

Market Structure in the New Gas Economy: Is Cartelization Possible?

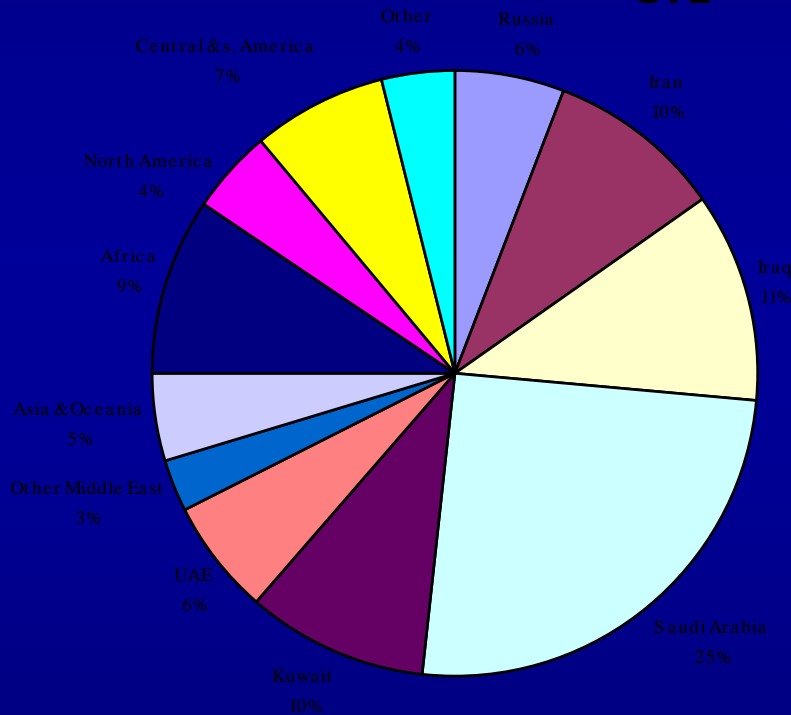
Amy M. Jaffe and Ronald Soligo

The Issues

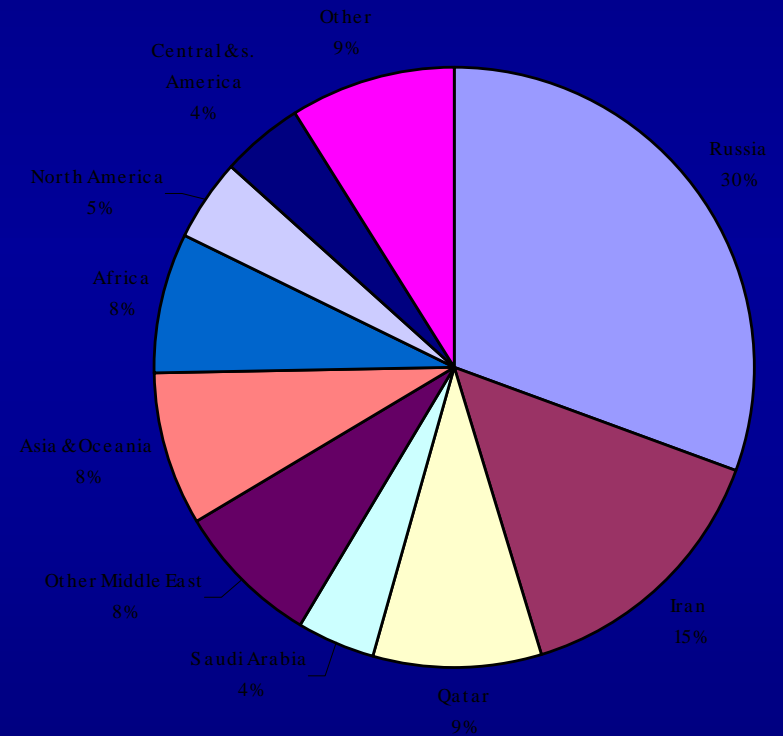
- How are gas reserves and exports distributed?
- What are the implications of those distributions for:
 - Security of gas supply
 - Cartelization of gas supply
- Collaboration with OPEC

