Understanding the Environment: World and North America Supply & Demand

by
Peter Miles
Senior Vice President, Research
Canadian Energy Research Institute

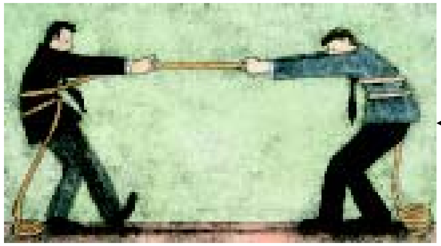
About the Canadian Energy Research Institute

- Founded in 1975
- Applied energy economics research
- Independent and objective
- Supported by public and private sector members

CERI Scenarios

$22 (US$2000)
Material World

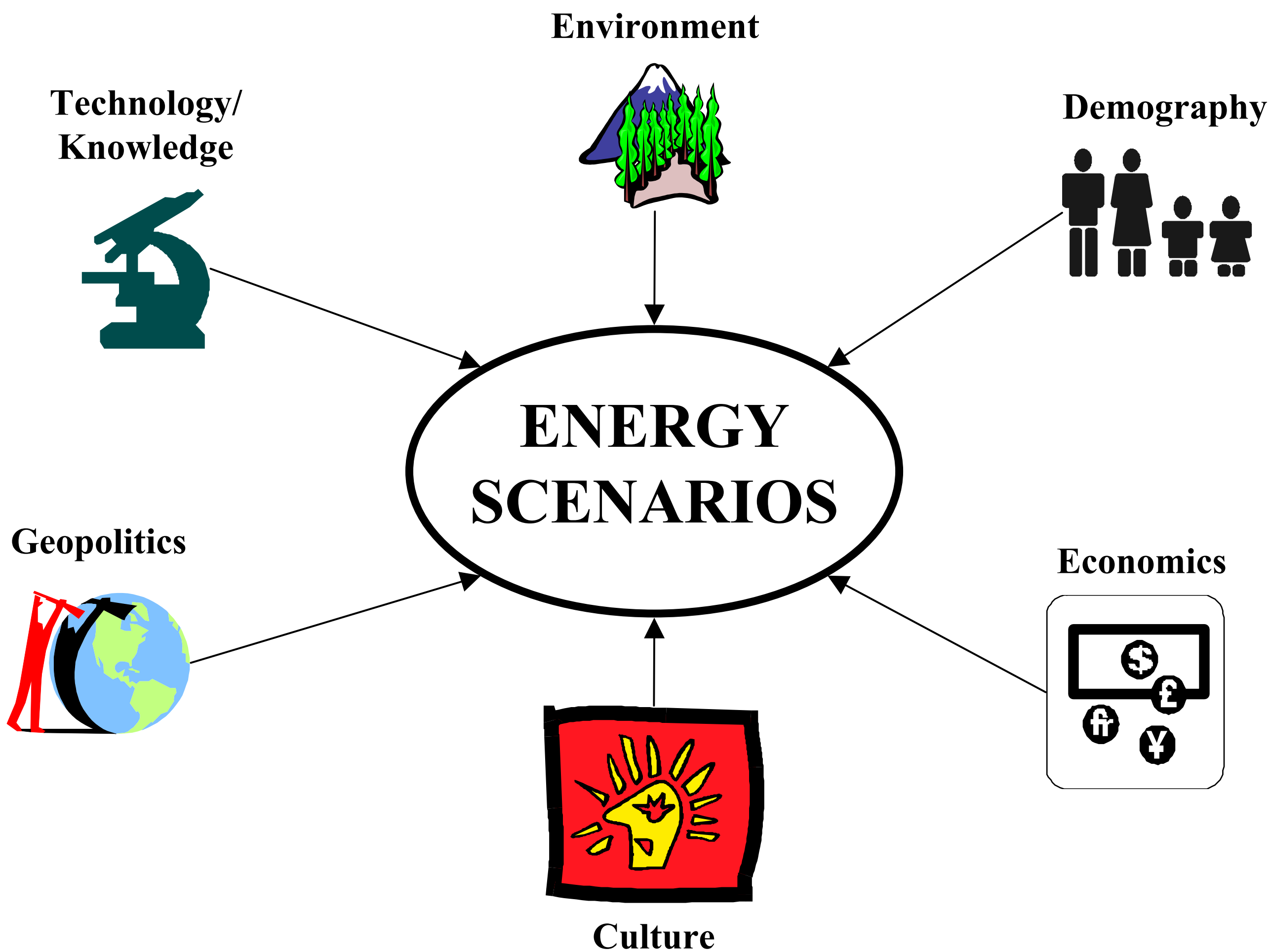
$18 (US$2000)
Nasty, Brutish and Short



ENERGY SCENARIOS

$14 (US$2000)
Utopia

Scenario Drivers



CANADIAN ENERGY RESEARCH INSTITUTE

Material World

- Economics dominates politics
- Information, knowledge, globalization
- Environmental degradation continues
- Prosperity abounds

Nasty, Brutish and Short

- Life is a zero-sum game
- Regional conflict destroys globalization
- Severe environmental destruction
- Lack of economic opportunity

Utopia

- Economic growth more evenly distributed
- Pragmatic environmentalism
- Global social contract

