



Construction of Baku-Supsa oil pipeline. Photo: Remi Benali, Corbis

How to get a pipeline built

| *By Jérôme Guillet*

There are regularly stories in the media about pipeline projects that are announced with much publicity, and are seen to have major strategic consequences, or conversely about projects that are more discreet but are seen as the "real" justification for various military or diplomatic acts. For instance, the announcement last year of an agreement between Russia and several central Asian republics about a new pipeline to be built to be connected to the Russian pipelines towards Europe, was widely interpreted as a major move against

European energy security. Similarly, the war in Afghanistan has often been connected with the American project of a planned pipeline from Turkmenistan through Afghanistan to Pakistan.

These analyses, however, usually ignore the economic dynamics of what it takes to actually get a pipeline deal done. To understand pipelines, it's easiest to cut the task into smaller pieces, and see how these are required to be put in place and fit together. The first question to ask, is: oil or gas? The two are quite separate

businesses, but very often mixed up by uninformed commentators. Beyond that first step, a cursory look at what is to be linked by any pipeline can help further eliminate many public relations stories. In the rest of the article, I will focus on gas pipelines.

What is needed to get a gas pipeline built are: a supply of gas, a supplier, a market, a purchaser, an entity operating the pipeline, government authorizations for crossing the territory of each country, a price for gas transport, an entity (or more) building the pipeline, an entity (or more)

paying for the pipeline. All of these components and parties need to be present at the same time for the project to come to fruition. And by 'being present', I mean 'irrevocably making binding commitments, representing large sums of money.' It is a surprisingly difficult job to bring all the parties to the table in that way at the right moment - which is why fewer pipelines than one would expect are actually built. As we shall see, being able to pay for the pipeline is not quite enough.

A pipeline concept will usually come to life (i) when a large supply of gas needs to be brought to market, (ii) when a large enough market/customer needs gas, and (iii) when a large supply of gas and a large market are close enough that it might be worth linking them. But that's just a concept. At that point, economics have not been examined. The concept may be floated by analysts, examined by energy companies, pushed by entrepreneurs, or developed by politicians on any territory potentially involved. This may already lead to punchy announcements by any one of these. What is important to understand is that at this point, the pipeline has no existence and no prospects yet. What happens at this stage is a PR drive to try to give reality to the project and get serious players interested. It may also be part of a campaign to favor one potential project over another, as companies and countries jockey to try to get their hands on potentially juicy assets - and also scare off competitors and alternatives.

If the concept looks potentially attractive (basic economics look okay, the resource base is sufficient, there exists a need for transport capacity), more detailed studies will get funded to look a bit more closely at the engineering side and get a better handle of potential costs. These studies will, again lead to further (often triumphant) announcements before and after the study, and fancy-sounding but, at this point, worthless, 'memorandums of understanding' or similarly fluffy agreements that will be signed in front of the media. At this point, the pipeline is still nowhere near existing, and has

Fancy-sounding announcements are made for the media

not been subject to any kind of investment decision.

Let's take a look again at the criteria for attractiveness. First the resource base. Enough gas must be available from the production area to fill up the pipeline. Filling it up means using up the capacity for at least 20 years. A 10 bcm/y (billion cubic meters per year - 10 bcm/y is almost equal to 1 mmcf/d - one million cubic feet per day) pipeline will thus require a resource of at least 200 bcm (or 7 Tcf - trillion cubic feet) that needs to be transported. This is not a trivial issue: many gas fields are called 'stranded reserves' because they are not

big enough (or too far away) to justify economically the construction of a pipeline to bring them to market.

Secondly, the gas resource must not have any other existing or obviously cheaper transport alternatives to be brought to market. Any project where the gas is already using some other route, or could use another route, is unlikely to happen. For instance, all the gas pipeline projects from Central Asia (including the Russian one I referred to above) make no sense because a pipeline already exists and is not full - the mere existence of that available capacity is enough to undercut any alternative project and kill it.



A rotating welder is used during construction of the Trans-Siberian gas pipeline. Photo: Fabian Cevallos, Corbis

Thirdly, the basic economics come into play. They focus on the price of gas (production costs plus taxes) and the distance it needs to be transported, compared to the expected price on the destination market - which itself depends on whether the pipeline connects to a liquid market/network, to a single client

sided. In other words, that entity needs to be an acceptable counterparty to all the other participants to the project.

This argument is enough to kill the notion that 'China has billions of dollars, it can pay to build a pipeline (from Turkmenistan or elsewhere)'. Money is not enough. China must credibly

supplier? How much gas will it be able to supply? For how long? Does it make economic sense for it to bring the gas into the proposed pipeline? Are there, or will there be more attractive (and likely) alternatives in the future? It's these questions that makes pipelines like the trans-Afghanistan one, or any trans-Caspian gas pipeline no more than pipe dreams - because the only entity that has the resources to conceivably provide for that requirement (the Turkmenistan national company) will not commit it: (i) because commitments from that country over 15 years are not credible, and (ii) because they can already ship their production in an existing pipeline, the one going to Russia which, not having to support any construction or financing costs, can always undercut any alternative that does. But that factor also makes Russian announcements of more pipelines from Central Asia to Russia just as silly, because they are equally unneeded and impossible to fill up.

