

Cook Inlet Natural Gas Supply and Demand

**Kevin Banks, Acting Director
Division of Oil and Gas**

February 2007

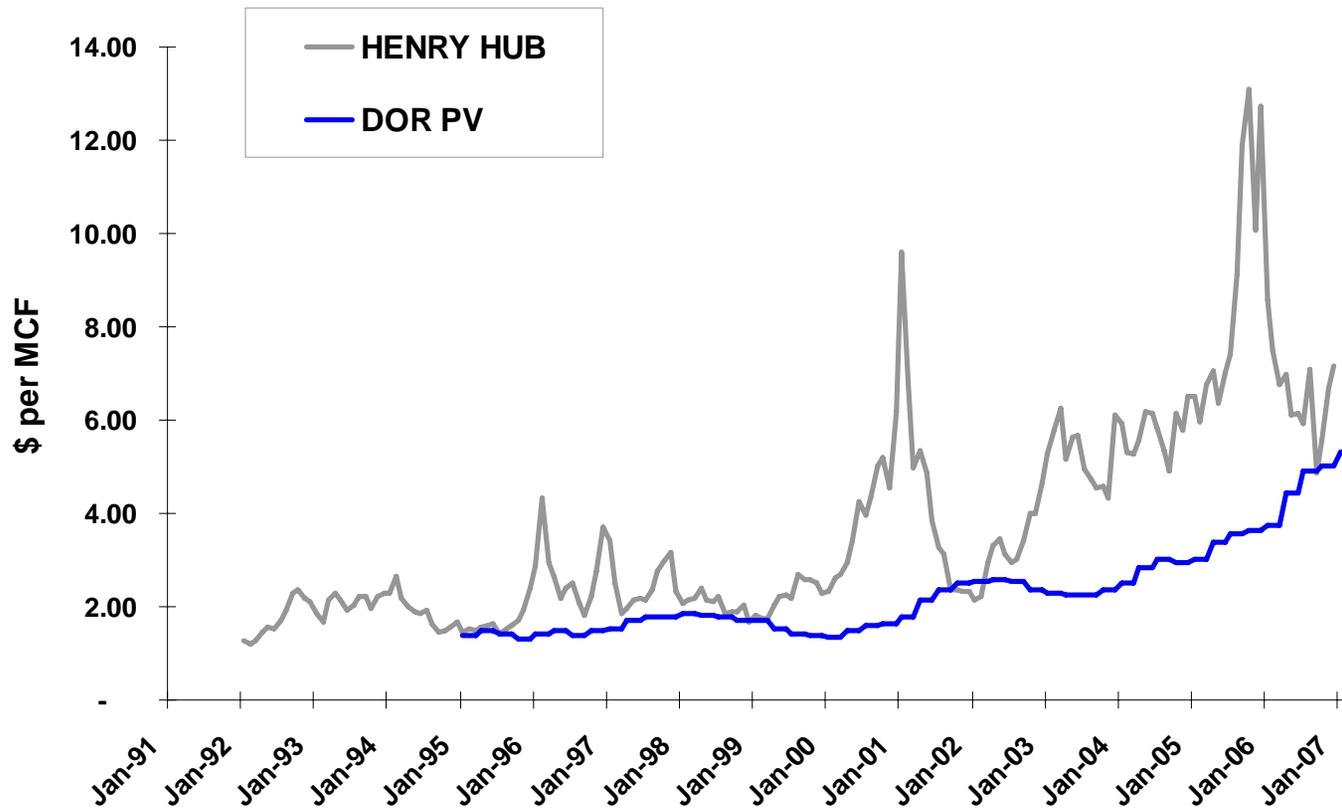


Alaska Department of
**Natural
Resources**

Issues

- **Price**
- **Agrium**
- **Extension of LNG Export License**

Prices Paid by Utilities

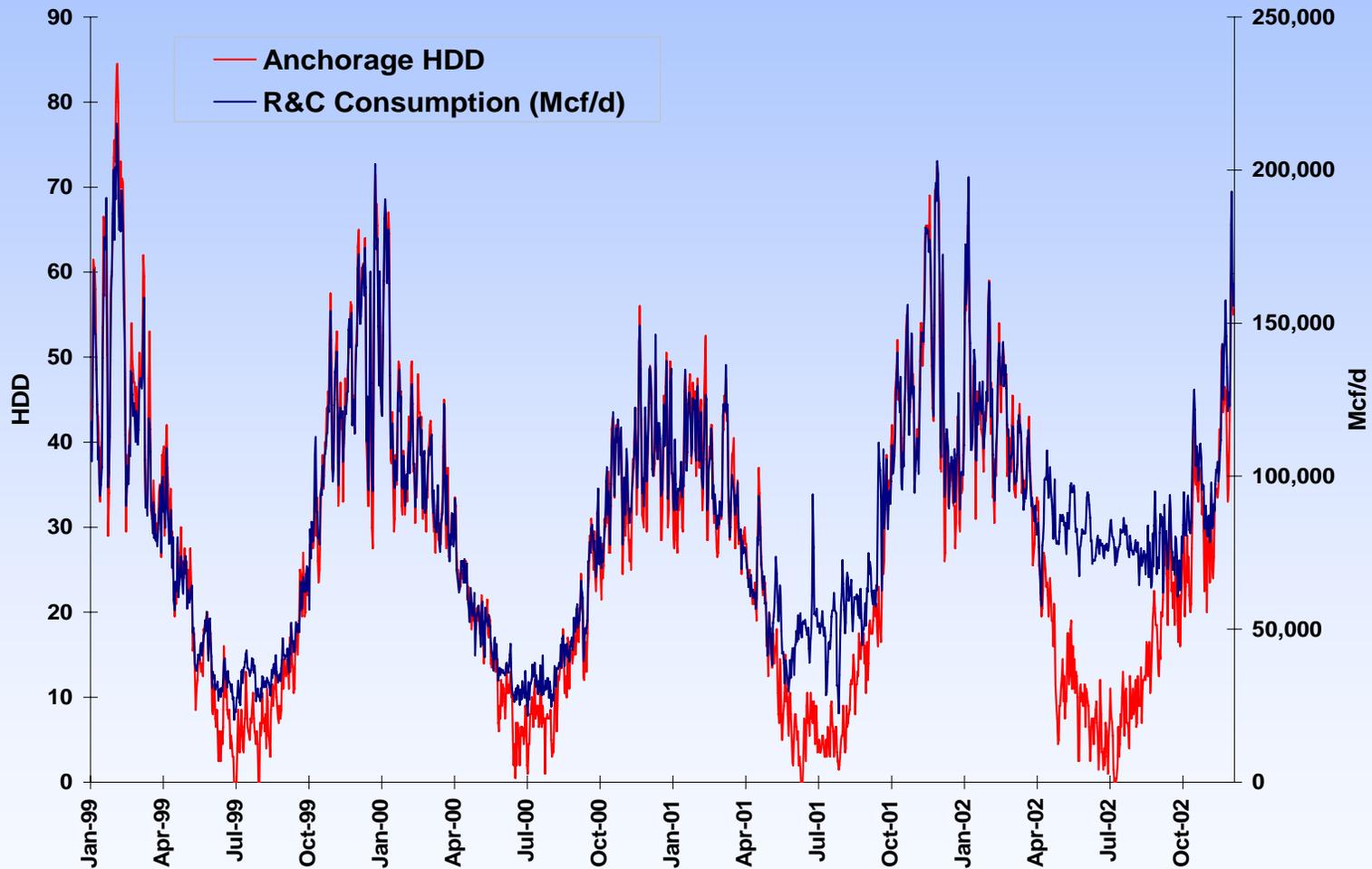


Prevailing value is the weighted average price of significant sales of gas to publicly regulated utilities in Cook Inlet.

Industrial Use is 2/3's of the Total

		2005		1996-2005	
		<u>(Bcf/Yr)</u>	<u>(%)</u>	<u>(Bcf/Yr)</u>	<u>(%)</u>
Res & Com		33	16%	31	15%
Electric		42	20%	36	17%
Industrial		132	64%	145	68%
	LNG	75	36%	76	36%
	Fertilizer	40	19%	48	23%
	Field Ops	17	8%	21	10%
Total		207	100%	213	100%

Residential and Commercial Use Subject to Seasonal Swings



One heating degree-day is given for each degree that the daily mean temperature departs below the base of 65°F. HDD is used as an indication of fuel consumption. Source: Lukens Energy Group (for DNR), 2004.

