Lecture Meeting

25th September 2002

Natural Gas In Asia: supply and project uncertainty

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Thank you very much. And it is a real pleasure to be here. Like many of you, I wish we could have continued to hear Robert Mabro's thoughts on this fascinating oil situation. I fear that what I am going to say is going to be less interesting. But never mind.

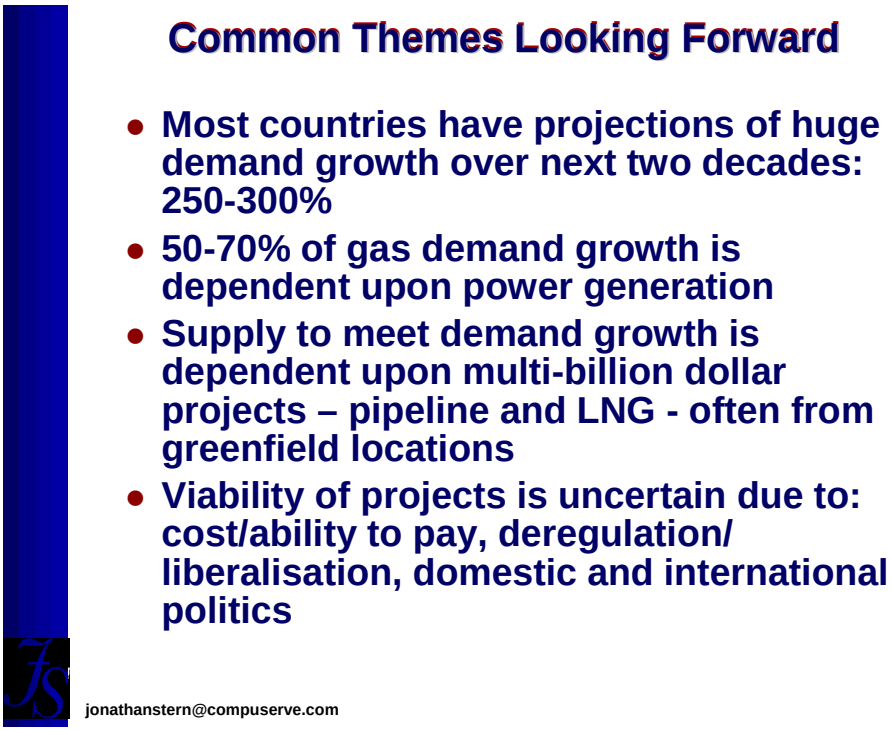
Thank you, Sakamoto-san, thank you Toichi-san, for inviting me to speak here.

One of the things that everybody I think agrees about is that natural gas will become a much more important fuel in the next 20 years. And that was shown by Mr. Priddle this morning.

It certainly will become more important in Japan, because there are two things that I have spent a lot of time on in the last 6 months for the paper I wrote for the International Energy Forum Conference in Osaka on natural gas, and the work that I have been doing for the World Gas Conference, which will happen, as I am sure you all know, next year in June in Tokyo.

So the next time I come back here will be for the World Gas Conference. And I expect to be hearing a great deal about some of the issues I am going to spend some time talking about now.

Asia is a very big place. But there are some common themes. And they are shown in this slide (Slide: Common Themes Looking Forward): projections of huge demand growth over the next two decades, 250-300% in many countries.



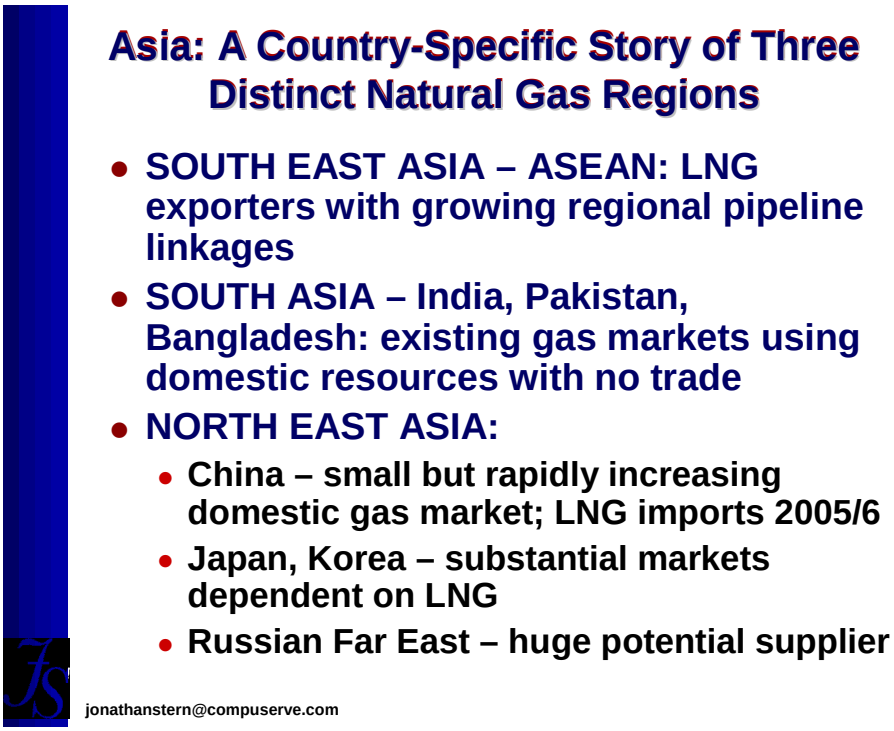
However, most of this demand growth, well over half, is dependent on power generation. Therefore, if there is a problem with gas-fired power generation, we will not get this kind of demand growth.

In addition, a lot of this supply is going to be dependent on multibillion-dollar projects, especially pipelines but also LNG, often from greenfield locations, that is, not expansions of existing projects but places where infrastructure does not exist, where production does not exist. And therefore, the viability of projects like this is uncertain, because they are very, very costly, and the ability of customers in Asia to pay to make these projects viable is not certain.

In addition, the coming of deregulation and liberalization of gas industries in Asia add to this uncertainty. And domestic and international politics add further to the uncertainty.

