

WWS 401c: The Problem of Caspian Energy

Professor Harold Feiverson

**Timeframes, Markets and Government Influence:**

**An Economic-Based Look at Pipeline Routes for Caspian Sea Oil**

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I pledge that the following is my own work in accordance with University regulations,

## **Executive Summary**

Because the decision to build an export pipeline for Caspian oil is influenced by so many non-economic factors, making a purely economic-based decision is difficult. However, it is clear that the Baku-Ceyhan route promoted by the United States is simply not economically viable. The most cost effective and least risky routes for larger volumes of oil, if the reserves merit, are expanded lines following the initial routes. With regard to the problem of the Bosphorus, the main advantage of Ceyhan, construction of a bypass route from the Black Sea into Europe would still be cheaper than a direct Baku-Ceyhan line.

If much greater reserves were discovered in the region, a main export pipeline could become economically cost-effective over the long term; however, a route through Iran would still be considerably cheaper than Ceyhan.

The oil companies understand that they are making very high-cost, long-term investments; for any pipeline to be constructed, it must meet the economic demands of the oil companies and producing countries and cannot be forced by political motivations. What is most likely to occur in the region is the development of a number of smaller volume export routes including both pipelines and swap with Iran. There is no doubt that Caspian Basin oil is a commodity that will be developed, but when and where the oil will flow is far from certain.

## **Introduction**

The problem of, and the answer to, the Caspian region is oil. To the international oil companies, oil is money and market share; to the newly independent producing countries, oil is prosperity and development; to the United States, oil is a strategic resource, whose production and transport must be guided in the proper direction. The difficulty balancing all these different interests is a problem that has always found a solution, even in very dangerous and unstable areas of the world. However, the Caspian Basin adds a whole new level of complexity to the puzzle. Besides the previously mentioned interests, any discussion of this region must include the interests of countries through which oil exports must pass, the United States' conflict with Iran, Russia's worries about meddling in what they view as their backyard, and Turkey's role in the region. The Caspian problem is not only an oil problem, but also a geopolitical conflict on a truly grand scale. Each country and interest demands a share of the pie and the slices are certainly going to be different than what each expects.

The U.S. is highly involved in the region, promoting its own policy concerning pipeline routes, which does not allow for the flexibility desired by both the producing countries and the oil companies. The scramble for Caspian concessions is reminiscent of many other oil rushes in history, but now oil companies are more globally integrated, and edicts from governments have far less pull. The U.S. perspective still has powerful sway over any decision, but the simple fact remains that oil will not flow unless all interests can be satisfied under market conditions. With the current low oil prices and little expectation of price increases, this may prove extremely difficult. Not only will the host

country and oil companies require an ample return on their investment, but the countries through which any pipeline would pass will also demand substantial transit fees. There is no doubt that Caspian Basin oil is a commodity that will be developed, but when and where the oil will flow is far from certain.

### **Caspian Oil**

Oil resources in the Caspian are located primarily in the Northeast and East-Central Kazakhstan or offshore Azerbaijani. The two projects that are of highest importance, due to their export route plans, are the Azerbaijan International Operating Company (AIOC) and TengizChevroil. The AIOC, a huge consortium of 10 foreign companies from 7 nations — whose international structure is largely due to Azerbaijani politics — is the largest operator in Azerbaijan, with contracts for the Azeri, Chirag, and Guneshli offshore fields for a total of about 4 billion barrels of oil. The AIOC is currently producing about 75,000 barrels per day (b/d) and exporting all of it through a Russian route via Dagestan and Chechnya to the port of Novorossiysk<sup>1</sup>. The other large project in the Caspian is TengizChevroil, a joint venture between the Kazakh government (25%) and Chevron (45%) first formed in 1993. LukArco (5%) and Mobil (25%) now also have shares in the project. The Tengiz field is one of the largest in the world, with 6 to 9 billion barrels of reserves. The project is currently producing 180,000 b/d of oil, much of it exported through the Russian pipeline system to Novorossiysk<sup>2</sup>.

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<sup>1</sup> Julia Nanay, the Petroleum Finance Company, “Iran’s role in Central Asia,” A Dialogue with AIPAC, sponsored by the Middle East Institute, prepared remarks, September 24, 1998, p. 7.

There are a number of other projects in development in the region, but none with proven recoverable reserves. Also other producers in the region plan on using the export pipelines developed by the AIOC and TengizChevroil to get their crude to market.

The Caspian's advantage on the international market is that the oil from the AIOC fields is extremely high quality, light, sweet crude that can be easily processed into high-demand petroleum products. TengizChevroil has huge reserves of light crude that can be extracted with low lifting costs. The oil from both areas could command a premium on world market due to their quality, which is driving the development of dedicated pipeline routes. Currently all oil exported through the Russian pipeline system becomes mixed with Russian oil from Ural and Siberian fields and is sold as Urals blend, which garners no premium in the market<sup>3</sup>. Tengiz oil does have a high sulfur content, leading to dispute with the Russian pipeline company Transneft about Tengiz oil contaminating the pipeline, but Mobil and Chevron spent \$100 million to construct a demercaptanization facility to remove sulfur compounds from the oil before shipment.

Overall estimates for reserves in the Caspian Basin vary dramatically, largely due to lack of exploration. During the Soviet era, exploration of offshore fields and onshore

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<sup>2</sup> Julia Nanay. "Prepared Statement on Caspian Oil and Gas Developments" Testimony to U.S. Congress, House of Representatives, International Relations Committee, May 6, 1998. (Washington: Petroleum Finance Company, 1998.), p. 3.

<sup>3</sup> AIOC and Tengiz oil could be worth as much as \$1-\$2 per barrel over Urals blends. Julia Nanay, the Petroleum Finance Company, presentation to WWS 401c, October 5, 1998. Urals blend was selling at 10.45 a barrel in July 1998, about a \$1.50 less than crude comparable to Caspian oil. <http://www.energyintel.com/keycrude.htm>

fields with complex geology was limited due to lack of technical knowledge<sup>4</sup>. Proven reserves are probably about 20 to 25 billion barrels<sup>5</sup>, with estimates varying between 15 and 40 billion barrels<sup>6</sup>. Estimates of additional potential reserves vary from 70 to 150 billion barrels<sup>7</sup>, most likely on the lower side. The most accepted estimate is a total of about 90 billion barrels of recoverable reserves<sup>8</sup>. With this level of reserves, exports from the region could reach 2 million barrels per day by 2010<sup>9</sup>.

