

## 4<sup>th</sup> Asian Ministerial Energy Roundtable

Sustainable Growth and Energy Interdependence 18 April 2011, Kuwait

**Background Paper** 

#### I. Background

With Asian destinations emerging as the principle consumers for Asian production, and the share of Asia in global production and consumption likely to progressively increase, cooperation between Asian producers and Asian consumers is crucial to ensuring Stability, Security and Sustainability though mutual interdependence in the Asian oil and gas economy. To serve such purpose, a first Roundtable of Asian Ministers on Regional cooperation in the oil and gas economy was hosted by India in New Delhi on 6 January 2005.

At this first roundtable, it was agreed that the momentum of the Roundtable of Asian Ministers on Regional Cooperation in the Oil and Gas Economy, initiated in India, must be maintained<sup>1</sup>.

The Roundtables now follow an established pattern of alternating between net importing and net exporting countries. It was also decided that for the preparation of Ministerial Roundtables, the Secretariat of the International Energy Forum plays a supportive role.

That First Roundtable of Ministers of the principal East Asian oil and gas importing countries and the principal West Asian (Gulf) oil and gas exporting countries was supplemented by an additional Roundtable of Ministers of the principal East Asian oil and gas importing countries and the principal North and Central Asian oil and gas exporting countries convened by India, cohosted by the Russian Federation and facilitated by the IEF Secretariat in New Delhi in November 2005.

The Second Asian Ministerial Energy Roundtable on the theme "Promoting Prosperity through Energy Interdependence and Co-operation" was held in Riyadh on 2 May 2007 hosted by H.E. Ali I. Al-Naimi, Minister of Petroleum and Mineral Resources of Saudi Arabia and co-hosted by H.E. Akira Amari, Minister of Economy, Trade and Industry of Japan. Energy Ministers of seventeen East, South and West Asian countries - Bahrain, Brunei, China, India, Indonesia, Iran, Iraq, Japan, Kuwait, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, South Korea, Thailand and UAE participated – along with heads of the IEA, OPEC and IEF Secretariats.

The concluding statement issued jointly by host Saudi Arabia and co-host Japan in line with IEF convention recognizes the growing importance of Asia in both the global economy and global energy market as well as the importance of ensuring Asian dimensions are accounted for in efforts to deepen the global dialogue in the IEF. It calls for greater co-operation and co-ordination among and between Asian energy exporters and importers at bilateral, regional and global levels. Underscoring the need for investment and supporting cross-national investment, the statement also confirms support for the Joint Oil Data Initiative (now Joint Organisations Data Initiative).

The Third Roundtable of Asian Ministers was hosted by Japan and co-hosted by Qatar. At the invitation of the Government of Japan, Energy Ministers of 21 Asian countries and representatives of 2 international organizations gathered in Tokyo to discuss Asia-specific energy

<sup>&</sup>lt;sup>1</sup> The following countries have agreed to host/co-host subsequent Roundtables: Second Round Table in Saudi Arabia in 2007, Third Round Table in Japan in 2009, Fourth Round Table in Kuwait in 2011, Fifth Round Table in Republic of Korea in 2013, Sixth Round Table in Qatar in 2015.

issues. Participants recognized that excessive fluctuations in oil prices are undesirable for both energy producers and consumers, and that financial markets have an influence on oil price formation. They welcomed the important progress made so far in the Joint Oil Data Initiative (now Joint Organisations Data Initiative) coordinated by the IEF and also encouraged partner organizations and countries to make further improvements to JODI to provide more complete and timely energy data, including stock data, and the inclusion of gas-related data. Ministers also discussed the increasingly important role of natural gas in enhancing energy security and mitigating climate change.

The Fourth Asian Ministerial Energy Roundtable will focus on "Sustainable Growth and Energy Interdependence" and the discussions will be organized around three sessions. The <u>first session</u> "*Asian Energy Outlook up to 2035*" will discuss the region's medium and long-term energy outlooks and economic prospects with a focus on potential areas for demand and supply growth in Asia-Pacific and the Middle East. The session will address the region's prospects for renewable and nuclear energy, growth in the electricity and transportation sectors, and the growing interdependence between the Asia-Pacific and Middle East regions.

The <u>second session</u> "Demand Management and Future Investment" will discuss the effects of current and projected long-term demand growth in Asia, and the energy policies that influence the region's future demand patterns. The session will also discuss the drivers and opportunities for energy efficiency in the region as well as the issues of energy subsidies and sustainable energy. The second session will focus on the level of investment required in the oil and gas sector to meet future energy demand and the challenges facing the industry in this regard. The development and diffusion of advanced technology among Asian countries will also be a point of discussion. Moreover, the session will aim to develop recommendations to enhance regional cooperation.

The <u>third session</u> "*Energy Price Volatility*" will address the primary drivers of excessive energy price volatility and potential strategies for dealing with the phenomenon. The session will consider the role of data transparency as a tool for mitigating price volatility as well as the role of governments and companies in stabilizing energy markets. The session will aim to develop recommendations to enhance regional cooperation with a specific focus on reducing unwarranted energy price volatility.

#### II. Energy Outlook up to 2030

In 2010, the IEA, IEF and OPEC agreed on a joint programme of work which was endorsed by Energy Ministers at the 12<sup>th</sup> International Energy Forum (Cancun, March 2010) as part of the Cancun Declaration<sup>2</sup>.

IEA, IEF and OPEC areas of cooperation include an annual Symposium on Energy Outlooks. The first event was held in Riyadh on 24 January 2011. The Symposium offered a platform for sharing insights and exchanging views about energy market trends and short- medium- and long-term energy outlooks, including analysis of market behaviour and discussion of key drivers of the energy sector and discussion of the myriad associated uncertainties. The main findings of the IEA-IEF-OPEC Symposium are laid out below<sup>3</sup>.

#### II.1 Short-Term Outlook Short-Term Oil Demand

IEA and OPEC both made several upward adjustments to their demand projections during 2010, driven mainly by mixed evidence of economic recovery as well as weather related issues and revisions of baseline data. In addition, both reports forecast a rise in demand growth into 2011. There is around 1.1 mb/d (million barrels per day) difference between the two reports on 2010 oil demand growth, with the IEA expecting much higher growth, but their estimates for 2011 world demand growth are identical with both organizations projecting world an increase of 1.4 mb/d in 2011.

	IEA			OPEC				
	2009	2010	2011	2009	2010	2011		
OECD	45.4	46.1	46.0	45.5	46.0	46.3		
North America	23.3	23.9	24.0	23.3	23.9	24.2		
Europe	14.5	14.4	14.4	14.5	14.4	14.4		
Pacific	7.7	7.8	7.7	7.7	7.8	7.7		
Non-OECD	39.5	41.8	43.3	39.0	40.3	41.5		
China	8.4	9.4	10.0	8.3	9.0	9.5		
FSU	4.0	4.3	4.4	4.0	4.1	4.1		
World	85.0	87.9	89.4	84.5	86.4	87.8		

Table (1): World oil demand 2009-2011 (mb/d)

The differences between the IEA and OPEC's estimates stem mainly from their diverse views on the demand growth levels in the non-OECD countries - especially demand growth in China. Table (1) shows that the IEA estimates for demand in non-OECD countries by 2011 are

<sup>&</sup>lt;sup>2</sup> http://www.ief.org/Events/Documents/CANCUNMINISTERIALDECLARATION.pdf.

