

Outlook for Western U.S. Natural Gas Markets

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North American Gas Market Overview

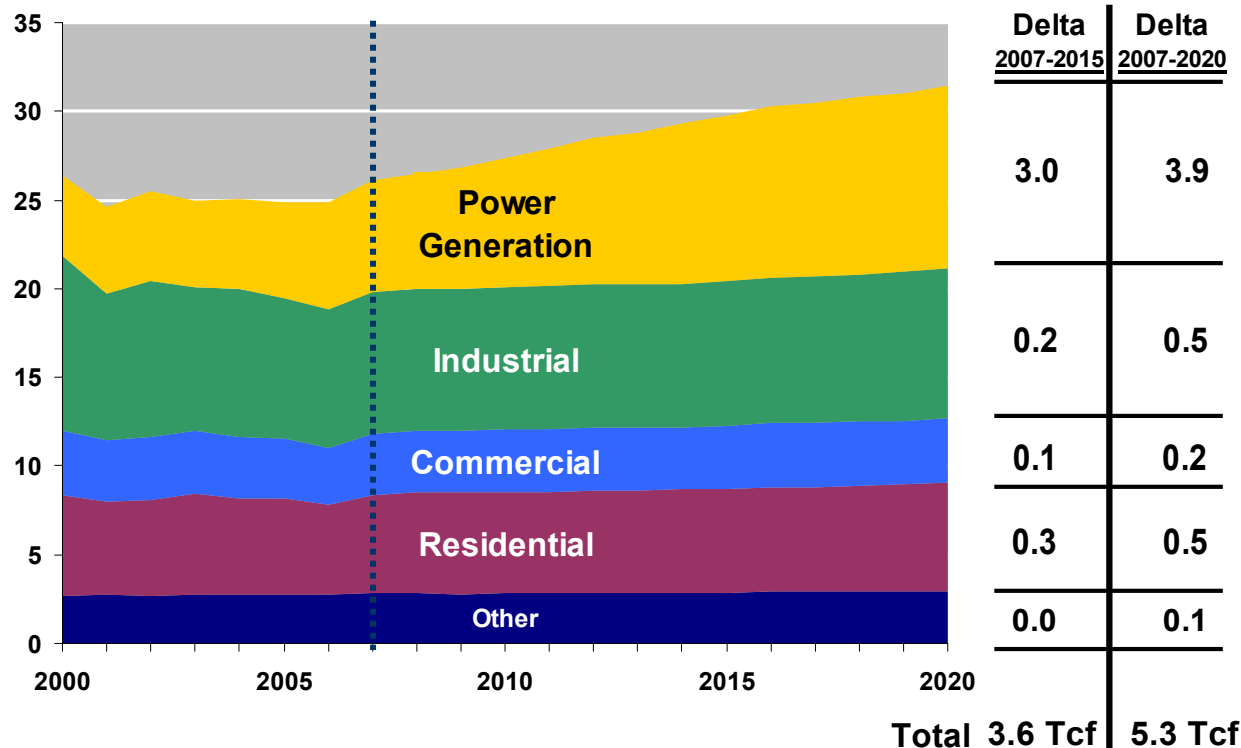
Gas Demand Outlook

The North American gas market may be best characterized as a “demand leads supply market” for the foreseeable future.

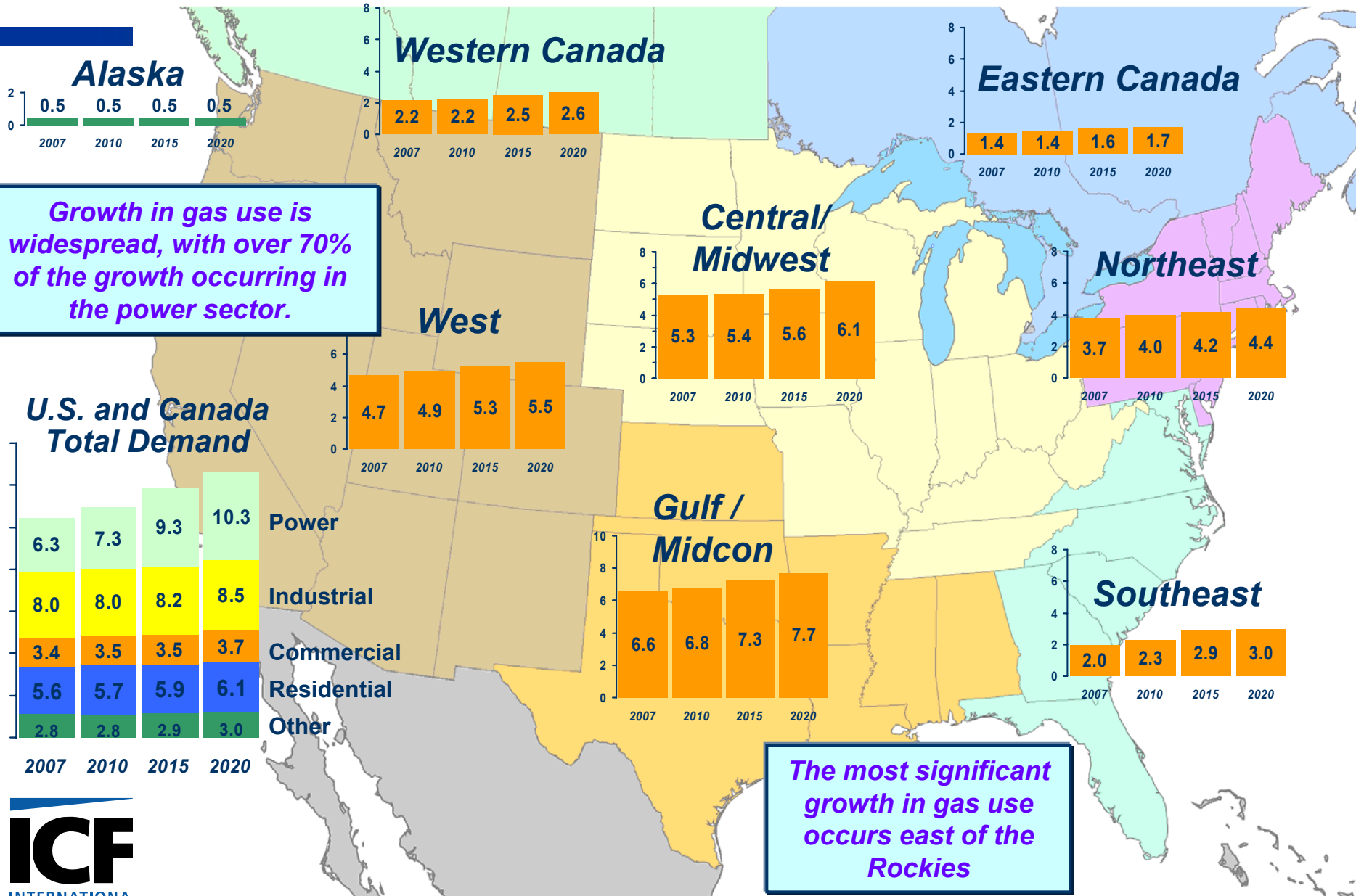
- Gas consumption in the power sector will grow substantially.
- Other sectors grow as a result of growth in input factors (i.e., GDP, disposable income, population, and industrial activity).
- When necessary, price-induced demand reductions will balance the market.

