testimony on behalf of Public Service of New Mexico, FERC Docket No. EL05-151-000, September 15, 2005.

Cost of Service and Peak Demand, FERC, Responsive Testimony on behalf of Public Service of New Mexico, August 23, 2005, Docket No. EL05-19.

Prudence of Acquisition of Power Plant, Testimony on behalf of Redbud, September 12, 2005, No. PUD 200500151.

Proposed Fuel Cost Adjustment Clause, FERC, Docket Nos. EL05-19-002 and ER05-168-001 (Consolidated), August 22, 2005.

Market Power and the PSEG Exelon Merger on Behalf of the NJBPU, FERC, Docket EC05-43-000, May 27, 2005.

New Air Emission Regulations and Investment in Coal Power Plants, rebuttal testimony on behalf of PSI, April 18, 2005, Causes 42622 and 42718.

Rebuttal Report: Damages due to Rejection of Tolling Agreement Including Discounting, February 9, 2005, CONFIDENTIAL.

New Air Emission Regulations and Investment in Coal Power Plants, supplemental testimony on behalf of PSI, January 21, 2005, Causes 42622 and 42718.

Damages Due to Rejection of Tolling Agreement Including Discounting, January 10, 2005, CONFIDENTIAL.

Discount rates that should be used in estimating the damages to GTN of Mirant's bankruptcy and subsequent abrogation of the gas transportation agreements Mirant had entered into with GTN, December 15, 2004. CONFIDENTIAL

New Air Emission Regulations and Investment in Coal Power Plants, testimony on behalf of PSI, November 2004, Causes 42622 and 42718.

Rebuttal Testimony of Judah Rose on behalf of PSI, "Certificate of Purchase as of yet Undetermined Generation Facility" Cause No. 42469, August 23, 2004.

Rebuttal Testimony of Judah Rose on behalf of the Hopi Tribe, Case No. A.02-05-046, Mohave Coal Plant Economics, June 4, 2004.

Supplemental Testimony "Retail Generation Rates, Cost Recovery Associated with the Midwest Independent Transmission System Operator, Accounting Procedures for Transmission and Distribution System, Case No. 03-93-EL-ATA, 03-2079, EL-AAM, 03-2081, EL-AAM, 03-2080, EL-ATA for Cincinnati Gas & Electric, May 20, 2004.

"Application of Southern California Edison Company (U338-E) Regarding the Future Disposition of the Mohave Coal-Fired Generating Station," May 14, 2004.

"Appropriate Rate of Return on Equity (ROE) TransAlta Should be Authorized For its Capital Investment Related to VAR Support From the Centralia Coal-Fired Power Plant", for TransAlta, April 30, 2004, FERC Docket No. ER04-810-000.

"Retail Generation Rates, Cost Recovery Associated with the Midwest Independent Transmission System Operator, Accounting Procedures for Transmission and Distribution System, Case No. 03-93-EL-ATA, 03-2079, EL-AAM, 03-2081, EL-AAM, 03-2080, EL-ATA for Cincinnati Gas & Electric, April 15, 2004.

"Valuation of Selected MIRMA Coal Plants, Acceptance and Rejection of Leases and Potential Prejudice to Leasors" Federal Bankruptcy Court, Dallas, TX, March 24, 2004 CONFIDENTIAL.

"Certificate of Purchase as of yet Undetermined Generation Facility", Cause No. 42469 for PSI, March 23, 2004.

"Ohio Edison's Sammis Power Plant BACT Remedy Case", In the United States District Court of Ohio, Southern Division, March 8, 2004.

"Valuation of Power Contract," January 2004, confidential arbitration.

"In the matter of the Application of the Union Light Heat & Power Company for a Certificate of Public Convenience and Necessity to Acquire Certain Generation Resources, etc.", before the Kentucky Public Service Commission, Coal-Fired and Gas-Fired Market Values, July 21, 2003.

"In the Supreme Court of British Columbia", July 8, 2003. CONFIDENTIAL

"The Future of the Mohave Coal-Fired Power Plant – Rebuttal Testimony", California P.U.C., May 20, 2003.

"Affidavit in Support of the Debtors' Motion", NRG Bankruptcy, Revenues of a Fleet of Plants, May 14, 2003. CONFIDENTIAL

"IPP Power Purchase Agreement," confidential arbitration, April 2003.

"The Future of the Mohave Coal-Fired Power Plant", California P.U.C., March 2003.

