



Strategic Advisors in Global Energy

# Latin America: The Reach of the US Unconventional Gas Revolution

XIX Annual Latin American Energy Conference

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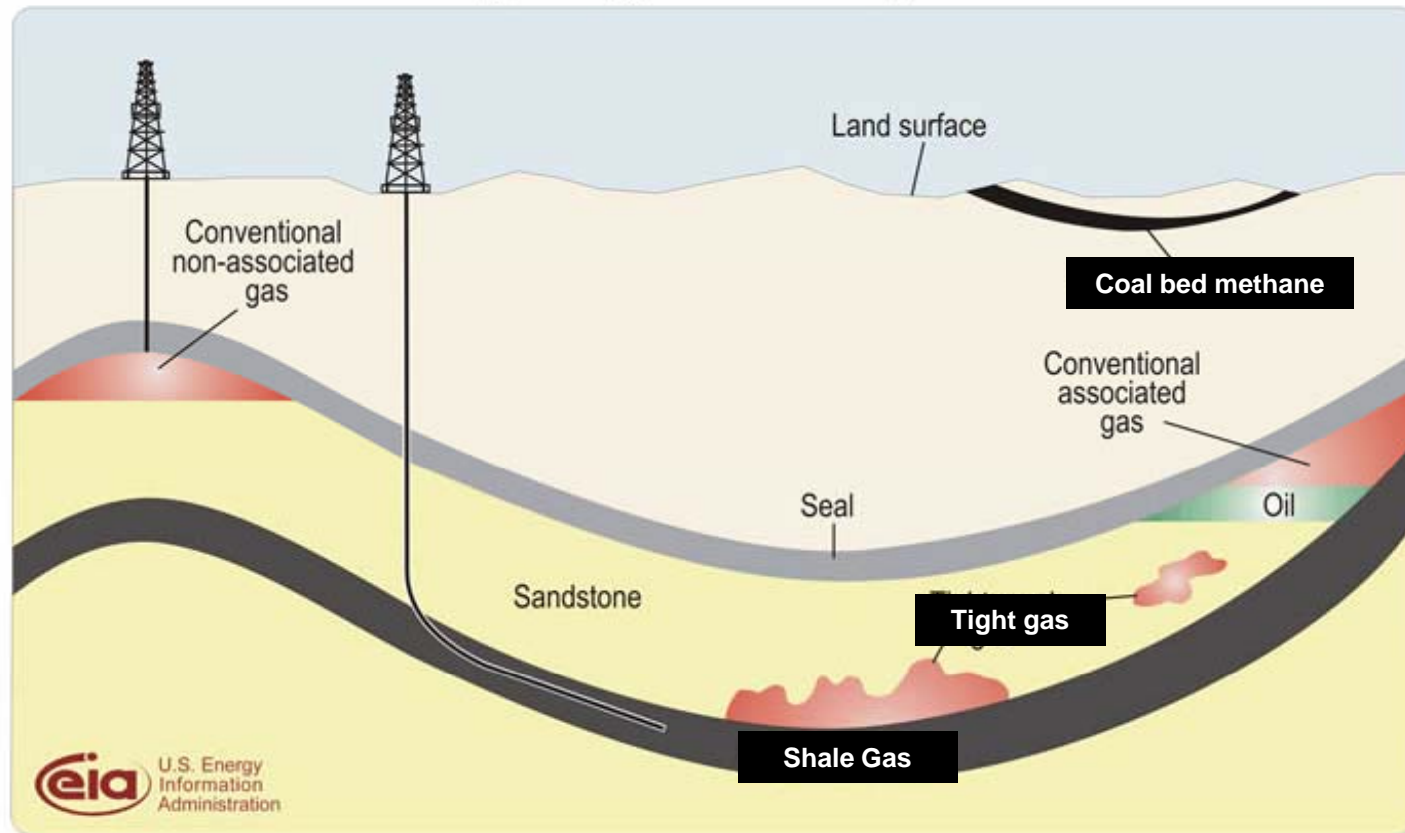
## Key Messages

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- **The rise in unconventional gas output, particularly shale gas, has fundamentally altered the North American gas market.**
- **Latin America's gas exporters, however, are confronting larger obstacles than a softening US gas market.**
- **Shale gas production in North America is also spurring interest in similar reservoirs in the Western hemisphere, but conditions particular to the US shale gas industry may not be easy to replicate.**

# Defining Unconventional Gas Production

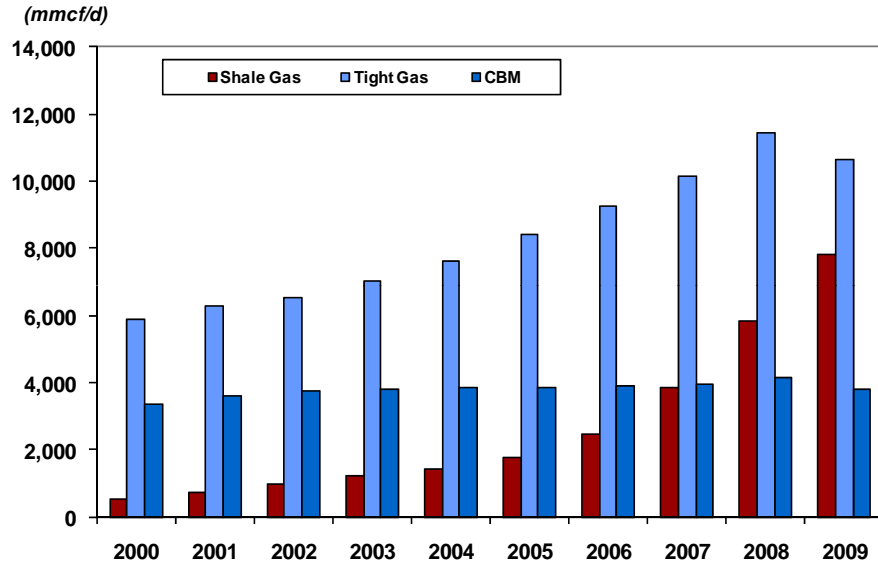
Schematic geology of natural gas resources



