

QUARTERLY FOCUS:

Review of 1995 Cross-Border Electricity Trade and the Use of Canadian Gas by the Non-Utility Generation Sector

Introduction

The Office of Fossil Energy (OFE) is responsible for collecting data and preparing statistical reports on North American natural gas and electricity trade. These statistical reports are done in conjunction with the OFE's overall regulatory responsibilities associated with authorizing imports and exports of natural gas, exports of electricity and the issuing of Presidential permits for the construction of international electrical transmission facilities.

The *Quarterly Focus* in this report is comprised of two parts. **Part I** summarizes the electricity trade between the United States and Mexico and Canada during the calendar year 1995. This portion of the *Quarterly Focus* was prepared by Steven Mintz of the Office of Coal & Power Import and Export Activities (formerly a part of "Office of Fuels Programs"). **Part I** does not include several appendices attached to the original report on cross-border electricity trade. The appendices include general information about the regulatory program and detailed information on cross-border electricity trade, by company. Anyone seeking a copy of the full report should contact Steven Mintz at (202) 586-9506, or download the entire report from the office's electronic bulletin board at (202) 586-7853.

Part II of the *Quarterly Focus* reviews the extent that Canadian natural gas has been used during the past seven years (1990 - 1996) in supplying the non-utility generation sector (NUGS). Canadian natural gas has

captured a large portion of this market during this time period, but this growth likely will reach a plateau in 1997. This part basically is an update of an earlier *Quarterly Focus* included in the second quarter of 1994.

With the advent of the new power marketer in cross-border electricity trade, and in a world where electricity and natural gas industries seem to be converging, our office thought that there might be considerable interest in what kind of cross-border trade is taking place for electric power. As the electric power industry moves toward deregulation and a more competitive marketplace, independent power marketers are quickly emerging as important players in the industry. These wholesale power marketers are very similar to the natural gas marketers that evolved from efforts to deregulate the natural gas industry in the mid-1980's. They buy electric energy from various sources for their own account, and sell this power to various utilities and end-users, usually industrial or public consumers.

Most of these power marketers do not own or control any electric generating or transmission facilities, nor have franchised service areas. The majority of these power marketing firms, or their affiliates, also are engaged in marketing other energy commodities, such as natural gas and petroleum. With the January 1994 passage of the North American Free Trade Agreement and the emergence of these fully

integrated marketers who offer a complete portfolio of different types of energy supplies, there has been increasing interest among these firms to obtain electricity export authorizations. The first export authorization granted by OFE to this new type of power marketer was Enron Power Marketing, Inc. (Enron), on February 6, 1996. Since this initial export authorization to Enron, OFE has granted eleven additional export authorizations to power marketers this year. The table below lists all of the power marketers which received export authorizations in 1996, as well as the listing of fifteen other firms seeking similar

authorizations. All of these power marketers were authorized by the Federal Energy Regulatory Commission (FERC) to make sales of electric power at wholesale in interstate commerce, at negotiated rates.

Since OFE granted its first export authorization to a power marketer this year, the summary of 1995 cross-border electricity trade found in **Part I** will not reflect any trade by this group. However, it will be interesting to monitor over the next few years whether these power marketers have much of an impact on the existing cross-border electricity trade patterns.

ELECTRICITY EXPORT AUTHORIZATIONS GRANTED TO POWER MARKETERS			
<i>Power Marketer</i>	<i>Date Issued</i>	<i>Docket No.</i>	<i>Export Market</i>
1 CalPine Power Services Co.	10/08/96	EA-116	Mexico
2 CNG Power Services Corp.	06/20/96	EA-110	Canada
3 Destec Power Services, Inc.	05/31/96	EA-113	Mexico
4 Enron Power Marketing, Inc.	02/06/96	EA-102	Mexico
5 Enron Power Marketing, Inc.	09/26/96	EA-115	Canada
6 MidCon Power Services, Corp.	07/15/96	EA-114	Canada
7 NorAm Energy Services, Inc.	05/30/96	EA-105-MX	Mexico
8 NorAm Energy Services, Inc.	08/16/96	EA-105-CN	Canada
9 North American Energy Conservation, Inc.	05/30/96	EA-103	Canada
10 Portland General Electric Co.*	02/09/96	EA-97-A	Canada
11 San Diego Gas & Electric Co.*	02/09/96	EA-100-A	Canada
12 US Generating Power Services LP	06/27/96	EA-112	Canada

PENDING APPLICATIONS OF POWER MARKETERS TO EXPORT ELECTRICITY			
<i>Power Marketer</i>	<i>Date Filed</i>	<i>Docket No.</i>	<i>Proposed Export Market</i>
1 Coastal Electric Services Co.	10/21/96	EA-133	Canada
2 Coastal Electric Services Co.	10/21/96	EA-132	Mexico
3 Edison Source*	07/31/96	EA-120	Canada
4 Edison Source*	07/31/96	EA-119	Mexico
5 Electric Clearinghouse, Inc.	09/17/96	EA-122	Canada
6 Electric Clearinghouse, Inc.	09/17/96	EA-121	Mexico
7 Federal Energy Sales, Inc.	10/08/96	EA-126	Canada
8 Federal Energy Sales, Inc.	10/08/96	EA-125	Mexico
9 PECO Energy, Co.*	09/05/96	EA-123	Canada
10 Quixx Corporation*	10/11/96	EA-127	Mexico
11 Sonat Power Marketing, L.P.	10/18/96	EA-131	Canada
12 Sonat Power Marketing, L.P.	10/18/96	EA-130	Mexico
13 Newco US, L.P.	11/29/96	EA-136	Canada
14 Newco US, L.P.	11/29/96	EA-135	Mexico
15 New York State Electric & Gas Corp.*	12/05/96	EA-137	Canada

*Electricity utility, or wholly-owned subsidiary of an electric utility

PART I: REVIEW OF 1995 CROSS-BORDER ELECTRICITY TRADE

ELECTRICITY TRANSACTIONS

ACROSS INTERNATIONAL BORDERS 1995

SUMMARY

This report summarizes the electricity trade between the United States and Mexico and Canada during Calendar Year 1995. The construction, connection, operation and maintenance of facilities at the international border of the United States for the transmission of electrical energy is prohibited in the absence of a Presidential permit pursuant to Executive Order No. 12038. Exports of electric energy from the United States to a foreign country are regulated and also require authorization under section 202(e) of the Federal Power Act. The information contained herein was reported to the Department of Energy (DOE) by the holders of Presidential permits and electricity export authorizations as listed in each of the forthcoming regional summaries. The energy values reported represent scheduled transactions. This often differs from the other method of recording electric energy transactions, that is, metered flows.