<sup>&</sup>lt;sup>3</sup> As per the recommendation of the 3rd Asian Ministerial Energy Roundtable held in Tokyo, Japan on April 26, 2009, the Institute of Energy Economics of Japan (IEEJ) prepared, with the assistance of experts from Asian Petroleum Producing-Consuming Countries, a joint study on the "Asian Energy Outlook" which will also be made available to Ministers in Kuwait.

1.8 mb/d higher than OPEC's estimates. Both reports also have different views on OECD countries' demand. For example in 2011, the IEA report projects a slight decline in OECD demand while OPEC's report projects a slight increase over the same period.

#### Short-Term Oil Supply

Turning to supply, the IEA and OPEC reports also made several upward revisions to their non-OPEC supply projections upward during 2010, forecasting a rise in non-OPEC supply for both 2010 and 2011. However, there is around 0.5 mb/d difference in their non-OPEC supply figures for 2009 which has a cumulative effect on the 2010 and 2011 deltas. This difference stems mainly from differences in their assumptions on the level of Russian production and processing gain.

Table (2) shows that the growth in non-OPEC supply in 2010 is very similar in both OPEC and IEA reports. As the two reports project non-OPEC supplies to increase by 1.1 mb/d in 2010, the 2010 gain alone is greater than the total increase in non-OPEC supply over the four-year period from 2004–2008 and is largely the result of delayed projects coming on-stream, at a time owing mostly to the recession and drop in oil prices However, for 2011, the IEA is rather more optimistic than OPEC, with non-OPEC supply increasing by 0.84 mb/d according to the IEA report versus 0.53 mb/d in OPEC's report. Both reports point out that output growth remains concentrated in a few non-OPEC countries including Brazil, Russia, Azerbaijan, Kazakhstan, Colombia, Ghana, US Gulf of Mexico and Canada. Elsewhere, new developments are relatively much smaller.

The IEA report expects OPEC NGLs and non-conventional oil to average 5.3 mb/d in 2010 and 5.86 mb/d in 2011, representing growth of over 0.5 million barrels per day for both years, a growth similar to OPEC's figure. However the **absolute levels for 2010 and 2011 differ by more than 0.5 mb/d**, as the IEA report sees more OPEC NGLs and other liquids in 2009. Adding this figure to the difference in the non-OPEC supply level mentioned above, this will result in more **than 1 mb/d difference between the IEA and OPEC projections**.

		$\mathbf{IEA}^*$			OPEC	
	2009	2010	2011	2009	2010	2011
OECD	19.77	19.98	20.10	19.72	19.89	19.86
North America	14.38	14.96	15.08	14.36	14.90	15.11
US	8.18	8.66	8.71	8.14	8.58	8.68
Canada	3.24	3.35	3.44	3.24	3.36	3.52
Mexico	2.97	2.96	2.93	2.96	2.96	2.91
Western Europe	4.73	4.38	4.32	4.73	4.39	4.17
OECD Pacific	0.66	0.63	0.64	0.64	0.60	0.58
China	3.93	4.14	4.24	3.85	4.14	4.20
Other Asia	3.64	3.71	3.65	3.70	3.69	3.71
Europe	0.14	0.14	0.14	0.14	0.14	0.14
Latin America	4.38	4.63	5.02	4.41	4.72	4.93
Middle East & Africa	4.29	4.30	4.39	4.34	4.38	4.51
Russia	10.21	10.46	10.52	9.92	10.14	10.19
Other FSU	3.07	3.13	3.20	3.04	3.08	3.16
Processing gains	2.25	2.30	2.35	2.00	2.08	2.08
Total Non-OPEC	51.69	52.79	53.63	51.13	52.26	52.79
Supply						
ODEC NCLs and other	1 91	5.30	5.96	4 35	4 70	5.25
Liquids	4.01	5.50	5.00	4.55	4.79	5.25
Call on OPEC Crude	28.69	29.22	29.90	28.71	29.2	29.8
World Supply	85.19	87.32	89.39	84.20	86.05	87.32
Global biofuels	1.57	1.82	2.00	1.57	1.85	2.07

Table (2): World oil Supply 2009-2010-2011 (mb/d)

\* Biofuels are included in the countries and regions

The primary conclusion is that the IEA and OPEC projections are similar in terms of supply/demand growth figures for 2011. This paints a market situation in 2011 characterised by a high level of spare capacity, in both upstream and downstream; relatively high OECD commercial inventories, an expected slowdown in oil demand growth compared to 2010, and increases in oil supply.

#### II.2 Medium-Term Outlook Medium-Term Global Oil Demand

Both the IEA and OPEC expect robust growth in global oil demand over the medium term. However, their projections differ by around 2.4 mb/d by 2014, Table (3). The IEA's higher demand projections over the medium-term can be traced to their higher assumptions for economic growth, especially for 2010 and the difference in the base year mentioned above.

By 2014, the IEA and OPEC expect global oil demand to average 92.3 mb/d and 90 mb/d respectively, an annual growth ranging from 1.5 mb/d to 1.0 mb/d over the years to 2014 on average.

	IEA			OPEC			
	2009	2014	Change 2009/2014	2009	2014	Change 2009/2014	
OECD	45.5	44.9	-0.6	45.5	45.3	-0.2	
North America	23.3	23.7	0.4	23.3	23.8	0.5	
Europe	14.5	13.9	-0.6	14.5	13.9	-0.6	
Pacific	7.7	7.3	-0.4	7.7	7.6	-0.1	
Non-OECD	39.5	47.4	7.9	39.0	44.6	5.6	
China	8.4	11.2	2.8	8.3	10.4	2.1	
World	85.0	92.3	7.3	84.5	89.9	5.4	

Table (3): Medium-term oil demand outlook (mb/d)

At the regional level, both the IEA and OPEC expect oil demand to be driven by non-OECD countries, though the IEA projection for demand in non-OECD countries in 2014 is 2.8 mb/d greater than OPEC's projection, one quarter of this difference attributed to China alone. The IEA report projects that total non-OECD oil demand will overtake the demand for oil in the OECD countries by 2013, while OPEC's report shows that by 2014, total OECD demand continues to account for over half of the world's oil demand. When considering the OECD region, the IEA expects oil demand in OECD countries to decline slightly more than OPEC's report estimates by 2014.

#### Medium-Term Global Oil Supply

The IEA and OPEC both project high growth in global oil supply over the medium term to meet the projected demand increase by 2014. However, their medium term global oil supply forecasts differ by around 2.4 mb/d by 2014 as is the case with their oil demand numbers.

Table (4) shows convergence of the **IEA and OPEC projections when it comes to the growth in non-OPEC supply over the medium term**, with non-OPEC supply reaching 53.6 mb/d by 2014 according to the IEA projection versus 53.3 mb/d by OPEC.

	2009	2010	2011	2012	2013	2014	Increment 2009/2014
Non-OPEC							
IEA	51.7	52.8	53.4	53.8	53.5	53.6	1.9
OPEC	51.1	51.9	52.2	52.6	52.9	53.3	2.2
<b>OPEC NGLs*</b>							
IEA	4.8	5.3	5.8	6.3	6.6	6.9	2.1
OPEC	4.3	4.8	5.3	5.7	5.9	6.2	1.9
OPEC Crude							
IEA	28.50	29.40	29.50	30.0	31.0	31.8	3.3
OPEC	28.7	29.3	29.2	29.6	30.2	30.6	1.9
Total Supply							
IEA	85.0	87.5	88.7	90.1	91.1	92.3	7.3
OPEC	84.2	86.0	86.8	87.8	89.0	90.1	5.9

\* including GTLs.

