Workshop on perspectives, concerns and overall planning for the setup of an independent energy regulator in Azerbaijan (CWP.01.AZ)

Current conditions and commercial interrelations regarding operation of the energy sector of Azerbaijan

Dr. Vagif Nasibov
Country Expert of Azerbaijan, Regulatory Expert

Baku, March 9, 2016
The importance of energy in the economy of Azerbaijan

- Azerbaijan is a fast developing oil and gas oriented economy and has achieved its highest economic growth during the past years, mostly based on oil exports.

- The share of oil-gas commodities in total exports, in 2015, amounted to 86.2%.

- The economy of Azerbaijan is highly dependent on oil prices, and given both, the current global economic slowdown, and the fact that oil prices remain volatile and below their mid-2008 peak, it is apparent that the country needs to diversify its economy.

- **Azerbaijan covers 100% of its gross energy consumption** through **domestic production**, which is currently largely reliant on the exploitation of the country’s hydrocarbon reserves, namely oil and natural gas.

Table 1 (next slide) illustrates that Azerbaijan is a net energy exporter, and exports 5 times its own total final energy consumption.
Table 1. Energy Balance of Azerbaijan (thousand toe)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary production, including :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil (with NGL)</td>
<td>52 312.5</td>
<td>46 949.4</td>
<td>44 632.7</td>
<td>44 717.7</td>
<td>43 295.9</td>
</tr>
<tr>
<td>Natural gas</td>
<td>15 555.6</td>
<td>15 265.2</td>
<td>16 086.9</td>
<td>16 696.1</td>
<td>17 565.1</td>
</tr>
<tr>
<td>Renewables and waste</td>
<td>386.5</td>
<td>326.9</td>
<td>254.3</td>
<td>285.7</td>
<td>271.0</td>
</tr>
<tr>
<td>Net imports of all energy products</td>
<td>-54 779.3</td>
<td>-49 255.4</td>
<td>-46 246.9</td>
<td>-46 788.7</td>
<td>-46 302.0</td>
</tr>
<tr>
<td>Total energy supply</td>
<td>12 566.5</td>
<td>13 594.9</td>
<td>14 390.0</td>
<td>14 630.6</td>
<td>15 085.5</td>
</tr>
<tr>
<td>Transformation processes</td>
<td>-2 692.7</td>
<td>-3 160.0</td>
<td>-3 418.2</td>
<td>-3 438.1</td>
<td>-3 491.3</td>
</tr>
<tr>
<td>Energy industries own use</td>
<td>931.1</td>
<td>1 031.7</td>
<td>1 225.7</td>
<td>1 180.9</td>
<td>1 188.2</td>
</tr>
<tr>
<td>Total Final energy consumption</td>
<td>6 710.6</td>
<td>7 291.8</td>
<td>7 463.0</td>
<td>7 765.6</td>
<td>8 241.7</td>
</tr>
</tbody>
</table>
Energy consumption by Sectors

- The largest energy consumer is the households sector (40% of TFEC), at the second place is transport sector (32% of TFEC) and at third industry and contraction (16% of TFEC).
- Energy consumption (EC) in industry and construction, commerce and public services, and the transport sector significantly increased during the last 5 years (by approximately 150%).
- EC in agricultural sector has remained relatively stable.
- EC in household consumption has slightly decreased, mainly due to mass installation of modern meters (smart and prepayment) for electricity and gas.

In the Table 2 (next slide) the Total Final Energy Consumption is shown.
## Table 2. Total Final Energy Consumption by Sectors (thousand toe)

<table>
<thead>
<tr>
<th>Economic sectors</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry and construction</td>
<td>797.5</td>
<td>961.8</td>
<td>1 258.9</td>
<td>1 263.5</td>
<td>1 329.2</td>
<td>166.8%</td>
</tr>
<tr>
<td>Transport</td>
<td>1 704.4</td>
<td>1 984.7</td>
<td>2 180.8</td>
<td>2 473.5</td>
<td>2 559.4</td>
<td>150.0%</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>406.6</td>
<td>428.0</td>
<td>452.8</td>
<td>469.4</td>
<td>461.8</td>
<td>113.6%</td>
</tr>
<tr>
<td>Commerce and public services</td>
<td>440.0</td>
<td>508.1</td>
<td>588.6</td>
<td>636.0</td>
<td>665.0</td>
<td>151.1%</td>
</tr>
<tr>
<td>Households</td>
<td>3 362.1</td>
<td>3 409.2</td>
<td>2 981.9</td>
<td>2 923.2</td>
<td>3 226.3</td>
<td>0.96%</td>
</tr>
<tr>
<td>Total</td>
<td>6 710.6</td>
<td>7 291.8</td>
<td>7 463.0</td>
<td>7 765.6</td>
<td>8 241.7</td>
<td>122.8%</td>
</tr>
</tbody>
</table>

