

Council for Security Cooperation in the Asia - Pacific

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Session: Energy Security

**Presentation: The Global Energy Scenario:
Prospects for Asian cooperation
for Energy Security**

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1. Global Supply and Demand

- Oil changing form: geographically, geologically, chemically and economically
- **Conventional supplies** have plateaued and are slowly decreasing; will be increasingly replaced by “new oils”: oil sands; tight oil; new heavy oil; deep water oil, oil shale
- **Global oil supply** could increase up to 40 mbd by 2020 with increased supplies from Iraq; USA; Brazil (deep water presalt) and Canada (tar sands)

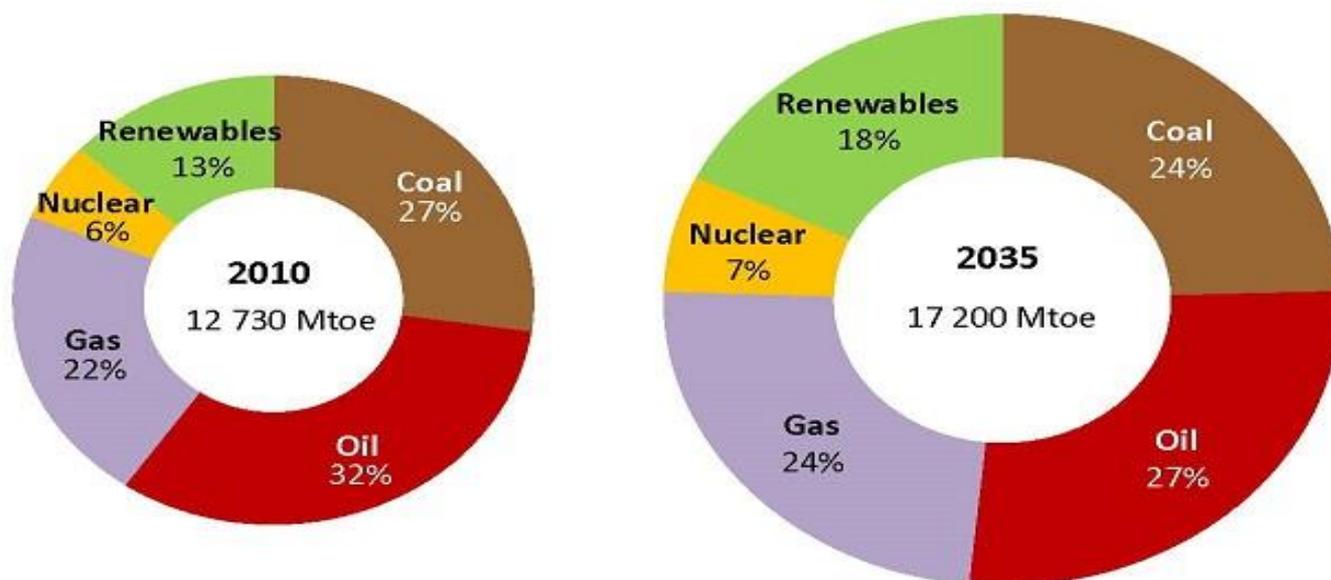
Oil: * **Unconventional oil**: Global estimates: 3.5 trillion barrels
* USA: 800 billion barrels
* China: 720 billion barrels

Gas : Unconventional shale gas in place globally –
35,000 TCF v/s 6400 TCF conventional gas

The energy mix is (slowly) changing

WORLD
ENERGY
OUTLOOK

Energy demand by fuel, 2010 & 2035



Global energy demand grows by more than one-third over the period to 2035, with China, India & the Middle East accounting for 60% of the increase

Geopolitics of Energy Security

Long-term region-wise oil demand outlook (in mbd)

Region/Country	2012	2020	2035
OECD	46	44.2	40.4
Developing Countries	37.8	46.6	62.1
India	3.7	5.0	9.3
China	9.7	12.7	17.5
Eurasia	5.0	5.5	6.0
World	88.9	96.3	108.5

Source: World Oil Outlook 2013, Executive Summary, OPEC, November 7, 2013, 10.