Distribution of Reserves

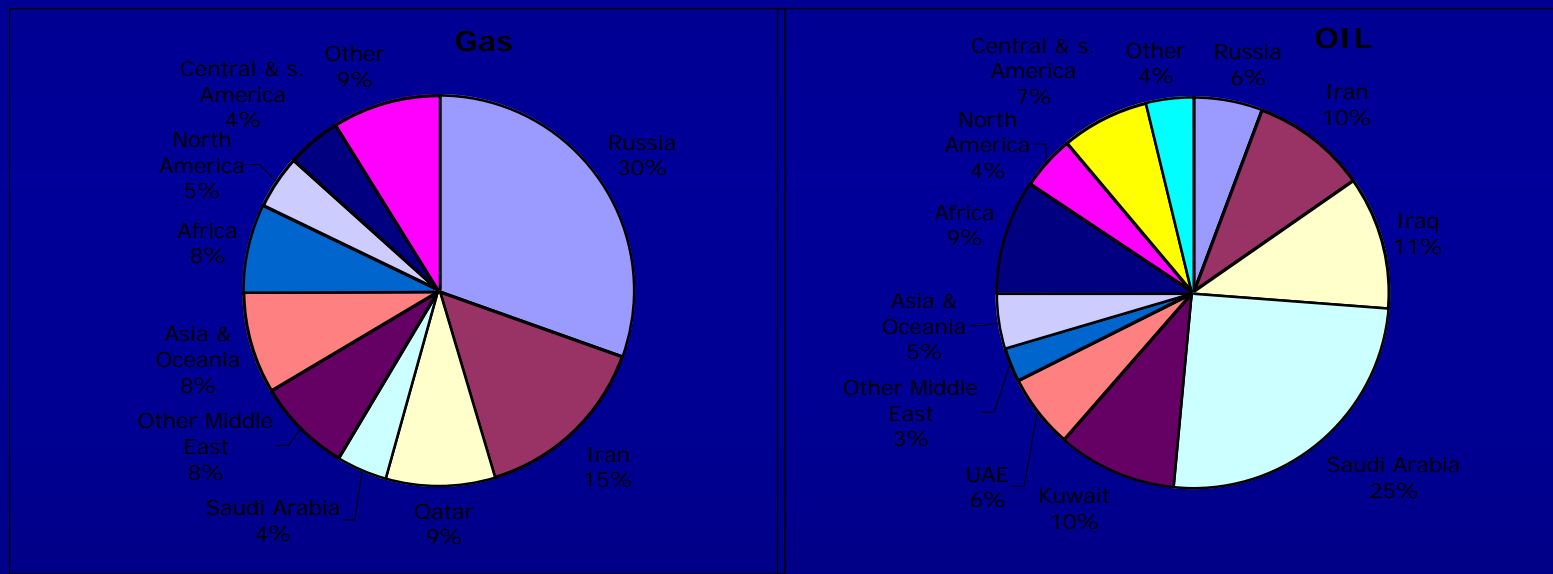
OIL



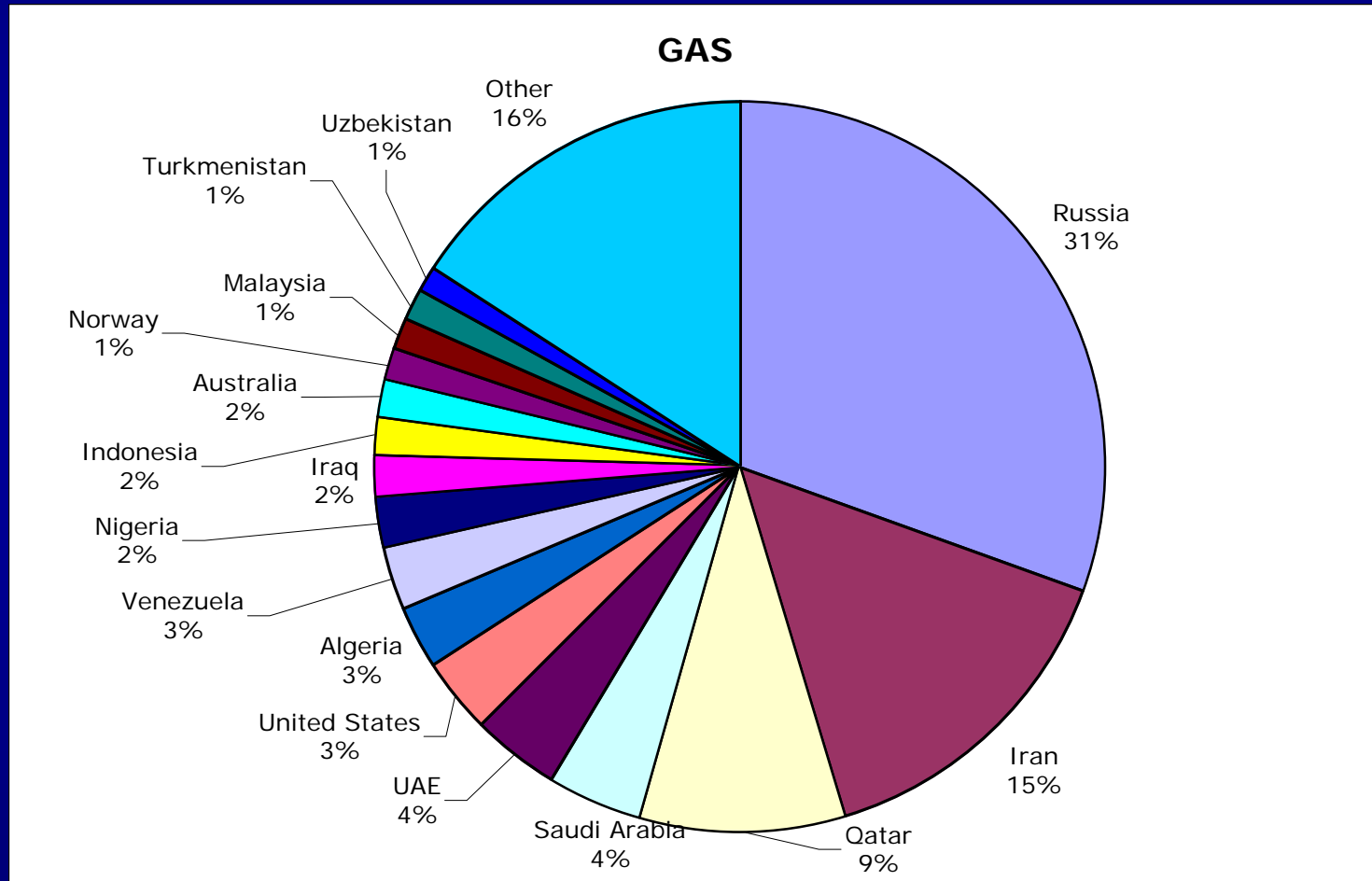
Gas



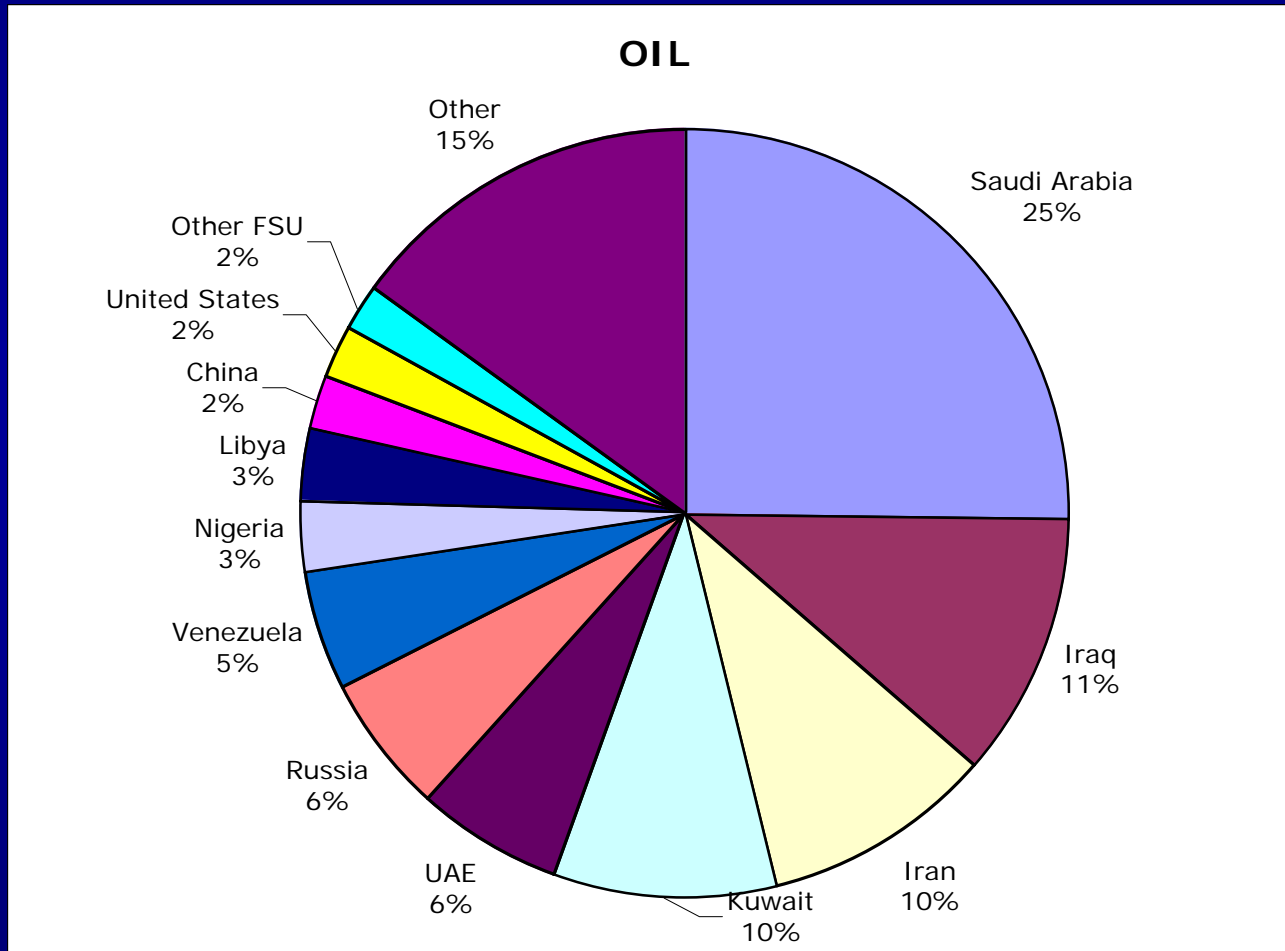
Distribution of Exports



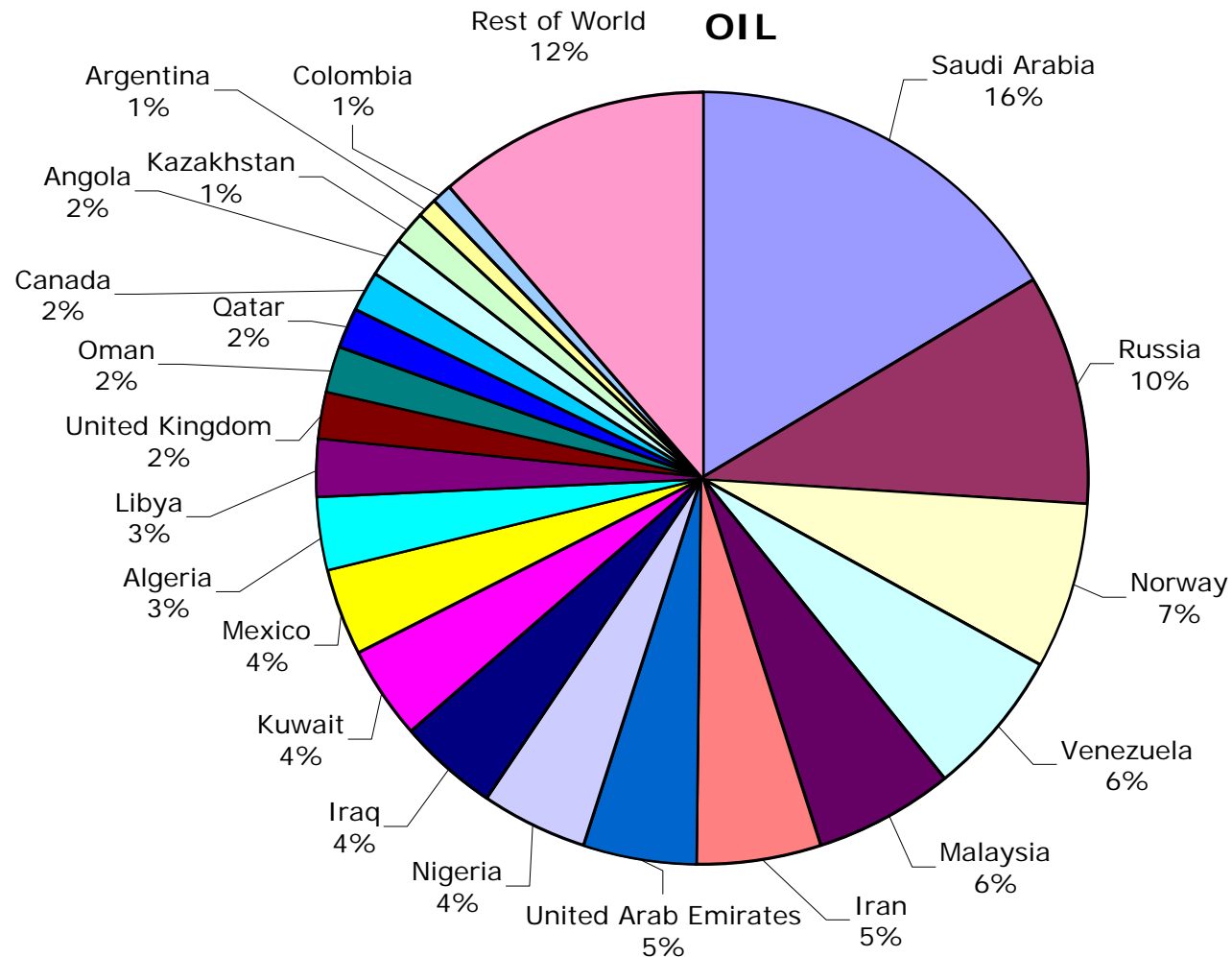
Distribution of Gas Reserves



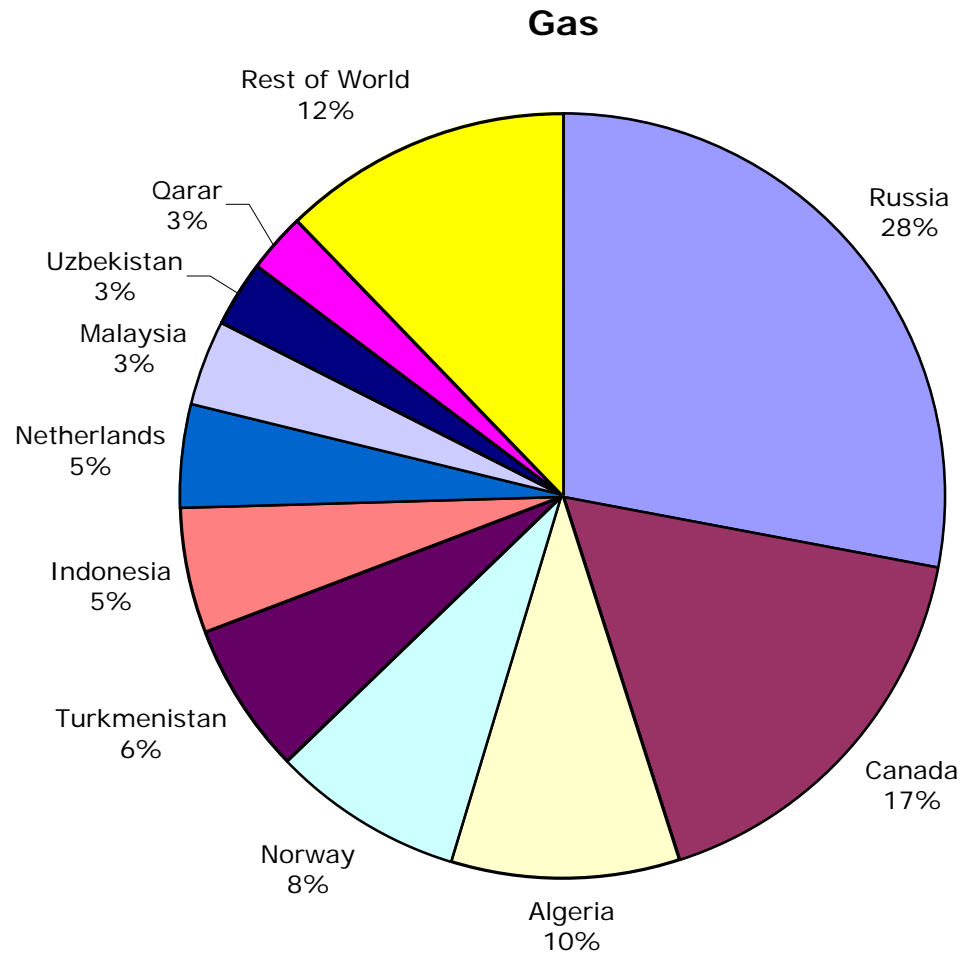
Distribution of Oil Reserves



Distribution of Oil Exports



