Natural Gas and Energy Security
Implications of Gas Pipelines

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Energy Security

Definition

guaranteed “reliable” access to energy carriers at a “reasonable” price.

Paths to “energy security”

- Direct control of sources – self-sufficiency: “energy independence”
- Competitive markets: diversified competing sources — high price elasticity of supply
- Mutual interdependence/integration among suppliers and users — “bilateral monopoly” sharing ‘rents’ to cooperation and raising costs of breakdown
- Subordination to dominant supplier
  - acquiesce to terms/conditions of monopoly supplier
  - “political dependence” — critical national political/economic decisions depend substantially on the will of another ‘power’
The General Problem

- Energy Demand Inexorably Growing Everywhere
  - IEO2008 predicts global growth from 2.9 to 4.5 tcm/yr

- Energy Supply Growth Lagging, Ultimately Limited
  - Most energy carriers (hydrocarbon-based) are exhaustible — must be replaced with new reserves
  - Hydrocarbon carriers environmentally questionable (GHG generators)
  - “Clean Energy” supply limited in medium-term, or pose other risks (Nuclear)

- Supply & Reserves Increasingly Concentrated
  - Limited number of large suppliers, in increasingly
  - Politically Inhospitable/Unstable Regions
    - Russia
    - Central Asia
    - Persian Gulf
    - Arctic
Problem of Natural Gas
The “cleanest” hydrocarbon energy carrier

These Problems are Aggravated for Natural Gas

- Sources More Concentrated than for Other Energy Carriers
  - Sellers are far from users
  - New sources are costly to develop
- Key Reserve Holders: Russia (47.6 tcm), Qatar (26 tcm), Iran (27.6 tcm), Turkmenistan (10 tcm)
- Physically very hard to transport (low energy by volume: 1.375 mcm $\approx$ 1 ton LNG $\approx$ 1.22 tons oil)
  - Require substantial infrastructure development
    - Pipelines: $5 - 9$ billion/1000km, 3 – 5 years construction
    - LNG conversion facilities
  - Massive Investment — high fixed cost, very low variable costs make pipelines a “natural monopoly”
- Hence, limited possibility for competition, for “market” to emerge
  - Low cost, high quality supply, once in place
  - Pipelines create “network lock-in”
The Eurasian NG Network

Feeds Gas from Russia and Central Asia to Europe, East, West, and South
The Eurasian NG Network

Controlled by *Gazprom* to border of Russia, through “Transit States” of FSU, Ukraine and Belarus, and Turkey

Lines
Network Interdependence

- European and EU critical dependence on Russian controlled NG for energy, heating, and industry;
- European demand growing 1.4%/yr
- Russia provides 36% of European Consumption (30% of EU Consumption) and 65% of NG imports: \( \sim 165\ \text{bcm/yr} \) (2007)
- Russian financial dependence on European purchases, and (potentially) investment

is Asymmetric

- Russian NG has an immediate production and welfare impact on Europe
- European finance has a budgetary impact on Russia
- Europe/EU is a divided partner, with different countries pursuing differing national interests
- Russia (Gazprom) is a focussed national entity, with the state as key decision-maker
Key Issues

and Three-Sided: Russia-Transit FSU-Europe

- Near-monopoly supplier, with power to withhold
- Vulnerable ‘transit’ states, with power of disruption
  - operational control over major pipeline routes
  - low ability to pay
- Rich, but disorganized, collective users in Europe

Create Energy Security Problems

- monopoly pricing potential
- economic damage from supply disruption
- ‘hold-up’ for political or other economic advantage
- coordination problems wrt technical issues: pressure, routing, maintenance
- limited availability of new supply
The Eurasian Players

6 in order of significance

- Russia — controls all Eurasian supply to its western border
- Europe: EU, Eastern & Southern Europe — high value and growing demand for Eurasian NG
- Transit States: Belarus, Ukraine [, Georgia & Turkey] — both users and key links in the supply chain to Europe
- Central Asian Producers — supply both Russia, Central Asia, and Europe through the Russian (controlled) network
- Azerbaijan — only Eurasian supplier outside the Russian controlled network
State Energy Security Strategies