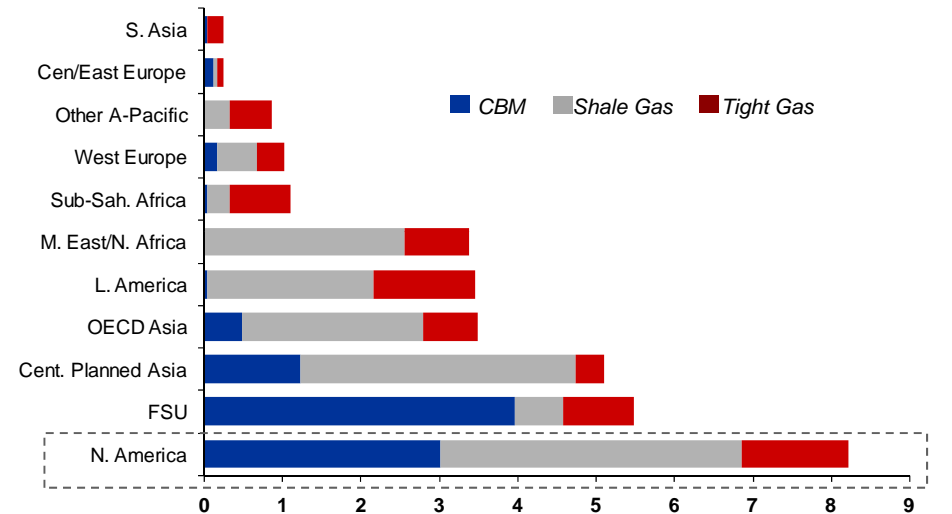
# Growth in Shale Gas Production & Resource Base



Unconventional Gas Production by Type



Global Unconventional Gas Resources



Source: NPC 2007 based on Rogner 1997

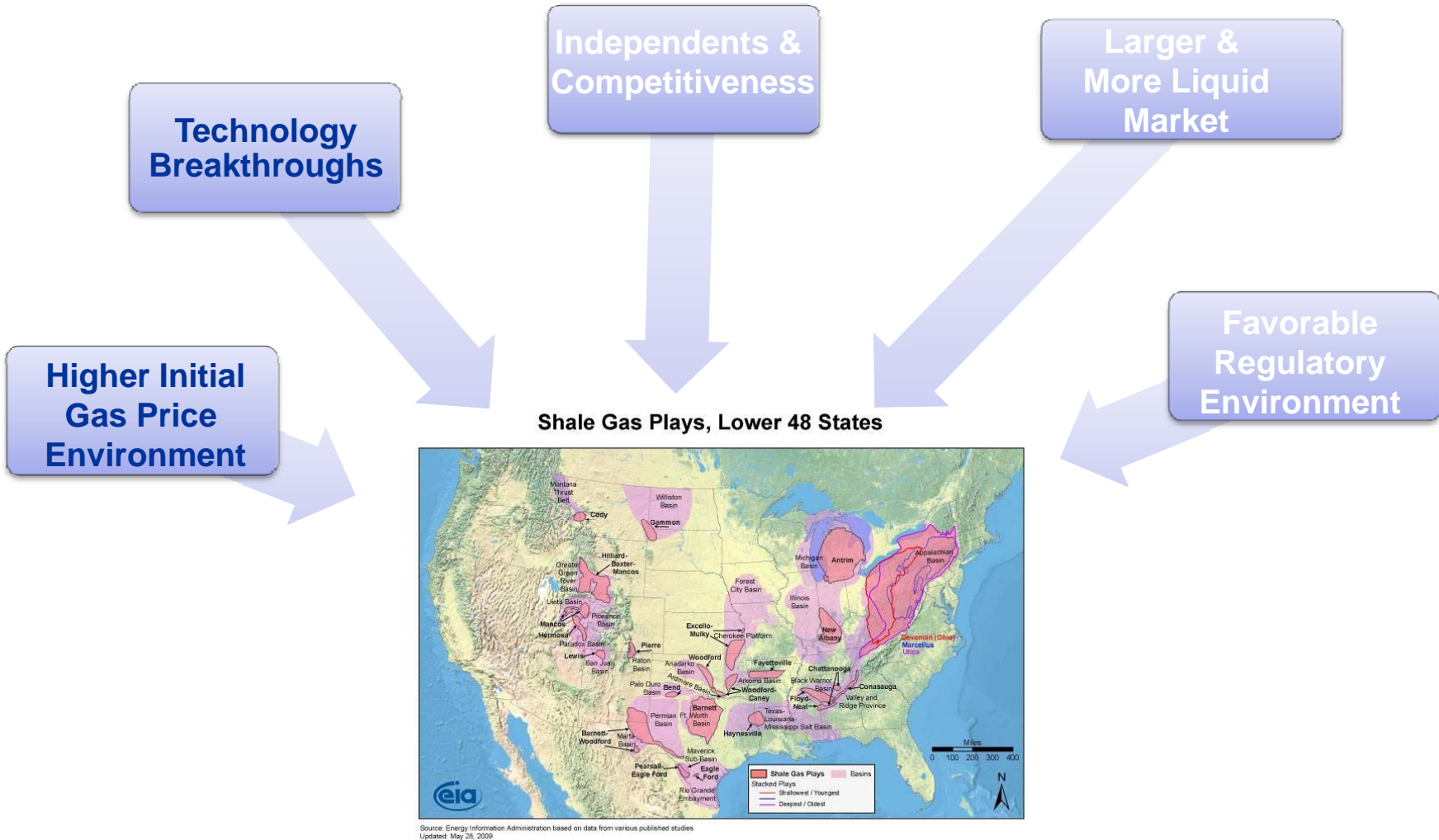
Thousand Tcf

- Gas production from shale gas sources increased more than ten-fold from 2000 to 2009, and provided the majority of the growth in overall U.S. gas production from 2007 to 2009.

