

# HART ENERGY

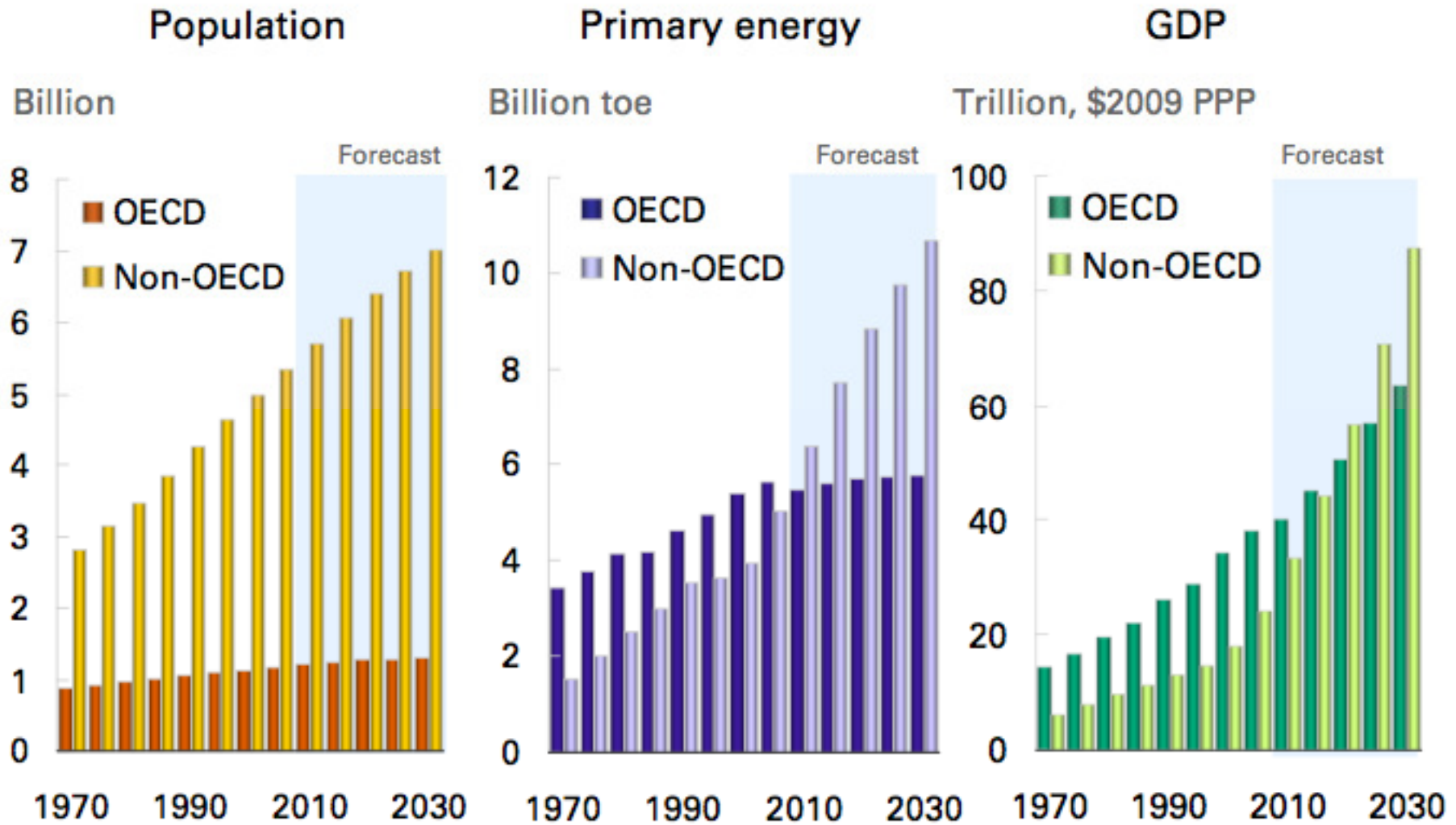


## **International Market – Production and Demand for Aviation Fuels**

**Rodrigo Favela**

February 13, 2012

