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incentives for the domestic use of gas- to build demand and encourage the development of ancillary industries. As an aside, under WTO, subsidies may be difficult to sustain in the long term. Given the right incentives, the power of innovation should never be underestimated. Gas utilization can be encouraged in areas never before anticipated. Somewhere out there is a small Iranian businessman who is going to use clean affordable gas to turn his small business into a big business.

For that to be achieved, the domestic gas price must be competitive with alternatives. Energy pricing policy is a key element in the further development of the domestic gas industry as it dictates what share of the market gas will win. That will, in turn, determine the type of gas projects that will be commercially viable.

Several methods can be used to encourage the use of gas in commerce and industry. The Dutch successfully used a multi-tier pricing system- commercially structured- in order to provide the right incentives.

Right from the beginning the Dutch also stressed exports to neighbouring countries. The Malaysians took a similar path- stressing LNG exports. The development of an export industry- in addition to earning foreign exchange- helps develop and maintain gas- related

industries in the source country.

In essence, the Dutch took a multi-prong approach, encouraging development in as many different directions as possible. They then allowed the normal market forces to operate in order to determine the optimal path.

That allowed the industry to develop rapidly and deliver maximum economic benefit. I think it is important to point out that the Netherlands is far from the most liberalised market in the world. We are not talking here about ideology but about pragmatic ways of getting things done- and getting them done quickly.

I've emphasized that size is necessary to get things moving. I'm sure you'll forgive me for one small bit of advertising- Shell is the largest private producer of gas in the world. We have extensive experience both in the pipeline business and in LNG where we have an outstanding track record of reducing the costs of liquefaction plant over the last 25 year. We are interested- as are our major competitors- and we believe we have much to contribute.

So, what needs to be done to get this process underway?

First of all a path needs to be mapped out.

We recognize the need for Tehran to protect the national interest in the gas industry and think that we can assist the Government to do so. The examples I have mentioned show that liberalisation is not necessary to establish a viable gas business. Shell works in all types of markets- from the most liberal to the most controlled. We believe that the important thing is to deliver what the customer wants.

There are several major impediments to development in Iran that have already been identified-including some legislative barriers. I believe that, with goodwill, these can be overcome and that an integrated vision of the development of the gas industry can be developed.

Provided the right framework is



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created, the significant investments that will be required to fully develop the industry will fall into place and rapid development will be possible.

Iran, with its huge reserves, will then be able to take its place as a major player in the world gas industry. The benefits to be reaped are many and long lasting. Iran's economy will receive an immediate and a longer-term benefit, becoming more sophisticated and diversified in the process.

Finally, let me summarize the areas where action is necessary for Iran to efficiently develop its gas reserves.

First, integrated planning along the value chain is essential.

Secondly, the legislative barriers to investments in all sectors of the industry need to be addressed.

Thirdly, incentives for investment must be in place, and finally, efforts to develop both domestic and international markets are vital.

The prize is certainly worth struggling for. Shell believes it can help at many levels and in many ways in this complex and challenging process and we aspire to build a long-term relationship with Iran. I hope that, over the coming days and months we will be able to work together to help realise the extraordinary opportunity that is opening up before us.



**Liberalisation of the market does not mean systematic suppression of all rules and regulations. On the contrary, it requires careful regulation, developed over the years, in order to have a consistent and predictable set of rules for all players**

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International oil and gas companies such as Shell, have a lot of experience in a broad spectrum of environments. In partnership with the State agencies concerned they can help and guide development, from the beginning, right the way to a mature developed industry. But first, one has to understand the society and the market. The Integrated Gas Utilisation Study, which we propose for Iran, is an important step in this direction.

The forces pushing the gas business towards liberalisation are global. There are a number of examples from around the world. In some cases it is politics that is driving the change, in others it is purely the economics of the industry and the development of an efficient market economy. In all countries however, this opening up of the market needs to be regulated to ensure that all stakeholders are adequately protected.

At the end of the spectrum, there are a few extensively liberalised markets, particularly the US and UK. The UK has probably moved the furthest in recent years.

The whole system has been opened to competition from the upstream through to the consumer. Third party access to pipeline transportation has typically been a catalyst for market liberalisation. But each market has

progressed through the liberalisation process in its own unique way and at its own pace. As a result of liberalisation, consumer gas prices have largely delinked from oil prices and generally declined, and gas demand has increased, particularly in the power generation industry. These are examples of the benefits that can be achieved from market liberalisation.