- North America has the largest known amount of unconventional gas resources in the world

# Rise in US Shale Production

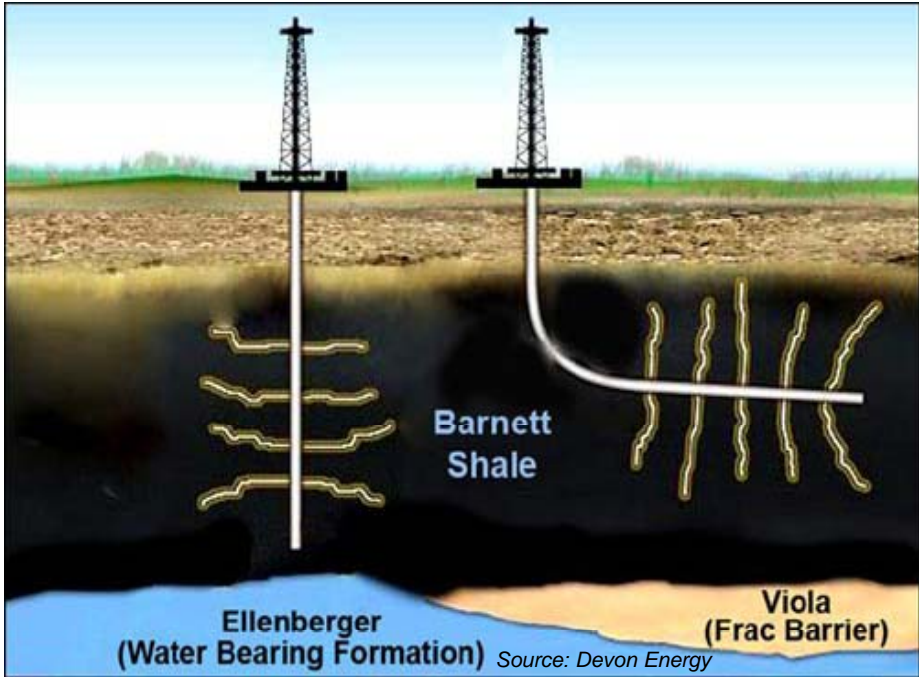
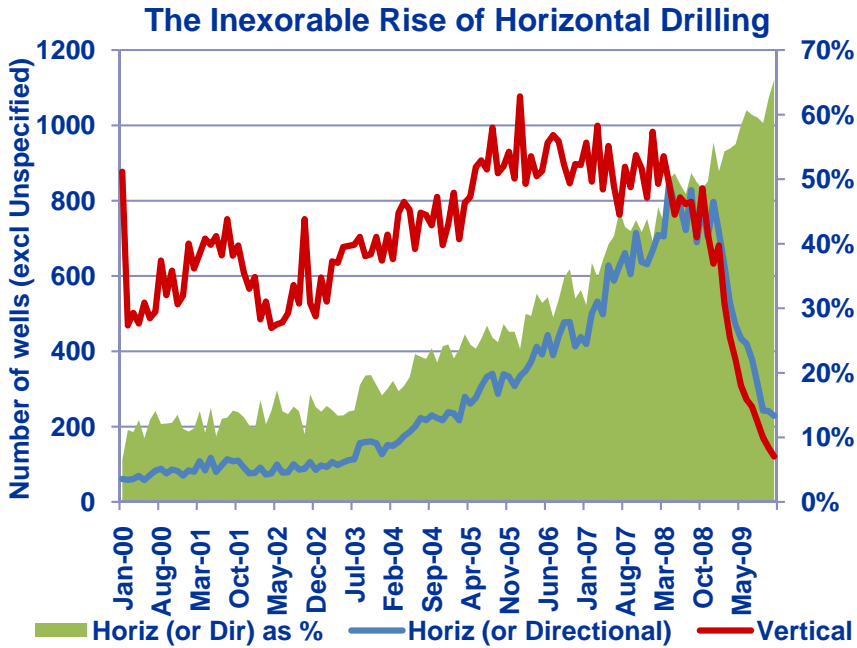
*Fueled by numerous factors*



**The resource was always there, but there were shifts in numerous conditions that fueled the boom in US unconventional gas production.**

# Technology Breakthroughs

- **Unlocking unconventional resources entails a number of conditions to be present, but perfecting of two technologies played a key role**
  - Horizontal drilling – allows operators to access more of the shale formation
  - Multi-stage fracturing – crack the rocks to increase the drainage radius