Gas Supply

- Remaining Proved-Developed-Producing (PDP) = 1,648 Bcf.
- PDP Reserves-to-Production Ratio (R/P)
 - 1980 21
 - 1990 17
 - 2000 10
 - 2006 8
- Yet-to-Find
 - 1.8 Tcf of undiscovered gas
 - “Missing Fields” in range of 200 Bcf to 1.5 Tcf OGIP*
 - Many small/medium fields Yet-to-Find

* David Hite. *Cook Inlet Resource Potential*, for South Central AK Energy Forum (Sept 2006.)

Reserves: Proved and Potential

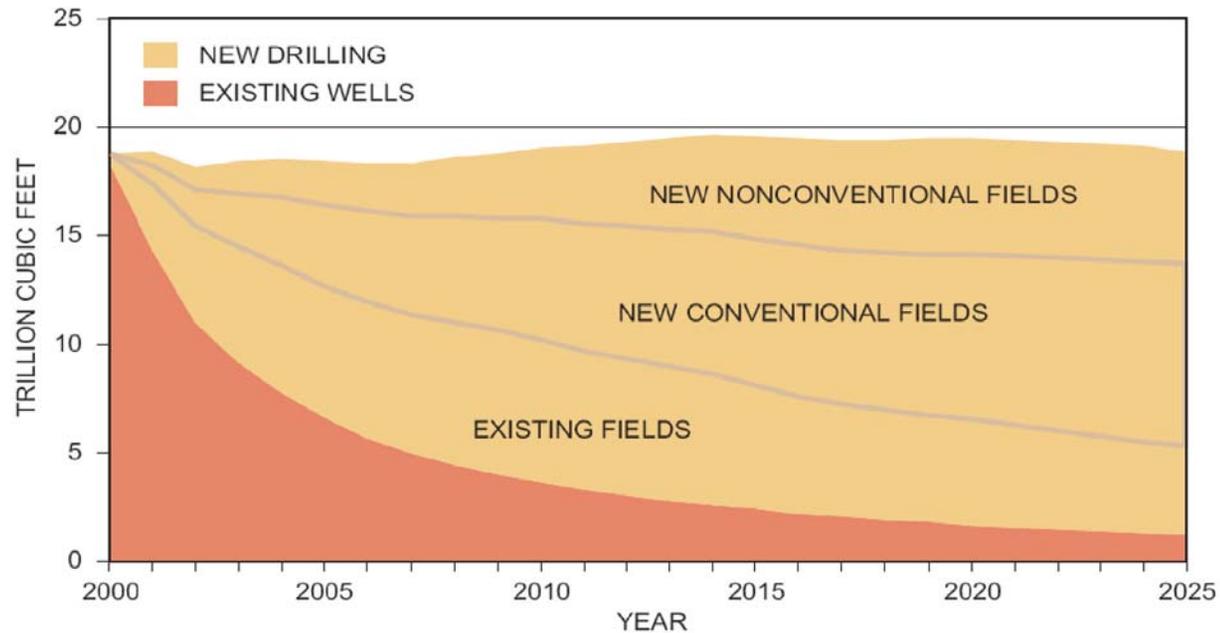
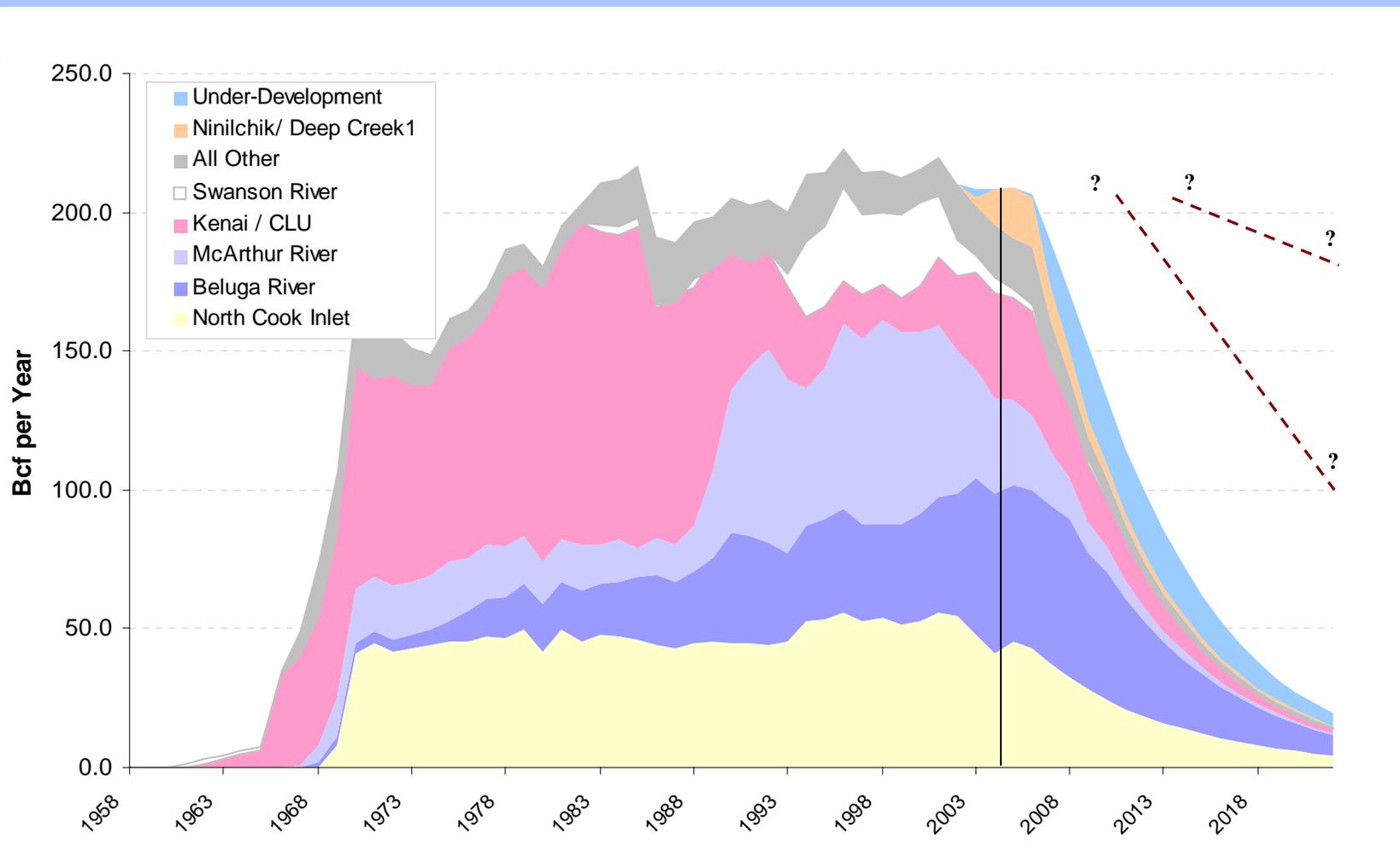


FIGURE 28
LOWER-48 PRODUCTION, EXISTING AND FUTURE WELLS

National Petroleum Council – Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy, September 2003.