Source: State Statistical Committee of Azerbaijan
# Tariffs system on electricity

<table>
<thead>
<tr>
<th>Name of service</th>
<th>Tariffs for 1 kWh, AZN*10⁻²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wholesale tariffs</strong></td>
<td></td>
</tr>
<tr>
<td>Generation by “Azerenerji” OJSC</td>
<td>4.1 (2.35 €cent)</td>
</tr>
<tr>
<td>Generation by private small hydro stations</td>
<td>2.5 (1.44 €cent)</td>
</tr>
<tr>
<td>Generation by wind power stations</td>
<td>4.5 (2.58 €cent)</td>
</tr>
<tr>
<td><strong>Retail tariffs</strong></td>
<td></td>
</tr>
<tr>
<td>For all consumers</td>
<td>6.0 (3.45 €cent)</td>
</tr>
<tr>
<td><strong>Tariffs for transit transmission</strong></td>
<td></td>
</tr>
<tr>
<td>Transit transmission of the electricity</td>
<td>0.2 (0.11 €cent)</td>
</tr>
<tr>
<td>Enterprises of the chemical and aluminum industry, mining ore based steel foundries, with direct energy supply from 35 kV and 110 kV lines and for production purposes, with average monthly consumption not less than 5 million kWh</td>
<td></td>
</tr>
<tr>
<td>Day (08.00 - 22.00)</td>
<td>4.2 (2.4 €cent)</td>
</tr>
<tr>
<td>Night (22.00 - 08.00)</td>
<td>2.0 (1.13 €cent)</td>
</tr>
</tbody>
</table>
## Tariffs system on gas

<table>
<thead>
<tr>
<th>Name of service</th>
<th>Tariff (AZN/1000m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas processing</td>
<td>5.5 (3.16€)</td>
</tr>
<tr>
<td>Transportation (per 100 km)</td>
<td>2.0 (1.13€)</td>
</tr>
<tr>
<td>Wholesale price to gas distributors</td>
<td>42.0 (24.1€)</td>
</tr>
<tr>
<td>Retail price</td>
<td>100 (57.5€)</td>
</tr>
<tr>
<td>Sale to chemical, aluminum enterprises, steel foundry on the basis of mining ore, electricity generators consuming natural gas for the purpose of production by connecting to gas main directly (on condition that monthly consumption is not under 10 million m³)</td>
<td>80 (46.0€)</td>
</tr>
</tbody>
</table>
Parties involved in Energy Sector

Cabinet of Ministries

Governmental Level

Ministry of Energy
Ministry of Economy
Tariff (price) Council
State Agency for ARES

State owned companies

Azerenerji JSC
Azerishig JSC
SOCAR
Azeristolik-tejhizat JSC
Nakhichevan Energy Agency

Private Energy Companies

Private small HPPs

Private Wind PP

Auto producers

Temis Sheher, Petrochemical enterprises, SOCAR, BP etc
Power System current situation
Structure of the power capacity

1. Installed capacity of the power plants is 7129 MW.
   - Traditional thermal power plants – 3413 MW
   - Modern combine cycle gas-turbine power plants – 1705 MW
   - Module gas turbine power plants – 856.8 MW
   - Hydro Power Plants – 986.5 MW
   - RES (small hydro power plants, wind power plants, solar PV plants, municipalities waste) – 111 MW.

2. Pick load of the power system in winter time for 2012-2016 still at approximately stable level of - 3800 MW

3. Capacity in reserve (standby power) – 3300 MW/46%. The potential and technical possibilities for export of electricity is exist.
   - All thermal power plants used the natural gas.
Azerbaijan Power system map
Ownership and structure of the current energy market

1. All subjects of the power system are under the State property.

2. Power supply to whole country is provided by the 3 State companies: Azerenerji, Azerishig and Nakhichevan Energy Agency (Autonomic).

3. The electricity market has the vertical and horizontal integrated structure starting from generation to the end consumer. There is no competitive between market subjects.

4. The wholesale is realized between Azerenerji and Azerishig on the whole territory of the country on the price of 4.1 gepik, and with special consumers (with monthly not less than 5 mln. kWh) by price depend of day and night (4.2 gepik from 8.00-22.00 и 2.0 gepik. from 22.00-08.00).