Not all markets will necessarily move to full liberalisation. Experience has shown that, where the supply and market conditions are suitable, it can be a very attractive way to go. Other markets, for their own very good reasons, will not move to full liberalisation.

The degree of control exerted by national governments obviously varies- but not as much as some might think. As markets become more liberalised, the role of regulation becomes more significant. At early stages, when companies are state owned or intimately linked with the government, regulation tends to be weak and national energy policies resolve issues. As the distance between the various players grows- and their number increases- regulation becomes more important.

This is necessary to protect everyone involved, to protect the customer, to protect the companies and to protect also the investments of the different people in the value chain.

I'd now like to turn to the present position in the Iranian industry and look at ways it could be further developed. The domestic industry is already substantial- consuming close to 2 Tcf a year. The structure of the industry is still clearly in the early phase. As of today there is no export industry and many opportunities for further development of the domestic industry remain unexploited. In addition there is the geographic challenge- the source of supply is quite a long way from the main consumption centers. What is the best way to move forward?



**Experience in various parts of the world shows that the type of model that will maximise the economic benefits for the country depends on the characteristics of the society- and the market- and that it typically evolves with time**

Strong growth is predicted for domestic energy demand over the coming years. This augurs well for the domestic gas industry, which, with careful coordination would be able to meet much of this demand. Iran currently consumes some 1.2 million b/d of oil. If not consumed domestically this oil could be exported- within the OPEC production quota- earning precious foreign exchange. In addition, there are a number of possible export markets in the region- Pakistan, India and Turkey- and, of course, opportunities for LNG exports.

So the potential for expansion is considerable, as are the economic benefits to be gained. Furthermore, these benefits are likely to grow over time. It is a rich prize for Iran and it is there for the taking. The challenge is to establish a framework to encourage the developments that will quickly deliver all these benefits.

The Groningen example provides some clues in this direction. First of all, an alignment of interests- between the government and the industry- is necessary all along the value chain. There must be private sector involvement in the whole value chain. It brings in capital, taking the load off the government treasury. The private partners in this type of development must, of necessity, be large. They are the only ones with the necessary skills and resources.

Secondly, the Dutch provided



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times. That is, for every dollar generated by the gas industry, a further 5 to 8 dollars is earned in ancillary industries. Groningen has been and still is truly a motor of the Dutch economy.

Groningen has also generated a lot of jobs- both directly and indirectly. In addition to those employed in the operating company it is estimated that some 12-to20 man-years of labour are created by each million dollars invested.

Over the three and a half decades of operation, Groningen has produced approximately 150 billion dollars in revenues for the Dutch Government. Last year, the Netherlands earned 4 billion dollars from gas exports alone.

In one of the most densely populated corners of the world there are also significant environmental benefits. Gas is the cleanest of the hydrocarbon-based fuels- a factor to be taken into account in these post-Kyoto days.

So, in summary, it is quite a success story. A basic resource has been developed in such a way as to maximise benefits to the national economy. The key to success was the adoption, by the Government, of a structure for the gas industry, which enabled both private and government companies to take part in an integrated development of the gas fields, the transportation and the marketing of the gas. Incentives provided to develop gas demand and broaden the industry base were also

crucial.

Another, and more recent good example, of the development of a pragmatic transition to a more diversified gas industry is provided by Malaysia. LNG exports have been undertaken since the 1980s- based on gas from Sarawak where local markets are very limited. Back in 1991, due to rapid economic growth, the power generating system in that country was coming under increasing capacity pressure. There were a number of brown outs. In and, in one case, a local demand peak. combined with a component failure and consequent failure of a single component- had a domino effect that led to a complete and prolonged electrical black out. Prime Minister Mahathir recognized that such problems were a major disincentive to development of the country. Under his leadership, he encouraged active partnership between private investors and state oil and power companies to complete a trunk line gas infrastructure linked to privately built IPPs. The immediate problem was solved in months, and the resulting system has gone from strength to strength as a major motor of Malaysia's growing economy. Over the last 15 years, Malaysia has put in place a structure that has allowed the development of a significant gas business in close co-operation with large international companies. The Malaysian gas industry is I believe another good example of state-private cooperation bringing great benefits to the country.

Having looked at those two examples, let's look at the global picture.