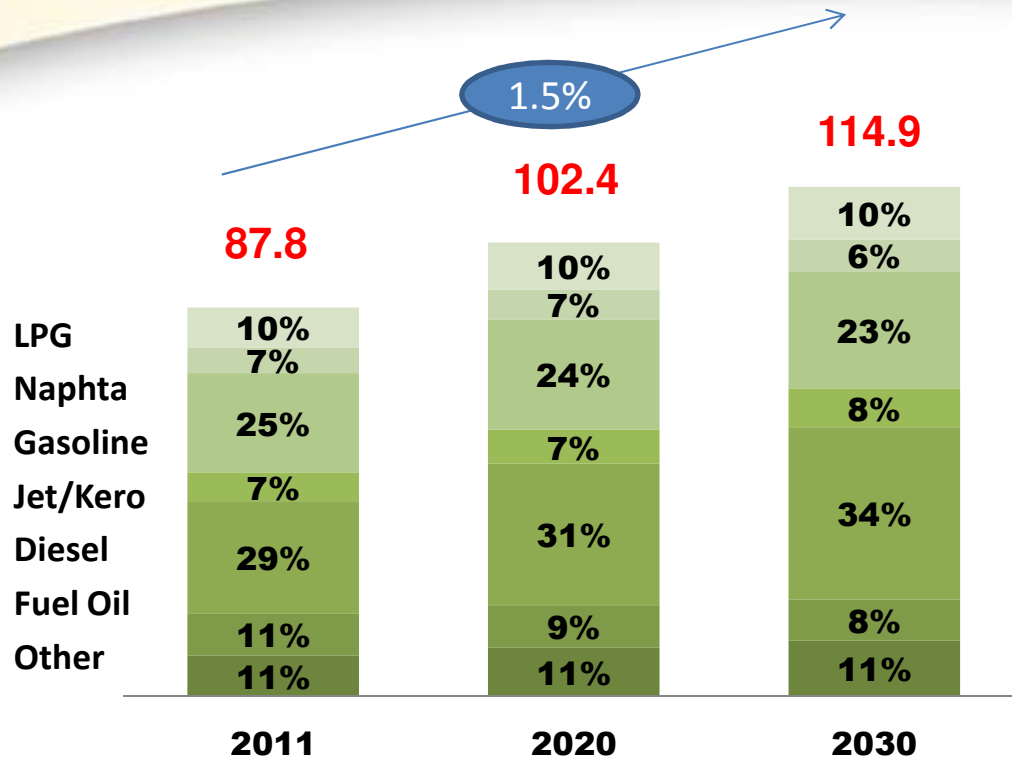
# Primary Energy Demand Growth



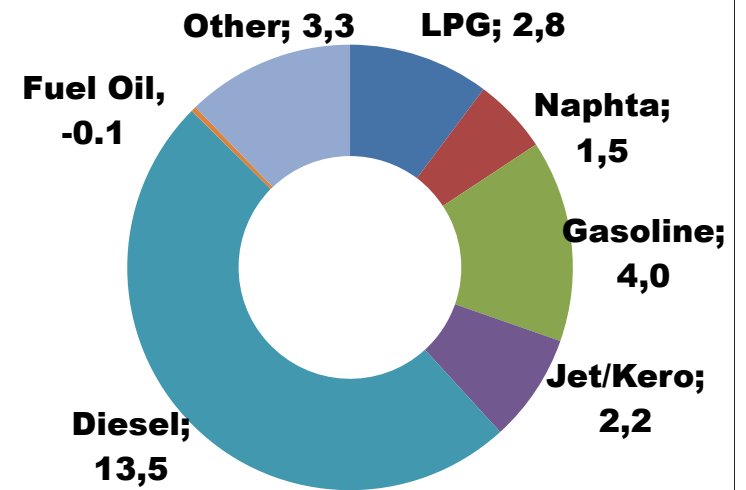
BP Outlook, 2011

# Global Refined Product Demand

(Million barrels per day)

