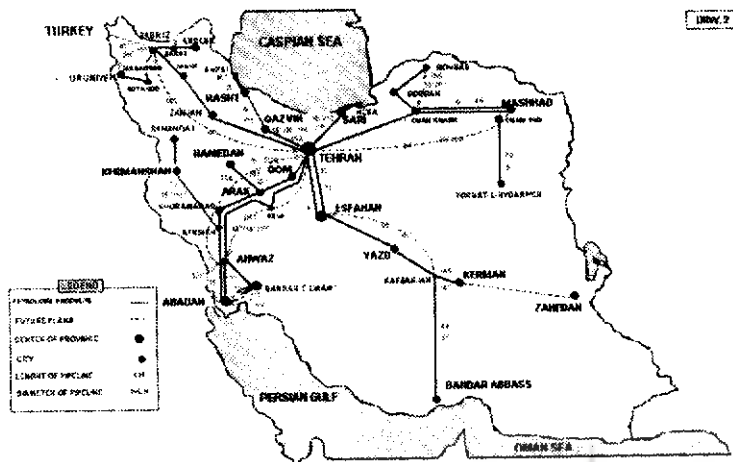


Iranian Product Pipelines



demand for natural gas as well. It is worth noting that this continent's share of gas consumption is estimated to increase from 21% (470bcm) in 1996 to 29% (580bcm) in 2010. It therefore follows that natural and economical market for the surplus gas of Caspian region will not only be Europe but Asia too.

The Islamic Republic of Iran which by itself accounts for 15% of the world gas reserves can along with gas-rich Turkmenistan provide for a great part of European gas market.

On the other hand in view of 8 August 96 agreement for sale of gas ratified between Iran and Turkey, there is a chance that the Turkmen gas is utilised in the northern parts of Iran and equivalent volume of Iranian gas, tapped from its southern fields, be transmitted to Turkey and Europe.

In choosing the routes for the transmission of Caspian region gas to Europe and Asia, there seems to be certain interference from some countries who give priority to their political interest rather than that of economic interests of the countries of the region.

This can be very destructive for the economies of these countries.

Let's emphasize that Iran does realise its responsibility in providing for part of ever increasing demand of gas in the world and by developing its recovery capacities and creating acceptable facilities for the transmission of gas resources of the neighbouring countries to the markets will fulfil its obligation. In this direction, connection of the Turkmen gas pipeline to the existing network in Iran and the ones under construction will cover Europe and the Indian subcontinent.

In Conclusion

It is obvious that the route through Iran is not the only way for the export of oil and gas of Central Asia and the Caucasus. There will surely be other routes created. This route is among the cheapest ones, and yet some industrial states first try creating more difficult and costlier ones and then propose the route through Iran for their own counterparts in the region. This is because creation of new facilities for such a transmission is of both economic

and political considerations. The political one is decided by governments and the economic by companies and investors. For all practical purposes a blend of the two aspects is necessary. And any one aspect overweighing the other would be detrimental. Especially if the political aspect is over emphasized and the economic side is ignored then the main target which is the improvement of the economic situation of the central Asian countries will not be achieved.

One of the important and noticeable statements in this regard is the testimony of Mr. J. Robinson West, Chairman of the Petroleum Finance Company on Caspian Sea infrastructure projects at the US senate foreign relations committee.

He says, "A route through Turkey is definitely desirable, but private companies should be called upon to build it only if they determine that the economics warrant it. Multiple pipelines are the most politically desirable result for unlocking the resources of the Caspian through Russia, Turkey, Georgia, Iran, China and even Afghanistan, once that option becomes available. Let the markets decide the order in which they are to be built. This would benefit the countries of the Caspian."

As mentioned earlier Iran will welcome any route that would secure the bilateral and multilateral regional relations which would ensure the real interests of the countries and facilitate their economic growth. The security from supply of energy of the region to the world would be guaranteed via this way.