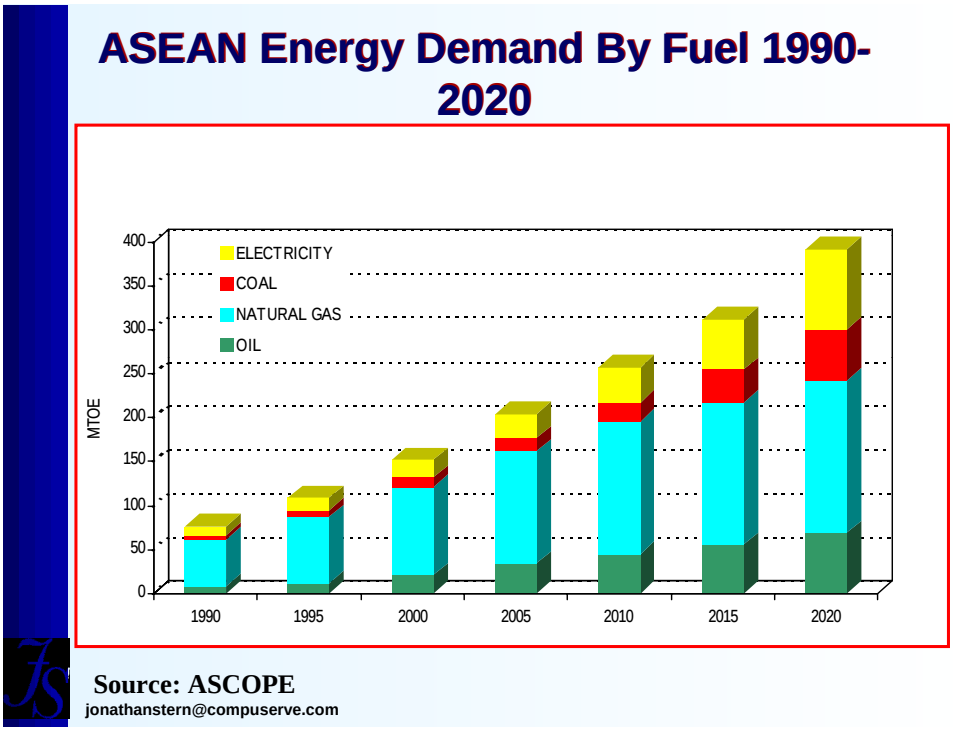
And I am going to be talking throughout this presentation about prices and about the difficulties of getting these projects off the ground, given what that may mean for prices in the consuming countries.

I have divided Asia into three regions (Slide: Asia: A country Specific Story of 3 Distinct Natural Gas Regions). There is a case for dividing it into many countries. But regions, given the time I have, is what I am going to talk about: ASEAN, South Asia (but in particular, India), and Northeast Asia (where I will spend the most time).



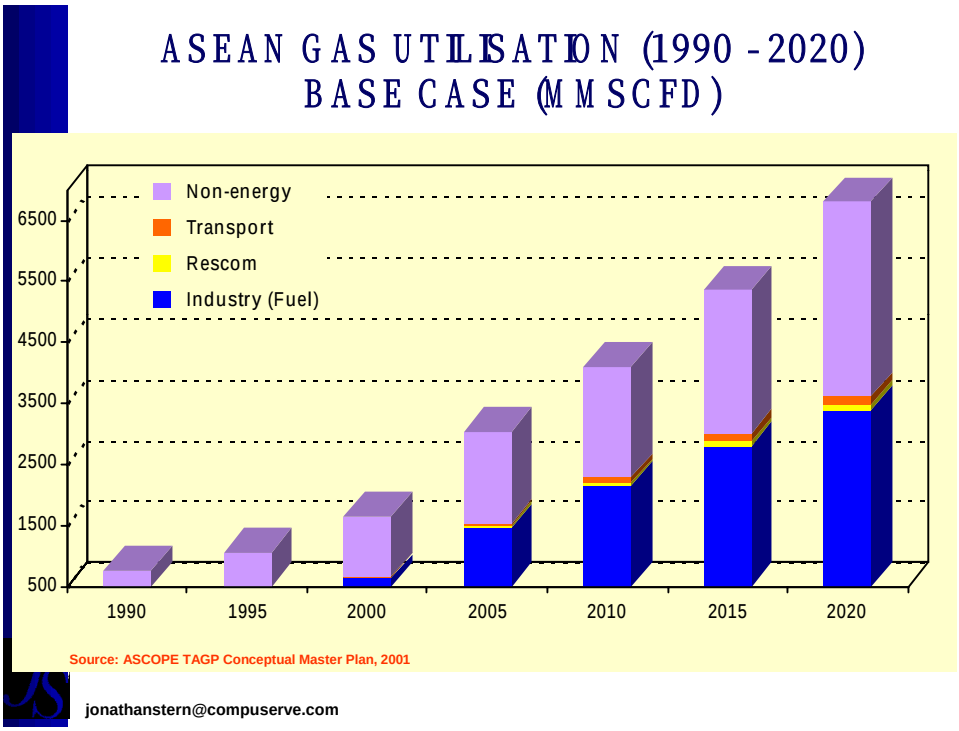
The regions are really very different. In ASEAN you have LNG exporters but with growing regional pipeline links. In South Asia you have existing gas markets but with no trade. And with Northeast Asia you have a lot of LNG but not much pipeline gas, and you have China (small existing market but rapidly growing), Japan and Korea (LNG importers but with no pipeline gas), and the Russian Far East (an enormous potential supplier but a very small gas market).

So let me start with ASEAN. This slide shows you the projections of ASCOPE, which show energy demand by fuel, projections over the next 20 years (Slide: ASEAN Energy Demand by Fuel, 1990-2020).



And what it shows is quite interesting. Natural gas is dominant energy, and it remains the most important energy. But relatively, its share goes down. So it is interesting that in ASEAN you see growth in gas but the share of gas going down.

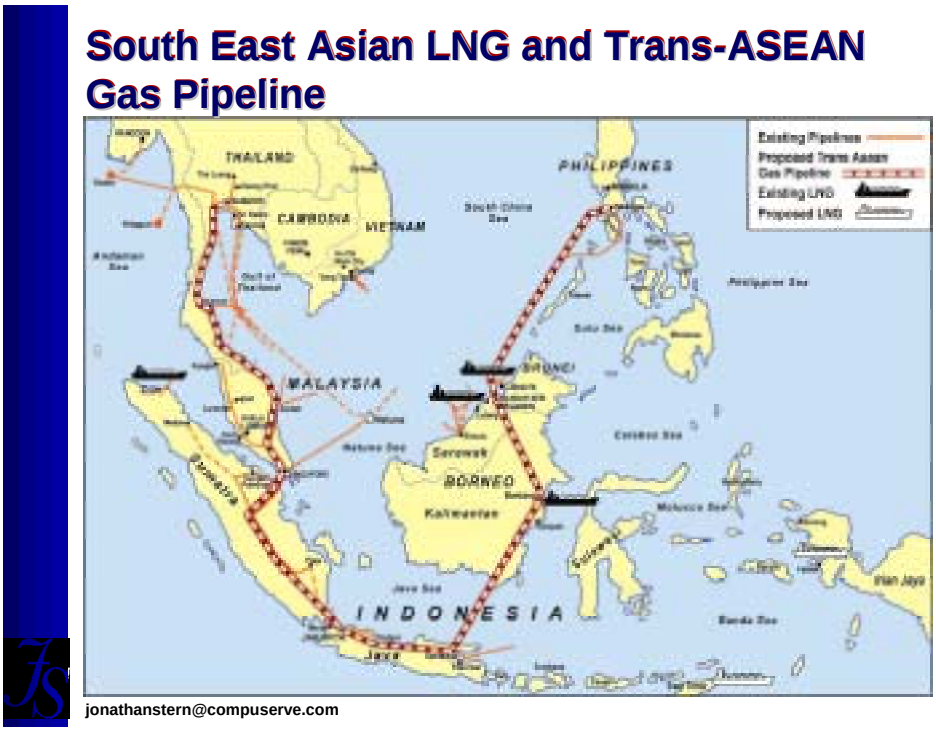
And equally interestingly and quite uniquely in Asia but also in many other parts of the world you see in the gas utilization, although big growth in power generation, which is the non-energy column in this chart (Slide: ASEAN Gas Utilization 1990-2020). You see very huge growth of gas in industry in ASEAN.