Russian Objectives

- Hegemony over NG supply = market power
  - “Energy Security” through control of energy Eurasian NG transportation & distribution networks
  - equity participation/control in non-Russian sources
  - “Gas OPEC” — Eurasian Alliance of Natural Gas Producers [Tehran, 21 October 2008]

- Guaranteed stable long run demand at "market" prices
  - long-term contracts, negotiated country by country

- Direct, active participation in European retail supply
  - ownership (partial) of distributors and retailers
  - control (partial) over storage facilities & distribution pipelines

- Guaranteeing strong revenue flow, driving economic growth & development

- and substantial political leverage, particularly wrt the “near abroad”
Increasingly “green” energy inputs, with NG as critical ‘bridging’ source to non-carbon based energy

“Energy Security” — guaranteed “reliable” access to energy (NG) at a “reasonable” price.

- without political constraints, limitations on foreign policy objectives
- within a set of agreed, stable, and enforceable rules for ‘energy market’

Competitive supply in integrated European system

Participation in ‘energy carrier’ production and transportation by European firms
Transit Country Objectives

- “Energy Security” as defined above!
- Substantial revenue for transit of NG, oil
- National autonomy wrt both foreign and domestic policy

Central Asian Supplier Objectives

- Develop own resources, integrate own networks
- Diversify investor pool
- Diversify customer base, export outlets — China, Europe direct
Lock in European demand with long-term state to state contracts, and new transportation capacity, increasing European dependence

- Higher prices for supply guarantees
- Alternate ‘secure’ supply routes, added to Blue Stream (to Turkey):
  - Nordstream (55 bcm/yr),
  - South Stream (30 bcm/yr)
- Bypassing transit states, undercutting their hold-up power

Buying into (equity) European users’ distribution systems: Germany, Belgium, Hungary, Italy, France

- tying them more tightly to Russian (Gazprom) supplies
- reducing their support for alternative sources

Offer transit states bargain prices for control over their (Soviet built) pipelines; “market prices” otherwise

- Enforce with ‘shut off’ of energy supply: e.g. Ukraine – 2006, 2009; Belarus – 2007
  - Also Moldova, Georgia, Azerbaijan, Baltic states
Constructing new pipelines, to new users: Siberian-Pacific (ESPO) Pipeline system to China and Japan

- Putin promised 80 bcm/yr to China in 5 years

Exploiting its monopsony position vis-a-vis Central Asian suppliers

- contractually locking in supplies
- and taking ownership shares in producers and processing facilities

Obstructing efforts of Central Asian suppliers to by-pass the Gazprom export pipeline system

- directly (e.g. through raising Caspian environmental concerns), and
- indirectly by providing alternative routes/pipelines that render new pipelines unprofitable — Blue, Nord, and South ‘Streams’
State Energy Security Strategies
Russian Policies - 3

- Maintaining *Gazprom*'s monopoly over Russian (and Central Asian) NG export
  - expropriating and/or blocking foreign ownership of gas reserves and gas production and transportation operations in Russia
  - Support Russian companies buying into Central Asian production (Kashagan, Turkmenistan)
  - New pipelines to Russian network (*Prikaspiiskii* 20 bcm/yr)
- Encouraging diversion of uncontrolled supply away from Europe
  - Qatar and Iran → I-P-I
  - Turkmenistan → TAPI
- Taking equity stakes in foreign suppliers to influence their sales of NG
  - Algeria to Europe
European Energy Charter Treaty (ECT) and Transit Protocol.
- Open access to distribution networks
- EU wide agreement on transit tariffs and pricing
- Set, uniform rules for regulation and conflict resolution [ACER]

- Collective response to energy security issues
- Unified intra-European distribution network [ENTSOG, NETS]
- Separation of producers and distributors (ownership and control)
- Invest in increasing Russian NG supply capacity

Currently divided, each major country pursuing own policies and contracts, as Russia wishes
Cooperate as single ‘monopsony’ buyer of NG — single EU contract with each supplying country

Development of alternative sources — non-Russian pipelines for Caspian NG:
- Baku-Tbilisi-Erzurum (BTE) NG Pipeline (8.8 bcm/yr)
- TGI (Turkey-Greece-Italy) Interconnector Pipeline
- Tracecca ‘transit corridor’ from Trans-Caspian Pipeline
- NABUCCA (11-31 bcm/yr)
- White Stream (24-32 bcm/yr)

Develop LNG facilities and market

Open/increase access to Iranian and North African NG
Transit Countries are in an increasingly weak position as Russia and Europe work toward their respective goals.

