Joint IEPR and Electricity &Natural Gas Committee Workshop

Natural Gas Market in North America

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North American Natural Gas Market

Natural gas industry in the last 20 years

Stage 1. Increasing natural gas production

Stage 2. Gas demand increased substantially

Stage 3. Domestic natural gas production peaked

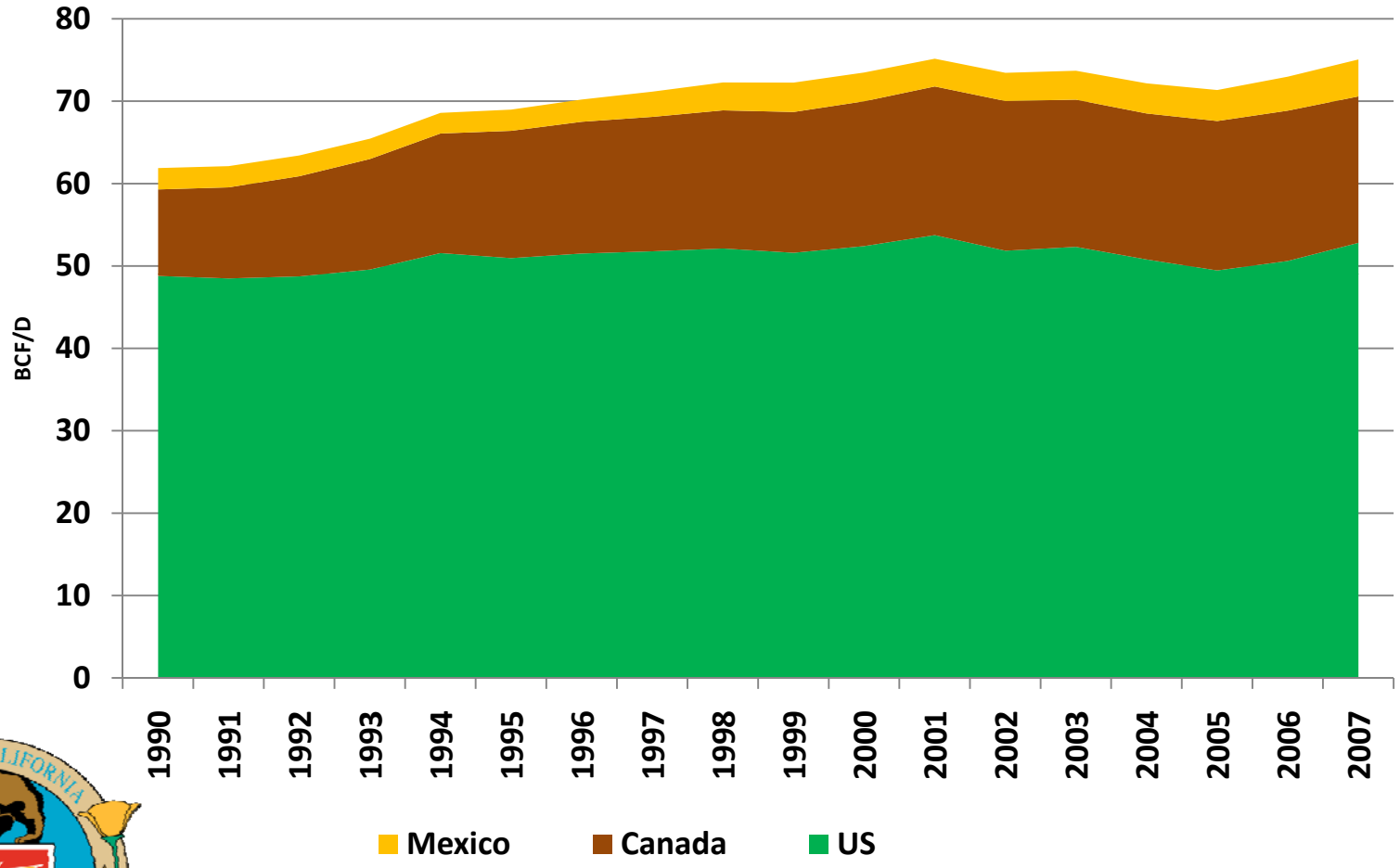
Stage 4. LNG possible solution

Stage 5. New technology/new potential