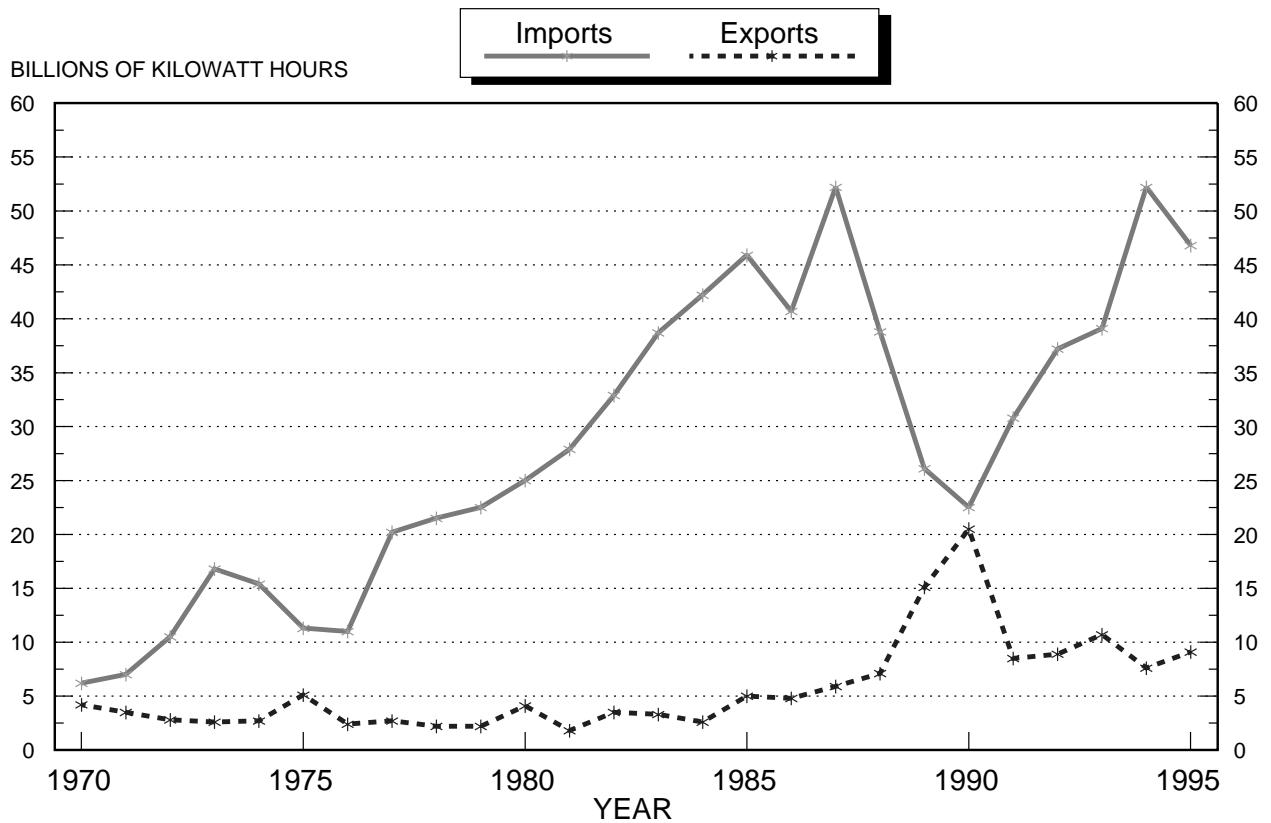
Table 1 contains a summary of the amount of electricity imported into and exported from the U.S. and the respective costs and revenues during Calendar Year 1995. During 1995, the U.S. imported 46,760,373 MWh (megawatt hours; 1 MWh = 1000 kilowatt hours) of electric energy at a cost of \$882,796,044. Of this total, 44,502,962 MWh (95%) were imported from Canada and the remainder, 2,257,411 MWh (5%), were received from Mexico. During this same period, U.S. exports of electric energy totaled 9,146,710 MWh with gross revenues of \$93,058,057. Of this, 7,992,289 MWh (87%) representing \$45,533,189 in revenue were delivered to Canada, and 1,154,421 MWh (13%) representing \$47,524,868 in revenue were delivered to Mexico. On a net basis, the U.S. was an importer of 37,613,663 MWh of electric energy. These 1995 values constitute a decrease of slightly more than 10 percent in gross imports and an increase of more than 20 percent in gross exports compared to 1994 levels. It should be noted that a significant number of exports to Canada were not "sales" but rather exchanges for which no money changed hands.

Table 1

SUMMARY OF INTERNATIONAL ELECTRICITY TRANSACTIONS FOR 1995						
1/ REGION	IMPORTS FROM CANADA (MWH) COST(\$)		EXPORTS TO CANADA (MWH) REVENUE(\$)		2/ NET CANADIAN TRANSACTIONS (MWH) COST(\$)	
NPCC - New England	13,572,573	288,090,010	473,259	22,813,038	13,099,314	265,276,972
NPCC - New York	9,503,980	159,736,447	631,016	4,170,608	8,872,964	155,565,839
ECAR	5,798,944	112,119,115	40,078	875,932	5,758,866	111,243,183
MAPP	10,332,719	184,821,075	474,250	1,282,620	9,858,469	183,538,455
WSCC	5,294,746	45,636,189	6,373,686	16,390,991	(1,078,940)	29,245,198
SUBTOTAL CANADA	44,502,962	790,402,836	7,992,289	45,533,189	36,510,673	744,869,647
1/ REGION	IMPORTS FROM MEXICO (MWH) COST(\$)		EXPORTS TO MEXICO (MWH) REVENUE(\$)		2/ NET MEXICAN TRANSACTIONS (MWH) COST(\$)	
ERCOT	0	0	6,475	680,659	(6,475)	(680,659)
WSCC	2,257,411	92,393,208	1,147,946	46,844,209	1,109,465	45,548,999
SUBTOTAL MEXICO	2,257,411	92,393,208	1,154,421	47,524,868	1,102,990	44,868,340
GRAND TOTAL U.S.	46,760,373	882,796,044	9,146,710	93,058,057	37,613,663	789,737,987
<p>1/ Regions are five of the ten reliability councils of the North American Electric Reliability Council which had trade with either Canada or Mexico.</p> <p>2/ Positive values indicated that the U.S. utilities are net importers of electric energy and the dollar figures associated with these transactions are costs to utilities. Negative values appear in parentheses and indicate that the U.S. utility is a net exporter of electricity and the dollar figures associated with these transactions are paid to utilities.</p>						