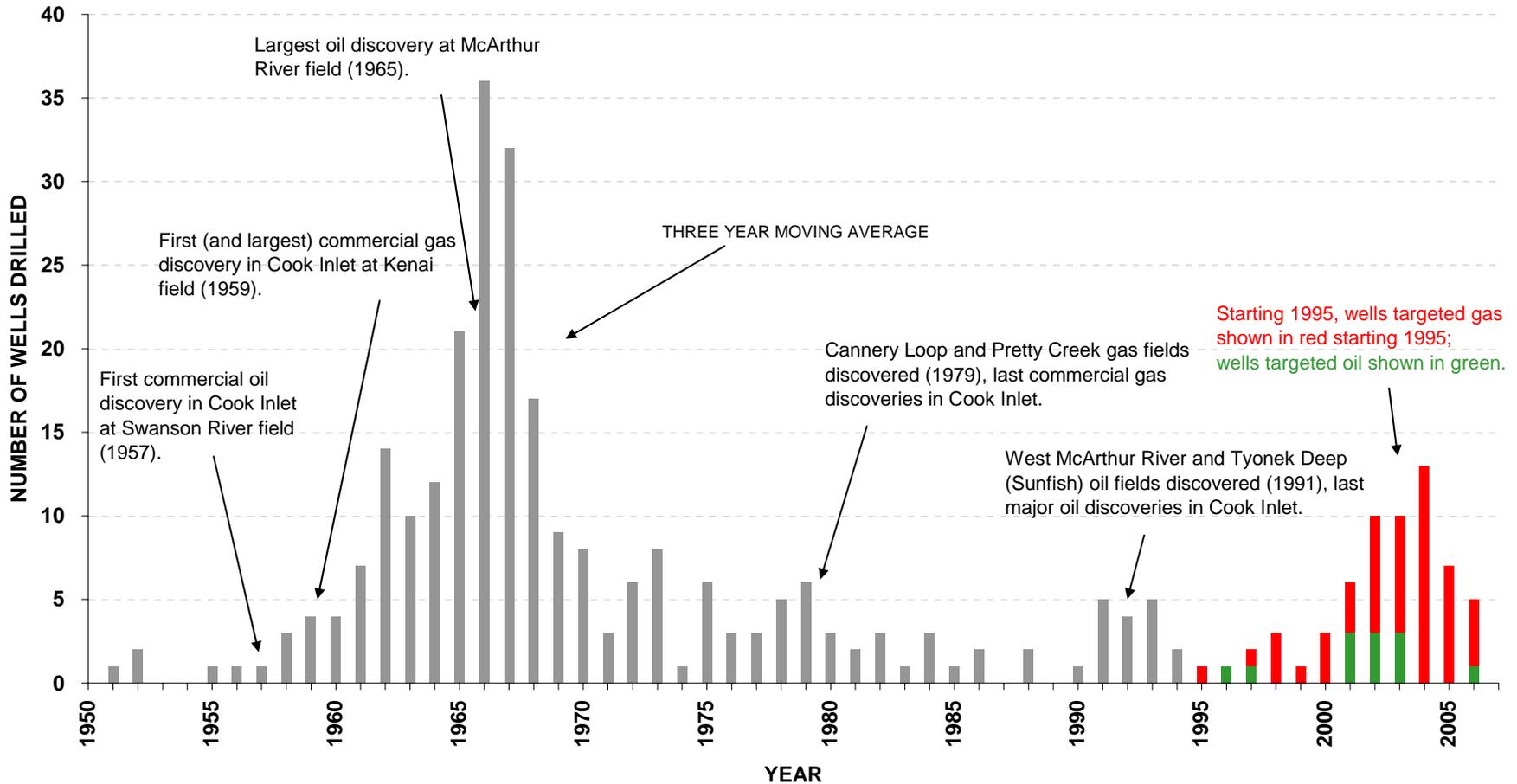
Cook Inlet Historic and Forecast Gas Production, 1958 - 2025



Market Response to Rising Prices

Year	Number Tracts Sold	Avg. Winning Bid \$/ Acre
1999	41	\$11.42
2000	27	\$8.72
2001	30	\$9.00
2002	21	\$6.50
2003	27	\$9.34
2004	72	\$7.33
2005	55	\$6.12
2006	71	\$13.19
TOTAL	344	
AVG.	43	\$8.95

Cook Inlet Exploration Wells Drilled, 1950 - 2006

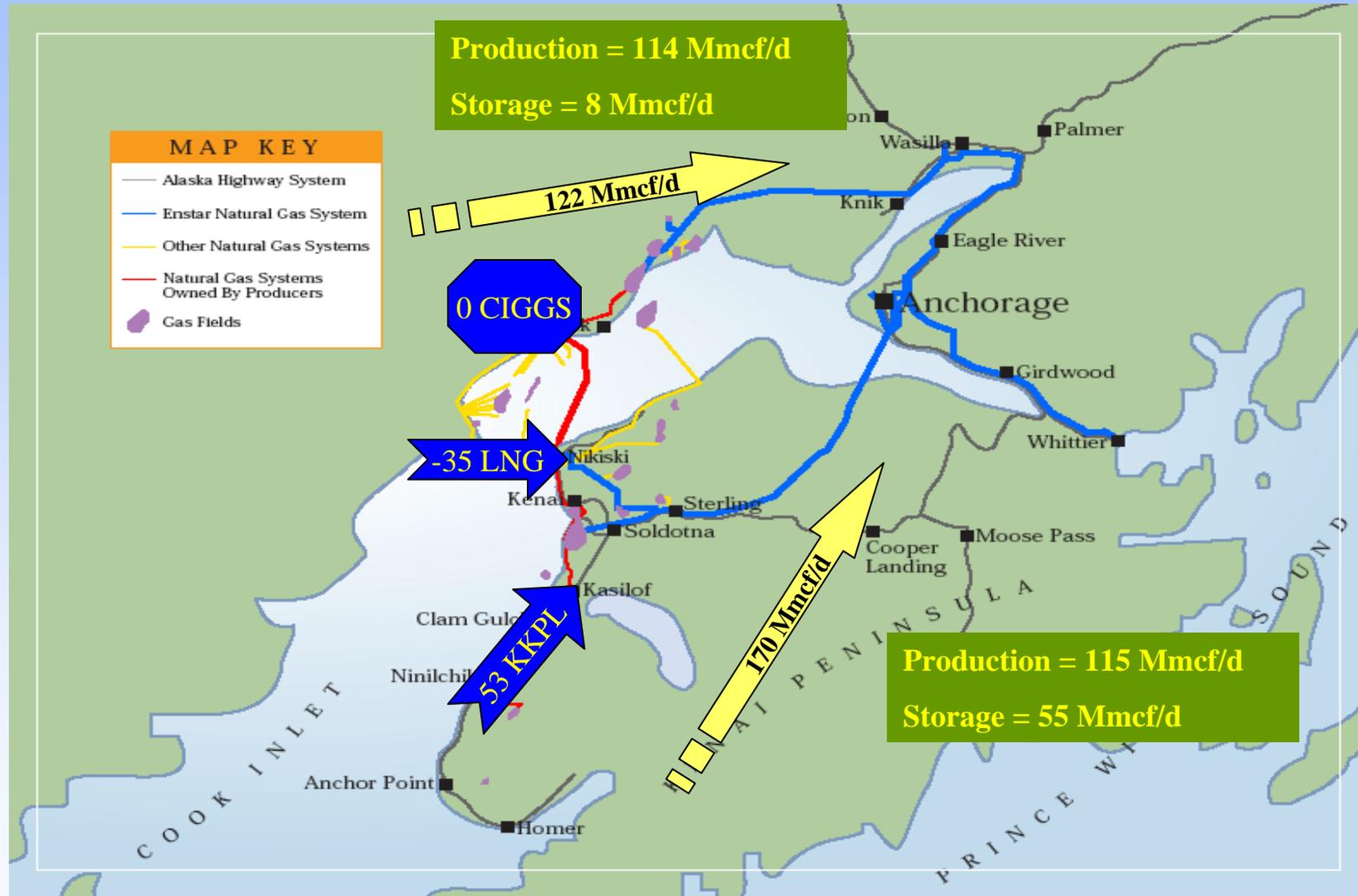


Storage

- Storage common in L-48 to serve peak demand.
- Today, four working storage formations permitted and running (depleted reservoirs)
 - Kenai Gas Field, Pretty Creek, Swanson River (2, fed lands)
 - 10 bcf design capacity
 - Operations challenges (depleted Reservoirs)
- Gas storage increases overall efficiency of infrastructure and is important for Cook Inlet peak load deliverability [and, possibly, to Spur line gas balancing].