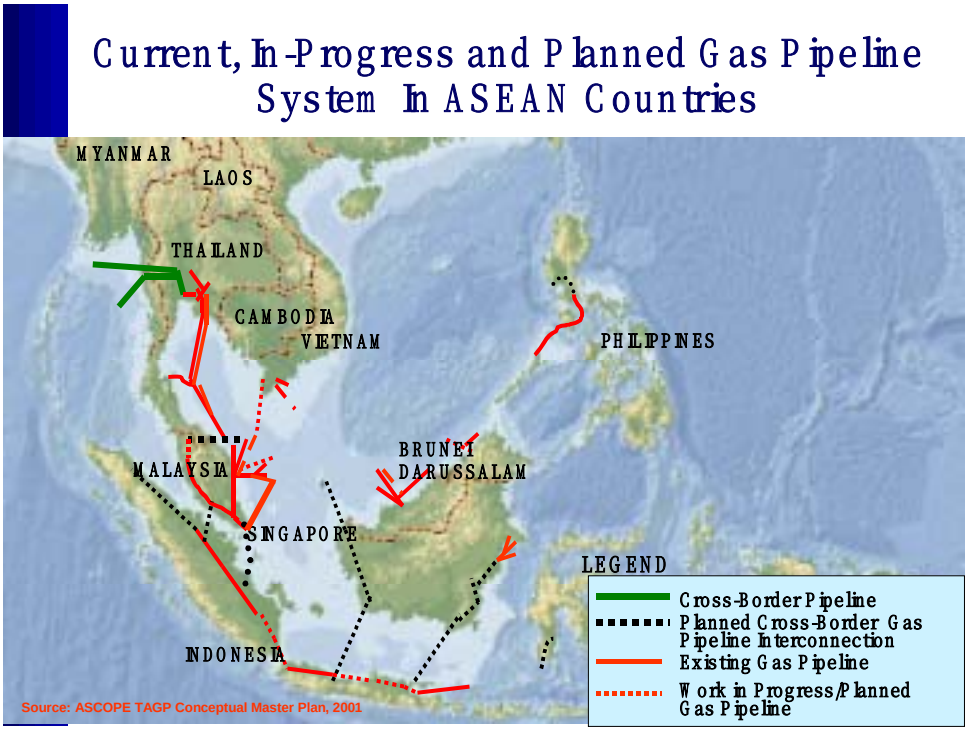
And this is interesting and quite unusual. Not much residential and commercial, not much transportation, but substantial growth in industrial gas use.

When we look at ASEAN in terms of supply, you see the existing LNG exports in Brunei, in Malaysia and in Indonesia. And you can possibly make out the proposed LNG exports where projects have been signed now in East Timor and possibly in the other parts of Indonesia, in Tangguh, will go to China for the second project.

But I included this slide (Slide: South East Asian LNG and Trans-Asian Gas Pipe Line), because when the Trans-ASEAN gas pipeline was proposed about 10 years ago, I found this concept extremely unconvincing. It seemed like it was just joining up countries with lines.

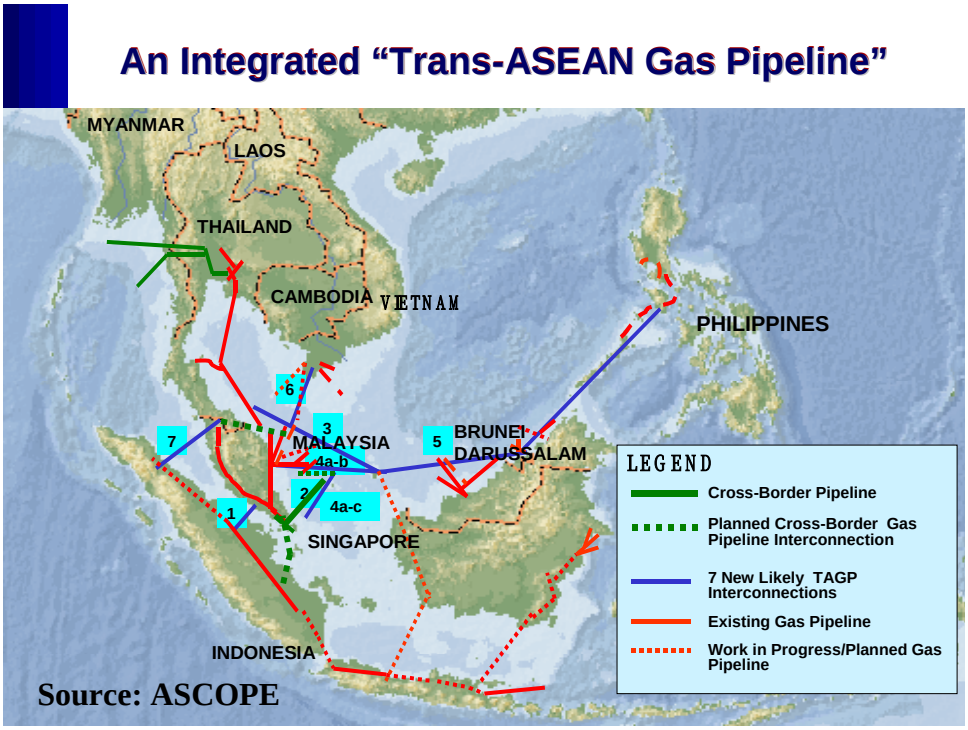


What I think impressive for me over the past 10 years is how slowly this concept, not by a kind of grand plan but by a series relatively small and piecemeal projects, is beginning to construct the Trans-ASEAN concept (Slide: Current, in progress and planned gas pipeline system in ASEAN Countries).



And we already have the Myanmar-Thailand line. We already have Malaysia-Singapore, Indonesia-Singapore, and soon we will have another line

between Indonesia and Singapore, and some pipelines which are relatively short, do not grab big headlines, but are beginning to link this region up (Slide: An Integrated "Trans-ASEAN Gas Pipeline").



Obviously, we may have to wait some time for the Sarawak or Brunei-to-Philippines line, which is on this map.

I do not think we will have to wait too long for an Indonesia-Malaysia pipeline.

Therefore, what I want to suggest to you is that what is happening in ASEAN, although maybe it does not get the headlines of some of the projects that I will speak about in a moment, is extremely impressive, and may begin to transform this region in terms of gas in a way that, perhaps, certainly myself, did not expect 10 years ago, when the concept was announced.