5. Except of Nakhichevan Autonomus Republic the electricity supply at the whole territory of the country realized by Azerishig. For all consumers retail tariffs is 6 gepik.
Current situation at the internal energy market

Parliament, President, Cabinet of Ministries
(Law, Decrees, Secondary legislation)

Ministry of Energy (licences)

Minister of Economy, Tariff Council (energy tariffs)

Producers
Transportation networks
Distribution Networks
Supply Networks

Power Plants

“Azerenerji” JSC

- 500 kV
- 330 kV
- 220-110 kV

“Azerishiq” JSC

- 110-35 kV
- 0,4 – 35 kВ

Consumers

Specified Consumers

Wholesale Market
Retail Market
Activities type and current situation with market liberalization

1. «Azerenerji» - State Company
   - Monopoly on electricity generation and transmission on whole country
   - No competitive, activities types and subject are not unbundled.
   - From generation to supply – there is no internal wholesale market

2. «Azerishig» - State Company
   - Monopoly on electricity distribution and supply on whole country
   - Horizontal and vertical monopoly, no division of subjects and no competition between them
   - About 100% of the volume of the wholesale realized between Azerenerji and Azerishig.

   Company monopoly on generation, transmission, distribution and supply of electricity on the whole territory of the Nahkichevan Autonomus Republic. Subject not devided, no competition. There is a connection between power systems of Turkey and Iran.

In all three companies all kind costs, including network losses and fuel consumption at the power plant is too much high of world standards. Market liberalization is not carried out.
Some of the indicators (achievements) of the liberalization of the energy market in the world (about 25 countries) and comments on Azerbaijan.

• **Availability of the legal acts** on regulation of energy markets. It is necessary to adopt the relevant Laws in Azerbaijan.

• **Reforms duration.** From 2 to 9 years. Azerbaijan is still remains practically at the initial stage

• **Decreasing of the networks losses.** In the various countries the networks losses level is between 3,7% and 11,5%. In Azerbaijan is about 20%.

• **Prices reducing.** In these countries the prices fell down between 5% to 57%. Prices to a certain extent coordinated the interests of producers, consumers and investors. Established on the basis of justified costs. In Azerbaijan, there is no reduction of prices and they are set by the administrative decision. The responsibility for investments rests with the government and consumers.

• **Reducing standby power.** Standby power in these countries has been reduced to an average of 25%, in Azerbaijan it is 46% of the installed capacity of the power system.

• **The elimination of cross-subsidies.** In these countries, almost eliminated, but in Azerbaijan are fully kept.
Measures on liberalization of the internal energy market

- Development of the power and gas sectors on the basis of the long term national strategy,
- Development and approval of the State Programme on implementation of electricity and gas internal market reform,
- Development and approval of the Law Regulatory authority and establishment of Independent Regulatory Agency,
- Development and approval of the Law on Electricity,
- Development and approval of the Law on Gas,
- Development and approval the Law on Energy Saving, Energy Efficiency and RE
- Division of the subjects (parties) of the energy enterprises and their demonopolisation
- Step by step opening of the internal energy market and integration with regional markets,
- Unbundling of the existing monopoly in (generation and supply) from the natural monopoly (transmission and distribution) and given them the independent status,
- Approval of the Grid Code for energy market,
- Increasing of the share (%) of the eligible consumers,
- Connectivity of the third parties to transmission and distribution networks without discrimination of their rights,
Proposed model of the internal energy market

Parliament, President, Cabinet of Ministries (Laws, Decrees, Secondary legislation)

Independent Regulatory Authority

- Generation
  - SPP
  - GTP
  - HPP
  - MPP
  - RES

- Transmission Networks
  - 500 kV
  - 330 kV
  - 220-110 kV

- Distribution Networks
  - 110-35 kV

- Supply Networks
  - RES 1
  - RES 2
  - RES n
  - Baku ES
  - 35–0.4 kB

- Retail Market
  - Consumers
  - Eligible Consumers

Electricity Exchange

Wholesale market
Current potential on EE in Power Sector

<table>
<thead>
<tr>
<th>Measures</th>
<th>Potential</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decreasing of Network Losses</td>
<td>1.8 billion kWh</td>
<td>By export of the saved energy resources - about $700 mln:</td>
</tr>
<tr>
<td>2. Optimisation of the using modern power plants</td>
<td>1.0 billion kWh</td>
<td>- relieving pressure from the State Budget</td>
</tr>
<tr>
<td>3. Using of the full capacity of power plants (except</td>
<td>2.6 billion kWh</td>
<td>- increasing the revenues of the energy consumers because of cost reducing.</td>
</tr>
<tr>
<td>reserve)</td>
<td>0.8 billion kWh</td>
<td></td>
</tr>
<tr>
<td>4. Increasing of EE of the end users</td>
<td>0.3 billion kWh</td>
<td></td>
</tr>
<tr>
<td>5. Decreasing of the power system own usage</td>
<td>Total: 6.5 billion kWh</td>
<td></td>
</tr>
</tbody>
</table>
Thank you for attention

Vagif Nasibov
(+99450) 210 94 37
vnasib@gmail.com