THE SOUTHERN GAS CORRIDOR
IN EUROPEAN ENERGY

November 9th, 2015
8:30 AM – 5:00 PM

CONRAD N. HILTON
UNIVERSITY OF HOUSTON
Strategic Importance of the Region and Access to it (the “corridors”) for both the US and Europe

John Maresca, born in Italy, is a former United States diplomat, business executive, peace negotiator and educator whose career has included positions as Deputy Assistant Secretary of Defense for Europe and NATO at the US Defense Department, Director of Western European Affairs in the State Department, European postings including Minister at the US Embassy in Paris, and U.S. Ambassador for mediation of conflicts in Cyprus and Nagorno Karabakh.

He was Rector of the United Nations University for Peace, in Costa Rica, from 2007-2013, and now advises the Rector of the newly-established ADA University in Baku, Azerbaijan. He founded the Business Humanitarian Forum in Geneva in 1999, and lectures around the world on business, energy and international security issues.
The Evolving Strategic Situation in the Southern Gas Corridor Region
The “Three Seas” Region
Strategic Role of Pipelines

- Difference Between Oil and Gas
- Gas Needs to be Supplied in Large Quantities
- Pipelines form the Guarantee for Supplies
- They Link Countries and Regions for Years
- Gas Corridors Must be Economic and Secure
- Mutual Confidence Strengthens Political Links
The TANAP Southern Gas Corridor

• Pipeline route from the Caspian to Italy
• Three separate pipeline projects, linked together to form one long pipe
• From the Caspian Seabed near Baku
• Corridor Across Azerbaijan
• Through Georgia, Turkey, Greece, Albania, under the Adriatic Sea to Italy
The Southern Gas Corridor
More Than Just a Gas Corridor

• Energy for Europe
• Economic Development
• Political Links Growing
• Refugee Flow
• Transportation Corridor
• Common Challenges, such as ISIS
• Maintaining Security Along the Route
The Surrounding Regions
Strategic Central Asia

-- Land link between Europe and China
-- Border between Christian and Moslem Worlds
-- Borderline of developed and developing worlds
-- Borders world’s two most populous countries; China and India
-- Includes some troubled regions
China’s “March West”
Pipelines to China
A Strategic Region

• “Near Abroad” plus outreach for Russia
• “March West” region for China
• Site of Israeli-Palestinian Confrontation
• Recent Conflicts in Afghanistan and Iraq
• Current Conflict in Syria and Iraq
• Home ground for Al Qaeda and ISIS
• Source of mass migration to Europe
• Re-emerging Iran is a central player
A Narrow East-West Corridor
Baku-Ceyhan Oil Pipeline
US & European Interests in the Region

- Peace, Stability, Prosperity, Human Rights
- Elimination of Terrorist Organizations
- Support for Allies and Friends
- Encourage Democratic Governments
- Settlement of Refugees
- Stable Free Market Democracies
- Major Source of Energy
- Access to Central Asia
Russia Is The New Wild Card

• Russia’s View of the Near Abroad
• Russia’s Regional Aspirations
• Reasserting World Power Role
• Putin’s Personal Character as a Factor
• Scruples?
The Players

• Russia
• China
• Europe
• Turkey
• India
• Iran
• Energy Industry
• Radical Islam
• USA
• Azerbaijan
Dr. Christine Economides  
UH Petroleum Engineering  

Geopolitical Landscape: What is the context?

Christine Ehlig-Economides is Professor and holds the William C. Miller Chair honoring Charles V. Fitzpatrick at the University of Houston. She was Professor at Texas A&M University for the last 10 years and before that worked 20 years for Schlumberger. While at A&M, she managed research in production and reservoir engineering in conventional and shale reservoirs and helped the petroleum engineering department to grow and evolve to a broader energy scope. Professor Ehlig-Economides was elected to the US National Academy of Engineering in 2003, was a member of the National Academy of Science Committee on America’s Energy Future, and is currently a member of the NRC Board on Energy and Environmental Systems (BEES). She is one of the 16 Quantum Reservoir Impact (QRI) Scholars and has recently been named a Chief Scientist for the Sinopec Research Institute on Petroleum Engineering as one of the Thousand Talents in China.
Global Energy Landscape

UH Energy Conference
November 9, 2015
Dr. Christine Ehlig-Economides
A World of Oil

North America
16.8 MM BPD
230 BBO
2,805 / 167 BBO
1,391 / 69.6 BBO

Europe
6.4 MM BPD
16.6 BBO
52 BBO
1,551 / 88.6 BBO

Former Soviet Union
10.8 MM BPD
131.2 BBO
2,254 BBO
75.8 BBO

Assessed Basins
- With Resource Estimate
- Without Resource Estimate

South America
7.3 MM BPD
330 BBO
2,174 / 220 BBO
1,152 / 59.7 BBO

Africa
8.8 MM BPD
130 BBO
184 BBO
882 / 38.1 BBO

Middle East
28.4 MM BPD
685 BBO
470 BBO

Asia-Pacific
8 MM BPD
38.7 BBO
1,375 / 61.1 BBO

Legend:
- Conventional
- Heavy Oil
- Tight Oil
Reserves Increase vs Production

The diagram illustrates the reserves increase (in Billion STB) and production increase (in Million STB/d) for various countries.
Rates and Prices

[Graph showing oil production and prices from 1980 to 2015, with lines representing Saudi Arabia, Russia, and the USA, and a separate line for unconventional oil production and oil price trends.]
Demand/Supply Ratio

Source: IEA Oil Market Report
Oil Price Impact
Oil Production/Consumption Ratio

- OPEC
- Non-OPEC

Countries: India, Europe, China, Indonesia, United States, Brazil, Mexico, Canada, Iran, Colombia, Russia, Venezuela, Iraq, Saudi Arabia, Oman, Algeria, UAE, Kuwait, Libya, Kazakhstan, Norway, Qatar, Nigeria, Azerbaijan, Angola.
Transparency (or Lack Thereof)
Billion Dollar Disaster Events

Source: 2015 DOE Quadrennial Energy Review
Electricity Cost Comparison

Source: EIA
The United States has ample wind resources, including more than 8,000 GW land-based – the most affordable type to harness.
Simulation – Electricity Generation with 35% Renewables

Source: GE Energy, 2010
Electricity Cost Comparison

Source: IEA Harnessing Variable Renewables (2011)
Natural Gas Reserves

2014 Total
187.1 Trillion m³
US Natural Gas Production

Source: DOE EIA
Gas Prices $/Mmbtu
World Unconventional Gas

http://pacwestcp.com/
Major Gas Trade Movements 2014

Trade flows worldwide (billion cubic metres)

Source: Includes data from Cedigaz, CISStat, FGE MENAgas Service, IHS CERA, PIRA Energy Group.

