The Caspian Region gas pipeline development prospects

Eastern Corridor of Turkmen gas export

By Igor Korobov (2012)
Transafghan (TAPI)
Transcaspian project (Nabucco, White Stream, South Caucasusian)
Caspian Costal pipeline (to Russia)
Turkmenistan – Iran
Transasian (Turkmenistan–China)
Turkmenistan-Afghanistan-Tajikistan-China (2012)
One must not forget that Soviet geologists have virtually built the fundament of Turkmenistan's gas industry, and even though the new data appears, the initial data nevertheless reflects the actual potential...

There are no grounds for statements that the gas field are of such extensions... The new fields are not simple and gas there is complex. Serious investments are required.

Alexandr Medvedev, Vice Chairman of Gazprom

Gas production & consumption in Turkmenistan, 1985-2011

Source: BP (2011)
Turkmenistan energy policy

Gas sale at the national borders
• Avoids investments in pipelines outside
• Avoids transit issues

Gas buyer diversification

Commitment to oil formula gas pricing

State monopoly on pipeline infrastructure (?)

No guaranteed volumes to buyers
Development of gas pricing

Spot-market
Supply = Demand

Discretionary
Monopsony of Gazprom

Long-term contracts
\[ P_{LTC} = P_0 (0.5 \times G/G_0 + 0.5 \times M/M_0) \]
\[ P_0 \text{ – base gas price} \]
\[ G \text{ – gas oil price} \]
\[ M \text{ – fuel oil price} \]

Long-term contracts (Oil-Based)
Equivalent to % of crude oil price
Turkmenistan’s Gas Reserves

Reserves assessments in 2010

<table>
<thead>
<tr>
<th></th>
<th>BP</th>
<th>Turkmenistan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.00</td>
<td>26.2</td>
</tr>
</tbody>
</table>

October 15, 2009. "The work undertaken by Gaffney, Cline & Associates on the Southe Yolotan/Osman and Yashlar fields in 2008 was based on original field data provided by State Concern Turkmengeologiya. Further, these results were the product of GCA's original and independent work on the base data, and not dependent upon any previous interpretations made by Turkmen or other international specialists”.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Bcm</td>
<td>2.59</td>
<td>2.6</td>
<td>2.68</td>
<td>8.1</td>
<td>8.0</td>
<td>13.4</td>
<td>24.3</td>
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</table>

Source: BP (2012)
Galkynys and Yashlar gas in-place: 2008 & 2011

<table>
<thead>
<tr>
<th></th>
<th>Galkynsh: Gas-Initially-in-Place (GIIP)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Total Gas including non-hydrocarbons</td>
<td>Low</td>
<td>Best Estimate</td>
<td>High</td>
</tr>
<tr>
<td>2008</td>
<td>Trillion Cubic Metres (TCM)</td>
<td>4</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Trillion Cubic Feet (TCF)</td>
<td>140</td>
<td>210</td>
<td>495</td>
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<tr>
<td>2011</td>
<td>Trillion Cubic Metres (TCM)</td>
<td>13.1</td>
<td>16.4</td>
<td>21.2</td>
</tr>
<tr>
<td></td>
<td>Trillion Cubic Feet (TCF)</td>
<td>462</td>
<td>575</td>
<td>745</td>
</tr>
</tbody>
</table>

|                      | YASHLAR: Gas-Initially-in-Place (GIIP) |          |          |          |
|                      | Total Gas including non-hydrocarbons   | Low      | Best Estimate | High     |
| 2008                 | Trillion Cubic Metres (TCM)            | 0.3      | 0.7       | 1.5      |
|                      | Trillion Cubic Feet (TCF)              | 11       | 25        | 53       |
| 2011                 | Trillion Cubic Metres (TCM)            | 1.45     | 2.65      | 5.0      |
|                      | Trillion Cubic Feet (TCF)              | 50       | 95        | 175      |

Impurities: 8-14% is H₂S and CO₂

Source: Gaffney, Cline and Associates (2012).
“One must not forget that Soviet geologists have virtually built the fundament of Turkmenistan’s gas industry, and even though the new data appears, the initial data nevertheless reflects the [actual] potential... There are no grounds for statements that the [gas] field are of such extensions... The new fields are not simple and gas there is complex. Serious investments are required.”

