Conference on Energy in Southern Africa

Rosebank

3 December 2009

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A review of reputable published projections of global oil industry trends relevant to refining in SA

These are not necessarily the views of Shell.

Tightening global crude availability would re-establish $100-200/bbl prices and dampen both global and SA demand

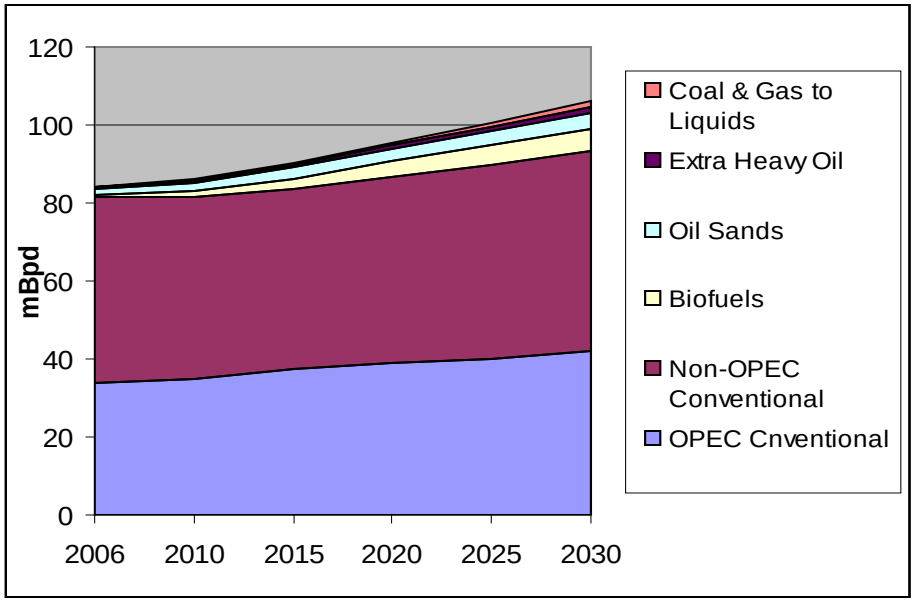
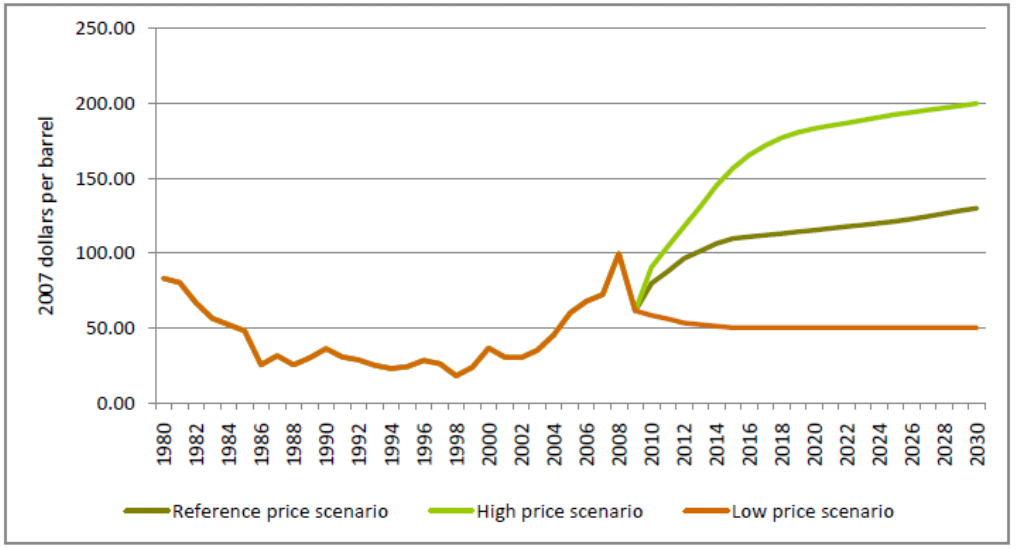