To offer some comparison to other major oil producing regions, the Caspian Basin's 90 billion barrels pale in comparison to the Middle East, which contains nearly 700 billion barrels of reserves, 65% of the world's proven oil reserves, and supplies over 40% of internationally traded oil<sup>10</sup>. Saudi Arabia today has 2 million barrels a day locked in excess capacity, which equals the amount of oil expected to be exported from the Caspian region in 2010<sup>11</sup>. The Caspian Basin is certainly not another Middle East; the

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<sup>4</sup> Caspian fields were also ignored by Soviet officials in favor of Siberian fields for security and ethnic considerations. Fredrick Starr, Director Central Asian Institute, Johns Hopkins University, Washington, D.C., presentation to WWS 401c, November 3, 1998.

<sup>5</sup> Geoffrey Kemp, Senior Analyst, Nixon Center for Peace and Freedom, Washington D.C., presentation to WWS 401c, November 3, 1998.

<sup>6</sup> International Energy Agency. Caspian Oil and Gas. (Paris: OECD Publications, 1998), p 32.

<sup>7</sup> *Ibid*. The high end estimate comes from the US government and is widely disparaged by independent experts and the oil companies in the region.

<sup>8</sup> Nanay, to WWS 401c.

<sup>9</sup> Kemp. Again, estimates varying widely. The IEA cites a figure of 1.5 million b/d by 2000 and 2.5 million barrels per day by 2010 and Baker and Soligo assume 3.5 million b/d, both of which seem high.

<sup>10</sup> IEA, p 34.

<sup>11</sup> Kemp. Many experts speculate that increases in Saudi production in reaction to the opening up of the Caspian could significantly decrease interest in the region.

most common comparison is with the North Sea, which has about 38 billion barrels of reserves and is currently producing 5.6 million b/d<sup>12</sup>. This is a dangerous and potentially misleading comparison to make. While the reserves in the Caspian exceed the North Sea, the North Sea does not have any transit difficulties, is located close to major oil consuming countries, and controlled by highly developed and stable governments. Also, although North Sea oil is costly to extract, the industrial base necessary to support oil development is nearby and offshore platforms can be manufactured and simply towed out to sea. To reach the Caspian, oil rigs must be cut into pieces and shipped into the region through the Russian canal system at very high costs. Currently there is only one semi-submersible rig operating in the Caspian region. The North Sea's role as a secure oil-producing region to supplement the Middle East is unlikely to be duplicated by the Caspian.

Given relatively low export volumes, the Caspian Basin is unlikely to have a significant effect on the world price of oil. There are, however, a number of scenarios where Caspian oil could further depress the world oil price<sup>13</sup>. Moderate oil prices are historically maintained when oil supplies come from a mix of areas, OPEC and non-OPEC sources. OPEC members, particularly Saudi Arabia, have immense reserves whose production capacity must be limited in order to keep prices up. Projections are that oil from non-OPEC sources will grow significantly in the next 10 years, possibly leading to

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<sup>12</sup> September 1998 data. Energy Intelligence Group website.

<sup>13</sup> A number of oil prices are used for benchmarks for the world oil price. A common marker is OPEC "basket" a conglomeration of OPEC production, particularly Saudi light. January 1999 futures for light,

an oversupply situation. To defend price levels, OPEC or other producers would have to further shut in capacity if demand does not increase commensurate with supply<sup>14</sup>. In this scenario, oil from the Caspian could push OPEC to release some shut in capacity in an attempt to drive Caspian oil out of the market. This is possible due to the lower production cost of Gulf oil *vis-à-vis* the Caspian. Saudi Arabia does appear to be worried about this possibility, as it has made overtures to oil companies about opening up its territory in return for the companies staying out of the Caspian<sup>15</sup>. If demand over the next 10 years is much higher than expected, especially in the region surrounding the Caspian<sup>16</sup>, the Caspian could serve the opposite role of defending lower prices. This projection seems unlikely due to growing concerns about fossil fuel use and the current recession in Russia and the Ukraine.

Another concern for oil development in the Caspian is the possibility that a change of government in Iraq could bring production back on line in short order. Iraq has the second largest reserves in the world and large areas that are still unexplored. Iraq could potentially possess 100-200 billion barrels of oil, which could be easily exported

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sweet crude are currently trading at just under \$11 a barrel on NYMEX.

[http://quotewatch.com/exchanges/nymex\\_cs.html](http://quotewatch.com/exchanges/nymex_cs.html)

<sup>14</sup> Current OPEC shut in capacity is about 1 to 2 million b/d. Under a moderate growth scenario of 2% per year, oil demand would be 89 million b/d in 2010, leading Saudi Arabia and other OPEC members to shut in 12 to 15 million b/d to balance supply. Richard Soligo and Amy Jaffe. *Unlocking the Assets: Energy and the Future of Central Asia and the Caucasus*. (Houston: Baker Institute for Public Policy, April 1998), p 39.

<sup>15</sup> Rodney MacAlister, Conoco, interviewed by the author, November 2, 1998. MacAlister commented on the longer-term view of the Saudis and their desire to draw Conoco away from the Caspian.

<sup>16</sup> Estimates by Planecon, a Washington based oil consultancy specializing in the FSU. High estimate scenarios for consumption by Black Sea nations are almost double low estimates due to uncertainty about the future economic development of these countries. Baker and Soligo, p. 12.



through existing pipelines and oil terminals<sup>17</sup>. Were sanctions to be removed, Iraq could be exporting 2 to 3 million barrels a day within 2 years. Iraq would likely be desperate for oil revenue and have little incentive to shut in production, possibly leading to a crude price crash to as low as \$10 a barrel. Such a crash could make most of the exploration projects currently being discussed for the Caspian uneconomical and prevent further development if export pipelines were not already constructed<sup>18</sup>.

### **Breakdown of Oil Costs**

A multitude of different schemes exists for dividing oil revenue between the host country and the producing oil company. The usual target for distribution of revenue from production after sale is about 85% to the host country and 15% to the oil company. This ratio can be construed in a variety of different ways with different types of contractual forms depending on the host country's own laws and preferences, but in general oil companies target this ratio. This number has varied throughout time and country. For example in Saudi Arabia, the ratio is much higher in favor of the Saudis due to huge reserves and lower production costs. In the Caspian, the ratio is likely to be lower due to additional transport costs of getting the oil out of the region, i.e. pipeline construction costs and transit fees, and political risk in the area. Part of the problem with signing contracts with Caspian nations has been the nations' unwillingness to recognize the economic necessity of this decrease in percentage<sup>19</sup>.