January 9, 2007

292 Mmcf/d (-10 degrees F)



Appendix

Supply

Cook Inlet Areawide Lease Sale Results

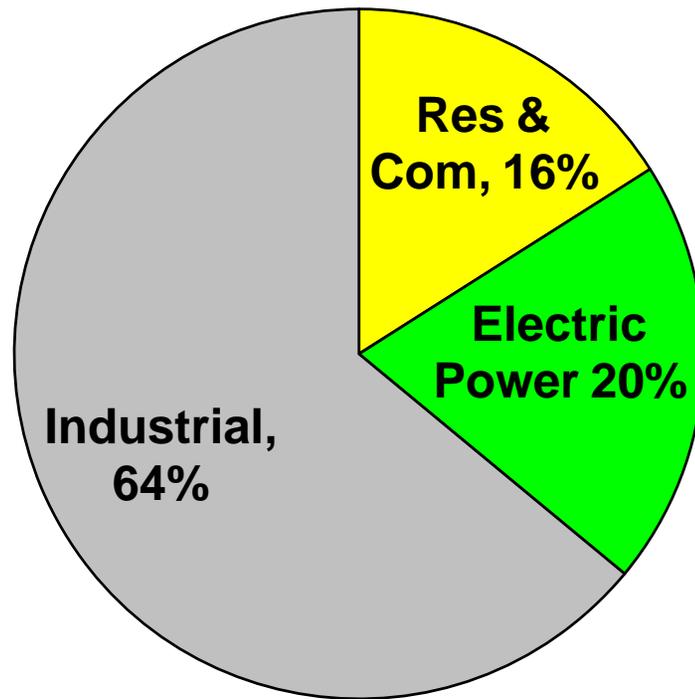
	Number Bids Rec'd	Number Tracts Sold	Multiple Bid Tracts	Total Acreage Sold	Total Pre- Adjudication Bonus Rec'd	Avg. Winning Bid	Max Bid Rec'd	Major Oil Company	Active Independ- ent	Majors &/or Indep. Consortium	Small Co. & Individual Investor(s)
				Acre	\$	\$ / Acre	\$ / Acre	Number of Tracts Sold By Category			
1999	54	41	5	114,269	\$1,434,950	\$11.42	\$53.42	5	13	0	23
2000	27	27	0	69,928	\$609,358	\$8.72	\$36.01	3	21	0	3
2001	31	30	1	135,040	\$1,215,046	\$9.00	\$22.18	0	7	0	23
2002	24	21	3	64,923	\$421,840	\$6.50	\$27.03	2	6	0	13
2003	28	27	1	73,869	\$689,949	\$9.34	\$33.28	1	15	0	11
2004	77	72	5	363,520	\$2,629,820	\$7.33	\$40.25	11	49	0	12
2005	62	55	7	245,120	\$1,501,152	\$6.12	\$11.26	0	23	0	32
2006	92	71	21	364,160	\$4,802,650	\$13.19	\$45.41	5	31	0	36
TOTAL	395	344	43	1,430,829	13,304,766						
AVG.	49	43	5	178,854	\$1,663,096	\$8.95	\$33.60	3	21	0	19

Exploration Drilling

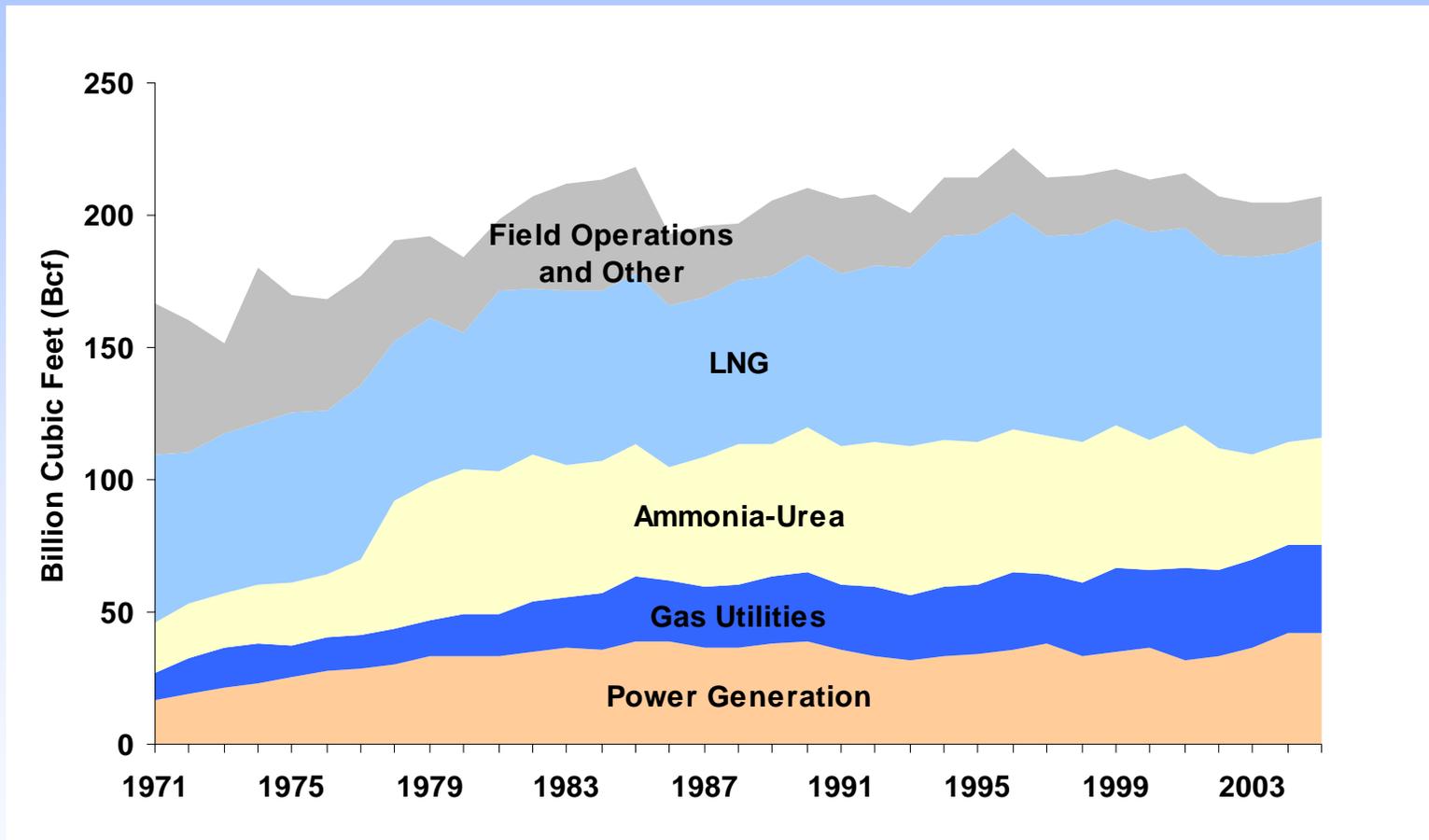
- AOGCC Reports Production from 29 Fields
- Three Fields Account for 80% of Estimated Ultimate Recovery
 - Kenai
 - Beluga
 - Tyonek
- Of the 320 Cook Inlet Basin exploration wells drilled to date, only 30 targeted gas; nearly all since mid 1990s.
- Field Size Distribution indicates missing fields may exist