I want to move on now and talk a little bit about South Asia. But before I do, these are some projections for South Asian and major Northeast Asian countries, which we published in a new book, of which I am one of the co-editors, published by Robert Mabro's institute at the beginning of this month.

The projections are quite interesting, in that they show, as I mentioned at the beginning, very substantial growth in natural gas for 2020 (Slide: Gas Demand Projections for Major Asian Markets).

Gas Demand Projections for Major Asian Markets - Bcm (% primary energy demand)

	2000 Actual	2020 Likely	2020 High
Japan	71 (13)	93-102 (14-15)	122-140 (20)
Korea	21 (8)	53 (14)	60 (15)
China	27 (2)	120 (6)	200 (10)
India	20 (9)	110 (13)	140 (16)
TOTAL	139	376-385	522-540

Source: Ian Wybrew-Bond and Jonathan Stern, *Natural Gas In Asia*, OIES/OUP 2002

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But even our so-called likely-projections are extremely ambitious and in fact, interestingly, more ambitious than the figures in the new World Energy Outlook that Robert Priddle was talking about this morning.

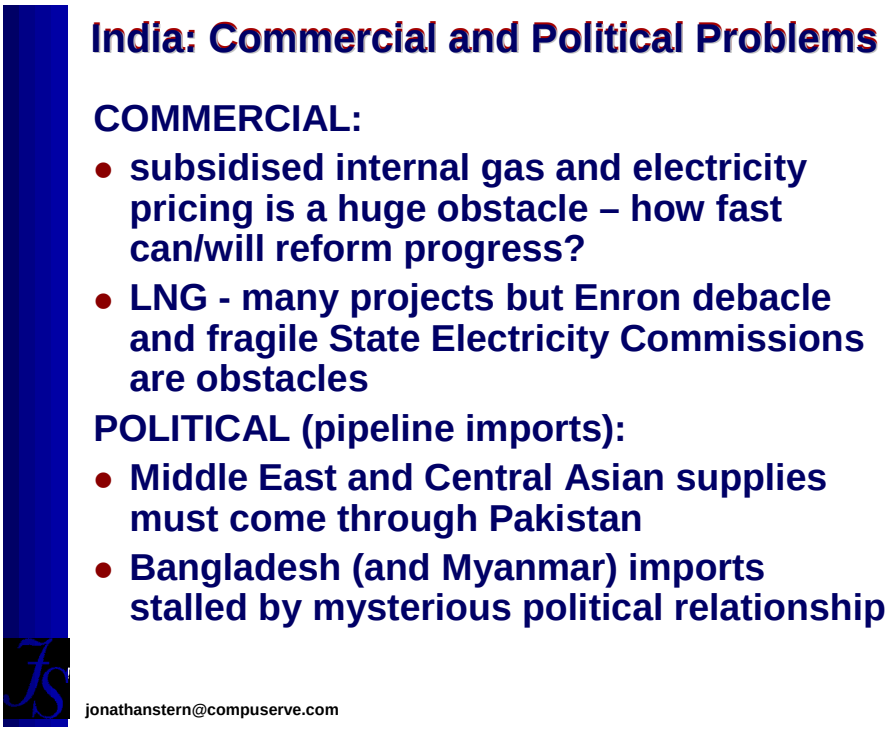
The thing that interested us in starting this book was the question "Would the major Asian countries over the next 20 years achieve the same level of gas in their energy balances as the average OECD level of 24% today?"

That was the question we posed for ourselves. And the answer we got, even with these rather ambitious circled likely-figures, never mind the over-ambitious high figures you see in the other column, is "No, they would not." Twenty years is far too short a time-frame for Asia to achieve 20- 25% primary energy demand dependent on gas.

But even though that may seem a slightly disappointing conclusion, you can see that even our likely-figures all involve huge increases in gas demand in these countries.

And in the next few minutes I am going to try and indicate how supplies need to increase in order to achieve even these likely-figures.

Let me start with India (Slide: India: Commercial and Political Problems). The biggest problem in India, and in fact in the whole of South Asia, is that subsidized gas pricing in the major sectors (fertilizer and power) is a huge obstacle to any of the big new import projects (pipeline or LNG).



And the other problem in India is that the state electricity commissions, which are the big players certainly for gas-fired power generation, are in a very difficult, some would say bankrupt, financial condition.

In India it is very difficult to criticize the government policy on subsidies. This is a huge country with a huge population largely dependent on agriculture. Many of the people in this country subsist on only a few dollars a day.

So how in a democracy can you raise gas prices when the impact on the population would be devastating? And this is the difficulty faced by the Indian government. And this is why it is difficult to see how natural gas can increase dramatically its demand if it is based on the current level of prices. And it is difficult to see how the current level of prices can be substantially increased.

That is a big enough obstacle. But there are other obstacles.

The political problems between particularly India and Pakistan mean that it is at the moment and for the foreseeable future not acceptable to the Indian government to depend greatly, or maybe even at all, on a gas pipeline that would pass through Pakistan.

And what this map (Slide: Map of Middle East) shows you is that the two major large-scale sources of gas for India are the Middle East, whether Oman or Iran, and Central Asia (the famous Turkmenistan-Afghanistan Pipeline). These would both need to pass through Pakistan in order to reach India.

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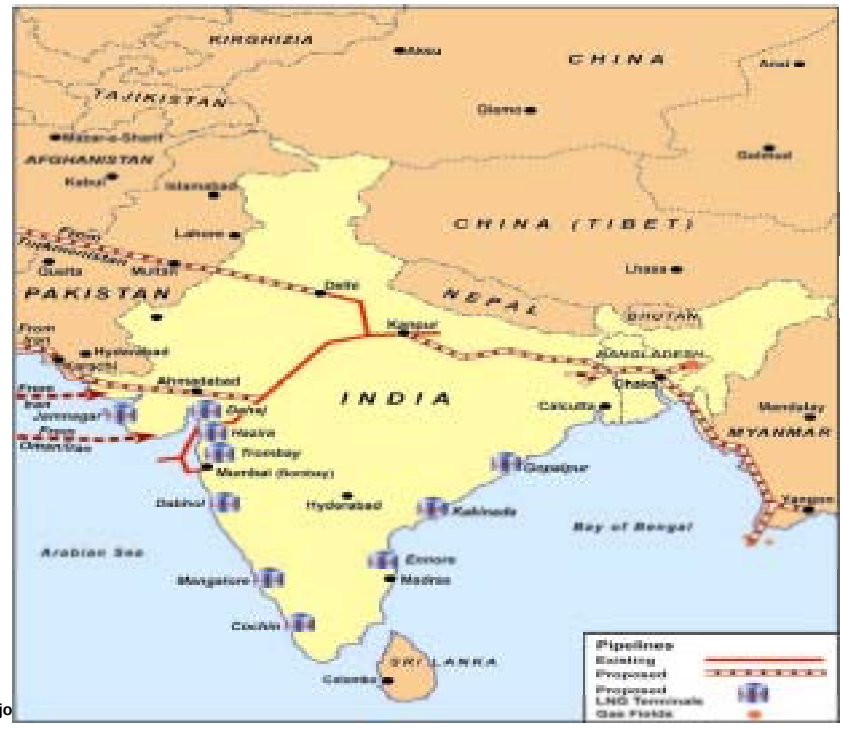


The only non-Pakistan route would be a deep-water route, probably via Oman, direct to India. And this, again, would be extremely expensive.