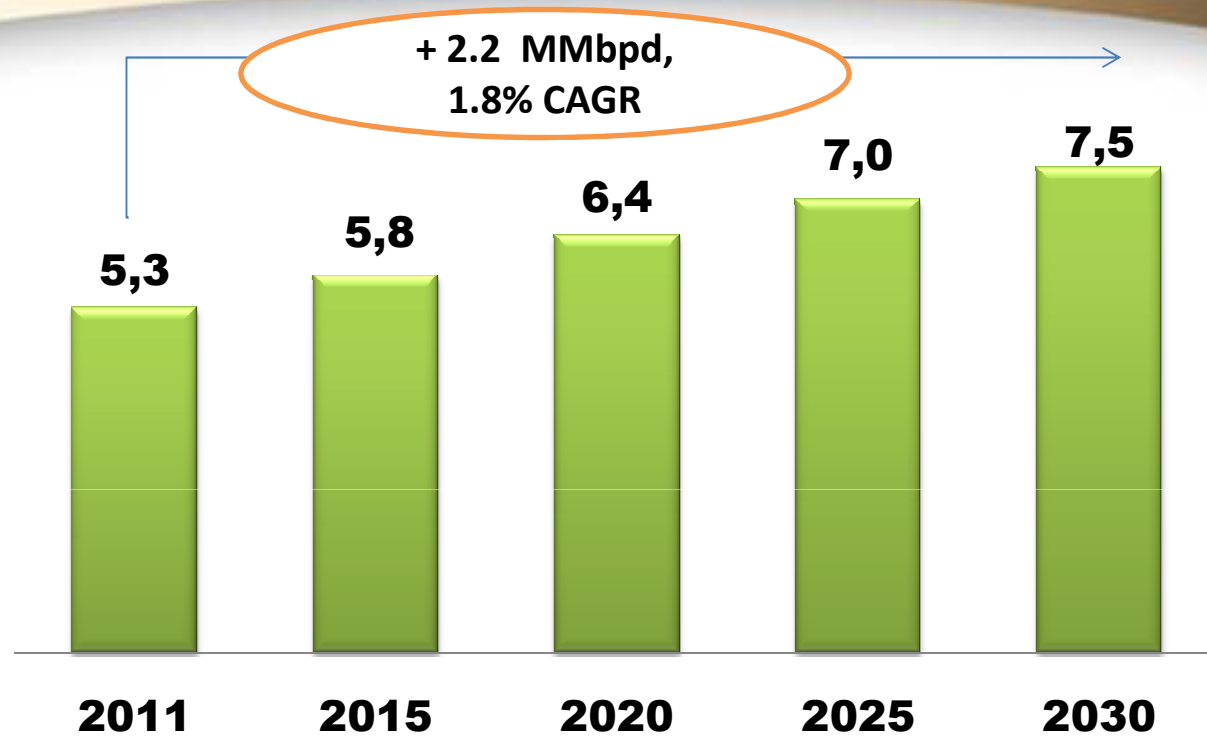


Increment 2011-2030 = 27.2



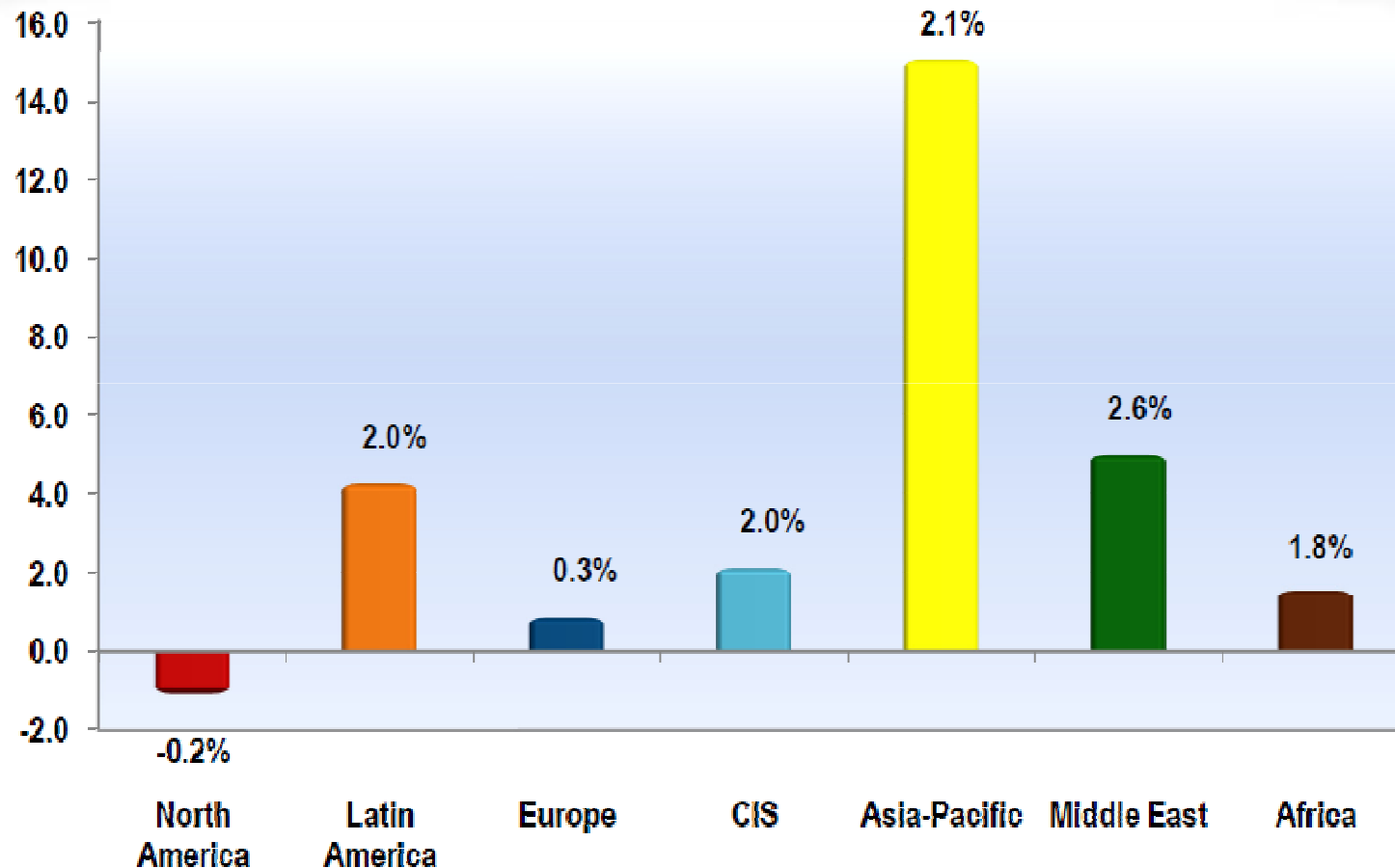
- Demand will grow by 27.2 MMbpd, 30% in the next two decades.
- Transportation fuels like diesel and gasoline represent almost 70 % of total demand , JET represents 7%
- Diesel will experience strongest growth by 2030 – 50% of increment (13.5 MMbpd)

# Jet Fuel Demand



- Fastest-growing fuel globally past 20 years.
- Fuel prices and financial pressure on airline industry yielded efficiency improvements.
- Jet fuel is projected to grow at 1.8% annually - growth in air commerce offset by efficiency gains. Growth from 308 to 435 billion liter per year

