



Qatar's Role in the Energy Landscape of the Future

Keynote Address by Peter Voser, CEO, Royal Dutch Shell

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Thank you, Your Excellency, Dr. Mohamed Al Sada, for that kind introduction.

I would also like to thank Your Excellency for hosting the 20th World Petroleum Congress here in Qatar, the first time this prestigious event has been held in the Middle East.

We've been asked today to talk about Qatar's role in the global energy landscape of the future. I would like to begin by sharing recent developments in Shell's strategic partnership with Qatar. I'll take a look at the world's future energy challenge and the current outlook for the oil and gas sector. Then I'll discuss the opportunities emerging from the expansion of global natural gas supplies in a bit more detail.

Shell in Qatar

Just last year, Qatar fulfilled its vision to become the liquefied natural gas capital of the world, reaching annual LNG production capacity of 77 million tons. Qatar achieved this milestone in record time ... building the world's largest LNG trains and tankers.

Shell is honored to have played a role in this achievement, as a shareholder in Qatargas 4, and as the provider of operations and maintenance services to the Nakilat LNG fleet.

More recently, Qatar also embraced the vision to become the world leader in gas-to-liquids, or GTL. Just two weeks ago, we joined with our partner Qatar Petroleum to fulfill that vision as The Emir, His Highness Sheikh Hamad bin Khalifa Al Thani, inaugurated Pearl GTL.

Pearl GTL provides Qatar new ways to derive higher value from its abundant gas resources, through high quality fuels and related products.

The visionary leadership of His Highness, The Emir, together with this nation's pioneering spirit, have made such achievements possible.

Over the last five years, Shell has invested almost 20 billion dollars in Qatar. It is a reflection of this nation's business climate that we feel confident to make such a large commitment.

Indeed, I was delighted to sign a Heads of Agreement on Sunday for a petrochemicals complex with Qatar Petroleum.

This project will feature a mixed feed cracker and a 1.5 million tons per year MEG plant, the largest ever built. This agreement consolidates Shell's strong partnership with Qatar Petroleum across the full chain of hydrocarbon development.

The project will not only supply the world with much-needed products, but it will create more jobs and opportunities for derivatives here in Qatar, further expanding and diversifying Qatar's industrial base in line with the Qatar National Vision 2030.

Just last month, Qatar Petroleum and Shell also announced plans to create a Project Management Centre of Excellence here in Qatar. The centre will help develop local competence by sharing skills and experience in managing complex, large-scale projects. It's another example of the great physical and intellectual infrastructure that is being created here in Qatar.

Our partnership with Qatar also stretches overseas. Shell brought Qatar Petroleum International in as a partner in our Singapore Petrochemical operation in 2009. And together with PetroChina, we are making plans to develop a world-scale refinery and petrochemical complex with QPI in China.

The Future Energy Challenge

Qatar's rise to prominence in the global energy sector could not have come at a more important time.

Rapid economic development in non-OECD countries is driving sustained, and long-term demand growth for all forms of energy.

And we know that the global energy mix is going to be dominated by hydrocarbons for decades to come. This places a particular responsibility on our industry to mitigate against growing environmental stresses, in particular around carbon and water.

Energy demand could increase by two thirds to 2050. And meeting that demand will need the development of more complex oil & gas reserves, with implications for higher costs and higher prices.

This is the outlook with which most of us are familiar.

Our scenarios team would say that if we project historic patterns of energy use associated with economic development, we end up in 2050 at about three times the level of 2000. There will be advances in energy efficiency, which we can realistically expect to moderate this demand by around 20% over the same period.

On the supply side, ordinary supply increase in that period could be about 50%.

Yet this would still leave an enormous gap between supply and demand equivalent to the size of the global energy industry as it stood in 2000.

In oil alone, this means that we would need 65 million to 70 million additional barrels a day to bridge this gap. That's equivalent to nearly two OPECs of additional supply, not to mention the additional capacity we need to bring onstream to absorb the underlying production decline.

This year's events in Japan, North Africa and the Middle East have added pressure to oil prices that have been rising anyway on the fundamentals. In addition, there are a lot of regulatory and political uncertainties, which are adding to both price and cost volatility in this long-term energy growth trend.

As a result, we are entering a "zone of uncertainty." To get through it, we will need not only an enormous expansion in supplies, but also very strong measures to moderate demand.

Pro-active demand growth moderation would involve well-targeted policies and improved efficiency in transport, cities and power.

However, if the demand trends are ignored, we could see demand moderation through price shocks, knee-jerk policies and frustrated aspirations.

Diversity of supply

So how can the oil and gas sector ensure resilience through all this?