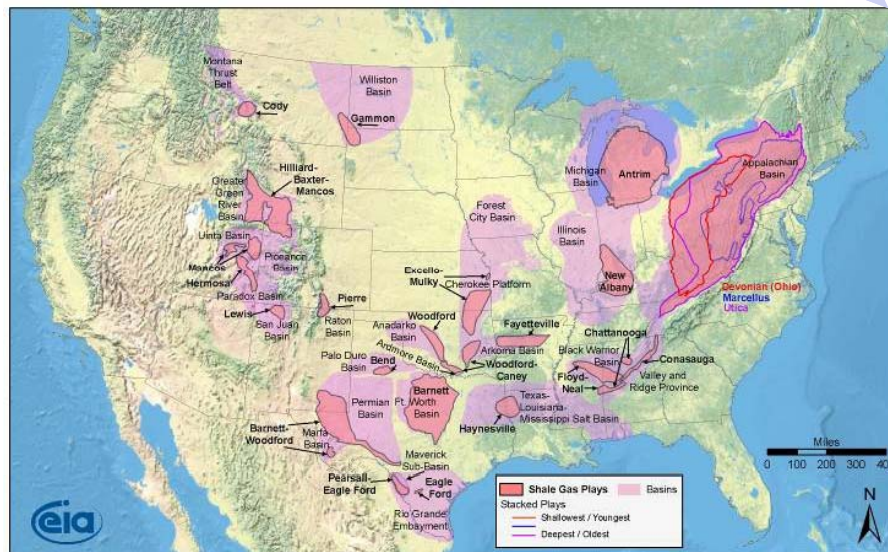


# Rise in US Shale Production

And a number of factors that may be more particular to the US



Shale Gas Plays, Lower 48 States



Source: Energy Information Administration based on data from various published studies  
Updated: May 28, 2009

# Implications for Latin America

*Is the country a gas importer or exporter?*



**LNG Exporters (current & potential): How does it impact the North American supply demand balance? Gas prices?**

- Trinidad
- Peru
- Brazil
- Venezuela

**LNG Importers: Will these economies benefit from lower gas prices?**

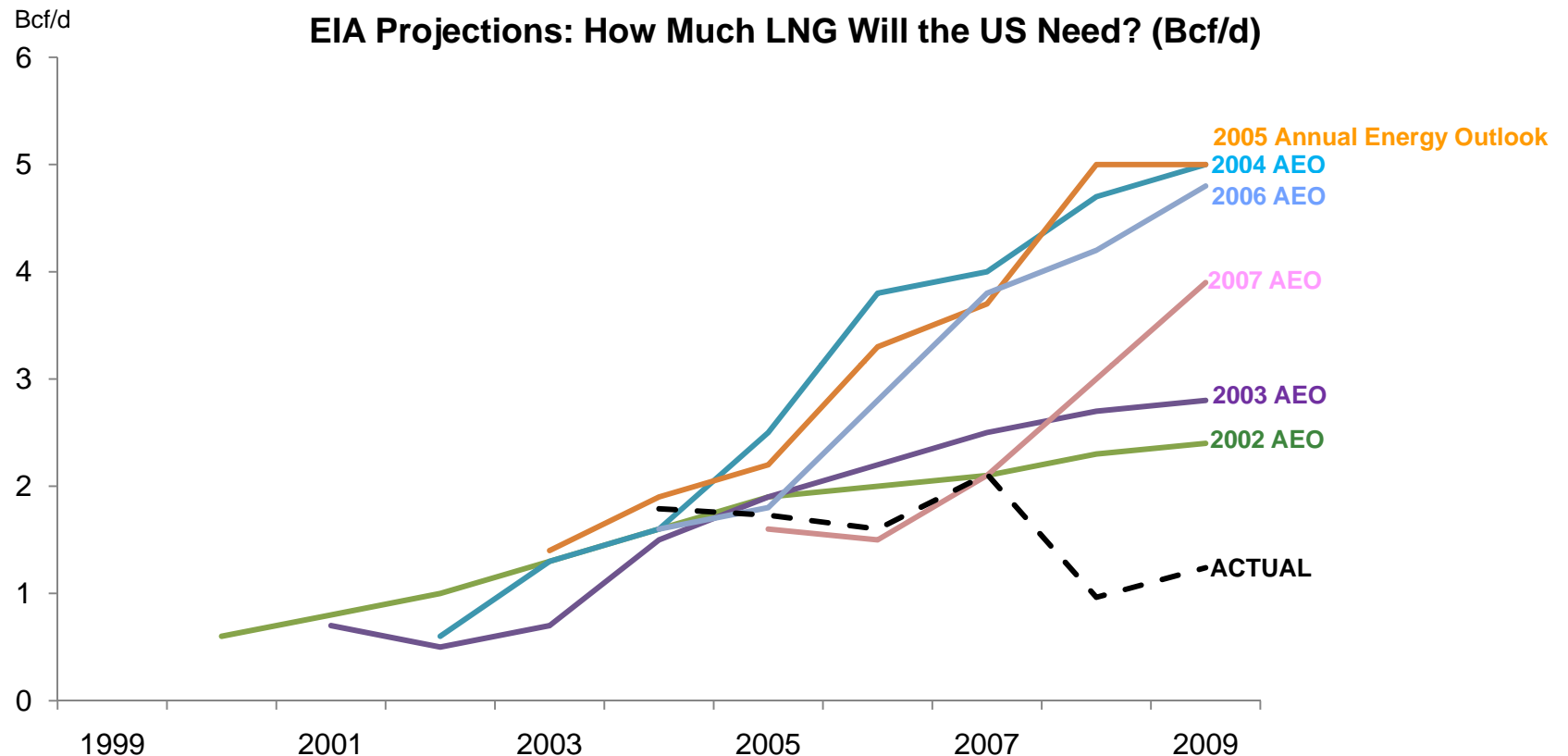
- Argentina
- Brazil
- Dominican Republic
- Chile
- Mexico

