



China's energy future – Bob Dudley's speech to Tsinghua University

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Dear Mr Zhang Guobao, Prof. He Jian Kun and Ladies and Gentlemen. Good afternoon

Thank you for inviting me to visit you here at Tsinghua University today.

It is a real privilege for BP to be associated with an institution, like Tsinghua, which has such a great global reputation for education and innovation.

I am particularly pleased to congratulate you on your 100th anniversary. BP also celebrated its centenary two years ago – so we are a similar age. I hope we are still working together when we are both 200 years old!

I am also honored to be asked to contribute to this series of talks. I think it is important for the future leaders of any country to look at the world beyond their own borders.

For me of course, this visit is also a chance to see and talk with the leadership about what is happening in China and here at Tsinghua.

And what I see here at the university is, that among the many issues you are working on, you are addressing two of the biggest challenges that China faces – how to make energy supplies secure – and how to make energy use sustainable at a time of rapid growth.

BP has been committed to China since the 1970s and I have been working with China for a very long time.

I remain personally committed to my company's continued investment in China for the long term and to working with our Chinese partners to support and find solutions to your country's energy security and environmental agenda.

As one example of this, BP supports the Tsinghua - BP Clean Energy Research and Education Center. This facility is doing really valuable work in areas such as energy saving, natural gas development, low carbon power generation and transport modeling.

This is a very tangible demonstration that some of China's best minds are fully focused on the issues of energy security and sustainability. And these are the issues I would like to focus on in my remarks today.

So in the next 25 minutes I will first explain the global context in which we see China's development.

Then I'll look at what this means for China and then share how BP sees its role in helping tackle the challenges.



1. The global energy future

So let's first consider the global picture. Earlier this year our company published a set of projections that we call the Energy Outlook 2030.

Most of the projections I am going to discuss are from what we call our 'base case'.

This is a scenario that we regard as the most likely outcome for the world's energy in 2030.

It is based on our assessment of how the key drivers of demand and supply are likely to evolve - as well as economic and policy trends.

We estimate that by 2030 the world could be consuming as much as 40 percent more energy than it does today. That is a huge number and is equivalent to adding two more Chinas to the world's consumption of energy.

This increase will be partly driven by industrialization - but partly by sheer population growth.

Almost all of this growth - we estimate 93% - will come from the fast growing emerging economies such as China, Indonesia, India, South America and the Middle East. At the same time, energy demand in the US and EU is expected to be relatively flat.

This pattern is not new.

Over the past 40 years, rapid growth in the emerging economies outside the OECD grouping has driven global energy consumption up 2.5 times - and the balance of demand has been shifting rapidly.

In 1970, the OECD countries used around 70% of the world's energy.

Today, the non-OECD countries have caught up and consumption of the world's energy is split equally between OECD and non-OECD countries.

And by 2030, we expect that non-OECD countries will account for 65% of global consumption or two-thirds.

So within the space of 60 years, we will have seen one group of countries take over from another group as the world's major consumers of energy.

So how will this phenomenal growth in energy demand be met? We expect that all forms of energy will be required, but that non-fossil fuels will likely account for a significant source of growth for the first time ever. Between 2010 and 2030 the contribution to energy growth of renewables is projected to increase from 5 percent to 18 percent.

What about fossil fuels? Their contribution to primary energy growth is projected to fall from 83 percent to 64 percent, with coal and oil losing market share as natural gas ramps up.

Coal will continue to be important in emerging economies like China where resources are plentiful. And although oil demand growth will be low, given the decline in existing fields, we will need to continue to keep exploring for new sources of supply.

Over the same period, we expect non-OECD countries to become more energy efficient. This will have a positive effect on energy intensity - in other words the amount of energy needed for each unit of output.



So what does all this mean for the environment? In the last two decades, carbon dioxide emissions have grown by nearly 2% a year. That is a high number.

Our base case assumes that countries can reduce that rate of growth by almost half by encouraging energy efficiency and lower carbon energy. However, given the sheer scale of the growth in demand, we still expect CO2 emissions to be more than 25% higher in 2030 versus today.