# Regional Petroleum Product Demand Growth 2010-2030

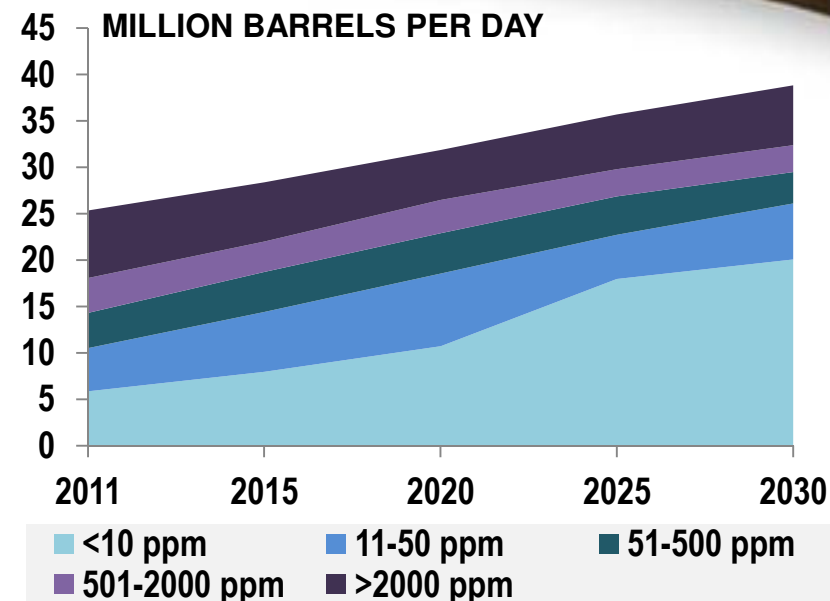
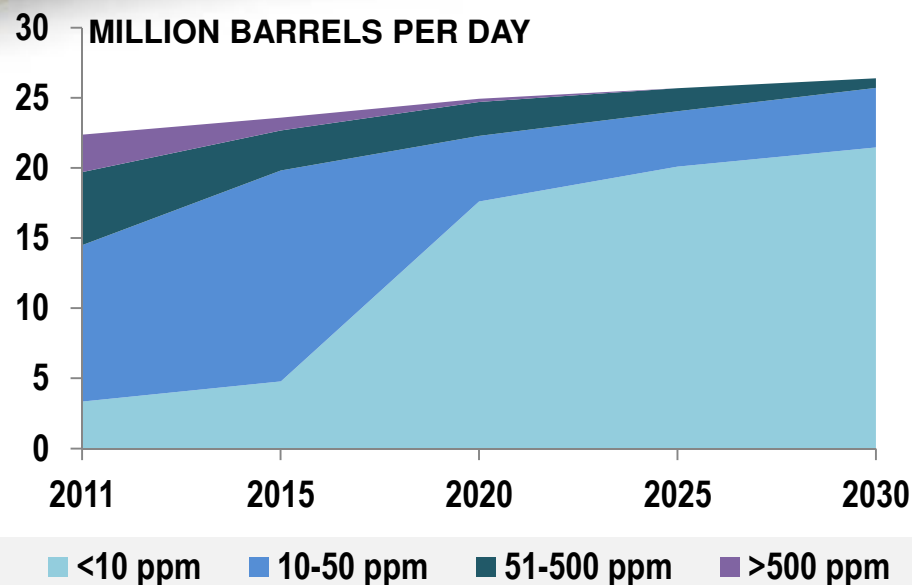


Source: Hart Energy analysis and forecast (2011)

# Jet Fuel Regional Demand

Global Jet Fuel	2011	Market share	2011 - 2015		2020-2015	
			Increm. Volume	CAGR %	Incremen. Volume	CAGR %
<b>North America</b>	1.59	30%	0.05	0.8%	0.07	0.9%
<b>Latin America</b>	0.32	6%	0.05	3.7%	0.05	2.9%
<b>Europe</b>	1.18	22%	0.11	2.3%	0.11	1.8%
<b>CIS</b>	0.31	6%	0.03	2.3%	0.03	1.9%
<b>Asia-Pacific</b>	1.43	27%	0.18	3.0%	0.27	3.5%
<b>Middle East</b>	0.3	6%	0.04	3.2%	0.05	3.1%
<b>Africa</b>	0.2	4%	0.03	3.6%	0.03	2.8%
<b>Total</b>	<b>5.32</b>		<b>0.5</b>	<b>2.3%</b>	<b>0.62</b>	<b>2.2%</b>

# Transport Fuel Quality Evolution 2010-2030



- ◆ Fuel quality improvement is a continuous process.
- ◆ Both gasoline and on-road diesel markets will continue to evolve into less than 10 ppm ULS fuels
- ◆ There are already plans to lower sulfur in off-road diesel and marine fuels: 500ppm for on-road diesel by 2015 & below 100 ppm by 2025, 500 ppm for marine fuels before middle next decade.