The same question needs to be asked at the other end of the line: who will actually purchase the gas to be transported, and pay for it? Does that entity need it? For the next 15 years? Can it afford it? Does it have the relevant infrastructure to use that gas? Now that issue is the single major difference between oil and gas - once your oil is on the market (i.e. on a boat on open ocean, or in a big, open network), you don't really need to care who will buy it. Oil cargoes will always be sold, at or close to the prevailing market prices, and paid for in hard currency. So finding a buyer (unless the end destination of your pipeline is a narrow market with only one or a few buyers) is not usually as burning an issue for oil pipelines.

For gas, it is a fundamental issue. Gas is a lot more dependent on infrastructure, and you cannot just expect to dump your gas on a market exchange and be done with it - you need to know that it will be handled properly, and that someone will do it consistently for you, for all the relevant volumes pumped day in and day out. So you need an end buyer: a large

All stakeholders must commit large amounts of money before a project can go through

or to other transport facilities (LNG terminal, more pipeline transit) which impose additional costs before the gas is actually sold. A very rough estimate is that it costs \$1-2 to transport a tcm (thousand cubic meters) over 100 km (approximately - it costs 5-10c to transport a MBTU over 100 miles). The way these estimates are usually done is to start from the point of sale, deduct all transport and other costs to bring the gas there, and identify the 'netback' that market provides at the point of production, i.e. the net amount that would end up in the producer's pocket.

After the basic economic 'smell test' has been run, the more detailed studies will give potential players a better grasp of the potential cost of the pipeline, and of the volumes of transit gas required to cover that cost in an economically sensible way. Such a study will usually have been paid for by one or more potential parties along the gas chain and made available in more or less detail to possible partners. What's needed at that point is an entity able to drive the project to fruition. Such an entity has to have a direct interest in getting the project done (any of the above can play that role), but it needs something more, which is a lot rarer, and which explains why so many pipeline projects don't become reality: that entity needs to be able to credibly convince others that the project will happen and thus that they can actually make their own commitment to it in the certainty that it's not one-

convince the Turkmens that it will pay for the gas even if Kazakhstan blocks transit for some reason. It must credibly promise the Kazakhs that it will pay the transit fees even if gas is not delivered. Because the amount at stake is not just the cost of the pipeline, it's potentially the value of gas sales over 20 years. And, more importantly, the Chinese must be able to trust the Turkmens to deliver the gas even if they have built the pipeline.

So, in practice, the leader of the project is either a company or an entity that controls most of the chain (say, Gazprom, which has the gas, the technical know-how, the financial means and the ability to get approval for pipelines inside Russia), or a company that both has a stake in the pipeline and the track record to lead such projects - i.e. an oil major or, in a few cases, very large gas buyers like the aluminum smelting companies. Absent these, a project is highly unlikely to ever happen.

Let's look in more detail at some of the above-mentioned elements that are needed to bring a pipeline project to life. The first question is, who will be the



Inspection in Alaska. Photo: Karen Kasmauski, Corbis



The new Nord Stream pipeline in progress. Photo: Wintershall

utility, power producer or big industrial user or a very large trader. Nothing underlines more the importance of the buyer than the almost systematic nature of the contracts they are asked to sign: the so-called 'take-or-pay' contracts. Take-or-pay means that the buyer has to take the gas (and pay for it, of course), or pay for it (even if it does not take delivery). Buyers are in effect asked to guarantee a minimum level of income, irrespective of their physical ability to deal with the gas, provided that it can be delivered by the proposed pipeline. That means, of course, that the buyer is willing and able to make such a commitment, and that such commitment is considered credible, both in that there is a binding contract and that it actually makes sense for the buyer to make it. It should therefore be a large user (or distributor) of gas, with a strong balance sheet and, in all likelihood, a strong credit rating. It must need that gas, and not have a surplus of alternative cheaper supplies. The price it will pay must make sense for it (by being close to market conditions, or by providing some other advantage, such as a fixed price, or a maximum price). As this requirement mirrors that above for the gas provider, it is obvious that both ends to the chain must be satisfied with one another, as they underpin what the other actually needs - a reliable supplier and a reliable

buyer. In most cases, the main commercial contract (the Gas Sales and Purchase Agreement) will be between these two parties alone, not including the other links in the chain, which will have their own contracts.

In the same way, the other requirements for the pipeline project can be discussed. After the major parties have been identified, and begin to discuss terms, the detailed economics of the project must be examined anew. Now a more detailed case must be made that the pipeline will actually generate enough revenue for all in most foreseeable

the Gas Sales and Purchase Agreement - on the understanding that it is committing to its side of that contract as the anchor for the pipeline, and as an incentive for the other players to jump in with their own commitments.

Thus, as long as one of the big Chinese energy companies is not willing to say 'I'll buy x bcm/y of gas at market prices, no gas pipeline will be built to China. And, as long as domestic gas prices are constrained by both price gaps and the competition from cheap coal, no commitment of the sort will be made (nor should be). And, as long as Nabucco supporters cannot credibly say where

No pipeline will cross the Caspian as long as the pipeline to Russia is not full

circumstances, and that those that bear the financial risk in the case of shortfall are willing and able to do so. Pipelines require contracts that include more or less binding guarantees to pay amounts equal to these full volumes (and that is well understood by PR people, when they trumpet '\$100 billion contracts' even if purely in-principle agreements have been signed). That means they have to be driven by at least one of the parties of

they intend to buy the gas needed to fill that pipeline, it just won't get built. No pipeline will cross the Caspian for as long as the existing pipeline going to Russia is not full. ■

Jérôme Guillet is editor of the European Tribune. This article is adapted from theoil drum.com