So there is a big difficulty with pipelines. In this slide you see almost all of the proposed projects. Looking at this presentation last night I found one that had been left off. But you can see how many proposed LNG projects there are around the coast of India, the West Indies.

We know the problems of Dabhol, even before the collapse of Enron. And that was a very long story, but I would just like to say that I think there was fault on both sides. And the concept of a project which requires a state electricity commission to buy foreign LNG at a price which is several times more than it is paying for other power-generation fuels, and make that project economic by averaging it in with its other power-generation projects, for me, is a tremendously problematic concept.

And I think that both sides should have been able to see what a problematic concept that was from the beginning. And yet, I am not clear how any of these LNG projects can take place unless that is the financial model.

So that is the difficulty I have with a lot of the Indian LNG projects.

But if you look on the other side of India, on the Bangladesh side, you can see the potential for a pipeline from Bangladesh and from Myanmar through Bangladesh.

This, sadly, is also fraught with great political difficulties, not because the relationship between India and Bangladesh is hostile. In fact, it is very difficult to understand what the problem is in the relationship between India and Bangladesh.

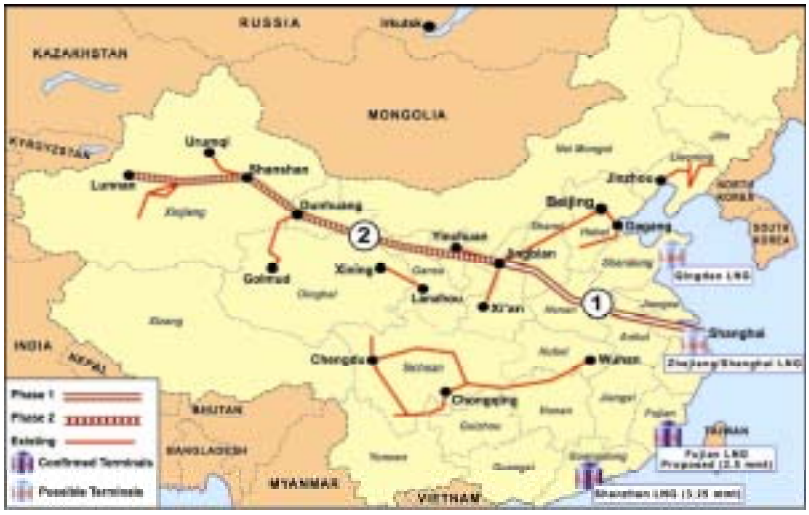
But what I have understood is that neither of these countries will enter into a project if it believes that the other side will gain a big advantage. Therefore, that contribution to the Indian NG balance is stalled until there can be some agreement between India and Bangladesh.

And that means that not only is there a problem for India with its internal pricing, but there are serious political problems for all of the large-scale pipeline options that the country has.

And that is why until these problems are resolved, India will have to depend only on domestic production of gas.

Let me move on and talk about Northeast Asia. What you see here in this slide is the West-East Pipeline that Robert Priddle referred to this morning, from the Tarim Basin to Shanghai (Slide: China’s East-West Pipeline and LNG Projects).

China's West-East Pipeline and LNG Projects



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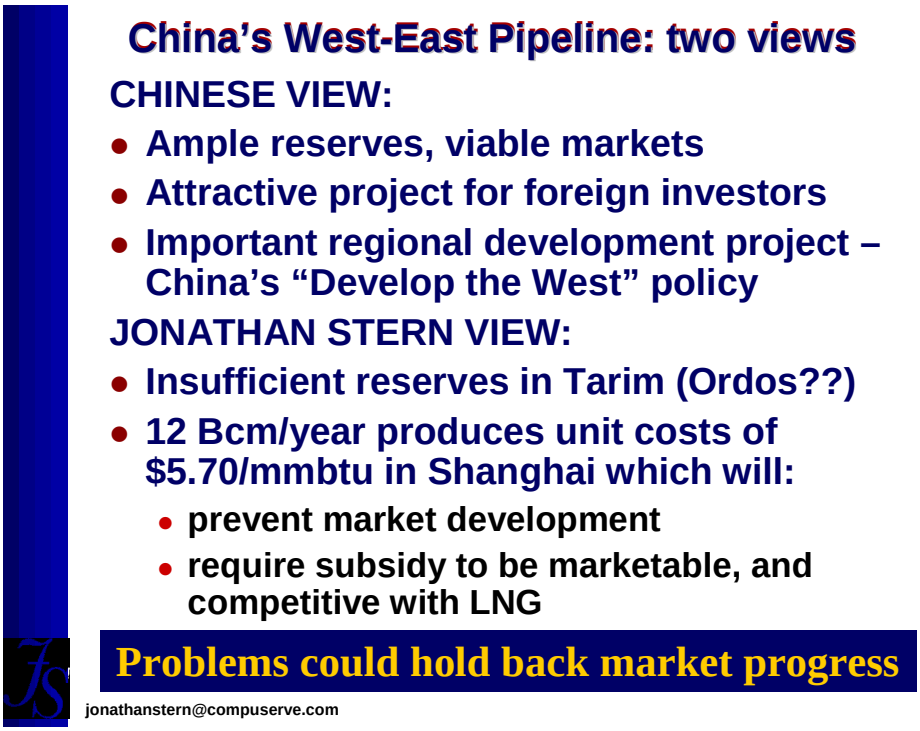
You also see LNG projects, the first of which is in the south, in Shenzhen and Guangdong, which has just been agreed, and the second one in Fujian looks as if it has been agreed, at least in principle.

There are two views on the West-East Pipeline (Slide: China's East-West Pipeline, Two views). There is the Chinese official view, which says there are ample reserves, viable markets in the east, that this is an attractive prospect for foreign investors, and in particular is very important for the Chinese so-called "Develop the West" policy, western China being relatively poor, eastern China being relatively rich. And this is an important regional project.

The line is 4,000 kilometers long. The expected throughput is 12 billion cubic meters, rising eventually to 18 billion cubic meters some time in the future.



It is expected that the first stage (the Jingbian-Shanghai leg) will be completed around 2004 or 2005, and the second phase (from the Tarim Basin to Jingbian) one or two years after that.

The problem I have is that when I look at this project I cannot make any of the numbers work in terms of market development. 12 billion cubic meters a year gives you, according to the Chinese, a figure of $5.70 at the Shanghai city gate.

Now, ladies and gentlemen, I do not know anywhere in the world where you can sell gas at $5.70. You certainly cannot sell that gas at that price at a city gate in the United States or in Europe. I am not even sure that you can sell that in Japan, which traditionally has quite high gas prices.

