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# **Adapting to Global Energy Pattern Adjustment, Embracing a Brighter Future of Petroleum Industry through Technological Innovation**

Keynote Speech at CEO Plenary of 2013 IPTC

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## **Zhou Jiping**

President of China National Petroleum Corporation

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## Ladies and gentlemen, distinguished delegates, good morning!

I feel very pleased to attend this great event and deliver a speech at this session of IPTC 2013.

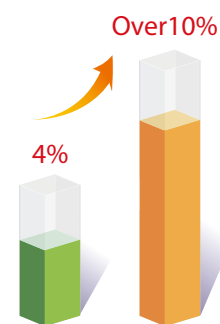
March is still chilly here in Beijing, while it is indeed a time of rebirth and new beginning. To some extent, our world economy is just like this early spring season. We have already seen some signs of recovery, while low economic growth is still lingering in many countries. The pressure from inflation and asset bubbles is still evident. During the past few years, the world's petroleum reserves and output keeps growing, and we have also seen robust upstream investment and international trading. Meanwhile, the pattern of global energy supply and demand is gradually undergoing new changes. Quietly but significantly, the westward movement of supply gravity and eastward shift of demand gravity is coming into being. Natural gas is entering its golden period. And there have been new adjustments or even transformations in such aspects as geopolitical patterns, oil price trends, shale gas development and the policy orientations of major producing and consuming countries. We are faced with severe challenges brought about by the replacement of old, multi-polarization and more diversified development.

Now, I would like to share with you my thoughts on the future development of the petroleum industry.

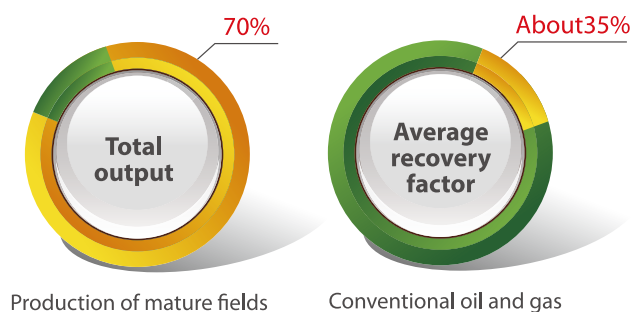
**Firstly, traditional fossil fuels will continue to play a dominant role in our energy structure for a fairly long period of time, while new sources of energy are due to rise gradually.**

Ever since the Industrial Revolution, fossil energy has been the essential driving force for human society and civilization. We have had the era of coal and oil, and now we are embracing a new era of natural gas. The development of fossil energy, especially oil and

gas, has always been full of vigor and vitality. By the middle of this century, oil and gas will still be the world's most abundant and reliable energy sources, and its dominant position in the global energy mix will remain unchanged. At present, the major energy source of China is still coal, taking up nearly 70% of our energy consumption framework. However, we are sure to see an ever-rising proportion of oil and gas in China's energy structure. For example, the weight of natural gas is expected to grow substantially from 4% to over 10% in our country's primary energy mix. On the other hand, the development of non-fossil energy has attracted widespread attention and grown rapidly since early this century. According to the plan of the Chinese government, the proportion of non-fossil energy is expected to reach 15% in our domestic primary energy mix in 2020.



Weight of natural gas



Production of mature fields

Conventional oil and gas

**Secondly, the further development of conventional petroleum resources is still of huge potential and great practical significance, while unconventional resource development enjoys very broad prospects.**

In recent years, we witnessed a boom of unconventional oil and gas development around the world, and some gratifying achievements have already been obtained. As a result, unconventional oil and gas has become an increasingly important component of the resources to succeed. Nevertheless, it should also be noted that the world's growth potential still largely relies on conventional resources. Therefore, it is important to continue to raise the recovery factor of conventional resources and further tap the potential of mature oilfields. Nowadays, mature fields contribute 70% of the world's total output, and the average recovery factor of conventional oil and gas is only about 35%. Over the past few decades, CNPC has remained committed to unlocking the potential of mature fields together with developing and applying advanced EOR technologies. Thanks to our great efforts, CNPC has created the miracle of stabilizing the output of Daqing Oilfield at 50 million tons and 40 million tons for 27 and 10 consecutive years respectively, and raising the recovery factor to over

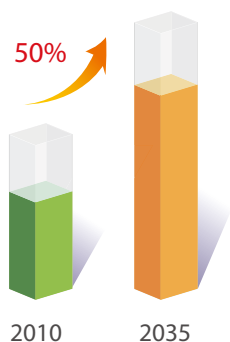
50% in Daqing's main fields. In Changqing Oilfield, we have succeeded in ramping up its output to 45 million tons in a relatively short period of time by effectively developing tight oil and gas resources. Moreover, our advanced technologies and expertise have been applied in countries like Peru, Venezuela and Kazakhstan, and their highly mature fields with a history of decades or of even more than 100 years, have achieved substantial increases in output.