BP Statistical Review of World Energy 2015
Summary

• No oil shortage
• Price dependent oil supply geography
• Importance of natural gas
• Expected changes in natural gas supply geography
Caner Can, Counselor for Energy at the Turkish Consulate General in Houston.

Mr. Can joined the Department of Energy at the Ministry of Foreign Affairs as contracted officer in 2000. Mr. Can became an Energy Advisor in 2008 at the Turkish MFA before he started his post at the Turkish Consulate General in Houston as the Counselor for Energy on September 2015. As a part of his professional portfolio at the Turkish MFA, he represented Turkey at various meetings of international energy organizations, namely the International Energy Agency, the European Organization for Nuclear Research, the International Atomic Energy Agency, the Energy Charter, International Renewable Energy Agency and G20 Energy for Sustainability Working Group. Mr. Can also served for assessment, preparation and development stages of several international energy projects undertaken by Turkey as a member of the Turkish MFA. Mr. Can earned a Bachelor degree in American Literature in Ankara University. He is married with one son.
Turkey: Regional Energy Hub and Important Contributor to Global Energy Security

Caner Can
Counselor for Energy
Turkey: Country Overview

Turkey is big, fast-growing and strategically placed.

Turkey is young, and has a dynamic economy which could give a boost to an ageing EU market.

Area: 783,562 km²
Population: 77 million (2014)
GDP: $800 billion (2014)
GDP per capita: $10,400 (2014)
Growth in GDP: 4.7% (2002-2014)
17th largest Economy in the World
Geograstrategic Location

50% of global oil and natural gas consumption (US + EU)  70% of global proven oil and natural gas reserves

Turkey, a reliable and stable attractive partner with solid links to Europe and the United States, and her ever deepening relations with the countries in the region.
Turkey’s Energy Outlook

Turkey is a country with

- a rising energy import bill (around 50% of the foreign trade deficit).
- high import dependency - around 74%. (≈92% for oil and ≈98% for gas)
- an estimated annual energy demand increase of ≈ 5-7% (≈ 2% in EU).
- an energy demand set to see the fastest growth among the IEA and OECD countries.
- electricity consumption at a pace, comparable to China.

Turkey is

- the 6th biggest electricity market in Europe.
- the 17th biggest economy in the world and 6th in Europe.
- among the top 10 natural gas importers in the world.
- the 2nd biggest market in Europe for the Russian gas.
Turkey’s Energy Strategy

- Decreasing the import dependency
- Diversifying energy mix (increasing the share of renewables and introduction of nuclear)
- Making better use of its indigenous resources (hydro, coal, geothermal and unconventional gas)
- Improving energy efficiency, key component of energy security

Efforts to meet high energy demand

Contributing to the Global Energy Security

Ensuring Domestic Energy Security
Installed Capacity (2015 as of August)
Natural Gas Imports (48 bcm in 2014) (2012 and 2013, 45 bcm)

Russia: 55%
Iran: 18%
Azerbaijan: 12%
Algeria: 9%
Nigeria: 3%
Spot: 3%
Supply and Demand Portfolio

ALGERIA + NIGERIA 4+1.2 bcm LNG

DEMAND
48 bcm in 2014
~51 bcm in 2015
~60 bcm in 2020

AZ 6.6+6 * bcm

RF 8+6 bcm

RF 16 bcm

IRAN 10 bcm

*6 bcm Azeri gas will be in the Turkish market once TANAP is in operation.
Natural Gas Imports (2014)
RUSSIA’S NATURAL GAS EXPORT TO EUROPE IN 2013, bln cubic meters

Overall in 2013: 172.6

In the first nine months of 2014 Russia’s gas supplies to Europe went down 3.6% amounting to 114.246 billion cubic meters.

### Gazprom exports to Western Europe

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<td>Greece</td>
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<tr>
<td>Switzerland</td>
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</tbody>
</table>

Source: Gazprom
Oil and Gas Reserves

Proven Reserves

OIL: 60% of WORLD
GAS: 72% of WORLD
### Gas Transit Potential by 2020

#### Potential Transit
- **West Line** 14 bcm
- **LNG** 12 bcm
- **TR Stream** 16-63 bcm
- **Blue Stream** 16-32 bcm

#### Potential Supply
- **Azerbaijan** 30-40 bcm
- **Kazakhstan** 30-40 bcm
- **Turkmenistan** 30-40 bcm
- **Iran** 30-40 bcm
- **Iraq** 10-15 bcm

#### Domestic Demand
- **60 bcm**

#### Potential Transit
- **68 – 156 bcm**

#### Potential Supply
- **128 – 216 bcm**
Assessment on Gas for TURKEY

- A reliable, favorable and economic Transit State for the region
- High domestic gas consumption and it is increasing.
- Net importer of gas, but with source and route diversification
- A developed gas grid & market, but still a great potential for investors for transit purposes.
- 2 LNG terminals + 1/2 to be constructed.
Power demand in Turkey is growing faster than anywhere else in the world, comparable to China. The electricity sector alone will need $110 billion in new investments by 2020.
Turkey: Contributions to Global Energy Security

**The first pipeline** specifically designed to export Caspian oil without going through Russia. BTC can transport 1 million barrels of oil a day from Azerbaijan via Georgia to the Turkish port of Ceyhan.