This is of course a projection, not a proposal. It's not what we want to see but what we believe is likely to happen. It should be a wake up call.

In BP we would like to see faster progress, including a price for carbon and targeted transitional support for renewable and low carbon technologies that are near to commercialization and have clear potential to compete.

So, the environmental challenge is clear.

But there are other challenges too. With many of the world's major oil and gas basins in decline, our industry will have no choice but to continue to look to new and increasingly challenging frontiers. These include the Arctic, unconventional energy sources like shale gas and the very deep water.

Blazing new trails always carries risks that need to be understood and managed

In BP we understand this only too well after the tragic accident last year on the Deepwater Horizon rig in the Gulf of Mexico that claimed 11 of our colleagues' lives.

This was a complex and unprecedented accident. Our investigation and others have identified a series of failures that contributed to it. Among other things, these relate to cementing of the pipe in the well, the interpretation of various pressure tests of what was occurring deep in the well and something called the blow-out preventer on the seabed, which did have multiple fail-safe devices, but did not activate.

We are now taking steps to implement the lessons that have been learned from this tragedy, and we are sharing those lessons around the world.

For example, we will now drill all of our oil and gas wells to the same high standards worldwide, no matter what contractor we use.

We are using third parties to verify that the blow out preventers will work in an emergency.

We are enhancing our oversight of cementing work performed by our contractors.

More widely, we have set up a powerful new safety and operational risk organization which has 500 new experts embedded in BP's units worldwide to advise and - if needed - intervene.

This organization also has a highly experienced central team which maintains and updates BP's safety and risk management standards. Already the organization has intervened in a number of situations to make absolutely sure that risks are being managed properly, even if this involves delaying an operation or stopping production until we are sure it is safe to proceed or deciding not to use a particular rig.

We responded immediately to the accident by mobilising more than 48,000 people, 6500 vessels and 125 aircraft. One year later, the beaches have been cleaned and tourism and fishing have been restored. In time, I hope that it will be recognized as an act of great corporate responsibility.



This was a shocking tragedy for BP and it caused us to ask many questions – but we believe we should continue to deploy the experience and capability we have built over the decades in deepwater drilling, while implementing the lessons that have been learned.

And it is good to see governments and partners demonstrating that they have confidence in us. In the last year we have been granted new contracts in the deepwater in many places, including China of course.

The disaster has made us determined to operate safely and steadily. We are putting more emphasis on all the factors that contribute to creating value in a long-term, sustainable, way. These factors include safety, capability, rigorous standards, advanced technology and strong relationships.

I know that such factors are also highly valued in China. Indeed I have great respect for China's systematic, long term approach. There is a lot here for us to learn from.

2. China's energy future

So with those opportunities and challenges in mind, let's look at the specific circumstances of China.

The recent history of China is a story of scale and speed. China is currently the second largest economy in the world, having recently overtaken Japan. It is widely expected to become the world's largest economy before 2030.

Over the last 10 years, Chinese GDP has almost tripled and its energy consumption has more than doubled.

It has become the world's largest energy producer, the largest energy consumer, taking over from the US, and the largest aggregate emitter of energy-related carbon dioxide – according to the International Energy Agency and others.

Of course, we appreciate that on per capita basis, China's emissions are still far below those of the US and other developed countries.

Our 2030 Outlook suggests China's energy demand will increase by 80% over the next 20 years – that's twice the rate of growth for the world as a whole and is likely to account for over 40% of the increase in total energy demand in this period.

These are all projections, but they are phenomenal. They show how significant China is in the energy world. But they also raise some challenging issues, not least around sustainability.

I know how seriously the Chinese leadership is taking this issue. There is a deep recognition here that this energy intensive pattern of growth is not sustainable and a matching aspiration to move towards an energy-efficient, lower-carbon approach.

There is also a recognition that China will play a very large role in the global effort to address climate change. Just look around this university for proof of that.

And we are already seeing dramatic results. In the last Five Year programme - ending last year - there was a target to reduce the energy intensity of GDP by 20%. That was an extremely ambitious target - but it was essentially achieved, with an outcome of 19.1%. Well done!