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<sup>17</sup> Kemp.

<sup>18</sup> John Roberts, Caspian Pipelines, (London: Royal Institute for International Affairs, 1996), pp. 6-7.

<sup>19</sup> MacAlister.

The oil industry divides business into two sectors: upstream and downstream. Upstream includes exploration, development, and production. The upstream breakdown of costs is about 10% for exploration to find an economical field (odds are about 1 in 10 holes drilled will hit a commercially sized field), 80% (or higher) to develop the find, and 10% in operating costs to produce the oil. Exploration costs are cash expenditures including payments for exploration licenses to the host countries, whereas development costs are capital costs depreciated over time, and operating costs pay for themselves with the sale of production. Downstream includes transportation of crude to the refinery, refining, transportation of products to market, and marketing. If one were to examine the cost breakdown of a gallon of gas averaged around the world, from ground to market, the distribution would be approximately: 2.5% for exploration, 12.5% (or more) for production and development, 20% to the host government, 2.5% for transportation to a refinery, 7.5% for refining, 2.5% to transport to market, 2.5% for marketing, and 50% in taxes to the consumer at the pump<sup>20</sup>.

Crude prices are determined at port of sale on the basis of oil quality. There is no “world price” of crude oil, each type is priced according to its ability to be refined for different uses, with higher prices for lighter crudes — which yield a higher percentage of consumer products such as gasoline — and lower prices for heavy crudes — which yield a greater percentage of industrial products such as fuel oil.

In Azerbaijan the preferred form of contract is a production sharing agreement (PSA) among different foreign companies and SOCAR, the Azerbaijani national oil

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<sup>20</sup> *Ibid.* The author is very grateful for the above explanation.

company. In a PSA, risk is shared in proportion to share of product and the producer has complete title to that product share. PSAs also usually have lower tax rates than other contract forms. For example joint ventures in Azerbaijan are subject to a 35% tax, while PSAs are taxed at 25%<sup>21</sup>. Each PSA is individually crafted for the project in question, the terms of which are not made public, and the president and parliament must individually approve each PSA. Presumably this allows the government to extract progressively better terms if production is successful. Currently there is no petroleum investment legislation, although Azerbaijan and especially SOCAR seem to realize that standardized legislation would be an aid to investment as a draft bill is currently circulating in parliament<sup>22</sup>.

In Kazakhstan the preferred contract form is a joint venture between a foreign firm and a state enterprise, generally Kazakhoil, the state oil company. In a joint venture both the state enterprise and the foreign venturer invest stated amounts of capital which can take various forms, including physical assets and rights to land. Risk is shared in proportion to capital invested. The amount of control the foreign firm has is usually limited, and in some cases joint ventures are little more than contracts for procurement. Little is publicly available on the terms of individual joint ventures. Despite a more restrictive contractual structure, Kazakhstan has taken the largest steps in the region towards encouraging foreign investment, including the promulgation of the 1994 Law of Foreign Investments and the restructuring of national oil production under Kazakhoil<sup>23</sup>.

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<sup>21</sup> IEA, p. 127.

<sup>22</sup> *Ibid.* p. 122+125 and 184.

<sup>23</sup> *Ibid.*, p. 122 and 239.

## **Pipeline Choices**

### *Constraints*

The pipeline network in the Caspian region was designed during the Soviet era, with no regard for ethnic or political borders. Most pipelines in the area flow north to Russia's industrial centers. The few East-West pipelines that do exist were designed to bring Siberian or Ural crude into the region for refining. Under the Soviet system, refineries and oil fields were rather haphazardly linked. For example, the Chechen city of Grozny was designed as a central refining site for Siberian crude. There is a pipeline between Grozny and Baku, but the flow was intended to bring crude and refined products to market in Azerbaijan, not send oil out<sup>24</sup>. The worst example is Kazakhstan, whose refineries and population centers are located in the eastern part of the country and oilfields are in the western part, without any linkage by pipeline. Kazakh refineries and consumers must pay to import oil from Russia rather than utilize cheaper Kazakh oil<sup>25</sup>.

Under the existing pipeline arrangement, Russia has a virtual stranglehold over exports. Transneft, the Russian pipeline consortium, has been very difficult to deal with and has failed to live up to its agreement for export with TengizChevroil, first citing quality complaints and then volume limitations. Other companies operating in the region have been wary of establishing any export agreements with Transneft due to the

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<sup>24</sup> This pipeline has been reversed and is being used by the AIOC to export small volumes of oil to Novorossiysk.

<sup>25</sup> One of the major development projects for the Kazakh government is to develop a pipeline to link Tengiz with the pipeline network in the eastern part of the country. The project is believed to be uneconomic. IEA, pp. 210-211.

TengizChevroil experience. The problems with Transneft are probably due to the Russian view of Caspian exports as a significant threat, both economically and geopolitically. Russia appears to be strongly opposed to projects in the region that allow Caspian countries greater independence.

The Soviet pipeline system is also in very poor shape. The pipelines were not originally designed to Western standards and years of poor maintenance have allowed the pipeline to deteriorate and have resulted in heavy leakage. The assumed loss rate for the Caspian oil exports through Russian pipelines is 8% compared to 4.5% in OECD countries<sup>26</sup>. There is a significant risk to the environment at this level of leakage. Upgrading the Soviet pipeline system to meet Western standards is likely to be more expensive than running new pipe in many areas, especially when additional volumes are involved<sup>27</sup>.

As Soviet efforts were directed almost completely towards onshore fields, there are very limited resources in the region for offshore drilling. Furthermore, the landlocked nature of the Caspian presents an especially difficult problem for offshore drilling. Usually either offshore rigs are constructed and towed out to sea, or huge drilling ships are used. There is currently no shipyard capable of producing offshore drilling rigs in the Caspian, and drilling ships cannot access the region due to draft limitations on the Soviet

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<sup>26</sup> Losses as high as 11% have been reported in Kazakh gas lines. Proposed export plans for AIOC and TengizChevroil would probably have losses of about 5% because the lines would consist of new or completely refurbished pipe. *Ibid.*, p 59.

<sup>27</sup> Soviet pipelines are currently running well under capacity due to worries that increased pressure could cause ruptures. Kemp.

canal network. Therefore all rigs must be disassembled and barged down the Volga from the Baltic or through the Volga-Don canal from the Black Sea. The rigs are then reassembled and towed into place.