BTC provides around 1.5% of world oil supply.

Alongside BTC runs the BTE (or South Caucasus) gas pipeline.

The first time, TGI allows the delivery of Caspian gas to Europe without crossing Russian territory.
BTC, a critical piece of infrastructure for global energy markets.

In 2014 alone, the BTC pipeline brought more than 250 million barrels of oil from the Caspian Sea to world markets via Ceyhan Terminal.
Southern Gas Corridor
TANAP+TAP supports the EU’s initiative to enhance Europe’s energy security by connecting to new sources of natural gas in the Caspian Sea with new routes.

**TANAP+TAP will be the first pipeline to open the Southern Gas Corridor, 4th main artery for the EU after RF, Norway and Algeria.**

10 bcm/a initially available from Shah Deniz II will correspond to the amount of energy necessary to supply 7 million households in South Eastern and Western Europe.
TANAP Project

Backbone of the Southern Gas Corridor

The EU views TANAP as an important element in its strategy to reduce its dependence on natural gas supplies from Russia.

* June 2012 IGA and HGA were signed.
* December 2013 FID by the Shah Deniz Consortium.
* Groundbreaking Ceremony on 17 March 2015 in Turkey
* Pipeline construction commenced in 2015.
* 6 bcm to be delivered to Turkey in 2018 and 10 bcm to TAP in 2020.

Once TANAP is commenced, other Caspian sources can be delivered to Europe via TANAP.
Final Remarks

- High domestic demand (48 bcm in 2014) and transit potential (up to 160 bcm by 2020).
- Reliable, favorable and economic transit State for the region
- Great potential for gas trade and physical and liquid gas hub for the Southeast Europe.
- Diversified gas market in terms of suppliers and routes.
- Enhanced pipeline grid (app. 13,000 km of high pressure pipelines).
- Turkey has proved its reliability and stability in the energy sector and at the same time expands infrastructure and expertise in energy trade.
Teşekkür ederim.
Thank you.
Consul of Greece Georgios Papanikolaou accepted his duties on October 18, 2011. He was born in Athens in 1975. He has studied International Relations and International Economy at the University of Macedonia, Thessaloniki, Greece, (1993-97), at the University of Nice, France (1997-98), and has completed his studies with an MA in International Economic and Monetary Relations from the American University and Georgetown University, Washington D.C., USA (1998-2000).


More information on the [Consulate’s website](https://sgchouston.com).
“Southern Energy Corridor Conference”
The Greek perspective

George Papanikolaou
Consul of Greece in Houston
Houston, November 9, 2015
“certain uncertainties”

• tensions and the geopolitical instability
  • Middle east/Ukraine
  • Plummeting oil prices

• long term energy supplies security for the EU
  • the dependence of the European oil and gas market on one single supplier (Russia)
  • the growing supply – demand imbalance in Europe
Europe Faces a Growing Supply Demand Imbalance

Europe needs to replace ~100 bcm from declining production by 2025.

Most of its existing suppliers will not increase exports.

Europe faces a supply-demand gap by 2020 and it grows larger by 2025.

Source: PFC Energy
Opening up the Southern Gas Corridor
Trans-Adriatic Pipeline (TAP)

Total investment of approx. USD 45 billion
TAP's Key Features

Alignment with EC policy objectives

- Designed to expand from 10 to 20 bcm (plus) per year
- Up to 80% of physical reverse flow and potential gas storage
- Connecting directly to TANAP on the Turkish-Greek border
- Interconnection with various existing and proposed pipelines providing energy security in SE Europe
- Delivering gas and interconnecting to multiple markets in Western and Central Europe
TAP: Pipeline construction in Greece

- The length of the pipeline in Greece is approximately 550 kilometres. TAP’s longest section will start at Kipoi, near the country’s border with Turkey, and finish at its border with Albania, south-west of Ieropi.
- The Greek section will include one compressor station near Kipoi for 10 bcm and an additional one near Serres should TAP’s capacity be upgraded to 20 bcm. There will be 23 block valve stations along the Greek route.
TAP: Advantages for Greece (1)

- The choice of the Trans Adriatic Pipeline (TAP) for carrying natural gas from the Caspian to Europe is an extremely positive development that upgrades Greece’s position on the global energy map.

- The choice of the TAP is a “vote of confidence” in Greece. A “vote of confidence” that both acknowledges the stabilization of the Greek economy and contributes to the improvement of the economic climate.

- TAP is a foreign direct investment of €1.5 billion that will create 2,000 direct jobs and 10,000 collateral jobs, at no cost to the state.
TAP: Advantages for Greece (2)

• TAP strengthens Greece’s energy security, because it is an additional source of natural gas that will bolster competition and secure the supply of natural gas for Greece’s consumers and industries at lower prices. According to the agreement Greece will obtain some 1.0 BCM’S of Azeri gas from TAP for its domestic needs, in addition to the 0.75 it is already receiving via the existing Greek-Turkish interconnector.

• The pipeline functions as an additional factor for regional cooperation and stability. It enhances Greece's cooperation with Italy, Albania, Turkey and Azerbaijan, as well as with countries in the region that are to be linked to this project in the future via the IAP and IGB interconnector pipelines (Croatia, Montenegro, Bosnia-Herzegovina and Bulgaria).
IGB acts as a gateway to SEE through Greece, which is situated at the crossroads of all the new sources. IGB will be carrying 3bcma, scalable up to 5 bcma. IGB’s national importance has been announced by both the Greek and Bulgarian governments. IGB’s regional significance has been reaffirmed by the EU, receiving a €45million grant through the EEPR framework.