"Power Supply in the Pacific Northwest," contract arbitration, December 5, 2002. CONFIDENTIAL

"Power Purchase Agreement Valuation", Confidential Arbitration, October 2002.

"Cause No. 42145 - In support of PSI's petition for authority to acquire the Madison and Henry County plants, rebuttal testimony on behalf of PSI. Filed on 8/23/02."

"Cause No. 42200 - in support of PSI's petition for authority to recover through retail rates on a timely basis. Filed on 7/30/02."

"Cause No. 42196 - in support of PSI's petition for interim purchased power contract. Filed on 4/26/02."

"Cause No. 42145 - In support of PSI's petition for authority to acquire the Madison and Henry County plants. Filed on 3/1/2002."

"Analysis of an IGCC Coal Power Plant", Minnesota state senate committees, January 22, 2002

"Analysis of an IGCC Coal Power Plant", Minnesota state house of representative committees, January 15, 2002

"Interim Pricing Report on New York State's Independent System Operator", New York State Public Service Commission (NYSPSC), January 5, 2001

"The need for new capacity in Indiana and the IRP process", Indiana Utility Regulatory Commission, October 26, 2000

"Damage estimates for power curtailment for a Cogen power plant in Nevada", August 2000. CONFIDENTIAL

"Valuation of a power plant in Arizona", arbitration, July 2000. CONFIDENTIAL

Application of FirstEnergy Corporation for approval of an electric Transition Plan and for authorization to recover transition revenues, Stranded Cost and Market Value of a Fleet of Coal, Nuclear, and Other Plants, Before PUCO, Case No. 99-1212-EL-ETP, October 4, 1999 and April 2000.

"Issues Related to Acquisition of an Oil/Gas Steam Power plant in New York", September 1999 Affidavit to Hennepin County District Court, Minnesota

"Wholesale Power Prices, A Cost Plus All Requirements Contract and Damages", Cajun Bankruptcy, July 1999. Testimony to U.S. Bankruptcy Court.

"Power Prices." Testimony in confidential contract arbitration, July 1998.

"Horizontal Market Power in Generation." Testimony to New Jersey Board of Public Utilities, May 22, 1998.

"Basic Generation Services and Determining Market Prices." Testimony to the New Jersey Board of Public Utilities, May 12, 1998.

"Generation Reliability." Testimony to New Jersey Board of Public Utilities, May 4, 1998.

"Future Rate Paths and Financial Feasibility of Project Financing." Cajun Bankruptcy, Testimony to U.S. Bankruptcy Court, April 1998.

"Stranded Costs of PSE&G." Market Valuation of a Fleet of Coal, Nuclear, Gas, and Oil-Fired Power Plants, Testimony to New Jersey Board of Public Utilities, February 1998.

"Application of PECO Energy Company for Approval of its Restructuring Plan Under Section 2806 of the Public Utility Code." Market Value of Fleet of Nuclear, Coal, Gas, and Oil Power Plants, Rebuttal Testimony filed July 1997.

"Future Wholesale Electricity Prices, Fuel Markets, Coal Transportation and the Cajun Bankruptcy." Testimony to Louisiana Public Service Commission, December 1996.

"Curtailment of the Saguaro QF, Power Contracting and Southwest Power Markets." Testimony on a contract arbitration, Las Vegas, Nevada, June 1996.

"Future Rate Paths and the Cajun Bankruptcy." Testimony to the U.S. Bankruptcy Court, June 1997.

"Fuel Prices and Coal Transportation." Testimony to the U.S. Bankruptcy Court, June 1997.

"Demand for Gas Pipeline Capacity in Florida from Electric Utilities." Testimony to Florida Public Service Commission, May 1993.

"The Case for Fuel Flexibility in the Florida Electric Generation Industry." Testimony to the Florida Department of Environmental Regulation (DER), Hearings on Fuel Diversity and Environmental Protection, December 1992.

SELECTED SPEAKING ENGAGEMENTS

Rose, J.L., ICF's New York City Energy Forum, - Market Recovery in Merchant Generation Assets, June 10, 2008.

Rose, J.L., Southeastern Electric Exchange – Integrated Resource Planning Task Force Meeting, Carbon Tax Outlook Discussion, February 21-22, 2008.

Rose, J.L., AESP, NEEC Conference, Rising Prices and Failing Infrastructure: A Bleak or Optimistic Future, Marlborough, MA, October 23, 2006.