And that is the city gate. It is not the final customer in a country, which is significantly poorer than the OECD countries.

So my question is "How is this project going to be economically viable and successful?" I do not have any doubt that the Chinese government is pressing ahead with this. Like the rest of you, I know that construction has started.

The problem is this. Undoubtedly they can force customers to take this gas and pay that price. But how are they going to get those customers to stay in business? My understanding is that the power generators in the Shanghai region have offered about $3.50, which is a pretty good price in most places in the world.

But the logic of the pipeline, 4,000 kilometers, 12 billion cubic meters,

actually means that you get that unit cost in Shanghai.

Of course, they really should have built a pipeline more than twice as large. They should have built a 25-30 billion cubic meter pipeline. But unfortunately, they do not have the reserves in the Tarim Basin to support that capacity of that pipeline.

And my concern is that this extremely high-cost pipeline gas will in fact hold back market development in China rather than promote market development, which is what we all hoped for.

And because of this, what would have been a good idea, because there are at the moment insufficient reserves in the Tarim, it would have been a very good idea if the Chinese government had agreed, if they insisted on building the West-East Pipeline, to join that pipeline up to additional sources of gas.

On this map, I am showing you a number of different options for the Chinese government to import gas (Slide: Proposed Russian and Central Asian Gas Pipelines for North East Asia). If you look up at the top left-hand corner, you will see that both Central Asian gas from Kazakhstan and Turkmenistan could connect with the West-East Pipeline, or gas from western Siberia. And given that both Shell and Gazprom will be potential investors in the West-East Pipeline, this could have been a very nice match for the line.

Still it would not have been cheap gas in Shanghai. But nevertheless, it would have allowed the pipeline to be twice the capacity. Therefore, you would have had a reasonable expectation of a unit cost in Shanghai that customers could bear.

In fact, and equally unfortunately for the Chinese government, it is not the best project to deliver gas to this region. In my view, both the Kovykta project, near Irkutsk and Lake Baykal, and Sakhalin gas delivered to northeast China and possibly down as far as Beijing, are preferable in economic terms (Slide: Russian Gas Exports to China).

Very understandably but I think sadly, the Chinese authorities determined that the period up to 2010 will be for domestic gas and imported LNG only. And this, I think, is extremely problematic for the development of the Chinese gas market.

I can only hope that possibly the parameters of the project will become changed. But I am not very hopeful, because they are already starting to build. They are pressing ahead. And it seems to me likely that when we get to 2010 the difficulties in the market development will be discovered, but it will be too late and expensive to really change anything.

It goes without saying, therefore, that I am not confident that the Kovykta project or Sakhalin pipeline gas will be in China certainly before 2010, and possibly, given how long those projects will take to negotiate, before 2020.

And that means, in my mind, that it is going to be very difficult for Chinese gas demand to increase above 100 billion cubic meters by 2020.

This is, of course, substantially less than the Chinese government is saying. But this is, for me, the inexorable logic of what they are doing.

Let me talk for just a few minutes about Korea (Slide: Korean Gas Pipelines and LNG Terminals). Korea is an interesting country in this region,

because it is the only country with a national pipeline network, although wholly dependent on LNG.

Korean gas pipelines and LNG terminals

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For Korea, in my view, Sakhalin pipeline supplies, which I showed you on the previous map, are probably the most attractive in terms of commercial viability of pipeline gas. But they would involve passage through North Korea. And this is very difficult (Slide: Russian Gas Exports to Korea).

Russian Gas Exports to Korea

- **Sakhalin pipeline supplies are the most attractive but would involve North Korea.**
- **Kovykta pipeline supplies are possible but expensive and will depend on Chinese willingness and timing.**
- **LNG from Sakhalin (and other sources) will be competitive with – and perhaps cheaper than – pipeline gas.**

Uncertainties about privatisation, restructuring and deregulation are obstacles to any rapid decision-making

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Kovykta pipeline supplies from Irkutsk are certainly possible, but they are going to be expensive. And they will depend on Chinese willingness and the timing of that project, which I have said I think will be longer-term.

LNG from Sakhalin, and perhaps from other sources, will be competitive with and possibly cheaper than pipeline gas. And that makes me wonder whether pipeline gas is going to be possible in Korea if more LNG terminals continue to be built.

But the most immediate uncertainty in Korea is what will happen with the privatization of Kogas and the restructuring and deregulation of the gas market in general. And we will not know that until the Korean election has taken place next year.

So my sense is that, although I certainly expect Korean gas demand to increase substantially, there is a big uncertainty in Korean gas because of the doubt as to whether pipeline gas will be included and when.

So we arrive at a more familiar picture to most of you here, the possibility of bringing pipeline gas to Japan, a completely LNG import-dependent market (Slide: Proposed Sakhalin Gas pipeline to Japan).

Proposed Sakhalin Gas Pipeline to Japan

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Many of you have heard me speak before in Tokyo on this subject. And I am going to say what I have said before when I have spoken here.

For the past 30 years, probably longer, electricity and gas utilities have had no desire to import Russian gas, either as pipeline gas or as LNG (Slide: Russian Gas Exports to Japan). And that is not a criticism. It is simply a statement.

The standard response that Japanese gas buyers give when asked whether they want to import Russian gas is that they have no demand, or that Sakhalin gas is too expensive compared with other projects, or that uncertainties related to deregulation mean that at the present time they cannot commit to buying large quantities of gas.

And the question that I asked myself as I was preparing this presentation is "Has this view changed?" And my answer is that it has not changed, or at least not changed sufficiently to make a big difference in bringing certainly pipeline gas to Japan, but I think even possibly I see no great enthusiasm for Sakhalin LNG imports.

I was given a reason to possibly moderate that view when I heard one of the Japanese ministers in Osaka during the week say that the Japanese government would like to see gas increase to around 20% of primary energy demand in Japan, and that in his view that would require the import of pipeline gas from Sakhalin.

I understand, but I do not know because I have not seen it. But I understand that the feasibility study that was commissioned by Sakhalin 1 partners showed that Sakhalin 1 gas would be competitive in Japan.

But I think there is something quite fundamental in terms of energy policy, which is at stake. The reason I was very interested in the Japanese minister's comment is that as far as I am concerned it is not going to be possible for gas to achieve a 20% share of primary energy demand in Japan unless pipeline gas arrives.