Distribution of Gas Exports



Security of Gas Supplies

- Reserves are highly concentrated at top of distribution:
 - Russia has 30.5%
 - Russia + Iran have 45%
 - Add Qatar, Saudi Arabia + UAE
 - These 5 countries have 62%
- But regional distribution is better. Middle East has 36% of gas reserves compared with 65% of oil reserves.

Conditions for an Effective Cartel

- Cartel members control large share of market
- Must agree to production quotas or capacity controls
- Must prevent cheating
- Must prevent new entry
- Inelastic demand for product
- Low elasticity of supply of non-members
- Small number of members
 - Easier to coordinate
 - Easier to catch cheaters

Prospects for a Gas Cartel

- Distribution of gas reserves is concentrated
- Gas exports are even more concentrated.
 - Russia has 28%
 - Top 7 have 79% of exports
 - But Canada, Norway and Netherlands with 30% of exports are not likely to join
 - Only significant Middle East exporter is Qatar with 2.6%
- But export concentration reflects underdevelopment of gas deposits in many countries.
- More widespread development will create many sources of supply. (the supply elasticity of non-members of a cartel is large in short - intermediate term)

Prospects for Gas Exporting Countries Forum (GECF)

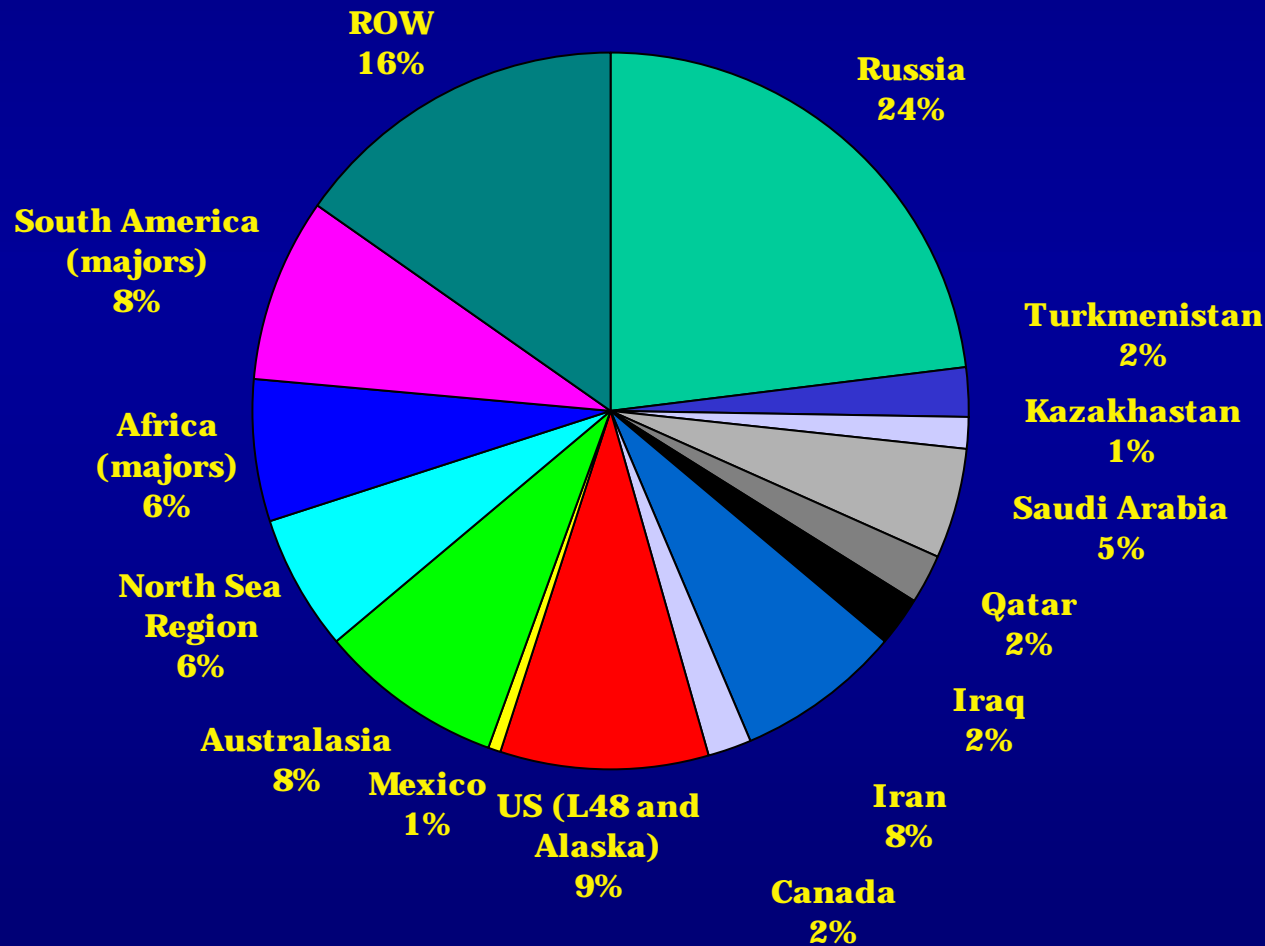
- Little power at present
 - Attempts to prevent European liberalization
 - Algerian gas for Boston
- Too many members with competing interests to constrain capacity expansion in intermediate term.