Costs for rigs in the region have been very high. AIOC is currently using the only functioning semi-submersible rig in the region. Refurbishing costs for that rig were originally estimated at \$40 million and ended up totaling \$72 million. British Petroleum is currently refurbishing another rig at an estimated cost of \$200 million dollars<sup>28</sup>. There also a limited number of jack-up rigs in the region, generally in very poor shape<sup>29</sup>. Companies have formed rig-sharing clubs, but given the large number of contracts already signed, some firms may have trouble meeting drilling deadlines. Several PSAs, particularly in Azerbaijan, require that production start within the next two years, which seems unlikely given the drilling resources<sup>30</sup>. Also each failure to find oil lengthens the waiting time for other projects. AIOC's Karabakh field is planned to begin oil production in 2001, but recent drilling has found only gas. Further failures to strike oil could fundamentally change the direction of the AIOC project<sup>31</sup>.

### *Pipeline Options*

There are a variety of options for transport of Caspian Basin oil out of the region. Each has its advantages and problems. The Caspian is a very difficult region to work in,

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<sup>28</sup> Nanay, to WWS 401c.

<sup>29</sup> IEA, p. 191.

<sup>30</sup> Soligo and Jaffe, p. 7.

as the complex mix of local ethnic and political factors combine with global geographical and diplomatic influences to create a very complicated economic situation. Caspian oil is not fungible until it reaches a port with access to ocean transport routes. Essentially Caspian oil is a different type of commodity than most oil, due to this transport issue. However, Azerbaijani and Kazakh oil can be piped in almost any direction: north through Russia, east to China, south through Iran, or west through a number of different routes. Each of these routes must be examined given the political, geographic, ethnic, and security constraints of each option, including pricing for oil and funding for pipelines.

Even with numerous limitations to development, the Caspian will be a significant producer in the near future. The question is where, when, and at what cost the oil will flow. In oil production, economies of scale are crucial to keeping production costs down, especially when determining pipeline routes. This argues strongly for the consolidation of different projects in the Caspian Basin into a single, main export pipeline (MEP). For example, Soligo and Jaffe cite a \$274 million per year differential cost between using two 750,000-b/d pipelines and one 1.5 million-b/d line for transporting oil from Baku to the Black Sea<sup>32</sup>. Currently it is unknown if the Caspian will have a sufficient volume of oil to support a major export pipeline. Perhaps the Caspian will be more important as a supplier for regional consumers than for the global market. If this is the case, then building an expensive MEP might not be cost-effective. In choosing pipeline routes, this possibility must be considered. Certainly the Caspian will have more oil than can be absorbed by

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<sup>31</sup> Nanay, Julia. "Coming to Grips with U.S. Interests in the Caspian." Draft for Middle East Policy Journal, October 1998, p. 6.

Black Sea nations<sup>33</sup>, given Russian competition for the market, but perhaps Caspian oil could be most profitable when distributed among Eastern Europe, Turkey, Iran, and even Russia<sup>34</sup>. Even if there were enough oil to justify a MEP, there is still a question of where the natural market for the oil is located, in Asia or Europe, as marginal transportation costs are a more important factor in the Caspian *vis-à-vis* other oil regions<sup>35</sup>. Essentially there is a tradeoff between the political unrest of many of the areas through which a MEP would pass — which argues for the redundancy provided by multiple pipelines in the event that regional conflict or terrorism disrupted a MEP — and the lower cost of a single MEP due to economies of scale.

There is also a question of timing. Most projects in the region are running well behind schedule, and the AIOC has already postponed a decision on its MEP route. There is a large push underway, led by the U.S. government, to get a fixed decision on a MEP; however, the timing might be premature. Oil companies are arguing that a decision on a MEP would be foolish until it is certain that enough reserves exist. AIOC has never underestimated the importance of a practical early oil scheme, as a program for full development of the three fields cannot be implemented until an early oil export scheme

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<sup>32</sup> Soligo and Jaffe, p. 14.

<sup>33</sup> A common argument against the development of a MEP. If the economies of the Black Seas littoral nations boomed, demand might be high enough to take a large percentage of Caspian oil, but probably not all of it.

<sup>34</sup> Kemp argues that Russia should buy high-quality Caspian oil cheaply using the Soviet, Russo-centric pipeline system, allowing Russia to export Siberian crude to high-profit markets in Asia.

<sup>35</sup> MacAlister believes that the Caspian oil's "natural market" is Asia via a pipeline through Iran and that a European oriented MEP would be uneconomic.



has been proved<sup>36</sup>. This could be impossible for several years given uncertain reserve levels and economic conditions in the region.

The cost of the oil is highly dependent on the choice of pipeline routes, which again depends on the destination and demand. Each pipeline project proposed has significant costs; and recent experience in the region has shown that preliminary estimates of pipeline construction costs have been well on the low side, primarily due to difficulties with obtaining transit concessions from the different regions involved. Any MEP selected is likely to experience the same cost overruns.

### **Azerbaijani Oil**

#### *Early Oil*

When the original PSAs for the AIOC fields were signed in 1994, the agreement stipulated that an export system should be in place by mid-1999 to handle around 200,000 b/d with allowances made for the need to expand to a minimum of 500,000 b/d by 2010<sup>37</sup>. The structure of this agreement divided production in early oil, i.e. the oil that would be developed by 1999 and pumped through the initial pipeline, and late oil, which would exit via the higher capacity line. After many months of postponements, the AIOC has begun construction on its line for early oil. The pipeline will flow from the offshore AIOC fields through Baku and along a new pipeline roughly following existing gas and rail lines to the Georgian capital of T'blisi and then along an existing 20" Soviet pipe to the port of Supsa. This line will have a total length of 550 miles and a capacity of

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<sup>36</sup> Roberts, p. 34.

100,000 b/d. AIOC had planned to spend \$300 million to construct the new pipe and refurbish the Soviet line and by the end of 1998, but costs have soared to over \$600 million, primarily due to underestimation of the repairs required for the Soviet pipeline. The estimated completion date is now mid-1999<sup>38</sup>. When the Soviet pipe is eventually replaced, flow is expected to increase to 250,000 b/d. Currently, AIOC partners have spent about \$2 billion in total investment to develop the oilfields, with little to show for the expenditure<sup>39</sup>. With lifting costs about \$5 / barrel and low oil prices, AIOC is currently hard-pressed to make a profit.