U.S. & Canada Gas Consumption

(Trillion Cubic Feet, Tcf per year)



U.S. and Canada Regional Gas Demand (Tcf per year)

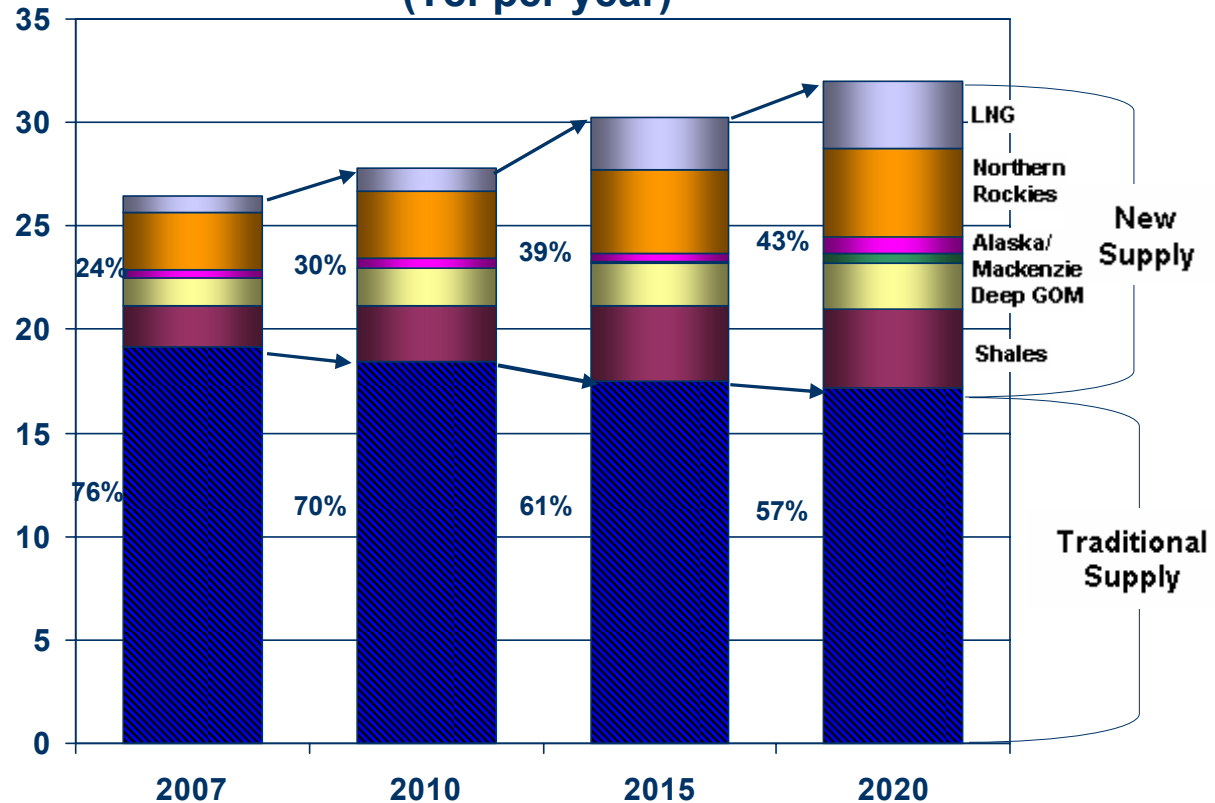


Natural Gas Supply

Relying On New Frontiers

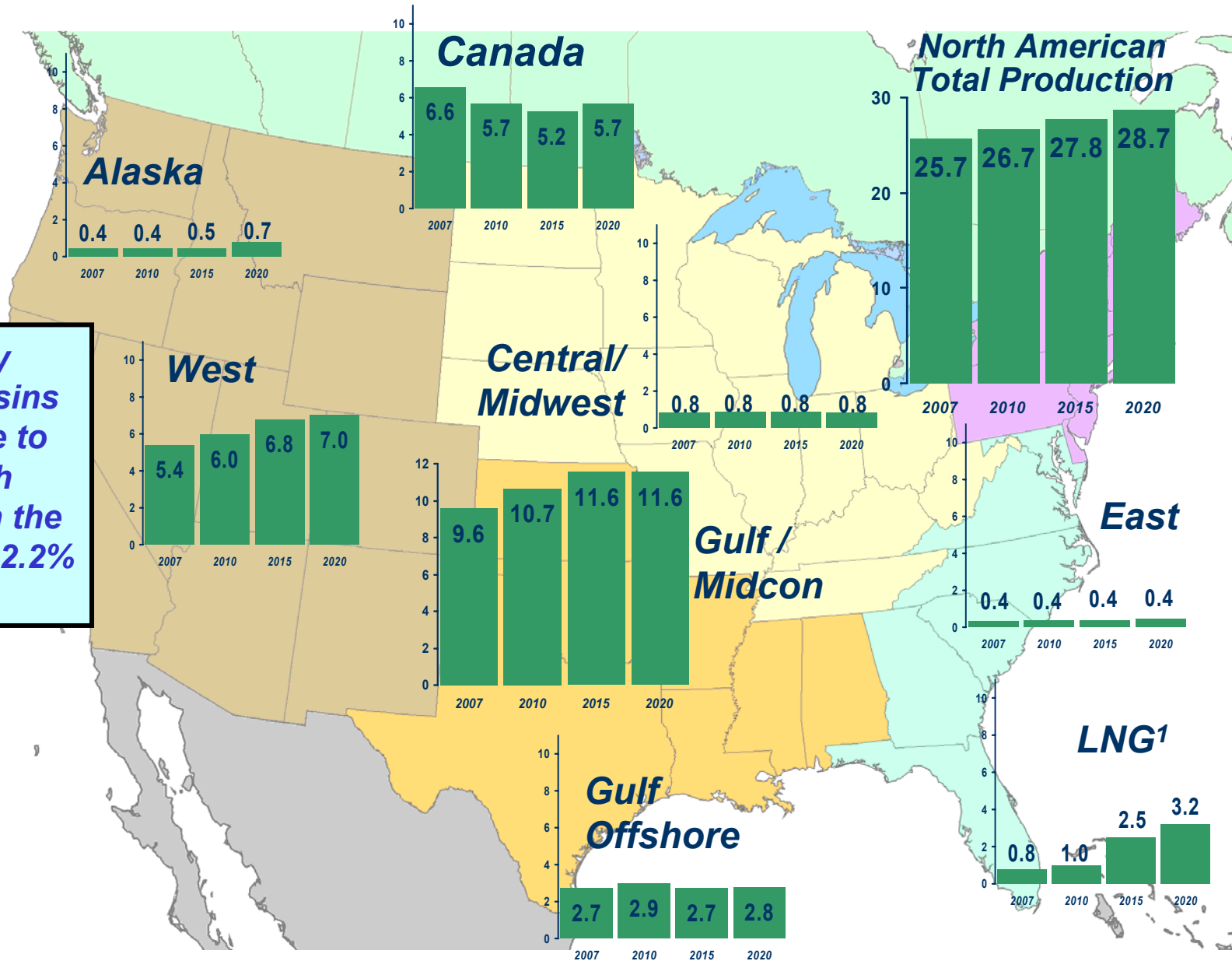
- Production from traditional supply areas will decline.
- New frontier supplies will account for well over 40% of total supply by 2020, versus only 24% today.

**U.S. & Canada Gas Supply
(Tcf per year)**



U.S. and Canada Regional Gas Supply (Tcf per year)

The Rocky Mountain Basins will continue to shine, with production in the west rising at 2.2% per year.