**Thirdly, natural gas development is being accelerated, and we are due to place emphasis on both oil and gas in the coming decades.**

As a green fossil energy, natural gas has gained increasing attention and achieved rapid development worldwide. It is estimated that global gas consumption in 2035 will increase by 50% in comparison with 2010, accounting for over 25% of the world's energy mix. Natural gas has a huge reserve base with a reserve life of over 100 years for conventional gas and 200 years for unconventional gas. It is foreseeable that oil's weight in primary energy mix will decline in the next few decades. However, it is predicted that total oil consumption will still increase considerably, and oil will still maintain its position as the world's largest energy resource.

The changing trend of global energy patterns reveals that: first, technological innovation should be taken into consideration as a major factor when studying and judging energy situations. Technological innovation is vital to our industry and has brought about the adjustments of the global energy pattern. Second, it is crucial to have the concept of a "global chain of energy security" in mind. In today's world, energy security is no longer an issue of only one country or region. Actually, the interdependence and balance of supply and demand security, the closer collaboration among host countries, importing countries and oil companies have led to the

Global gas consumption



formation of a very tight security chain. Any broken part of the chain may negatively impact the whole situation.

CNPC stands firm on our business in China, and at the same time, expands our overseas presence in a proactive manner. We have brought technology and management expertise to our international partners, and promoted the socio-economic development of the host countries we collaborated with. Through our own efforts, CNPC has made its due contributions to increasing global supply, stabilizing the market, and ensuring a global chain of energy security.

Based on the above thoughts and CNPC's practices, I would like to take this opportunity to share with you the following suggestions:

### **1. Maintain and increase investment in oil and gas exploration and development.**

From the U.S. subprime crisis to the global financial crisis and world economic recession, almost all industries have suffered to various degrees. Under such circumstances, our investment in exploration and development has shown significant growth. According to statistics, 350 oil companies in the world had a total exploration and development investment budget of 600 billion dollars in 2012, up 11% year-on-year. And this figure is expected to witness another 7% increase this year. During the three years from 2009 to 2011, CNPC's exploration and development investment recorded an annual average growth rate of 8%. Therefore, our confidence in maintaining and intensifying upstream investment is justified, in order to play our role in boosting the economic recovery through the development of our industry.

### **2. Further unlock the potential of conventional resources and mature fields by fully utilizing technological innovations from unconventional oil and gas.**

Our industry is now keen on learning from North America's successful experiences in shale gas development. Specific situations vary greatly from country to country, so simply duplicating the process will not work. And it should be noted that, since conventional exploration and development are changing from mid and deep layers to ultra-deep, complex traps and complex reservoirs, we are now in the position to utilize unconventional technologies to discover new conventional reserves and enhance oil recovery. In China, lots of conventional fields are facing such great challenges as ultra-low permeability, ultra-deep layer, and high steep structure, which require us to apply unconventional techniques. In recent years, CNPC utilized a series of new fracturing technologies in conventional wells by absorbing unconventional development technologies. This has deepened our understanding and characterization of complex reservoirs, and improved single well productions and the efficiency of exploration.

### **3. Carry out international technological cooperation in an innovative manner, so as to achieve mutual benefits and win-win at a higher level and broader range.**

In the face of increasingly complex situations, oil companies, service companies, IOCs, NOCs, large companies and small companies, all of us must join hands to cope with exploration and development challenges. As China's largest oil and gas producer



and supplier, CNPC has always been a proactive practitioner of international cooperation. We have established excellent relationships with host countries, oil companies and service companies. And we keep making new progress in our collaboration with foreign partners in China. Recently, we achieved daily single well production of over one hundred thousand cubic meters in a number of shale gas wells in south Sichuan, and one of these wells is the joint efforts with an international major. I would like to take this opportunity to express our heartfelt thanks to all of our international partners. CNPC is willing to further develop our international cooperation in an innovative manner, so as to jointly crack technological bottlenecks and achieve win-win results.

Ladies and gentlemen, our petroleum industry is now in an era of significant adjustments, which is full of opportunities, challenges and risks. I think that we should be far-sighted instead of overambitious, pragmatic instead of hesitant to act. Let us joint hand and be more open-minded and conduct innovative cooperation with a strategic vision for the sustainable development of the global petroleum industry.

Thank you!