The Baku-Supsa route passes near a number of political flashpoints, particularly the Azerbaijani separatist region of Nagorno-Karabakh. Also the Georgian political situation is far from stable with rebellions currently quieted but not completely controlled in South Ossetia, Abkhazia, and Ajaria. The Ajaria separatist movement forced the relocation of the Georgian export terminal from the existing port facilities of Bat'umi in Ajaria to relatively stable Supsa. Supsa, however, has limited facilities and requires the construction of an expensive single-point mooring facility for oil exports.

AIOC had considered using the Russian system for exports for early oil, but the considerably higher cost led to a decision to use a central route through Georgia. A Russia route to Novorossiysk does have the advantage of utilizing the existing pipeline

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<sup>37</sup> *Ibid.*, p.33.

<sup>38</sup> Julia Nanay. "Prepared Statement", p. 3.

<sup>39</sup> It is estimated that TengizChevroil has spent a roughly equivalent amount, but Tengiz output is double the AIOC. Nanay, "Coming to Grips," p. 7.

network which, even if in need of replacing, has rights-of-way already secured. The AIOC Northern, Baku-Novorossiysk line would have run 868 miles (90 miles in Chechnya) and cost \$2.4 billion<sup>40</sup>, primarily in repairs to the Chechen lines damaged by the Russian-Chechen conflict. Any line from Azerbaijan would have to cross Dagestan and Chechnya, both of which have unresolved separatist conflicts. Furthermore, terminating a line at Novorossiysk does not avoid the problem of exiting via the Bosphorus and would incur high Russian transit fees.

#### *Main Export Pipeline*

AIOC is poised to make a decision on a MEP for late oil, but there are a number of considerations, both political and economic, that have led to delays. The central Georgian route is the most likely to be subject to ethnic disturbances, but experience in Columbia with terrorist disruptions to pipelines has shown that repairs can be made quickly and losses can be recovered if excess flow is possible. Economically there is the worry that oil volumes will not support the construction on a large volume export line. If the planned export volume of 1.5 Mb/d is realized, it does make economic sense to establish one main line, even accounting for risks of terrorist disruptions. Soligo and Jaffe estimate that the differential cost for disruptions to one main line vs. two pipelines is only \$1.6 million per day. There would have to be numerous disruptions each year to add up to the certain cost of \$260-330 million per year in lost benefits of scale<sup>41</sup>.

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<sup>40</sup> United States Energy Information Administration. "Caspian Sea Region," October 1997. <http://www.eia.doe.gov/emeu/cabs/caspian.html>.

<sup>41</sup> The Baku-Supsa line is being constructed with excess capacity to allow for possible terrorist disruptions. Soligo and Jaffe, p. 14.

There are two major proposals for a MEP, an increased diameter Baku-T'Bilisi-Supsa line or a Baku-T'Bilisi-Ceyhan line. The oil companies have generally taken a wait-and-see attitude towards the decision until reserve volumes are known. The Baku-Ceyhan line is strongly supported by the Turkish and U.S. governments, but is economically questionable. A high volume 550 mile line to Supsa would cost about \$1.6 billion, while a 1100 mile line to Ceyhan would have a total cost of over \$4 billion. Capital recovery cost per barrel for the Ceyhan line would be \$2.44 compared to \$0.68 for the Supsa line<sup>42</sup>. To this must be added transit costs and some economic quantification of risk, mostly likely through political risk insurance<sup>43</sup>. Ceyhan also allows the use of Very Large Crude Carriers (VLCC), while Supsa and Novorossiysk are restricted to smaller LR-2 tankers by the need to exit via the Bosphorus.

<b>Baku-Supsa (900 kb/d)</b>	<b>Cost / b</b>	<b>Baku-Ceyhan (800 kb/d)</b>	<b>Cost / b</b>
Lifting costs at AIOC	\$5.00	Lifting costs at AIOC	\$5.00
Pipeline to Supsa	\$0.68	Pipeline to Ceyhan	\$2.44
Georgian Transit Fee <sup>44</sup>	\$0.43	Georgian Transit Fee	\$0.43
Shipping to Rotterdam, LR-2	\$1.23	Turkish Transit Fee <sup>45</sup>	\$1.50
<b>Subtotal</b>	<b>\$7.34</b>	Shipping to Rotterdam, VLCC	\$0.76
		<b>Subtotal</b>	<b>\$10.13</b>

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<sup>42</sup> Capital cost calculations for all pipeline routes are as follows: Using 15% capital recovery factor, which does include some evaluation of risk.  $0.15 * \$1.5 \text{ billion} / (0.9 \text{ md/d} * 365 \text{ d}) = \$0.68 / \text{barrel}$

<sup>43</sup> The author was unable to obtain estimates for risk insurance along the different routes. A theoretical insurance cost of \$1 / b could be assumed for all projects in the region. The actual cost probably varies between \$0.50 and \$1 / b depending on political, ethnic, and economic factors.

<sup>44</sup> Roberts, p. 28.

<sup>45</sup> Author's estimate for point of comparison. Actual fee is unknown and could vary from \$1 to \$3 / b

With this estimate of costs, oil companies are insisting that any total transit costs over \$3 per barrel (including pipeline costs, transit fees and risk insurance) be paid out of the host country's share<sup>46</sup>. In terms of security the Ceyhan line would suffer from many of the same problems as a Supsa line, plus the danger of a resurgence in the Kurdish insurrection in Turkey. Also there is the problem of the proximity of Ceyhan to the highly militarized Turkish-Syrian border.

To help justify a Ceyhan line, the U.S. has supported a number of proposals, including an underwater 370 mile Trans-Caspian pipeline to bring Kazakh oil from Aktau in Kazakhstan to Baku and then out to market via the Baku-Ceyhan line. Estimated costs for this line would be \$2.5 to \$3 billion<sup>47</sup>. This proposal has run into stiff Russian opposition over environmental issues. Considering the disputed nature of the Caspian Sea and the considerable investment in the CPC line, the Trans-Caspian line seems highly unlikely. The U.S. has also proposed that Russian oil, via a pipeline from Novorossiysk to Supsa, could also help justify the Ceyhan line<sup>48</sup>, but this also appears to be highly improbable due to increased transit costs and general lack of Russian cooperation. With increased oil finds by AIOC or by tying in Kazakh or Russia oil, a Ceyhan MEP could be economically viable, but probably not without these additional inputs.

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<sup>46</sup> Richard Morningstar, Ambassador for Caspian Energy Policy, U.S. State Department, presentation to WWS 401c, November 2, 1998.

<sup>47</sup> United States Energy Information Administration, p. 10.

<sup>48</sup> Morningstar, to WWS 401c.