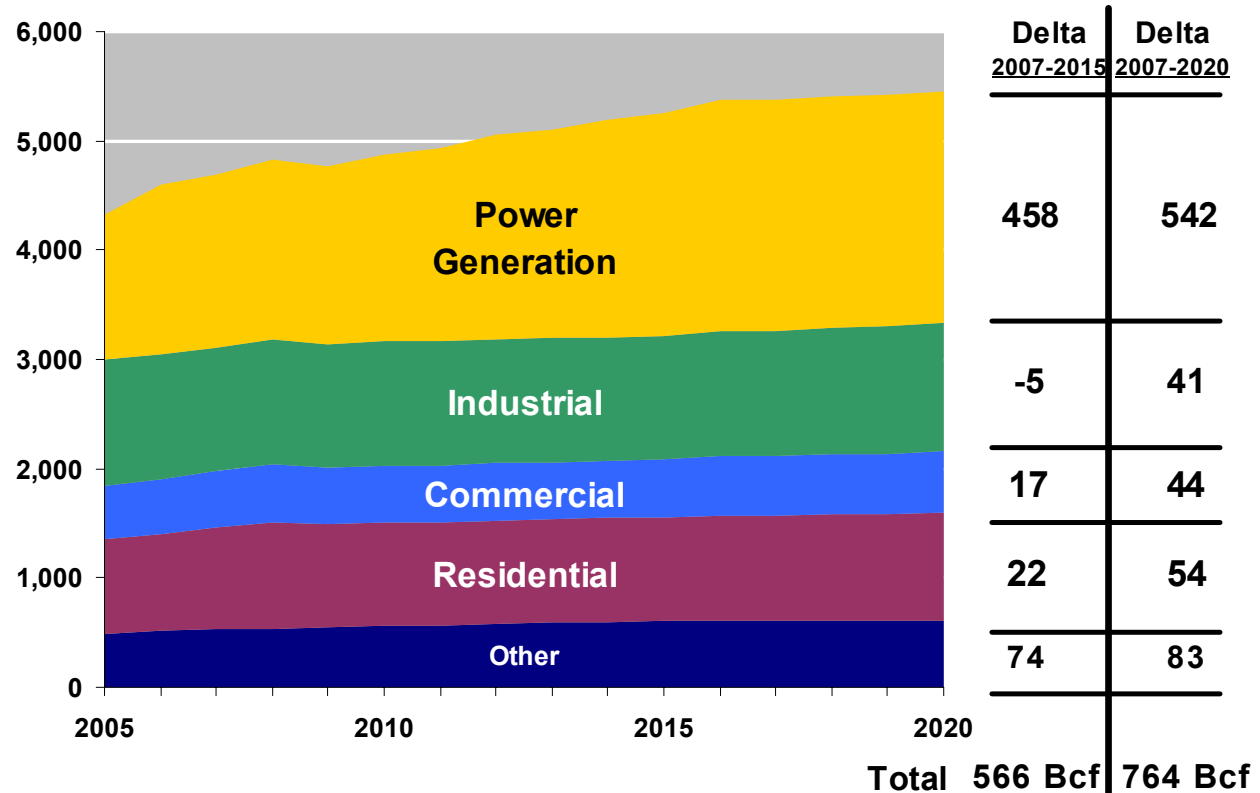


1) U.S. and Canadian LNG Imports Only (Mexican imports not included.)

Western U.S. Gas Markets

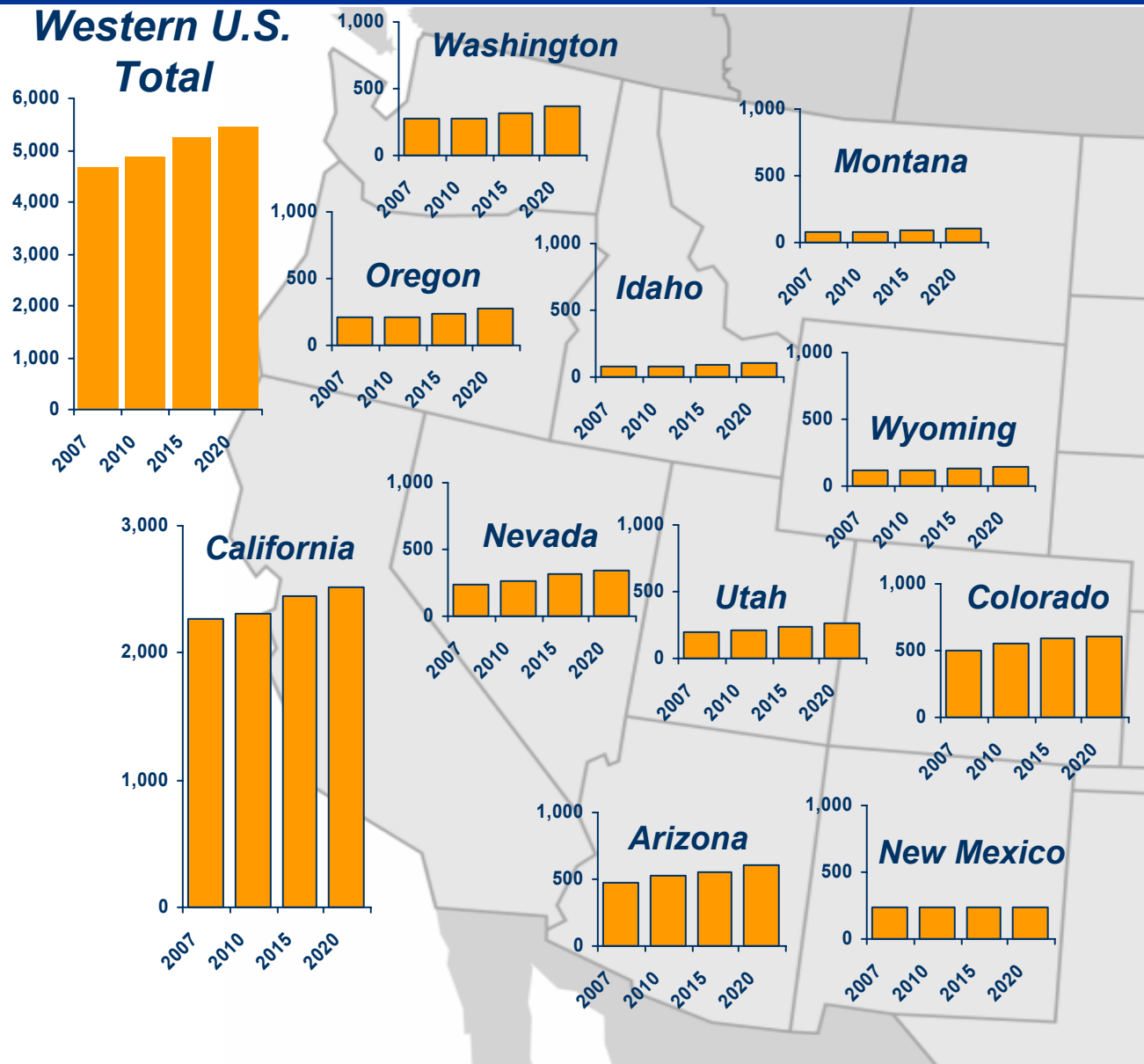
Western U.S. Gas Demand, Bcf per Year

- Annual demand in the Western U.S. increases by over 700 Bcf, an increase of about 15%.
- The vast majority of growth is in the power sector, with the sector accounting for about 70% of the total growth.