The IEA projects OPEC NGLs and non-conventionals to average 6.9 mb/d by 2014, representing growth of 2.1 mb/d, a figure consistent with OPEC's figure of 1.9 mb/d, Table (4).

Given that the IEA projects a greater increase in oil demand than OPEC does over the medium term, the net result is a higher call on OPEC crude expected by the IEA. By 2014, required OPEC crude is projected as 31.8 mb/d by the IEA and 30.6 mb/d by OPEC, a difference of around 1.2 mb/d. However, the IEA sees more NGLs coming from OPEC countries than OPEC's own report does.

The IEA and OPEC both project an increase in OPEC crude production capacity over the medium term, but with different assessments of the level of capacity increase. The IEA projects OPEC crude capacity to increase by 1.8 mb/d, from 2009 to 2014 versus 3.0 mb/d in OPEC's report. Consequently, whereas OPEC foresees a steady increase in OPEC spare capacity over the medium term to reach over 7.0 mb/d by 2014, Table (3), the IEA expects spare capacity to fall after 2009, to around 4.9 mb/d by 2015. This implies that the IEA assumes there is less capacity coming on stream over the medium term than OPEC does.

### II.2 Long Term Energy Outlook Long term Global Energy Demand

The IEA projects that global primary energy demand continues to grow (CPS: Current Policies Scenario) but at a slower rate than in recent decades. By 2030, it is 38% higher than in 2008, a growth similar to OPEC's projection. Non-OECD countries account for over 90% of the increase. Fossil fuels maintain a central role in the primary energy mix (CPS), although their share declines slightly, from 81% in 2008 to 79.5% in 2030, Table (5). Oil demand<sup>4</sup> is up by 22%, from 84 mb/d in 2009 to 102.7 mb/d in 2030. Coal demand is around 49% higher in 2030 than today, with almost all of the growth before 2020. Gas demand is up by 43% in 2030 compared to 2008, though it does not surpass that for coal. The share of nuclear power stays more or less flat over the projection period at around 6%. The use of modern renewable energy, including wind, solar, geothermal, marine, modern biomass and hydro, increases over the outlook period, with its share in total primary energy demand rising from 7% to 14.4%.

	IEA	A <sup>a</sup>	OPEC			
	Growth p.a. 2008-2030	Fuel shares 2030	Growth p.a. 2008-2030	Fuel shares 2030		
Oil	0.8	28.5	0.9	30.2		
Coal	1.8	29.1	1.6	28.5		
Gas	1.7	22.0	2.0	24.5		
Nuclear	1.7	6.1	1.7	6.4		
Hydro	1.9	2.5	2.3	2.8		
Biomass	1.3 <sup>b</sup>	9.6 <sup>b</sup>	3.3	5.4		
Other renewable	6.9	2.3	7.8	2.1		
Total	1.5	100.0	1.6	100		

Table (3): World primary energy growth and fuel share (7)	Table	(5):	World	primary	energy	growth	and	fuel	share	(%	5)
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a. Current Policies Scenario.

b. Includes traditional and modern uses.

<sup>&</sup>lt;sup>4</sup> Excludes biofuels demand, which is projected to rise from 1.1 mb/d (in energy-equivalent volumes of gasoline and diesel) in 2009 to 3.0 mb/d in 2030.

In the future, developing countries will account for most incremental demand, however energy use per capita in developing countries will remain well below that of the OECD countries in 2030. Fossil fuels maintain a prominent role, and though their share in the energy mix is expected to fall, it remains over 80% throughout the period to 2030. Oil's leading role in the energy mix will continue with its share remaining above 30%, albeit falling over time. Oil use, however, grows at the slowest rate of all fuel types. The rate of expansion in natural gas use is expected to be up by 54% in 2030 over 2008 levels, especially with the technological developments that have made the exploitation of unconventional resources economically viable. Coal is expected to retain its importance in the energy mix as the second most important fuel; it grows by more than 42% over the forecast period. Renewable energy will grow fast, but from a low base, while both hydro- and nuclear power witness some expansion.

	IE	A <sup>a</sup>	OPEC			
	2008	2030	2008	2030		
Oil	82.6	98.3	80.9	97.6		
Coal	67.5	100.4	64.8	92.1		
Gas	52.9	75.8	51.4	79.1		
Nuclear	14.5	21.2	14.4	20.7		
Hydro	5.6	8.5	5.5	9		
Biomass	24.9 <sup>b</sup>	33.0 <sup>b</sup>	8.6	17.5		
Other renewable	1.8	7.8	1.3	6.8		
Total	249.9	344.9	226.8	322.9		

Table (	6):	World	primary	energy	(mboe/	d)	)
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a. Current Policies Scenario

b. Includes traditional and modern uses

OPEC projects slightly higher growth in world primary energy use than the IEA does, 1.6% versus 1.5% Table (4). However, the global energy demand levels in the IEA Current Policies Scenario by 2030 are slightly higher than OPEC's reference case projections; this is mainly due to the higher base data, as the IEA WEO includes traditional biomass uses. **The IEA WEO and OPEC WOO's growth rates by fuel type are relatively comparable**.

Both IEA and OPEC project that oil will continue to be the single largest constituent of primary energy demand in 2030; although its share as a proportion of total fuels will have fallen to 30% from more than 35% in 2008 according to OPEC's report and to 28.5% from around 33% in 2008 according to the IEA.

The IEA long-term projection for world oil demand in 2030 is 107.1 mb/d whereas OPEC's Reference Case projection is 105.5 mb/d, a difference of around 1.6 mb/d; this is mainly due to the higher base data used by the IEA. Both outlooks see decline in OECD oil demand over the forecast period with developing countries accounting for most of the incremental demand. However, they have different views on the absolute levels of demand.

#### **II.2.2 Long-Term Supply Outlooks**

The IEA and OPEC outlooks make quite similar assumptions regarding the availability of resources and the size of the resource base. According to both organizations, the ultimately recoverable conventional resources- a category that includes initial proven and probable reserves from discovered fields, reserves growth and economically recoverable oil that has yet to be found amounts to 3.5 trillion barrels with the remaining resources as of the end of 2009 at around 2.5 trillion barrels.

A comparison between IEA and OPEC supply projections appears in Table (7). Both outlooks have been adjusted for the purposes of consistency of the comparison. There are very minor differences in expectations for total non-OPEC supply between the two outlooks; the IEA projects non-OPEC supply to increase slightly more than OPEC does, reaching 57.7 mb/d by 2030, against OPEC's projection of 57.5 mb/d. However, there are some differences on the regional/country level.