Rose, J.L., Infocast Gas Storage Conference, "Estimating the Growth Potential for Gas-Fired Electric Generation," Houston, TX, March 22, 2006.

Rose, J.L., "Power Market Trends Impacting the Value of Power Assets," Infocast Conference, Powering Up for a New Era of Power Generation M&A, February 23, 2006.

Rose, J.L., "The Challenge Posed by Rising Fuel and Power Costs", Lehman Brothers, November 2, 2005.

Rose, J.L., "Modeling the Vulnerability of the Power Sector", EUCI – Securing the Nation's Energy Infrastructure, September 19, 2005

Rose, J.L., "Fuel Diversity in the Northeast, Energy Bar Association, Northeast Chapter Meeting, New York, NY, June 9, 2005.

Rose, J.L., "2005 Macquarie Utility Sector Conference", Macquarie Utility Sector Conference, Vail, CO, February 28, 2005.

Rose, J.L., "The Outlook for North American Natural Gas and Power Markets", The Institute for Energy Law, Program on Oil and Gas Law, Houston, TX, February 18, 2005.

Rose, J.L. "Assessing the Salability of Merchant Assets – What's on the Horizon?", Infocast – The Market for Power Assets, Phoenix, AZ, February 10, 2005.

Rose, J.L. "Market Based Approaches to Transmission – Longer-Term Role", National Group of Municipal Bond Investors, New York, NY, December 10, 2004.

Rose, J.L. "Supply & Demand Fundamentals – What is Short-Term Outlook and the Long-Term Demand? Platt's Power Marketing Conference, Houston, TX, October 11, 2004.

Rose, J.L. "Assessing the Salability of Merchant Assets – When Will We Hit Bottom?, Infocast's Buying, Selling, and Investing in Energy Assets Conference, Houston, TX, June 24, 2004.

Rose, J. L. "After the Blackout – Questions That Every Regulator Should be Asking," NARUC Webinar Conference, Fairfax, VA, November 6, 2003.

Rose, J. L., "Supply and Demand in U.S. Wholesale Power Markets," Lehman Brothers Global Credit Conference, New York, NY, November 5, 2003.

Rose, J.L., "Assessing the Salability of Merchant Assets – When Will We Hit Bottom?", Infocast's Opportunities in Energy Asset Acquisition, San Francisco, CA, October 9, 2003.

Rose, J.L., "Asset Valuation in Today's Market", Infocast's Project Finance Tutorial, New York, NY, October 8, 2003.

Rose, J.L., "Forensic Evaluation of Problem Projects", Infocast's Project Finance Workouts: Dealing With Distressed Energy Projects, September 17, 2003.

Rose, J.L., National Management Emergency Association, Seattle, WA, September 8, 2003.

Rose, J.L., "Assessing the Salability of Merchant Assets – When Will We Hit Bottom?", Infocast's Buying, Selling & Investing in Energy Assets, Chicago, IL, July 24, 2003.

Rose, J.L., CSFB Leveraged Finance Independent Power Producers and Utilities Conference, New York, NY, "Spark Spread Outlook", July 17, 2003.

Rose, J.L., Multi-Housing Laundry Association, Washington, D. C., "Trends in U.S. Energy and Economy", June 24, 2003.

Rose, J.L., "Power Markets: Prices, SMD, Transmission Access, and Trading", Bechtel Management Seminar, Frederick, MD, June 10, 2003.

Rose, J.L., Platt's Global Power Market Conference, New Orleans, LA, "The Outlook for Recovery," March 31, 2003.

Rose, J.L., "Electricity Transmission and Grid Security", Energy Security Conference, Crystal City, VA, March 25, 2003.

Rose, J.L., "Assessing the Salability of Merchant Assets – When Will We Hit Bottom?, Infocast's Buying, Selling & Investing in Energy Assets, New York City, February 27, 2003.

Rose, J.L., Panel Discussion, "Forensic Evaluation of Problem Projects", Infocast Conference, NY, February 24, 2003.

Rose, J.L., PSEG Off-Site Meeting Panel Discussion, February 6, 2003 (April 13, 2003).

Rose, J.L., "The Merchant Power Market—Where Do We Go From Here?" Center for Business Intelligence's Financing U.S. Power Projects, November 18-19, 2002.

Rose, J.L., "Assessing U.S. Regional And The Potential for Additional Coal-Fired Generation in Each Region," Infocast's Building New Coal-Fired Generation Conference, October 8, 2002.