Demand

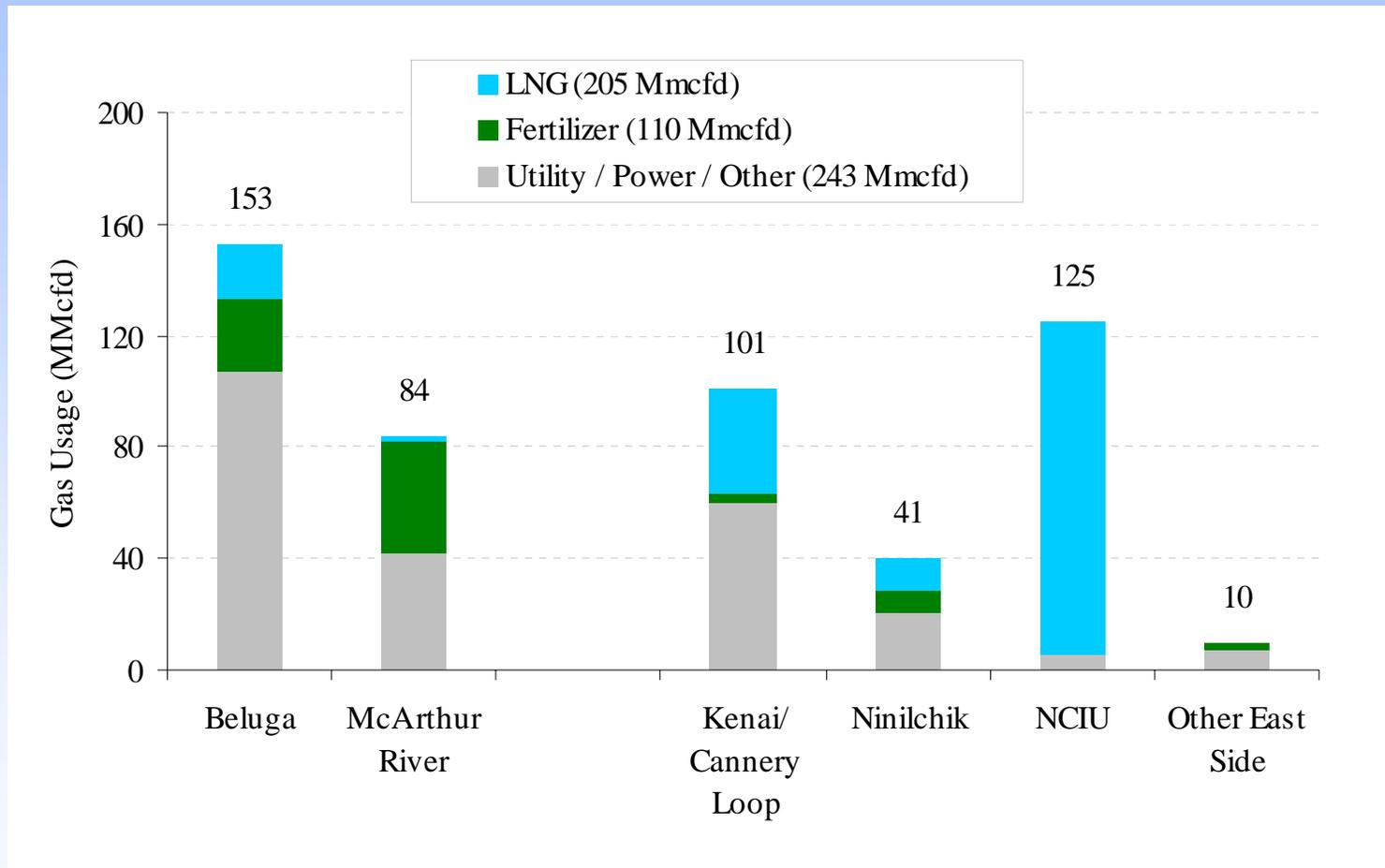
Total Gas Consumption in 2005 = 207 Billion Cubic Feet (Bcf)



Annual Average Natural Gas Consumption by Major Group 1971 - 2005



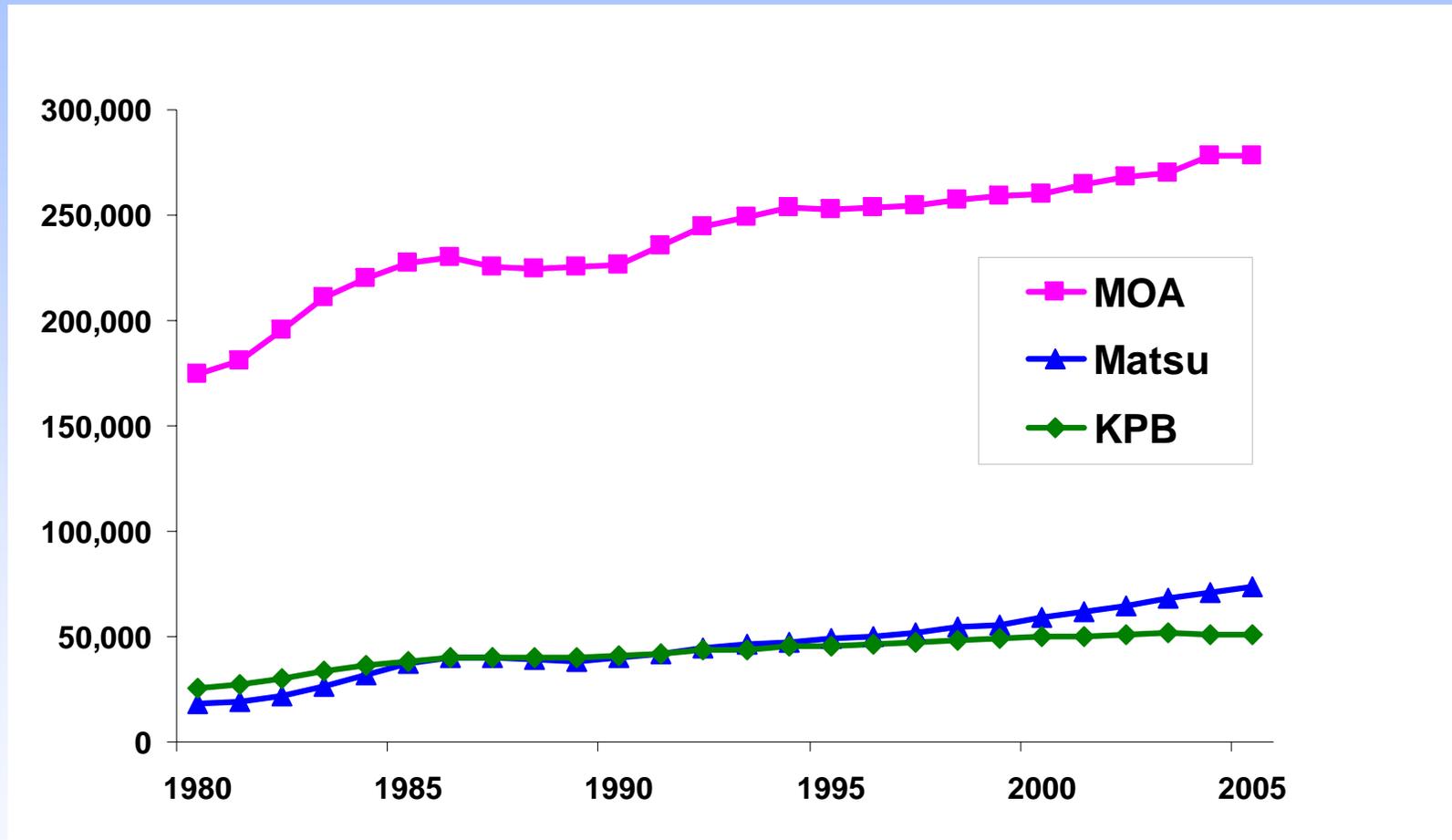
Cook Inlet Gas Usage by Major Fields 2005 (MMcfd)



Residential & Commercial

- Growth driven by South Central Economy
 - South Central Pop Growth 1980-05 = 2.5%
 - Expect R&C >1.2% per year through 2018
 - Housing Stock
- Dependent upon Natural Gas
 - Historically inexpensive
 - Clean, efficient fuel
- Fuel Oil
 - Former fuel of choice
 - \$18.77 Mm Btu Equivalence
- Seasonality and Deliverability

