China and India's Energy Policy Directions:
Implications for the Global Oil and Gas Markets and Iran Sanctions

Presented

by

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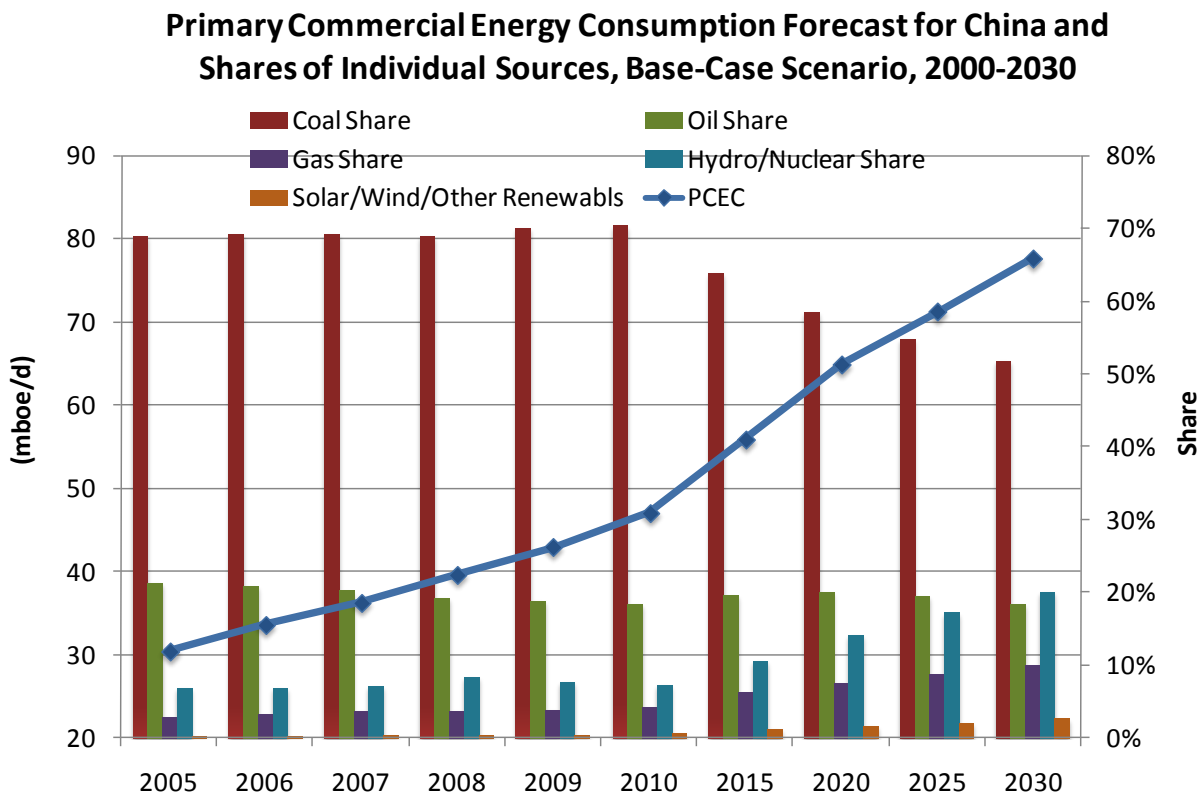
I. China

The Energy Scene

- Future growth of PCEC is led by gas, nuclear power, and hydroelectricity, but coal will continue to play the dominant role by 2020.
- Beyond 2020, there is a good chance that China's coal and oil consumption growths will slow down considerably, while gas and nuclear power continue to the leaders.



Note: 2010-2030 data are projections.

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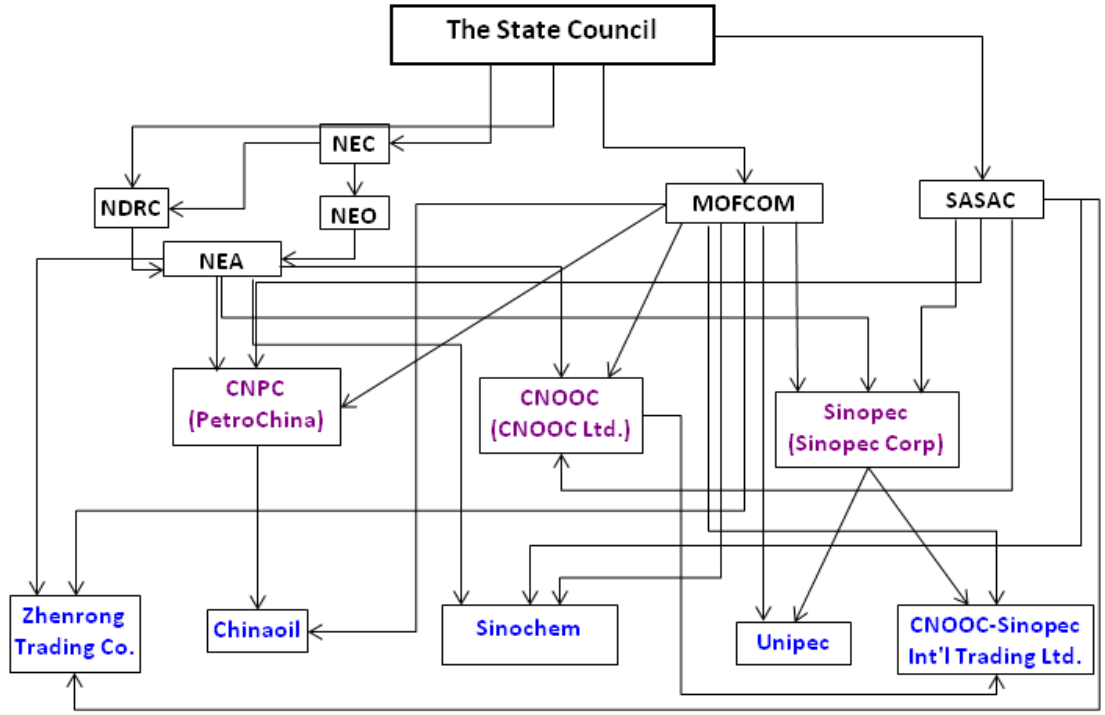
Who's Who of the Chinese Oil Industry

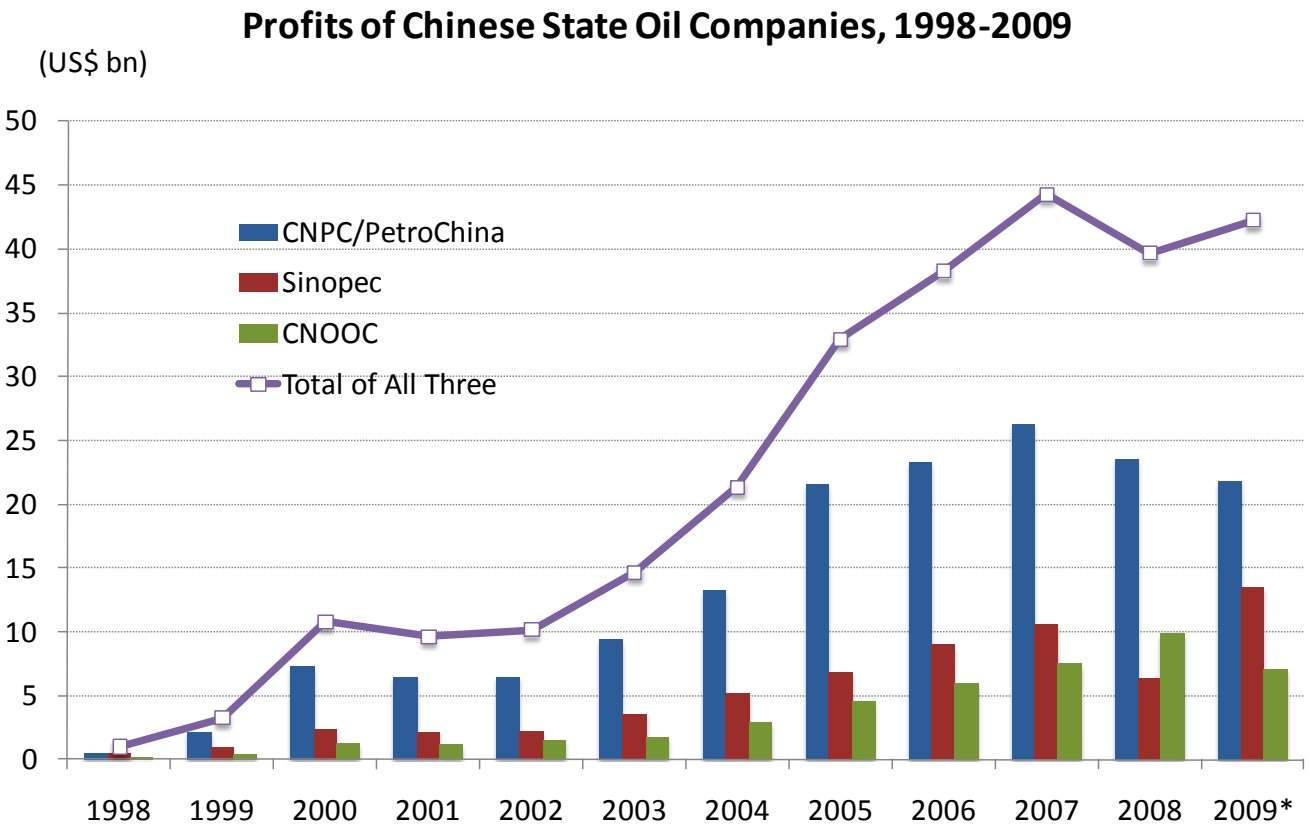
Organizational Chart of the Chinese Petroleum Industry (State), 2010



NEC: National Energy Commission. NEA: National Energy Administration. NEO: National Energy Office.
NDRC: National Development and Reform Commission. MOFCOM: Ministry of Commerce.
SASAC: State-Owned Assets Supervision and Administration Commission
CNPC: China National Petroleum Corporation. PetroChina: PetroChina Company Limited.
Sinopec: China Petrochemical Corporation. Sinopec Corp: China Petroleum and Chemical Corporation
Unipec: United International Petroleum & Chemicals Co., Ltd. Chinaoil: PetroChina International Co., Ltd.
CNOOC: China National Offshore Oil Corp.

Profits of Chinese State Oil Companies

- Despite China's price controls for products before 2009 and fluctuations in the international oil prices, the net profits of CNPC, Sinopec, and CNOOC continue to be very strong. Together, the three account for 55-75% of the total net profit of the petroleum and chemical sectors in China.



*2009 data are estimates.