Alexandr Medvedev,
Vice-Chairman of Gazprom

### Gas import structure of China in 2010 & 2011

<table>
<thead>
<tr>
<th></th>
<th>2010 LNG, bcm</th>
<th>2010 PPL, bcm</th>
<th>2011 LNG, bcm</th>
<th>2011 PPL, bcm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinidad and Tobago</td>
<td>0.07</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>0.08</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>0.51</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>0.08</td>
<td></td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Equatorial Guenea</td>
<td>0.08</td>
<td></td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>0.17</td>
<td></td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Qatar</td>
<td>1.61</td>
<td></td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>0.08</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td>Yemen</td>
<td>0.7</td>
<td></td>
<td></td>
<td>1.1</td>
</tr>
<tr>
<td>Australia</td>
<td>5.21</td>
<td></td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.45</td>
<td></td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Malasia</td>
<td>1.68</td>
<td></td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td></td>
<td></td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Turkmenistan</td>
<td></td>
<td>3.55</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td><strong>Total export</strong></td>
<td>12.8</td>
<td>3.55</td>
<td>16.6</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>16.35</strong></td>
<td><strong>30.9</strong></td>
</tr>
</tbody>
</table>

Source: BP (2012)
Research Questions

• How effective has been the energy policy of Turkmenistan in pursuing diversification?

• Has the Transasian gas pipeline affected Turkmenistan’s gas diversification?

• To what extent has the Transasian gas pipeline contributed to creation of “Intraasian” gas market?
Hypotheses

1. The genuine policy for pipeline projects (both constructed or discussed) is price increase rather than genuine diversification.

2. A fundamental contradiction between China and Turkmenistan policies in relation to gas price.

3. Turkmenistan’s energy diversification policy has swapped dependence among buyers (here, Russia and China).
Methodology

Interviews

Data Bases (i.e. LexisNexis)

Policy Analysis (pipeline negotiation and construction processes)
Theory

• Geo-economics

• Path Dependence
Structure of the Dissertation

1. Introduction to topic
   i. History of the Turkmen gas industry

2. Research Questions

3. Assumptions

4. Methodology
   i. Literature/ Interviews/ Databases
   ii. Policy Analysis
      a. Pipeline *Surrounding* Process

5. Theory
   i. Geo-economics
   ii. Path dependency

6. Structure of Dissertation

7. Time Table

8. China’s gas market and its affairs in Central Asia

9. Analysis of the policy associated with Transasian (China-Turkmenistan) gas pipeline

10. Conclusion
# Time Table

## Phase II: SS 2012
- Specification of theoretic concept
- Further research on existing theoretical literature
  - 
  *Comparative analysis of theoretical concepts with empirical data, formulation of theoretical framework and drafting of theoretic chapter*
- Completion of “History of Turkmenistan’s gas industry” chapter

## Phase III: WS 2012/2013
- Research of methodological approaches and writing of the Methodology chapter
- Research of the Chinese gas sector structures
  1. Research of the Chinese production, refining and transportation facilities
  2. Research of the gas import (including LNG) in China as well as the contract portfolio and transit price estimation will be studied to define the economic rational of the pipeline in focus
  3. *Comparative analysis of forecasts of economic development of China in terms of the future gas balance*

## Phase IV: SS 2013
- Study of the Turkmen legislation.
  - Research of the Hydrocarbon Law, the Foreign Investment Law and Tax Code of Turkmenistan and its actual practice with relevant case studies.
  - Research of the Turkmen gas sector structures
    1. Research of the Turkmen production, refining and transportation facilities
    2. Analysis of the researches of gas reserves (i.e. research South Yoloten field by Wood Mackenzie)
    3. Research of the Turkmen gas pricing policy
- Analysis Turkmenistan’s budget policy in relation to its gas revenue and budget execution
- Collection of updated empirical data and update of research results and its incorporation into research

## Phase V: WS 2013/2014
1. CNPC representative or an energy policy representative of Chinese government
2. Gazprom representative in charge of Asian direction
3. Experts/companies’ representatives involved in gas sector in Turkmenistan and China
- Analysis of Gazprom’s role in the region.
  - Research of Gazprom’s role as the competitor as both a potential gas supplier to China and a gas buyer in Turkmenistan and its pricing police on both markets
- Preparation of interview questions
- Conducting the interviews
- Drafting of sub-chapters and their integration into the dissertation

## Phase VI: SS 2014
- Summary of research results
- Categorization of data
- Discussion of results
- Writing introduction/conclusion
- Editing research paper
- Submission of dissertation
That’s how it all started