Figure 1

ELECTRICITY TRANSACTIONS 1970 - 1995



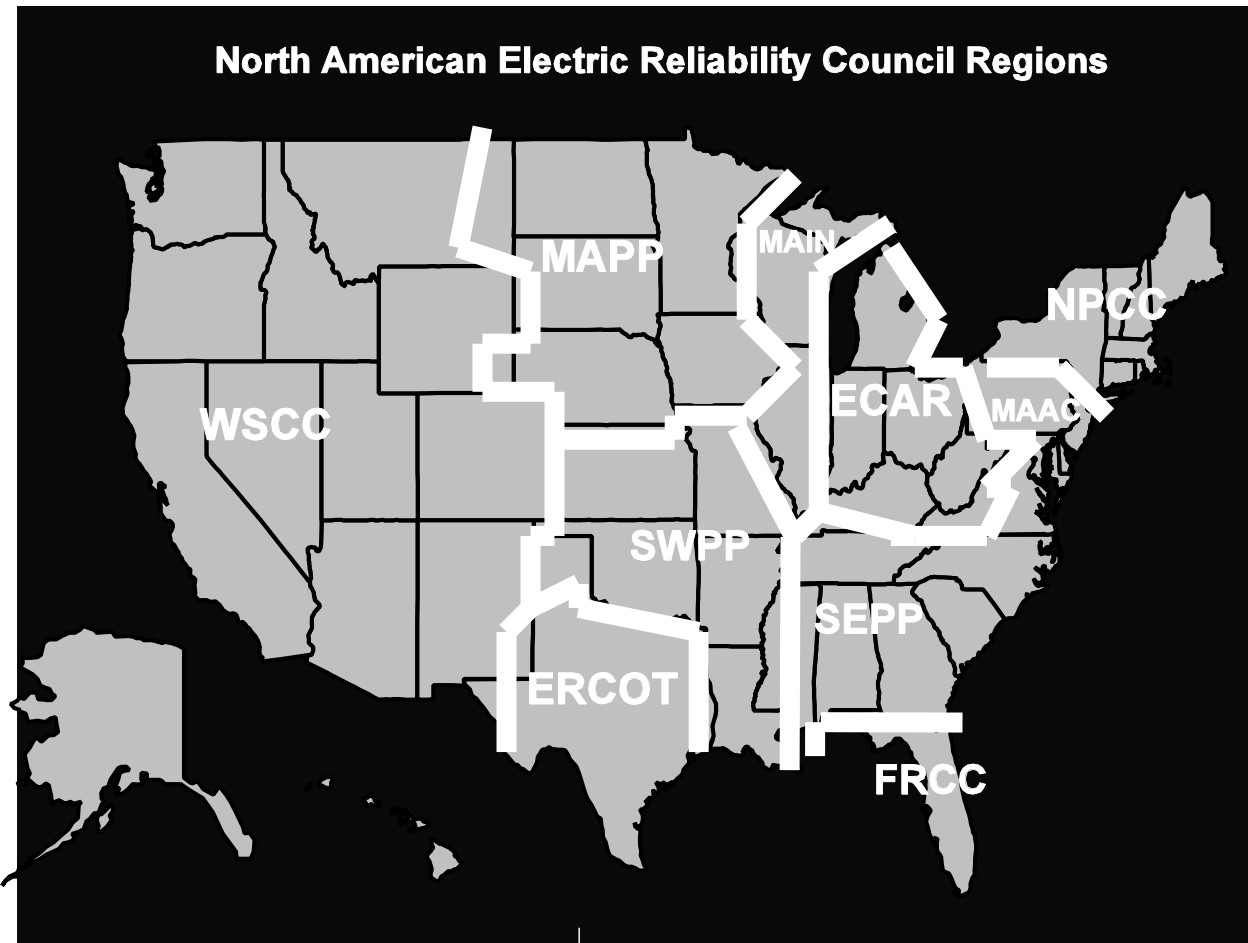
TRENDS IN INTERNATIONAL ELECTRICITY TRADE

Figure 1 shows the gross imports and exports between the U.S. and Canada and Mexico from 1970 through 1995. The levels of imports and exports remained comparatively small until the early 1970's when U.S. imports relative to exports began to rise sharply. This change closely correlates to the rise in imported oil prices and appears to represent a substitution of Canadian hydroelectric energy for more expensive oil-fired generation in the U.S. Throughout the 1980's U.S. gross imports continued to rise, reaching 52,218,963 MWh in 1987, while U.S. exports remained at low levels.

However, in 1989 U.S. exports rose sharply, and by 1990 reached 20,526,041 MWh. More than half of this increase resulted from sales to Ontario Hydro. During this time period, U.S. utilities were called upon to help Ontario Hydro deal with electricity shortages caused by severe drought, higher than expected load growth, outages on several nuclear generating units, and derating of coal-fired powerplants due to restrictions placed on air emissions. While U.S. exports dropped dramatically in 1991, they still reached their third highest level since 1970. In 1995, U.S. imports declined slightly more than 10 percent below 1994 levels (the highest level ever recorded), while gross exports rose more than 20 percent above 1994 levels.

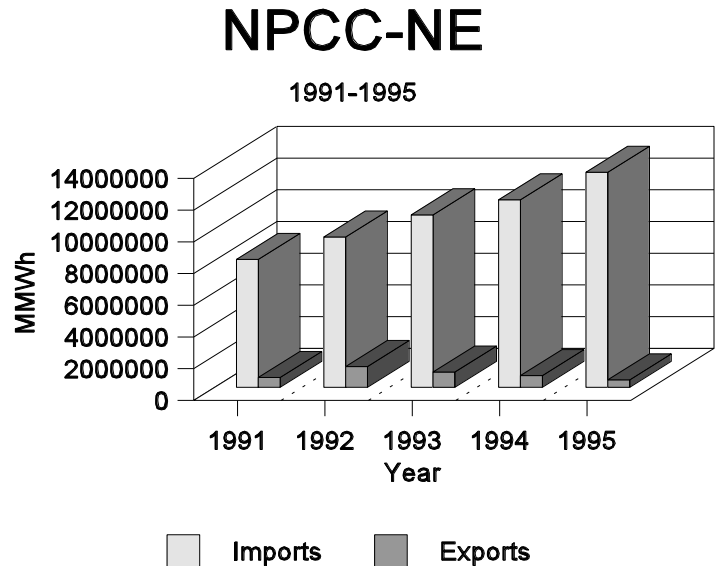
TRENDS IN REGIONAL ELECTRICITY TRANSACTIONS

This section describes the five-year trend of electricity transactions for each of the five North American Electric Reliability Council (NERC) regions that have electrical interconnections with either Canada or Mexico. Also displayed are descriptions of each permitted or authorized transmission line that crosses an international border within each of these regions.



I. Northeast Power Coordinating Council (NPCC) - This region, divided into two parts, New England and New York, is the most heavily interconnected. It regularly accounts for almost 50 percent of total U.S. imports.

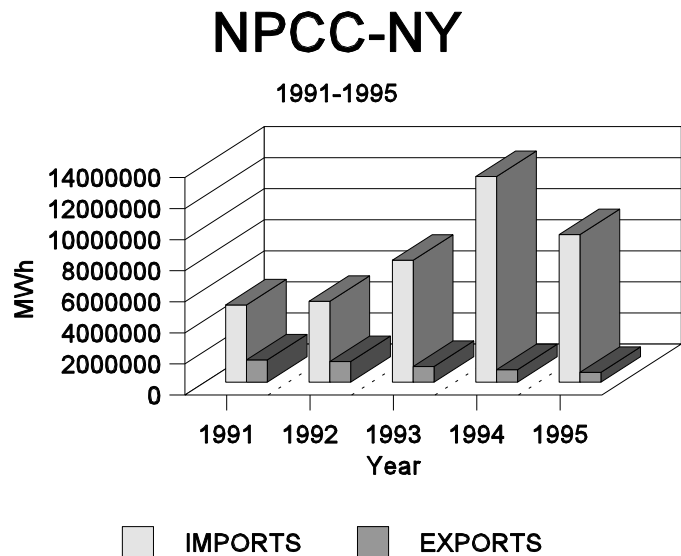
A. New England - From 1991-1995 electricity imports showed a steady annual increase, reaching 13,572,573 MWh in 1995 (the highest one-year total for any region or sub-region over the last five years). Exports remained at relatively low levels, exceeding 1 million MWh only in 1992. On a net basis, this sub-region was a net importer averaging almost 10 million MWh of net imports over the five-year period.



HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
NPCC-NE - CANADA

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Central Maine Power Company	PP-62		76-09-29	2-1/0 triplex cables 120-240 V Coburn Gore,ME
Citizens Utilities Company	PP-66	EA-66-B	79-06-21	1-120 KV Derby Line, Vermont
Citizens Utilities Company	PP-80	EA-80	83-08-05	1-25 KV Cannan, Vermont 1-25 KV Norton, Vermont
Eastern Maine Electric Coop, Inc.	PP-20		53-05-27	1-6.9 KV Forest City, Maine
Eastern Maine Electric Coop, Inc.	PP-32	E-6853	59-02-05	1-69 KV Calais, Maine
Fairfield Energy Venture & Maine PS Co	PP-83EA			Trans. over facilities in PP-12 and PP-29
Fraser Paper Limited	PP-11	IT-5952	45-11-20	1-69 KV Madawaska, Maine
Joint Owners of the Highgate Project	PP-82		85-04-14	1-345 KV operating at 120 KV-Franklin, VT
Maine Electric Power Company	PP-43	E-7534	69-07-25	1-345 KV Houlton, Maine
Maine Public Service Company	PP-12	E-6751	48-01-03	1-69 KV Limestone, Maine 1-69 KV Fort Fairfield, Maine
Maine Public Service Company	PP-29	E-6751	57-09-18	1-138 KV @ BM #62, Aroostock County, ME 2-69 KV Madawaska, Maine
Maine Public Service Company	PP-81		84-09-21	1-7.2 KV River-de-Chute, Maine
New England Power Pool		EA-76-C		Authorized to use PP-76
Vermont Electric Cooperative	PP-69		80-10-09	5-4 KV Derby Line, Vermont 1-48 KV Derby Line, Vermont
Vermont Electric Transmission Co.	PP-76		84-04-05	1-450 KV DC Norton, Vermont 1-345 KV Sandy Pond to Milbury #3 Substa 1-345 KV Milbury #3 to West Medway Substa

B. New York - In four of the last five years, electricity imports rose steadily, reaching 13,249,551 MWh in 1994 before declining in 1995. Electricity exports in this sub-region slowly declined over the five year period. In fact, exports in 1995 declined to 631,016 MWh, a level that was typical throughout most of the 1980's. On a net bases, the NPCC-NY sub-region averaged less than half the net exports over the last five years than it experienced throughout most of the 1980's.

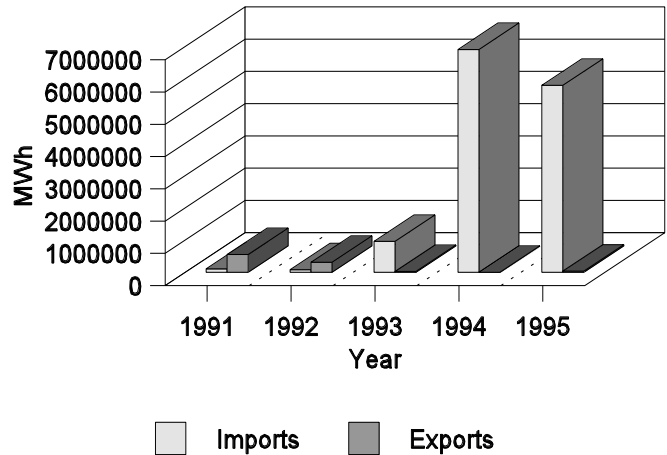


HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
NPCC-NY - CANADA

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Long Sault Incorporated	PP-24		55-06-26	2-115 KV Massena, New York
New York Power Authority	PP-25		55-09-26	2-230 KV Massena, New York
New York Power Authority	PP-30		58-02-28	1-230 KV Devil's Hole, New York
New York Power Authority	PP-56		74-09-13	1-765 KV Fort Covington, New York
New York Power Authority	PP-74		81-09-04	2-345 KV Niagara Falls, New York
Niagara Mohawk Power Corp.	PP-13	IT-6078	48-01-31	1-4.8 KV Hogansburg, New York
Niagara Mohawk Power Corp.		EA-24	56-01-24	Authorized to use PP-24
Niagara Mohawk Power Corp.	PP-31	E-6797	58-02-28	1-230 KV (3 phase) Devil's Hole, New York 2-38 KV Buffalo, New York 2-69 KV Queenstown, New York 4-12 KV 3/c cables - Rainbow Br. New York 1-12 KV 1/c cable - Rainbow Br. (never built)
Presley, E. T.	PP-54		73-03-16	2-69 KV Devil's Hole, New York 1-4.8 KV (1 phase) Wellesley Island, NY

ECAR

1991-1995



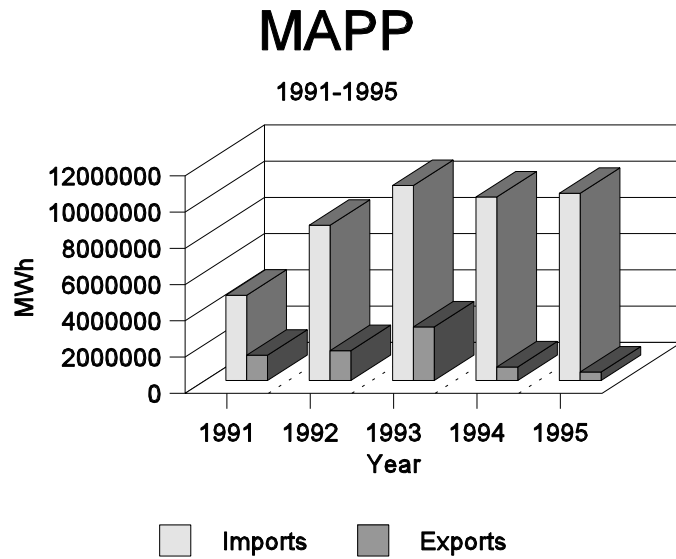
II. East Central Area Reliability Coordination Agreement (ECAR) - Imports for this lightly interconnected region were at record levels in 1994 and 1995, reaching 6,909,582 MWh and 5,798,944 MWh respectively. Exports over the five-year period returned to historic low levels after the unusual 1989 and 1990 periods where exports reached almost 11 million MWh in 1990. In 1991 and 1992 ECAR was a net exporter. From 1993-1995 the region was an overwhelming net importer.

HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
ECAR

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Detroit Edison Company	PP-38	E-7206	66-03-01	1-345 KV St. Clair, Michigan
Detroit Edison Company	PP-21	E-7206	53-10-12	1-230 KV Marysville, Michigan 1-230 KV Detroit, Michigan
Detroit Edison Company	PP-58	EA-58-E	75-07-25	1-345 KV St. Clair, Michigan
St. Clair Tunnel Company	PP-99	EA-99	94-12-21	1-4.8 KV St. Clair, Michigan

III. Mid-Continent Area Power Pool (MAPP) -

From 1993-1995 electricity imports into the MAPP region exceeded 10 million MWh for each year. These imports were the highest levels ever reached in the region. In fact, only once, in 1986, did imports approach 8 million MWh. In 1993 exports rose to 2,958,591 MWh, which was the second highest export level reached since 1988. In 1994 and 1995 the MAPP region was an overwhelming net importer, reaching all-time high net import levels.



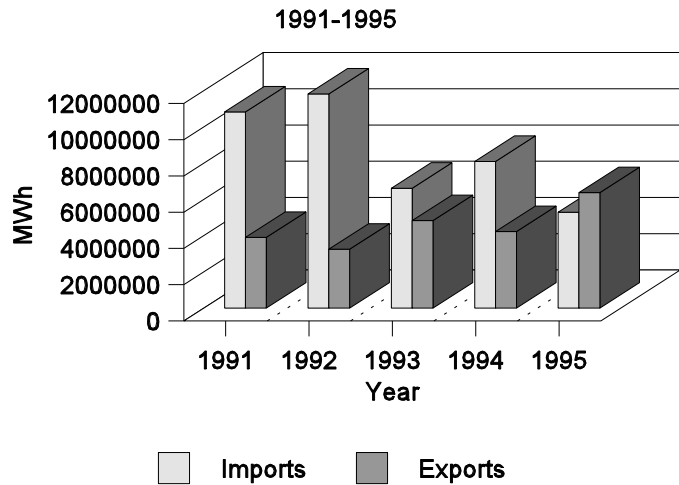
HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
MAPP