IGB:
- Has a total cost amounts to 250mln euros
- Has received the PEIA permit in Greece and submitted the EIA while in Bulgaria the EIA public consultation has been recently concluded.
The Greece – Bulgaria Interconnector (IGB)

First gas is expected to flow in 2018.
Χαρακτηριστικά του Καθέτου Διαράματος και χώρων όπου θα επωφεληθούν από την άδειωσή του

- Καθέτος Διαράματος
- Διασωστικός Αγωγός (Σε λειτουργία)
- Διασωστικός Αγωγός (Υπό κατασκευή – σχεδίαση)
- Διαφημιστικά Αγωγάς (TransBaikal Pipeline)
- Εθνικό Τύπου Αερίου
- Πέλας Εισόδου Αερίου
Ionian – Adriatic Pipeline (IAP)

In Fier, IAP would be connected with the planned TAP. TAP AG has signed memorandums of understanding with developers of the IAP project, including Plinacro (Croatia), BH-Gas (Bosnia and Herzegovina), and governments of Montenegro and Albania. In Split, the pipeline would be connected with the existing gas transmission system of Croatia. In addition, it may be connected with other new gas infrastructure, including the proposed Adria LNG terminal in Krk. The length of pipeline would be 516 klm (321 mi). The pipeline would be bi-directional and its capacity would be 5 bcm (180 billion cubic feet) of natural gas per year. Ministerial declaration on IAP project was signed on 25 September 2007.
Conclusion

- TAP will add to TWO (2) other important energy related projects that link Greece with EU and supply areas, rendering Greece the main transit hub in the area and the key factor in the EU energy diversification process

- Regional Gas Hub

- will have significant political and economic gains boosting investment and enhancing political understanding and cooperation between transit and producing countries

- lower gas prices for households
Ed Hirs teaches the energy economics courses to undergraduate and graduate students. With his co-authors in the Yale Graduates Energy Study Group, Ed has published several top downloaded and referenced papers in energy economics available on ssrn.com. He has authored and co-authored published opinion pieces on energy markets and corporate governance. He founded and co-chairs an annual energy conference at Yale University. He is frequently consulted by national and international media. Ed’s articles and quotes have circled the globe with the impact of bringing apolitical, energy economic analysis—without the hyperbole of political agendas—to the forefront of discussion. Ed is Managing Director for Hillhouse Resources, LLC, an independent E&P company developing onshore conventional oil and gas discoveries on the Texas Gulf Coast.
Crude Oil and Natural Gas Markets

The Southern Gas Corridor in the European Energy Security and Diversity

November 9, 2015

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Topics

- World Crude Oil Market & Prices
  - Structure, Price behavior, concerns
- World Gas Market & Prices
  - Structure, Price behavior, concerns
- European Energy
World Crude Market

Figure 1. The World Oil Market à la Magritte

This is not a bathtub.

William Nordhaus
World Market is a Network

Figure 1. The simple network
Major oil trade movements 2014
Trade flows worldwide (million tonnes)
Crude Oil Prices

The price of crude has decreased for two reasons:

1) USD has strengthened against all currencies as the Federal Reserve Bank ended Quantitative Easing

2) World Supplies have increased more than World Demand
Trade-weighted value of USD
## Oil and USD

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<td><strong>WTI</strong></td>
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<td><strong>Brent</strong></td>
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<td><strong>Trade Weighted USD</strong></td>
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<td><strong>2014 Eq. 2015 WTI</strong></td>
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<tr>
<td><strong>2014 Eq. 2015 Brent</strong></td>
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</tbody>
</table>
Price Elasticity of Demand

The Price Elasticity of Demand is defined as the ratio of the percentage change in Quantity Demanded to the percentage change in Price.
Price Elasticity of Demand

Yale Graduates Energy Study Group’s

Price elasticity of demand = -0.04

For 2% increase in Quantity—

Price declines 50%
Supply has increased

According OPEC members, the world crude supply is 2 million bbls per day more than “optimal”
Marginal Cost of Shale Crude

According to Morgan Stanley, the average marginal cost per barrel of production:

- Niobrara Shale: $51/bbl
- Mississippi Lime: $52/bbl
- Bakken: $64/bbl
- Permian: $63/bbl
- Eagle Ford: $66/bbl
How is Price of Oil Set?

OPEC follows Nash-Cournot Theorem and sets price for profit maximization.

OPEC estimates what the rest of the world will produce and then OPEC works backward to set Price
How is Price of Gas Set?

Generally, natural gas trades worldwide at its heat equivalent value of oil. Therefore, with Brent is at $60/bbl, natural gas will be priced at $10/mmBtu in general.

Why? Natural gas is used as a substitute for crude oil in many economies but NOT in the U.S.
Gas Price and Brent
Major gas trade movements 2014
Trade flows worldwide (billion cubic metres)
Shale Gas in the U.S.

Shale gas in the U.S. dates from the 19th Century when “town” gas was used for lighting.

George Mitchell’s pioneering work in hydraulic fracturing made vertical shale wells economic in 1999.
The Arithmetic of Shale Gas
US Shale Consumer Benefits

Consumers surplus is $\Delta P \times Q$

Price in 2008: $7.97/\text{mcf}$
Price in 2011: $3.95/\text{mcf}$
2008 Gas Consumed: 25.6 tcf
Consumers Surplus = $102.9 \text{ billion}$
Europe’s Gas Imports

- Europe’s net imports of gas amount to more than 50% of annual consumption
- Europe relies heavily upon Russia
Competition from LNG
Europe’s future supplies

- Azerbaijan
- French shale development
- Israel
- Egypt
- West Africa
Resources

• BP Statistical Review 2015
• Energy Information Agency
• Federal Reserve Bank of St. Louis
Crude Oil and Natural Gas Markets

The Southern Gas Corridor in the European Energy Security and Diversity

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Dr. Vitaly Baylarbayov
SOCAR Deputy Vice-president

Caspian Basin Resource Potential, Azerbaijan’s Stewardship:
Shah Deniz and beyond