Stage 1. Increasing Gas Production

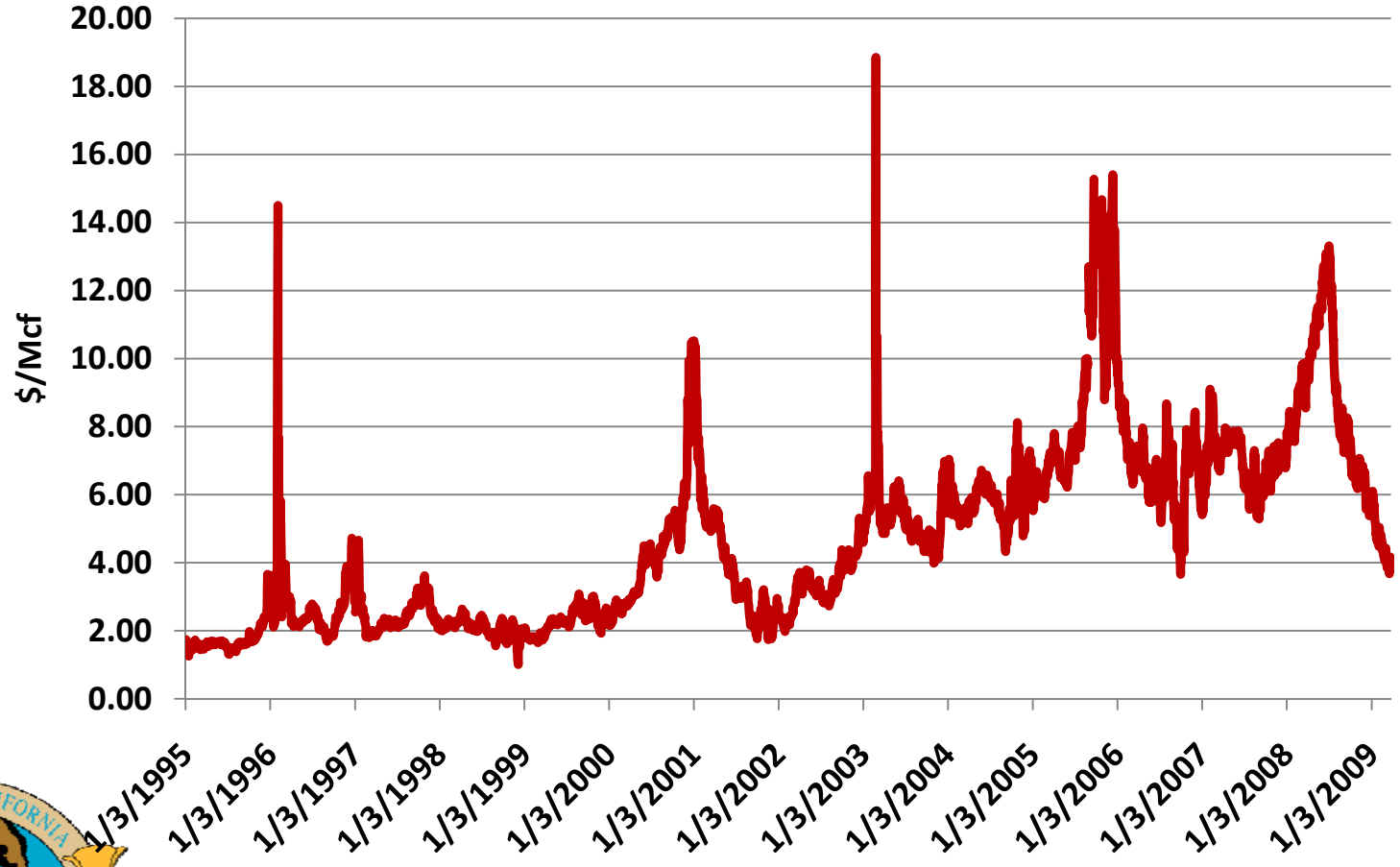
- Early 1990s outlook optimistic for natural gas supply
- Lower 48 states and Alaska's North Slope
- Strong production from WCSB and McKenzie Delta
- Mexico exploration program increased
- Prices under $2/Mcf through 1980s and 1990s

Stage1 cont. Historic North American Natural Gas Production



Source: BP Statistical Review of World Energy June 2008

Stage 1 cont. Henry Hub Natural Gas Price ($/Mcf)