200920152030200920152030OECD18.717.417.218.717.817.3North America13.613.214.313.613.614.1US & Canada10.610.711.810.611.012.1Mexico3.02.52.53.02.62.0Western Europe4.53.52.44.53.62.6OECD Pacific0.70.70.50.60.60.7
OECD 18.7 17.4 17.2 18.7 17.8 17.3   North America 13.6 13.2 14.3 13.6 13.6 14.1   US & Canada 10.6 10.7 11.8 10.6 11.0 12.1   Mexico 3.0 2.5 2.5 3.0 2.6 2.0   Western Europe 4.5 3.5 2.4 4.5 3.6 2.6   OECD Pacific 0.7 0.7 0.5 0.6 0.6 0.7
North America13.613.214.313.613.614.1US & Canada10.610.711.810.611.012.1Mexico3.02.52.53.02.62.0Western Europe4.53.52.44.53.62.6OECD Pacific0.70.70.50.60.60.7
US & Canada 10.6 10.7 11.8 10.6 11.0 12.1   Mexico 3.0 2.5 2.5 3.0 2.6 2.0   Western Europe 4.5 3.5 2.4 4.5 3.6 2.6   OECD Pacific 0.7 0.7 0.5 0.6 0.6 0.7
Mexico 3.0 2.5 2.5 3.0 2.6 2.0   Western Europe 4.5 3.5 2.4 4.5 3.6 2.6   OECD Pacific 0.7 0.7 0.5 0.6 0.6 0.7
Western Europe 4.5 3.5 2.4 4.5 3.6 2.6   OECD Pacific 0.7 0.7 0.5 0.6 0.6 0.7
<b>OECD Pacific</b> 0.7 0.7 0.5 0.6 0.6 0.7
China 3.8 3.8 3.1 3.8 3.9 3.9
Other Asia 3.6 3.6 2.8 3.6 3.9 3.4
Latin America 3.9 5.3 6.5 3.9 4.8 5.7
Middle East & Africa 4.2 4.0 3.1 4.3 4.2 3.6
Russia 10.2 10.2 9.2 9.9 10.4 10.7
Other FSU 3.2 3.9 5.5 3.2 3.9 5.0
Non-OPEC Supply <sup>2</sup> of which 47.7 48.2 47.4 47.5 49.1 49.6
Crude Oil 39.6 38.4 35.0 40.0 39.9 36.2
NGLs 6.2 6.6 6.9 5.7 6.4 7.1
Non-conventional 1.8 3.1 5.6 1.8 2.8 6.3
Biofuels <sup>3</sup> 1.6 2.5 5.1 1.6 2.4 5.1
Processing gains 2.3 2.5 2.9 2.0 2.3 2.9
Total Non-OPEC Supply 51.6 53.2 55.5 51.1 53.9 57.5
OPEC NGLs and other Liquids 4.6 7.3 10.5 4.3 6.5 9.5
NGLs 4.6 7.1 10.1 4.2 6.2 8.9
Non-conventional 0.0 0.2 0.4 0.1 0.3 0.6
OPEC Crude <sup>4</sup> 28.7 31.2 35.4 28.7 30.8 38.7
World Supply 85.0 91.7 101.5 84.2 91.2 105.7

Table (7) Long-term world oil Supply, mb/o	d
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1. New Policies Scenario,

- 2. Includes non-conventional and exclude biofuels,
- 3. Volumetric bases
- 4. Include Venezuela extra heavy oil

The oil supply projections are also available by oil type and this analysis attempts to further demonstrate where differences may lie. The projections by oil type are given in Table (8). OPEC

and the IEA project almost the same non-OPEC non-conventional oil and NGLs, and they have only 0.6 mb/d difference in their non-OPEC crude oil projections. However, the IEA sees more NGLs coming from OPEC member countries than OPEC does, the difference by 2030 is around 2.2 mb/d.

Both outlooks recognize that there will be a wide range of sources of oil to satisfy demand. In particular, they see non-crude liquids supply, from both OPEC and non-OPEC sources, such as non-conventional oil, condensate and NGLs and biofuels, almost doubled by 2030. Consequently, global conventional crude supply in 2015 is around 2.2 mb/d higher than 2009 levels, and by 2030 the demand for crude is projected to reach 74.9 mb/d, according to OPEC and 74.3 mb/d based on IEA projections, a difference of only 0.6 mb/d. On the other hand global non-crude supply in 2015 is more than 5 mb/b higher than 2009 levels, and by 2030 the non-crude supply is almost doubled.

	IEA*			OPEC			
	2009	2015	2030	2009	2015	2030	
Non-OPEC crude Oil	39.6	38.4	36.8	40.0	39.9	36.2	
Non-OPEC NGLs	6.2	6.7	7.1	5.7	6.4	7.1	
Non-OPEC non-conventional*	1.8	3.1	6.4	1.8	2.8	6.3	
Biofuels	1.6	2.5	4.4	1.6	2.4	5.1	
Processing gains	2.3	2.5	3.1	2.0	2.3	2.9	
OPEC crude oil**	28.7	31.9	37.5	28.7	30.8	38.7	
OPEC NGLs and other Liquids	4.6	7.4	11.7	4.3	6.5	9.5	
World crude oil	68.3	70.3	74.3	68.7	70.7	74.9	
World non-crude	16.7	22.3	32.8	15.5	20.5	30.8	
Crude oil share, %	80	76	69	82	78	71	
Non-crude liquid share, %	20	24	31	18	22	29	

Table (8) Long-term world oil Supply by type (mb/d)

1. \* Included oil sands, \*\* Include Venezuela extra heavy oil

It is worth noting that **despite the fact that energy and environmental policies rank among the key drivers for future energy demand and supply, they represent one of the most uncertain areas of the outlooks**. The differences in the IEA and OPEC's projections for future energy demand especially those for oil demand can be attributed mainly to their assumptions on energy and environmental policies.

#### III. Demand Management and Energy Efficiency

The fast pace of growth in primary energy demand that has occurred in the Asian region over the last decade is set to continue. According to the IEA<sup>5</sup>, Asia (including Middle East) will account for 49% of world total primary energy demand by 2035. Asia (including Middle East) will account for 76% of the total energy demand growth and for more than 100% of global oil demand growth from 2008 to 2035.

China's primary energy demand is expected to surge by 75% in 2008-2035, a far bigger increase than in any other country or region. India is the second largest contributor to the increase in global demand to 2035, accounting for 18% of the rise. China and India will account for 51% and 19% of total primary energy demand in Asia in 2035, respectively. Besides China and India, the Middle East is expected to register the fastest rate of demand increase between 2008 and 2035 (2% annually).

Total primary energy demand in Asia (excluding Middle East) will increase from 4.2 billion toe in 2008 to 7.3 billion toe in 2035, showing a 1.7-fold increase. China and India account for 70% of total primary energy demand in Asia excluding Middle East in 2035. The share of Japan will decline from 12% in 2008 to 6% in 2035. The share of Middle East energy demand will slightly decline, from 13% in 2008 to 12% in 2035. Oil and natural gas together account for 98% of total primary energy demand in 2008, and will continue to dominate the energy mix in the Middle East until 2035.

Oil will remain the dominant fuel in the primary energy mix until 2035, although the share in total energy demand will decrease from 33% in 2008 to 28% in 2035. Growth in demand for natural gas will far surpass other fuels, backed by its large supply availability and favorable environmental attributes. The share of fossil fuels will remain above 73% through to 2035.

Although cheap and abundant energy resources in many producing countries have rendered demand management a less pressing issue, soaring domestic demand growth in many producing countries will affect future exports and revenues unless new policies to manage domestic energy demand are quickly implemented. Despite energy intensity improvement registered across the region over the past years, there is still a **large potential for improving energy efficiency in all sectors**, industry (including its energy segment), transport and households. Energy efficiency measures throughout the energy chain **support economic growth** in a cost-effective manner, **help to mitigate climate change**, ensure a more **effective use of finite global resources** and **enhance global energy security**.

