Changes in the global LNG market

And what they could mean for Alaska

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ALASKA NATURAL GAS
TRANSPORTATION PROJECTS
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It's all about the market

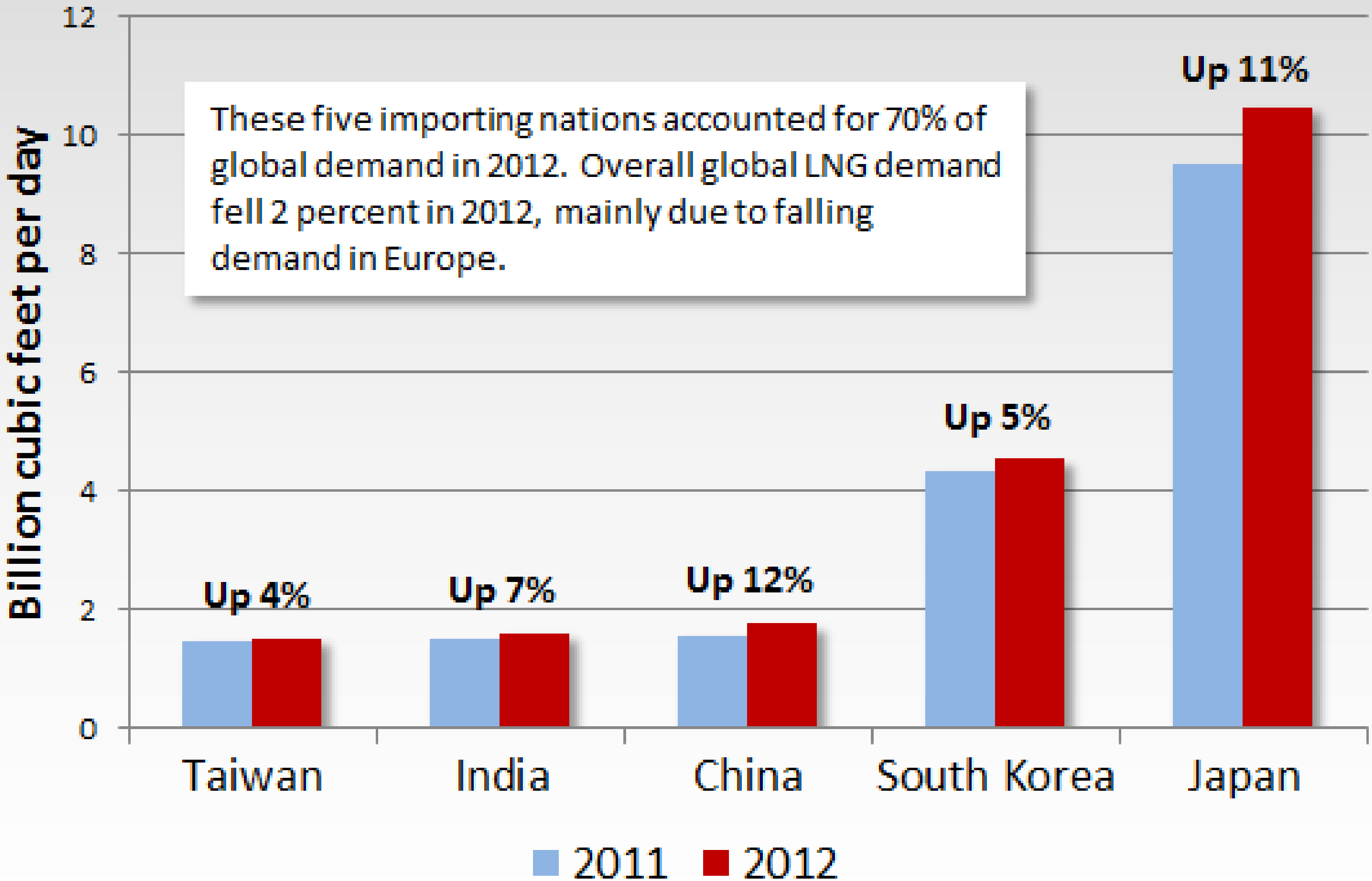
- Competition for LNG customers is intense
- Both demand and supply are growing
- Alaska must be cost-competitive to have a chance
- Japan Ministry of Economy, Trade & Industry official:

  "*We will tell the Russians we have U.S. shale gas.*

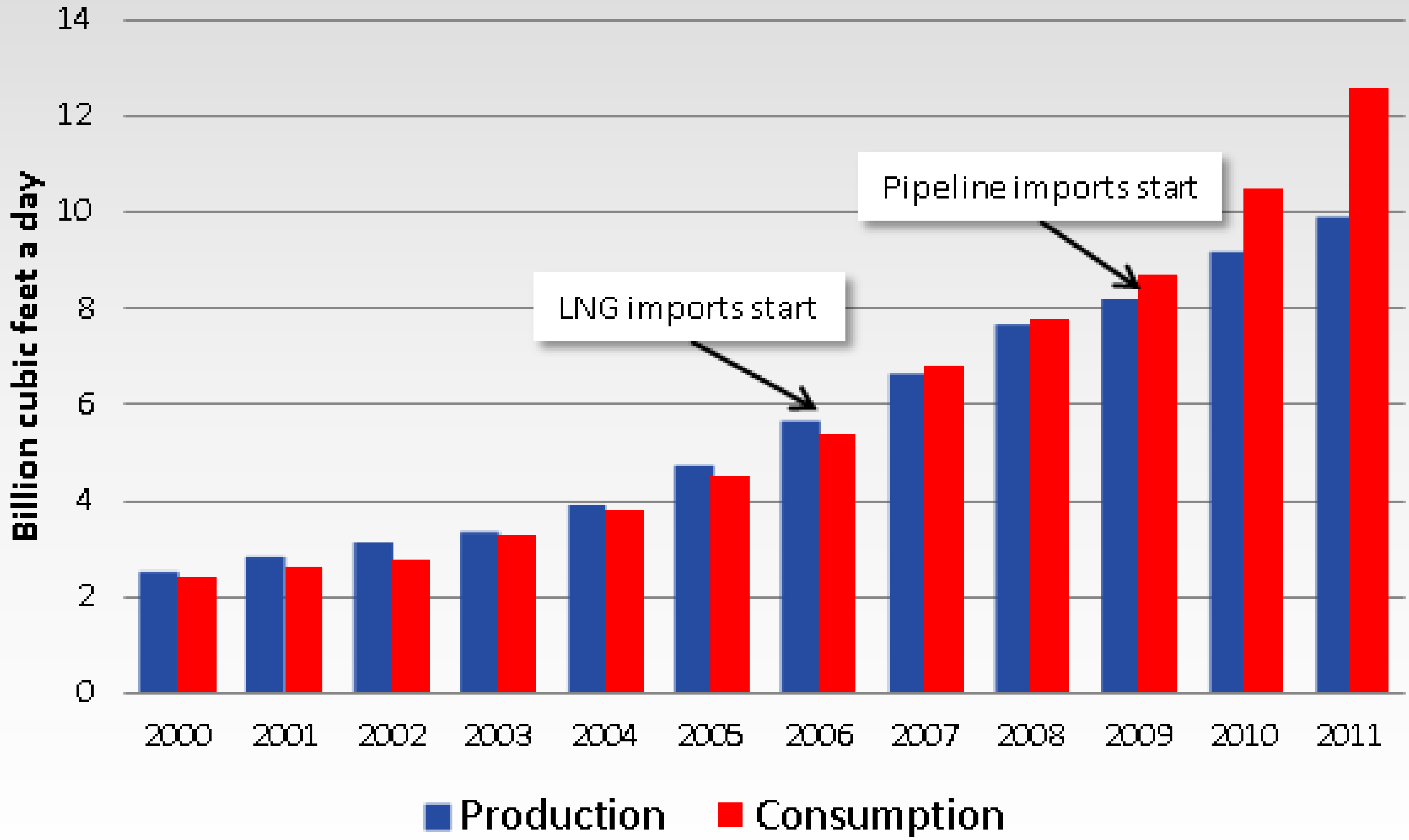
  We will tell the Americans we can also buy Russian gas.