April 3, 2006 General Agreement on gas pipeline signed by Niyazov

July 17, 2007 PSA signed & gas purchase contract for up to 30 bcm by 2013

June 24, 2009 contract extended up to 40 bcm by 2014

Nov.23, 2011 Contract extended to 65 bcm by 2015-2016
Transasian pipeline

14.12.2009  Pipeline opening ceremony

Resource base:
- Bagtyarlyk (Amu Darya’s right bank) **new, PSA**
- Malay **operational**
- Dovletabad **operational**
- Galkynysh **new**

**Initially planned export:**
- 30 bcm by 2013
- 40 bcm by 2014
- 65 bcm by 2015-16

**Imports in 2010:** 3.55 bcm
**Imports in 2011:** 14.50 bcm

Source: BP (2012)
Transasian pipeline

Length ~ 7000 km
(1,833-km line in Central Asia and 5,200 inland)

Launched on 14 December, 2009

CNPC’s own production under PSA at Bagtyyarlyk: 13 bcm/year (2011)

As of April 9, 2012, **25 bcm** have been delivered to China from CA
TV-Business Channel RosBiznessConsulting:

“China pays $170 for Turkmen gas“.

Business magazine “Profil”, № 37 in www.turkmenistan.ru

“Its[Chine’s] position is collaborated that China purchase gas from Turkmenistan at the price of $165 and intend to increase volume up to 30 bcm“.

Konstantin Simonov, National Energy Security Fund, Director

“I can bet any money that the price there [in Turkmen-Chinese gas contract] in no way is higher $140“.
Chinese Assumptions
on the price/tcm paid by China for Central Asian gas at the exporters’ borders

• **US$ 195** (Hou Chuangye*, CNPC Vice general manager: 2008)
• **US$ 145** (Higashi, 2009)**
• **US$ 195** ... includes a $50 [transit fee] to western China***

* IHS Global Insight, 22 Jan, 2008. “Revelation of Turkmen Gas Export price to China Will Reverberate in Russia, Iran, Central Asia”. Moscow.
** Natural Gas in China. Market evolution and strategy: IEA.
*** China Securities Journal:
West-to-East gas pipeline, #

- From Zhongwei (Ningxia) to Guangzhou (Guangdong)
- Capacity was upgraded from 30 to 45 bcm
- Will connect the 2441km western section, which starts at Horgas (Xinjiang)
- Will be built 3 underground storage facilities
- An LNG storage facility in Shenzhen (Guangdong)
- Length 2,477km
- Cost $15 billion
Altai gas pipeline

Length: 2,600 km
Capacity: 30 bcm/year (potentially) 68 bcm

Resource base: Kovykta
Est. reserves: ~2 tcm
Owner: Gazprom

Memorandum of understanding signed in March, 2006

The export contract was expected to be signed in mid-2011. First supplies are planned for late 2015. Contract period will be 30 years.

Source: Gazprom (2011)
“Wenn in Europa die Preise nicht stimmen, liefern wir eben nach Asien”*

For Russian gas under fixed price contract

- China bids 160-170 US$
- Gazprom asks 200 US$

Good Deal?!

Europe pays at least two times more

Does China really need Russia gas?
Turkmen vs. Russian pipeline

- China has reserved a bargaining “card” (Altai ppl) to bid lower price for TM gas and vice versa
- Chinese military leadership regards a gas pipeline from Russia as a threat of its energy and national security (Nixon, 1999)
- Turkmen initially requested US$ 4 bln vs. US$ 25 bln of Gazprom’s
- Closed and authoritarian Turkmenistan lacks support from the West and no longer has strong political ties with Russia (ongoing conflict on dual citizenship and gas supply disruption in 2009)
- Turkmenistan can be vulnerable to pressure related to gas supply stability and beneficial gas pricing
- A possibility of expanding political influence in the transit countries
Resource Base in Central Asia

Turkmenistan, gas fields

Dovletabad: discovered in 1982
Accounts for 80% of Turkmenistan’s production

- Initial reserves: 1.9 bcm
- Residual reserves: 0.9 bcm
- Turkmen appraisal: 4.5 bcm

Galkynysh: production is expected before 2013
Reserves: 17.5 tcm

Complicated gas field like Astrahanskoye (Russia), - McKenzie.