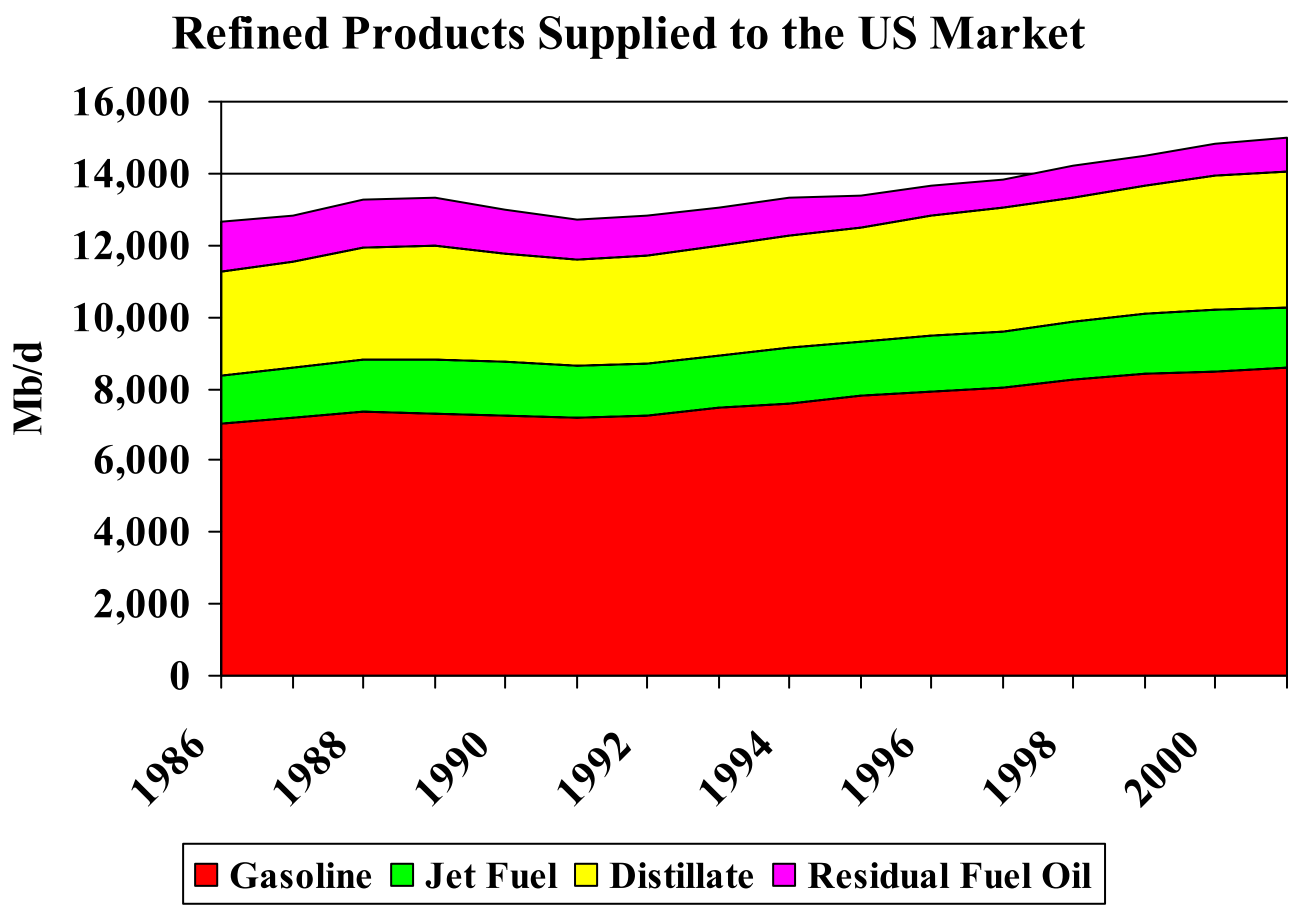
North American Oil Market

	1999	2005	2010
Crude Oil Supply (MMb/d)	14.0	14.9	15.3
Crude Oil Demand (MMb/d)	23.8	25.1	26.3
Import Dependency (%)	41	41	42

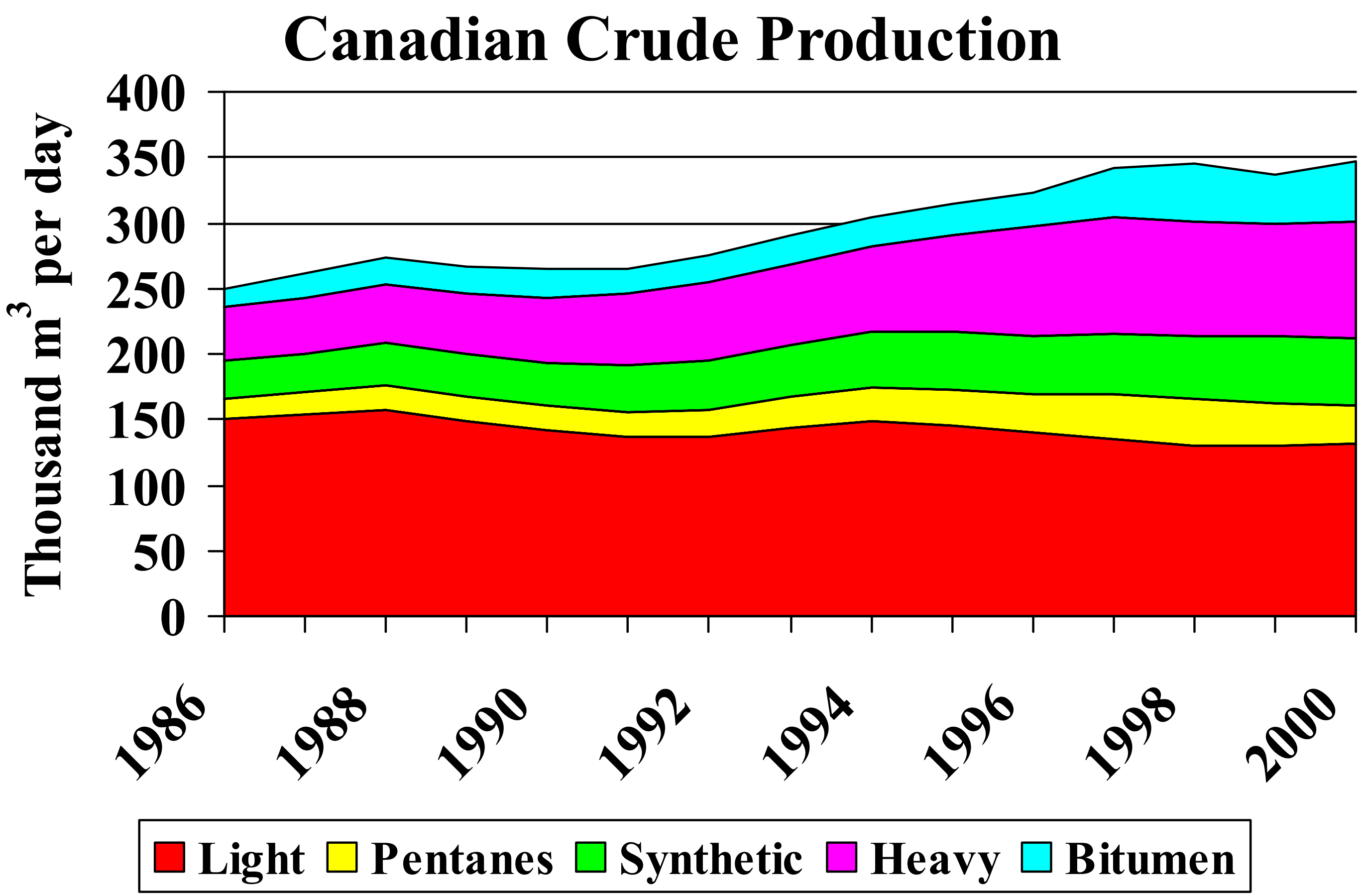
The Canadian Contribution
(billion barrels in place)