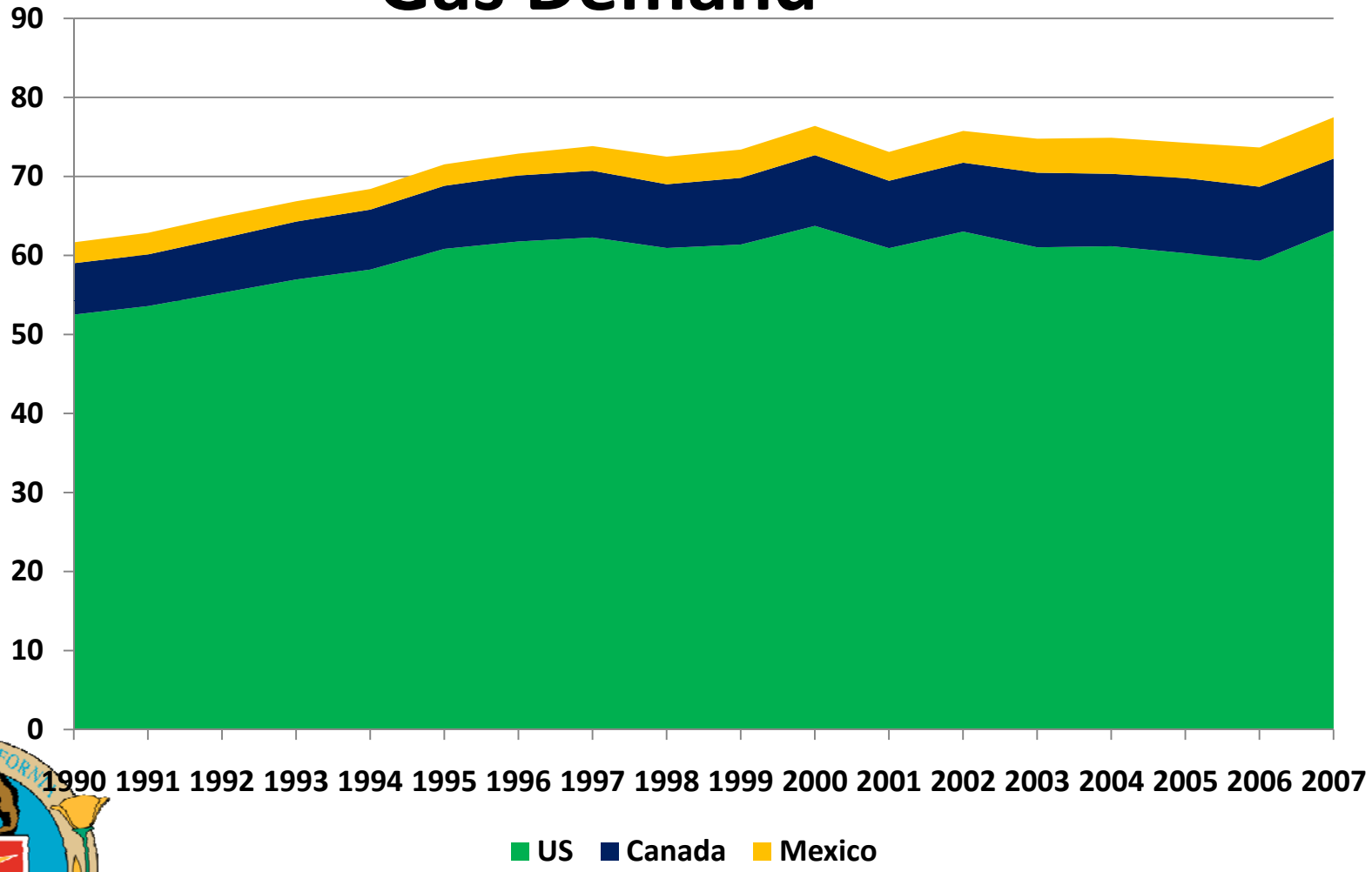


Source: Natural Gas Intelligence

Stage 2. Gas Demand Increased

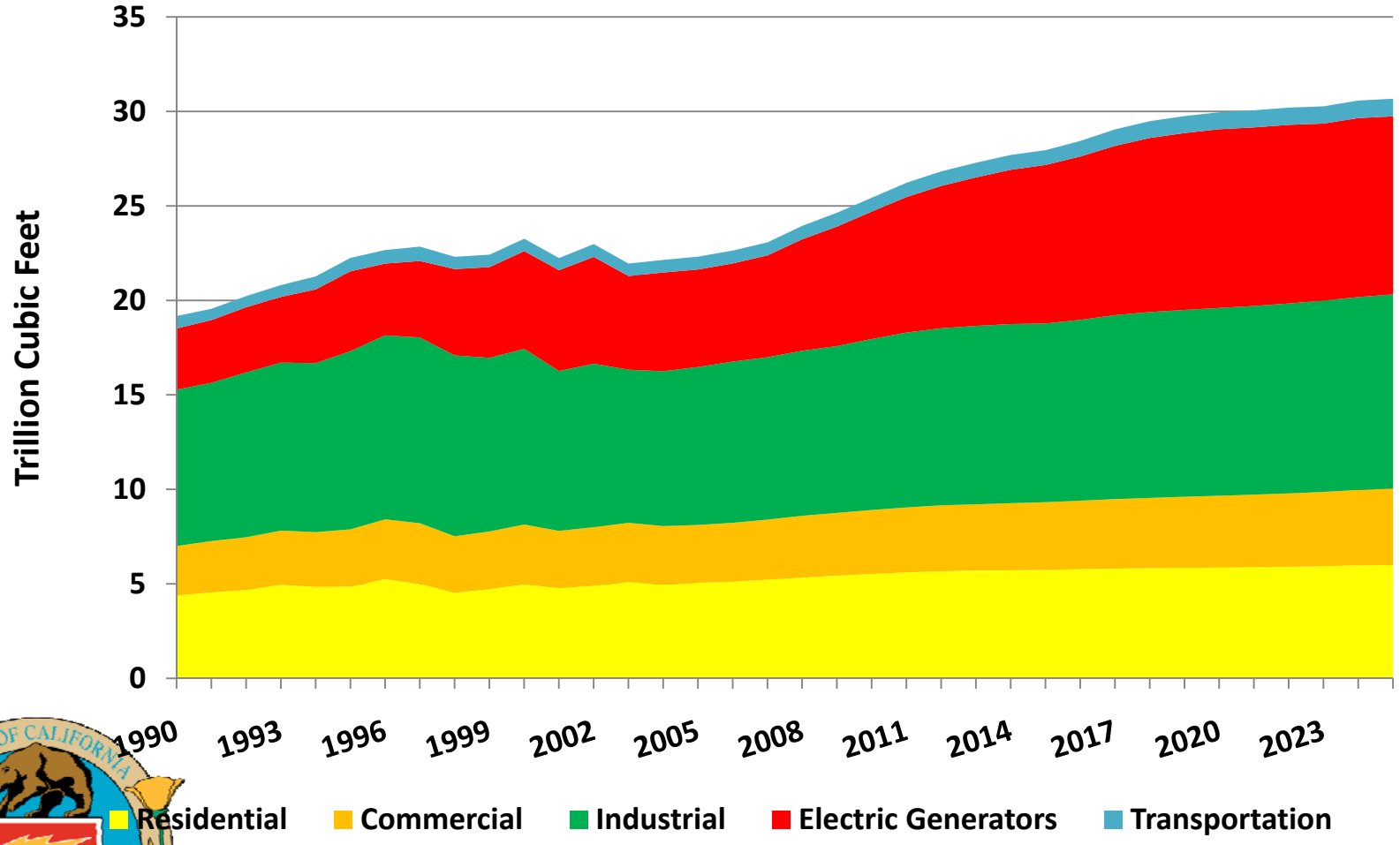
- Initial concerns on GHG
- Replacing high carbon fuels (coal and petroleum) with natural gas
- Acceleration of gas power generation
- NPC 1999 study projected 110 GWs by 2010
- Revised 2003 NPC study expected to exceed 200 GWs 2005