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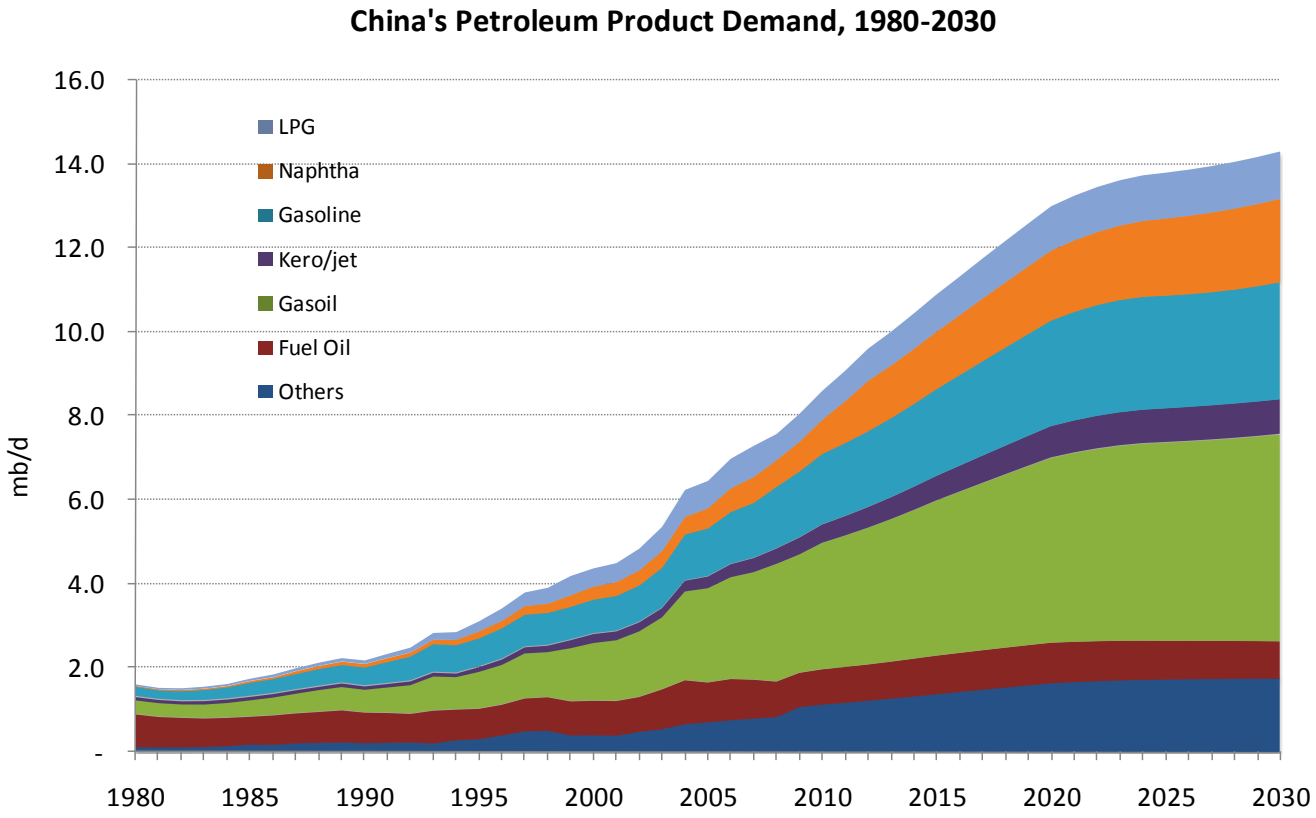
China's Petroleum Product Demand

- Petroleum product demand in China reached 8.06 mb/d in 2009, up by 6.3% from 2008.
- The demand was hit by the economic downturn in late 2008 and early 2009. However, demand began recovering since the second quarter of 2009.
- For 2010, we project that China's demand growth will be 6.8%, reaching 8.61 mb/d.
- China is currently the second-largest oil consumer in the world after the US. The country continues to be the driving force in the region. For the Asia-Pacific region as a whole, China is likely to account for more than 60% of the incremental demand growth through 2030.

China's Petroleum Product Demand (cont'd)

- The future oil demand growth is robust for China. However, a big uncertainty is expected to emerge after 2020 when the demand growth may be slowing down significantly.



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Refining Capacity at Present

- At the start of 2010, China's total refining capacity reached at least 10.7 mb/d, which included many locally-owned small refineries.
  - Sinopec 45%
  - CNPC/PetroChina 31%
  - Local/Other NOCs 24%.
- In 2009, China processed 7.5 mb/d of crude oil, up by 8.2% from 2008. Back in 2000, the crude runs were 4.1 mb/d. For 2010, we expect that China's refining crude runs will surge to 8.2 mb/d.
- At the start of 2010, China's capacity of sour crude processing was around 2.9 mb/d, which is sufficient to meet demand for now.

Future Refining Expansions

- China's refining capacity is continuously expanding.
  - Between the start of 2010 and the end of 2015, 2.1 mb/d of new refining capacity will be added under firm and likely plans.
  - Between the start of 2016 and the end of 2020, another 2.8 mb/d of new capacity is likely to be added.
  - Moreover, around 2.2 mb/d of additional capacity is proposed in the meantime by various players, but their status is uncertain at this point in time.
  - By 2015, China's capacity for handling sour crudes is expected to increase to 5 mb/d.
  - Indeed, China may overbuild. This can be assessed from the product balances later on.

Oil Product Prices

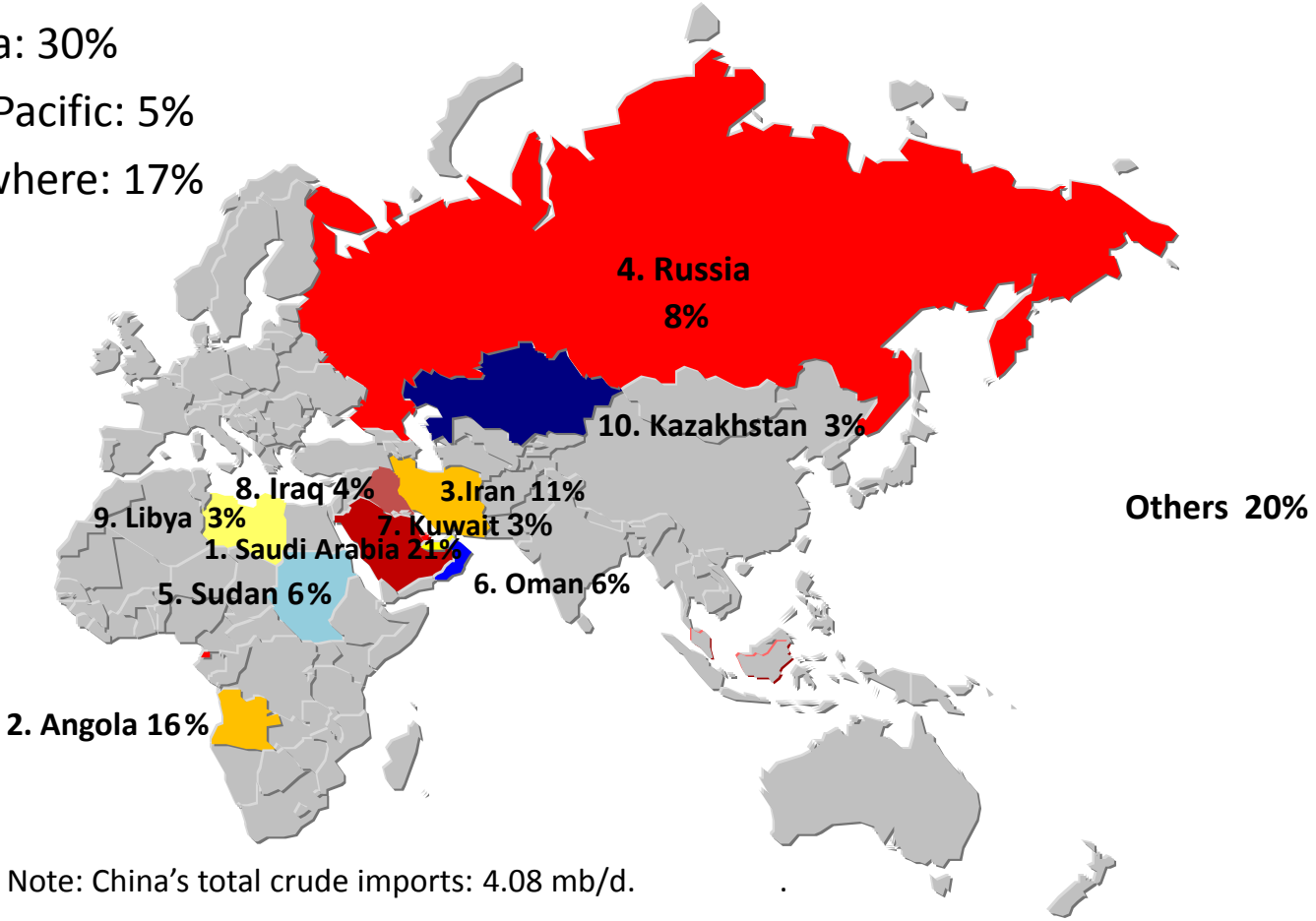
- The price regime adopted by the NDRC in May 2009 that is still in effect includes the following features:
  - Prices under government guidance:
    - The NDRC set maximum retail prices for gasoline and diesel for each province. Maximum retail prices are set on the basis of imported crude costs.
    - Retailers may set their own retail prices as long as the prices do not exceed the maximum prices set by the government.
    - Minimum wholesale-retail differentials are regulated.
    - Special rules for railway, transportation, and other designated users.

Oil Product Prices (cont'd)

- New Price Regime (cont'd)
  - Prices set directly by the government applies to gasoline, diesel, and jet fuel that are supplied to state reserves and the construction corps of Xinjiang Autonomous Region. For these products, ex-refinery prices are set.
  - Frequency and crude price range for product price adjustments.
    - Frequency: for every 22 working days, if the average imported crude prices goes up or down by more than 4%, price adjustments may be made by the NDRC.
    - Crude price range: Rules are different when international oil prices are below US$80/bbl, above US$80/bbl, or above US$130/bbl. In the latter case, the government will not raise or if necessary, raise the retail prices by a very small amount.

China's Crude Imports in 2009

- China's crude imports are dominated by the Middle East and Africa. In 2009:
  - Middle East: 48%
  - Africa: 30%
  - Asia Pacific: 5%
  - Elsewhere: 17%



Note: China's total crude imports: 4.08 mb/d.