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Basin Electric Power Coop	PP-64	IE-78-5	79-11-30	1-230 KV Tioga, North Dakota
Boise Cascade Corp	PP-39	PP-39EA	66-11-07	1-6.6 KV International Falls, Minnesota
Minnesota Power & Light Company	PP-78	PP-78EA	82-09-30	1-115 KV International Falls, Minnesota
Minnkota Power Cooperative, Inc.	PP-61	E-9534	76-07-06	1-230 KV Roseau County, Minnesota
Minnkota Power Cooperative, Inc.	PP-70		80-10-10	1-12 KV Lake of the Woods County, Minnesota
North Central Electric Coop, Inc.	PP-67		79-06-27	1-12.5 KV u/g Dunseith, North Dakota
Northern Electric Cooperative Assoc.	PP-28	E-6670	56-12-12	3-7.2 KV Valley County, Montana
Northern Electric Cooperative Assoc.	PP-44	E-7465	69-07-02	1-12.4 KV St. Louis County, Minnesota
Northern Electric Cooperative Assoc.	PP-60	E-9554	76-07-12	2-14.4 KV St. Louis County, Minnesota
Northern States Power Company	PP-45-1	E-7482	69-09-19	1-230 KV Red River, North Dakota
Northern States Power Company	PP-63	EA-63-B	79-03-06	1-500 KV Roseau County, Minnesota
Roseau Electric Cooperative, Inc.	PP-42	E-8361	68-11-25	1-7.2 KV (1 phase) Roseau County, MN
Roseau Electric Cooperative, Inc.	PP-55	E-8361	74-05-09	1-25 KV (1 phase) Roseau County, MN

IV. Western Systems Coordinating Council (WSCC) - The WSCC is the largest geographic area of all the NERC regions. It is the only region that is both interconnected with Canada, on it's northern border, and with Mexico, on it's southern border.

WSCC - CANADA

A. Canada - In 1991 and 1992 this sub-region had its third and fourth highest levels of imports ever recorded. From 1993-1995 imports returned to their historic amounts. Exports, in 1995, reached their highest level ever recorded (6,373,686 KWh). Also in 1995, for the first time, the WSCC-CANADA sub-region was a net exporter of electric energy.

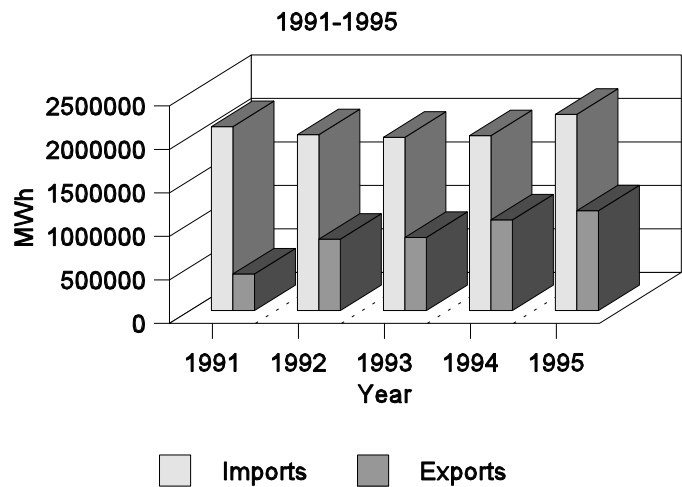


HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
WSCC - CANADA

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Bonneville Power Administration	PP-10		45-10-27	2-500 KV Blaine, Washington
Bonneville Power Administration	PP-36		64-09-03	1-230 KV Nelway, British Columbia
Bonneville Power Administration	PP-46		70-08-29	1-230 KV Nelway, British Columbia
Glacier Electric Cooperative, Inc.	PP-18	EA-18-B	52-07-12	1-120/240 V Carway, Alberta 1-120/240 V Del Bonita, Alberta
Marias River Electric Coop, Inc.	PP-41	IT-6097	68-07-28	1-6.9 KV Sweet Grass, Montana
PUD #1 of Pend Oreille County, WA	PP-34		59-11-05	1-7.2 KV (1 phase) Pend Orielle County, WA
Portland General Electric		EA-97		Authorized to use PP-10, PP-34, PP-46
Puget Sound Power & Light Co.	PP-06-1		81-04-28	1-25 KV Pt. Roberts, Washington
San Diego G&E Company		EA-100		Authorized to use PP-10, PP-34, PP-46
Washington Water Power	PP-86		93-03-08	1-230KV Northport, WA
Western Systems Power Pool		EA-98		Authorized to use PP-10, PP-34, PP-46

B. Mexico - Imports remained at virtually the same level throughout the five-year period. Exports during the period rose steadily, reaching an all-time high of 1,154,421 MWh in 1995. On a net basis the WSCC-MEXICO sub-region remains a net importer. The overwhelming majority of electricity transactions between the U.S. and Mexico occur within this sub-region.

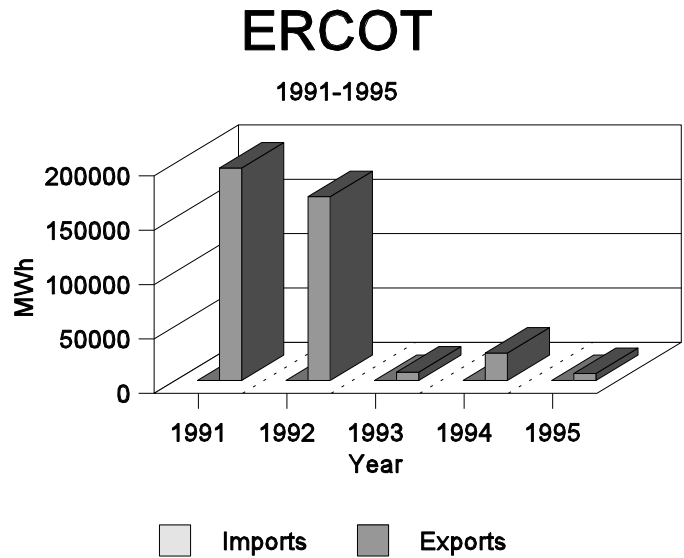
WSCC - MEXICO



**HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
WSCC - MEXICO**

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Citizens Utilities Company	PP-16	E-6431	52-08-08	1-13 KV Nogales, Arizona 1-2.3 KV Nogales, Arizona
Citizens Utilities Company	PP-40	E-7370	67-12-29	1-13.8 KV Lochiel, Arizona
El Paso Electric Company	PP-48	EA-48-I	70-09-30	1-115 KV El Paso, Texas (Ascarate)
El Paso Electric Company	PP-92		92-04-16	1-115 KV Diablo Substa., Sunland Park, NM
Imperial Irrigation District	PP-90		90-11-29	1-34.5 KV in Calexico, California
San Diego Gas & Electric Company	PP-49	E-7545	70-12-29	1-69 KV Tijuana, Mexico 1-12 KV Tijuana, Mexico 1-12 KV Tecate, Mexico
San Diego Gas & Electric Company	PP-68	PP-68EA	81-01-12	1-230 KV San Diego Co, CA (Miguel-Tiajuana)
San Diego Gas & Electric Company	PP-79	PP-79EA	83-12-20	2-230 KV Imperial Valley, CA
Southern California Edison Company	PP-79SC		56-04-06	1-161 KV Andrade, CA

V. Electric Reliability Council of Texas (ERCOT) - This region has a relatively large number of small lines interconnected with Mexico (no line exceeds 138KV). Thus historically, ERCOT, has had virtually no imports or exports. Over the past five years, this was certainly true for imports. However, in 1991 and 1992 exports reached levels that were 3-4 times higher than anything ever previously recorded before returning, in 1993, to more normal amounts of MWh. This is the only region that is a consistent net exporter.