At the end, the author would like to conclude that the Caspian question is not a matter of "to be or not to be";

Rather, it is a matter of "options and obligations."

Kazakhstan and Turkmenistan Pipeline to Europe via Iran



privilege of possessing a comprehensive pipeline network. Besides, the Persian Gulf is considered a desirable terminal for the international markets. Iran can take care of the task by two means: first, oil swaps, second, by constructing a new pipeline to the Persian Gulf terminals. The swaps project will be completed through three phases. It is estimated that the total costs of the first and second phases will reach so far \$350 million. From security point of view, Iran is regarded as the most consistent country in the region which can provide the desirable security for oil and gas transfer required by the oil companies and other states in the region.

To do this study, the following issues were taken into consideration

1. Economical administrative capabilities of the governments
2. Political risks
3. Debt indices of the governments
4. The proportion of consumed loans to the total sum of loans
5. Valid indices available in each country
6. Accessibility to bank facilities
7. The extent of the governments short-term financing
8. The accessibility of each country to the international capital markets
9. Possibility of paying back and damages to investors and merchants

10. The number of transit countries in between

11. Assessment of geographical costs (including frosted regions, straits, seas, and mountains).

Regarding the above mentioned issues, adoption of the most convenient project hinges on the following

indices:

1. The proportion of capital to distance
2. The proportion of capital to capacity
3. The proportion of capacity to distance
4. The proportion of project capacity to the proved reserves in the next 25 years

The Precise and objective surveys concluded that "Turkmenistan-Persian Gulf" route, is holding the first rank. Besides, this pipeline terminates in the

Persian Gulf where there is no need to invest on loading terminals, and in coming years it will be able to provide for the increasing demands of the South East Asia where the rate of the demands for gas, oil, and energy has increased to the greatest extent since the early 21st century.

Regarding some limited %7 growth of Europe's demand for gas and oil AIOC route has some advantages over other options (excluding "Turkmenistan-Persian Gulf" route). However compared with the crude oil swaps via Iran, AIOC route seems to lose those so-called advantages.

Besides, some oil producing countries in the region are readily able to meet the limited increase in Europe's demands for oil. Therefore, AIOC route relies on uncertain markets (of course excluding Turkey).

Transfer of Natural Gas

Now Let's touch on the subject of transmitting natural gas through Iran. As you may know, the Asian market especially that of the south and east has a clear prospect of an increasing

Crude Oil Pipeline from Kazakhstan and Turkmenistan to Iranian Northern Refineries



geopolitical, economical, and security aspects, this is regarded as the most convenient of the routes to transfer gas of Turkmenistan to Europe. However the US government objects this project simply because it crosses Iran.

Iranian Crude Oil Pipelines



3. North Route

The already in use FSU network of pipelines is being utilised to transfer a portion of the region's oil and gas. This network known as "The north routes" includes "Tengiz-Samara-Europ", "Tengiz- Volgograd- Norosisk", Tengiz-Komsomolesk-Norosisk", and "Baku, Grozvey, Norosisk" route. The last route is by far shorter than the former ones, which seems to be its advantage. There are, However, some risks in this route, for example, it requires \$300 million to repair the corroded parts, which could lead this project to a complete failure.

After a run of discussions, AIOC signed a contract to construct a line from Khazakhstan to Norosisk in 1997. This 1700 km pipeline requires some \$2.5 billion investment, and a new export terminal needs to be built in order to load tankers which, in turn, carry oil via the Bosphorus and Dardanelles Straits to the Mediterranean Sea. By increasing the cross-strait traffic, ecological disasters seem to be more probable due to the fact that the 31 km Bosphorus Strait is only 800-4400 meters wide.