Stage 2 cont. North America Natural Gas Demand



Source: BP Statistical Review of World Energy June 2008

Stage 2 cont. United States Natural Gas Demand by Sector

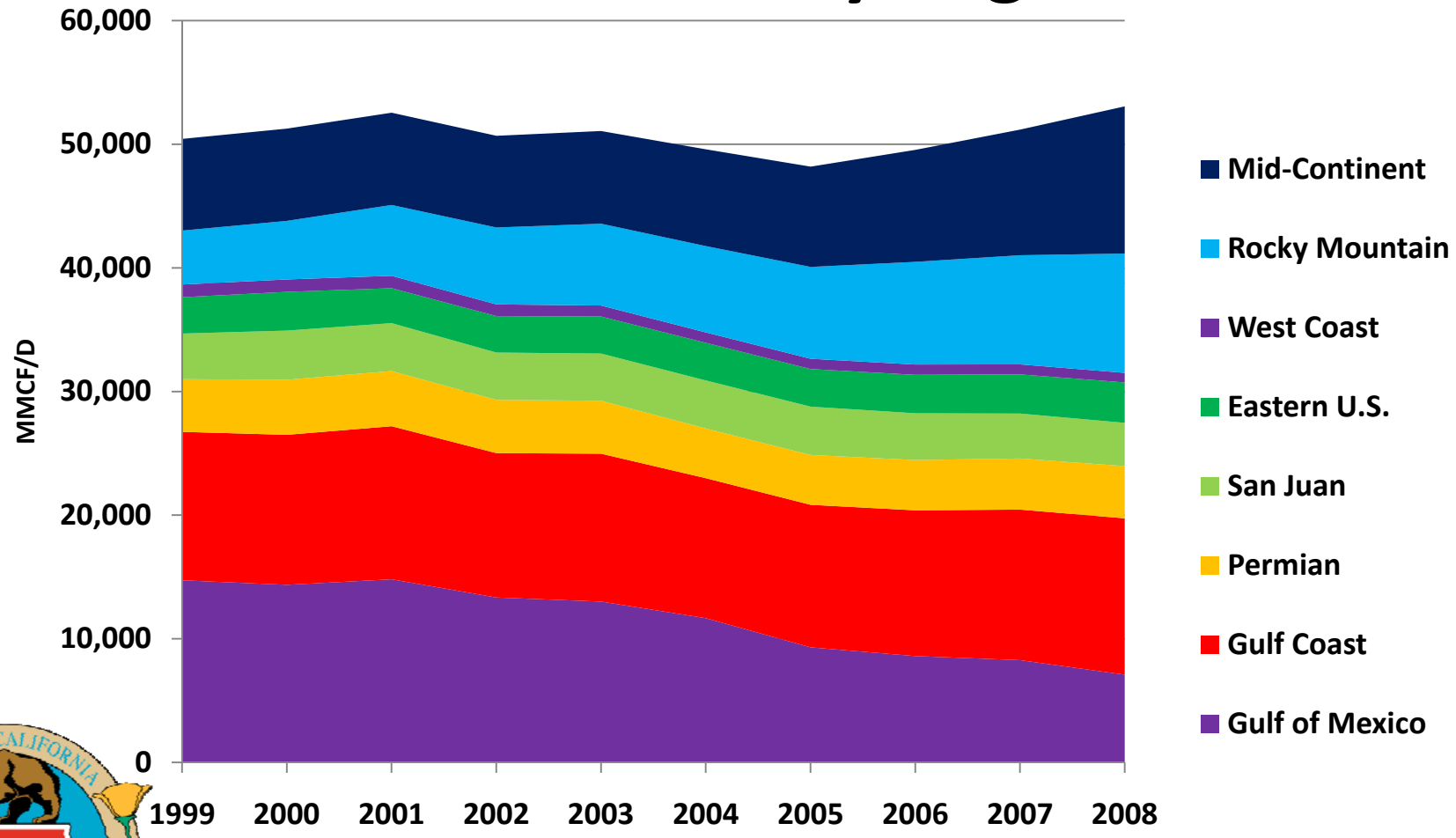


Source: Energy Information Administration

Stage 3. Domestic Natural Gas Production Peaked

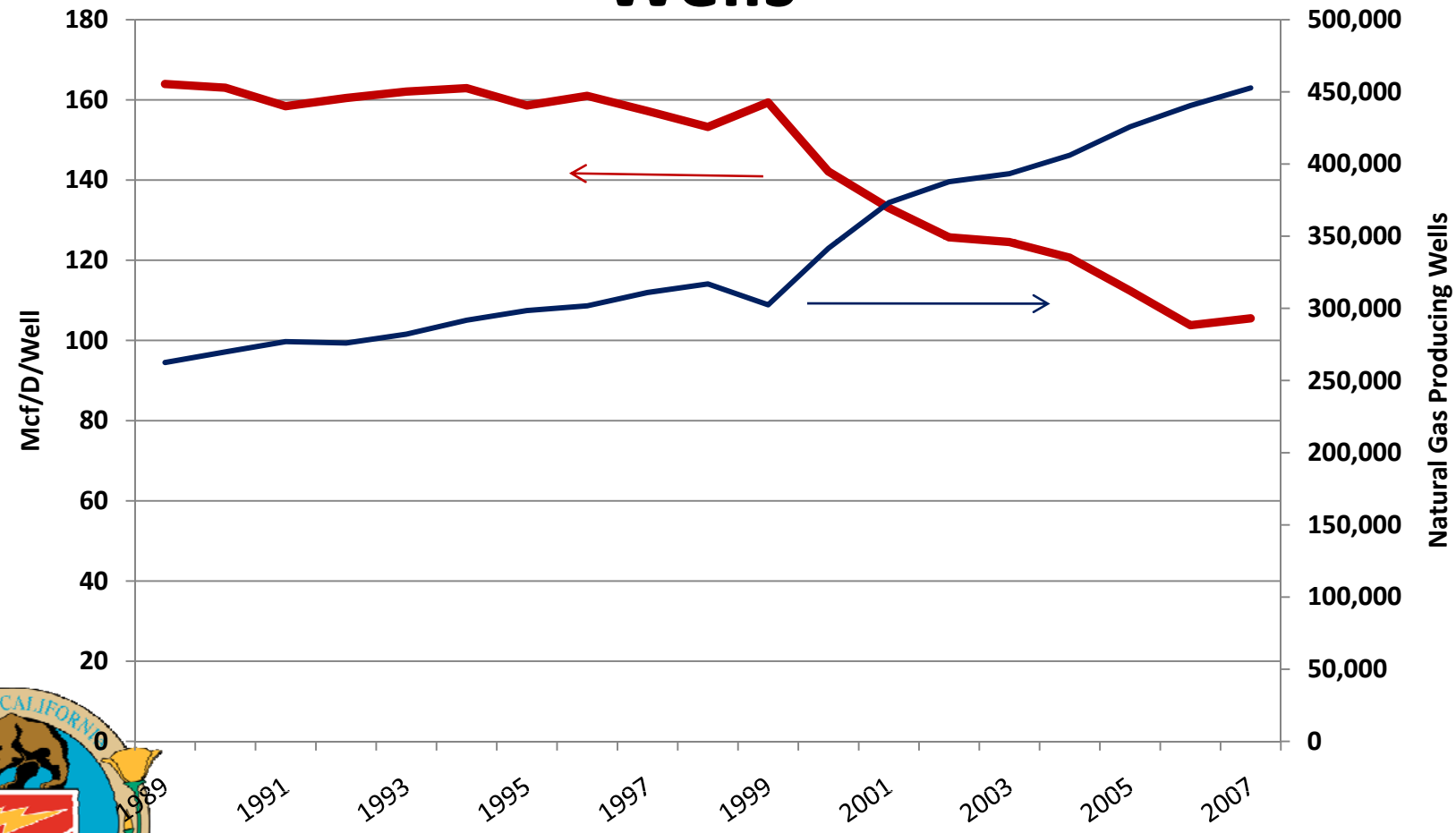
- Delays in construction of pipelines from Alaska's North Slope and McKenzie Delta
- Increased consumption from lower 48 states and WCSB
- Domestic production peaked by 2001
- Steep decline in production from the Gulf of Mexico