Rose, J.L., "Predicting the Price of Power for Asset Valuation in the Merchant Power Financings, "Infocast's Product Structuring in the Real World Conference, September 25, 2002.

Rose, J.L., "PJM Price Outlook," Platt's Annual PJM Regional Conference, September 24, 2002.

Rose, J.L., “Why Investors Are Zeroing in on Upgrading Our Antiquated Power Grid Rather Than Exotic & Complicated Technologies,” New York Venture Group’s Investing in the Power Industry—Targeting The Newest Trends Conference, July 31, 2002.

Rose, J.L., Panel Participant in the Salomon Smith Barney Power and Energy Merchant Conference 2002, May 15, 2002.

Rose, J.L., “Locational Market Price (LMP) Forecasting in Plant Financing Decisions,” Structured Finance Institute, April 8-9, 2002.

Rose, J.L., “PJM Transmission and Generation Forecast”, Financial Times Energy Conference, November 6, 2001.

Rose, J.L., “U.S. Power Sector Trends”, Credit Suisse First Boston’s Power Generation Supply Chain Conference, Web Presented Conference, September 12, 2002.

Rose, J.L., “Dealing with Inter-Regional Power Transmission Issues”, Infocast’s Ohio Power Game Conference, September 6, 2001

Rose, J.L., “Where’s the Next California”, Credit Suisse First Boston’s Global Project Finance Capital Markets Conference, New York NY, June 27 2001

Rose, J.L, “U.S. Energy Issues: What MLA Members Need to Know,” Multi-housing Laundry Association, Boca Raton Florida, June 25, 2001

Rose, J.L., “How the California Meltdown Affects Power Development”, Infocast’s Power Development and Finance Conference 2001, Washington D.C., June 12, 2001

Rose, J.L., “Forecasting 2001 Electricity Prices” presentation and workshop, What to Expect in western Power Markets this Summer 2001 Conference, Denver, Colorado, May 2, 2001

Rose, J.L., “Power Crisis in the West” Generation Panel Presentation, San Diego, California, February 12, 2001

Rose, J.L., “An Analysis of the Causes leading to the Summer Price Spikes of 1999 & 2000” Conference Chair, Infocast Managing Summer Price Volatility, Houston, Texas, January 30, 2001.

Rose, J. L., “An Analysis of the Power Markets, summer 2000” Generation Panel Presentation, Financial Times Power Mart 2000 conference, Houston, Texas, October 18, 2000

Rose, J.L., “An Analysis of the Merchant Power Market, Summer 2000” presentation, Conference Chair, Merchant Power Finance Conference, Atlanta, Georgia, September 11 to 15, 2000

Rose, J.L., “Understanding Capacity Value and Pricing Firmness” presentation, Conference Chair, Merchant Plant Development and Finance Conference, Houston, Texas, March 30, 2000.

Rose, J.L., “Implementing NYPP’s Congestion Pricing and Transmission Congestion Contract (TCC)”, Infocast Congestion Pricing and Forecasting Conference, Washington D.C., November 19, 1999.

Rose, J.L., “Understanding Generation” Pre-Conference Workshop, Powermart, Houston, Texas, October 26-28, 1999.

Rose, J.L., “Understanding Capacity Value and Pricing Firmness” presentation, Conference Chair Merchant Plant Development and Finance Conference, Houston, Texas, September 29, 1999.

Rose, J.L., “Comparative Market Outlook for Merchant Assets” presentation, Merchant Power Conference, New York, New York, September 24, 1999.

Rose, J.L., “Transmission, Congestion, and Capacity Pricing” presentation, Transmission The Future of Electric Transmission Conference, Washington, DC, September 13, 1999.

Rose, J.L., “Effects of Market Power on Power Prices in Competitive Energy Markets” Keynote Address, The Impact of Market Power in Competitive Energy Markets Conference, Washington, DC, July 14, 1999.

Rose, J.L., “Peak Price Volatility in ECAR and the Midwest, Futures Contracts: Liquidity, Arbitrage Opportunity” presentation at ECAR Power Markets Conference, Columbus, Ohio, June 9, 1999.

Rose, J.L., “Transmission Solutions to Market Power” presentation, Do Companies in the Energy Industry Have Too Much Market Power? Conference, Washington, DC, May 24, 1999.

Rose, J.L., “Repowering Existing Power Plants and Its Impact on Market Prices” presentation, Exploiting the Full Energy Value-Chain Conference, Chicago, Illinois, May 17, 1999.