4. Trans - Caspian Route

This route was proposed to make the main Baku-Jeihan route of early production project convenient. The Trans - Caspian route travels 595 kilometers on the Caspian seabed in order to cross neither Iran nor Russia. This pipeline is to carry oil from Tengiz and Turkmenbashi to Baku and requires some \$2.5 million. Iran and Russia objected this project because of the oil leak due to the probable pipeline

breakage caused by earthquakes in the sea bed. The capacity of this project reaches 500,00 b/d. It is proposed that this project should be connected to one of the projects, namely "The main pipeline of Azerbaijan oil consortium", "The West route of early production" "The North route of early production", or "The North route-Chechnia bypass".

Considering the project capacity, the sole acceptable route is the main exports pipeline of Azarbaijan oil consortium (AIOA). Carrying Khazakhstan and Turkmenistan oil, this pipeline puts the Caspian Sea at the risk of pollution. Limitations due to Georgia mountainous region, high costs, and other limitatins caused this project to receive no remarkable attention.

5. East Routes

The Far East and China are considered as major markets for the oil of this region, however the long distance between Khazakhstan oil fields and these markets, and other factors such as deserts and mountainous regions with frosting winters and hot summers gives a steep rise to the costs of pumping

facilities maintenance. And it is likely that oil flow stops in winter due to frost. Besides, this pipeline travels through some politically inconsistent regions. Khazakhstan, Turkmenistan, Uzbekistan will be able to export their oil through this 2896 kilometer pipeline which requires \$3.5 billion.

6. Turkmenistan, Afganistan, Pakistan(South East Routes)

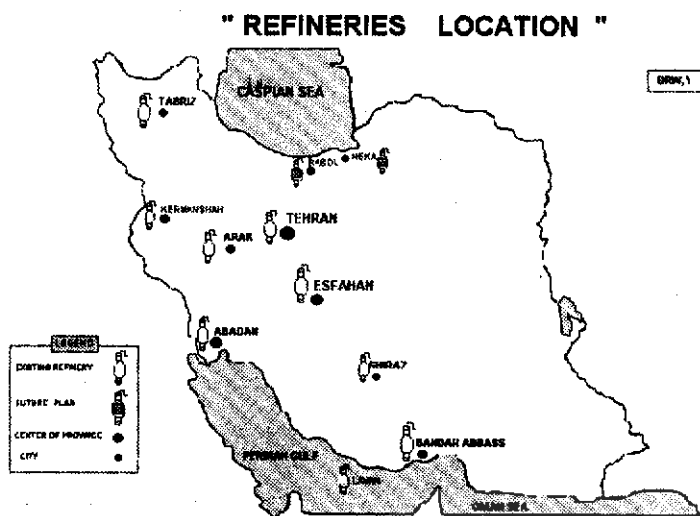
This project is aiming at the transfer of Turkmenistan and Khazakhstan's oil. The forecasted length of this pipeline is estimated at 1600 kilometers which requires some \$2.5 billion investment.

The capacity of this project is 1,000,000 b/d which is pending at present due to lack of security and consistency in Afghanistan and some other limitations.

7. The South Route

This unique 1500 km pipeline which is to transfer some 1,000,000 b/d through the sole transit country of Iran, is theoretically the most reasonable and viable project, because Iran has the

Location of Iranian Refineries



A comparative Analysis of the Methods of Transferring the Caspian Hydrocarbon Resources;

Reviewing the existing projects, either proposed or under construction, 14 different main and marginal routes are considered to be convenient to transfer the Caspian hydrocarbon resources to the world markets. Therefore, these main routes would be analysed comparatively. This analysis which is based upon a comprehensive study carried out in Iran distinguishes these routes as follows:

1. The Baku- Jeyhan pipeline

This 1760 km pipeline is to carry the crude of Baku to the Mediterranean port of Jeyhan. The capacity of this line is expected to be 1,000,000 b/d. The project costs are estimated by the US and Turkey at \$2.4 billion respectively. However, independent international organizations believe that the costs reach \$4 billion. Besides, with the difficulty of providing sufficient crude to put into operation this line and the high costs of construction imposed on the oil

producing nations. This project proves not to be economical. Geographical limitations such as mountainous regions of Turkey and threats to the security of transit countries, namely, Georgia and Turkey, are among the demerits of this route.