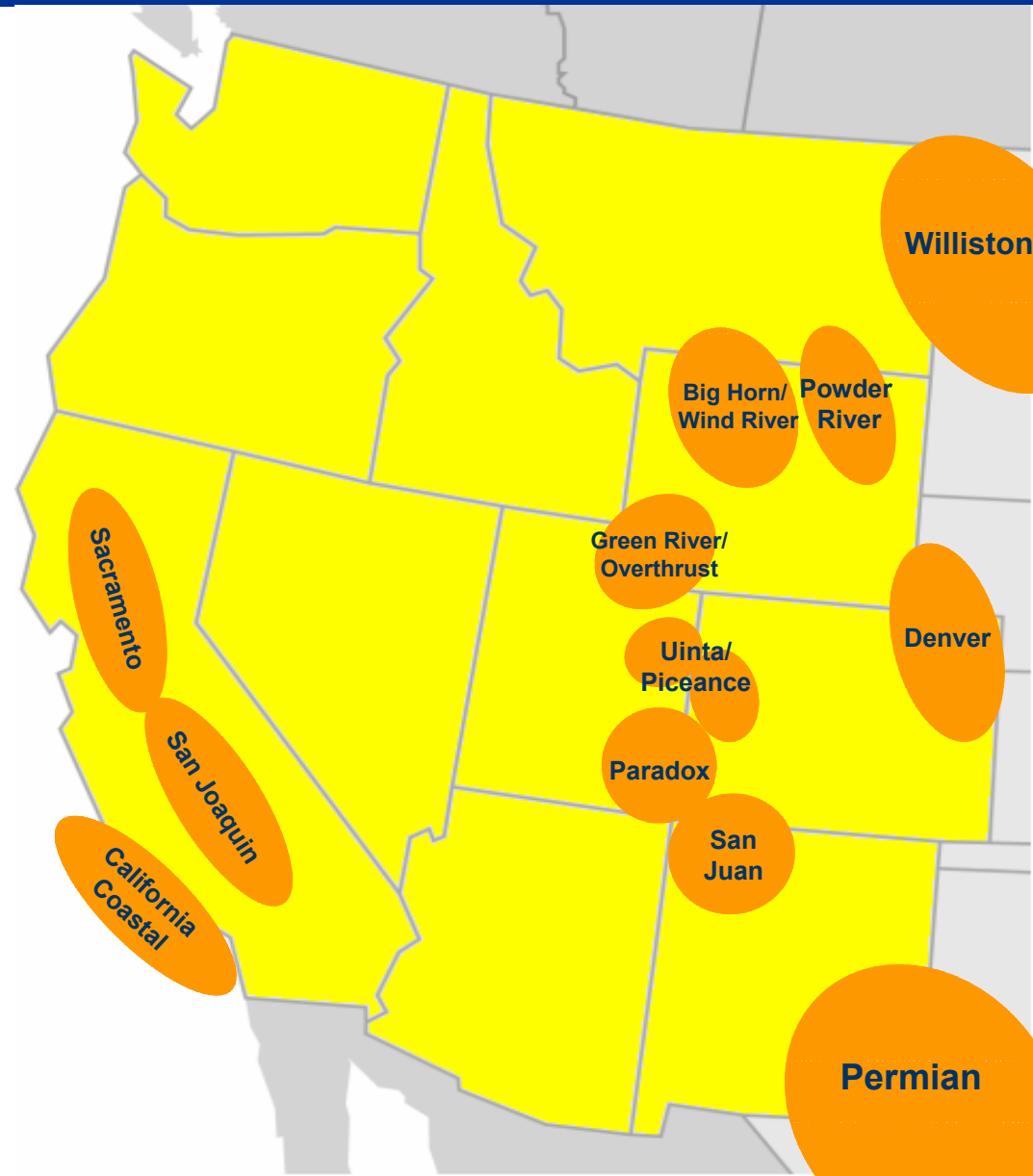
Western U.S. Gas Demand, Bcf per Year

- On average, total demand in the West grows at just over 1% per year.
- California gas use grows relatively slowly, compared to growth in nearby states.