Rose, J.L., “Transmission and Retail Issues in the Electric Industry” Session Speaker, Gas Mart/Power 99 Conference, Dallas, Texas, May 10, 1999.

Rose, J.L., “Peak Price Volatility in the Rockies and Southwest” presentation at Repowering the Rockies and the Southwest Conference, Denver, Colorado, May 5, 1999.

Rose, J.L., “Understanding Generation” presentation and Program Chairman at Buying & Selling Power Assets: The Great Generation Sell-Off Conference, Houston, Texas, April 20, 1999.

Rose, J.L., “Buying Generation Assets in PJM” presentation at Mid-Atlantic Power Summit, Philadelphia, Pennsylvania, April 12, 1999.

Rose, J.L., “Evaluating Your Generation Options in Situations With Insufficient Transmission,” presentation at Congestion Management conference, Washington, D.C., March 25, 1999.

Rose, J.L., “Will Capacity Prices Drive Future Power Prices?” presentation at Merchant Plant Development conference, Chicago, Illinois, March 23, 1999.

Rose, J.L., “Capacity Value – Pricing Firmness,” presentation at Market Price Forecasting conference, Atlanta, Georgia, February 25, 1999

Rose, J.L., “Developing Reasonable Expectations About Financing New Merchant Plants That Have Less Competitive Advantage Than Current Projects,” presentation at Project Finance International’s Financing Power Projects in the USA conference, New York, New York, February 11, 1999.

Rose, J.L., “Transmission and Capacity Pricing and Constraints,” presentation at Power Fair 99, Houston, Texas, February 4, 1999.

Rose, J.L., “Peak Price Volatility: Comparing ERCOT With Other Regions,” presentation at Megawatt Daily’s Trading Power in ERCOT conference, Houston, Texas, January 13, 1999.

Rose, J.L., “The Outlook for Midwest Power Markets,” presentation to The Institute for Regulatory Policy Studies at Illinois State University, Springfield, Illinois, November 19, 1998.

Rose, J.L., “Developing Pricing Strategies for Generation Assets,” presentation at Wholesale Power in the West conference, Las Vegas, Nevada, November 12, 1998.

Rose, J.L., “Understanding Electricity Generation and Deregulated Wholesale Power Prices,” a full-day pre-conference workshop at Power Mart 98, Houston, Texas, October 26, 1998.

Rose, J.L., “The Impact of Power Generation Upgrades, Merchant Plant Developments, New Transmission Projects and Upgrades on Power Prices,” presentation at Profiting in the New York Power Market conference, New York, NY, October 22, 1998.

Rose, J.L., “Capacity Value – Pricing Firmness,” presentation to Edison Electric Institute Economics Committee, Charlotte, NC, October 8, 1998.

Rose, J.L., “Locational Marginal Pricing and Futures Trading,” presentation at Megawatt Daily’s Electricity Regulation conference, Washington, D.C., October 7, 1998.

Rose, J.L., Chairman’s opening speech and “The Move Toward a Decentralized Approach: How Will Nodal Pricing Impact Power Markets?” at Congestion Pricing and Tariffs conference, Washington, D.C., September 25, 1998.

Rose, J.L., “The Generation Market in MAPP/MAIN: An Overview,” presentation at Megawatt Daily’s MAIN/MAPP – The New Dynamics conference, Minneapolis, Minnesota, September 16, 1998.

Rose, J.L., “Capacity Value – Pricing Firmness,” presentation at Market Price Forecasting conference, Baltimore, Maryland, August 24, 1998.

Rose, J.L., “ICF Kaiser’s Wholesale Power Market Model,” presentation at Market Price Forecasting conference, New York, New York, August 6, 1998.

Rose, J.L., Campbell, R., Kathan, David, “Valuing Assets and Companies in M&A Transactions,” full-day workshop at Utility Mergers & Acquisitions conference, Washington, D.C., July 15, 1998.

Rose, J.L., “Must-Run Nuclear Generation’s Impact on Price Forecasting and Operations,” presentation at The Energy Institute’s conference entitled “Buying and Selling Electricity in the Wholesale Power Market,” Las Vegas, Nevada, June 25, 1998.

Rose, J.L., “The Generation Market in PJM,” presentation at Megawatt Daily’s PJM Power Markets conference, Philadelphia, Pennsylvania, June 17, 1998.