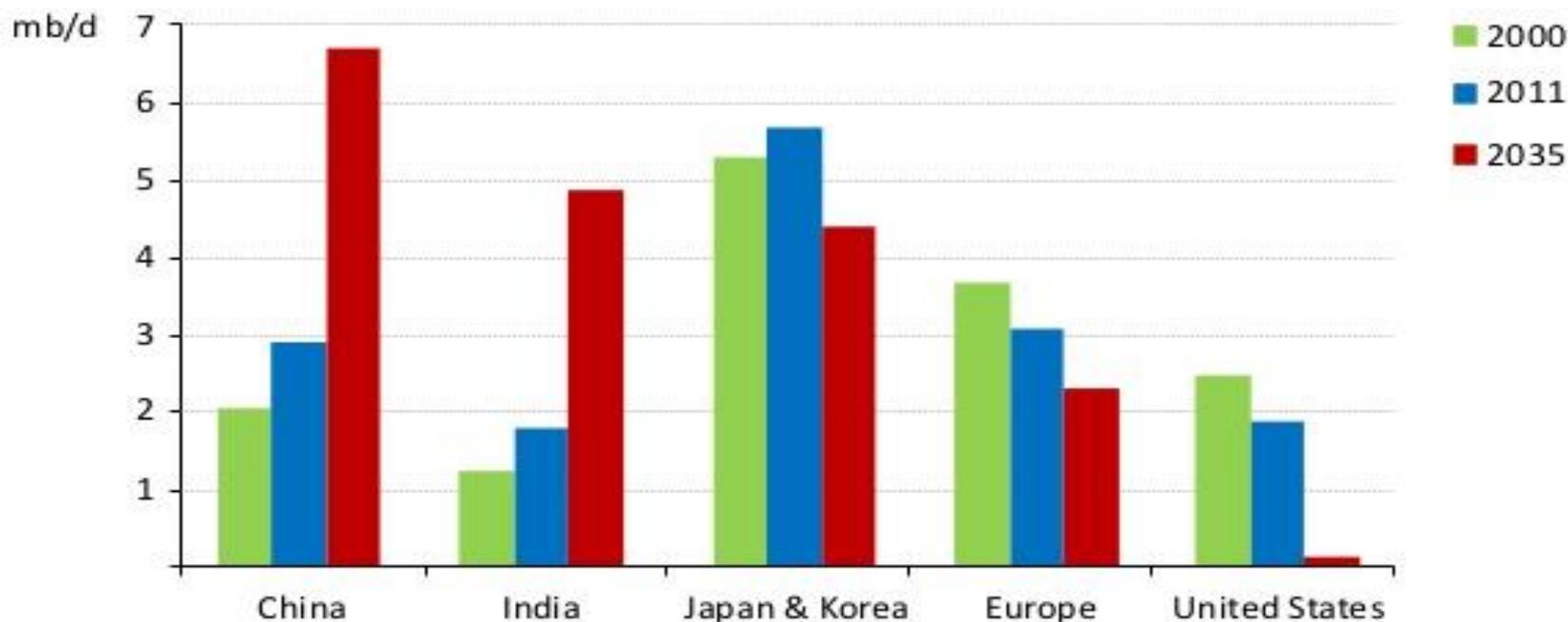
During the next 10-15 years, even as the US reduces its oil imports, most of the Gulf production will shift to Asia. The Asian giants – China, Japan, Korea and India – will depend on Gulf supplies to the extent of 60-90 per cent, while around 90 per cent of Gulf production will go to Asia. Oil prices in real terms will be between \$110-125 per barrel in 2035.

Overview of Global Oil Demand

- (i) **Global Energy demand** will increase by one-third from 2011 to 2035;
- (ii) **emerging economies** will account for 90 percent of net demand growth in 2035, with China, India and the Middle East constituting 65 percent of the total increase;
- (iii) global energy trade will **shift eastwards** from the Atlantic to the Asia-Pacific: by the early 2020s, China will become the world's largest oil importer, while India will emerge as the largest coal importer.
- (iv) **fossil fuels** which accounted for 82 percent of energy supply in 2010, will constitute 80 percent of the global total in 2035; each of the three fossil fuel types (oil, coal and gas) will converge around similar shares of about 26-27 percent; and,
- (V) long-term **oil demand** will increase by 20 mbd over 2012-35, reaching 108.5 mbd in 2035; of this increase, developing Asia will account for 88 percent.
- (vi) Both IEA and OPEC agree that, while **rising non-OPEC output** from North America and Brazil will reduce demand from OPEC suppliers over the next decade, OPEC will regain its role as the key source of oil supply growth from the mid-2020s.

Middle East oil to Asia: a new silk road

Middle East oil export by destination



By 2035, almost 90% of Middle Eastern oil exports go to Asia; North America's emergence as a net exporter accelerates the eastward shift in trade

Demand

In recent years, the most significant development in the consumption of hydrocarbon fuels is the increase in Asian demand. In fact, there has been a consistent increase over the last few decades: between 1970-94, Asian energy demand increased by 400%, with demand for oil increasing by 265% world demand growth during this period was only 63%.