	Produced	Remaining	Total
WCSB	17.2	13.5	30.7
Mackenzie/Beaufort	0.0	6.7	6.7
Grand Banks, Nova Scotia	0.3	5.0	5.3
Other Frontier	0.0	9.4	9.4
Sub-Total	17.5	34.6	52.1
Oil Sands			315

The Thirst for Adventure

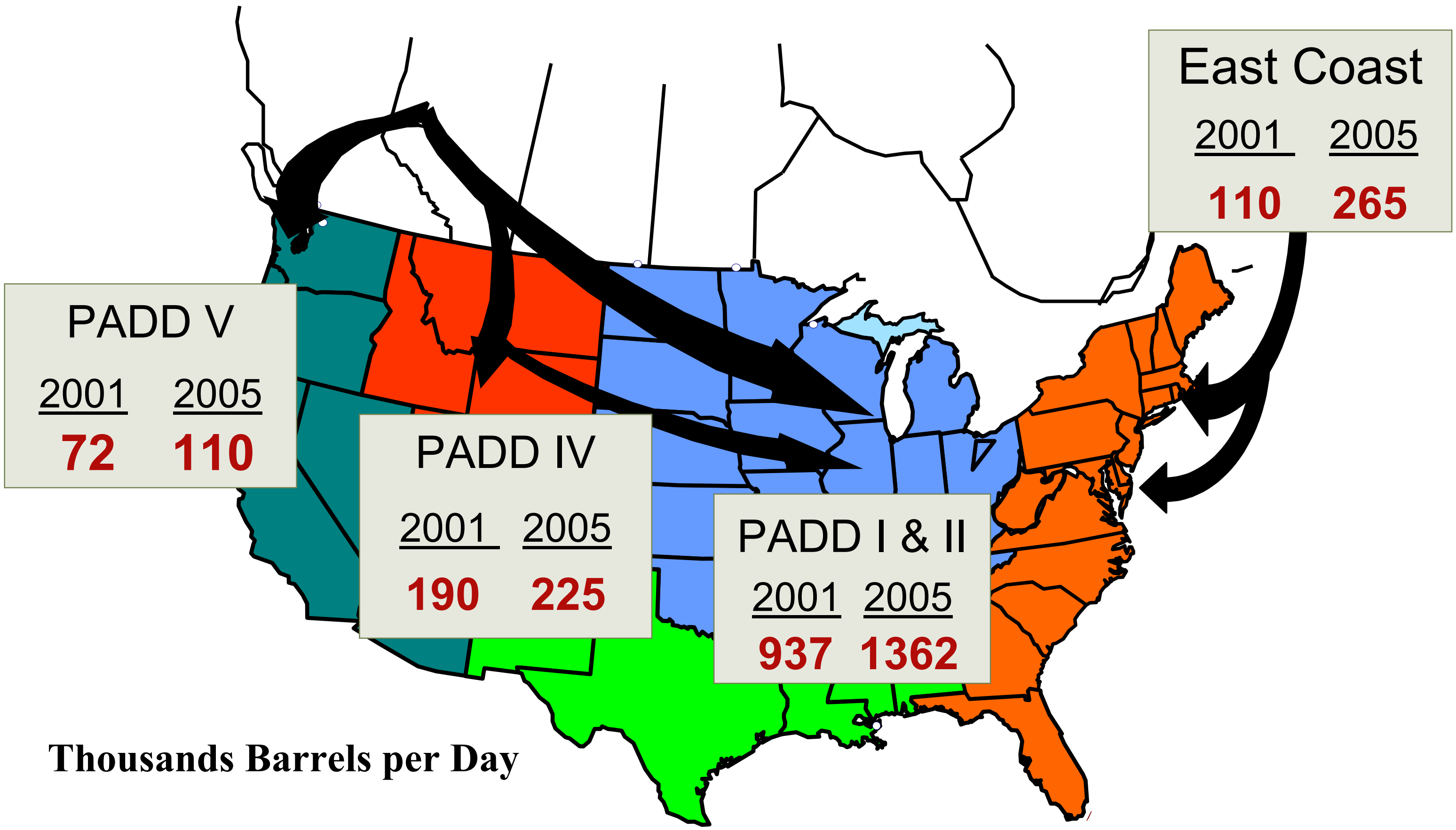


The Darkening of the Barrel



CANADIAN ENERGY RESEARCH INSTITUTE

Logistical Challenges