#### III.1 Delivering energy efficiency

Securing future energy demand through the pursuit of energy efficiency is technically **the least expensive method** for doing so, but the costs associated with some of the measures may still be significant and barriers to widespread implementation must be addressed. Implementing energy efficiency policies is complex and requires a good delivery mechanism together with the requisite human and financial resources.

<sup>&</sup>lt;sup>5</sup> New Policies ScenarioWEO2010

Energy efficiency oriented policies should be differentiated across the sectors. Initiatives targeting households are likely to be educational, tax-based or incentive-based, whereas industry schemes may focus on regulatory or voluntary standards or building design and manufacturing, and tax- or market-based measures are likely to focus on energy consumption.

A **successful energy efficiency** governance system should cover enabling frameworks (laws and decrees, strategies and plans, funding mechanisms), coordination mechanisms (inter- and intra- governmental coordination, targets and goals, evaluation and oversight) and institutional arrangements (implementing agencies, role of energy providers, funding mechanisms, private sector cooperation, stakeholder engagement, international cooperation).

The starting point for any energy efficiency policy is an **assessment of current consumption patterns**. Numerous Asian countries lack the detailed statistics on energy demand (by sector, by user, etc.) necessary to facilitate a proper assessment of consumption patterns and behaviour. Assessment of consumption patterns is a prerequisite for determining sectoral priorities and actions.

**Technology** is clearly an area with the potential to contribute to improvements in energy efficiency throughout the whole energy chain and in all sectors. Policy instruments — both economic incentives and direct regulations — can hasten the diffusion of energy-efficient technologies.

Appropriate and comprehensive **regulatory measures** accounting for all relevant factors (infrastructure, transportation, appliances etc...) are also necessary to help achieve energy efficiency targets.

**Domestic energy prices** are an important determinant of energy demand. As a policy tool, subsidies are often applied to deliver social benefits, improve access to modern energy, stimulate rural development, or encourage the use of selected fuel(s) for environmental and/or energy security purposes. However, subsidised / low end-use prices may lead to higher energy use as the economic incentive to conserve or save energy has been reduced. Subsidised energy prices may also undermine the energy provider's return on investment and therefore lower the incentive to invest in much-needed infrastructure. In all cases, subsidies lead to undue strain on the government's budget, misallocation of resources and impairment of the country's balance of payments, in particular when the gap between international and domestic prices is widening.

The difficulty in crafting an effective subsidy scheme is in reaching the intended demographic. Blanket subsidies for fuel or electricity which fail to account for the wealth or demand profiles of individual consumers do not assist the poor any more than they do the wealthy; they often benefit those who would otherwise be ready and willing to pay higher prices for energy, such as industry and better-off households.

In recent years many Asian countries have announced plans to reform their domestic energy pricing policy by phasing out inefficient subsidies and replacing them with transparent "smart" pro-poor, subsidy mechanisms. Measures have been implemented and progress made and there are many examples from which useful lessons can be drawn. For example, China introduced a mechanism to link oil product prices to a basket of international crude prices in 2008, increased natural gas prices in 2010, and plans to introduce changes in its electricity pricing structure. India abolished gasoline price regulation in 2010, and increased retail kerosene and LPG prices and the price paid to producers of natural gas. Indonesia has a goal to reduce spending on energy subsidies by 40 % by 2013 and to fully eliminate fuel subsidies by 2014. Malaysia has announced a plan to phase out subsidies for petrol, diesel and LPG. Iran has plans to replace subsidized energy pricing with targeted assistance to low-income groups over the period 2010-2015. Saudi Arabia has voiced its concern about the pace of domestic demand growth and announced plans to review electricity tariffs for industrial and commercial users, and established an agency to propose ways and measures to improve energy efficiency.

Reforming energy subsidies as called for by the G20<sup>6</sup> does not necessarily mean the abandonment of social policy goals and can be introduced in a **gradual and programmed fashion**, towards a sustainable, market-linked pricing policy accompanied by targeted subsidies for low-income households.

#### III.2 Cooperation on demand management and energy efficiency

Energy efficiency policies implemented in developed countries over the past three decades have delivered tangible results with substantial improvements in the efficiency of energy use in the transportation, housing and industrial sectors. Developing countries have not played a major part in this energy efficiency progress, due in part to the level and nature of their energy consumption but also in many cases due to the lack of institutional capability to promote energy efficiency policies.

# Developing Asian countries can benefit from energy efficiency policies and measures already implemented in other Asian countries.

Improving energy efficiency will require deployment of new technologies as well as implementation of market mechanisms and investment approaches on an unprecedented scale. Stakeholders including Governments and energy consumers and producers must co-operate and co-ordinate effectively to achieve the timely delivery of the required energy efficiency improvements at an appropriate level.

Best practices and measures already in place in the residential, industrial and transportation sectors in developed countries could be implemented and disseminated in the developing countries. Producing and consuming countries in the Asian region could coordinate their efforts to improve capacity building and knowledge sharing and seek collaboration between industry and government, and among countries, to further improve and spread adoption of the principles and practices of energy efficiency.

**Cooperative frameworks** such as the International Partnership for Energy Efficiency Cooperation (IPEEC) can also add value to existing structures and agreements that tackle energy efficiency, its purpose being to facilitate those actions that yield high energy efficiency gains and improvements, and where the participating countries see an added value for themselves and therefore choose to take action in the areas of their interest on a voluntary basis. For example,

<sup>&</sup>lt;sup>6</sup> IEA/OPEC/World Bank Report on energy subsidies for G20

the IPEEC's "Worldwide Energy Efficiency Action through Capacity Building and Training" project aims at helping share best practices for energy efficiency through on-site training workshops and online materials.

The International Energy Agency has conducted extensive work on energy efficiency and supports energy efficiency policy in both developed and developing countries. In addition to the 25 Energy Efficiency Recommendations developed for the G8 but applicable to developing countries as well, the IEA does important policy research on issues such as: (i) organizing energy efficiency policy implementation; (ii) disseminating best practice for energy efficiency policy implementation pathways; (iii) cooperating on energy efficiency capacity building, in conjunction with other international energy efficiency networks such as IPEEC; and (iv) development of new sectoral policies for scaling-up energy efficiency.

In line with its approved Programme of Work and guided by the deliberations of Energy Ministers in Mexico<sup>7</sup>, the IEF Secretariat will be holding an IEF Symposium on Energy Efficiency in Developing Countries in Jakarta, Indonesia on 21-22 June 2011<sup>8</sup>. The symposium will discuss the drivers and the barriers to energy efficiency in developing countries, review policies and share best practices with regard to energy efficiency. The IEF Secretariat will work closely with IEA, IPEEC and the World Bank<sup>9</sup> to encourage the deployment of energy efficiency oriented policies across all sectors in developing countries, drawing not only on the experience of developed nations but by showcasing success stories and examples of best practice from other developing countries. Findings and recommendations of the Symposium will be conveyed to the 13<sup>th</sup> IEF Ministerial in Kuwait in 2012.

#### III.3 The investment challenge in an uncertain environment

The global financial crisis has had a significant effect on the availability of investment capital. Capital expenditure budgets been reduced as the effects of cash flow constraints and the need to preserve liquidity have been exacerbated by restricted availability of credit and asset finance due to the precarious state of financial markets and bank balance sheets. Over the last two years 2008 and 2009 energy investment has fallen in the face of the financial and economic crisis, and the subsequent weakening demand.