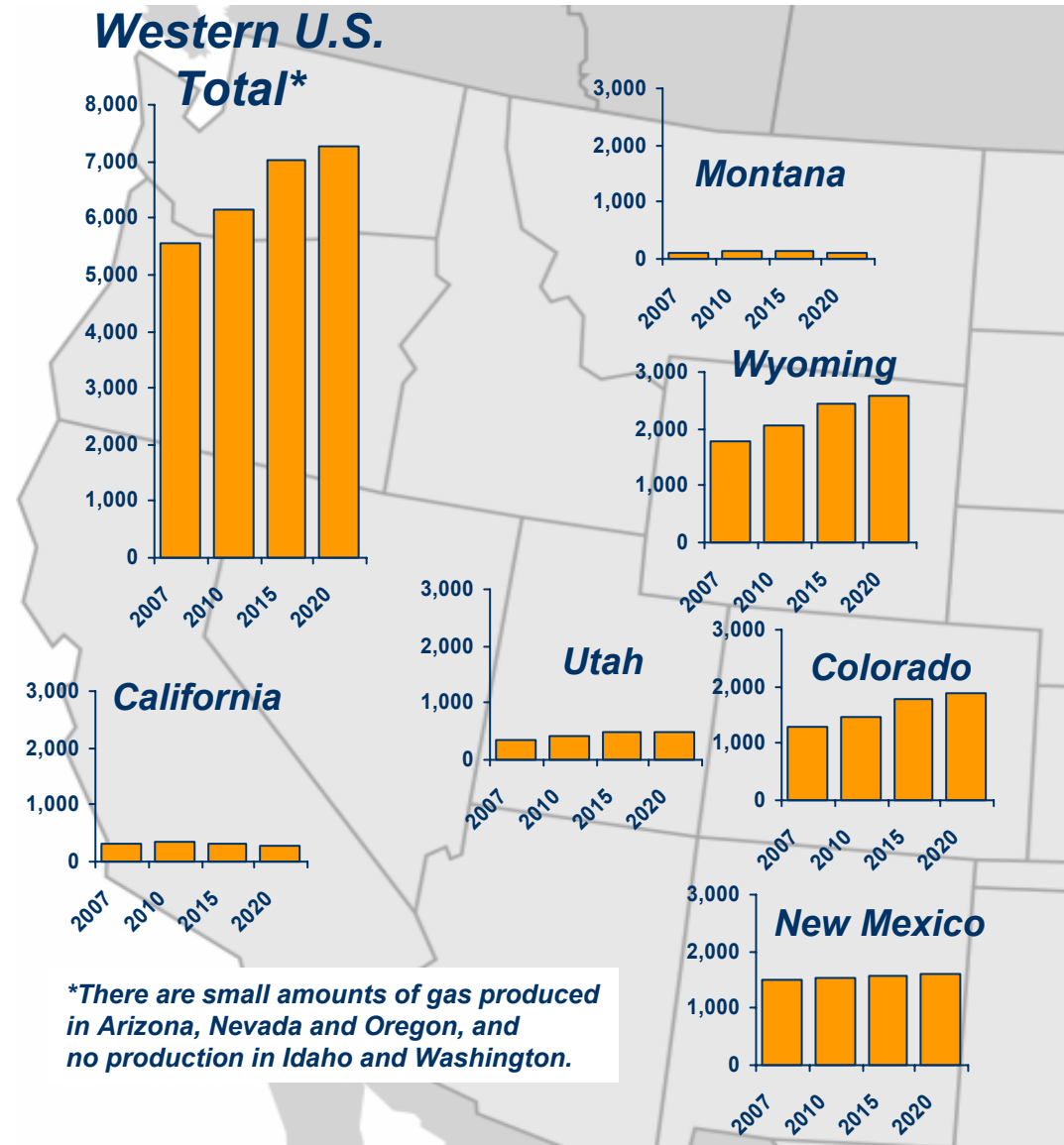
Western U.S. Production Basins

- 12 major producing basins in the West.
- 4 of them, the Permian, San Juan, Green River, and Uinta/Piceance, account for 75% of today's production from the area.
- Significant growth expected in the Uinta/Piceance and Green River Basins.



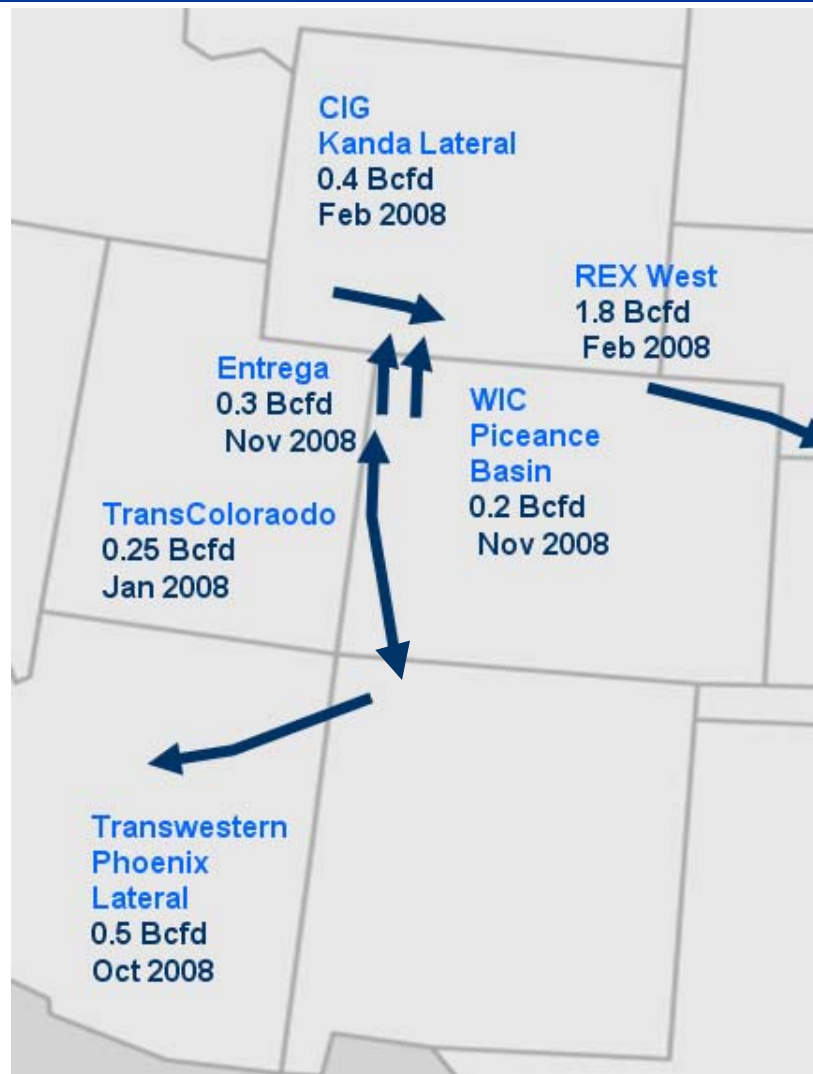
Western U.S. Gas Production, Bcf per Year

- In total, Western U.S. production increases by almost 30% by 2020.
- Half of the production growth occurs in Wyoming, mostly in the Green River Basin.
- Most of the rest of the growth is in the Uinta/Piceance Basin in Colorado and Utah.