Southcentral Population, 1980-2005



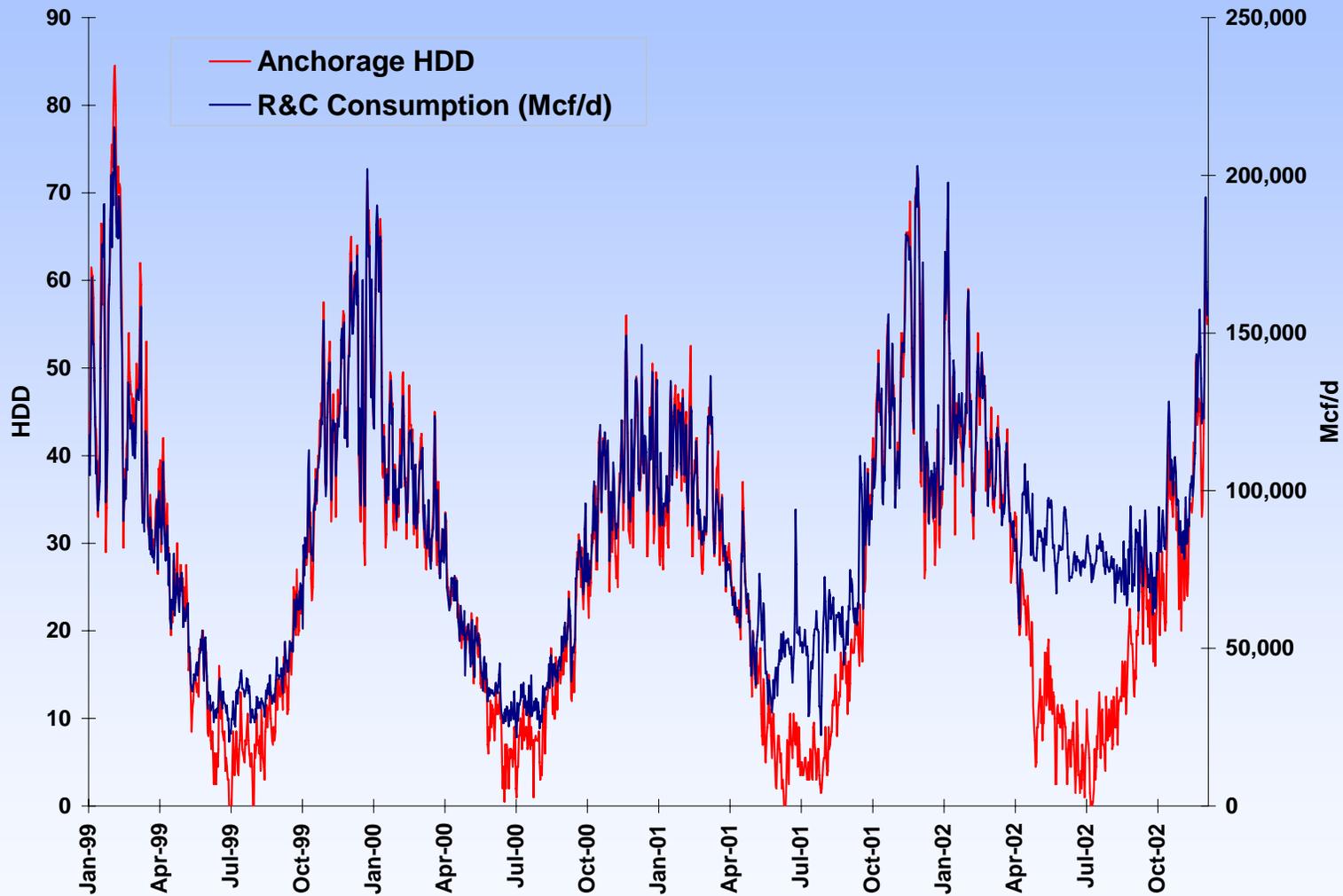
Gas-Fired Electric Generation

- CEA and MLP: 25 Plants, 1,008 MW
 - Capacity = 115 Mmcf/d, 42 Bcf/y (20% of CIB)
 - Infrastructure almost entirely gas based
 - Some hydroelectric capacity
- Long term gas supply
 - CEA gas supply contracts ~2011+
 - MLP equity gas ~2016+
 - Generator replacement

Peak Deliverability Requirements

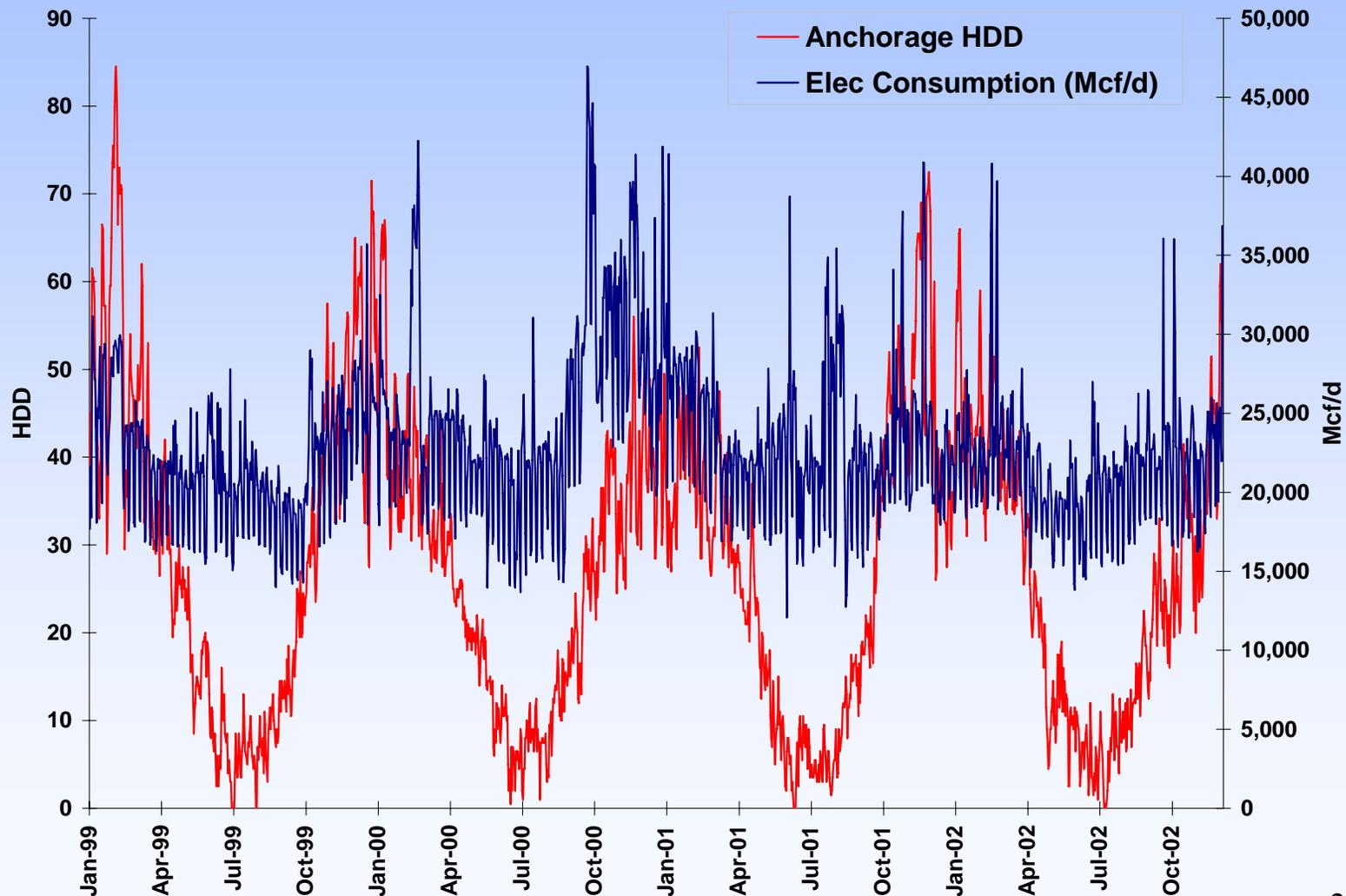
- Residential, Commercial, and Gas Fired Electrical Generation - Big Seasonal Swing
- Capacity of Producing Fields & Pipe
 - Just Enough to Serve Peak – TODAY!
 - Four Gas Storage Projects in Operation today
- Industrials Provide Backstop Deliverability if needed