Despite decline in demand engendered by the recent economic crisis and uncertainty about the rate of growth, future energy demand is set to increase in the next decades and most substantially in the developing world. Energy resources are sufficient to meet projected demand for the next decades, but one of the greatest challenges ahead is securing the very high

<sup>&</sup>lt;sup>7</sup> "IEF Ministers have affirmed that improving energy efficiency through action plans, sectoral approaches and sharing of best practices in energy production, transportation and consumption is cost-effective and beneficial for both producing and consuming countries in enhancing energy market stability, environmental sustainability and economic development." 12th IEF Ministerial, Cancun, 30-31 March 2010.

<sup>&</sup>lt;sup>8</sup> The IEF Secretariat appreciates the commitment to this event expressed by Japan through its extra financial contribution and thanks Indonesia for hosting this IEF Symposium.

<sup>&</sup>lt;sup>9</sup> The World Bank's financing of energy efficiency projects in developing countries rose from \$262 mln in 2007 to 1,771 bln in 2010 (total of energy projects from \$3,6 bln in 2007 to 13 bln in 2010).

level of investment in new energy infrastructure required to maintain and replace existing systems, as well as to meet incremental demand growth and environmental objectives.

The most recent estimates (IEA WEO 2010) indicate that the cumulative investment required to meet projected energy demand over the period 2010-2035 is projected to amount to \$33 trillion, equal to \$1.3 trillion per year on average. This investment enables the replacement of reserves and production facilities as well the expansion of production and transport capacity to meet demand growth. From this amount, the oil sector requires \$8.1 trillion, (25 % of total investment), equal to \$310 billion per year. 85 % of this amount is needed in the upstream. The gas sector is expected to account for \$7.1 trillion (22 %) or around \$270 billion per year.

Required investments<sup>10</sup> in 2035 in Asia (other than Middle East) and Middle East are estimated at \$9.6 trillion and \$2.1 trillion respectively, thus **making Asia and the Middle East a destination for one third of global investment**. China alone will need to invest \$5.1 trillion, or 16% of the world total.

The global economy has recovered from the 2008 crisis, and is expected to grow in 2011; however the sustainability of this growth is uncertain in the medium to long term. Beside global economic growth and its potential impact on the growth of demand, other key determinants are sources of uncertainty when estimating investment; energy and environmental policies, upstream costs, human resources adequacy, the oil price path, technology evolution, and the issue of sustainable development are all likely to have significant influence on the level of investment in an increasingly complex industry characterized by long-lead times and payback periods.

Underinvestment or delays in investment could lead to shortfalls in the incremental capacity required to meet demand, resulting in price hikes, while overestimates in investment may lead to over-capacity and idle resources. Therefore, the most pressing challenge facing the industry is to take the long-term view and continue to invest despite uncertainties. Asian producing and consuming countries are interdependent and enhanced cooperation between them could help to redress some of the negative influence of uncertainty on the investment climate.

In 2010-2035, global investment to meet projected global demand for oil amounts to \$8.1 trillion and cumulative investment in the natural gas supply chain is projected at \$7.1 trillion, with the oil and gas sectors accounting for some 46% of the world total. To ensure that such investment is delivered in a timely manner despite the many uncertainties and challenges surrounding its business environment, the energy industry will need to mobilize all its capabilities and skills. As immediate past history has shown, **uncertainties and challenges are better addressed when industry stakeholders are cooperating extensively and share costs, knowledge, risks and benefits**. The NOC-IOC Forum organized by the IEF is now established as a biennial platform for senior decision makers from National and International Oil Companies, service companies and experts, to discuss the key issues and common challenges facing the oil industry, exchange views, and identify ways and means to enhance cooperation and partnership among industry stakeholders. The second IEF NOC-IOC Forum, hosted by Total and Saudi Aramco, (Paris, 7-8 April 2011) will help to draw up IEF general principles or guidelines on NOC-IOC cooperation, based on best practices around the world, to facilitate this cooperation.

<sup>&</sup>lt;sup>10</sup> WEO2010

#### **IV. Energy Price Volatility**

Volatility in energy markets has reached unprecedented levels in recent years. From 2002 to 2008, the oil market endured a sustained increase in prices, during which the annual average price rose year-on-year for seven consecutive years. Most important was the two year price cycle from July 2007 to July 2009, where the price of crude rose only 10 % over the entirety of that two year period, but during those two years, volatility was extreme; the WTI benchmark rose from \$65 in July 2007 to \$147 in mid-July 2008, dropped to the low \$30s by the winter of 2008-2009 and then rose back up to the \$80s by November 2009 and over \$90 by December 2010.

The sharp swings in oil prices in 2008 and 2009 have raised concerns among both consumers and producers about the adverse economic, political and social consequences of such violent price movements. An underlying theme within these debates is the view that sharp price swings are harmful, because they increase uncertainty, hamper global economic growth and undermine investment in both the oil and alternative energy sectors.

Major fluctuations in energy prices in general and oil prices in particular have attracted heightened attention to the functioning of energy markets. The IEF's Jeddah and London Ministerial ad hoc energy meetings, held in June and December 2008, respectively, led to a **collaborative effort aimed at exploring ways and means to enhance the process of producer-consumer dialogue and address the issue of extreme volatility in energy markets**. The importance of addressing the issue was reiterated when IEF Ministers gathered in Cancun in March 2010 at the 12<sup>th</sup> IEF Ministerial and hen again at the Extraordinary IEF Ministerial Meeting on 22 February 2011 in Riyadh.

In this connection, and given the dual role that crude oil now plays as both a physical commodity and a financial asset, the International Energy Agency (IEA), the International Energy Forum (IEF) and the Organization of the Petroleum Exporting Countries (OPEC) recognized the need to **improve understanding of the interlinkages between the physical and financial markets** for energy, and agreed to jointly hold workshops on the functioning of energy markets<sup>11</sup>. These events form part of a wider joint programme of work agreed by the three organisations and were referenced at the 12th International Energy Forum (Cancun, March 2010) as part of the Cancun Declaration.

The Joint IEA/IEF/OPEC Workshop on physical and financial markets inter-linkages provided rich and diverse views from distinguished experts with different backgrounds and affiliations. The diversity of opinion expressed in the course of the two events reflected, to a large extent, the differences of viewpoint regarding the linkages between physical and financial markets, the relative impacts of physical and financial markets on the price of oil and its volatility and the complexity of the different market layers for price discovery and risk transfer, from spot to derivatives:

- With regard to the magnitude of the impact of the derivatives markets (either exchangetraded derivatives or OTC derivatives) on petroleum prices and volatility, there was no consensus; some participants underlined the role of excessive financial speculation in the surge in prices and volatility; other participants, especially those involved in price

<sup>&</sup>lt;sup>11</sup> IEA/IEF/OPEC Workshop on "Understanding the New Dynamic: How do the Physical and Financial Markets for Energy Interact", 22 November 2010, London, www.ief.org.

reporting, felt that spot markets set their own prices, independently of any influence from financial markets; a third group recognized that it is difficult to isolate the effect of the physical layers from the financial layers in the current oil pricing system and, therefore, it is difficult to construct theoretically and test empirically whether the financial market drives the physical or the other way around.