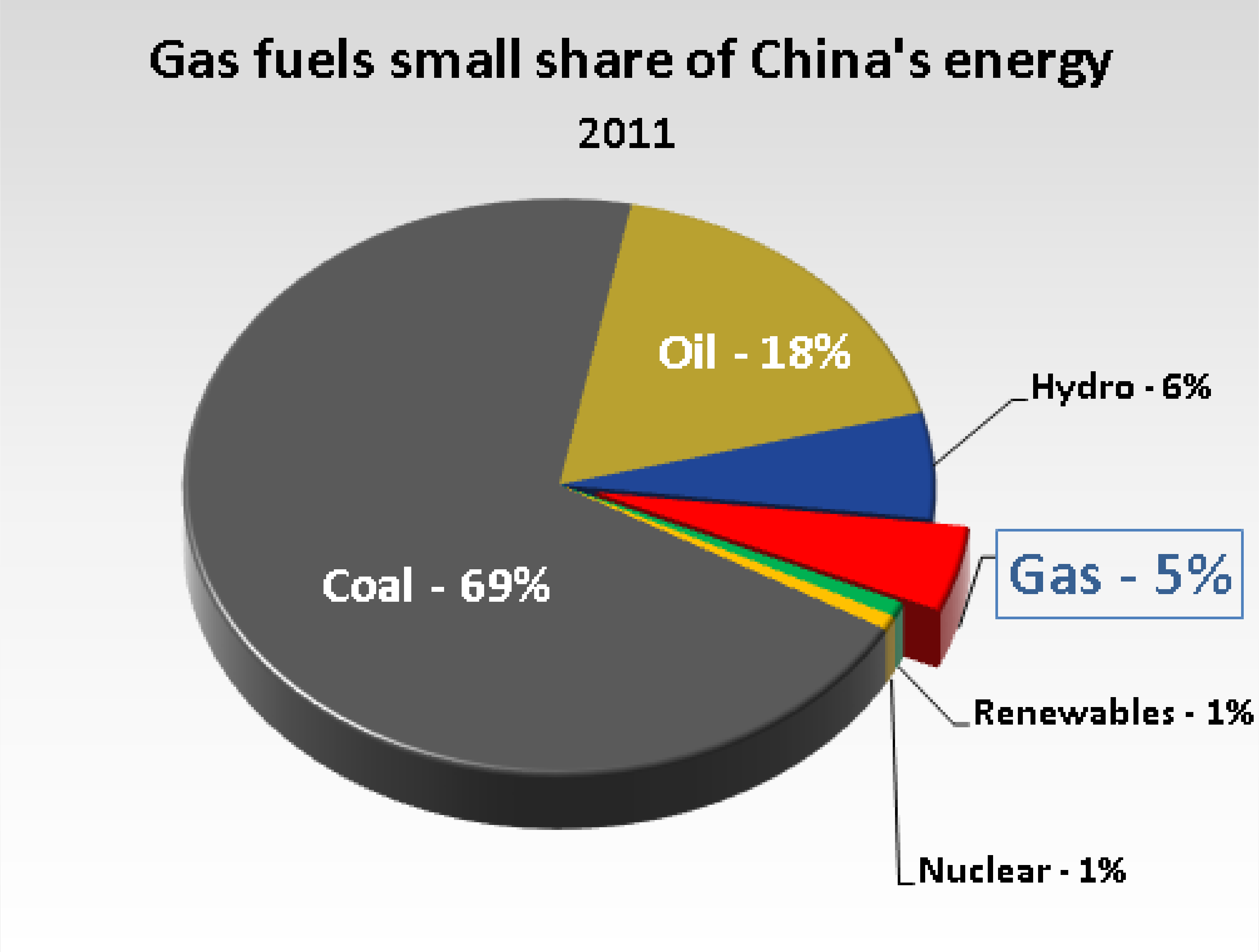
  We will demand the steepest discounts."

Asian LNG imports increased 2011 to 2012



China's gas consumption outpaces production




Gas fuels small share of China's energy
2011
Oil - 18%
Hydro - 6%
Gas - 5%
Coal - 69%
Renewables - 1%
Nuclear - 1%

Alaska’s competitors

- Qatar, with more than 10 bcf a day capacity
- Australia, adding $200 billion in export capacity; expected to overtake Qatar by end of decade
- Angola LNG to come online 2013
- Papua New Guinea scheduled to start up 2014
- The window: Australia, Angola, Papua New Guinea coming into market 2010s; Alaska looking to 2020s