**HOLDERS OF PRESIDENTIAL PERMITS AND EXPORT AUTHORIZATIONS
ERCOT**

PERMITEE	FE PERMIT NUMBER	EXPORT DOCKET NUMBER	DATE PERMIT SIGNED	DESCRIPTION OF LINES
Central Power & Light Company	PP-94	EA-94A	92-06-18	1-69 KV Brownsville, TX 1-138 KV Brownsville, TX
Comision Federal de Electricidad	PP-03	E-6137	41-08-26	1-12.5 KV (3 phase) Presidio, Texas
Comision Federal de Electricidad	PP-51	E-7651	71-10-15	1-7.2 KV (1 phase) Redford, Texas
Comision Federal de Electricidad	PP-59	E-7972	76-04-16	1-12 KV Amistad Dam NW of Del Rio, TX
Comision Federal de Electricidad	PP-75	PP-75EA	82-08-13	1-7.2 KV Comstoc, Texas
Comision Federal de Electricidad Golfo Norte	PP-50		49-04-29	1-138 KV Eagle Pass, Texas
Comision Federal de Electricidad Golfo Norte	PP-57	IT-5025	75-01-24	1-138 KV Laredo, Texas
Comision Federal de Electricidad Golfo Norte	PP-94		92-06-18	Brownsville, Texas
Matamoros, S.A., Compania Electrica	PP-15	IT-5656	41-08-14	1-69 KV Brownsville, Texas
Rio Grande Electric Cooperative, Inc.	PP-33	E-6868	59-07-28	1-14.4/24.9 KV Health Crossing, Texas
Rio Grande Electric Cooperative, Inc.	PP-53	E-7688	73-01-16	1-14.4 KV Lajitas, Texas 1-14.4 KV Castolon, Texas 1-14.4 KV Candelaria, Texas
West Texas Utilities Company		EA-3-G	79-03-19	Authorized to use PP-3

REGIONAL IMPACT OF ELECTRICITY IMPORTS

While net imports represented only 1.39 percent of the total U.S. electric energy requirements for 1995, the impact becomes greater when viewed from the regional perspective (See Table 2). For example, electricity imports provided 11.6 percent of New England's electric energy requirements for 1995. The next largest importers of electric energy (on a percentage basis) were the Mid-Continent Area Power Pool (MAPP) and the New York subregion of the Northeast Power Coordinating Council (NPCC) with 6.9 percent and 6 percent of their respective electric energy requirements being provided by electricity imports from Canada.

Table 2

REGIONAL ELECTRICITY IMPORTS

Council/Region	1995 ¹ Electric Energy Requirements MWH	1995 Net Electric Imports MWH	1995 Net Imports as % of Requirements
ECAR (Lower Michigan)	521,247,000	5,758,866	1.10%
MAPP	143,447,000	9,858,469	6.87%
NPCC (New England)	112,844,000	13,099,314	11.61%
NPCC (New York)	148,391,000	8,872,964	5.98%
WSCC ² (CA - S.NV; NWPP; AZ - NM)	542,745,000	30,525	0.01%
ERCOT	231,440,000	(6,475) ³	no net imports
TOTAL U.S.⁴	3,204,314,000⁵	44,637,717	1.39%

¹Sources are the voluntary coordinated regional bulk power supply program for each of the NERC regions reported to DOE as Form OE-411.

²WSCC is made up of four regions. Most of the electric energy imported from Canada as wheeled through the Bonneville Power Administration's system and delivered to utilities in the Pacific Northwest and California.

³This NERC region was a net exporter of electric energy during 1995.

⁴Total U.S. includes all of the ten reliability Councils of NERC. The remaining subregions of Councils listed above and the remaining five reliability Councils not listed (MACC, MAIN, SERC, FRCC, and SWPP) had no electricity imports from either Canada or Mexico.

⁵This value represents the total electric energy requirements for only those utilities which are members of NERC. However, these utilities represent in excess of 95 percent of the total electric energy requirements for the U.S. in 1995.

PART II: USE OF CANADIAN GAS BY THE NON-UTILITY GENERATION SECTOR

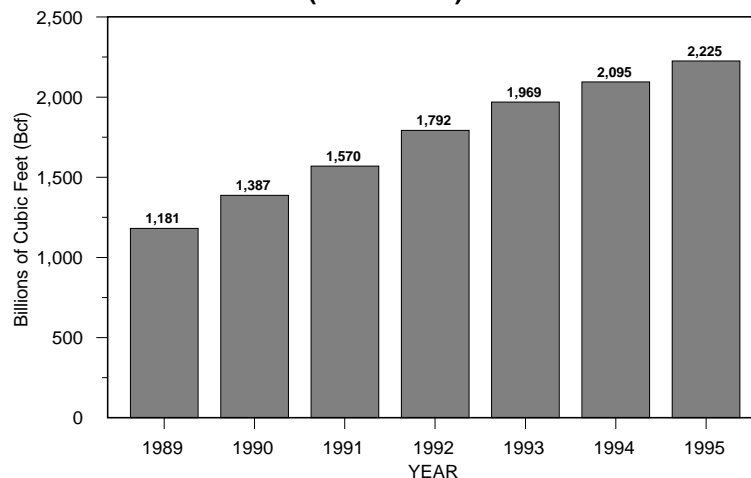
In the *Natural Gas Imports and Exports Quarterly Report* issued for the second calendar quarter of 1994, our *Quarterly Focus* provided some statistics and graphs on the use of Canadian gas by the non-utility generation sector (NUGS). The statistics showed that Canadian gas suppliers had made substantial inroads in capturing a portion of this fast growing market during the first four years of the 1990's. The primary purpose of this report is to provide a follow-up to our data of two years ago, and to determine whether Canadian gas continues to play a major role in supplying fuel to the NUGS.

Electricity generated in the United States by the NUGS has grown from a three percent market share in 1979 to twelve percent in 1995 [Edison Electric Institute, *1995 Capacity and Generation of Non-Utility Sources of Energy* (Washington, DC, November 1996), page 24. Natural gas is the fuel most used by nonutilities. In 1995, the NUGS produced 50 percent of its

electricity from natural-gas-fired facilities [Ibid., page 52].

Natural gas consumption used to generate electricity by the electric utility industry grew from 2,787 billion cubic feet (Bcf) in 1989 to 3,197 Bcf in 1995 [Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(96/11) (Washington, DC, Nov., 1996) p. 99]. This represents a 410 Bcf, or a 14.7 percent increase in use of gas over this six year period. **Figure 1** shows the growth in natural gas use by the NUGS during the same time period. The graph shows a robust growth in natural gas use by the NUGS between 1989 and 1995. Natural gas consumption increased from 1,181 Bcf in 1989 to 2,225 Bcf in 1995; this represents a 1,044 Bcf, or an 88.4 percent increase during this six year period. Based on company filings with our office, we estimate that Canadian natural gas supplies comprised about 29 percent of the incremental gas usage by the NUGS during this time period.

Figure 1
NATURAL GAS USE BY THE NON-UTILITY GENERATION SECTOR*
(1989 - 1995)



*Facilities that are 5 megawatts or larger
 Source: Energy Information Administration / DOE, Form EIA - 867, "Annual Nonutility Power Producer Report."

As noted above, Canadian natural gas suppliers have made substantial gains in capturing of this fast growing NUGS market over the past six years. In addition to supplying about 29 percent of the incremental growth in gas sales to the NUGS during this period, Canadian gas sales to this market represented over 20 percent of the total growth in Canadian gas sales to the United States.