Stage 3 cont. United States Natural Gas Production by Region



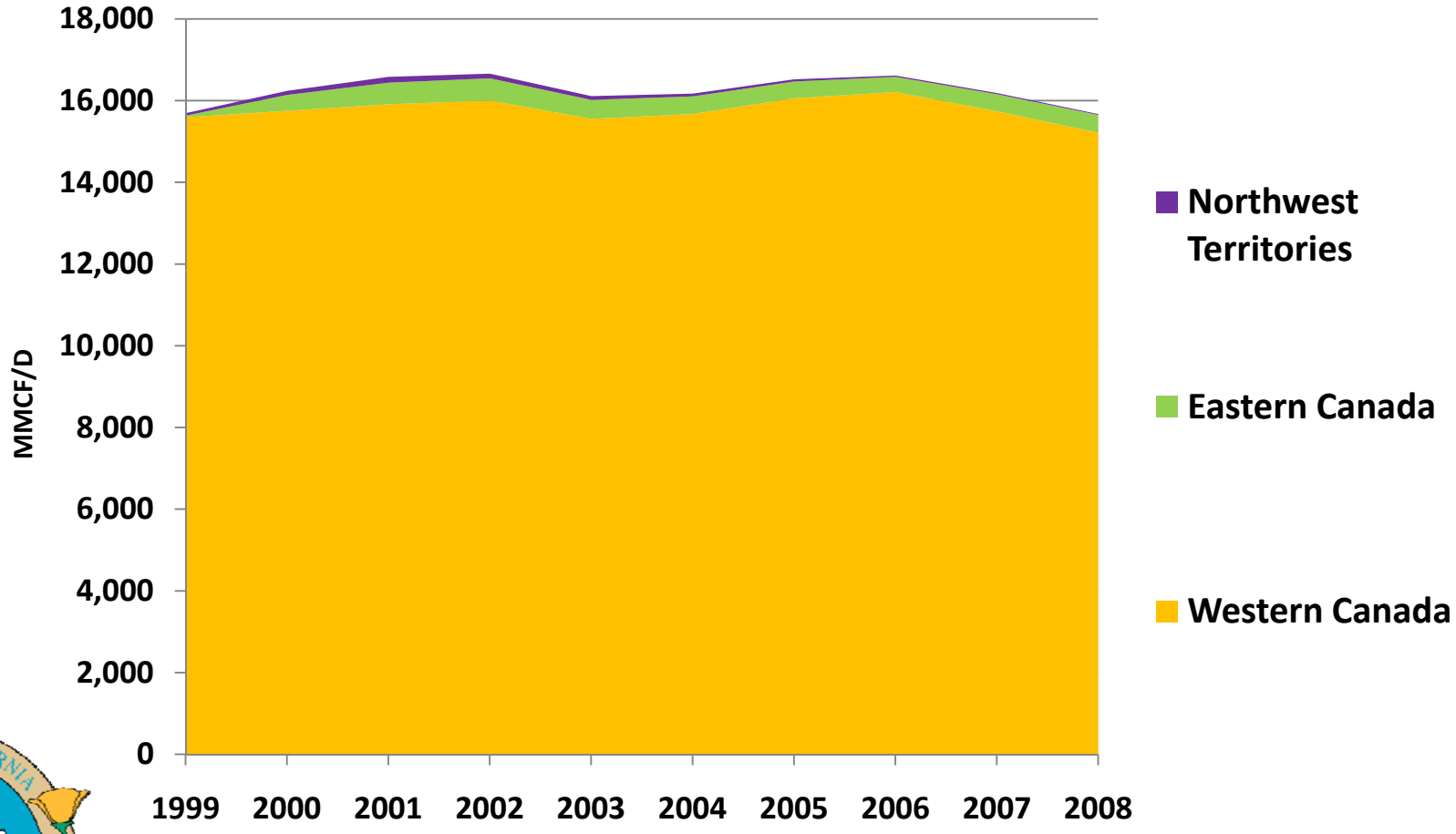
Source: Lippman Consulting, Inc.

Stage 3 cont. United States Average Well Production and Natural Gas Producing Wells



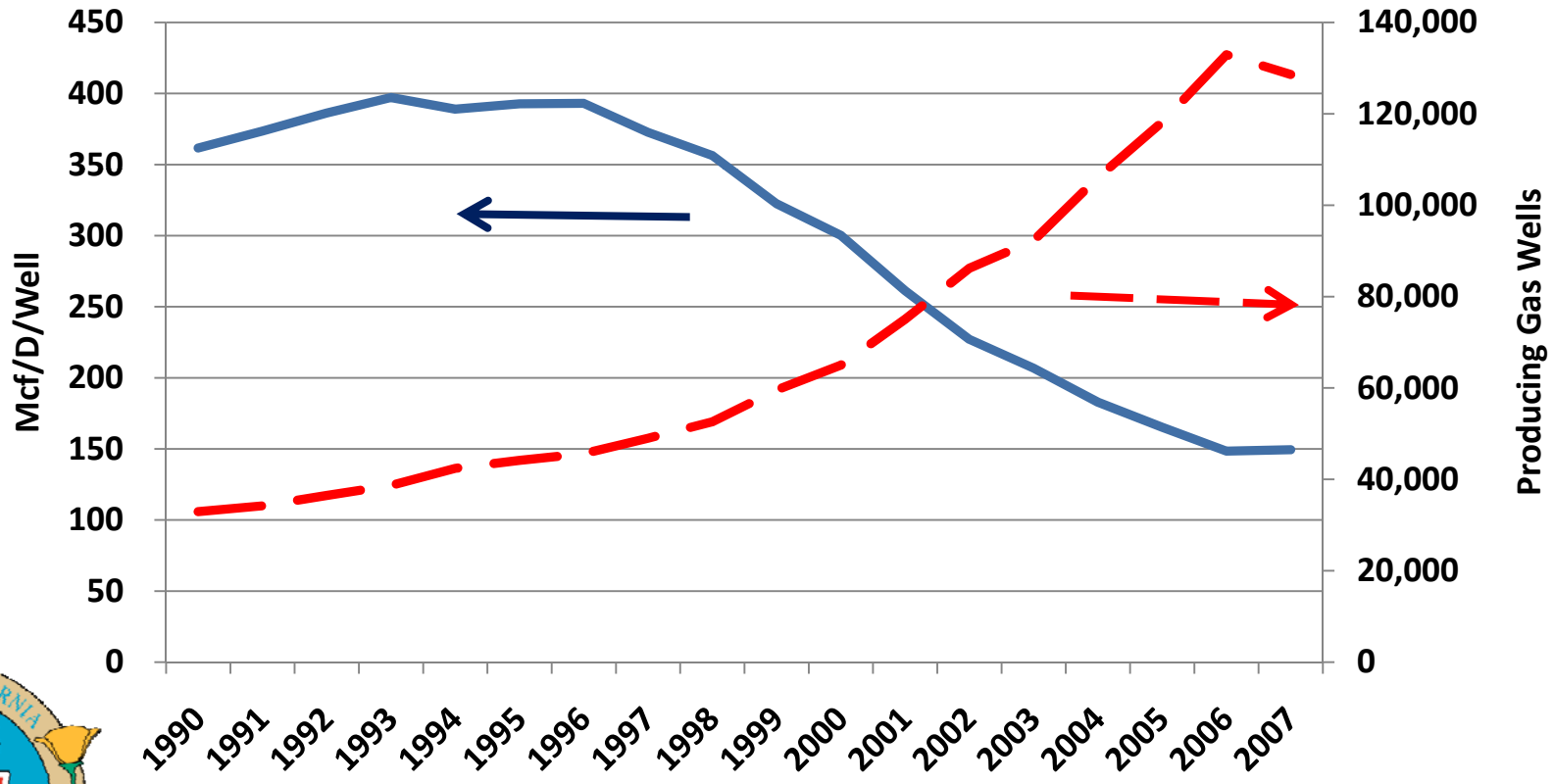
Source: Energy Information Administration