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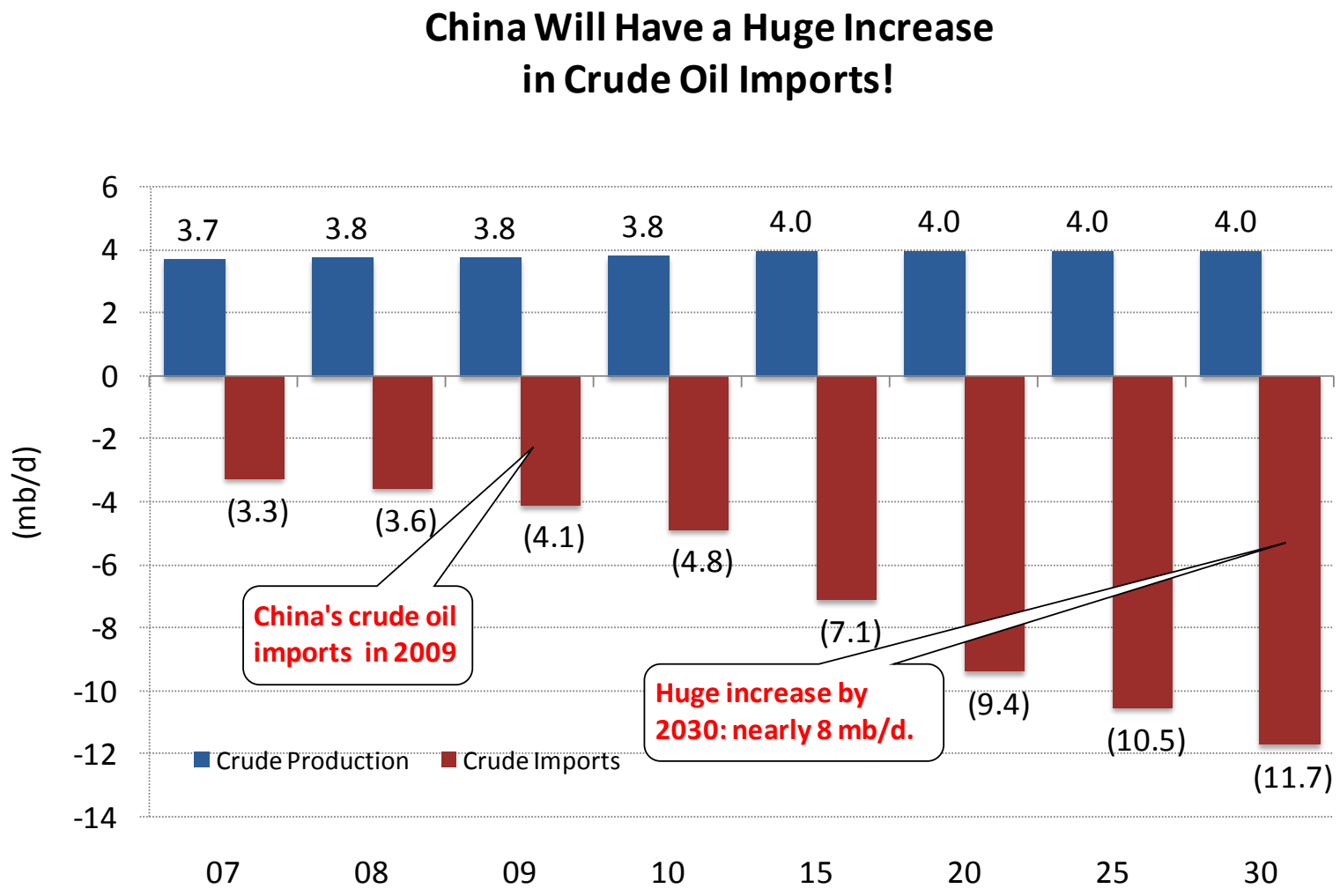
Outlook for Oil Imports



Note: 2010-2030 data are projections.

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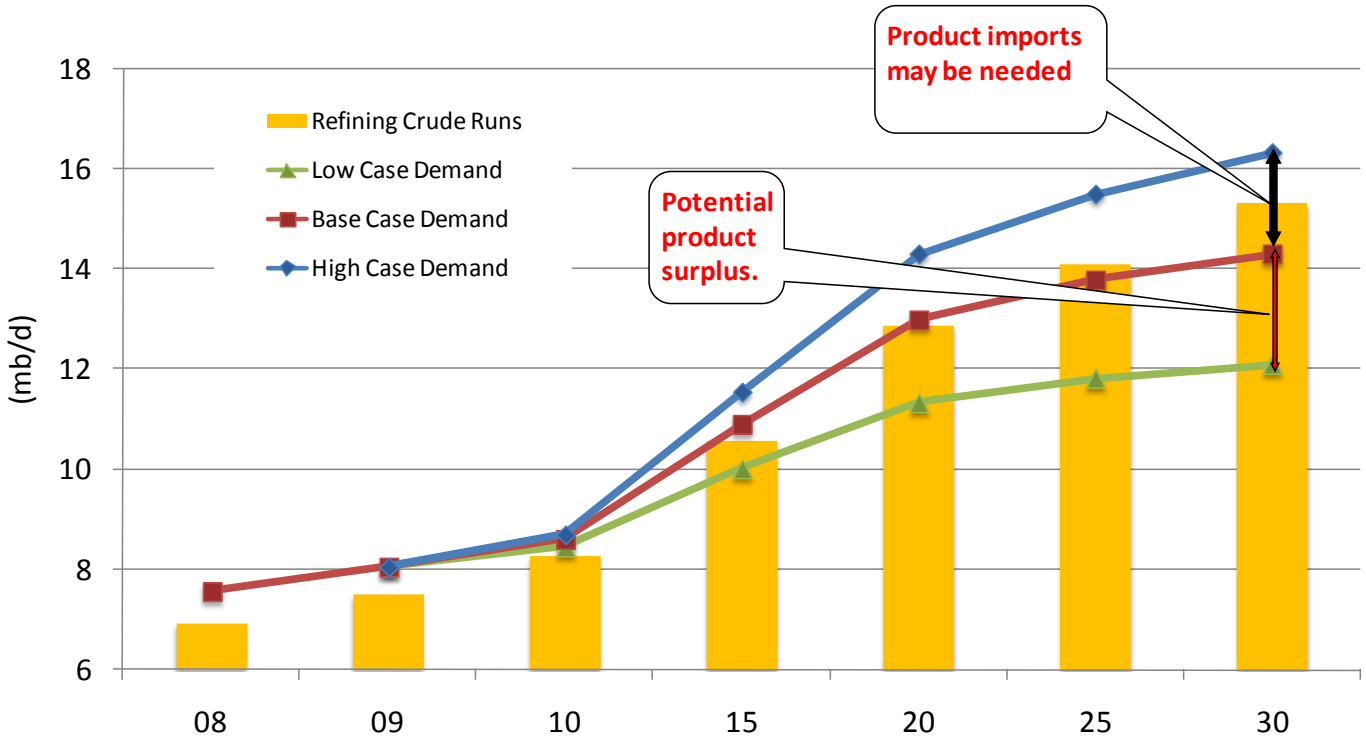
Outlook for Oil Imports (cont'd)

- China's refining capacity is likely to be overbuilt with potential exports of products, but there is a huge uncertainty on the demand side.

Uncertainty of China's Future Oil Demand



Note: 2010-2030 data are forecasts.

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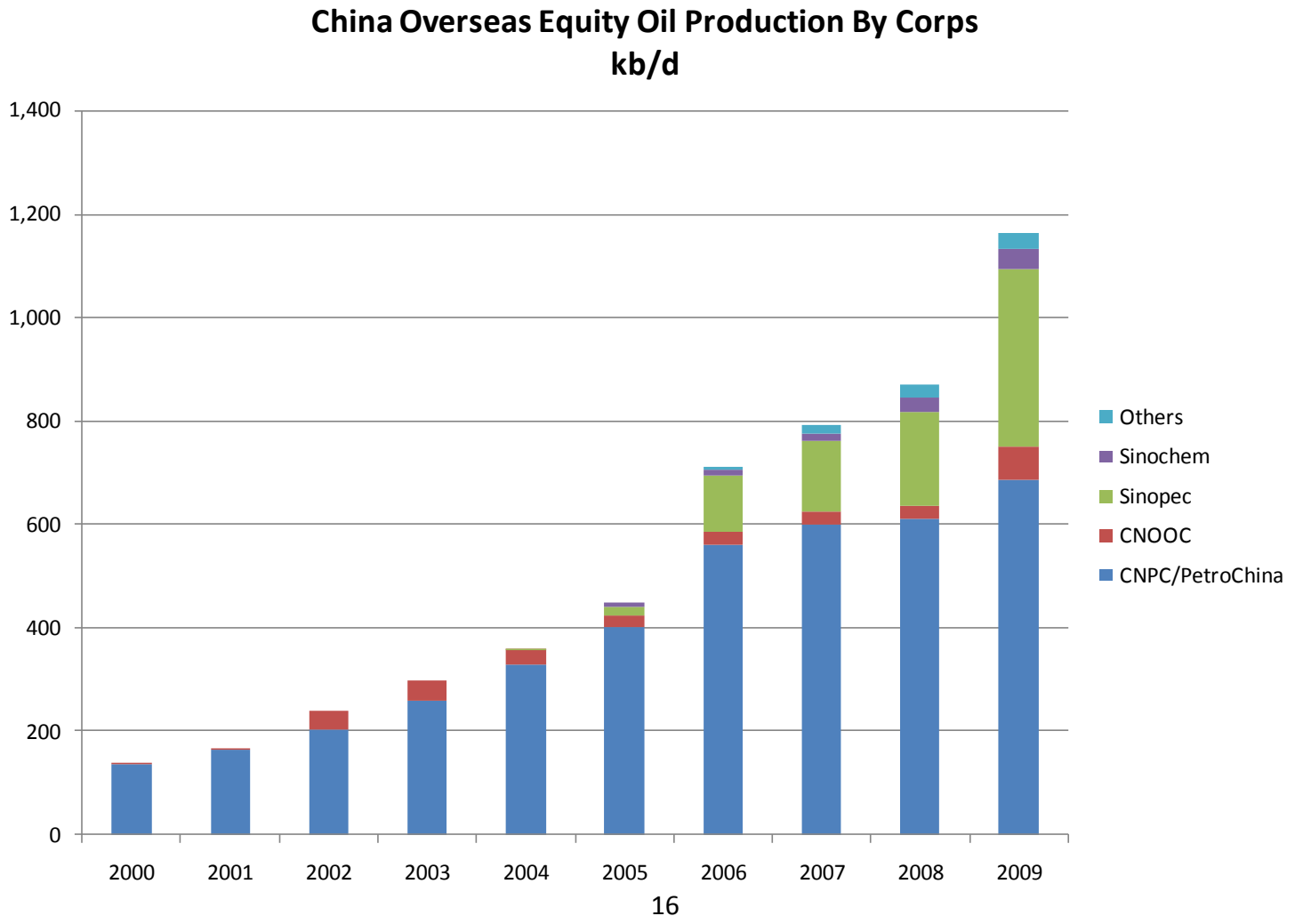
Strategic Petroleum Reserves (SPRs) in China

- China's SPR program is mainly to reduce the impact of crude supply disruption.
- Phase I (by end 2008): 16.4 million m^3 or 103 million bbl (approximately 31 days of net imports or 15 days of total consumption) in four sites (Zhenhai, Zhoushan, Huangdao, and Dalian). Phase I construction was completed and all the tanks were filled by April 2009, with average crude procurement price at US$58/bbl.
- Target for Phase II (by 2012/13): Another 26.8 million m^3 or 169 million bbl, totaling 272 million bbl (approximately 60 days of net imports or 33 days of total consumption).
- Target for Phase III (by 2015/2016): To establish 500 million bbl of SPRs.

China's Overseas Oil Equity Production

- In 2009, total overseas equity oil output is estimated at 1.16 mb/d, up from 870 kb/d in 2008, 710 kb/d in 2006, 360 kb/d in 2004, and 140 kb/d in 2000.