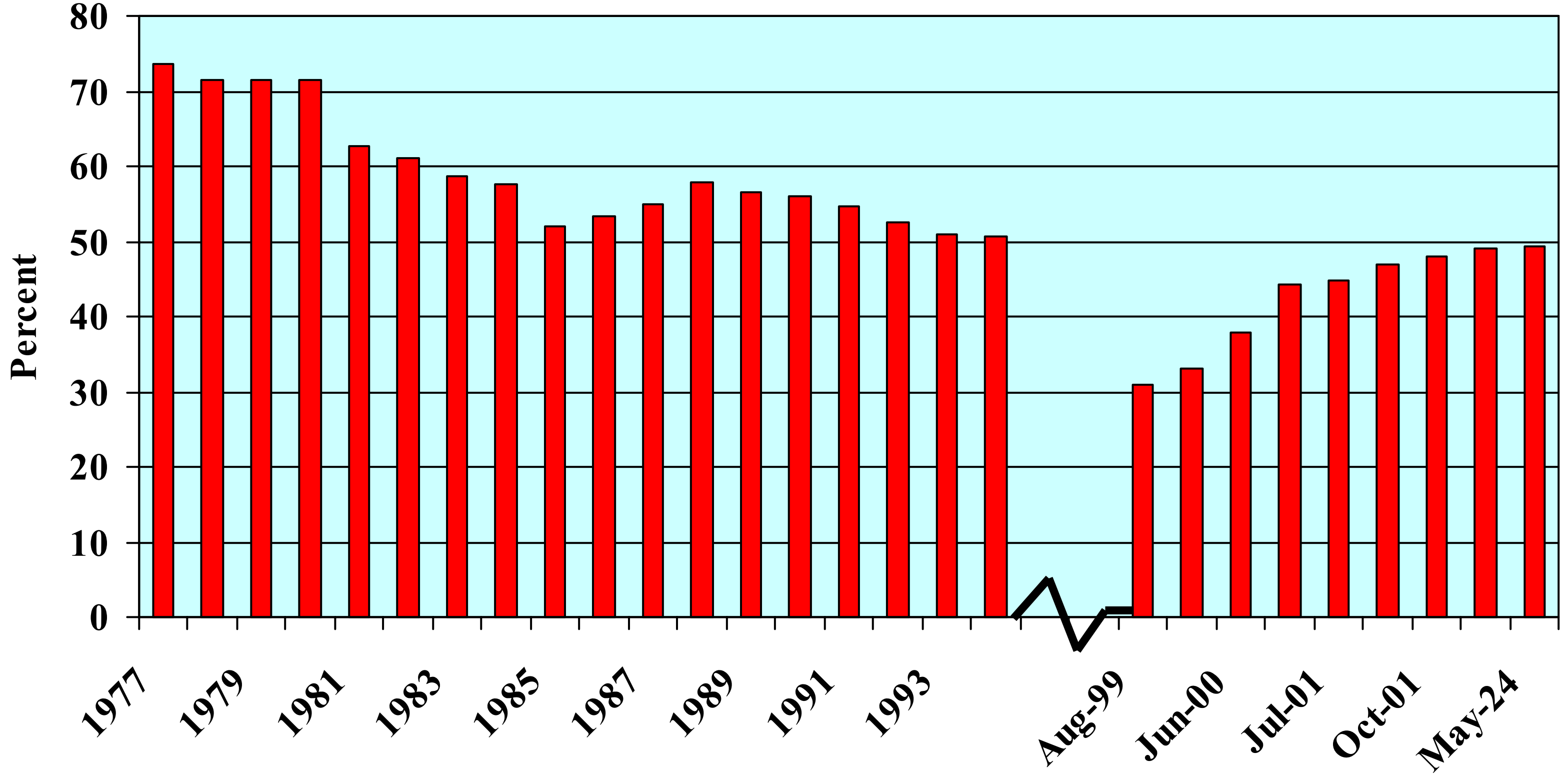
Thousands Barrels per Day

SOURCE: CAPP.

CERI CANADIAN ENERGY RESEARCH INSTITUTE

Influencing Our Destiny

Foreign Ownership in the Upstream Sector



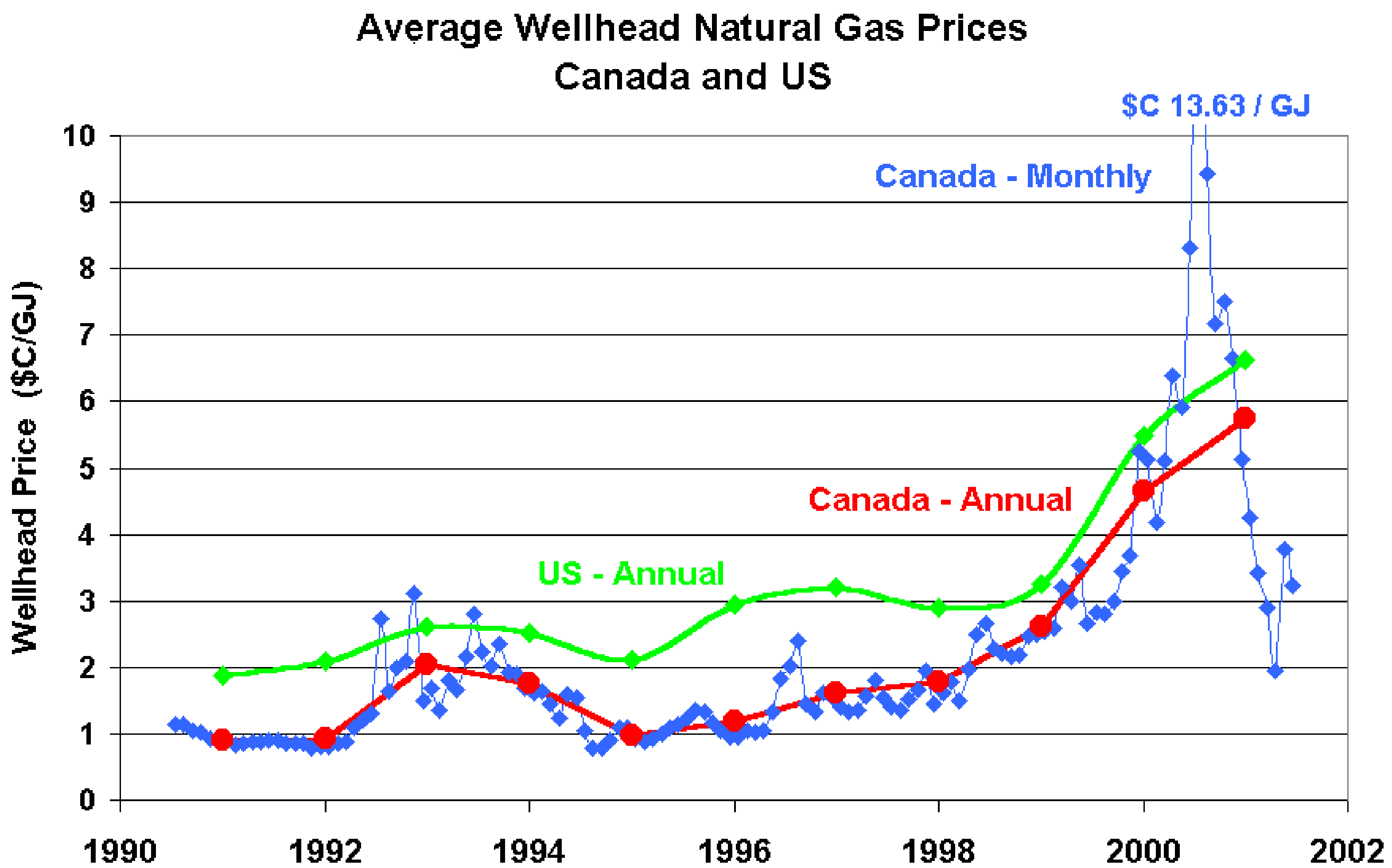
SOURCES: (1) 1977-1994 Petroleum Monitoring Agency; and (2) 2000-01 CAPP:
Based on residency of ownership of shares and boe production.