Stage 3 cont. Canada Natural Gas Production by Region



Source: Canada's National Energy Board

Stage 3 cont. Canada Average Well Production and Gas Production Wells

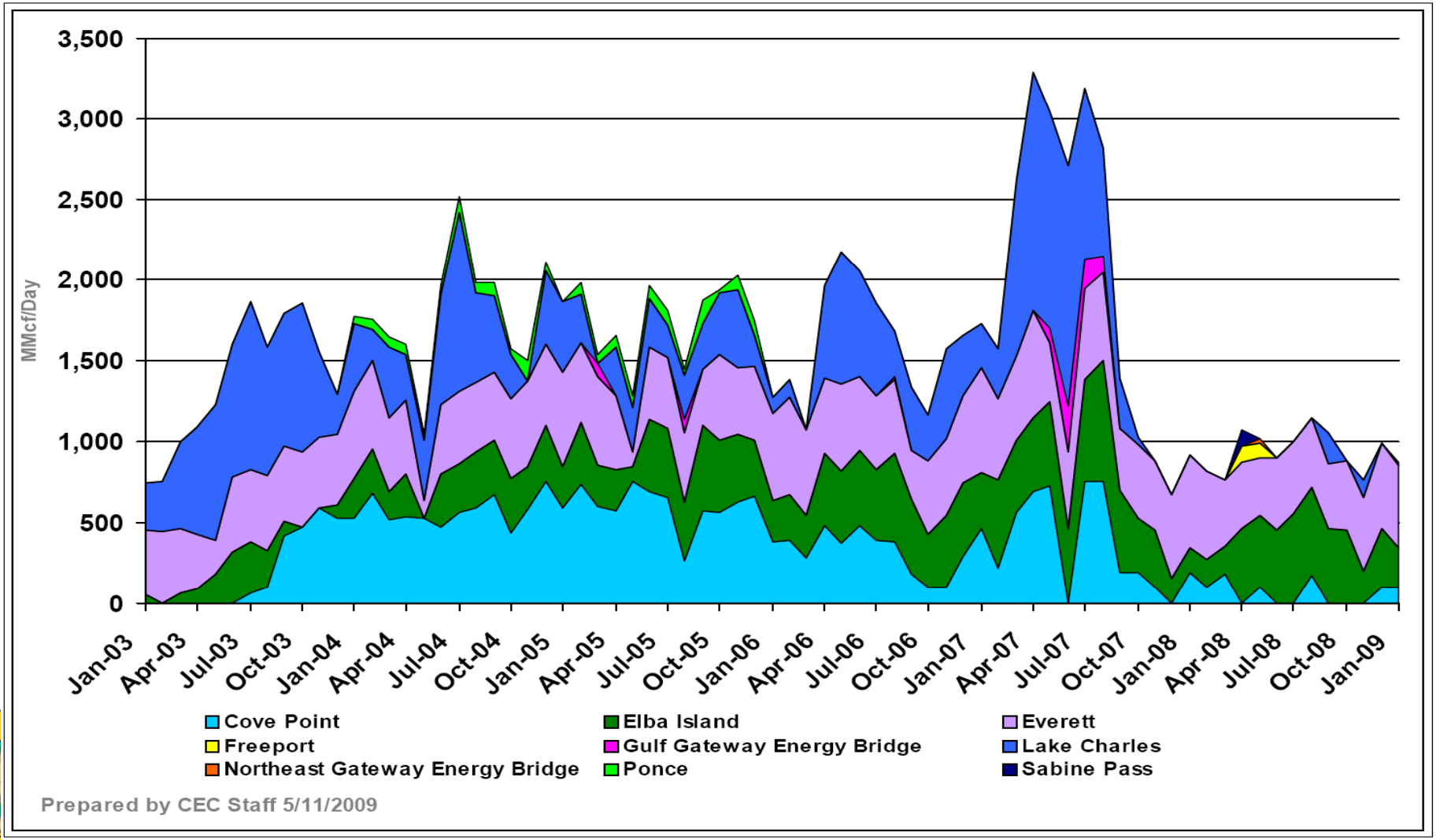


Source: Canada's National Energy Board

Stage 4. LNG to the Rescue

- LNG imported into the United States since the early 1970s
- In 1979 U.S. imported 253 Bcf from Algeria—Less than 80 Bcf afterwards
- By 2000 LNG imports accelerated
- LNG imports peaked in 2007 at 770 Bcf