For gas, the market is king. There are of course different types of market- they vary from monopoly of fully open. The structure is dependent on the level of control the government exercises at the various steps in the value chain. Experience in various parts of the world shows that the type of model that will maximise the economic benefits for the



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country depends on the characteristics of the society- and the market- and that it typically evolves with time. It also, of course, requires that the necessary framework be put in place to actually make it happen as intended.

Groningen was developed under a regulated monopoly. The various partners- including the government- were allowed to take stakes and the integrated project went ahead in a fairly tightly controlled environment. Right from the beginning, the Dutch realised the advantage of involving private companies- in order to take advantage of their capital resources and to ensure commercial development. If we look at the development of most major gas resources we find that in almost all countries, no matter what economic system prevails, the scale demands large players at least in the beginning. So, they are either state-owned entities or major multinationals.

Experience around the world shows that state control and involvement is usually high in the early phases of development of large gas resources. However real benefit to the economy comes when a structure is in place to stimulate private investment in all levels of the value chain. Liberalisation of the market does not mean systematic suppression of all rules and regulations. On the contrary, it requires careful regulation, developed over the years, in

be here with you today. I am honored to have been invited to address you on a topic that is close to the heart of Shell, as one of the largest private gas producers in the world. As a representative of Shell International, I have been personally involved in this region

for many years now, and specifically with Iran since 1993. I am very excited by developments here and the opportunities that are opening up.

It is not news that Iran is one of the most energy rich countries in the world. Both its oil and gas reserves are very large and considerable use has been made of them already. As in many other parts of the world, the oil reserves have been more intensively exploited than the gas. The question today for policy makers here in Tehran is how to further develop the gas reserves - 16 per cent of the global total - in such a way as to optimize the benefits for the national economy.

This is not as simple a matter as may first appear. Gas is a wonderful fuel - it has some excellent environmental qualities and, where it is easily available, it is clearly competitive with other energy sources. However, unlike oil, it is not easily storable or tradable and frequently the up-front costs of development and infrastructure dwarf those for oil. In gas projects demand is the key variable, not supply. The market has to be in place or growing so that with such heavy up-front costs, with gas the market is king and not the supply. The time between investments and a good assured cash flow can have to be kept to a minimum. Therefore, upstream gas projects have to be closely integrated

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## Realising Gas Market Potential



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with corresponding downstream developments in order to make them economic.

These characteristics of the industry mean that - inevitably - the development path is quite different to that of oil. Today, I'd like to take a quick look at various ways that gas industries have developed in other parts of the world. My aim is to offer some explanation of the way the industry develops - not argue for a particular model.

My primary example is the Groningen field in the northern Netherlands - a gas find that was instrumental in sparking off the western European natural gas industry. The Nederlandse Aardolie Maatschappij B.V. - known as NAM, discovered it in 1959. NAM is operated by Shell - and I must apologize here for the fact that most of my examples will be from Shell. These are, of course, the projects we know the most about. I'm sure others will be able to talk with more authority on their own projects.

Groningen's recoverable reserves were first estimated at 2 Tcf. Over time that has grown to 102 Tcf. It was brought on stream quite quickly, in 1963 just four years after initial discovery. It reached peak production in 1976, just over a decade later, when 3 Tcf. was produced.

This came about because was clearly the result of the recognition by the

from upstream development all the way to downstream markets. Despite the magnitude of Groningen, to avoid over-dependence on a single resource, from the early 70s onwards the authorities adopted policies that encouraged the search for, and development of other gas deposits in the Netherlands.

Until the Groningen discovery, gas did not have a significant role in the western European energy market. Coal gas and a little natural gas supplied local markets but, overall the energy market was dominated by oil and coal. The investment in Groningen set off a chain of developments, which has led to a still strongly growing - continent-spanning industry.

Early on in the development of Groningen, incentives were provided by the Government in order to increase domestic consumption and to develop exports. Around 50% of Dutch production is exported across Europe. In addition, gas is now traded with the United Kingdom, Norway and Russia, all gas suppliers in their own right. This has given the Netherlands an important position in the Western European gas market, which it is expected to maintain for the next few decades.

The economic benefits for the Netherlands have been substantial. The International Energy Agency estimates that gas has a multiplier effect in the Dutch economy of between 5 and 8

Dutch authorities recognised Groningen's of the potential and took the steps necessary to of Groningen and of what they needed to do to realise it that potential. They established a structure under which the Government and its private industry partners had an aligned interest along the entire value chain-