Building for the Future

($billions investment)

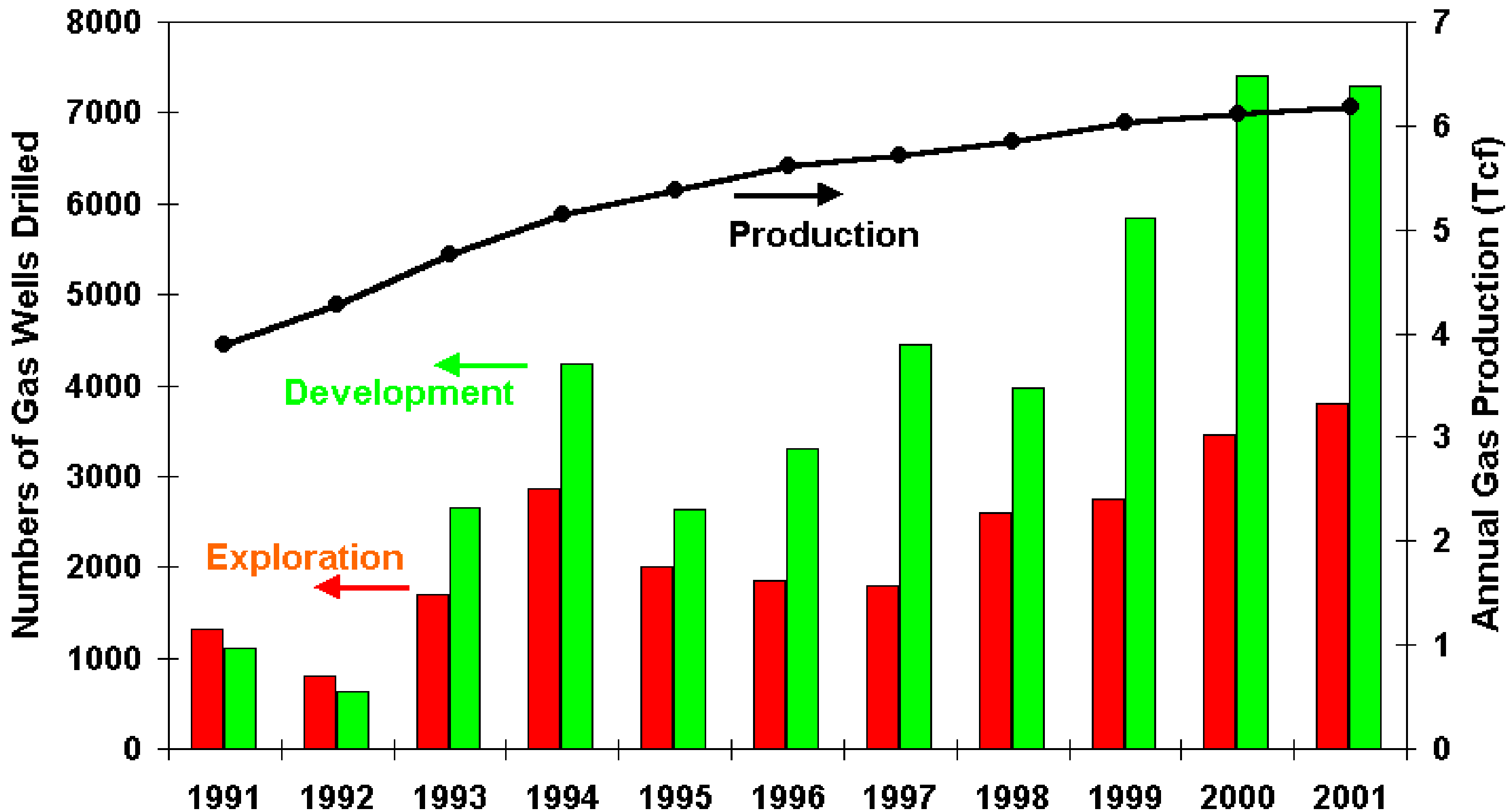
	1999	2000	2001	2002
WCSB	11.0	17.0	20.0	18.0
Northern Canada	0.2	0.3	0.4	0.5
Oil Sands	2.4	4.2	5.0	5.0
East Coast Offshore	2.7	1.8	1.5	1.0
International	1.7	2.1	3.5	3.0

SOURCE: CAPP.