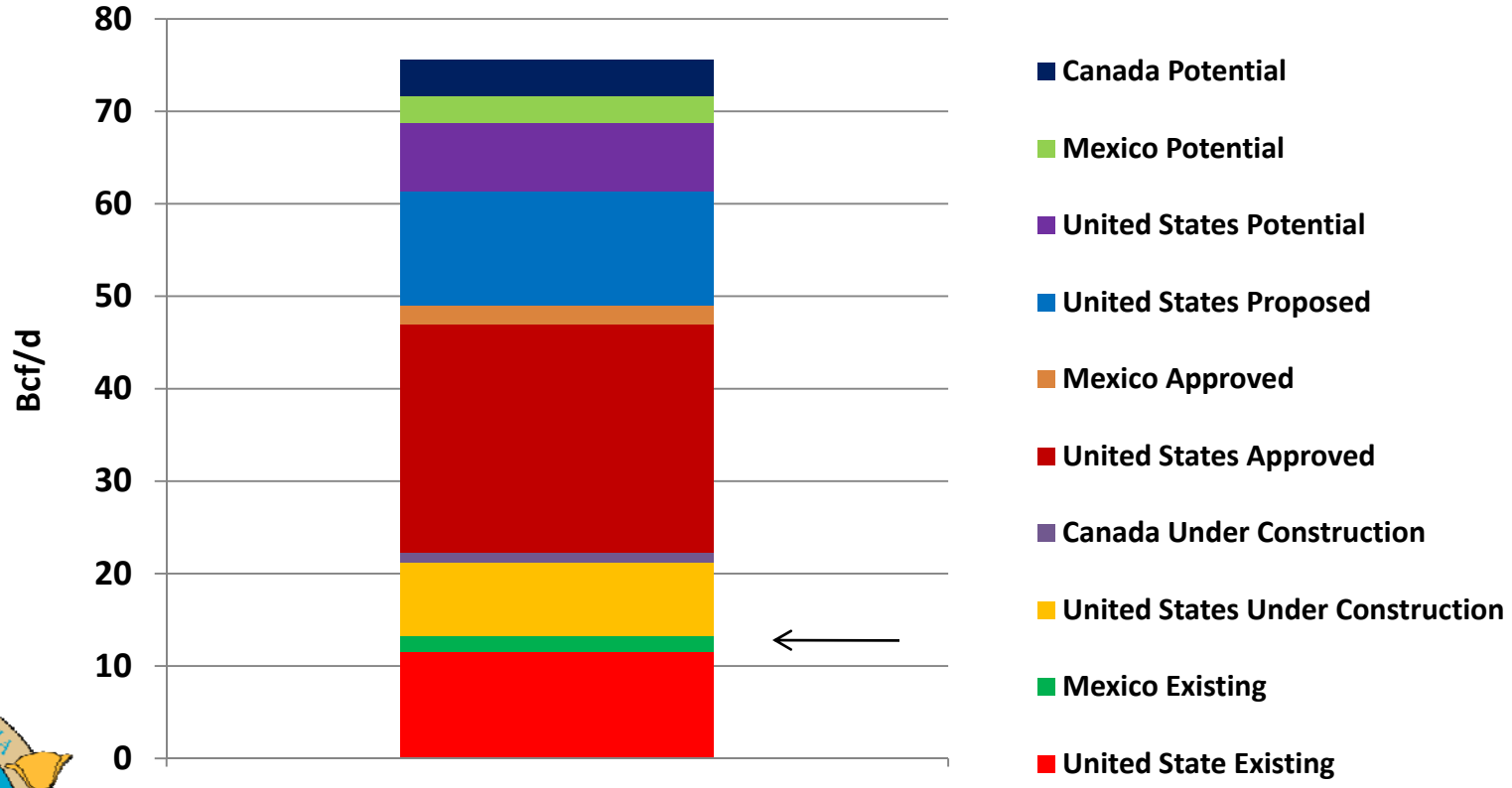
Stage 4 cont. LNG Imports 2005-2008 MMcf/d



Stage 4 cont. North American LNG Existing/Under Construction/Approved/Potential

- 11.8 Bcf/d existing LNG regasification capacity in North America
- 8 Bcf/d under construction
- 24 Bcf/d approved by regulators
- 30 Bcf/d potential