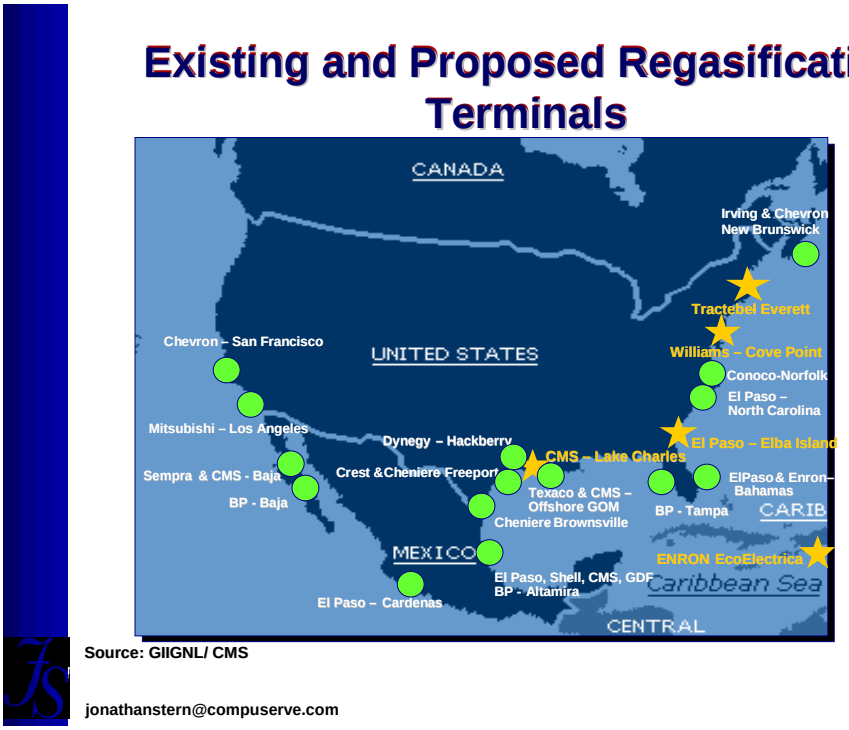
That then opens up the question of a national pipeline network, not a very difficult problem. Again, I am not optimistic about that in the near future. But there is a real important question of energy policy. And as far as Russia is concerned, there is a very important question of foreign policy.

I am not clear that the time is yet right to resolve either of those questions in favor of Russian pipeline gas.

I would say that in fact, unless Korea takes some Sakhalin LNG, it is most likely that the early Sakhalin gas could go to the U.S. west coast or Mexico, where a number of new terminals have been proposed.

Especially having spent a month recently in the United States talking to people, I have quite considerable reservations about whether many, or indeed, any of these terminals will get build, and when.

But it seems to me that if the North American gas market shapes up in a particular way, and if it proves possible to build one or two of the Mexican terminals, or one of the terminals in Baja California, it could be attractive for these promoters to take Sakhalin LNG (Slide: Existing and Proposed Regasification Terminals).



Whether the Sakhalin 2 project could be commenced on the basis of that kind of commitment I doubt.

But if that seems a pessimistic conclusion, let me show you a longer-term perspective (Slide: Sakhalin - A Major Oil and Gas Province).

Sakhalin: a Major Oil and Gas Province

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Sakhalin is not a field or a couple of fields. It is an oil-and-gas province of huge proportions. I made a small calculation just on the gas, that if we look at the five projects (Slide: Sakhalin – A World Scale Natural Gas Province), which have so far been proposed in any kind of firm way we come to a resource of 3-3.5 trillion cubic meters. And in my view, there is a lot more gas to find in Sakhalin.

Sakhalin: a World-Scale Natural Gas Province

SAKHALIN 1 pipeline gas to: Japan, Korea, China; reserves 485 Bcm

SAKHALIN 2 LNG to: Japan, Korea, USA, other; reserves 500 Bcm

SAKHALIN 3: reserves 970 Bcm

SAKHALIN 4: reserves 540 Bcm

SAKHALIN 5: reserves 600 Bcm

SAKHALIN 6: reserves ?

Sakhalin gas will be a very important resource for north east Asia – but maybe not for another 10-20 years

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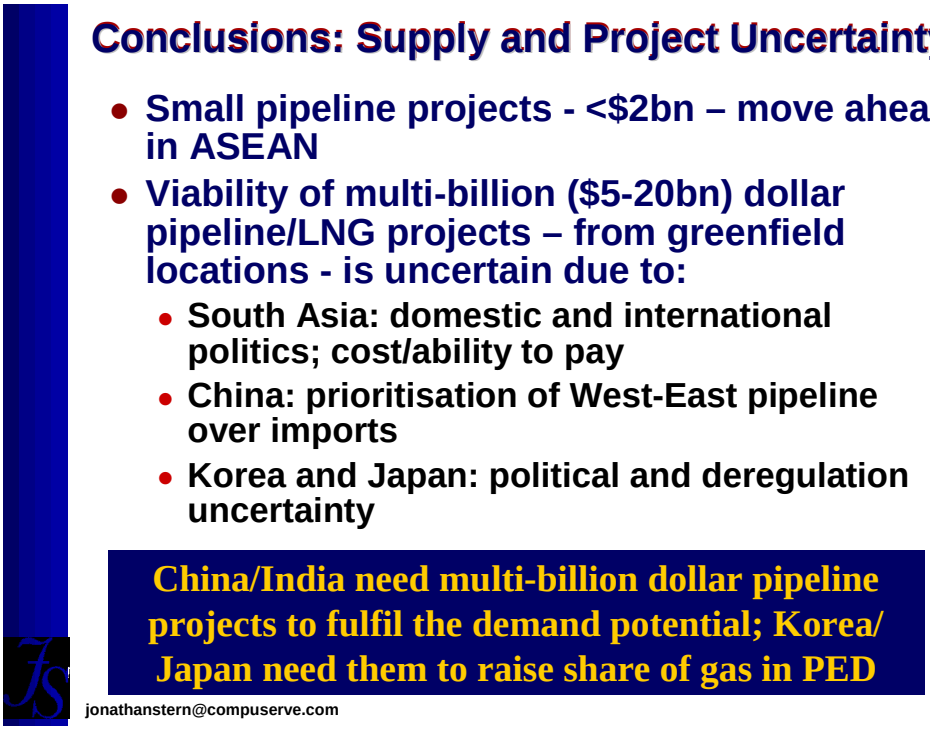
Now, I just want you to compare that number of 3-3.5 trillion cubic meters with my own country the U.K., where our gas resource base ultimately recoverable is around 2.5 trillion cubic meters. And with the resource base we have over the past 30 years developed gas production of over 100 billion cubic meters, with two-thirds of the gas that have already been discovered in Sakhalin.

So I want to suggest to you that Sakhalin gas is going to be a very important resource for Northeast Asia. But it is going to take longer. I do not know how long it is going to take. And I speak as somebody who has followed Sakhalin and its development for 25 years, since before I started coming to Japan. And I see people in the audience who I know have followed Sakhalin gas for more like 35 years.

So in another 10 years, possibly another 20 years (this is not a particularly long time), there is no doubt in my mind that this resource is going to be commercialized in Northeast Asia. The question is when.

So let me draw some conclusions (Slide: Conclusions – Supply and Project Uncertainty). I have tried to suggest to you that despite the huge potential there is a lot of uncertainty.



The small pipeline projects, the ones you do not hear so much about, in ASEAN have moved that region ahead much faster than the other parts of Asia.