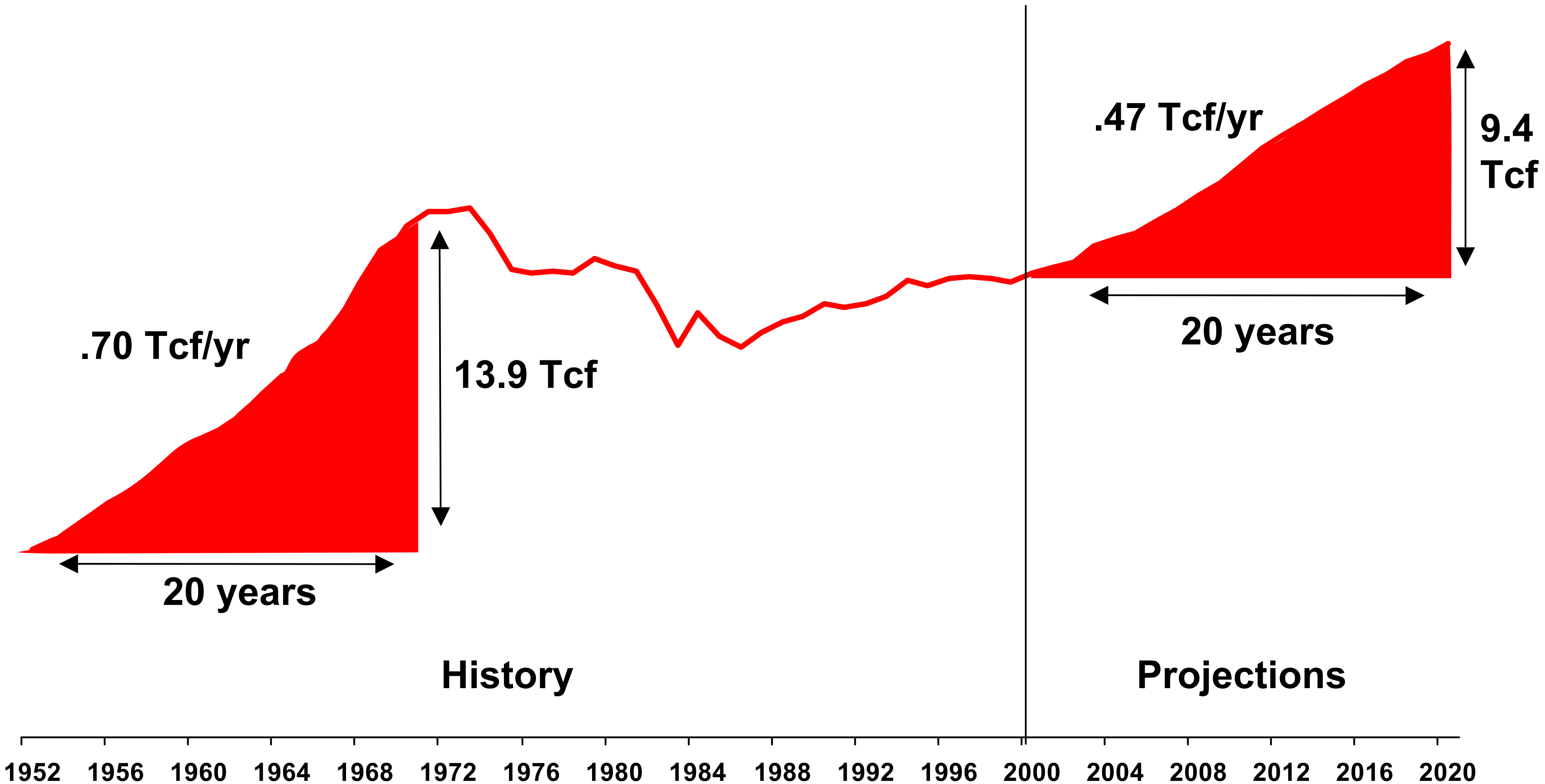
CANADIAN ENERGY RESEARCH INSTITUTE

Western Canada: Gas Production and Drilling



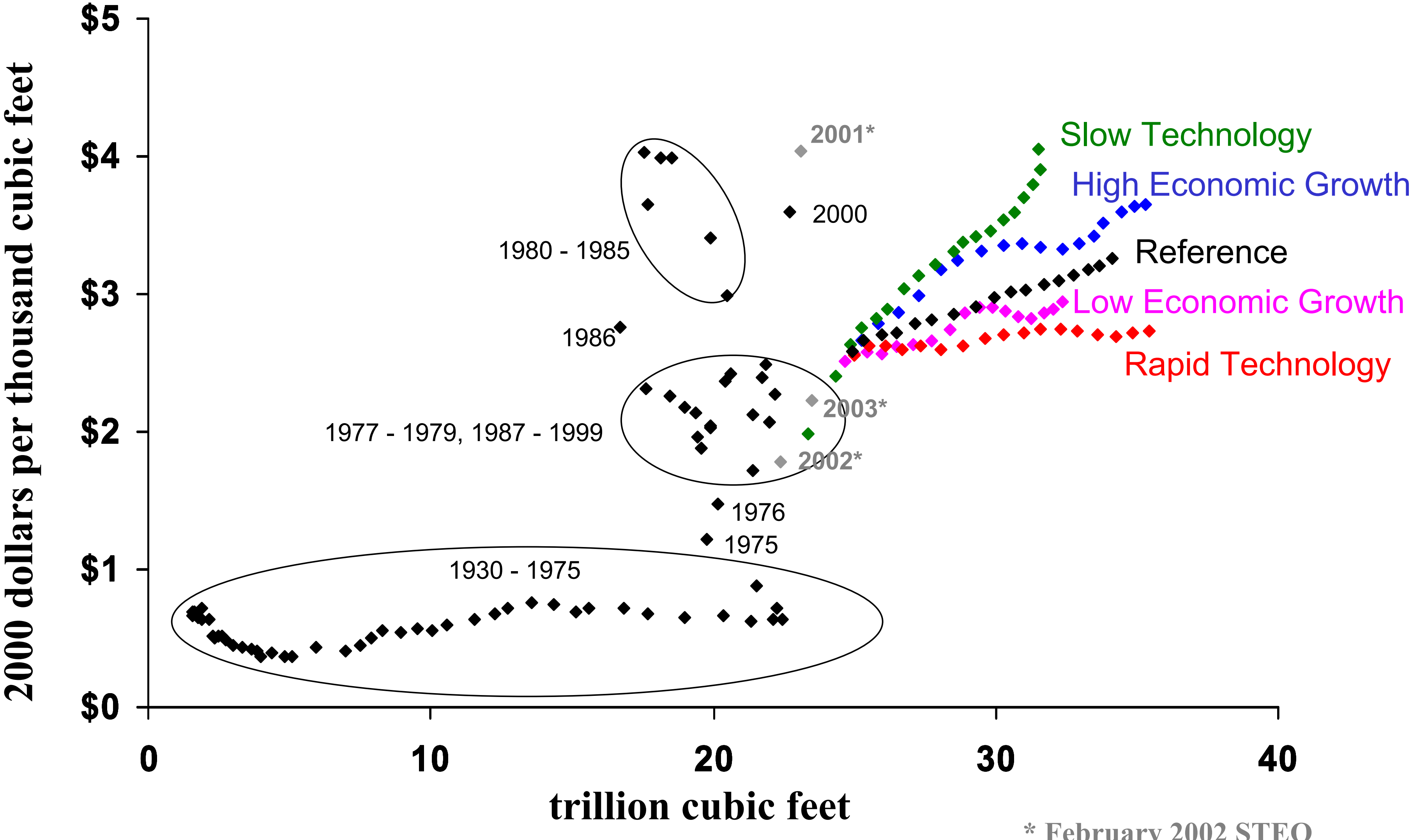