Stage 4 cont. North America LNG Regasification Existing and Potential

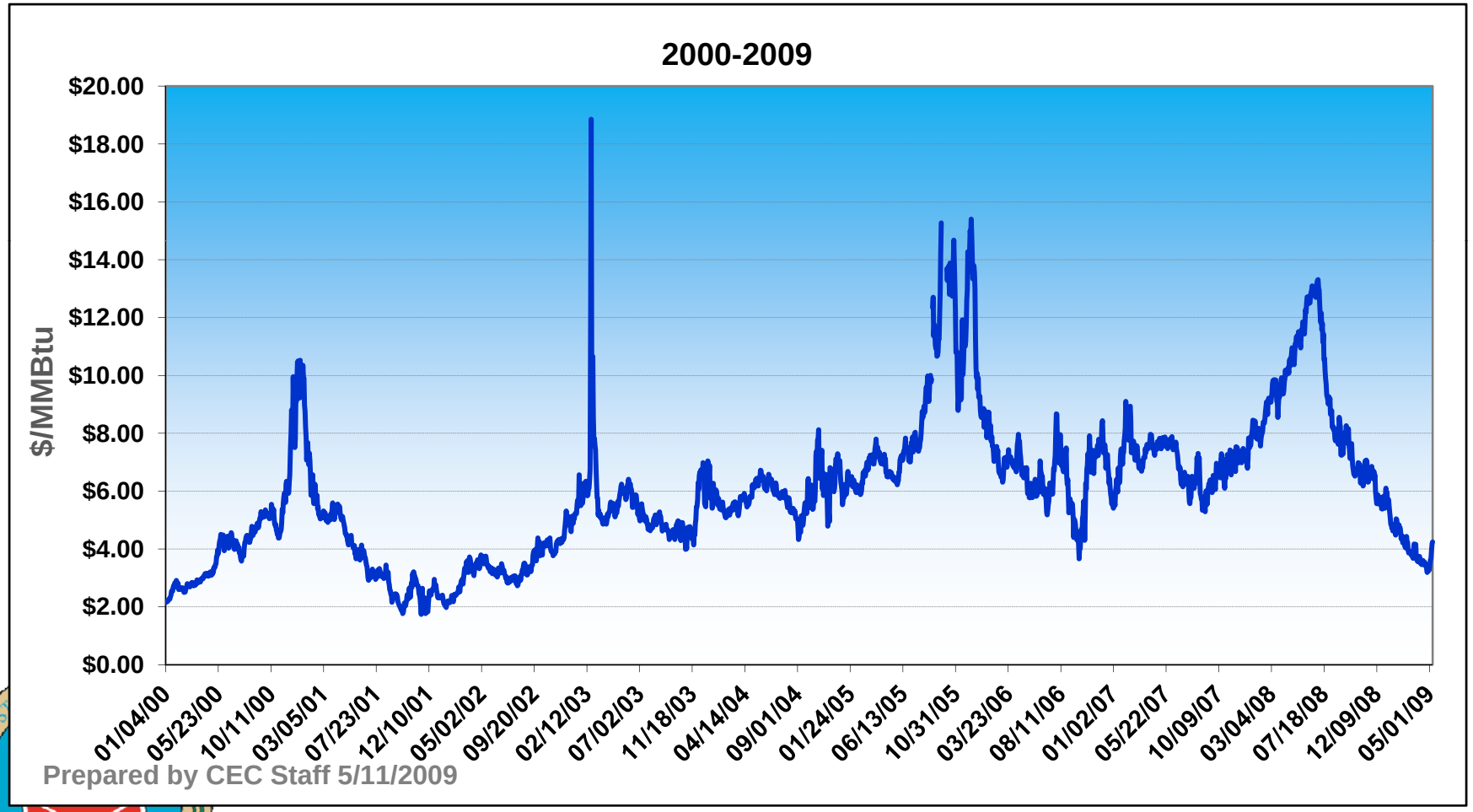


Source: Federal Energy Regulatory Commission

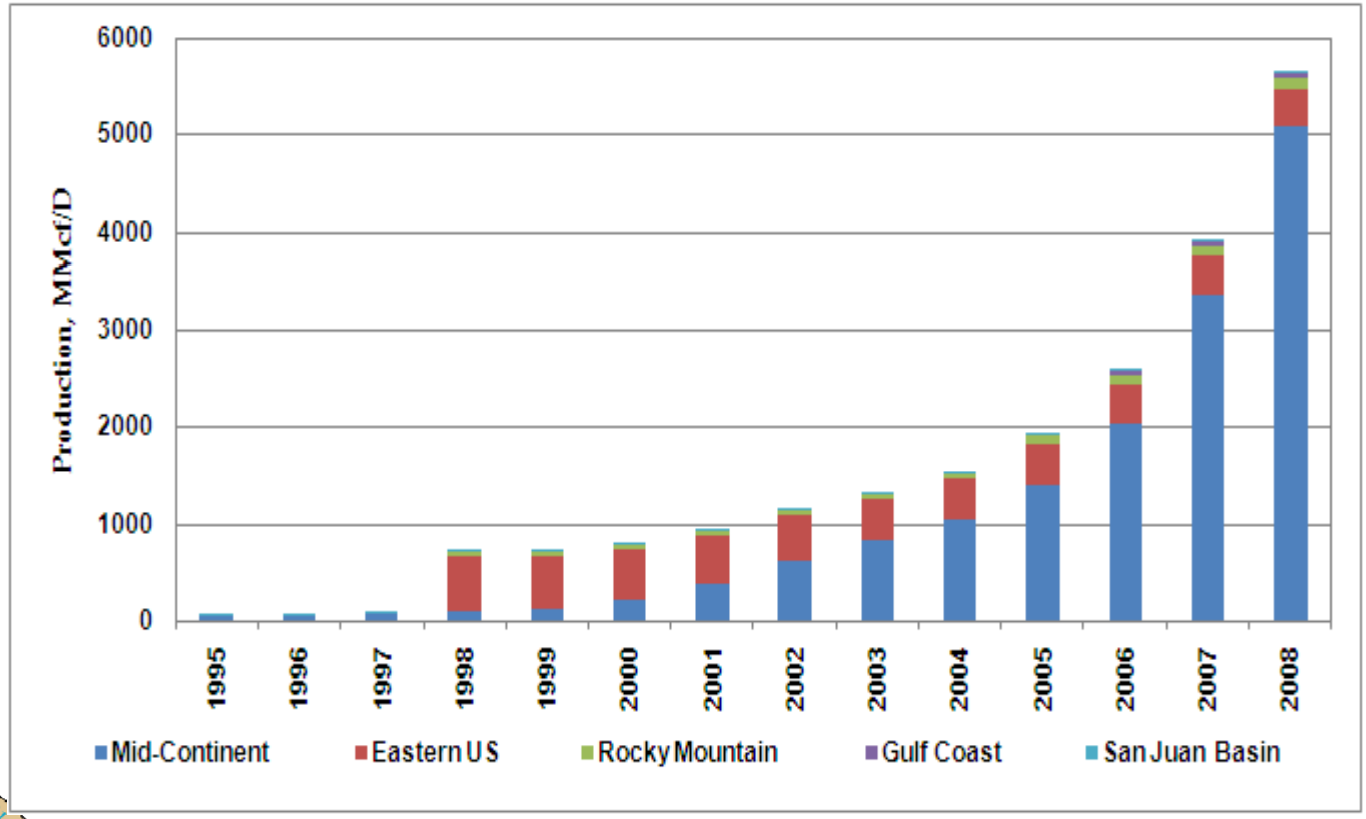
Stage 5. Natural Gas in the New Century

- Lower 48 consume average 62Bcf/day or ~22 Tcf/yr
- California consumes 6.3 Bcf/d ~2.3 Tcf/yr
- Price of natural gas increased 2000-current
- New technologies to extract unconventional gas—coal bed methane, tight sands and shale
- Production of unconventional gas has accelerated—9 percent increase in 2007-2008
- LNG imports declined in 2008

Stage 5 cont. Natural Gas Spot Prices at Henry Hub



Stage 5 cont. Historic Shale Gas Production



Source: Lippman Consulting, Inc.

Stage 5 cont. What is Next for Califonia?

- California imports 87 percent of gas needs
- Cal. natural gas production is expected to decline
- Would shale and other unconventional gas production continue to increase?—up to 800 Tcf shale recoverable reserves
- Would LNG be part of the supply mix?
- Do we need additional infrastructure?
- What would be the impact to the environment?

Questions and Comments