Rose, J.L., “Market Evaluation of Electric Generating Assets in the Northeast,” presentation at McGraw-Hill’s conference: Electric Asset Sales in the Northeast, Boston, Massachusetts, June 15, 1998.

Rose, J.L., “Overview of SERC Power,” opening speech presented at Megawatt Daily’s SERC Power Markets conference, Atlanta, Georgia, May 20, 1998.

Rose, J.L., “Future Price Forecasting,” presentation at The Southeast Energy Buyers Summit, Atlanta, Georgia, May 7, 1998.

Rose, J.L., “Practical Risk Management in the Power Industry,” presentation at Power Fair, Toronto, Canada, April 16, 1998.

Rose, J.L., “The Wholesale Power Market in ERCOT: Transmission Issues,” presentation at Megawatt Daily’s ERCOT Power Markets conference, Houston, Texas, April 1, 1998.

Rose, J.L., “New Generation Projects and Merchant Capacity Coming On-Line,” presentation at Northeast Wholesale Power Market conference, New York, New York, March 18, 1998.

Rose, J.L., “Projecting Market Prices in a Deregulated Electricity Market,” presentation at conference: Market Price Forecasting, San Francisco, California, March 9, 1998.

Rose, J.L., “Handling of Transmission Rights,” presentation at conference: Congestion Pricing & Tariffs, Washington, D.C., January 23, 1998.

Rose, J.L., “Understanding Wholesale Markets and Power Marketing,” presentation at The Power Marketing Association Annual Meeting, Washington, D.C., November 11, 1997.

Rose, J.L., “Determining the Electricity Forward Curve,” presentation at seminar: Pricing, Hedging, Trading, and Risk Management of Electricity Derivatives, New York, New York, October 23, 1997.

Rose, J.L., “Market Price Forecasting In A Deregulated Market,” presentation at conference: Market Price Forecasting, Washington, D.C., October 23, 1997,

Rose, J.L., “Credit Risk Versus Commodity Risk,” presentation at conference: Developing & Financing Merchant Power Plants in the New U.S. Market, New York, New York, September 16, 1997.

SELECTED PUBLICATIONS

Rose, J.L., “Should Environmental Restrictions be Eased to Allow for the Construction of More Power Plants?, The Costco Connection, April 2001.

Rose, J.L., “Deregulation in the US Generation Sector: A Mid-Course Appraisal”, Power Economics, October 2000.

Rose, J. L., "Price Spike Reality: Debunking the Myth of Failed Markets", *Public Utilities Fortnightly,* November 1, 2000.

Rose, J.L., "Missed Opportunity: What's Right and Wrong in the FERC Staff Report on the Midwest Price Spikes," *Public Utilities Fortnightly,* November 15, 1998.

Rose, J.L., "Why the June Price Spike Was Not a Fluke," *The Electricity Journal*, November 1998.

Rose, J.L., S. Muthiah, and J. Spencer, "Will Wall Street Rescue the Competitive Wholesale Power Market?" *Project Finance International*, May 1998.

Rose, J.L., "Last Summer's "Pure" Capacity Prices – A Harbinger of Things to Come*," Public Utilities Fortnightly,* December 1, 1997.

Rose, J.L., D. Kathan, and J. Spencer "Electricity Deregulation in the New England States," *Energy Buyer*, Volume 1, Issue 10, June-July 1997.

Rose, J.L., S. Muthiah, and M. Fusco, "Financial Engineering in the Power Sector," *The Electricity Journal,* Jan/Feb 1997.

Rose, J.L, S. Muthiah, and M. Fusco, "Is Competition Lacking in Generation? (And Why it Should Not Matter)*," Public Utilities Fortnightly,* January 1, 1997.

Mann, C. and J.L. Rose, "Price Risk Management: Electric Power vs. Natural Gas," *Public Utilities Fortnightly,* February 1996.

Rose, J.L. and C. Mann, "Unbundling the Electric Capacity Price in a Deregulated Commodity Market," *Public Utilities Fortnightly,* December 1995.

Booth, William and J.L. Rose, "FERC's Hourly System Lambda Data as Interim Bulk Power Price Information," *Public Utilities Fortnightly,* May 1, 1995.

Rose, J.L. and M. Frevert, "Natural Gas: The Power Generation Fuel for the 1990s." Published by Enron.

EMPLOYMENT HISTORY

ICF Resources Incorporated	Managing Director	1999-Present
	Vice President	1996-1999
	Project Manager	1993-1996
	Senior Associate	1986-1993
	Associate	1982-1986