Vitaliy Baylarbayov is the Deputy Vice-President of SOCAR for Investments and Marketing. He held executive positions in the negotiations related to exploration, development and the management of a number of major oil and gas upstream and midstream projects, including the giant Azeri-Chirag-Guneshli oilfields, the Shah-Deniz gas/condensate field, the Baku-Tbilisi-Ceyhan oil pipeline, Southern Gas Corridor Projects, including the expansion of the Southern Caucasus Pipeline, Trans Anatolian Pipeline (TANAP) and Trans Adriatic Pipeline (TAP). Dr. Baylarbayov has over 30 years’ experience in the oil and gas industry and holds a PhD in Economics.
SOCAR’S STRATEGY

ACG, Shah Deniz and beyond...
October, 2015

VITALIY BAYLARBAYOV, Deputy Vice-President for Marketing and Investments
Azerbaijan
A central hydrocarbon producing region since beginning of oil production age. In late 19th C produced half of the world’s consumption of oil. Azerbaijan’s oil production during World War II was crucial to the victory of the Soviet Union over Nazi Germany.

SOCAR
Founded during the Soviet period under various different names. In September 1992, SOCAR established by the independent Republic of Azerbaijan.

Our vision
is to become a vertically integrated international energy company resting upon advanced experience on operation efficiency, social and environmental responsibility.
Famous Azerbaijan Oil Firsts…

• First oil well in the world was drilled in 1848 in Baku in Bibi Heybat oil field

• In 1900 Azerbaijan produced more than 50% of world’s oil = 11.4 million tons

• In 1897-1907 the 1st largest oil pipeline in the world was built from Baku to Batumi (883 km x 200mm)

• First oil tanker Zoroaster by Branobel Company owned by Ludvig and Robert Nobels was built in 1885 and delivered to the Caspian Sea

• About 80% of oil used during WWII by USSR was produced in Baku (peak production – 23.5 million tons in 1941)

• First offshore oil production in the world started in Azerbaijan (1924 – Bibi Heybat seaside, 1949 – Oily Rocks – in open sea)
Company Strategic Goals

Maintain position as the leading oil and gas company in Azerbaijan and a key regional player, and becoming an international oil and gas group with vertically-integrated upstream, midstream and downstream operations.

Through focus on the following priorities:

- Keep stable flow of crude oil production
- Increase production and exports of natural gas
- Increase international activity in order to be a part of diverse international markets.
- Increase and consolidate domestic and regional downstream refining, marketing and petrochemical activities
- Enhance the efficiency of operations
- Contribute further to the Republic of Azerbaijan’s economic development
SOCAR’s National and International Goals

• As a national oil company, SOCAR strives to promote the national interest of Azerbaijan and its people through its projects and activities.

• Through linking Azerbaijan in trade and infrastructure with foreign countries, SOCAR strives to strengthen Azerbaijan’s foreign relations.

• The Contract of the Century was signed the same year as a painful ceasefire agreement with Armenia, which left 20 per cent of Azerbaijan’s territory under occupation that left a million Azerbaijani refugees homeless. International companies gave a vote of confidence to the Azerbaijani economy and political stability during this difficult period and this was crucial to Azerbaijan’s development.

• Implementation of the Southern Gas Corridor is the main project of the XXI century aimed to change the energy map of Europe.

• Azerbaijan wants SOCAR to play a role not only as a NOC, but an IOC.
Factors affecting strategy

• Long term view: the oil and gas industry works in long term price cycles lasting decades:
  • Contract of the Century was signed in 1994: oil price averaged $12
  • BTC pipeline and the South Caucasus natural gas pipeline became operational in 2006: oil averaged $60.
  • December 2013, sanctioning of the Southern Gas Corridor: oil price was at $92.
  • All these Azerbaijani oil and gas projects have been extremely profitable for investors, despite the swings in the oil price.

• Azerbaijan’s unique geography:
  Out of 47 landlocked countries in the world, Azerbaijan is one of the only few with substantial oil and gas reserves, so multiple pipelines is an artery for the country.
SOCAR’s Business Strategy

• “Above the ground” conditions are SOCAR’s comparative advantage:
  There is oil and gas in many locations around the globe, but the energy producing regions that are successful over long periods of time are those that possess conducive regulatory frameworks.

• Strong commitment to sanctity of contracts.
  Azerbaijan has never attempted to revised conditions of any of the PSAs it has signed.

• Azerbaijan’s parliament adopted these PSA’s as part of national legislation
  The structure of PSA’s encouraged foreign companies to come to Azerbaijan, in contrast to many other places where IOCs cannot book volumes.

• Energy as a tool for cementing partnerships but not for creating or exploiting dependence:
  Never in its history, Azerbaijan attempted to use energy for other purposes.
CONTRACT OF THE CENTURY

The Production Sharing Agreement signed in September 20, 1994 in Baku by the Government of Azerbaijan and a consortium of 11 foreign oil companies from six nations initiated a rapid period of development which has transformed the local energy supplier and changed the energy map of Europe. This contract became known as The Contract of the Century, as it represented the first major investment by Western multinational companies in any country of the former Soviet Union in 20th century.

- The contract covered the development of an area that covered three major oil fields in the Azerbaijan sector of the Caspian Sea – Azeri, Chirag and Deepwater portion of the Gunashli field (ACG) containing 2 billion tons of recoverable oil reserves
- Investment in ACG had reached more than $30 billion by the end of 2015
- ACG produced a total of about 3 billion barrels of oil production since first oil in 1997
- Total ACG production in 2014 was on average 638 000 barrels per day (233 million barrels or 31.5 million tons in total)
- Negotiations to extend the duration of the ACG PSA are ongoing
• In 2006, the BTC pipeline began operation: supplies oil from landlocked Azerbaijan through Georgia and Turkey, ending in Turkey’s Mediterranean port of Ceyhan.