Bagtyyarlyk: CNPC is the operator under PSA
Reserves: 1.3 tcm

Turkmen gas sector development required US$25 bln
(Ginsburg & Troschke, 2003)
- Galkynysh field (US$10 bln so far)
Resource Base in Central Asia

Usbekistan

• supplies 2-4 bcm/year since April, 2012, with extension possibility 10 bcm
• possible shortage due to declining production
• ceased gas supply to Tajikistan

Kazakhstan

• offered to supply 5 bcm, with extension possibility 12-15 bcm
Internal Risk Factors

Political
• TAPI (Turkmenistan-Afganistan-Pakistan-India)
  Resource base: Dovletabad field
  Length: 1680 km
  Capacity: up to 30 bcm
  Cost: was $4 bln, now $7.6 bln
  Very likely to be opposed by China
• The influence of Russia
  – Gazprom lost interest in Turkmen gas in 2009, but long will this last?
  – Control most transportation capacities
  – Gazprom is paying a “political premium” for Turkmen gas
  – Possible attempts to overbid the price

Economic
• Acceleration of shale gas production in China
• Economic slowdown in China

Technical
• Reserves Authenticity
  – The content of methane and recovery ratio indefinite (Polish case)
• Production cost
  – H2S, CO2 content is indefinite
1. NO shortage of transporting capacities

<table>
<thead>
<tr>
<th>Direction/ Pipeline</th>
<th>Pipeline capacity, bcm</th>
<th>Actual exports, bcm</th>
<th>Extra capacity, bcm</th>
<th>Actual exports, bcm</th>
<th>Extra capacity, bcm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran/ Korpeje-Kurtruy</td>
<td>8</td>
<td>6.5</td>
<td>13.5</td>
<td>10.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Iran/ Serakhs-Khangeran</td>
<td>12</td>
<td>9.68</td>
<td>30.32</td>
<td>10.1</td>
<td>29.9</td>
</tr>
<tr>
<td>Russia/ CAC</td>
<td>40-80*</td>
<td>3.55</td>
<td>15</td>
<td>14.3</td>
<td>30</td>
</tr>
<tr>
<td>China/ TransAsian</td>
<td>30</td>
<td>19.73</td>
<td>70.27</td>
<td>34.6</td>
<td>55.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>19.73</strong></td>
<td><strong>70.27</strong></td>
<td><strong>34.6</strong></td>
<td><strong>55.4</strong></td>
</tr>
</tbody>
</table>

2. Ukraine can no longer afford Turkmen gas, despite extra capacities in CAC* pipeline

* Central Asia – Centre

Source: Oil and Gas Ministry of Turkmenistan, BP (2011).
3. China expects to reach the desired (low) price by extending its own production at the Bagtyyarlyk field using PSA (Henderson, 2011)

4. Paying off the Chinese preferential loan is conducted in gas at a fixed price (contract price not revealed)

   In June, 2009  US$ 4.0 bln
   In April, 2011  US$ 4.1 bln

5. Revealed gas price for TAPI is used a policy instrument to renegotiate (increase) the gas price for China, after the loan is paid off
Actors

Iran
- interested in Chinese market for its own gas
- not interested in Turkmenistan-China gas trade
- interested in cheap Turkmen gas for its northern regions
- inexpensive gas production cost
- has been buying LNG vessels

India
- interested in cheaper gas
- diversification
- not interested due to possible gas deficit for TAPI

Pakistan
- Interested in cheaper gas
- Diversification
- possible political influence on India
- not interested due to possible gas deficit for TAPI

Taliban
- Western political support make TAPI a vulnerable target
- Beneficiary of transit fee issue (official government vs Taliban)
Gazprom as a major player

- interested in keeping Central Asian gas away from EU
- interested in political influence in the entire region
- interested in CA gas, but not willing to pay market price
- offered to participate in TAPI

Ukraine

- interested in cheaper Turkmen gas
- Interested in using “Turkmen card” for Gazprom’s concessions

European Union

- Diversification
- Reduction of Russian political influence

USA

- Political support of both TAPI to initiate China-India tensions over energy (Fenenko, 2012)
Implications

No new direction for pipeline projects possible

Any new buyer will have to pay uneconomic price

The current pricing approach is likely to crowd out the lowest payer for Turkmen market

HOWEVER, the European direction of Turkmen gas export will be on the agenda due to the highest price on the European gas market
Thank you for Your attention!