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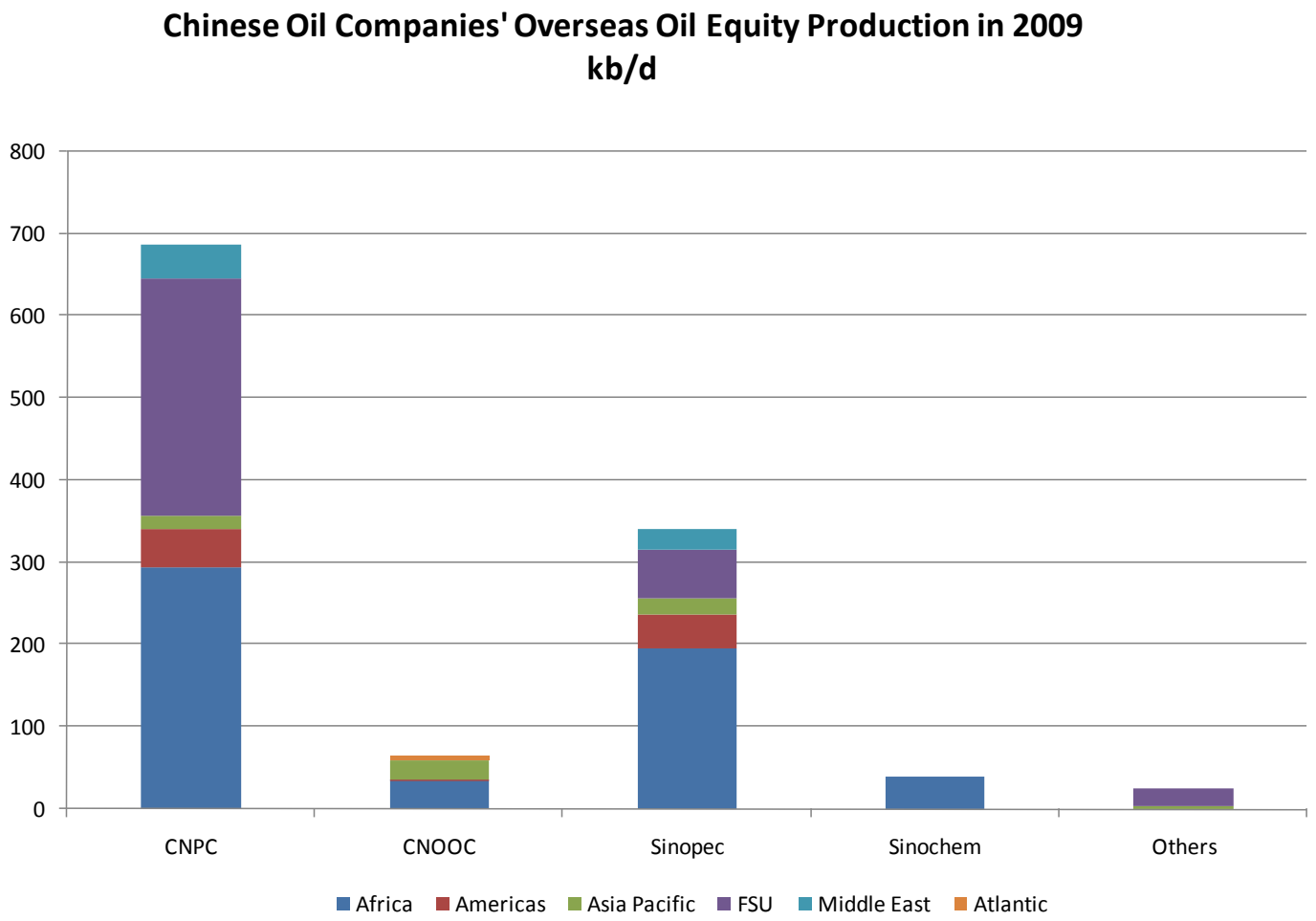
China's Overseas Oil Equity Production in 2009

- Current equity production is mainly in Africa (49%) and FSU (32%, mainly from Kazakhstan).



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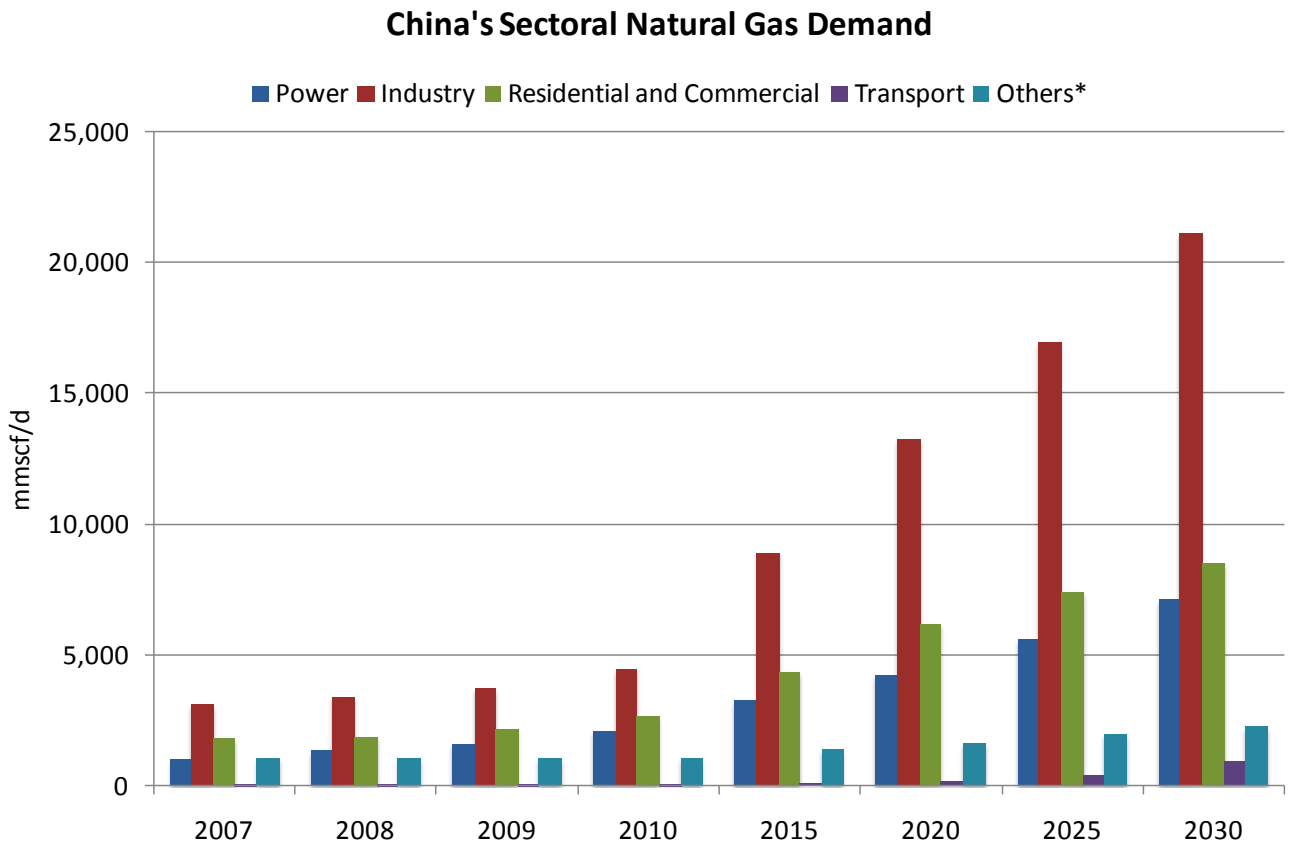
Role of Gas in China's Energy Use

- Average annual growth rate (AAGR) of consumption:
  - 15.4% between 2000 and 2009
  - 11.7% in 2009
  - 20.6% in 2010 (projections)
- 2009 Primary Energy Consumption (PEC) Mix
  - Coal: 64.1%
  - Oil: 17.2%
  - Gas: 3.5%
    - Gas' 2020 share is forecast at 7.1%
    - Gas' 2030 share is forecast at 9.5%
  - Hydro: 6.0%
  - Nuclear: 0.7%
  - Others: 8.5%

Natural Gas Demand

- Industrial and residential/commercial sectors dominate natural gas use, followed by power generation.



*Includes agricultural use, field use and non-specified others; excludes distribution losses.
Note: 2010-2030 data are projections.

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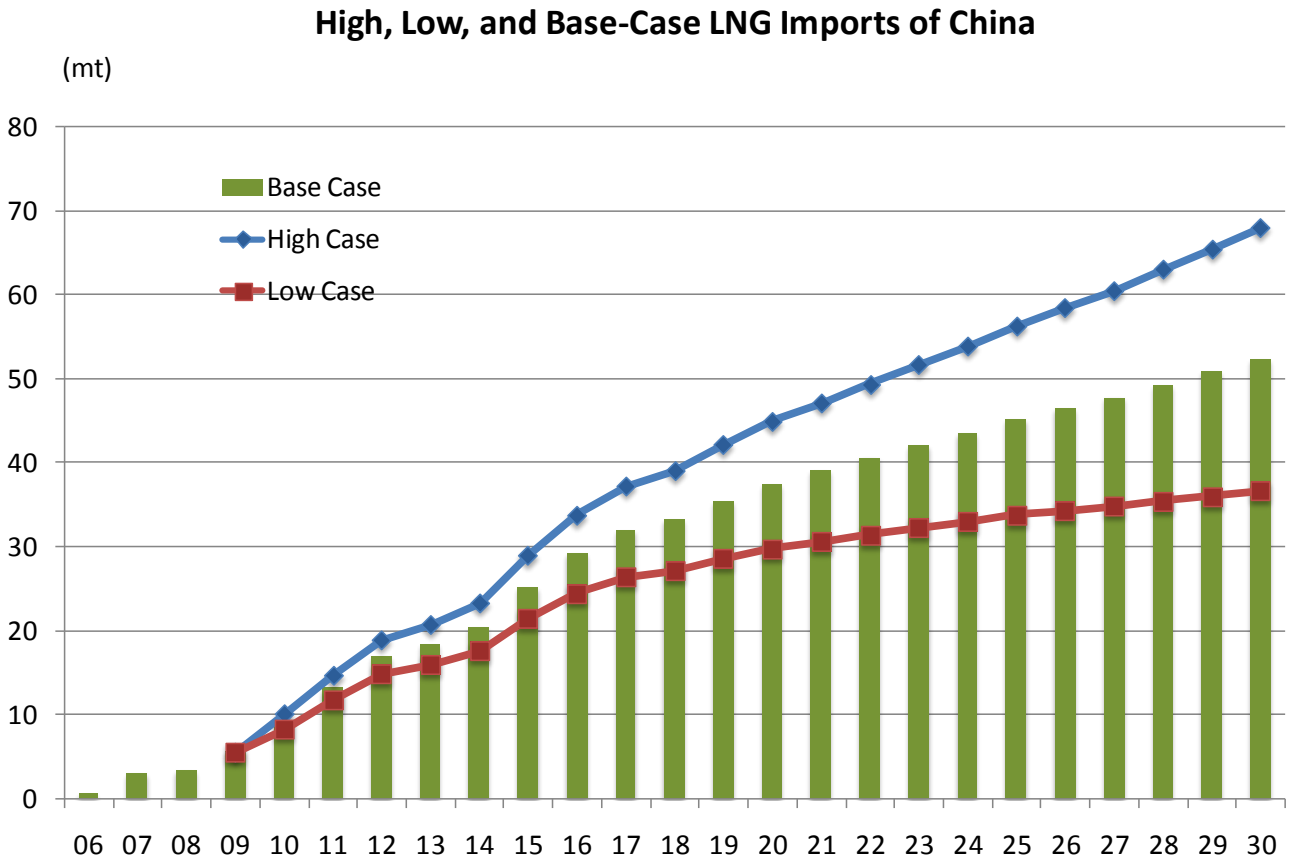
Outlook for LNG Imports

- China's LNG imports by 2020 and 2030 could have huge swings depending on the prices of imports and domestic demand.