• Landlocked geography makes oil export more complicated than sea abutting state, so multiple pipeline strategy to diversify and lower dependence on a single transit state.
2000s: Gas production and export

1999: Discovery of Shah Deniz one of the largest gas condensate fields in the world.
In 2006: South Caucasus Pipeline ("Baku-Tbilisi-Erzurum") become operational and Azerbaijan evolves from gas importer to gas exporter. Since 2006 Azerbaijan has proved to be a reliable regional supplier of gas.
With ample storage facilities and commitment to meet its contractual obligations. Recently, SOCAR has expanded of its storage facilities.

Instead of selling to local markets, SOCAR decided to embark on a “mega project” to export gas to the Europe

- A project that transits 7 countries
- Deals with six regulatory systems
- Involves 12 investing companies
- Includes 12 gas buyers
- Costs 45 billion dollars
The Southern Gas Corridor

New gas supply for Europe

• A superhighway that can facilitate the transport of gas from different sources, not only Azerbaijan but also Central Asia, Iraq, and East-Med
• Can reach additional markets in Europe, such as the Balkans
• Built with double the capacity and can be scaled up
• The first project in decades to introduce new gas supplies into Europe rather than simply re-routing existing supplies, thus diversifying sources
The FID on the Southern Gas Corridor took place in December 2013.

As part of the FID decision, Azerbaijan extended the PSAs on the Shah Deniz field to 2048.

This lengthens the presence and involvement of major European companies in Azerbaijan.

SOCAR is engaging in connecting “energy islands” to the center of Europe.

There is a large security of supply gap between Europe’s center and its periphery and this project aims to enhance the security of the more vulnerable markets.

It is a historic choice for Azerbaijan and the Caspian because it will for the first time connect the resources of the land locked region directly to the heart of Europe.
Equity Ownership across the Southern Gas Corridor

**Value chain**
- Shah Deniz Upstream
- SCP Expansion (SCPX)
- Trans-Anatolian Pipeline (TANAP)
- Trans-Adriatic Pipeline (TAP)

**Equity distribution**
- TPAO
- LUKoil
- NICO
- Petronas
- BP
- SOCAR (SCA)
- BOTAS
- Enagas
- Fluxys
- Statoil
- SOCAR
- BP

**Operator**
- UJV
- IJV

**Structure**
- Incorporated Joint Venture (IJV)
- Unincorporated Joint Venture (UJV)

**AGSC**
- TPAO
- LUKoil
- NICO
- Petronas
- SOCAR
- BP

*Notes*
- IJV: Incorporated Joint Venture
- UJV: Unincorporated Joint Venture
SD2 and the Southern Gas Corridor
Multiple mega-projects – $45 billion scope

- 26 wells $6bn
- Offshore facilities $15bn
- Sangachal Terminal expansion $2bn
- SCP Expansion $5bn
- TANAP $12bn
- TAP $5bn

Southern Gas Corridor scope

Total program capital expenditure = over $45 billion
Interconnectors

- The Southern Gas Corridor will be a strong catalyst for interconnectors across Southern Europe
- The TAP section can connect Caspian gas to multiple European markets
• In addition, there are signs of strong commercial interests in adding a component of the project into the Balkans.
THANK YOU VERY MUCH UoH
SOCAR is Israel’s top supplier of oil

- Israel is one of the main export destinations of SOCAR’s crude oil and oil products
- Azerbaijan has very friendly relations with Israel since its independence in 1991.
- Israel is one of Azerbaijan’s top 5 trade partners (some years top 3)
- During 2011-2015, SOCAR exported approximately 4 ml. tons annually of Azeri Light crude oil to Israel
- This constituted approximately 8% of the total volumes of Azeri Light exported by SOCAR
- Azeri origin crude oil constitutes about 30-40% of overall oil consumption in Israel
- In 2011-2015 approximately 200-300 thousand tons of Gasoil and Gasoline were annually exported by SOCAR to Israel
Backup Slides
Gas Export Potential

Billion cubic meters per annum (bcm/a)
Azerbaijan’s Gas Production

Shah Deniz Field
1,2 trillion cubic meters gas
240 million tons condensate

Annual production from Stage 2 will start by the beginning of 2018 and reach more than 16 bcm at plateau
Hydrocarbon Reserves of Azerbaijan

- Proven hydrocarbon reserves -- 4.55 billion tons
- Forecasted hydrocarbon reserves -- 10 billion tons
- Prospective onshore and offshore structures – 40
Greg Saunders is the Senior Director, International Affairs, responsible for US political and government relations in support of BP’s global portfolio of commercial operations. He joined BP’s Washington office in 2004. Greg was previously posted to BP’s corporate headquarters in London and then to Algeria. Resident in Algiers, he served as the Director for Communications and External Affairs and was responsible for corporate responsibility, reputation/branding and relationship management programs for BP’s extensive oil and gas operations in Algeria as well as its entry strategy in Libya. Prior to joining BP, he culminated a career with the US government with assignments in Asia, Africa, the Middle East and Europe. Mr. Saunders graduated from West Point in 1976 with a Bachelor’s Degree in Engineering. He has an MBA from George Washington University and an M.A. in International Relations from the Naval Postgraduate School. He is also a graduate of the French Ecole de Guerre in Paris. He speaks French and Portuguese.
The Southern Gas Corridor to Europe...
Demand for gas continues to grow

- Global gas demand grows at around 2% pa ~ double that of oil
- Global LNG demand grows at around 4% pa
- Demand driven by non-OECD countries
- North American unconventional supply growth continues

Source: Energy outlook 2035
Caspian Oil and Gas Export Routes
Shah Deniz – Phase II

- Contracts to sell gas to Turkey and Europe
- 16bcma upgrade for SCP, with >400km new pipeline and 2 compression stations in offshore processing
- Two new bridge linked platforms provide 16 bcma offshore
- Existing Stage 1 Platform
- New 2000km pipeline across Turkey (TANAP)
- New terminal at Sangachal with compressors for Shah Deniz and SCP
- 500 km of subsea pipeline network in up to 550m water depth
- 26 subsea wells drilled with 2 semi-submersible rigs
Southern Gas Corridor
Groundbreaking Ceremony
SD2 & SCPx Project Progress