First and foremost, diversity of supply will play a role. Our scenarios team believes that renewable energy sources could supply up to 30% of global energy by 2050, compared with just over 10% today (for the most part traditional biofuel and hydro-electricity).

That would be a massive achievement, given the enormous financial and technical hurdles facing new energy sources. But it will also mean that fossil fuels and nuclear will still account for around two-thirds of the world's energy in 2050.

Supply growth will mostly come from OPEC countries, growing at an average of 2% out to 2030, with an important role for Iraq.

However, we don't yet know whether the recent developments in the some countries in the Middle East and North Africa region will impact the longer-term picture for OPEC supplies.

Non-OPEC conventional crude supply has been relatively flat over the past years and is projected to remain so. We will also need to unlock significant additional non-OPEC conventional resources. This could come from offshore Brazil, further growth in Africa, and places like Kazakhstan.

Further resources could come from unconventional plays such as the Canadian Heavy oil deposits, light tight oil in North America and, of course, the Arctic offshore, whether in Alaska, Greenland, Norway, or Russia.

Much of this will take many decades and huge investments to unlock.

Satisfying rising demand will be expensive – the world must invest \$38 trillion on supply infrastructure in energy projects over the period of 2010-2035, according to the most recent IEA's World Energy Outlook. This is significantly higher than past spend trends.

That said, although large in absolute terms, this investment is relatively modest to the size of the world's economy, amounting to about 2.5% of global GDP on average over the next 25 years.

Natural gas

If we are going to meet demand and at the same time mitigate the environmental stresses, it's clear natural gas is going to have to play an even bigger role in the mix than it does today. This is especially true for the power sector, where we need to do more to advance the use of natural gas over coal.

Gas-fired power is faster and much less costly to install than any other source of electricity. It requires less than half the capital cost of coal per megawatt-hour.

In addition to the electricity sector, the abundance and affordability of natural gas is opening up new opportunities for gas, in chemicals and transport.

I already mentioned the heads of agreement for a gas-to-chemicals project here in Qatar – I can't give you a stronger proof point than that.

There is also growing momentum for LNG as a transport fuel for heavy trucks, buses, ships, barges and trains.

And of course there is gas-to-liquids technology, symbolised by Pearl GTL, another strong proof point. Pearl is ramping up to play an important role in diversifying the value Qatar derives from its gas resource through conversion into liquid fuels, lubricant base oils and chemical feedstocks.

It will carry Qatari gas into new markets, further expanding Qatar's international role while providing more balanced exposure to oil and gas price volatility.

Given all these opportunities, the recent dramatic expansion in the world's natural gas supplies is fortunate. Thanks to the boom in unconventional gas, worldwide recoverable gas resources are now estimated to be equal to about 250 years of current production.

This supply increase coincides with the expansion of liquefied natural gas. In the past two years alone, global liquefaction capacity has increased by about 40 percent, driven by demand growth in Asia and here in the Middle East.

Qatar, now the world's largest LNG exporter, accounts for more than a quarter of global liquefaction capacity. In developing its LNG production capacity, Qatar has created economies of scale that make its LNG cost-competitive even in the most distant markets.

The rapid global expansion of LNG in the coming decade is likely to include some surprises. For example, even North America is now debating whether to become an LNG exporter, something nobody would

have guessed possible five or 10 years ago. In fact, we are looking at exporting LNG from Canada to Asia-Pacific markets.

Growing demand for LNG will be met by further technological breakthroughs, like the ones we have seen here in Qatar.

Another example is Floating LNG, which will allow us to produce gas from offshore fields that previously would have been too costly to tap.

Conclusion

I'd like to conclude with a word about the changing role of partnerships in our industry. Our partnership with Qatar Petroleum is a good example.

In today's volatile world, one of the most effective ways for companies to address new and daunting business challenges is by forging strong, deep ties with partners – partners whose know-how, strategic aims, or geographic reach fill gaps in your own capabilities.☒

At Shell we have a long tradition of partnering with other oil and gas companies, particularly NOCs. In the past, the relationship typically was straightforward: We gained access to resources in return for technology, capital, or access to big consumer markets.

But the world is changing. NOCs increasingly have strong technical capabilities. They have strong cash flow and less need for outside capital. And they are moving beyond their borders, accessing resources around the globe.

This is where end-to-end integration of value chains has a key role to play. Integrated energy companies can continue to help orchestrate this through partnering and investments, from supply to consumption. The natural gas sector is a case in point.

Shell has forged several innovative strategic partnerships in recent years. One of which we are especially proud is our partnership with Qatar Petroleum and the State of Qatar.

As we look ahead at the significant challenges facing our world, it is through partnerships such as these that we can summon the innovation, resources, skills and cooperation needed to succeed.

I'm optimistic we will.