Residential and Commercial Seasonal Gas Consumption 1999-2002



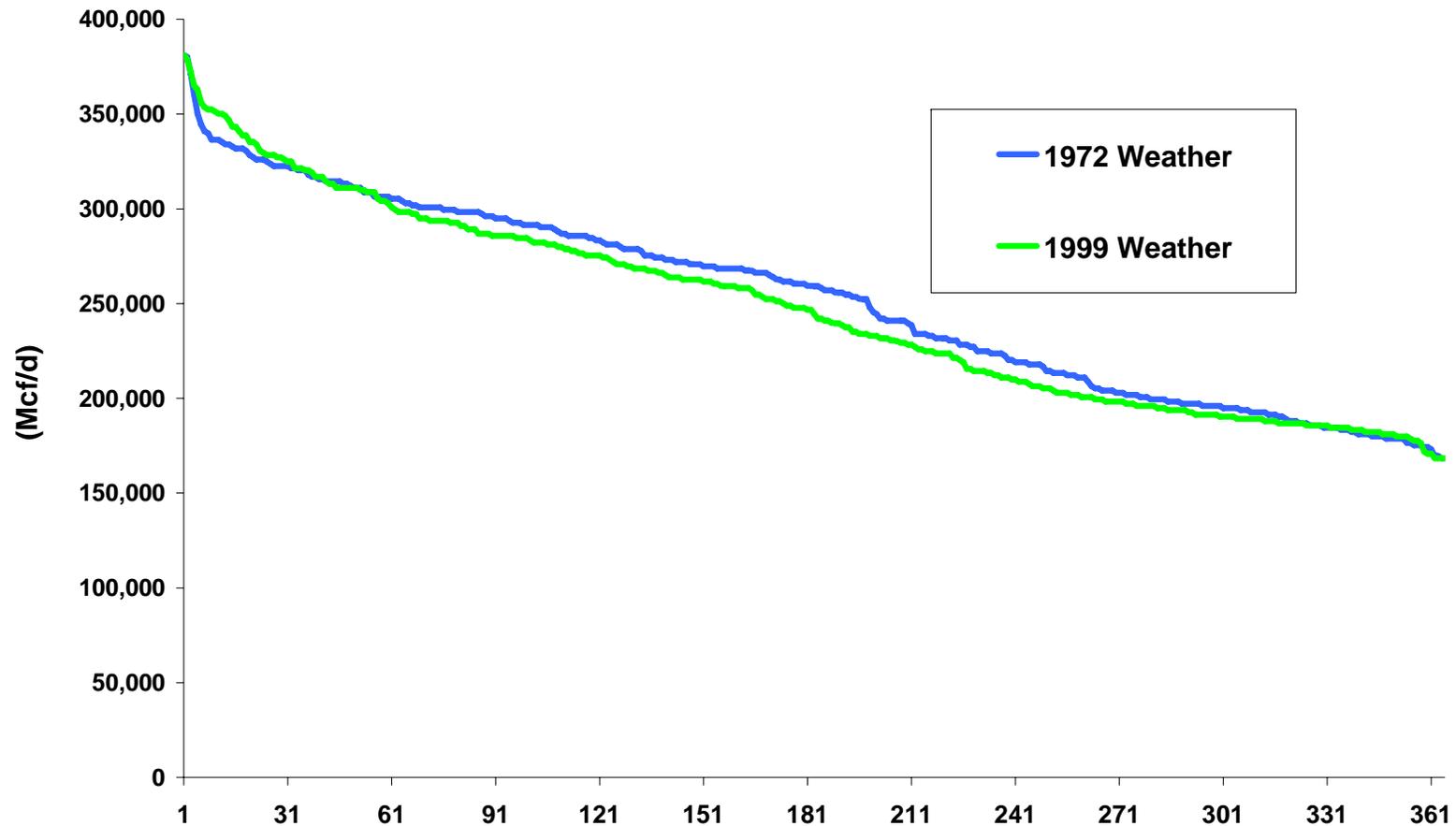
One heating degree-day is given for each degree that the daily mean temperature departs below the base of 65°F. HDD is used as an indication of fuel consumption. Source: Lukens Energy Group (for DNR), 2004.

GFEF Seasonal Gas Consumption 1999-2002



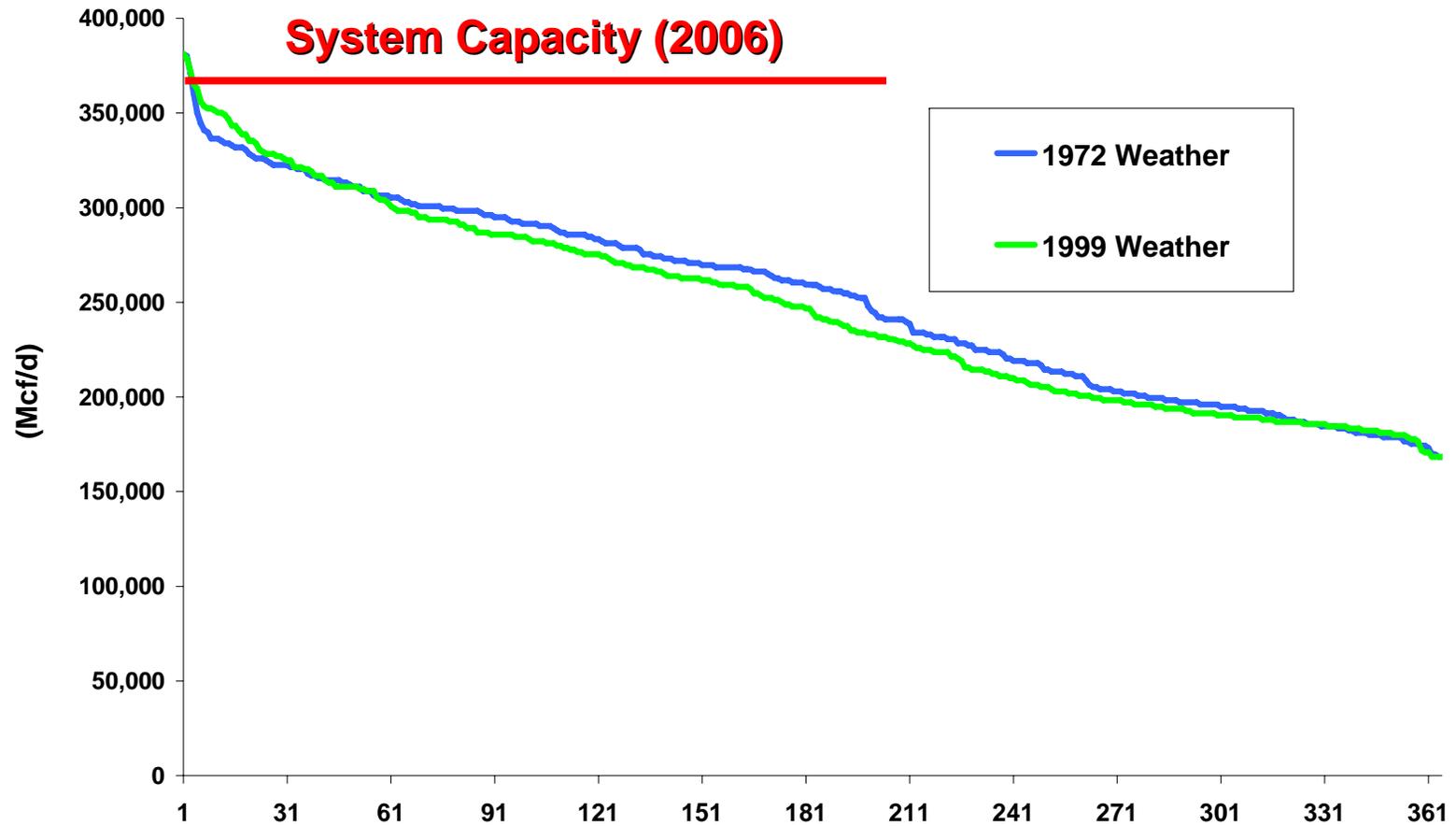
Source: Lukens Energy Group (for DNR), 2004.