Recent Pipeline Expansions

(Already Built, Under Construction, or Permitted)

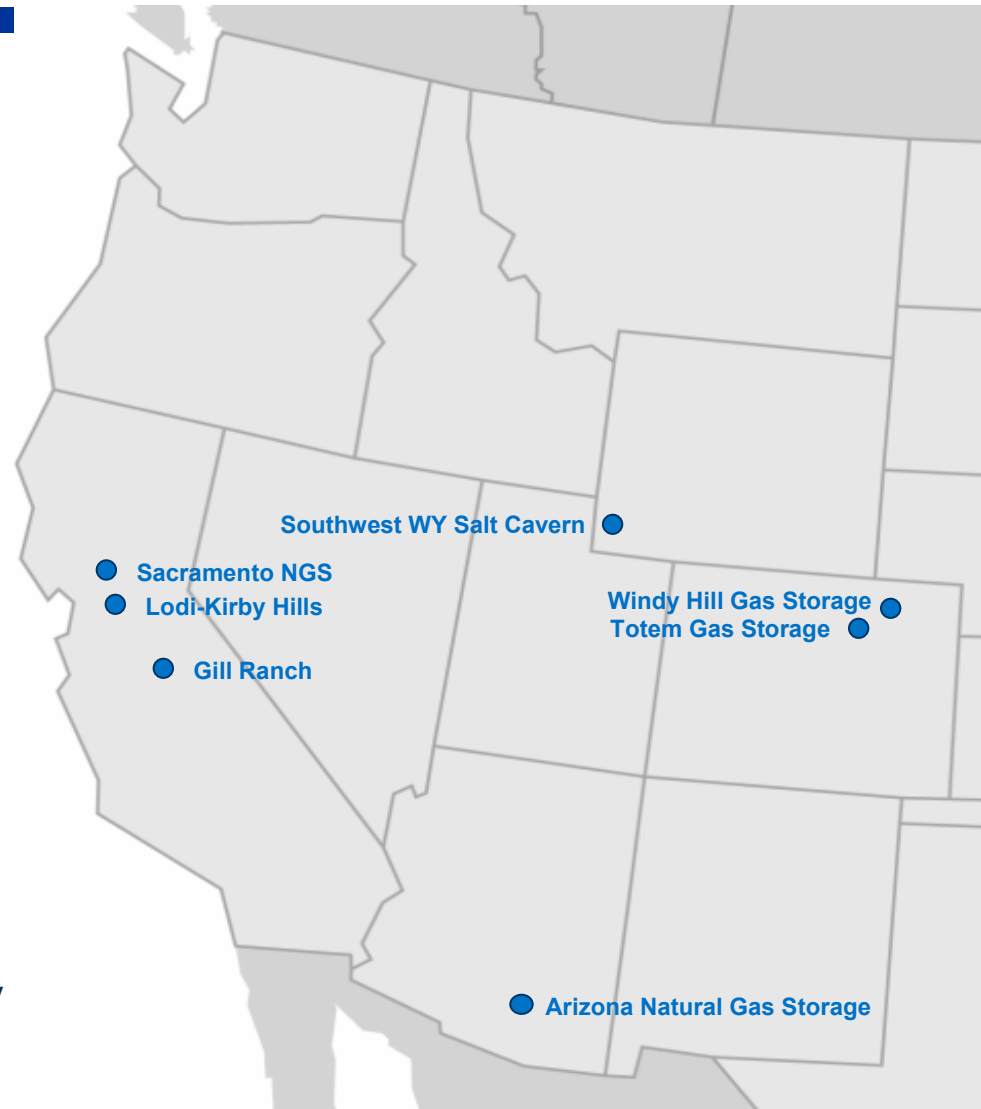


Proposed Pipeline Expansions for the West



Proposed Storage Expansion in the West

- **Kirby Hills Expansion – Lodi Gas Storage**
 - Location: Solano, CA
 - 12 Bcf Expansion , In-Service September 2008
- **Sacramento Natural Gas Storage**
 - Location: Sacramento, CA
 - 7.5 Bcf New project – conversion of depleted reservoir
 - Proposed, In-Service mid- 2009
- **Gill Ranch – Northwest Natural Gas and Pacific Gas & Electric**
 - Location: West of Fresno, CA
 - 20 Bcf New project – conversion of depleted reservoir
 - Proposed, In-Service Fall 2010
- **Arizona Natural Gas Storage – El Paso**
 - Location: Southeast of Phoenix, AZ
 - 3.5 Bcf New project – create four salt caverns
 - Proposed, In-Service mid-2011
- **Totem Gas Storage a.k.a. High Plains Storage – Colorado Interstate Gas**
 - Location: Adams county – northeast of Denver, CO
 - 7 Bcf Depleted reservoir
 - Proposed, In-Service June 2009
- **Windy Hill Gas Storage – NGS Energy Fund**
 - Location: Morgan county - northeast of Denver, CO
 - 6 to 18 Bcf New Project – salt caverns created in 3 to 4 Bcf increments
 - Proposed, In-Service – summer 2010
- **Southwester Wyoming Salt Cavern – Questar Pipeline**
 - Location: Evanston, WY
 - 5 to 12 Bcf New project – salt cavern
 - Proposed, Not moving forward at this time, but still possible.
- **Oil Springs – Source Gas Storage**
 - Location: Carbon county, WY
 - 10.3 Bcf expansion of existing storage field
 - New compression and injection-withdrawal wells to increase deliverability
 - April 2008 open season