# Jet Fuel Quality

## Sulfur

Jet fuel specifications allow for sulfur as high as 3,000 ppm, Market product around 1,000 ppm.

Reductions have been discussed in Europe with initiatives aimed at global harmonization at lower sulfur levels.

Hart estimates that:

- Europe, North America, Japan, South Korea, Australia – reduce to 50 ppm by 2025
- Rest of Asia Pacific, Latin America, Middle East, Africa, CIS reduced to 350 ppm by 2025
- Some countries like Brazil, Mexico, India, China and Russia might achieve 50 ppm

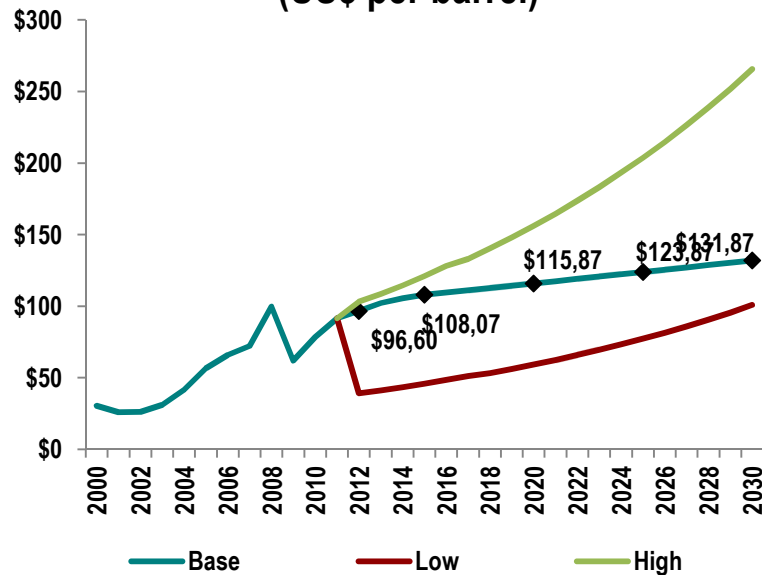
## CO<sub>2</sub>

- IATAs targets: Reduce CO<sub>2</sub> emissions by 1.5% per year to 2020, carbon-neutral by 2020, 50% reduction to 2005 by 2050
- Alternative fuels and fuel efficiency



# Crude Oil Supply

Hart Energy WTI Price  
Forecast  
(US\$ per barrel)



Crude Incremental Supply will come from Middle East, Africa, Canada, Brazil, Russia/Caspian Regions and Shale Oil