Load Duration Curves



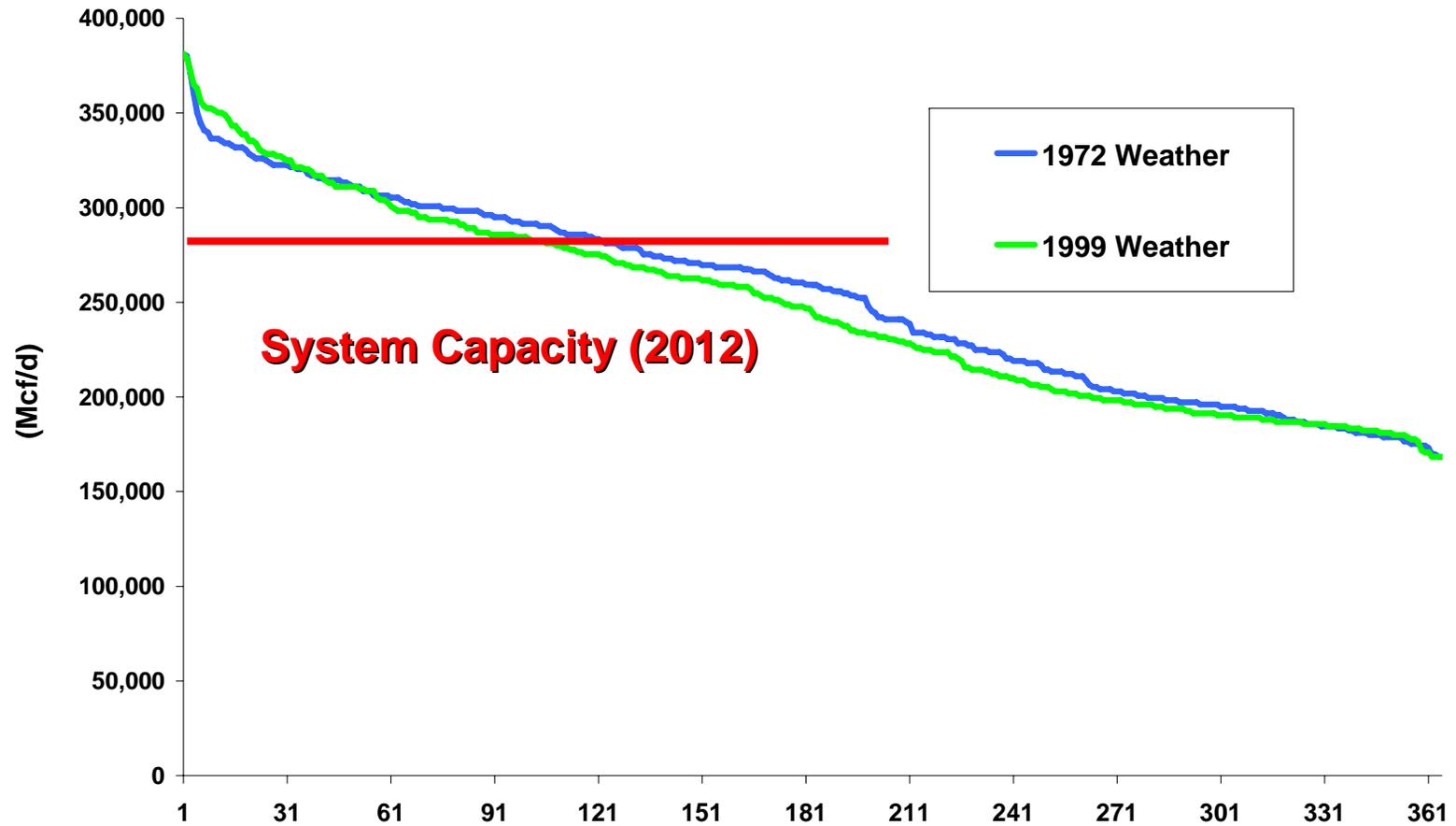
Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;
excludes LNG Plant and Fertilizer Plant.

Load Duration Curves



Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;
excludes LNG Plant and Fertilizer Plant.

Load Duration Curves



Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;
excludes LNG Plant and Fertilizer Plant.

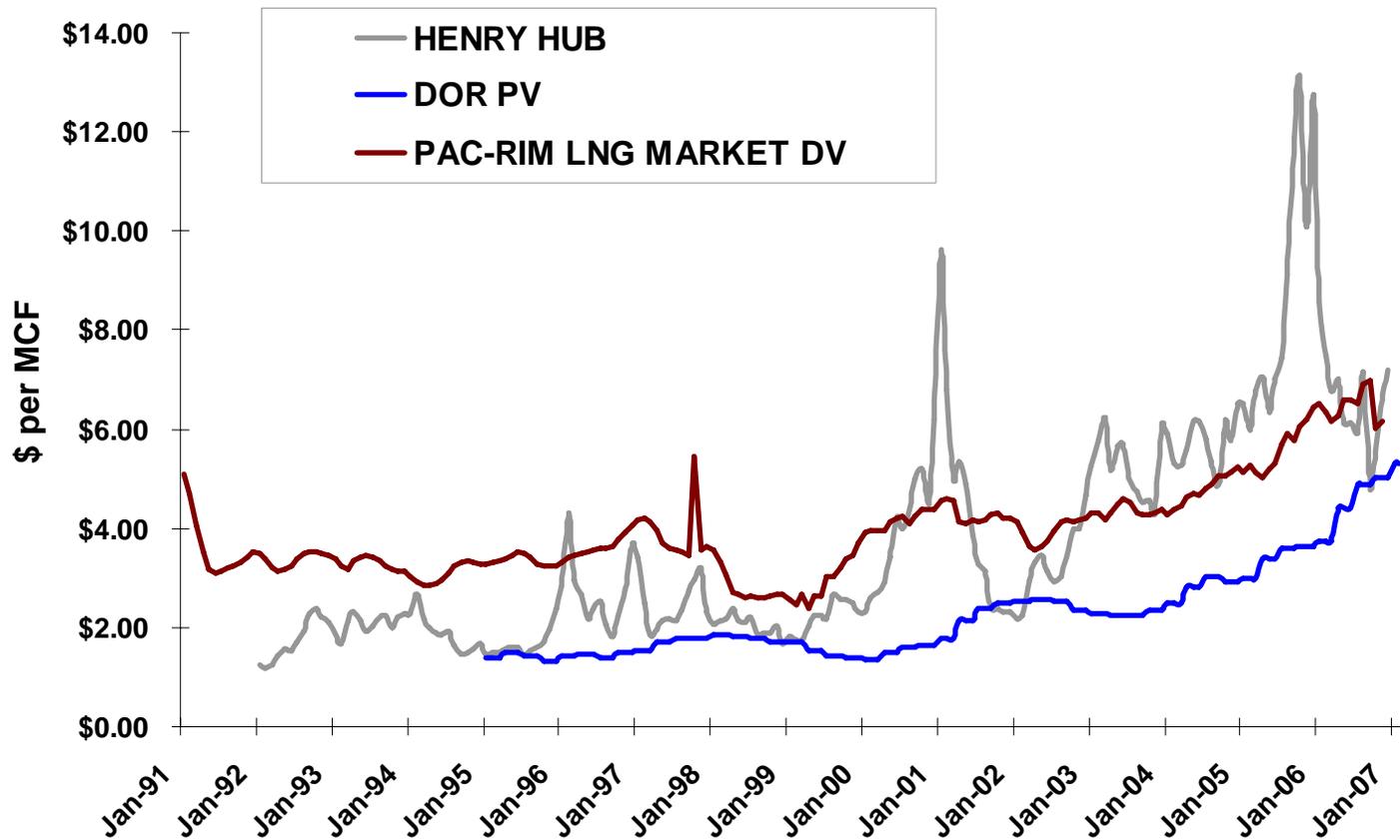
Industrial Demand

- Two-thirds of Consumption Pie
- Driven by Export Markets
- Depend on cheap, base-load gas supply
- Constrained by Supply/ Price

Nikiski LNG Plant

- Market – Japan Utilities
- Capacity = 220 Mmcf/d, 80 Bcf/y (36% of CIB)
- Export License Extension
 - Expect Application to be Noticed in Federal Register
 - Such action is likely to be controversial
- Destination Value

Pac Rim LNG Destination Value Jan 1991 – Dec 2006



Nikiski Fertilizer Plant

- Gas supply contracts through October 2007
- Plant operating at 50% capacity since Nov 2005
- Extended Shutdown during Winter Months
 - Jan 2006
 - Nov 2006 – Mar 2007
 - Gas storage helped keep plant running in 2006
- High Product Prices Help

Anhydrous Ammonia (NH₃) Spot Price, Jan 1991 - Jun 2006