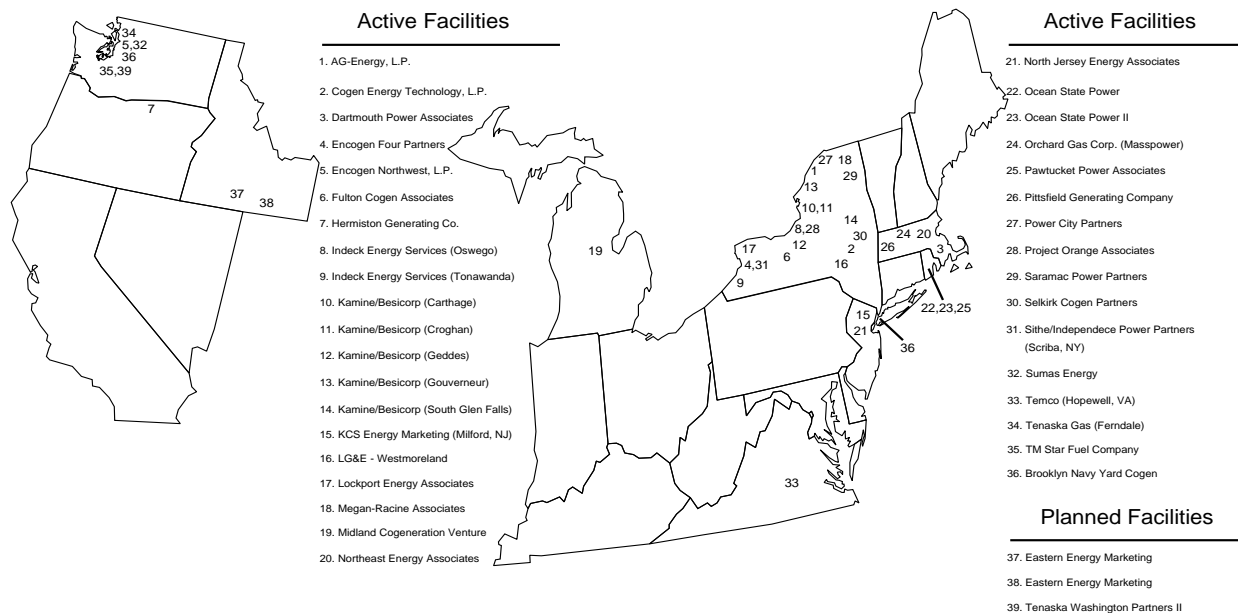
Based on information filed by importers, we estimate that during 1995, Canadian gas supplied over 13 percent of the total gas usage in the U.S. NUGS market. However, the NUGS in some regions of the country had a much higher level of dependence on Canadian gas. For example, we estimate that three-fourths of the gas supplying the NUGS in New England during 1995 came from Canada. Similarly, the NUGS in the state of New York obtained about half of its supplies from Canada.

Figure 2 is a map identifying the location of the 36 NUGS facilities which receive all or a portion of their natural gas supplies from Canada. The installed capacity of these facilities totals 7,475 megawatts (MW), or about 27 percent of the total installed capacity of NUGS in the United States (27,572 MW) using solely natural gas as a fuel [EIA, *Electric Power Annual*, DOE/EIA-0348(95)/2, (Washington, DC, December 1996), Table 52].

Among the currently operating facilities using Canadian natural gas, twenty of them are located in the state of New York. Most of the newly activated facilities are located in the state of Washington. There were two new facilities that became operational in 1996. In Hermiston, Oregon, a new 474-MW combined-cycle cogeneration facility began commercial operation on July 1, 1996. Under four separate 15-year Canadian gas supply contracts (Canstates, Home Oil,

Figure 2

NON-UTILITY GENERATION SECTOR FACILITIES SUPPLIED BY CANADIAN NATURAL GAS UNDER LONG-TERM IMPORT AUTHORIZATIONS



Chevron, Norcen) Hermiston is scheduled to receive close to 92 MMcf/day, or over 33 Bcf per year of Canadian natural gas to fuel this new plant. On October 1, 1996 the new 286-MW Brooklyn Navy Yard cogeneration facility began receiving Canadian natural gas under two 15-year supply contracts (Crestar, PanCanadian). Under these two contracts, this plant is scheduled to receive 25 MMcf/day, or over 9 Bcf annually.

The last three facilities listed in **Figure 2** are planned facilities which received natural gas import authorizations, but have not yet commenced operation. The two gas import authorizations held by Eastern Energy Marketing, Inc., will fuel two small cogeneration facilities (10-MW) being built near Glens Ferry and Rupert, Idaho. Finally, an import authorization was granted to Tenaska Washington Partners II to supply a proposed 248-MW cogeneration plant in Pierce County, Washington. Under the proposal, the Tenaska plant would sell electricity to the Bonneville Power Administration (BPA). In 1995, BPA said that it no longer wanted to purchase power from the Tenaska powerplant. Construction of the plant was suspended in June 1995 and

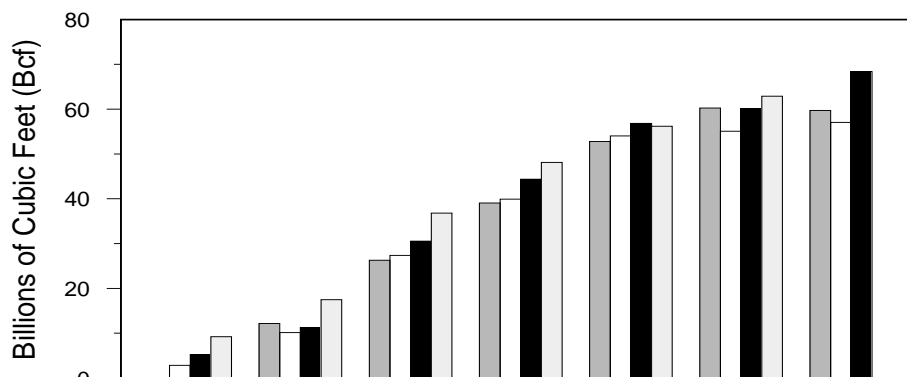
remains “on hold” pending dispute resolution of a suit Tenaska Partners filed against BPA in the U.S. Court of Federal Claims.

Over 80 percent of the Canadian natural gas sales to supply the U.S. NUGS market is done so under long-term purchase contracts, averaging 17 years in length. **Figure 3** shows the growth of these long-term Canadian natural gas imports for the NUGS from 1990 through the first nine months of 1996. During 1995, the U.S. NUGS market represented about 17 percent of all Canadian long-term gas sales to the United States. Last year Canadian natural gas supplied fuel to 34 different NUGS facilities under 50 long-term supply contracts. Many of these facilities were also supplied with domestic gas.