Data Sources: CAPP with analysis by CERI

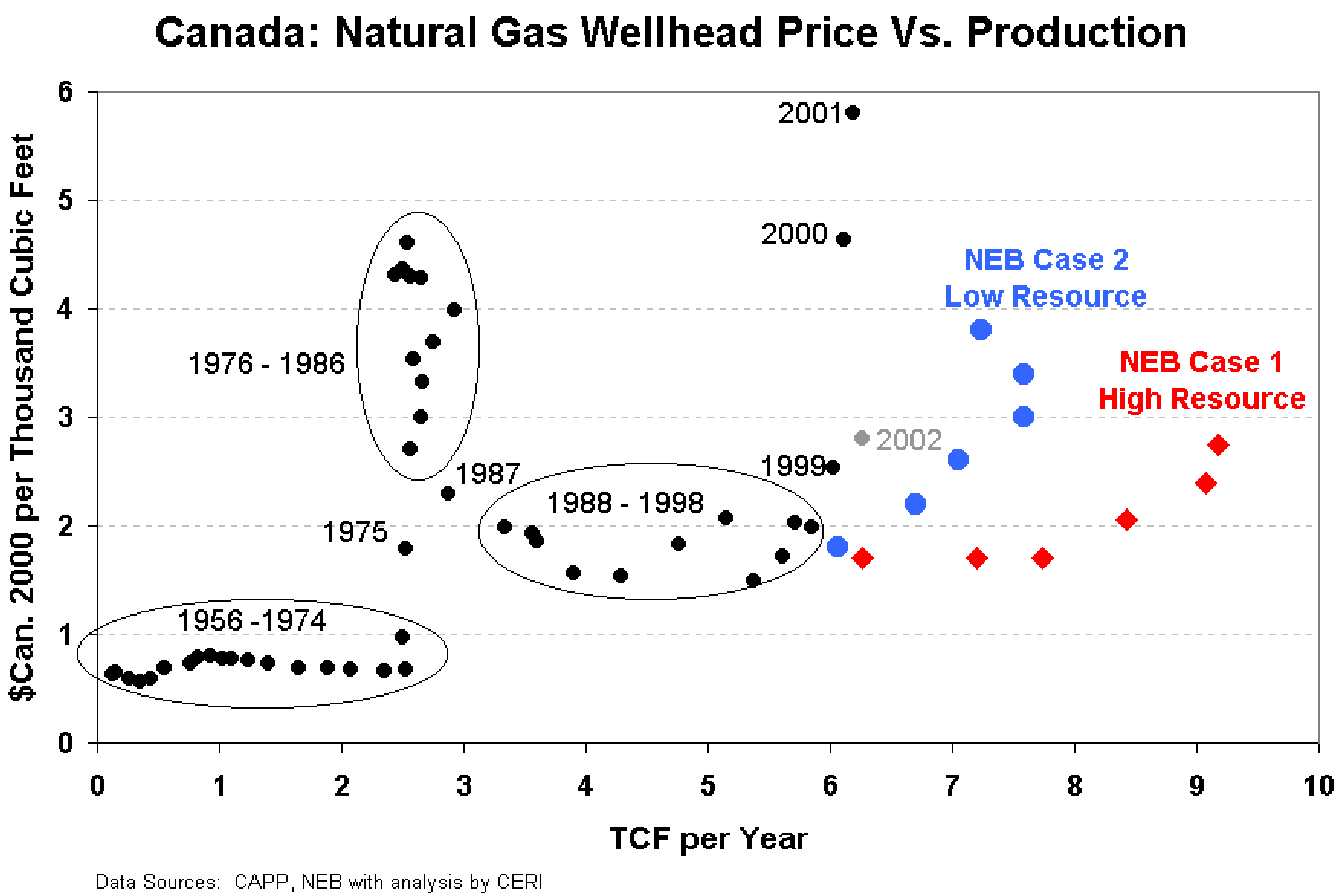
Natural Gas Production,1952 - 2020 (trillion cubic feet)