The new Five Year programme – running up to 2015 – sets out even more clearly China's energy aspirations.



It has another series of ambitious targets, for example to reduce energy GDP intensity by a further 16%.

Another goal is to almost double the share of non-fossil fuels in China's energy mix - from around 8% today to around 15% by 2020.

This will be achieved by lowering the proportion of coal in the mix and significantly increasing the proportions of natural gas and renewables.

For example, China intends to double its use of natural gas from 4% to 8% over the next five years.

On the renewables front, China has already made a good start. The country now has more installed wind power capacity than any other country and plans to triple that capacity by 2015. It also leads the world in solar panel manufacturing.

Linked to sustainability is the issue of energy security - whether China can gain access to enough energy to fuel its growth.

This is being addressed through greater efficiency, increased use of renewables, new investment to develop China's reserves of oil and gas, as well as investment overseas.

On this score, the challenges are not so much with coal but with oil and gas. China produces less than half of the oil it uses and has become the world's second largest oil importer.

However, over the last few years, China has made great progress in improving oil security. This includes pipeline links with Central Asia and Russia, the building of strategic petroleum reserves, more investment in domestic exploration and overseas investment by Chinese companies.

In terms of gas, currently China produces the majority of the gas it uses and has access to LNG imports from Australia and a variety of other sources in Asia and elsewhere.

Gas pipelines – as well as oil pipelines – have been developed or are being planned between China and neighbouring countries. And within China there are possibilities for developing so-called unconventional gas, such as coal bed methane – or CBM - and shale gas.

Nevertheless, because China's indigenous gas and oil resources are less abundant than coal, developing and accessing these resources will be challenging.

So, to sum up, China is the world's biggest producer and consumer of energy and on its way to being the world's biggest economy. But it is also well aware of the need to increase energy efficiency and shift the energy that is used towards lower carbon options.

And given that powerful role, it is clear that governments and international companies need to shape their strategies with China's ascendancy very much in mind.

3. BP and China – today and tomorrow

In BP, we are fully aware of China's significance in the world. As mentioned, we have been working here since the early 1970s and we think of ourselves not only as an inward investor but as a local company, with a large workforce of Chinese people.

We have built strong relationships, including those with central and provincial governments and the Chinese national oil companies, Sinopec, CNOOC and CNPC.



We have developed very good local business partnerships and those partnerships are now making multiple investments in China and beyond.

Our total investment in energy infrastructure by the end of this year will be nearly \$5.0bn. We have 27 JVs with Chinese companies as well as wholly-owned operations. We have 1,200 BP staff in China, along with 3,600 joint venture staff and 12,000 contractors. We also provide opportunities for our Chinese staff to work in our other businesses around the world.

We are a major petrochemical producer, a large scale fuel retailer, a top premium lubricant marketer and a major international gas supplier and producer. We participate in science and research programmes and we support social and community activities that meet China's needs.

Our aim, in China and around the world, is to use the capabilities we have developed in BP over 100 years to help countries access secure and sustainable supplies of energy.

And if we look at our partnerships in China, I hope these will illustrate we can clearly see how BP is supporting the national strategies that I have referred to.

Let me briefly look at three – natural gas, oil supply and sustainable energy.

We are in action in various ways to support the greater use of natural gas.

We have gas production interests in Indonesia and Australia from which we ship liquefied natural gas to China.

And we were pleased to be invited to be the only foreign investor in China's first LNG re-gasification terminal at Shenzhen.

We are in partnership with CNOOC in the South China Sea to produce natural gas, and bringing the story up to date, we have recently signed new agreements with CNOOC to explore for gas in two deepwater blocks.

Looking to one of the most significant and surprising contributions to natural gas supply over the last decade – we turn to shale gas. Its impact on the US has been phenomenal, moving the US from a country far short of the natural gas it needs to one that is currently oversupplied. Shale gas could also be a game changer in China. BP stands ready to leverage our technology and operational experience in shale gas and coal bed methane to develop this virtually untapped resource.

China is in the early stages of a long journey to develop natural gas as an alternative to coal. We are very much on board and looking forward to participating in that journey in every way we can.