- Major contracts awarded worth ~$11bln.
- Over 17,000 people working across the projects
- Nine production wells completed in preparation for first gas
- BP Operated projects progress at ca. 55%, including Engineering, Procurement and Construction
- Continued good safety performance
Project Progress in photos

- Diving Support Vessel at Baku Shipyard
- Subsea Construction Vessel – Baku Assembly
- Pin Pile Installation
- Emergency Generator Installation
- Pin Piles with Towing Bridles & Buoys
- Deck Fabrication
- Pipe Rack Erection
- SCPX Line Pipe Storage
- CSG-1 Compressor Foundation
- Line Pipe Manufacture in Turkey
- TANAP Line Pipe Arrival
- TAP Access Roads - Albania
The Southern Corridor

Shah Deniz 2 and SCP Expansion (SCPX)
Trans-Anatolian Pipeline (TANAP)
Trans-Adriatic Pipeline (TAP)

BP
SOCAR/SGC
TPAO
PETRONAS
LUKoil
NICO
SGC
BOTAS
ENAGAS
ENAGAS
FLUXYS
SGC

16.7%
15.5%
10%
19%
10%
28.8%
19%
16.7%
10%
15.5%
10%

109%
58%
Looking ahead - oil and gas prospects
...a new source of natural gas for Europe
Dr. Efgan Niftiyev
Strategy and Policy Coordinator
at Caspian Strategy Institute

Energy Outlook in South East Europe: Role of the Southern Gas Corridor

Dr. Niftiyev is Strategy and Policy Director at Caspian Strategy Institute based in Istanbul. He has extensive policy and academic expertise in the areas of energy and foreign policy of Turkey and Caspian region. Dr. Niftiyev received his graduate education at Georgetown University and The George Washington University. Previously he worked for Azerbaijan Diplomatic Academy (ADA) and several influential institutions in Washington DC.
Southern Gas Corridor (SGC)
Caspian Gas to Europe

Efgan Niftiyev
Caspian Strategy Institute
Introduction

• Global Energy Outlook

• European Natural Gas Demand

• Southern Gas Corridor
Introduction

- Affordable
- Access
- Sustainable
- Source Diversification
- Route Diversification
- Energy is a national security matter
Global Trends in Energy

• Falling oil prices (115 usd in June 2014 to 48usd today) market vs politics
• Shale gas revolution in US / 50 percent of US production/ US now number 1 in the globe (number 2 Russia)
• High efficiency measures
• Renewables not reached expected level (Technology and incentives)
• Energy demand growth will be coming from emerging economies
• OECD growth stagnant
• Cheap coal
• Demand for natural gas grows by more than half in coming decades, the fastest rate among the fossil fuels
• LNG trade (imbalance between export, transport and receiving capacities)
• Crisis in Ukraine (Politics of Gas)
• Europe spent on importing fossil fuels €406 billion in 2011 (bn) and €545 bn in 2012
Regional Trends in NG Consumption Growth

2013-2040

- Middle East
- Africa
- FSU
- Latin America
- Asia Pacific
- Asia
- Europe
- North America

XLS: C:\Users\[User]\Documents\NG\WOM \Subsector\Service\WOM \Subsector \Global \Forecast Report
Global NG Production
Global NG Production Growth
Key Trends in LNG Trade
Main Pipeline Flows
Europe Natural Gas Demand

<table>
<thead>
<tr>
<th>BCM/year</th>
<th>Current State 2013</th>
<th>Future State 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Production</td>
<td>202</td>
<td>128</td>
</tr>
<tr>
<td>Consumption</td>
<td>562</td>
<td>660</td>
</tr>
<tr>
<td>Imports</td>
<td>360</td>
<td>532</td>
</tr>
<tr>
<td>% Import Dependent</td>
<td>64%</td>
<td>80%</td>
</tr>
<tr>
<td>% Natural Gas of Energy</td>
<td>24%</td>
<td>30%</td>
</tr>
</tbody>
</table>
EU Natural Gas Imports
Imports 2012

- Russia: 37.57%
- Norway: 30%
- Algeria: 13%
- Nigeria: 3.1%
- Qatar: 8%
- Iran: 2%
- Azerbaijan: 0.01%
- Libya: 1%
- Egypt: 0.5%
EU Natural Gas Supply Perspective
Shale Gas in Europe

1. Population density
2. Tighter regulations
3. Some parts of EU banned drilling
4. Mineral rights belong to state
5. Ukraine and Poland exceptions

EU and USA:
two different world in regards to Shale Gas E&P
European NG Consumption
South East Europe

• GDP: 1,45 Trillion USD

• Oil Consumption: 1,76 million barrels/day

• Gas Consumption: 63,03 bcm/year

• Gas Production: 13,55 bcm
The Source - Azerbaijan
Azerbaijan Energy

- Baku – Once World’s oil capital
- Current reserves: 7 Billion Barrels
- Main Oil Field: Azeri – Chirag - Guneshli (ACG)
- Contract of the Century – September 20, 1994
- Non Russian export route
- Baku – Tbilisi – Cehyan Pipeline
Shah Deniz
Azerbaijan`s Gas Fields
Caspian Offshore Region
Shah Deniz

- Composed of Shah Deniz 1 and Shah Deniz 2 fields
- Located in territorial waters of Azerbaijan in the Caspian Sea, 70 miles off the land
- Discovered in 1999
- About 140 square kilometers
- Total reserve estimated at 1.4 trillion cubic meters
- Shah Deniz 1:
  - Single production platform
  - Annual production is 9bcm
  - Among the most efficient wells in the world
  - Exports to Georgia and Turkey
Reserves in Azerbaijan