The long-term (2035) Asian energy scenario has the following features:

- Asian primary energy demand will go from 4.2 billion toe in 2010 to 7.7 billion toe in 2035.
- In 2035, **Asia will account for 40 percent of global oil demand**, going up from 31 percent in 2010; Asia will also account for 60 percent of global oil demand growth.
- **China and India** will represent nearly 70 per cent of Asian energy demand in 2035, with China accounting for 52 percent and India 18 percent; Japan's share will decline from 12 percent in 2010 to 6 percent in 2035.

The Impact of “Fracking”

OIL

- From 1970, US oil reserves fell from a peak of 39 billion barrels to 19.1 bb in 2008. Since then, with unconventional shale oil entering the US energy basket, reserves estimates have been increasing annually, reaching 26.5 bb in 2011.
- Oil production followed the same pattern, declining from a peak of 9.6 mbd in 1970 to 5 mbd in 2008. After that, with shale oil, annual production has steadily increased, to reach 7.1 mbd in 2013, making the US the world’s largest oil producer, after Russia and Saudi Arabia.

GAS

- The production of shale gas has followed a similar pattern. Conventional US gas reserves had reached a peak in 1967 at 293 trillion cubic feet (tcf), and then declined to a low of 162 tcf by 1993. At this point, shale gas began to enter the US natural gas market, so that reserves were estimated at 211 tcf in 2006. Then, with more effective use of fracking, gas reserves showed significant increases, reaching 305 tcf in 2010 and making the US the fifth largest in the world in terms of reserves.
- US natural gas production has been increasing every year: by 690 bcf in 2010; by 1.59 tcf in 2011; by 1.16 tcf in 2012, and by 0.02 tcf by May 2013. In 2012, US natural gas production reached a high of 24.1 tcf per year, larger than the earlier high of 21.7 tcf in 1973, so that the USA now competes with Russia for the position of top producer globally.

4. Prices

- ❖ Fundamentals: Demand - supply
- ❖ Futures markets: “paper barrel”/ “electronic barrel”
- ❖ Geopolitical factors: the “fear premium”/ chokepoints
- ❖ Shifting “fair” price bands: (from producer’s perspective)
 - * 2004 : \$22 – 28/b
 - * 2005 : \$40 – 50/b
 - * 2011 : \$80/b
 - * 2012 : \$100/b

Rising threshold of minimally acceptable oil price due to GCC social spending
\$60 to \$80 to \$90:

- ❖ A rise of \$10 in the oil price shifts \$320 billion a year from consumers to producers.
- ❖ Recent plunge in oil prices: causes and implications:
 - (a) producers
 - (b) consumers
- ❖ Outlook for prices: 2015 / 2016

6. Nuclear Scenario

- Nuclear power represents 15% of world electricity
- **Nuclear “Renaissance”:**
 - * Between 2000-10, thirty-nine new plants went into operation
 - * Now, 60 plants under construction
 - * In US, 30 new reactors approved
- **Areas of concern:**
 - (a) High capital costs
 - (b) Storage of waste material: “deep geologic storage”
 - (c) “Dual use” fears
 - (i) Enrichment
 - (ii) Re-processing of spent fuel
 - (d) Serious safety concerns
- **Post – Fukushima:** “nuclear renaissance” now replaced by fresh fears: Japan moving away from nuclear power (30% to 10% in 2020) and toward fossil fuels [from 62% to 80% in 2020].

➤ Still, 61 nuclear reactors under construction, mainly in China and India.

* Japan now has only one nuclear power plant in operation:

Sendai 1 (from August , 2015)

Sendai 2 (ready to start up Mid-October, 2015)

The National Nuclear Emergency Reform Organization to
function from December 2016

Major political push to return to nuclear power, but outlook
uncertain; of 42 operable plants, only seven are likely to be
operational in coming years

* Bleak outlook for nuclear power

Overview

Over the longer term, there will be an inter-play between a series of **separate but over-lapping competitions**: between OPEC and non-OPEC producers; between conventional and non-conventional fuels, between fossil fuels and renewables, and between coal and gas.

On the **demand side**, these competitions will be influenced by: the global economic scenario, particularly the growth prospects of the major **consumers** - China, the USA, India, Japan, ROK, etc; the extent of global and regional commitment to **climate change** concerns, and the application of **technology** in promoting fuel-efficient and green transport, clean coal, safe nuclear power, and commercially viable renewables.