### Comparison of Transport Costs for AIOC Oil<sup>49</sup>

Route to Rotterdam, Tanker Size	Capacity (kb/d)	Cost to Port	Tanker to Destination	Total Cost
Baku-Novorossiysk, LR-2	800	\$1.35	\$1.23	\$2.58
Baku-Supsa, LR-2	900	\$0.68	\$1.23	\$1.91
Baku-Supsa, LR-2	1500	\$0.50	\$1.23	\$1.73
Baku-Ceyhan, VLCC	800	\$2.44	\$0.76	\$3.20

The U.S. government strongly believes that oil companies will see the political factors involved and choose the Ceyhan route<sup>50</sup>, but the oil companies are probably farther from that position than the U.S. would like<sup>51</sup>. The oil companies have not been willing to undertake such a project without significant economic incentives and security guarantees. The U.S. government is clearly opposed to providing either<sup>52</sup>. The only way Ceyhan could be economically viable is if Turkey developed a transit fee structure that was extremely low for lower initial volumes and increased according to volume. The Turkish government has yet to come forward with such incentives. This may be due to a realization that, at least for now, a decision to go to Ceyhan is economically unattractive. Also there is the problem of Georgian economic disincentives for going to Ceyhan. It would make no sense for Georgia to lower transit fees compared to the Baku-Supsa route for the portion of the Baku-Ceyhan route that passed through its territory. Georgia would also lose considerable investment in the Supsa port facilities if the final destination of a

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<sup>49</sup> Soligo and Jaffe, p. 53.

<sup>50</sup> *Ibid.*

<sup>51</sup> MacAlister referred to the Ceyhan route as “crazy” and “\$2 billion no one has got.”

MEP were Ceyhan. Turkey does have substantial interest in seeing oil flowing from the Caspian, apart from its own potential to collect transit fees. The Caspian states are important markets for Turkish goods and the Caspian countries need oil revenues to buy Turkish goods.

### *Bosporus Bypass*

The major advantage of the Ceyhan line is that it avoids the congested Bosporus, unlike Novorossiysk and Supsa. Passage of oil through the Bosporus is a key issue for the Turkish government, and the U.S. strongly supports the Turkish position. Even considering the additional costs of using LR-2s or the construction of a \$1 billion Bosporus bypass<sup>53</sup>, the Supsa route is considerably cheaper. Costs per barrel delivered to Rotterdam via LR-2 Tanker from Supsa are estimated at \$1.83 per barrel, via LR-2 from Supsa using a Bypass through Thrace at \$2.01 per barrel, and via a Baku-Ceyhan line at \$3.02 per barrel, again not including transit fees. At this rate the Baku-Ceyhan route is 150% of the cost of using a Bosporus Bypass.

<b>Baku-Supsa-Thrace (800 kb/d)</b>	<b>Cost / b</b>
Lifting costs at AIOC	\$5.00
Pipeline to Supsa	\$0.68
Georgian transit fee	\$0.43
Tanker to Thrace	\$0.40
Thrace bypass	\$0.59
Shipping to Rotterdam via VLCC	\$0.76
<b>Subtotal</b>	<b>\$7.86</b>

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<sup>52</sup> Morningstar, speech to the Carnegie Endowment for International Peace, November 3, 1998, televised on CSPN-2, November 4, 1998.

<sup>53</sup> Soligo and Jaffe, p. 49.

There is also a proposal to tanker oil from Supsa or Novorossiysk to Samsun on the northern Turkish Black Sea coast and then pipe the oil to Ceyhan. A Samsun-Ceyhan line would be able to utilize some existing pipe to Ceyhan and avoid the Bosphorus, but would be more expensive than a Thrace bypass, although cheaper than a direct Baku-Ceyhan line. Considering the economic advantages of other routes, Ceyhan does not appear a legitimate economic option to avoid the Bosphorus.

**Bypass Options: Transport Costs of Caspian Oil Delivered to Rotterdam<sup>54</sup>**

<b>Route from Baku, Tanker Size (Azeri Oil)</b>	<b>Cost / b</b>	<b>Cost as % of Bypass</b>	<b>Route from Tengiz, Tanker Size (Kazakh Oil)</b>	<b>Cost / b</b>	<b>Cost as % of Bypass</b>
Supsa, LR-2	\$1.83	91%	Novorossiysk, LR-2	\$2.25	93%
Supsa-Turkish Bypass, VLCC	\$2.01	100%	Novorossiysk-Turkish Bypass, VLCC	\$2.43	100%
Supsa-Samsun-Ceyhan, VLCC	\$2.54	126%	Novorossiysk-Samsun- Ceyhan, VLCC	\$2.96	122%
Baku-Ceyhan VLCC	\$3.02	150%			

**Kazakh Oil**

*Northern Route: CPC to Novorossiysk*

The first company to engage the export problem was Chevron, who determined in 1992 that a northern Russian route would be the most politically and commercially expedient for Tengiz crude. The goal of Chevron is to build a major export pipeline from Tengiz to the Russian port of Novorossiysk on the Black Sea. TengizChevroil is currently shipping crude to Novorossiysk through the Russia pipeline system, but the construction of a dedicated pipeline would avoid blending with lower-quality Russian oil and dealing with Transneft over quotas. This route was chosen to secure Russian support for the



project, known as the Caspian Pipeline Consortium (CPC). The CPC has undergone two iterations and numerous cost overruns, leaving the project well behind schedule and over budget<sup>55</sup>. The first stage of the CPC is to construct a 560,000-b/d, 930-mile line for completion in September 2001 (pushed back from 2000). Delays over rights-of-way with various Russian political units and environment issues<sup>56</sup> have hindered construction. A second stage would increase capacity to 1.3 million b/d by 2010 at an estimated cost of \$2.0 billion dollars. The total costs of the two stages are now closer to \$2.5-\$2.7 billion, leading the partners in the CPC to hold construction pending a progress review. One of the major difficulties with the CPC line has been the decision to build along a new route and the need to secure new rights of way. Also the CPC route terminates at Novorossiysk which is closed due to weather 30 days a year, has poor port facilities, and limited access for tankers due to need to exit via the Bosphorus. When construction of new offshore mooring facilities in Novorossiysk to avoid closure due to weather is included, costs may soar to \$4.5 billion<sup>57</sup>.

At this cost, the price per barrel would eventually be about \$1.42, given the full volume of about 1.5 million b/d<sup>58</sup>. To this must be added shipping, , transit fees and risk

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<sup>54</sup> Not including transit fees or risk insurance. *Ibid.*, p. 65.