3,2 TCM

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Reserves</th>
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<tbody>
<tr>
<td>Shah Deniz Field</td>
<td>1,132</td>
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<tr>
<td>Nakhchivan Field</td>
<td>300</td>
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<tr>
<td>Bahar Field</td>
<td>25</td>
</tr>
<tr>
<td>Absheron Field</td>
<td>350</td>
</tr>
<tr>
<td>Ashrafi Field</td>
<td>25</td>
</tr>
<tr>
<td>Karabakh Field</td>
<td>6</td>
</tr>
<tr>
<td>Shafaq Asiman Field</td>
<td>500</td>
</tr>
<tr>
<td>Umid Field</td>
<td>200-300</td>
</tr>
<tr>
<td>Babek Field</td>
<td>600</td>
</tr>
</tbody>
</table>
Shah Deniz

• Shah Deniz 2:
  • Annual gas production will be 16bcm
  • Development cost will reach to USD28 billion
  • Onshore gas processing plants, 2 production platforms, 26 gas production wells, 500km pipeline to connect undersea production wells and platforms with Sangachal terminal will be built
Azerbaijan – Natural Gas Production

Azerbaycan Doğal Gaz Üretimi

Natural Gas
TANAP – The Game Changer
TANAP : Fact Sheet

• Memorandum of Understanding: 26 June 2012
• First gas flow: 2018
• Initial capacity: 16bcm; 6bcm to Turkey 10bcm to Europe
• Capacity in 2023: 23bcm
• Capacity in 2026: 31bcm
• USD12 billion investment
• 3 main shareholders: SOCAR %58, BOTAŞ 30%, BP 12%
• Entry point to Turkey: Türkgözü, Georgia-Turkey border
• Exit points: Eskişehir point in Turkey and Turkey-Greece border
TANAP : Fact Sheet

- Pipeline passes through 20 cities and 67 districts
- Total length is 1841km
- 2 million tons of steel pipes planned to be used
- More than 15000 new jobs
- Around USD50 billion of economic circuit will be gained
- 56 inch pipeline from Georgia border to Eskişehir
- 48 inch pipeline from Eskişehir to Greece border
Trans Adriatic Pipeline – The Winner
TAP : Fact Sheet

• Italy:
  • Pass through Italian territorial waters
  • 1.5km long micro tunnel entering at a depth of 25 metres
  • Total length of onshore section is 8km
  • Block valve station at Lecce and near San Foca
  • Pipeline receiving terminal in Melendugno
  • 300 million euro will be added to Italian economy
TAP : Fact Sheet

• Status of Project of Common Interest given by European Parliament and European Council
• Also named as Project of Energy Community Interest
• Initial capacity: 10bcm, can be increased to 20bcm
• Main shareholders: BP 20%, SOCAR 20%, Statoil 20%, Fluxys 19%, Enegas 16%, Axpo 5%
• Onshore sections: 765km
  • Greece: 545km
  • Albania: 211km
  • Italy: 8km
  • 15 camp sites with 150 to 200 staff per site
• Offshore section: 105km
  • Traversing Adriatic Sea between Fier in Albania and Puglia region in Italy
Europe and Turkey – The Destination
Turkey

• High economic growth
• Strategic location between energy producing and energy importer countries
• High import dependency on energy
• Natural gas consumption tripled
• Natural gas imports: 98 percent
• High pressure natural gas pipelines from 2 thousands to over 15 thousand km
Turkey – Natural Gas Consumption
Turkey’s Natural gas Imports by year

<table>
<thead>
<tr>
<th>Yıl</th>
<th>Rusya</th>
<th>İran</th>
<th>Azerbaycan</th>
<th>Cezayir (LNG)</th>
<th>Nijerya (LNG)</th>
<th>Diğer* (LNG)</th>
<th>Toplam</th>
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<tbody>
<tr>
<td>2005</td>
<td>17.524</td>
<td>4.248</td>
<td>0</td>
<td>3.786</td>
<td>1.013</td>
<td>0</td>
<td>26.571</td>
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<tr>
<td>2006</td>
<td>19.316</td>
<td>5.594</td>
<td>0</td>
<td>4.132</td>
<td>1.100</td>
<td>79</td>
<td>30.221</td>
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<tr>
<td>2007</td>
<td>22.762</td>
<td>6.054</td>
<td>1.258</td>
<td>4.205</td>
<td>1.396</td>
<td>167</td>
<td>35.842</td>
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<tr>
<td>2008</td>
<td>23.159</td>
<td>4.113</td>
<td>4.580</td>
<td>4.148</td>
<td>1.017</td>
<td>333</td>
<td>37.350</td>
</tr>
<tr>
<td>2009</td>
<td>19.473</td>
<td>5.252</td>
<td>4.960</td>
<td>4.487</td>
<td>903</td>
<td>781</td>
<td>35.856</td>
</tr>
<tr>
<td>2010</td>
<td>17.576</td>
<td>7.765</td>
<td>4.521</td>
<td>3.906</td>
<td>1.189</td>
<td>3.079</td>
<td>38.036</td>
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<tr>
<td>2011</td>
<td>25.406</td>
<td>8.190</td>
<td>3.806</td>
<td>4.156</td>
<td>1.248</td>
<td>1.069</td>
<td>43.874</td>
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<tr>
<td>2013</td>
<td>26.212</td>
<td>8.730</td>
<td>4.245</td>
<td>3.917</td>
<td>1.274</td>
<td>892</td>
<td>45.269</td>
</tr>
</tbody>
</table>

* Spot LNG ithalatının yapıldığı ülkeleri temsil etmektedir.
Turkey – Natural Gas Imports

- Iran: 19%
- Azerbaijan: 9%
- Nigeria (LNG): 9%
- Other* (LNG): 3%
- Russia: 58%
Companies Importing Natural Gas in Turkey
Sources of Electricity Generation

![Chart showing sources of electricity generation in 2013: 45% from natural gas, 19% from HES Barajlı, 12% from Linyit, 12% from Ithal Kömür, 1% from Taş Kömürü, 1% from Asfaltit Kömür, 1% from Geothermal, 0% from LPG, 0% from Nafta, 0% from Fuel Oil, 3% from Rüzgar, and 0% from Biogaz.}