**Potential Unconventional Gas Producers: To what extent can the US production story be replicated?**

- Argentina
- Colombia
- Chile

# LNG Suppliers Diverted Away from the US

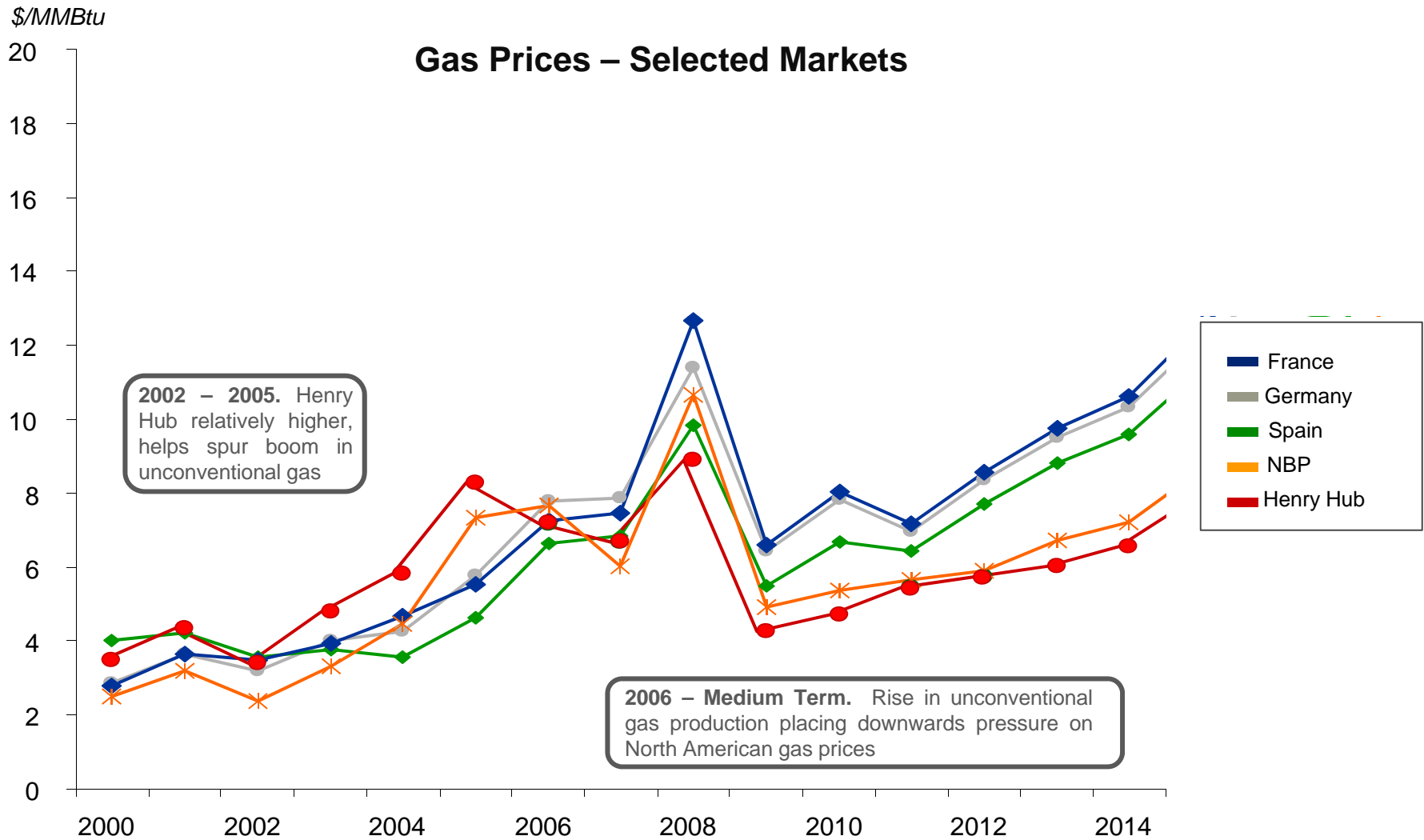
*Shale gas not part of the initial equation*



- **As recently as 2007, the consensus was that the United States would require increasing LNG imports because of basin exhaustion.**

# Links between Henry Hub and Shale Gas

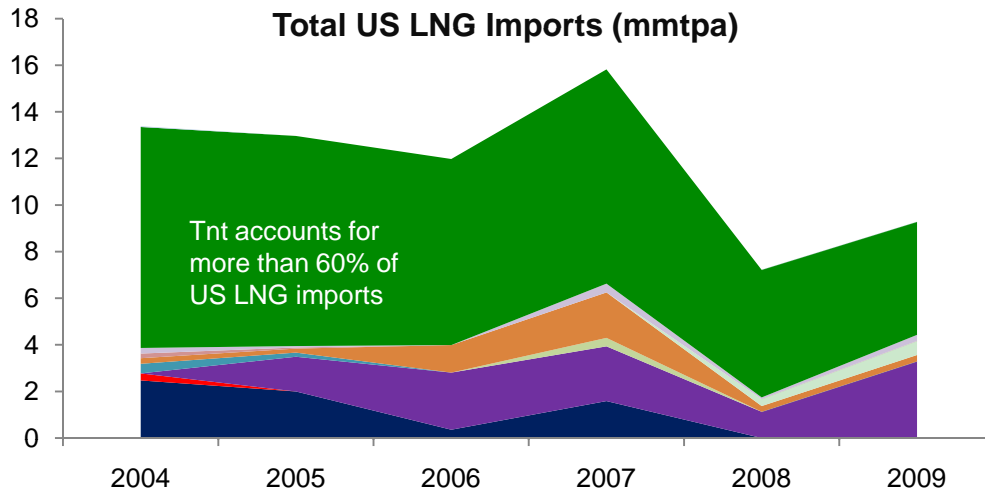
*Dampening gas prices*



Source: PFC Energy

# Latin American LNG

Confronting greater obstacles on the domestic front....