Factors Influencing Supply

- the continued ability of major **producers** to maintain their projected levels of production and export,
- security in **Iraq** and the successful implementation of its National Integrated Energy Strategy,
- increasing availability of **Iranian oil** following the easing sanctions
- the development of **new conventional sources** in Saharan and sub-Saharan Africa, Central Asia and Latin America,
- the continued development of **unconventional resources** in USA, Brazil and the Arctic, and,
- **price stability** at present levels that would encourage further conventional and unconventional exploration and developments.

Asian Strategic Role

(A) Gulf Stability

- ❖ Security and stability of the crucial far long-term Asian security.
- ❖ From hegemony and militarism to cooperative security arrangements
- ❖ Challenges:
 - (a) Gulf deeply divided and in confrontation
 - (b) no tradition of Asian dialogue on Gulf security

(B) The South China Sea

- ❖ Hundreds of small islands, atolls and reefs: PRC claim over all these geographical features, covering 80% of the sea
- ❖ Strategic Location: involves China, Vietnam, Malaysia, Brunei and the Philippines
- ❖ Rich in energy reserves:
 - * 11 billion barrels of oil
 - * 190 trillion cubic feet of natural gas
 - * potential limited plus high cost of production
- ❖ Disputed areas:
 - * Reed Bank: dispute over exploration right between China and the Philippines
 - * differences between China and Vietnam over latter's exploration in its EEZ
India involved since its state company, OVL has exploration rights
 - * Islands disputed between China and Indonesia

(C) Northeast Asia: Energy Challenges

- ❖ NE Asia covers: China, Japan, North & South Korea, and the Russian Far East
- ❖ High energy demand from: China, Japan & ROK –
 - * primarily dependent on supplies from the Gulf
 - * deeply concerned about energy security plus diversification of supplies
- ❖ Russia could emerge as a major supplier:
 - * Russian potential: 33% of global gas; 5% of oil reserves and 16% of coal. The Russian Far East (RFE) is particularly well-endowed: 30% of Russia's coal; capable of exporting 15-25 million tonnes of oil and 30-50 million cubic meter of gas
 - Eastern Siberia has 20% of world's gas and by 2020 could produce 130 bcm of gas
 - by 2035, oil production in East Siberia and RFE could be 95 M tonnes
 - * its natural gas could substitute for coal and oil for power generation
 - * oil and gas pipeline connectivities (going beyond LNG)
 - * Asian investment in Russia's energy sector

Co-operation for Energy Security: Indian Perceptions

- Unique features of energy security
 - a) Inherently cooperative
 - b) A dynamic concept
- **The logic of Global Co-operation**
 - (a) Need to mobilize resources globally:
 - * Hydrocarbon resources to meet global demand over next 30-35 years are available: new technologies continue to yield fresh discoveries and augment supplies from old fields.
 - * Oil will be available in physically challenging areas such as the deep sea or frozen terrain or environmentally sensitive locations.
 - * Exploration and development of these resources will require rather huge investments, amounting cumulatively to over \$5 trillion up to 2030, @ \$20 billion per annum.
 - (b) Need to protect the entire energy supply chain and infrastructure: production facilities, transport, refining, pipelines, storage facilities, power plants and transmission lines.
- Currently, daily 40 million barrels of oil cross the oceans in tankers; could come 67mill. barrels in 2020.
- Currently, 150n million tons of LNG is transported by sea; could come 460 MT by 2020.

Areas for Asian Cooperation

- ❖ Clean coal
- ❖ Conservation and efficiency
- ❖ Criss-cross investments
- ❖ Expansion of energy connectivities cooperation
- ❖ Energy: the new “silk road” of the 21st century

Towards a Pan – Asian Security Paradigm

The Asian Quest for Energy Security could lead to Asian regaining its traditional place – a place it has held for thousands of years of recorded history and lost only in the last two hundred years or so – in the vanguard of the advancement of human civilization.

The Asian renaissance brought us all to independence and liberation. Now, the Asian Resurgence depends on energy cooperation in Asia. The 21st century will indeed be the Asian century only if Asian countries – buyers or sellers – join hands together in a continent – wide bid at bringing Asia together and keeping Asia together. I am confident that we will.

-Mani Shankar Aiyar, Indian Petroleum Minister,

Jan 2006

Developing an alternative cooperative security arrangement based on a regional strategic consensus: towards a new Asian Gulf security paradigm.