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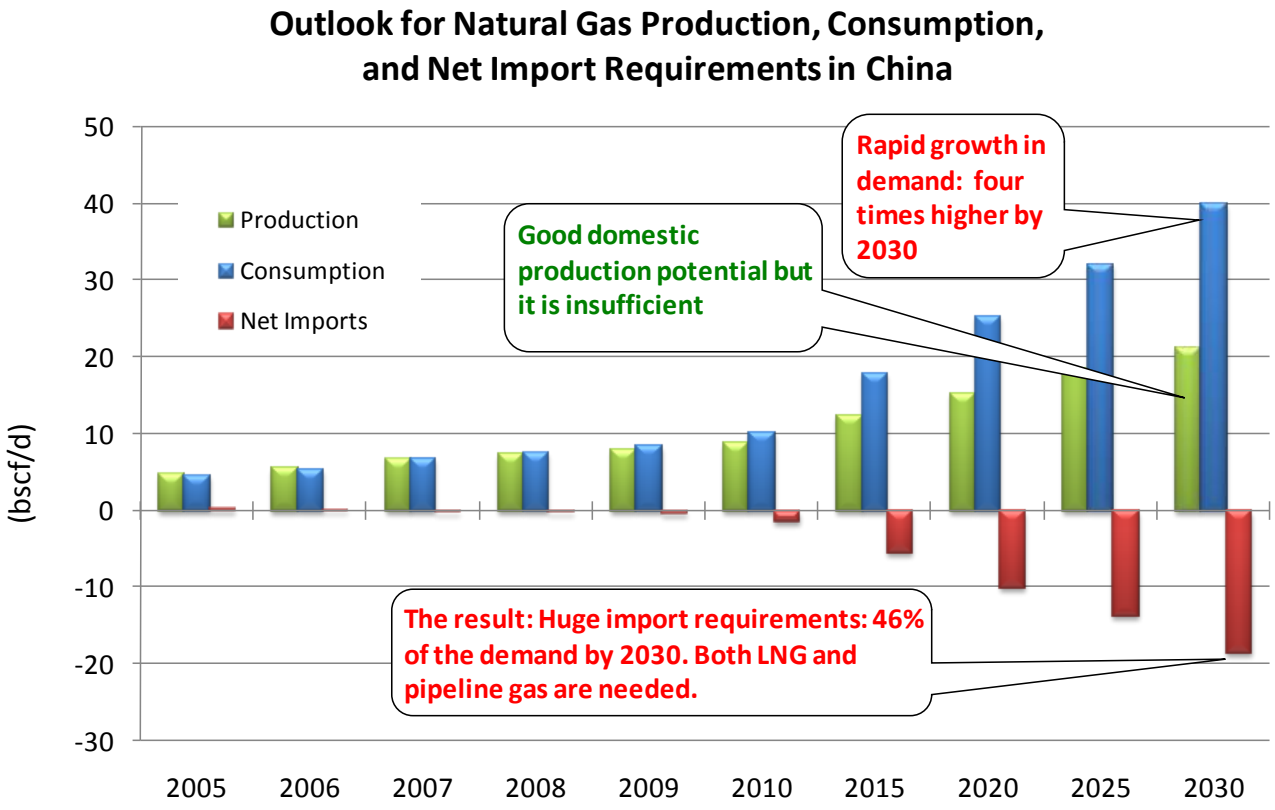
Overall Natural Gas Balances

- Despite good prospects for domestic production, consumption is poised to grow faster, leading to larger gas imports.



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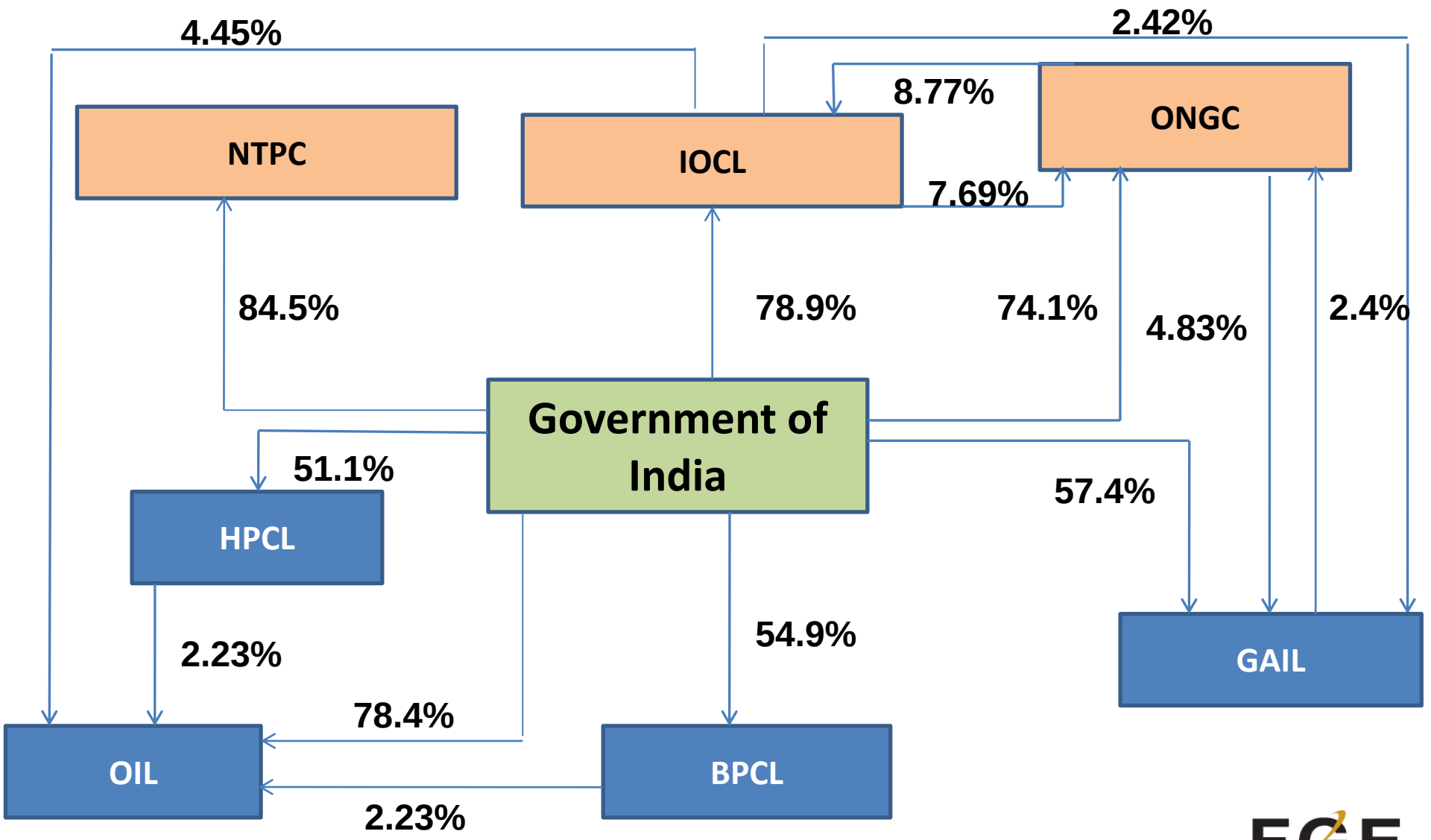
II. India

Energy Overview

- India is the 5th largest energy consumer in the world.
- In 2009, total primary energy consumption (PEC) was estimated at **680 mtoe,** up from 356 mtoe in 1990 and 513 mtoe in 2000.
- Per-capita energy consumption is still very modest: 0.560 ktoe vs world average 1.8 ktoe.
- Coal dominates the energy scene (37%), followed by combustibles, renewables, and wastes (CR&W) (32%), oil (22%), and natural gas (8%). Natural gas has been the fastest growing fuel in recent years.
- Oil demand growth: AAGR between 2000 and 2008 at 3.6%; 2009 registered a 4.9% growth. 2010 is projected at 4.7%.
- Overall, the PEC is projected to grow at **4.6%** annually through 2015 and 3.4% thereafter till 2020.

Oil & Gas Industry Structure



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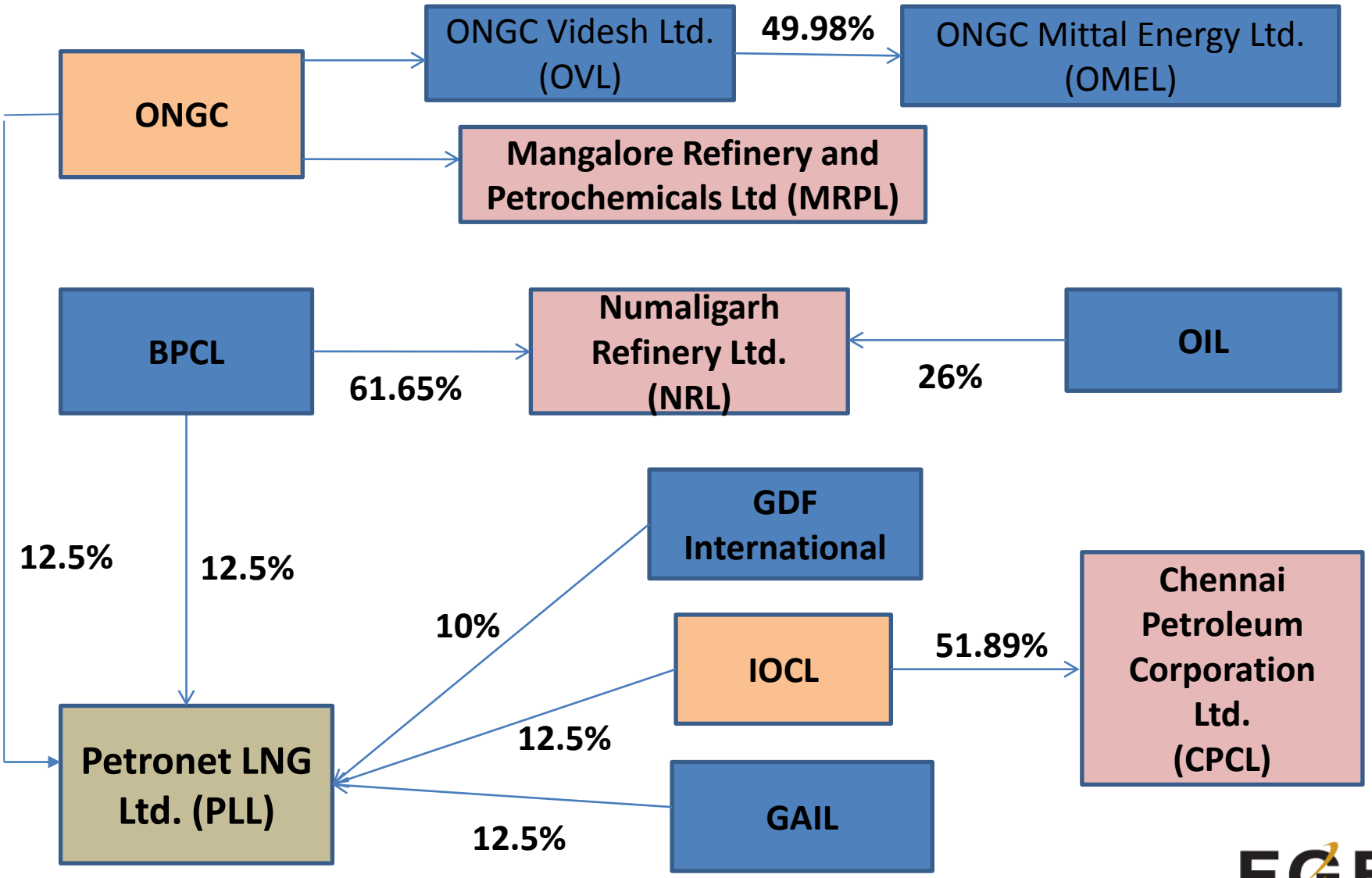
Other Key Players



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Titles Accorded by Government to Public Sector Units (PSUs)

- ***Navaratnas*** – Established in 1997 to give PSUs greater financial and operational autonomy. There are 16 ***Navaratnas***. These companies can invest up to Rs 10 billion (US$0.22 billion) or 15% of their net worth in a single project without seeking Government approval. HPCL, BPCL, OIL, and GAIL are ***Navaratnas***.