- The Workshop noted the increasing interaction of the physical and financial energy markets. It recommended continuing the ongoing effort to better understand the functioning of each of these markets, as well as the linkages between the physical and financial markets.

As part of their joint programme of work tackling market volatility, the **IEA, IEF, and OPEC** organized **a Forum on Energy Markey Regulation**<sup>12</sup> **in** November 2010, inviting market regulators and participants to exchange views about recent regulatory developments and their impact on market functioning, to share lessons and best practices, identify new challenges and discuss near-term prospects for regulatory evolution. The Forum also explored the need, potential and best means of coordinating energy market regulation globally.

- The Forum examined the current framework of regulation for commodity futures and derivatives markets and the objectives and extent of the proposed reforms. The potential impacts of regulation on hedging and risk management were discussed. The last session covered international coordination for market regulation.
- The Forum recognized that regulations have important effects on market functioning and participants' behaviour and emphasized the need for appropriate regulation and oversight in the financial energy markets, including the release of more frequent and granular market data.
- The Forum also acknowledged the significant legislative and policy response already in place for all financial markets and also to commodity-specific matters, including the work of the IOSCO Commodity Markets Task Force.
- There was wide acknowledgment that several useful actions may be undertaken by the relevant regulatory authorities to improve market transparency, reduce volatility, mitigate risk and improve market functioning. These include the provision of more information and better transparency of financial market transactions in both exchange-traded and OTC derivatives markets. In this respect, the Forum took note of the G20 roadmap to strengthen regulation, in particular the objective to have all standardized OTC derivative contracts traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest.
- There was no consensus on potential benefit/impact of tighter regulations on market transparency, market efficiency, oil price stability and cost; however, there was general agreement on improving market transparency, visibility, risk reduction and ensuring adequate liquidity in the market.

<sup>&</sup>lt;sup>12</sup> IEA-IEF-OPEC Forum on "Energy Market Regulation: Clarity and Coordination" 23rd November 2010, London, www.ief.org.

- There were diverse views on the desirability of exempting "end users" (i.e. those whose principal activity is trading physical commodities, not derivatives) from new regulations, as provided in the Dodd-Frank Act. Many participants pointed out that a distinction between purely-physical and purely-financial players on energy markets would be difficult to apply, since so many players participate simultaneously in physical and derivative markets. On position limits, some participants see it useful to set limits on trade with the participation of all relevant markets to avoid creating regulatory arbitrage; however, it was not clear how to set them and on which basis. Some others expressed reservations on position limits in terms of market liquidity as well as a preference for 'lighter touch' position management.
- The Forum commended the international coordination on financial market regulation and noted that financial regulation is already highly coordinated at the global level, through international, regional and bilateral cooperation in many areas.
- The Forum recognized that the OTC derivatives markets are global in nature and, therefore, the reforms will only be effective if there is a high level of international consistency. In this regard, the Forum commended the G20 commitment to improve transparency in derivatives markets and mitigate systemic risk.
- Following the G20 Seoul Summit<sup>13</sup> which requested IEA, IEF and OPEC, in cooperation with IOSCO, to prepare a report on how the oil spot market prices are assessed by oil price reporting agencies and how this affects transparency. The IEF and its partner organisations are actively working on this issue to deliver an intermediate report to the G20 Finance Ministers meeting in April 2011.

#### **III.1 Market and Data Transparency**

The issue of transparency has gained wide credence in the aftermath of the 2008 financial crisis with many organizations such as G8, G20, and the IEF calling for **improved transparency as a key element in efforts to enhance the functioning of the oil market and its price discovery function**. Transparency in oil markets however has more than one dimension. Although improving transparency in the physical dimension of the market is important to understanding oil market dynamics and enhancing the price discovery function, the analysis shows that transparency in the financial layers surrounding the physical benchmarks is as important. In this regard, it is important to emphasize three dimensions to the transparency issue.

First, obtaining regular and accurate information on key markets depends largely on the willingness of Price Reporting Agencies (PRAs) to release or share information. Currently, PRAs are under no legal obligation to report deals to a regulatory authority or to make the information at their disposal publicly available.

Second, the degree of transparency varies considerably within the different layers in the Brent, WTI and Dubai-Oman complexes as well as across benchmarks. Transparency in the futures markets at least when it comes to prices, open interest and traded volumes is relatively well

 $<sup>^{13}</sup>$  "We also request the IEF, IEA, OPEC and IOSCO to produce a joint report, by the April 2011 Finance Ministers' meeting, on how the oil spot market prices are assessed by oil price reporting agencies and how this affects the transparency and functioning of oil markets" G20 Ministerial meeting, Seoul, NOVEMBER 11 – 12, 2010.

established. The futures market generates a set of prices throughout the day which are instantaneously transmitted through a variety of channels increasing price transparency. On the other hand, a detailed description of the participants in the futures market and the identity of counterparties to a futures contract are not made publicly available although the exchange and regulators via the exchange do have detailed data for futures markets on these areas.

The third dimension of transparency relates to the extent to which assessed prices are accurate and are reached through a transparent and efficient process. An important element of price transparency is the ability of PRAs to collect reliable information in imperfect and often illiquid markets and analyze the information in an efficient and objective manner. The degree of price transparency is also very much interlinked to the activities of PRAs and the reporting standards and other procedures that they set and enforce internally.

Excessive price volatility is not limited to oil but affects other commodities as well. The IEF will be working closely with the IMF as well as IEA, OPEC and Gas Exporting countries Forum (GECF) to develop concrete recommendations to extend the G20's work on oil price volatility to gas and coal by October 2011<sup>14</sup>.

#### Data Transparency

Clearly, expectations are formed on the basis of data and information and the analysis surrounding that data. Poor data can contribute to the volatility of oil markets by allowing inaccurate information to filter into investors' expectations and by increasing uncertainty. Thus, extending the coverage of data and improving the quality of information about crude oil market fundamentals can help stabilize expectations and oil prices.

**Poor data contribute to the volatility of oil markets** both through allowing some inaccurate information to filter into investors' expectations and by increasing speculation on key data. Although the coverage and quality of information about crude oil market fundamentals have improved in recent years, there are still some major data problems.

In addition to lagging indicators of supply and demand, it is important to explore the possibility of increasing the availability and transparency of data that can help us better understand future market fundamentals. For instance, on the supply side, **detailed data on investment plans in the oil sector and investment** in alternative energy and information about new discoveries and change of size reserves can affect expectations about medium term and future market fundamentals. On the demand side, information on energy policies and their potential implications on long-term demand would also alter long-term expectations.

#### The Joint Organisations Data Initiative

An important action in this regard is to enhance the **international cooperation on market data improvement**, through mechanisms such as JODI. Indeed, the JODI model is an effective one that can be further improved and enhanced to achieve greater market transparency. One feature of JODI is that the database only includes statistical data provided by the States and the industry - which sometimes consider them confidential - and that the IEF and partner organizations<sup>15</sup> is

<sup>&</sup>lt;sup>14</sup> G20 Meeting of Finance Ministers and Central Bank Governors, Paris, 18-19 February 2011.

<sup>&</sup>lt;sup>15</sup> APEC, Eurostat, IEA, OLADE, OPEC, UNSD.

prohibited from supplementing them with its own estimations, unlike the work by other international bodies.