<sup>55</sup> Nanay. "Coming to Grips", p. 4.

<sup>56</sup> Russia has developed a new environmental concern that seemly to be almost purely politically motivated, given the environmental destruction caused by the Soviet Union, and is using the "environmental card" to block or complicate many issues in the region.

<sup>57</sup> Nanay. "Prepared Statement," p. 3.

<sup>58</sup> Soligo and Jaffe, p. 17.

insurance. Although lifting costs at Tengiz are very cheap (about \$2 a barrel, comparable to Saudi Arabia), Nanay estimates that the costs of getting the oil to Novorossiysk are currently about \$5 per barrel including all transit fees and construction costs<sup>59</sup>. With pipeline costs currently running \$2.11 / b<sup>60</sup>, this would imply a Russian transit fee of \$3 /

b. With high development costs, Tengiz oil has a very low profit margin for the oil companies involved when oil prices stand at about \$14 per barrel.

<b>CPC First Phase</b>	<b>Cost / b</b>	<b>CPC Final Phase</b>	<b>Cost / b</b>
Lifting costs at Tengiz	\$2.00	Lifting costs at Tengiz	\$2.00
Pipeline to Novorossiysk	\$2.11	Pipeline to Novorossiysk	\$1.42
Russian Transit Fee	\$3.00	Russian Transit Fee	\$3.00
Shipping via LR-2	\$1.23	Shipping via LR-2	\$1.23
<b>Subtotal</b>	<b>\$8.34</b>	<b>Subtotal</b>	<b>\$7.65</b>

#### *Eastern Routes: To China*

Eastern routes for oil are generally not considered due to the extremely long distances involved to reach population centers. However, China has taken a strong interest in Kazakhstan and has pledged \$9.5 billion to finance several Kazakh pipeline projects, most importantly a line to the Turkmen border for onward transport to Iran<sup>61</sup>. China has also taken test shipments of Kazakh oil by rail, but this project was discontinued due to the high cost (about \$6 per barrel) and logistical difficulties involving different track gauges between the two countries<sup>62</sup>. The major project under consideration

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<sup>59</sup> Nanay, to WWS 401c.

<sup>60</sup> *Ibid.*

<sup>61</sup> Nanay, "Prepared Statement," p. 3.

<sup>62</sup> Nanay, to WWS 401c.

is to build a 1,800-mile, \$3.5 billion line to connect the Kazakh Aktyubinsk and Uzen fields with Urumqi in northeast China<sup>63</sup>. China is very active in the region due to its anticipated large increases in oil imports. These imports will have to come from the Persian Gulf or the Caspian. The Chinese interest in Kazakhstan is probably due to security considerations, as the Chinese army could protect a pipeline, but China has no blue-water navy to protect exports from the Persian Gulf<sup>64</sup>.

*Southern Routes: via Iran*

Pipeline routes through Iran are currently not under consideration due to U.S. sanctions against the country. The Iran-Libya Sanctions Act (ILSA) prohibits any foreign investment in Iran over \$20 million dollars and a corresponding executive order forbids any U.S. companies from investing in Iran. If the sanctions were not in place, a pipeline through Iran might be the most logical and cost effective route. The proposed route would run from Turkmenbashi in Turkmenistan, connected to Kazakh oil by the Chinese funded pipeline, to the Iranian export terminal of Kharg Island in the Persian Gulf. This line would run for 930 miles and is expected to cost \$1.5 billion. This route is not only cheaper, but also avoids the Bosphorus problem and allows shipment via VLCC. The major disadvantage is that more oil would be flowing out through the Persian Gulf, with all its political and environmental risks, and transport to Europe would be much longer. But if the oil were destined for Asia, transport rates would be considerably cheaper.

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<sup>63</sup> United States Energy Information Administration, p. 10.

<sup>64</sup> Kemp.

Turkmenbashi-Kharg (900 kb/d)	Cost / b
Lifting costs at Tengiz	\$2.00
Pipeline to Kharg Island	\$1.57
Iranian Transit Fee <sup>65</sup>	\$3.00
Shipping via VLCC	\$0.93
<b>Subtotal</b>	<b>\$7.50</b>

Although not intuitively obvious, Iran would also have few incentives to cut off the flow of oil on a pipeline through its territory. Iran has ethnic and religious ties to the Caspian countries and is arguably the most politically stable country in the region<sup>66</sup>. A major pipeline through Iran would also have the effect of increasing opportunity for further development of Iranian resources, which are in desperate need of investment after years of deterioration. Iran is still a major producer and relies on oil exports for most of its hard currency, but it is also seeking to diversify its economy and increase its industrial base, both of which would benefit from a Caspian pipeline. Although if oil prices continue to fall, Iran could view Caspian oil as a threat to protecting the price of oil.

#### Comparison of Transport Costs for Kazakh Oil<sup>67</sup>

Route	Capacity (kb/d)	Cost to Port	Black Sea Tanker	Second Pipeline	Final Tanker	Total Cost
Tengiz-Novorossiysk	1300	\$1.42			\$1.23	\$2.65
Samsun-Ceyhan	1300	\$1.42	\$0.40	\$0.88	\$0.76	\$3.46
Novorossiysk-Bosporus Bypass	1300/1000	\$1.42	\$0.40	\$0.59	\$0.76	\$3.17
Turkmenistan-Kharg	900	\$1.57			\$0.93	\$2.50

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<sup>65</sup> Estimate for comparison only. Actual fee is undetermined and would probably be between \$2 and \$3 / b.

<sup>66</sup> Roberts, p. 10.

<sup>67</sup> Soligo and Jaffe, p. 17 + 58.

### *Swaps with Iran*

There is another possibility already underway that allows for Caspian exports to the south due to unique arrangement of industrial resources within Iran. Iran's industrial infrastructure and population are located primarily in the northern part of the country, while nearly all its oil and gas reserves are in the south. Particularly problematic for Iran is the location of its major refineries in the major cities of Tehran and Tabriz, closer to the Caspian than the southern oilfields. Due to the poor condition of the Iranian oilfields and pipeline network, these refineries have considerable excess capacity. There is also a high demand for cheap oil in Iran<sup>68</sup> that could be fulfilled by the Caspian without hard currency expenditures, which Iran cannot afford. The idea is to ship Kazakh and Azerbaijani oil via rail or barge (or eventually by pipeline) to Iranian ports in the north of the country and send the oil to Iranian refineries by rail or a new pipeline. Iran would then export an equivalent amount of oil from its southern oilfields out of Kharg Island. Caspian oil would then be sold at world prices, with Iran charging a swap fee for the service. Currently one UK company, Monument Oil, is engaged in this venture, barging oil from Aktau in Kazakhstan to Neka in Iran. The volume will be about 85,000 b/d in 1999 and Iran is reportedly charging a fee of \$2-3 per barrel<sup>69</sup>. The Azerbaijani owned Caspian Steamship Line is also reportedly charging \$1.90 per barrel<sup>70</sup> delivered between Aktau and Neka.