More competition

- At least three LNG terminals proposed in Russia
- All looking to sell gas into Asian markets
- Mozambique, Tanzania with 120 tcf of discoveries
- Israel, Eastern Mediterranean could be on the list
- British Columbia projects lining up to win approval:

  Chevron, Apache, Shell, Malaysia's Petronas,

  BG Group, Korea Gas, PetroChina, Mitsubishi

Lower 48 exports

- Cheniere (Louisiana) to start shipments 2015
- Freeport (Texas) received export approval May 17
- Total authorization 3.6 bcf a day, at full capacity
- Both projects fully subscribed for LNG output
- Still 19 more applications await Energy Department
- Analysts forecast up to 8 bcf/d capacity by 2020

They all have problems

- All is not lost for Alaska
- Our competition has just as many problems as us
- High costs, some politics, environmental issues, expensive pipelines, distance to markets, long development times, domestic energy needs
- Sales contracts to creditworthy customers before developers approve the final investment decision

Australia's problems

- Cost overruns in overheated construction market
- Projects under way: 43%, 25% and 15% overruns
- Earlier talk of expansion fading, as are new projects
- Environmental concerns build over coal-seam gas
- Domestic users worry about LNG-based pricing
- Locals complain about jobs going overseas for plant modules and floating LNG processing ships

Canada's problems

- Shale plays are undeveloped and very remote
- One estimate for production costs: $3.50 to $4.50
- Pipelines to Kitimat / Prince Rupert; 290 / 470 miles across two mountain ranges; $1.5 billion - $4 billion
- Project developers say they need oil-linked prices
- First Nations troubled over tanker traffic, air quality

Russia’s problems

- Gazprom loves its high prices
- Russian government needs Gazprom’s revenues
- Others want to break Gazprom export monopoly
- Buyers not so trusting of Gazprom or Russian politics
- Costly pipelines needed to ship gas to Pacific Coast
- One project estimated at $50 billion
- Russia-Japan, Russia-China not best of friends

East Africa’s problems

- Undeveloped nations; lack roads, ports, power
- Clear, predictable, stable legal framework needed
- Deep poverty a challenge for any development
- World Bank: Tanzania 134th and Mozambique 146th out of 186 nations in its ‘Doing Business 2013’ report
- Tanzania residents this month protested against gas pipeline plan, demanding more local benefits

Lower 48’s problems

- Long, costly tanker run from Gulf Coast to Asia
- Voyage three times as far as from Alaska
- Some tanker estimates as high as $4 per million Btu
- Higher U.S. natural gas prices, plus transportation, will cut into price advantage for exports to Asia
- At $6 Henry Hub, Lower 48 LNG could be $14 in Asia
- Rising domestic gas price could limit LNG exports

Lower 48's problems

- Politics always a problem
- Fracking opponents continue fight against exports
- Litigation can delay development, raise costs
- Energy Department and Congress continue to look at how LNG exports might hurt U.S. gas supply, price
- Energy Department has approved second project, but 19 more applications still await export decision

Alaska's advantages

- Closer to Japan than U.S. Gulf Coast, East Africa, British Columbia, Yamal Peninsula in Arctic Russia
- Gas production costs lower than undeveloped fields in British Columbia, Russia and other remote plays
- Proved reserves provide certainty of supply
- Oil pays the bills for North Slope infrastructure
- Known political and legal structure; no surprises

Alaska's disadvantages

- The obvious one: 800 miles of multibillion-dollar steel pipe across the Arctic, buried in permafrost
- High construction costs
- Seasonal restrictions on work
- Limited window for barge deliveries to North Slope
- Stronger environmental laws than most countries

LNG pricing

- The grip of strict, oil-linked pricing is slipping
- Gas utilities, power generators, manufacturers, fertilizer plants, home owners cannot afford $18 gas
- Asia LNG buyers looking for price relief, maybe a blend of oil and North America gas prices — at least softening the percentage at high oil prices
- Governments support pushback against oil-linkage

The ‘what ifs’ that matter

- China: Shale gas; economic growth; coal
- Pipeline gas from Russia to China and Japan
- Future of Japan’s nuclear plants
- European shale gas and economic recovery
- Does Gazprom get into a bidding war on price
- Asian government price controls on gas
- <u>The delivered price of a million Btu of Alaska gas</u>

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