2. West Routes

Western Gas and pipelines include

"Azarbaijan - Armenia - Turkey", "Azarbaijan- Iran- Turkey", "Azarbaijam- Georgia", and "Turkmenistn- Iran- Turkey" route,

Each route faces its own specific problems. For example, the "Azarbaijan- Armenia- Turkey" route encounters some security problems such as Chronic Conflicts between Armenia and Turkey, existing war conditions in Armenia- Azerbaijan borders.

The " Azerbaijan-Georgia" Route suffers from similar problems because of the civil war in Georgia and particularly in Abkhazia.

In addition, this route encounters numerous natural obstacles and the problems regarding the Bosphorus Strait. Although security problems do not threaten the "Azarbakjan-Iran-Turkey" route across Iran, this route is seriously endangered passing the Kurdish-dominated: South eastern regions of Turkey. Moreover, arduous heights give the construction costs a sleep rise. The "Turkmenistan - Iran - Turkey" route involves 2,177 km pipeline and requires some \$3.1 billion investment. This line will be able to transfer 30 billion cubic meter per year. Considering all the

Kazakhstan and Turkmenistan Export Crude Pipelines Through Iran



* Iran as a potential buyer for the Caspian oil

At this stage, with the production of about 2 million b/d in the Caspian, Iran's position is to pump Caspian Sea oil to its northern refineries, which requires some \$400 million investment. The total capacity of Tehran, Tabriz and at a later stage Isfahan and Arak refineries is as much as 600-700 Mb/d of oil.

Besides this cost of transport, the oil coming to Iran will bring money for the internal economy and stability in the international outlook.

Islamic Republic of Iran possesses the most accessible and efficient facilities to transport Caspian sea oil co-operatively to the world market, meanwhile Iran is regarded as a major potential customer of Caspian sea oil.

Esfahan and Arak refineries

Using this method a volume of 450,000 b/d of crude can come by the sea or through a pipeline from west or east of the Caspian to Tehran. Reversing the use of existing pipelines between Tehran - Esfahan and Tehran - Arak can take care of the task. Cost of building a pipeline either from Azarbayjan to Tehran or Khazakistan, Turkmenistan to Tehran will be 300 to 500 million dollars.

Stage three: Direct transfer of crude of Turkmenistan and Kazakhstan to the Persian Gulf, through Kharg and other terminals of Iran.

Alongside preliminary studies for the transmission of the crude directly into the Persian Gulf, the Ministry of Petroleum of Iran has undertaken a study of probable routes.

The important point to note is that the present loading capacities of Iran at Kharg, Lavan and Sirri are more than 5 mb/d and needs no fresh investment.

Besides points mentioned above there is yet another plan that has been taken seriously by Iran. Building one or two 200000 b/d new refineries to process the incoming curds and using their yields in the north of Iran.

In this respect, transfer of Kazakh crude to the Persian Gulf through Kharge, is one of the cheapest, shortest, and the most economically viable way to take 1.8 million barrels per day of oil over 1500 km.

The Iranian section of the two-phase project has already started in the form of a 390- km, 800,000 bpd link from the Caspian port of Neka to Tehran. The second phase involves a 1500 km, one million bpd capacity line from Kazakhstan to Iran via Turkmenistan. Both phases could be built within three years if talks with Kazakhstan and Turkmenistan progressed well.

The total cost of the project is estimated at \$1.2 billion.

Capacity of Iranian Northern Refineries

Tehran	220000 Bbls/Day
Tabriz	110000 Bbls/Day
Isfahan	200000 Bbls/Day
Arak	150000 Bbls/D

If the oil arrives at the Iranian borders in more than 700,000 b/d, then the economics of direct line is justifiable.

The fee that will be charged for the transit of Caspian resources through Iranian pipeline, or the swap fee, is the key factor to attract the oil producers in the Caspian region.

This fee once was set at \$3/bbl, and at present it seems that it should be reduced more, to be competitive comparing to other alternatives.