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<sup>68</sup> Iran is currently subsidizing domestic oil consumption by \$11 billion a year. Starr.

<sup>69</sup> Nanay, "Prepared Statement," p. 2.

<sup>70</sup> IEA, p. 220.

<b>Swaps with Iran</b>	<b>Cost / b</b>
Lifting costs at Tengiz	\$2.00
Barge to Neka	\$1.90
Iranian Swap Fee	\$3.00
Shipping via VLCC	\$0.93
<b>Subtotal</b>	<b>\$7.83</b>

The Indonesian company Dragon Oil has also undertaken a similar project, transporting Turkmen oil to Neka. Both Monument and Dragon have 10-year contracts with swap totals starting at 48,000 b/d and rising to 180,000 b/d by 2002<sup>71</sup>. This project benefits Caspian producers by allowing them a relatively inexpensive export route. Iran benefits by obtaining necessary oil without paying out hard currency for construction of new pipelines. The disadvantage, at least from the U.S. perspective, is that swaps tie the Caspian closer to Iran and bring increased revenue into the country, although the U.S. is considering an ILSA waiver for a Mobil swap project for Tengiz crude<sup>72</sup>.

Swaps with Iran are beneficial to all involved, but there are some serious limitations on increases in swap volume, including capacity at Iranian refineries and port facilities on the northern Iranian coast. Although drastically underutilized, Iranian refineries would require significant investment before they could handle large volumes of oil. Iran's four major refineries could handle 300,000 to 400,000 b/d with \$500 million in

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<sup>71</sup> Nanay, "Iran's Role," p. 8.

<sup>72</sup> Keith Weissman, American-Israeli Public Action Committee, Washington, presentation to WWS 401c, November 2, 1998.

investments and up to 750,000 to 810,000 with an additional \$450 million<sup>73</sup>. On June 4, Iran tendered a proposal for a 315,000-320,000-b/d pipeline from the port of Neka to the Tehran refinery. The cost of the line was estimated at \$280 million with another \$120 million for upgrading the refineries at Tehran and Tabriz. There is also an older proposal to build a line from the Iranian port of Bandar Anzali to Tehran at a cost of \$120-140 million<sup>74</sup>.

Besides refinery capacity, port facilities are a significant limitation. The port at Neka only has one berth with a maximum draft of 4 meters, although this may have been increased by dredging in 1997. Neka is capable of handling tankers up to 4,200 deadweight tons and has onshore storage tanks for 45,000 barrels. Bandar Anzali also only has one berth and a draft of 5 meters and no storage facilities. Bandar Anzali does have the benefit of an existing petroleum products pipeline that could be reversed to bring crude to refineries<sup>75</sup>. Iranian port facilities would require significant investment to handle increased volumes. Future swaps with Iran seem highly likely and beneficial, even considering ILSA, as current oil volumes are under the \$20 million limit. If volumes are increased, oil companies would be over the limit and ILSA would become another limiting factor.

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<sup>73</sup> Nanay, "Prepared Statement," p. 7. The IEA estimates that Iran could handle 650,000 b/d for an investment of \$500-600 million.

<sup>74</sup> IEA, p. 221.

<sup>75</sup> *Ibid.*, p. 139-145.

## **Conclusion**

Because the decision to build an export pipeline for Caspian oil is influenced by so many non-economic factors, the economics of the situation are obscured and making a purely economic-based decision is difficult. With the complex political situation both within the Caspian, export-route countries, and on a global scale, obtaining accurate estimates of costs are difficult, if not impossible. The current projects in the region have been plagued by cost overruns due to political conflict. Although it is possible to estimate construction costs and account for some political risk, the question of transit fees is very speculative. Unfortunately the structure of transit fees will probably be the determining factor for pipeline development.

Without making too many assumptions about transit fees, it is clear that the Baku-Ceyhan route promoted by the United States is simply not economically viable. The distance is cost-prohibitive and the benefits of Ceyhan do not outweigh the costs of using other ports. The AIOC and CPC have already made their basic decisions and both groups have sunk large investments into their respective projects and are very unlikely to change their routes. This is also probably true of future pipeline investment. The most logical routes for late oil, if the volumes merit, are expanded lines following the early oil routes. This is the most cost effective and probably least risky decision as the rights-of-way are already secured and considerable infrastructure is already in place. With regard to the problem of the Bosphorus, the main advantage of Ceyhan, construction of a bypass route through Thrace or via Samsun would still be cheaper than a direct Baku-Ceyhan line.



What is most likely to occur in the region is the development of a multitude of export routes, all lower volume. This actually best embodies the U.S. goal of multiple pipelines, except Iran would likely be included in the various routes either by swaps or direct lines. Other projects such as the Chinese line or the Trans-Caspian route seem highly speculative and not cost-effective. If much greater reserves were discovered in the region, a MEP could become economically cost-effective over the long term; however, a route through Iran would still be considerably cheaper than Ceyhan.

The major issue at stake for all the actors in the region is to develop an understanding of when and where Caspian oil will flow. The question of markets is a considerable one and whether the oil is destined for the Black Sea littoral nations, Europe, or Asia has a profound effect on the route decision. Currently it is unknown what that market will be and more importantly when Caspian oil will be required. The question of timeframe has been largely ignored by the U.S. government, but is very important to the oil companies. By pushing for a decision on a MEP — which may or may not be cost-effective — by 1999, AIOC is forced into a difficult situation. Without known reserves to justify a MEP decision, any choice is highly speculative. In any event a MEP would not be functioning till 2010, when the various projects become fully operational.

Peering 12 years into the future is a difficult task for anyone, even without interference by other actors. By 2010 the region could have changed drastically and Iran could again be a viable political option for export routes. The oil companies understand that they are making high-cost investments that will have very long payback times. Unfortunately the political situations in the U. S. and some of the producing countries in

the region do not allow for thinking on longer timescales. For any pipeline to be constructed, it must meet the economic demand of the oil companies and producing countries and cannot be forced by political motivations.

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