- **Feedstock may be inadequate given project requirements.**
- **Major project partners may lack the technical and financial wherewithal to execute proposed LNG projects.**
- **A volatile regulatory environment hinders investment and weakens contract sanctity.**

Project	Country	LNG Export Status
Atlantic LNG Train 1	Trinidad	●
Atlantic LNG Trains 2-3	Trinidad	●
Atlantic LNG Train 4	Trinidad	●
Atlantic LNG Train X	Trinidad	●
Peru LNG	Peru	●
Delta Caribe Train 1	Venezuela	●
Delta Caribe Train 2	Venezuela	●
Delta Caribe Train 3	Venezuela	●
Santos Basin LNG	Brazil	●

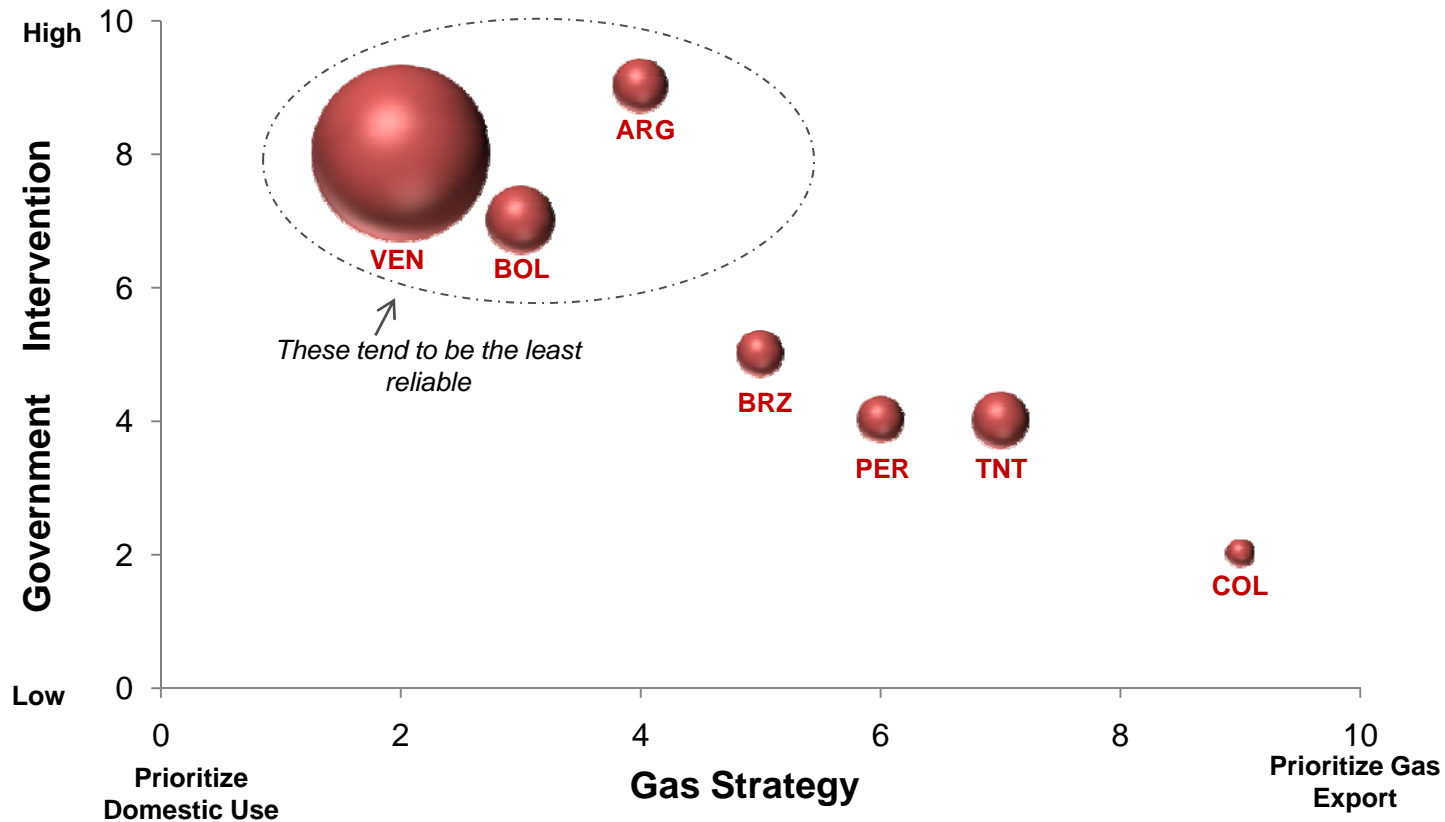
Source: PFC Energy Global LNG Service (GLNG)

# The Shifting Political Economy of Natural Gas

LNG & gas exports are no longer a question of reserves.....