As shown in **Figure 3**, the growth rate in Canadian gas sales to NUGS has slowed during the past couple of years. Based on the limited number of proposed future projects scheduled for commercial start-up in the foreseeable future, it does not seem likely that the growth rate for the remainder of the decade will parallel that of the early 1990's. It seems likely that Canadian gas

Figure 3

CANADIAN NATURAL GAS IMPORTED UNDER LONG-TERM CONTRACTS FOR USE BY NON-UTILITY GENERATION SECTOR



	1990	1991	1992	1993	1994	1995	1996
1st Quarter	0	12,168,540	26,267,706	39,059,827	52,778,420	60,242,154	59,716,773
2nd Quarter	2,826,685	10,138,259	27,353,191	39,899,381	54,028,210	55,079,441	57,045,832
3rd Quarter	5,241,535	11,259,507	30,520,425	44,346,566	56,829,959	60,100,497	68,386,028
4th Quarter	9,190,775	17,468,059	36,779,576	48,097,201	56,188,521	62,882,975	
Total (Mcf)	17,258,995	51,034,365	120,920,898	171,402,975	219,825,110	238,305,067	185,148,633

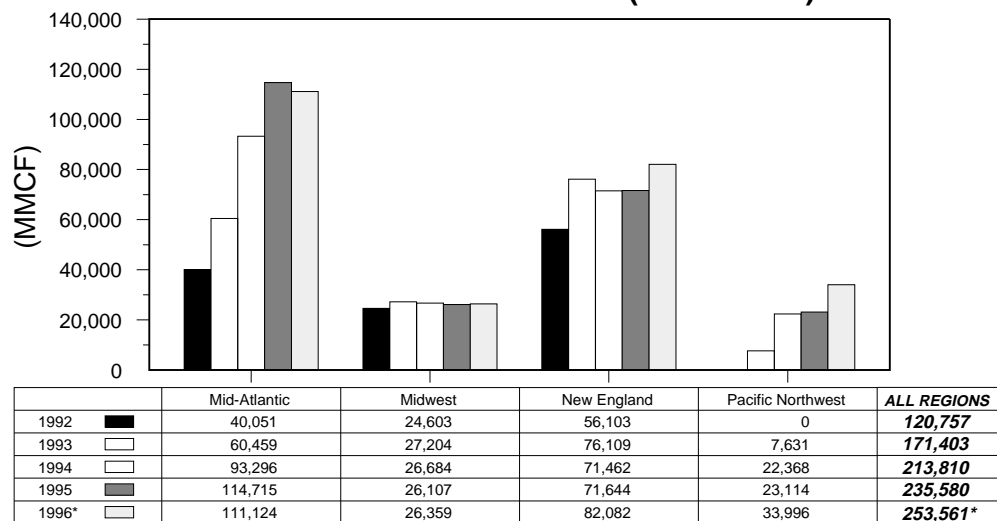
sales to the NUGS market will continue to grow but at a slower pace in the foreseeable future. Long-term Canadian gas sales to the NUGS likely will plateau at 300 Bcf per year in 1997, with prospects for smaller incremental growth during the remainder of the decade. Nevertheless, long-term Canadian gas sales to nonutilities should continue to grow given the federal government's environmental initiatives to improve air quality, and the possibility of natural gas replacing some of the electric generation which will be lost by the scheduled retirement of nuclear-fueled plants. Some other factors which may determine the future growth of Canadian natural gas in this market include the impacts resulting from the restructuring of the electricity industry, the electric power surplus in certain parts of the country, the price competitiveness of natural gas supplies, the projected economic growth in regions of

the country served historically by Canadian supplies, and the efforts by most Canadian gas suppliers to maintain diversity in their markets, both in terms of customer and geographic location.

Figure 4 illustrates the geographical distribution of Canadian long-term gas sales to the NUGS from 1992 through 1996. As shown, most of the growth in sales occurred in the Mid-Atlantic States during this time period. The graph also reflects the fact that several new cogeneration facilities commenced operation in the Pacific Northwest over the past three years. Based on our projected Canadian gas supplies fueling the NUGS in 1996, the primary NUGS market for Canadian gas will be the U.S. Northeast, with 76 percent of total sales. The Mid-Atlantic and New England Regions will represent about 44 percent and 32 percent of the market, respectively.

Figure 4

CANADIAN NATURAL GAS SUPPLIES DELIVERED UNDER LONG-TERM CONTRACTS TO NON-UTILITY GENERATION SECTOR BY GEOGRAPHIC REGION (1992 - 1996)



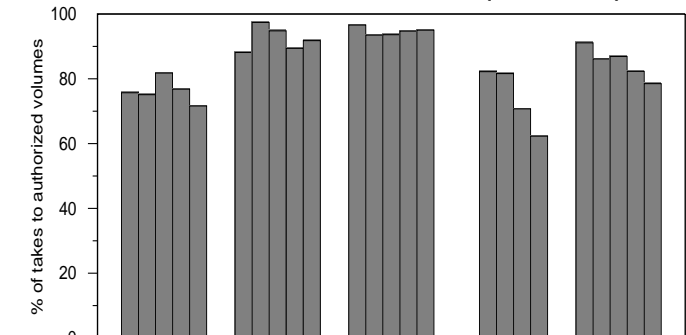
* Projected

Note: These data do not include small volumes of sales to other regions; e.g., South Atlantic.

Historically, long-term gas contracts supplying the NUGS have experienced a very high load factor (percentage of takes to authorized volumes). **Figure 5** shows from 1992 through the first nine months of 1996 the load factors of long-term Canadian natural gas contracts serving the NUGS, by geographic region. As depicted in the graph, the average load factor of **all** regions has declined from 91.1 percent in 1992 to 78.5 percent in the first nine months of 1996. Although the load factors for those long-term contracts supplying the NUGS in the Midwest and New England Regions have been relatively constant, there have been significantly lower takes under the long-term contracts serving the Mid-Atlantic and Pacific Northwest Regions. The region showing the largest drop in the average load factor were gas contracts serving the Pacific Northwest. The reduction in gas use by the NUGS in the Pacific Northwest is due mainly to the heavy rains and snow during the past two years, resulting in a large surplus of inexpensive hydroelectricity. The low load factors in some of the gas supply contracts with non-utilities in the Northeast are due in large part to more economic alternatives and a surplus of electric energy.

Figure 5

LOAD FACTORS OF LONG-TERM CANADIAN NATURAL GAS CONTRACTS SERVING THE NON-UTILITY GENERATION SECTOR, BY GEOGRAPHIC REGION (1992 - 1996)



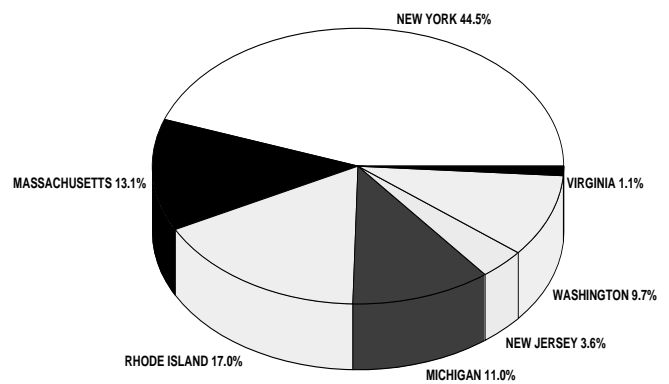
	Mid-Atlantic	Midwest	New England	Pacific Northwest	ALL REGIONS
1992	75.7	88.1	96.6	N/A	91.1
1993	75.1	97.4	93.5	82.2	86.1
1994	81.8	94.8	93.6	81.6	86.9
1995	76.8	89.4	94.7	70.7	82.3
1996*	71.6	91.8	95.0	62.3	78.5

* Through the first 9 months of the year.

Figure 6 is a pie chart showing the 1995 state-by-state distribution of long-term Canadian gas imports under long-term contracts for use by the NUGS. As shown, the primary NUGS market for Canadian gas was the U.S. Northeast, with 78.2 percent of total sales. New York State was the single largest user, with 44.5 percent of the market.

Figure 6

DISTRIBUTION OF LONG-TERM CANADIAN GAS SALES TO THE NUGS 1995



TOTAL SALES: 238.3 Bcf