Small pipeline projects (and when I say small, I mean up to $2 billion) will move ahead, because they have already gone ahead. And they have been successful.

But the viability of the big projects, the ones that you read about in the

newspapers, the ones that get headlines, I think is extremely uncertain. In South Asia, it is because of politics and the ability of customers to pay.

In China, I really regret to say that in my view, unless I have missed something, the prioritization of the West-East Pipeline over imports may have been a strategic error, although I quite understand why the Chinese government has gone in that direction.

In Korea and Japan you have political uncertainties and uncertainties over deregulation.

If you do not have these multibillion dollar projects that I have showed you, if you cannot in Asia be confident that the big international projects will take place, then with the resource base as we currently understand it you cannot raise the share of gas in primary energy demand very greatly.

It does not mean that gas demand will not increase. It will. It will increase considerably. But it will increase only in terms of LNG and domestic gas production.

And what that will suggest is that the huge potential for gas markets in Asia will either not be satisfied or will only be satisfied in a time-frame going longer than 2020.

Thank you very much.

Q: Thank you for your presentation. I have a couple of questions. One is that you view the problem only on the issue of supply and demand. But who will finance all these projects? These are multi-billion dollar projects. And the countries need infrastructure. Like China or India or ASEAN countries have very low-level capital formation domestically.

And their institutional setting is not really investment-friendly for the investment from the outside . So not only is demand a big problem, but also the financing of all these projects is a very critical issue that has to be addressed.

Even after you do a pre-feasibility study and a feasibility study you may find that a project can be profitable, but how do you get the financing? The international capital flow has become more scarce. ODA is on the decline. And foreign direct investment is concentrated only on certain countries, like China, for example. So other countries would not have attention from other sources like the World Bank or ADB.

So it may take more than we think, more than you project, to get these projects off the ground, because not only is the demand an issue, but also, I think, the financing is a very critical element in this game.

Thank you.

A: I certainly agree with you. But there is a strange thing about financing. I am not a finance person, so maybe you can take my comment for whatever it is worth.

I do not see China having a problem attracting foreign investors for the West-East Pipeline, despite the problems I see with that project.

The ASEAN countries, in my understanding, have not had a very serious problem in attracting investment for their relatively small pipelines.

The difficulty I see is for lines where you have a combination of political problems and market problems, like South Asia.

I am not saying that it is likely to be easy to finance a Kovykta-to-China-to-Korea pipeline. I do not think it would be easy. But nobody, not BP, the promoter, not the Koreans, no one has suggested it would be impossible. Likewise, no one has suggested it would be impossible to finance a Sakhalin-to-Japan pipeline.

What I have learned from the work that we have done in Asia is that of course there are financial problems, but there is a tendency to try and use these problems as an excuse for not doing a project when the real reasons are perhaps too embarrassing to talk about, like politics, where people really do not want to talk about the political difficulties.

And what we have tried to illuminate in our work is that there are a whole series of problems, but some of them seem more difficult and longer-term than others.

So I would agree with your conclusion, which is that it could take longer than I say. But I am not sure that in many cases this is especially because of the financing.

Q: When we consider the experience in Europe, during the 1980s there was a battle between gas and coal. And it was the natural gas that has won. The biggest reason is that at a low price the natural gas was supplied.

As a result, share for natural gas reached 24-25% in primary energy demand.

In Asia, in order for natural gas to increase, it should compete with coal. And natural gas should win. It should be advantageous economically, or the share for natural gas will not increase.

And I have one concern. If the existing various LNG projects, those supplies are oil majors like from ExxonMobil, and Royal Dutch/Shell. And they should be competitive. Because they are the majors, it is difficult for newcomers to be as competitive as the majors. And they cannot really provide reasonably priced new energy competing with players like Shell and ExxonMobil.

What do you think about the current mechanism that exists that inhibits those newcomers?

A: The question you raised about coal is exactly right. Coal is a fuel that in Europe has been on the decline for many years.

The domestic coal industries have fought and lost out to gas. And

interestingly, they have mostly lost out to imported gas, certainly in Continental Europe.

But, for me, this was a question of the environment and convenience. And I am old enough to remember when I was a child we used to burn coal at home in a furnace. And I remember when we switched to oil, which was much cleaner. And then, I remember when we switched to gas, which was even cleaner.

And the convenience, never mind the environmental benefits, is such that when a population reaches a certain standard of living this is possible.

This is why I laid so much stress on the cost of gas to the customer in Asian countries, because my fear is that for many of these projects the population will not reach the standard of living that will allow them to buy gas to replace some of these indigenous fuels, despite the advantages of gas.

So the point you make, I think, is absolutely the right one.

In terms of LNG competition, I am not sure that I have a good answer for you, except in this sense. I had not studied the LNG market for a long time, but coming back to it for the work that we carried out, I am extremely surprised that with the huge surplus of potential supply of LNG, expansions of projects, new projects, projects which cannot even get starting negotiations because there is no demand, I am very surprised that the mechanism for selling LNG (so-called oil parity) continues.

And I think part of an answer to your question is that I would have expected that some of the LNG sellers wishing to break into the market in Asia would have begun to make a different type of offer to buyers.

But then, frankly, I would have expected that some buyers would have started to make different demands from the sellers.

And it is the resistance to moving away from that traditional way of doing LNG business, which I think is holding back projects.

We now have a lot of experience in LNG. We know what the installations cost is. We know what those costs have been reduced a lot over the last 5-10 years.

We might have expected to see something more of a spot market growing up in Asia, as we are beginning to see in the Atlantic Basin.

Instead, my impression is that there is a resistance in Asia to seeing a big spot market for LNG developing, and a desire to cling to the old long-term contracts with oil indexation.

So that is my part of an answer to you. If people want to break into this market, new people, people who are less powerful than the majors, they have to make a different type of offer to the buyers. And if those traditional buyers want to stick with the majors, I think they will find new buyers who might be

prepared to entertain them.

Q: Thank you very much for your interesting lecture. I am not a specialist in natural gas in Asia. But the title of this lecture is Natural Gas in Asia. And you have divided Asia into three regions: ASEAN, Northeast Asia, and South Asia. What about West Asia, which has huge amounts of natural gas? Why is there no thinking about this region in your presentation?

A: May I just ask you whether you mean what I call Central Asia? Which countries are you thinking about when you say West Asia?

Q: I am thinking about Iran and Qatar, with their huge natural gas reserves.

A: I have to say that those countries in my geographical sense are what I call Middle East countries. Our book has a chapter on the Middle East. But the reason that I restricted myself to this is that it is quite hard in a short presentation just to cover this part of the world that I have tried to go through very quickly.

Of course there is another whole story to tell about Middle East gas. And we tried to tell some of it in our book. But these countries are mostly exporting countries.

But the internal development of gas in Iran, but also with the Dolphin Project in the Gulf, is another very interesting story. And the best answer I can make to you is that perhaps if the IEEJ invites me back I will give another presentation on that story another time.

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