## Will the Country be a Reliable Gas Exporter?

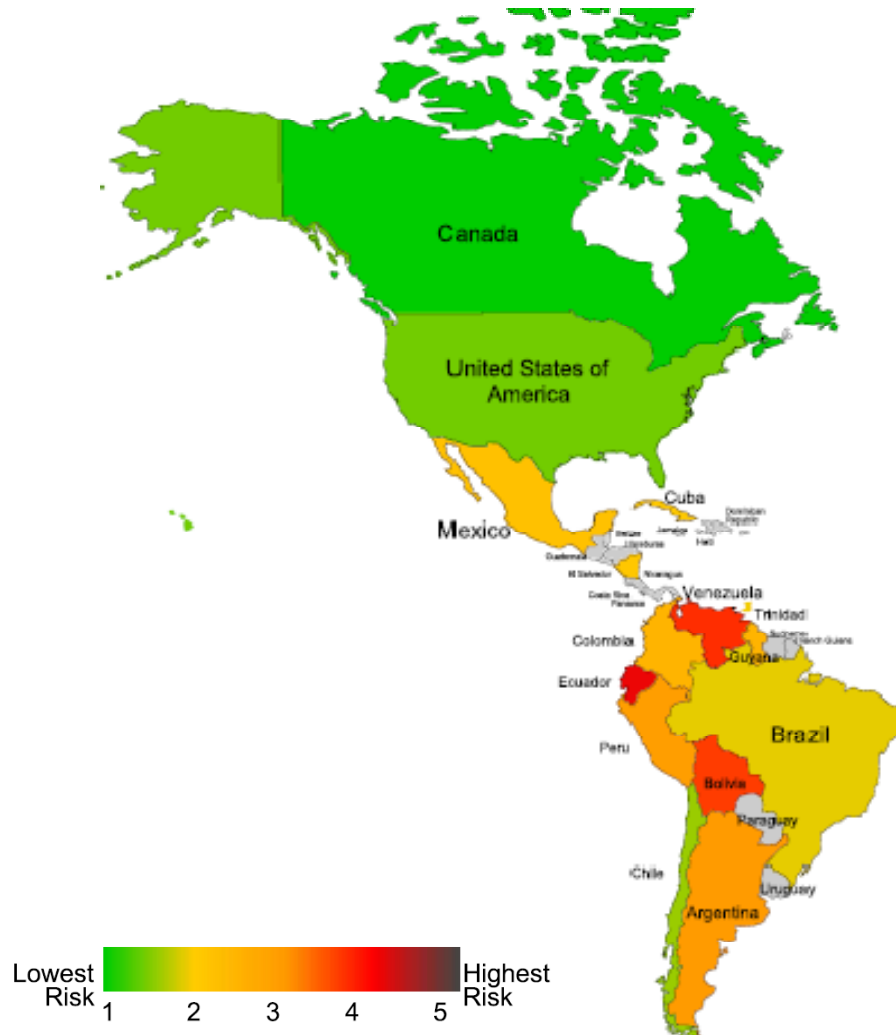


**A new political economic model has emerged that no longer favors exports as the default option for a gas-rich country.**

\* Size of bubble representative of proven gas reserves  
Source: PFC Energy Global LNG Service (GLNG)

# The Shifting Political Economy of Gas

*Increasing above ground risk for operators*



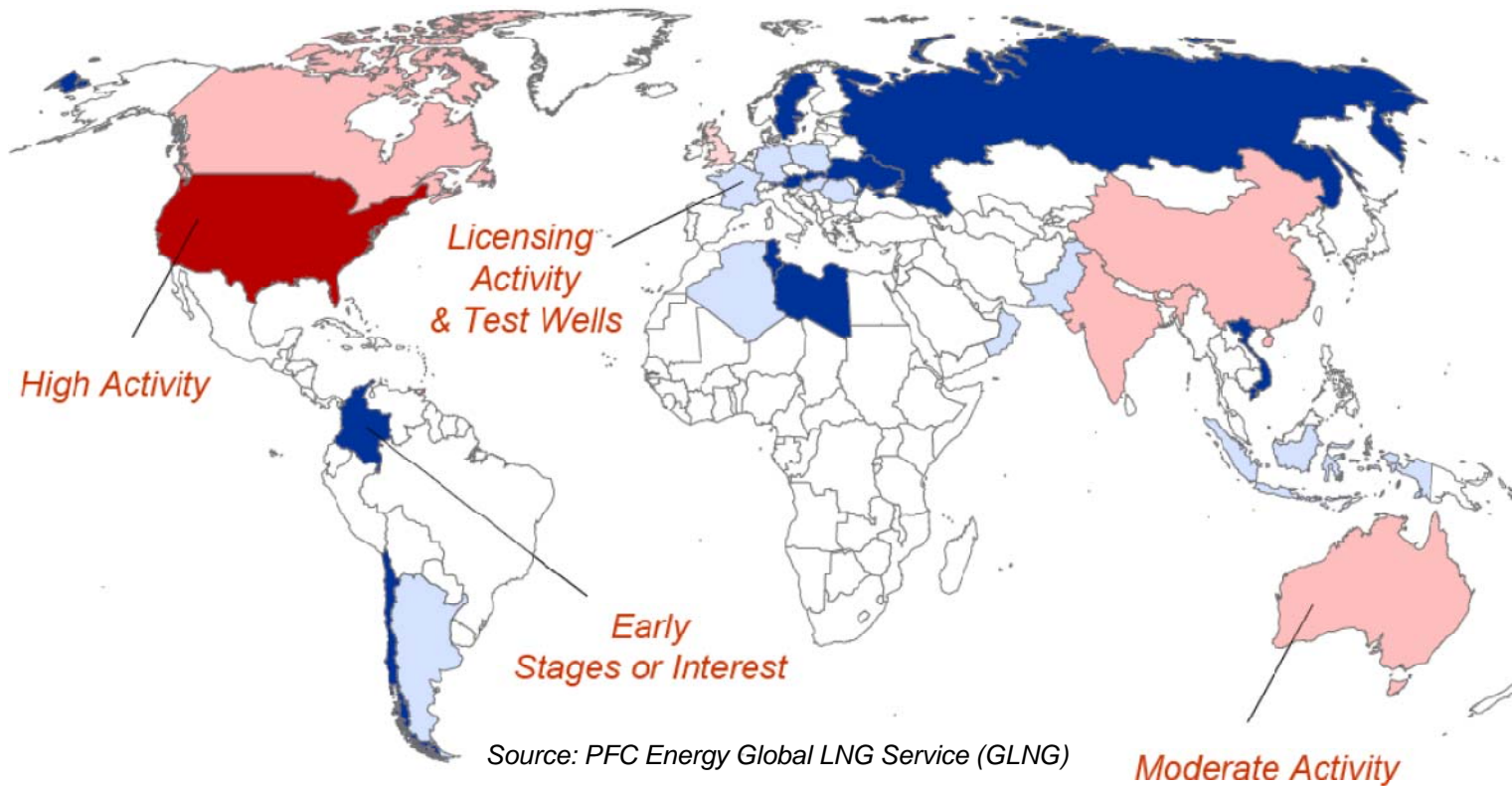
Source: PFC Energy Petroleum Risk Manager (PRM)