In terms of oil, we are also partnering with Chinese oil companies in accessing oil supplies through joint exploration and production activities overseas.

Notably, we are working with CNPC in Iraq in a huge project to expand production from the super-giant Rumaila field. This is a great example of working alongside a Chinese company outside China, but it is not the only one.

We are also partnering with Sinopec in Angola, and with CNOOC in Indonesia and Australia. In total, we have more than \$2 billion total investment in partnerships with Chinese NOCs outside China.

At the other end of the supply chain – the retailing of fuel - the 800 retail sites that we operate with our partners to serve 200,000 customers each day in China.



Between production and retailing of oil products comes the refining of crude oil into fuels - and of course BP also has global experience in this sector. So we are always interested in possibilities to create world class refineries in China.

And we are playing a multi-faceted role in China's efforts to achieve more sustainability in its use of energy.

In addition to the new research workstreams which we launched this year within the Tsinghua -BP Clean Energy Centre, we have a long standing partnership with the Chinese Academy of Science.

Another joint venture with the academy is the Clean Energy Commercialization Centre, based in Shanghai.

This has been in place since February 2009 and is particularly focused on commercializing advanced conversion technologies developed in China to create more sustainable ways of using coal.

Through our Castrol business, we also provide advanced lubricants – and in fact we have recently opened a specialist lubricants technology center in Shanghai which is working to help auto manufacturers meet new emissions standards.

Our petrochemicals businesses in China are very much part of the drive to reduce energy intensity in industry. One example is the technology being used at Zhuhai, where we have a joint venture with the Zhuhai Port Company making PTA, which is used to make plastic bottles, packaging and textiles.

We have two plants at Zhuhai and are planning a third which will be the world's largest single PTA plant. The advanced technology used in the second plant reduced greenhouse gas emissions by 65% and liquid waste by 75% compared to conventional plants, and the new facility will bring about another step change. Indeed the Ministry of Environmental Protection Administration has listed the project as a role model.

We're also applying BP patented technology in the effort to maximise efficiency at our acetic acid plants at Chongqing and Nanjing, where we are partners with Sinopec.

I would like to especially acknowledge the support and advice from Mr Zhang Guobao, who has lent his generous support to a number of projects we are operating today. Thank you very much for your support, Mr. Zhang.

I want to add that in everything we do – here as elsewhere - we strive to keep people safe by managing risks properly.

We are acutely aware of the importance of this after the accident in the Gulf of Mexico. In China we seek to operate safely and set a good example. One business that has set such an example is the SECCO ethylene plant near Shanghai, where 88 million hours have been worked by 10,000 people without a fatality or major process safety incident.

In short, BP's activities with and within China aim to serve several mutual objectives – meeting demand, increasing sustainability and supporting the economy while providing greater economic prosperity for our stakeholders.

We hope that as an international energy company, we can continue to be a trusted energy partner to China, and support the next stage of your growth.

Conclusion

In closing, I'd like to summarise with two points and two questions.



Firstly, China is at the centre of a massive, unprecedented shift in the global economy and the global energy industry.

The growth of the large emerging economies – and especially China - is the single most important long-term economic trend of our times.

Secondly, we must recognize that China is unique in many ways – the biggest energy producer, the biggest energy consumer, the biggest contributor to carbon dioxide emissions. But also the country with the most potential and, I would observe, the greatest commitment to manage its energy footprint.

In many ways, China's actions will have a huge impact on the way the world develops. But it faces tough questions, including these. Can China secure the energy it needs to meet its development goals? And can it make its energy consumption sustainable?

I believe there is a very good chance that it can. But as I am sure you agree, China will succeed by continuing along the path of partnership that it has travelled so successfully in the last few decades.

China will be looking for resources, capability and supplies from many partners to achieve sustainable growth.

What I can assure you as one of those partners is that BP is fully committed to China for the long term and we look forward to working with you for many years to come.

And as for you students here today, I wish you all the very best in your work ahead. Enjoy your time at Tsinghua, as it is a great university which you will come to appreciate more in time.

Thank you everyone. Sheah Sheah.