To underline the collaborative nature of the JODI, the Initiative was rebranded **Joint Organisations Data Initiative,** thus preserving the "JODI" label while allowing for extension of the Initiative to cover other forms of energy as per the wishes of the IEF Ministers.

<u>JODI-Oil</u>: To improve the quality of the JODI Database<sup>16</sup>, in terms of timeliness and reliability, JODI partner organisations will develop at country and organization level new tools and practices, to regularly check JODI data and facilitate data submission; enhance interaction with data users, in particular market analysts; continue their efforts in training statisticians in charge of JODI data compilation and submission in their respective countries and economies; and upgrade JODI related platforms such as the JODI website and the JODI database to make them more user friendly and useful.

Despite organisations efforts and progress made by Middle East and Asian countries to improve participation in JODI, there is clearly a room for further improvement, particularly with regard to timeliness and submission of data on oil stocks.

To achieve their goal, JODI organisations call on governments of participating countries and economies:

- to ensure that that administrations and organisations in charge of energy data collection are properly equipped and staffed;
- to implement an appropriate regulation that ensures that industry is fully engaged in the process of data submission with the required detail and format;
- to address confidentiality issues and reduce, if not eliminate, them. Asian countries can be helpful in further boosting the quality of the JODI-Oil Database through leading by example and setting a target of 3 smiley faces by the end of 2011. The 8<sup>th</sup> International JODI-Oil Conference to be hosted by China later this year will offer a timely opportunity to assess progress achieved in this regard.

<u>JODI-Gas</u>: Given the trend towards globalisation in the gas market, Energy Ministers indicated at the 11th IEF Ministerial in April 2008 that it was time to progressively **extend JODI to natural gas** and encouraged the IEF Secretariat to take the initiative to make this happen, working together with other relevant international organisations and to report to the 12th IEF Ministerial meeting in 2010, progress made in this regard. The extension was also advocated during the Ad-Hoc Energy Meeting in Jeddah in June 2008 and then later endorsed by Heads of State at the G8 Summit in L'Aquila (July 2009) and the G20 Summit in Pittsburgh (September 2009). IEF Ministers at the 12th IEF Ministerial Meeting in Cancun, Mexico (30-31 March 2010), welcomed the progress made in preparing the extension of JODI to cover monthly natural gas data. This is now well under way, including cooperation with the Gas Exporting Countries Forum (GECF), and will hopefully result in the launch of JODI-gas before the end of 2011.

<u>JODI-Investment</u>: An oil market characterized by volatility is unsettling for normal day-to-day activities and is an unwelcome element of uncertainty in the already complex risk assessment

<sup>&</sup>lt;sup>16</sup> Responding to G20 call, IEF and JODI partner organizations prepared an intermediate report presenting steps to improve the quality of the JODI Database was presented by IEF on 19 February 2011 at G20 Finance Ministers' meeting, available on www.ief.org.

necessary for sound upstream and downstream investment planning in the medium to long-term. Incomplete or missing data can further impede our ability to accurately formulate capacity projections, **both upstream and downstream**, and in turn this influences future market stability and predictability. Uncertainty about the veracity of upstream and downstream capacity and expansion plans provoke fears that the world may be running out of oil and sow the seeds of doubt that destabilise markets and encourage price spikes. IEF Ministers have expressed their concern over this issue and over the last two years, calls for the extension of JODI to cover annual data on upstream and downstream capacities and expansion plans have featured high on their list of priorities.

The Jeddah Energy Meeting (June 2008) Joint Statement emphasised that "the quality, completeness and timeliness of oil data submitted through the Joint Oil Data Initiative (JODI) should be enhanced. In order to further improve market transparency and stability, the seven organisations involved in JODI (APEC, Eurostat, IEA, IEF, OLADE, OPEC and UNSD) are called upon to start work to cover annual data that includes, among other things, upstream and downstream capacities and expansion plans". Six months later, participants in the London Energy Meeting emphasised the importance of annual data on investment plans and welcomed the IEF's plans to implement the collection and publication of this data as soon as possible". At the 12th IEF Ministerial Meeting in Cancun, Ministers welcomed the progress made in preparing the extension to annual data on upstream and downstream capacities and expansion plans. The work on extension to investment will start with oil and is currently under way, with first results expected at the earliest in 2012.

#### Conclusion

The fast pace of growth in primary energy demand that has occurred in the Asian region over the last decade is set to continue. 70% of the increase in global demand will take place in Asia. In 2035, Asia (including Middle East) will account for more than 50% of the world's total primary energy demand.

To address the **challenge of rising demand**, collaboration among Asian countries, as well as between industry and government can help further improvements in energy use and efficiency, through exchange of experience and sharing best practice, dissemination of technology and coordination of policies. Sustainable improvements in domestic use of energy and conservation of domestic resources can be best achieved through gradual and socially sensitive reform of domestic pricing policies.

**Inter-regional trade** in oil and gas within Asia is set to grow significantly over the coming years. China's net imports will grow from 4.3 mb/d in 2009 to 13 mb/d in 2035 according to the IEA. India will register one the biggest jumps in imports in absolute terms. In balance with this, the Middle East will see the biggest jump in exports, with much of the increase going to non OECD Asia, confirming and consolidating the interdependence among countries attending the 4<sup>th</sup> Asian Energy Roundtable.

The cumulative investment required to meet projected energy demand over the period 2010-2035 is projected to amount to \$33 trillion, equal to \$1.3 trillion per year on average. However, in an industry characterized by long-lead times there are significant uncertainties surrounding the

required investment which can be better addressed through cooperation among NOCs and IOCs.

The recent behaviour of markets has polarised views about the key drivers of oil prices. One view attributes recent price movements to structural transformation of oil market fundamentals. An alternative view considers that changes in fundamentals, or even expectations, have not been sufficiently dramatic to justify the extreme cycles in oil prices over the last two years and that oil markets have been distorted by substantial and volatile speculative financial flows. This dichotomy dominates the debate on appropriate measures to reduce oil price volatility and prevent a repeat of the latest price cycle. **The IEF will continue its scrutiny of this important issue,** in particular through work **in collaboration with IEA, OPEC and other relevant organisations**.

Full commitment of Asian countries to energy market transparency through submission of sound and timely data to JODI can significantly improve overall energy market stability. As global energy demand shifts eastward and major oil and gas market players emerge from the region Asia's commitment to transparency will become increasingly important.

On the occasion of the Extraordinary IEF Ministerial Meeting on 22 February 2011 in Riyadh, an **IEF Charter** for enhanced producer-consumer dialogue was signed by 86 countries, including 28 from Asia. The IEF Charter marks a new era of international energy cooperation built on greater mutual understanding and trust, with a significant reinforced political commitment to an informal and open global energy dialogue in the framework of the IEF among energy producing and energy consuming countries, including transit States. The IEF Charter creates a solid foundation for a productive dialogue that fosters greater mutual understanding between producing and consuming countries on key energy policy issues and, where possible, narrows the differences in views and helps build trust in policy intentions. With all the major energy producers and consumers united in this dialogue framework, this **fact sends a powerful positive signal to the energy world and energy markets** that difficult issues can and will be tackled in a global context, whenever necessary<sup>17</sup>.

<sup>&</sup>lt;sup>17</sup> Concluding Statement by the Kingdom of Saudi Arabia and the Secretariats of IEA, IEF and OPEC, 22 February 2011, Riyadh, Saudi Arabia, www.ief.org.