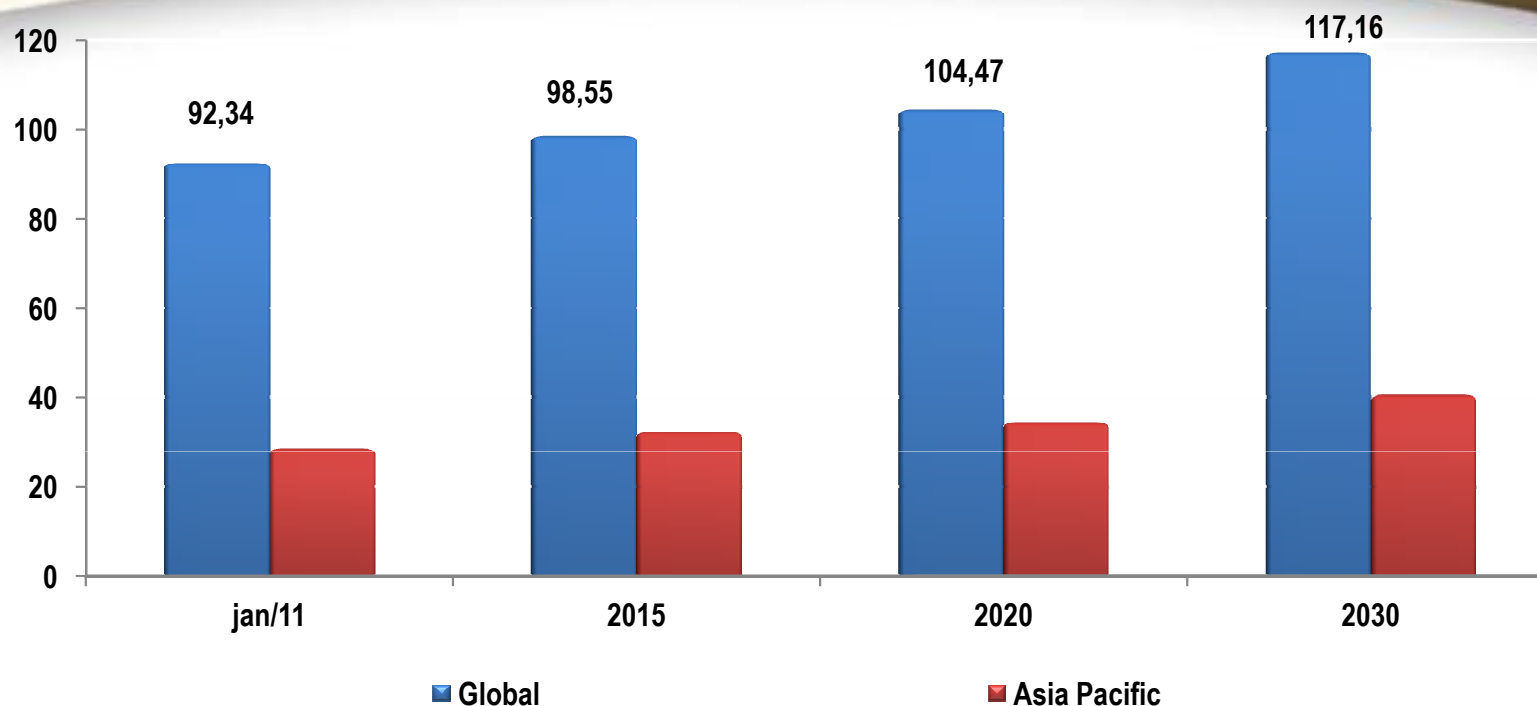
Heavy crude oil, biofuels and condensate/NGL will have largest contribution to liquid supply. Less diesel and more heavy and light ends

Crude and petroleum product prices will continue to rise (estimate average 115 USD/Bbl)

Source: Hart Energy analysis and forecast (2011)

# Refining Capacity Outlook

(million barrels per day)



- ◆ Refining will grow in BRICs, alone Asia Pacific will account for 48% of global increment.
- ◆ Consolidation of refining industry in Europe and North America (e.g East Coast)
- ◆ Investment in conversion, hydroprocessing and hydrocracking to achieve quality and transportation fuel volume increment.

Source: Hart Energy analysis and forecast (2011)

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# Jet Fuel Production and Balance

(million barrels per day)

Global Jet Fuel	2011			2030		
	Demand	Production	Balance	Demand	Production	Balance
<b>North America</b>	1.59	1.57	-0.02	1.82	1.87	0.05
<b>Latin America</b>	0.32	0.33	0.01	0.51	0.52	0.01
<b>Europe</b>	1.18	0.85	-0.33	1.52	1.16	-0.36
<b>CIS</b>	0.31	0.32	0.01	0.4	0.4	0
<b>Asia-Pacific</b>	1.43	1.6	0.17	2.48	2.51	0.03
<b>Middle East</b>	0.3	0.58	0.28	0.44	0.82	0.38
<b>Africa</b>	0.2	0.11	-0.09	0.32	0.25	-0.07
<b>Total</b>	5.33	5.36		7.49	7.53	

# Final Remarks

- Aviation will continue to be one of the fastest-growing fuels related economic global sector driven by population and GDP growth in developing countries.
- Jet fuel is projected to grow at 1.8% annually, from 308 to 435 billion liters per year - growth in air commerce will be offset by efficiency gains.
- ULS fuels, sulfur restrictions in residuals, higher combustion efficiency and reductions in carbon footprint will tighten even more the diesel balance helping to maintain high product and crude prices.
- Sulfur and CO<sub>2</sub> reduction in a high price environment, will be the main challenges to face in this decade.

## Questions/Discussion

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