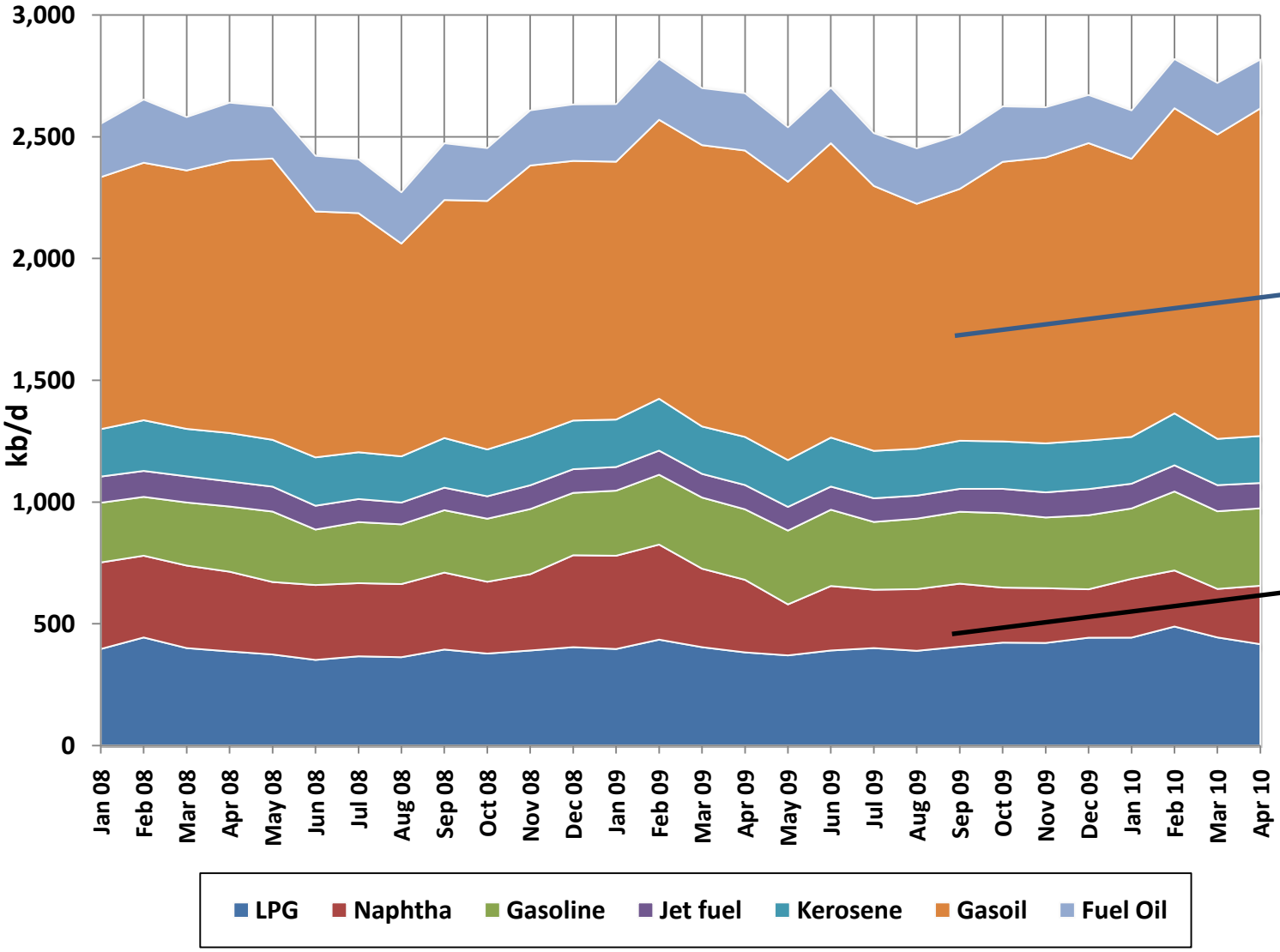
- ***Maharatnas*** – Established in 2009. These are identified as potential Indian multi-national companies. These can invest up to Rs 50 billion (US$1.09 billion) or 15% of their net worth in a single project without seeking Government approval. ONGC, IOCL and NTPC are ***Maharatnas***.

- ***Miniratnas*** – These are ranked lower than Navaratnas. Miniratnas can invest up to Rs 3 billion (US$0.07 billion) or their net worth, whichever is lower. Miniratnas can also form joint ventures and subsidiaries. CPCL, MRPL, and NRL are ***Miniratnas***.

Demand

- In 2009, India's total petroleum product consumption was estimated at 2.96 mb/d.
- The key stories for demand in 2009 were:
  - *Surge in diesel consumption from June due to poor monsoon that caused drought where the auto fuel was used to run pump sets for irrigation – 50% subsidy on diesel extended to farmers during Q3 and Q4;*
  - *Strong growth in gasoline due to double digit y-o-y growth in car sales for consecutive months since February 2009. Y-o-y, gasoline consumption grew 14%;*
  - *Increased substitution of naphtha and fuel oil with KG-D6 gas. For 2009 as a whole, fuel oil consumption dropped 15.5%.*

India Product Demand, 2008 to April 2010



Surge in diesel demand in 2H, 2009. Y-o-y diesel consumption grew 8% in 2009

With entry of KG-D6 gas, y-o-y naphtha consumption dropped 16% in 2009

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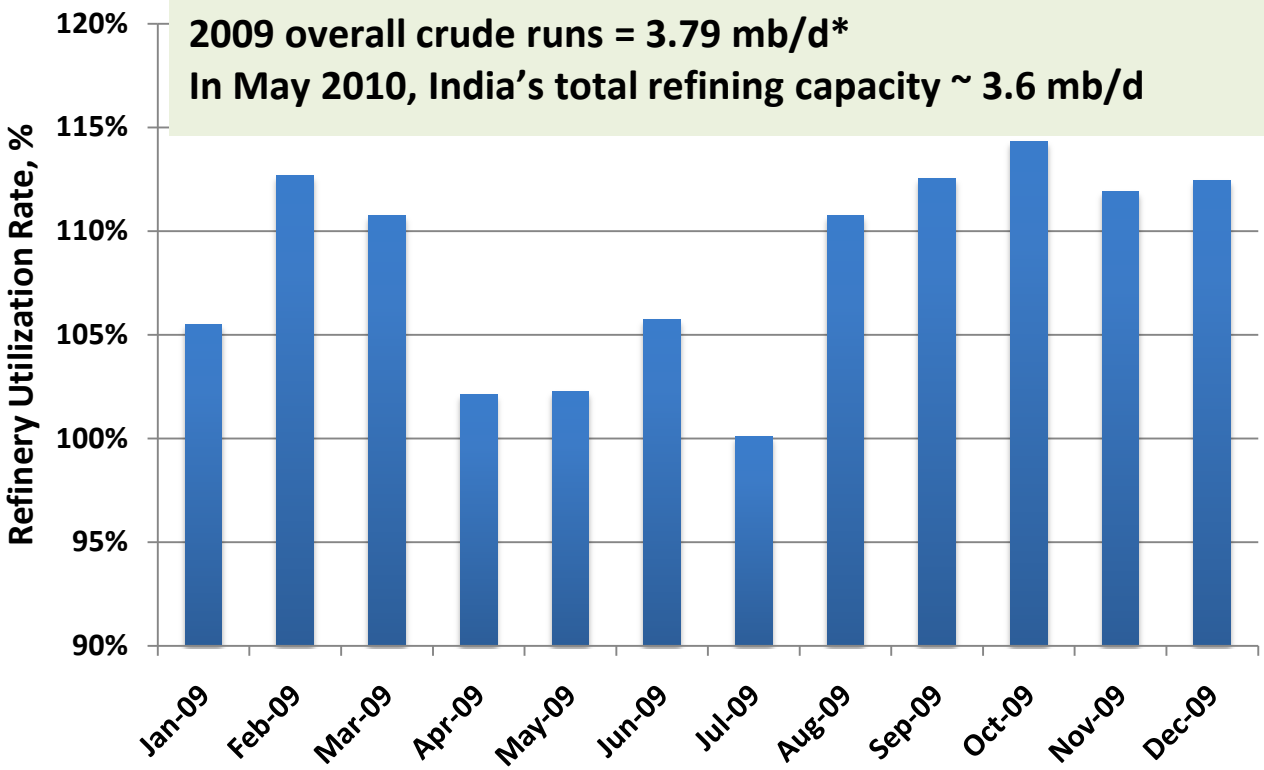
Demand Outlook

- **Positive factors that will contribute towards India's demand growth:**
  - *Revival in the industrial and manufacturing sectors due to fiscal stimuli. Work on key infrastructure and construction projects that stalled in 2009 have resumed;*
  - *Large-scale transition from lower to middle income class;*
  - *Continued double-digit y-o-y growth in passenger car sales;*
  - *Automobile manufacturers releasing new car models.*
- …. And negative factors that will limit or keep a check on demand growth:
  - *Slowdown in GDP growth – due to the global financial crisis;*
  - *Substitution of naphtha by natural gas in fertilizer. Potential large-scale substitution of gasoline by CNG and LPG by piped natural gas in major cities;*
  - *Improved efficiency in road transport with new engines and cleaner fuels;*
  - *Fuel price reforms – move towards deregulation*

Indian Refining

2009 overall crude runs = 3.79 mb/d*
In May 2010, India's total refining capacity ~ 3.6 mb/d



* Crude runs of Reliance's newer 580 kb/d refinery are estimated

India's utilization rates are usually high as refiners have to meet domestic demand. In **2007** and **2008** it was **108%** and **106%**,respectively.

Avg utilization rates are expected to be around 105-108% in 2010

By 2020, India is projected to add 1.25 mb/d of refining capacity; 0.74 mb/d of capacity is expected by 2015. Total cracking capacity is projected to increase by 0.83 mb/d, while treating and reforming capacity will rise by 0.63 mb/d and 0.16 mb/d, respectively.