If in fact Iran becomes the key link between the Caspian and the world markets, a new dynamism will develop with its neighbours.

The transport cost to the Iranian border is \$2/bbl by tanker and \$7/8/bbl by a new pipeline from Caspian area into the Iranian pipeline connection.

Now, let's elaborate the main choices open to achieve this goal, that is, the transfer of Caspian oil through Iran.

Stage one: Crude Oil Swaps using Tehran and Tabriz refineries.

Crude oil can be shipped to the northern ports of Iran from Azarbayjan, Turkmenistan and Khazakistan and then to Tehran and Tabriz refineries and swap quantities can be delivered at the southern ports of Iran. The forecasted capacity of the 390 Km pipeline carrying the crude from Iran's Neka port of the Caspian is estimated at 340,000 b/d. The cost involved to build such a pipeline is about 400 million dollars. It is worth noting that such a capacity is easily expandable with the provision of minimum investment.

Stage two: Crude Oil Swaps using

Iran at the Crossroads: Economics of Caspian Oil Swaps and Pipeline Reversals

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Once the American industrialist, Henry Ford, told in the early boom of his car business that his customers were free to choose the colour of their car, provided that they ordered a black one.

Likewise, in preliminary debates over the transfer of the Caspian Sea's oil and gas resources, the US State Department announced that the oil giants were free to decide their favourite options to carry the Caspian oil and gas, provided that those routes would not cross Iran or Russia.

In less than a decade, the Caspian Sea has turned into one of the thorniest international scenes of rivalry, grabbing the attention of most countries in the world. The inland sea has seen intensified rivalry of the regional and international powers, as well as an influx of IOCs as the new players of this scene.

In the aftermath of the disintegration of the former Soviet Union and the emergence of new independent republics, the tapping of the Caspian resources and their transfer to international markets have turned into a hot political, economic and

military topic in the world.

Ever since the eruption of debates over the Caspian Sea resources, the Islamic Republic of Iran has persistently stressed that any plans for the utilisation of the Caspian resources and their transfer to global markets should insure the maximum degree of interests for the shoreline nations, and bolster moves for the expansion of economic and political co-operation among the regional states.

Implementation of the plan will materialise the strategy of providing safety for the energy supply route, a sensitive issue for the industrialised countries particularly America. Alongside the proposed transparent policy proposed by Iran, there is a vague strategy imposed by the United States on the Caspian states and on the industrial countries; the US government has openly attempted to reduce Iran's role and interests in the strategic regional co-operation, an issue which is viewed in line with America's anti-Iran policy.

It seems that the US strategy in Central Asia is suffering from structural

deficiencies, a plight which will cost the United States dearly.

Besides, the US policy in Central Asia has some rifts with the International oil companies, however there are more radical problems on the board to be settled as follows:

1. The US strategy has ignored the long-term interests of the regional countries.

2. The US strategy has disregarded the interests of the two major powers of the region, and is in stark contrast to the moves by the Caspian Sea's littoral states towards further integration

3. The US strategy has jeopardised the marine environment of the Inland Sea.

4. The US strategy has restricted the regional energy markets, and stripped the regional countries of the possibility of exporting hydrocarbon resources to South and East Asia-the two major hubs of oil and gas demand in the next two decades.

As a historic point of view, Iran has had a strong tie with central Asia and the Caucasus. A number of these republics were parts of the Persian Empire, and the people of these nations share their religious, ethnic, linguistic and cultural roots with Iran.

Now, Iranian interest with these states is based on certain demographic, geographic and strategic realities. It's better to categorise Iran's relation with it's neighbours in two parts: Strategic and Economic.

In this paper about the Economic opportunities of Iran at the crossroads of the Caspian export routes, would be discussed.

* Export market, for Iranian crude oil.

* Well-known terminals for exporting oil.

* Iran's role as a transit country

* The pipeline already in use in Iran

* The refinery capacity