- A Variety of Transit Country Approaches:
  - Surrender control over transit for low prices, delayed increases (Belarus)
  - Exercise ‘hold up’ to delay price increases (Ukraine)
  - Support new Non-Russian route for NG: White Stream (Ukraine)
  - Enhance transit capacity (Turkey)
Central Asian Producers hold over 8% of world reserves, \( \sim 20 \, \text{tcm} \); now export \( \sim 90 \, \text{bcm} \) through Russia

- Diversify gas exports: China (Kazakhstan, Turkmenistan)
- Diversify investment sources in energy (from Russia): Western majors and China
  - Kazakh-China — 40 \( \text{bcm/yr} \) under construction
  - Turkmen-China — 30 \( \text{bcm/yr} \) under construction

- Support Western development of BTE and NABUCCO (especially Azerbaijan)
- Develop new south-bound pipelines: Aktau-Tehran, TAP(I)
- Push for opening of Russian pipelines to west (vs. selling at border)
Russia is back! And can be expected to leverage its energy supplier position as suggested by Putin in several interviews!
- Major power in ‘multi-polar’ world
- Clear sphere of influence in its “near abroad”
- Enforceable by both economic and military means (viz. Georgia, 2008)

Russia is successfully (to date) pursuing policies that maintain its NG monopoly power
- locking up Central Asian supply
- blocking trans-Caspian pipelines
- filling current (and future — NABUCCO) Turkish pipelines
- developing, with European (German, Italian, Hungarian) support, plans for north and south ‘transit country’ by-passes

Russia is successfully securing active investment and ownership participation in European distribution networks

Russia has substantial financial reserves against breakdown of delivery/payment, & is developing its own storage facilities in Europe
But Russia is facing serious issues of long-term supply capability:
- West Siberian fields have peaked (Medvezhye, Urengoi, Yamburg)
- New fields seriously lagging in development (Shtokman, Yamal, Sakhalin),
- due to lack of investment and technological constraints

Infrastructure, particularly in transit states, is deteriorated, requiring serious investment

Substantial new supply available in Central Asia, Azerbaijan, Kazakhstan, Turkmenistan and the gulf area (South Pars — Iran, Qatar)

Yet new pipeline development lags seriously, largely through Russian obstruction and lack of political will

Thus European “energy security” is threatened on both sides:
- A monopoly supplier, willing to exercise its market power
- Potential lack of supply to meet contracted needs
Energy Security in the Eurasian Network
The Heart of the Problem

- Energy *Independence* is a Myth! *Interdependence* is Inevitable.
  - “Energy Security” can only be based on the availability of sufficient real alternatives for all interconnected parties.
  - The ‘asymmetry’ in Eurasian interdependence is the key ‘energy security’ problem.
- Some asymmetry is inevitable: physical vs. financial dependence
- But the ‘leverage’ it provides can be minimized by the presence of ready alternatives:
  - Competing market suppliers, and buffer stocks (adequate storage)
  - Competing energy users, and financial reserves
Hence, a 2-Pronged Strategy to Reduce Asymmetry:

1. Integration: Integrated NG Market with common Regulatory Framework
   - Network of gas interconnector pipelines, particularly to the vulnerable east and southeast
   - Full Ownership Unbundling by European and Russian “national champions”
   - Full transparency under fixed rules for investment, contracting, and use
   - European commitment to long-run supply contracts
   - Russian acceptance of Energy Charter Treaty

2. Diversification: Expand NG availability to the Integrated System
   - Develop LNG market
   - Boost Russian output — Western investment
   - Western investment in Central Asian NG production and transportation
   - Develop infrastructure for access to trans-Caspian (Turkmen and Kazakh) and Persian Gulf NG sources
   - Pursue development of new energy sources.
The END or just the Beginning?