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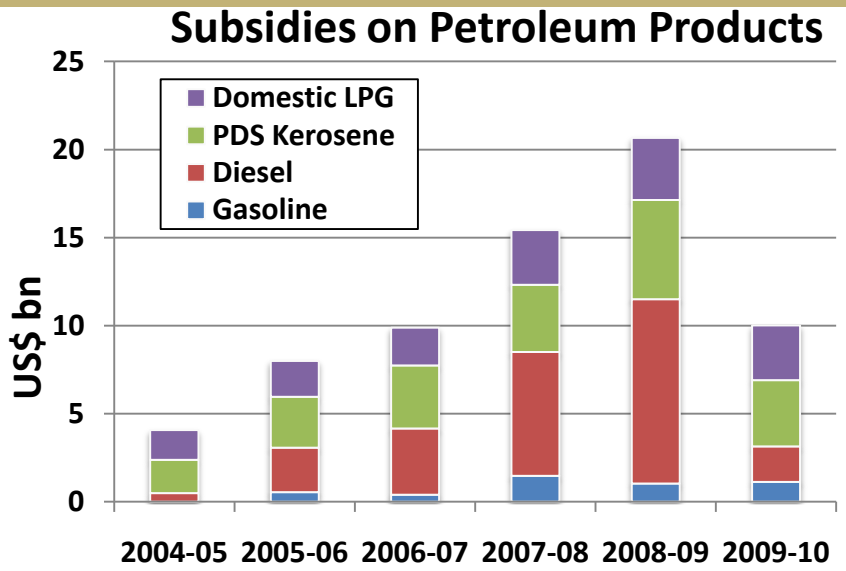
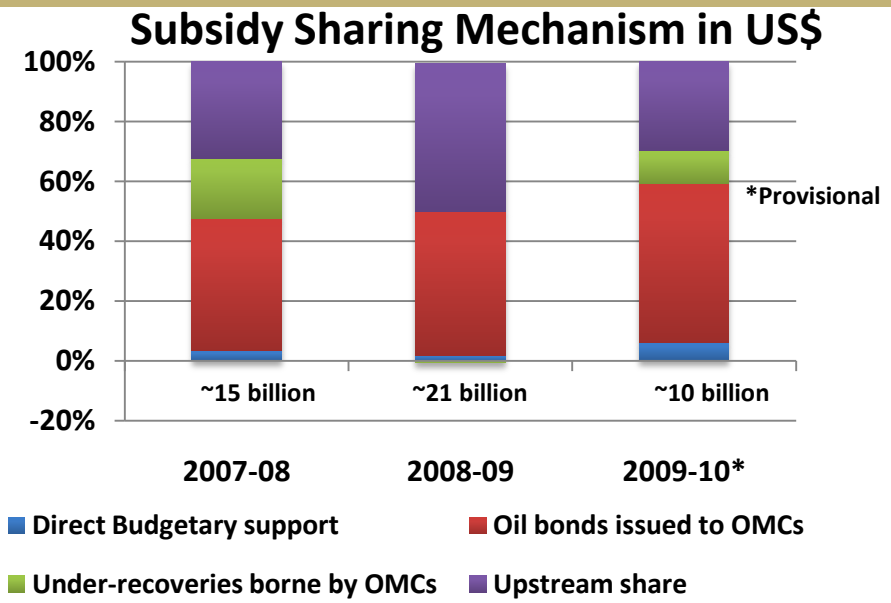
Key Projects by 2020

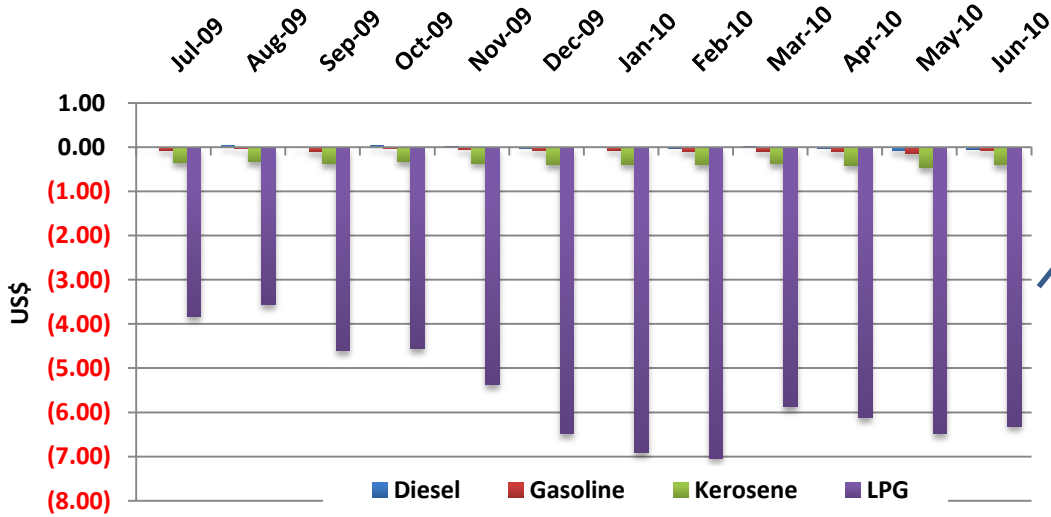
- IOCL's refinery expansions at Panipat (by 60 kb/d) and Koyali (by 40 kb/d) by Q3 2010,
  - Focus on improving the diesel quality, distillate yields, and residue up-gradation,
- Bina Oman Refinery Ltd's (BORL) Bina grassroots refinery (120 kb/d): Commissioned but we expect it to achieve a stable production portfolio only by Q4 2010,
- Essar Oil's Vadinar refinery expansion Phase I (150 kb/d): expected in Q1 2012 ,
- MRPL's Mangalore refinery expansion (by 64 kb/d) and upgrade: in Q2 2012,
- There is a rush among Indian refiners to commission their units before the deadline of March 31, 2012 set by the Government. This will allow them to enjoy a 7-year tax holiday.
- 3 projects will struggle to meet this deadline:
  - HPCL's Bhatinda grassroots refinery (180 kb/d) – expected in Q1 2014,
  - IOCL's grassroots refinery at Paradeep (300 kb/d): expected by Q4 2016,
  - Essar's Phase II will go ahead partially and will be complete only by Q1 2017

13 Indian cities moved towards Euro IV or BS IV norms on April 1, 2010. The rest of the country moving in a staggered fashion towards Euro III/BS III by October 2010.

Strong Case for Price Reform







Marketing margin on key petroleum products is negative. Fuel retailing in India – not a lucrative business!

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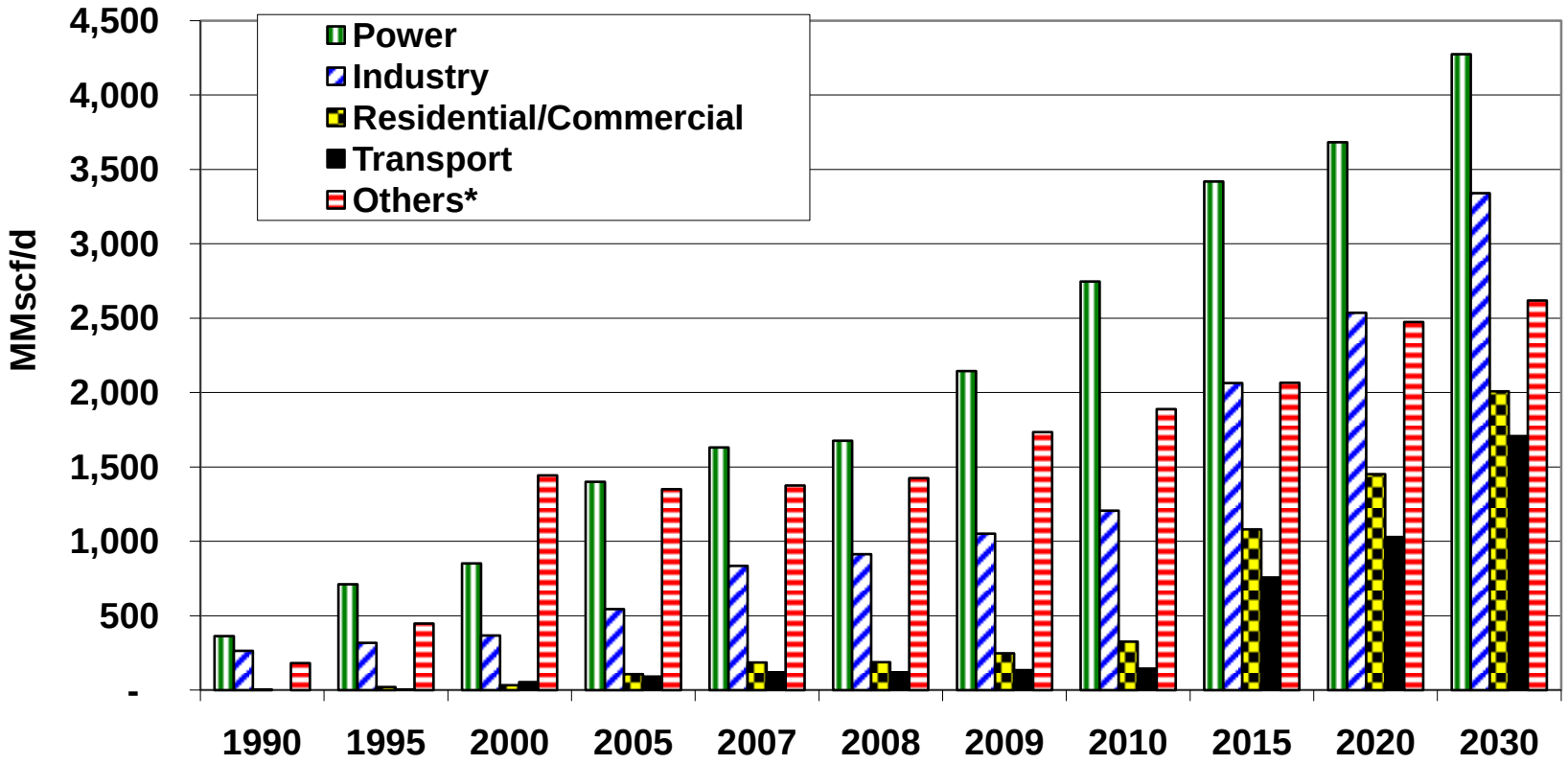
Recent Price Reform: Gasoline Deregulated for Now!

- After July 2009 and February 2010, this is the third time within a year that the Government has hiked the prices of gasoline and diesel.
- Gasoline prices ***will*** be market determined both at the refinery gate as well as at the retail level. Gasoline price was hiked by 7.3% to US$1.11/L (US$0.08/L hike).
- Government is ***yet to clarify*** the frequency of price revision for gasoline.
- Petroleum minister clarified that the Government ***would step in*** if required to protect consumers from high volatility in the international oil market.
- The Government ***has also not*** clarified whether state-owned oil marketing companies will be required to all sell gasoline at the same price.
- Prices of diesel, kerosene, and LPG were hiked ***but*** these will continue to remain ***regulated.***
- Diesel price was hiked by 5.2% to US$0.87/L (US$0.04/L hike), LPG by 11.3% to US$7.51/cylinder (US$ 0.76/cylinder hike) and kerosene by 32% to US$0.27/L (US$.07/L hike)
- The Government has announced its intention to ***free up*** the diesel prices but has not set a date for the same.