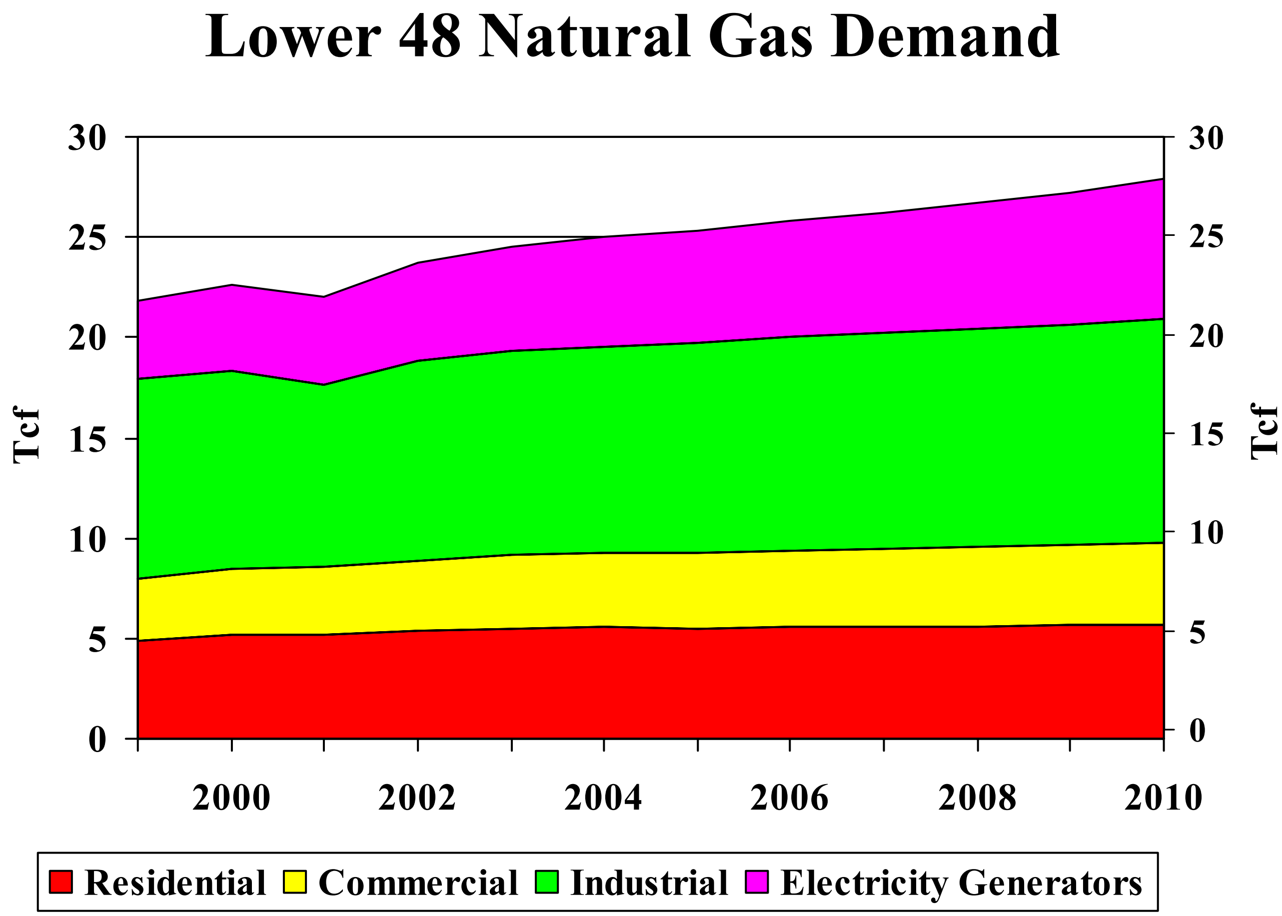
www.eia.doe.gov

Natural Gas Wellhead Prices vs. Total Supply, 1930 - 2020




Canada: Natural Gas Wellhead Price Vs. Production
$Can. 2000 per Thousand Cubic Feet
TCF per Year
0
1
2
3
4
5
6
7
8
9
10
2001
2000
NEB Case 2
Low Resource
NEB Case 1
High Resource
1976 - 1986
1987
2002
1999
1988 - 1998
1975
1956 -1974
Data Sources: CAPP, NEB with analysis by CERI

The Thirst for Power



The Far-Away Future?

Natural Gas Ultimate Potential
(Tcf)

Region	Produced	Remaining	Total
Alberta	220	50	270
British Columbia	37	13	50
Saskatchewan	4	5	9
Mackenzie/Beaufort	0	64	64
East Coast Offshore	0.5	62.5	63
Other Frontier	0	183	183

SOURCE: NEB.

Patience Rewarded?

- 6-9 Tcf discovered before 1975 (2-3 Tcf since?)
- Current production 4.5 Bcf/yr
- $650 million work bids in Mackenzie/ Beaufort since end of 1998
- $118 million work bids in Central Mackenzie since end of 1994
- $29 million work bids in Southern NWT since end of 1994

Mexico’s Standoff

	Mexico	Canada
Reserves (Tcf)	55.7	60.7
Production (Bcf/d)	3.3	16
Gas Wells in 2000 (estimated)	300	9,200
Annual Investment ($US millions)	200	6,000
Export Revenues in 2000 ($US millions)	35	12,000
Upstream Participants	1	600

Bringing It All Together

- Timing is everything – remember the winter of 2000-2001
- Frontier enthusiasm waning?
- Watch for commitments that bind supplies to markets
- Mexico remains a wild card

Fortress America

- Increased investment in energy processing infrastructure – particularly refineries
- Opening of ANWR to exploration
- Natural gas pipeline subsidies: What's up with that?

Conclusions

- Continued opportunity for higher-cost supplies
- Canada is still viewed as part of the solution
- The Northern debate continues