- **Governments that opt to prioritize natural gas for domestic use also tend to have other conditions that can hinder operations.**
  - Local content requirements.
  - Stronger NOC Influence.
  - Higher regulatory burden.
  - Export risk
- **Consequently, a number of foreign companies have been subject to forced contract migrations and outright nationalization.**
- **However, the re-emergence of North America as a major resource holder as a result of shale gas alters the investment landscape.**
  - Likely to reduce FDI to Latin America as companies now have more options

# Beyond the US

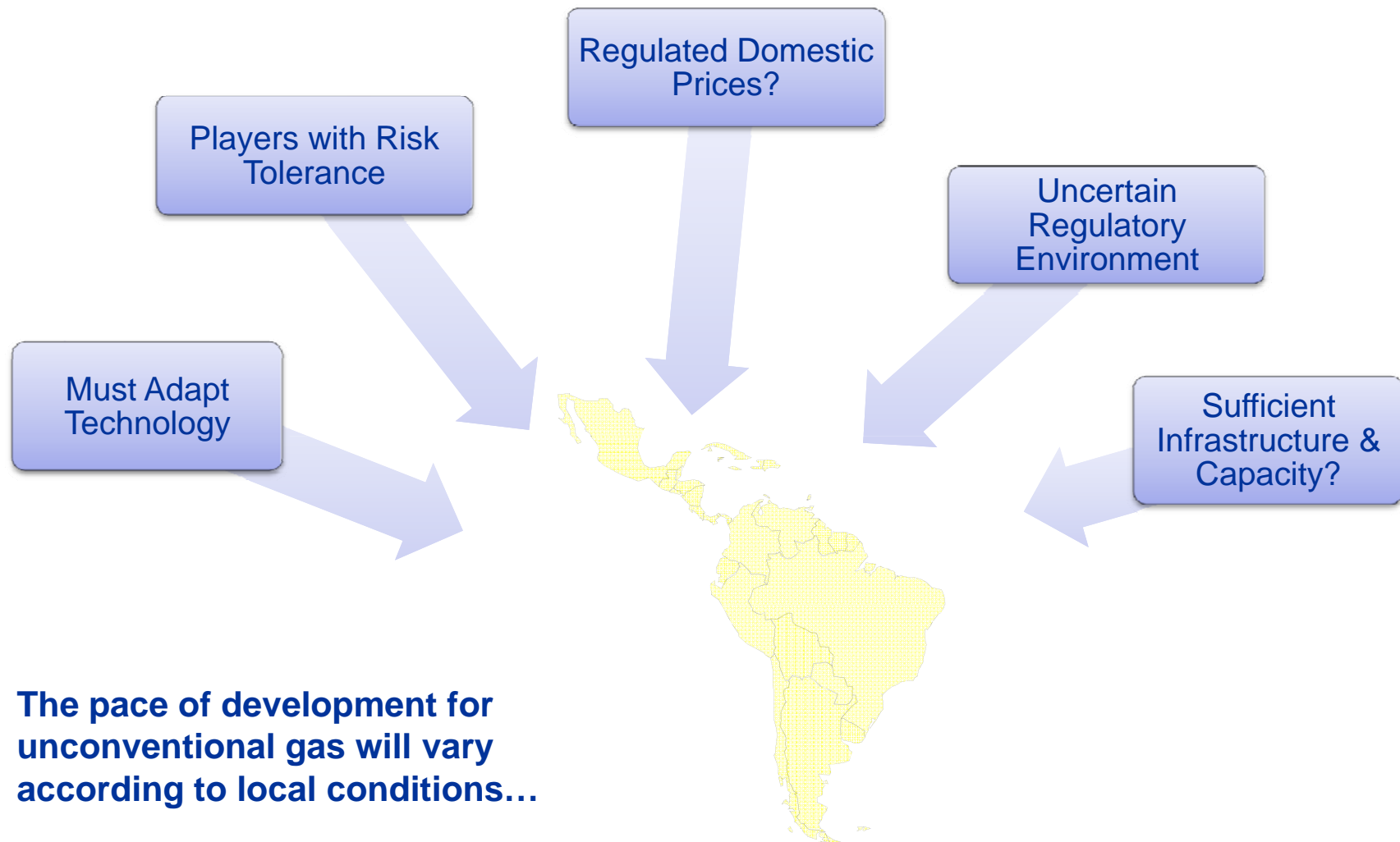
What about the other potential unconventional gas producers?

## Unconventional gas activity worldwide



# Latin America's Unconventional Gas Producers

*Can they replicate the US experience? It depends...*



- The pace of development for unconventional gas will vary according to local conditions...

## Conclusion

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- The rise in **unconventional gas** production in the United States has proved **a game changer** for regional markets.
- Latin America's LNG suppliers will continue to confront relatively lower LNG prices in North America, but **domestic policy presents a more pressing challenge** for the region's LNG projects.
- Unconventional gas production is expected to transform gas markets beyond the United States, but **local conditions will be critical to spurring a robust unconventional gas segment.**



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