Overseas Investment

- OVL has about 40 assets across 16 countries.
- Producing assets include: Greater Nile Oil Project and Block 5A in Sudan, Block 6.1 in Vietnam, Al Furat Project in Syria, Sakhalin-I Project and IEC in Russia, PIVSA (IJV), Venezuela, and Mansarovar Energy Project in Colombia.
- ONGC, who bought UK-based Imperial Energy Plc this year, is targeting 60 million tonnes of overseas oil and gas production by 2025.
- IOCL, HPCL, and BPCL are also engaged overseas via their subsidiaries.
- Energy Security – India's strategy - acquisition of acreages in relatively volatile countries with unstable political and regulatory regimes.
- Iran and Nigeria – Substantial efforts and signature bonuses ***have not*** amounted to much!
- India has set its sights on Africa, Latin America, and Russia.
- Indian companies are increasingly getting outbid by their Chinese counterparts in the race for equity in overseas projects.
- Loss of rights to develop Iran's South Azadegan oil field to CNPC of China, and loss of Hassi Bir Rekaiz oil field in Algeria to CNOOC, are some examples.

Natural Gas Demand



*** Includes agricultural use, fertilizer use, LPG-C2/C3 extraction and non-specified others; excludes distribution losses.**

2009 is estimated and 2010 - 2030 are projections

In 2009, natural gas accounted for 7.4% of India's primary energy consumption. Between 1990 and 2008 the AAGR of India's natural gas consumption was 9.7%.

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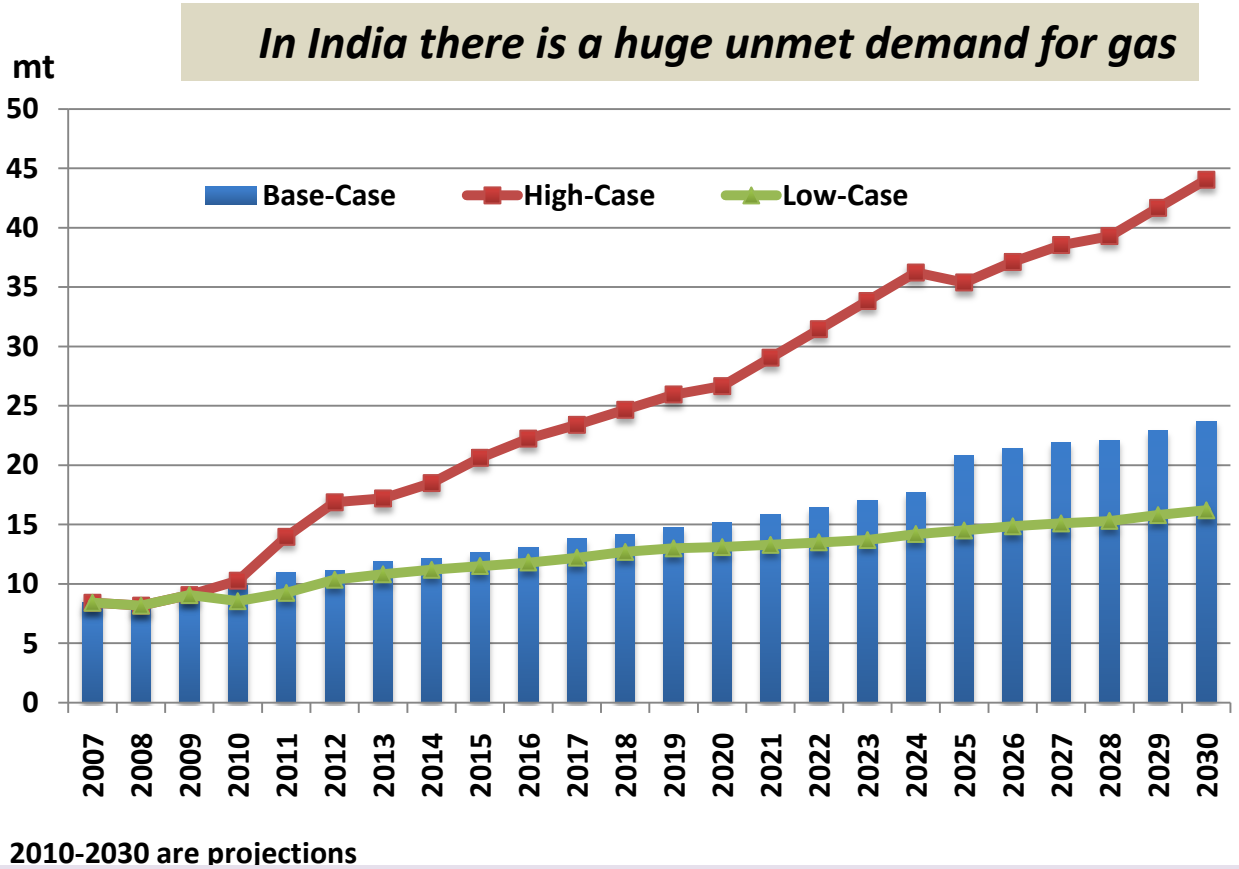
Outlook for LNG Imports – Demand Scenarios



Reliance's KG-D6 gas has opened the doors for gas investment in India and a gas market

- India will continue to remain price sensitive. The potential for LNG imports are huge but much will depend on the price and demand.
- India lacks gas infrastructure and players like Reliance and GAIL are building pipelines across the country.

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III. Relations of China and India with Iran

Role of China in Iran's Upstream Development

Despite political pressures on international oil companies, Chinese contractors could invest more than US$10 billion in upstream Iranian oil and gas sector in the in next few years.

List of Upstream Agreements Between Iran and China in Recent Years

Contractors	Project	Type of Contract	Signature Date	Estimated Value	Remarks
Sinopec	Exploration and Development in Garmsar Block	Binding Contract	2005	Minimum US$20 million for exploration activities	Sinopec committed to invest at least US$20 million for exploration activities of Garmsar Block, but exploration work has not showed any commercial oil reserves in the block yet.
CNPC	Exploration and Development in Koohdasht Block	Binding Contract	2005	Minimum US$18 million for exploration activities	CNPC promised to invest at least US$18 million for exploration activity in 2005 and completed the exploration work in end 2009. No significant commercial oil reserves in Koohdasht is found.
CNOOC	Development of the North Pars Gas Field	Preliminary Agreement	2006*	US$16 billion	CNOOC agreed to invest US$16 billion to develop the North Pars gas fields with NIOC and construct a 20 mtpa LNG liquefaction plant in Kangan.
Sinopec	Exploration and Development of the Yadavaran Oil Field	Binding Contract (Buyback)	Dec-07	US$2 billion	The project has two phases: phase 1 drilling and exploration and phase 2 production. Production level from phase 1 is expected to be 85 kb/d and that from phase 2 will reach 185 kb/d. Peak production is expected to be 300-400 kb/d once fully developed. Phase 1 was originally set on a 59-month schedule, ending in late 2016, but it may be further delayed. UK's Petrofac completed the Front End Engineering and Design for the development of the field for Sinopec and NIOC in November 2009. Drilling in the field will
CNPC	Development of North Azadegan field	Binding Contract (Buyback)	Jan-09	US$1.74 billion for the first phase	CNPC is expected to produce 75 kb/d in first phase while Phase II of the development will be considered based on the outcome of Phase I. Phase II is envisaged to increase production of the field to 150 kb/d and the total investment cost will be increase to US$3.5-4 billion. CNPC spudded the first appraisal well in April 2010.
CNOOC and Malaysian Amona	Development of Resalat oil field	Preliminary Agreement	Jun-2009**	US$1 billion	China Oilfield Services Limited (COSL, a subsidiary of CNOOC) will undertake drilling operations while CNOOC will build the required offshore infrastructure. Malaysian Amona is due to increase production capacity from 8 kb/d to 47 kb/d within 41 months.
CNPC	Development of the South Pars Phase 11	Preliminary Agreement (Buyback)	Jun-09	US$4.7 billion	CNPC signed a preliminary agreement with NIOC for the development of phase 11 of the South Pars gas field, replacing France's Total. They aim to produce 1.765 bscf/d of natural gas and other products.
CNPC and Inpex	Development of South Azadegan field	MOU for a Binding Contract	Aug-09	US$2.25 billioin by CNPC for the first phase	CNPC is to invest US$2.25 billion and Inpex US$0.25 billion for the first phase of development.

* CNOOC signed an upstream contract with NIOC in the form of a buyback agreement in 2008 to develop the North Pars gas field. However, the negotiation in downstream section (construction of the LNG plant) has remained in early stages.

** The original buyback contract was signed between Malaysian Amona and NIOC in 2008. Amona finalized negotiations with Chinese companies to join the Resalat development project consortium in July 2009.

Role of China in Iran

- Most of the upstream projects that the Chinese NOCs invested in may face delays not because of reservoir challenges but difficulties of securing the relevant equipments and technologies to undertake those vast projects due to the US sanction.
- Iran seems to indicate a greater willingness to provide more benefits to China, while the latter is lured by the attractive contracts offered despite the risky environment.
- A review of recent buyback agreements, especially with Chinese companies shows there have been more attractive terms offered to Chinese contractors.
- The recent signed buyback contracts with CNPC and Sinopec provides more flexibility in fiscal terms, shorter payback periods, and finally a 3% higher rate of return (ROR) for contractors compared with other regular buyback contracts in the past.

Role of China in Iran (cont'd)

- It should be noted that Chinese companies are not only involved in development of oil and gas fields. They are key suppliers for upstream equipment when Iran faces sanctions for American suppliers. Chinese companies are the most active players in providing upstream well equipment for the South Pars gas projects.
- Sinopec is also helping NIORDC to add a 94 kb/d FCC unit and expand the 80 kb/d CDU to 250 kb/d in Iran's Arak refinery. Sinopec Design Institute and other Chinese companies are also involved in the construction of Iran's Persian Gulf Star Project (three units of 120 kb/d condensate splitters at the Bandar Abbas refinery).
- Chinese corporations are heavily invested in Iran's domestic sectors.

India's Relationship with Iran

- With the US and the EU sanctions on Iran, India is cautious about transactions with Iran. It is reluctant to undertake any transaction in US$ or the Euro.
- In the name of Energy Security, India has exposed itself to several oil and gas projects in Iran – A question mark hangs over all of them!
    - SP-12 and Iran LNG Project - 6 mtpa of LNG to India.
    - Farsi Project – 6.5 mtpa LNG to India - OVL won the bid in 2002, is the operator of the Farsi block with a 40% stake, IOCL and OIL have 40% and 20% stakes, respectively. They have already committed US$85 million in the Farsi block.

US$ million	**Till 2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
Farsi*	88	125	190	465	1,015	1,275	1,345	965	90	5,558
SP-12	471	769	775	621	-	-	-	-	-	2,635
#Iran LNG										1,800
Total										**9,993**

*Capex phasing based on draft Master Development Plan (MDP) - MDP is yet to be finalized
Year wise cost break up for Iran LNG not available

India's Relationship with Iran (cont'd)

- ONGC and IOCL were flagged by the US administration for having energy ties with Iran.
- OIL ,OVL, and Petronet LNG Ltd signed agreements with Iran in 2009 to develop one of the 28 phases of the giant South Pars gas field and convert the fuel into LNG.
- In 2010, Reliance did not renew its term deal with NIOC for crude imports of 90-100 kb/d. Differences over pricing of Soroush and Nowrooz crude were cited as the chief reason.
- Several Iran-India projects are either put on hold or cancelled
    - Iran-Pakistan-India pipeline
    - LNG deal with Iran signed in June 2005 to import 5.0 mtpa starting 2009 over a 25-year period.

Thank You!

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