In the Long Run...

- As LNG market becomes more liquid. Qatar could emerge as a “swing producer”
- Rice World Gas Model Forecasts:
 - Russia’s dominance increases: pipeline gas is cheaper than LNG
 - Iran also show strong growth in pipeline gas
 - Saudi share (LNG) becomes important after 2030
- But Russian market power is constrained by potential entry of Middle East LNG
- Russia plays arbitrage role between Europe and East Asia

Supply projections

2030



Export Share Of Rest Of World Demand

Export Share of Rest of World Demand

	Russia	Saudi Arabia	Qatar	Iran	North Africa	Australia	Indonesia	Malaysia
2002	8.71%	0.12%	0.94%	0.02%	3.20%	0.56%	2.37%	1.47%
2004	9.58%	0.12%	0.93%	0.10%	3.24%	0.56%	2.16%	1.84%
2006	9.36%	0.13%	1.13%	0.17%	3.08%	0.50%	2.12%	2.06%
2008	9.19%	0.12%	1.24%	0.15%	3.10%	0.51%	2.13%	2.19%
2010	9.26%	0.13%	1.28%	0.14%	3.42%	0.50%	2.10%	2.16%
2012	8.65%	0.12%	1.22%	0.17%	3.49%	0.82%	2.09%	2.07%
2015	9.73%	0.13%	1.15%	0.25%	3.16%	0.76%	2.19%	1.80%
2020	11.71%	0.56%	1.05%	1.00%	3.34%	0.80%	2.27%	1.41%
2025	12.67%	1.70%	1.06%	3.23%	2.77%	1.07%	2.12%	1.25%
2030	13.38%	3.72%	2.01%	5.62%	2.57%	2.48%	1.93%	1.14%
2035	13.11%	4.19%	1.82%	7.61%	1.97%	2.24%	1.67%	0.82%
2040	13.40%	5.67%	1.57%	10.68%	1.17%	2.23%	1.44%	0.51%

Source: Rice World Gas Trade Model

Concluding Remarks

- As in oil, world will become increasingly dependent on few sources of gas after 2030
- Russia and OPEC will have incentives to coordinate pricing of oil and gas
- Consuming nations can reduce market power of exporters by
 - Promoting competition among energy sources by
 - Liberalizing domestic energy sectors
 - Develop technologies that facilitate fuel switching
 - Improve energy efficiency