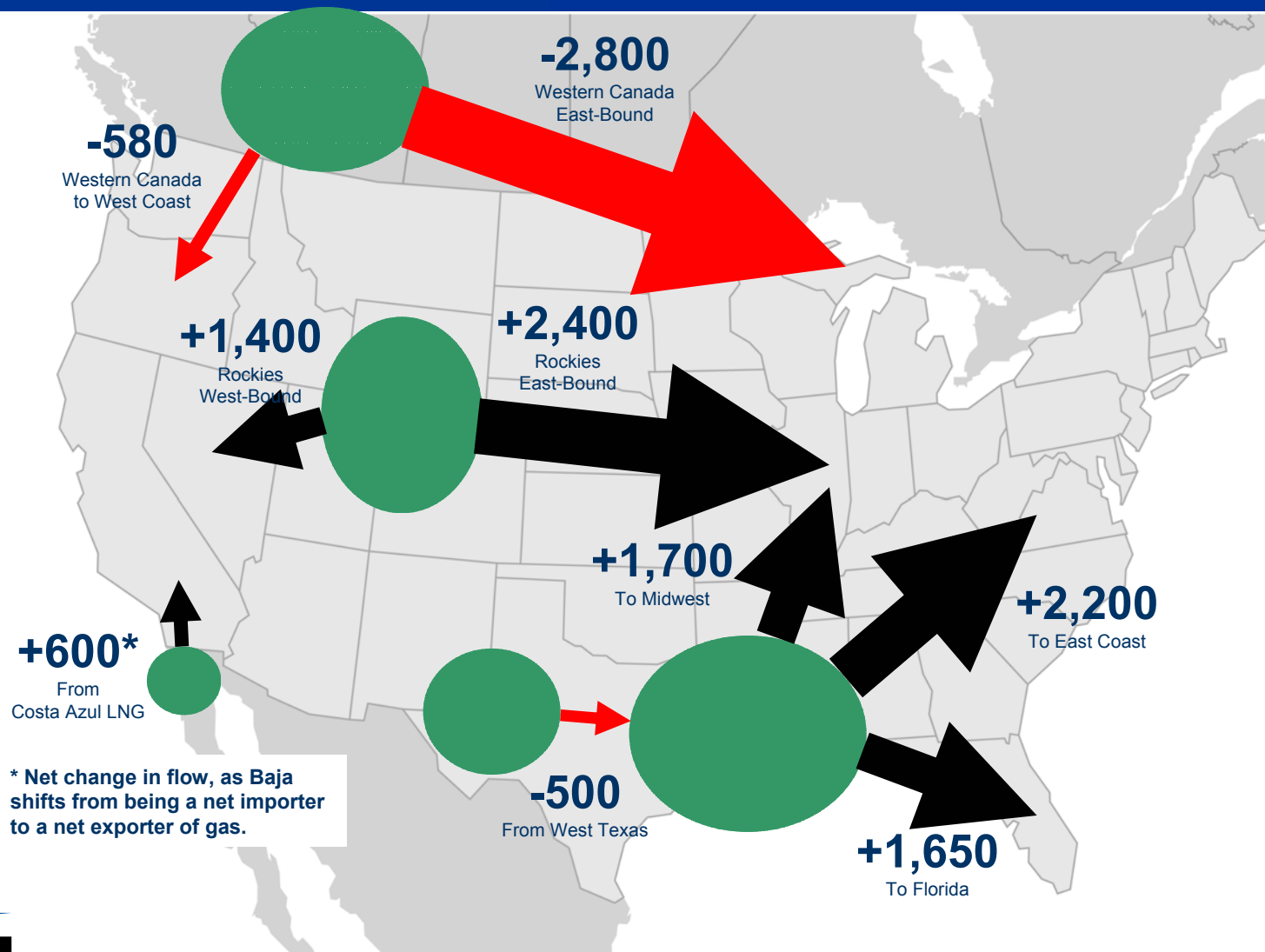
West Coast LNG Facilities

- *Operational*
- *Proposed to FERC*
- *Potential*

- Currently, Costa Azul is the only LNG import facility under construction in the West.
 - The first LNG delivery to Costa Azul is expected to arrive this month.
- There are eleven other LNG regas facilities that have been proposed to FERC or identified by developers as potential sites.



Changes in Gas Flows in MMcfd, 2007 to 2020



Gas Prices and Basis

- Prices will average near \$8 per MMBtu during the next 10 years.
- Basis below recent levels, but remains relatively high despite significant infrastructure development.

Gas Prices (2006\$/MMBtu)	Average 2005-2007	Average 2008-2020
Henry Hub	7.50	7.97
Opal	5.61	6.91
Southern California	6.69	7.86
Northern California	7.10	8.00
NPC/PGT Hub (Stanfield)	6.63	7.92

Basis (2006\$/MMBtu)	Average 2005-2007	Average 2008-2020
Opal to Henry Hub	1.89	1.06
Opal to SoCal	1.07	0.96
Opal to NoCal	1.49	1.09
Opal to NPC/PGT Hub	1.01	1.01

Conclusions: Climate Change

- The Western Climate Initiative (WCI), a collaboration formed by seven western U.S. states and two Canadian provinces to develop regional strategies to address climate change, has set a goal to reduce regional greenhouse gas (GHG) emissions to 15% below 2005 levels by 2020.
 - Later this year, the WCI is scheduled to complete its design of a market-based mechanism to help achieve that goal.
- Federal legislation on climate policy gaining momentum.
 - Such policy may supersede regional efforts.
 - Even so, the impacts of Federal GHG legislation will probably have a similar impact on Western power markets – i.e., greater reliance on gas-fired generation during the next 10 to 15 years.

Conclusions: Natural Gas Demand

- Two distinct trends for gas demand within the western states.
 - California's relatively slow growth.
 - Robust growth in some areas driven by rapid population growth.
- California's slower growth in gas demand is due to the State's aggressive energy efficiency measures.
 - California has the most stringent standards in the U.S. for home and commercial appliances and building efficiency, and SoCal and PG&E have implemented large-scale demand-side management (DSM) programs.
- Conversely, states like Arizona, Nevada, Oregon, and Washington will become more reliant on natural gas-fired generation to satisfy increasing electric loads.

Conclusions: Natural Gas Supply

- Some of the Rocky Mountain states are likely to experience robust growth in gas production, and, in aggregate, western production is likely to grow by over 2% per year in the foreseeable future.
 - Gas production is an important source of revenue for a number of western states.
 - The areas' production is important for consumers across North America, particularly if Western Canadian exports decline as many analysts expect.
 - Much new infrastructure is needed to make delivery of growing supplies possible.
- Restrictions on supply development and new regulations limiting access to supplies may have an adverse impact on supply growth.

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