Figure 10: World Oil Price Scenarios (in real terms), 1980-2030

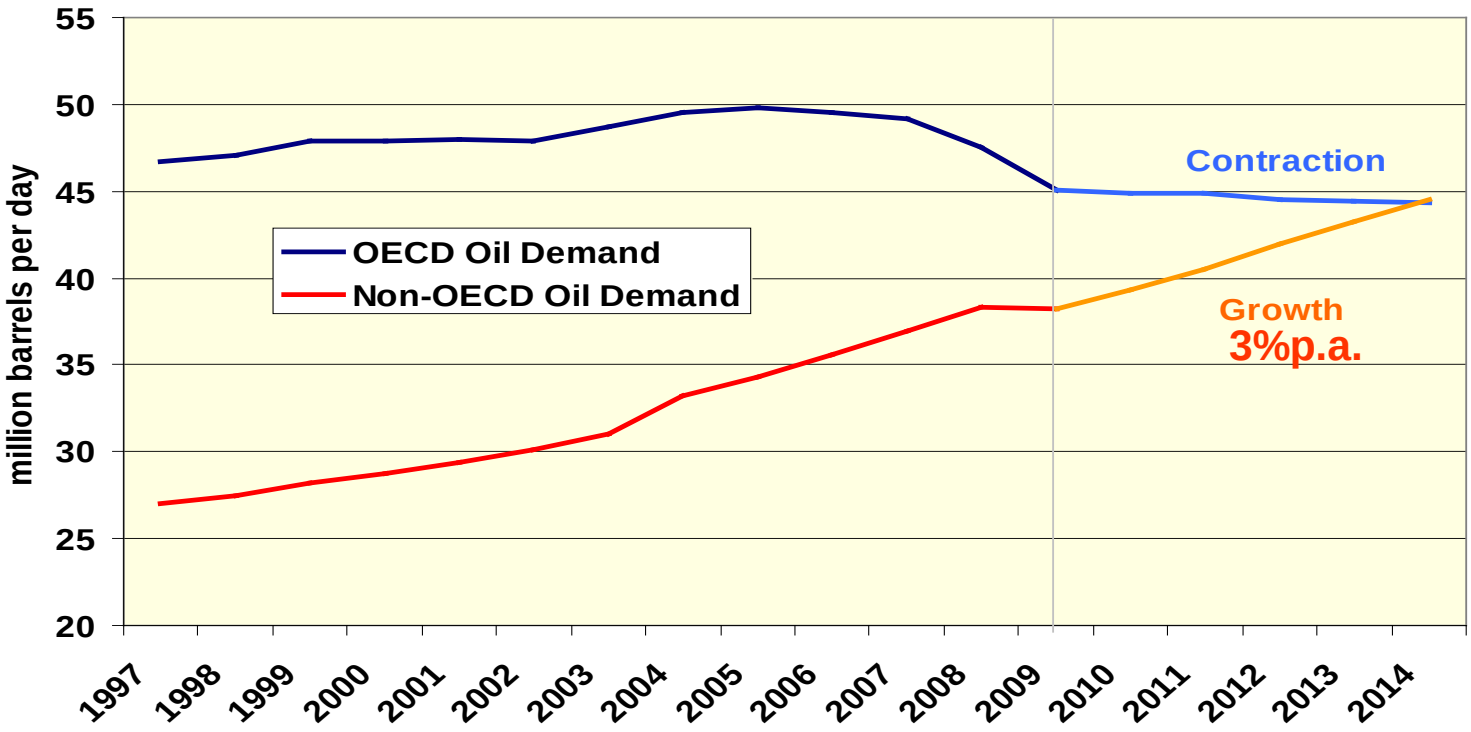


Source: International Energy Outlook (2009)

- **The EIA indicates shortage of conventional crude. Nearly half the 22 mbpd increase in demand will require high cost CtL, GtL, tarsands, biofuels.**
- **OPEC production decisions become critical and in the reference case increase by 8 mbpd to maintain 40% share**
- **Reference case crude prices are $100/bbl by 2012/13**
- **OPEC overproduction could result in a low price scenario and demand at 120 mbpd**
- **Similarly reduction by OPEC to 30% share will cause much higher pices and reduce demand to 90 mbpd**

Tightening global crude supply availability will raise global crude prices and dampen both global and SA demand – ***exacerbated by the recession***

Oil Demand Growth: OECD vs Non-OECD



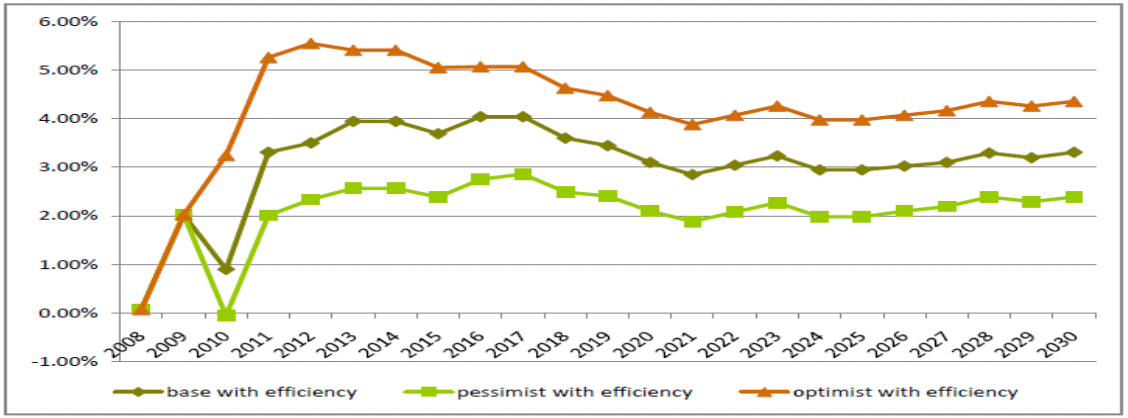
Source: International Energy Agency, 2009

- **Most of the demand growth is in developing countries but even here demand is around 3% - very much in line with recent forecasts for SA.**
- ***Lower demand does not mean less economic growth*. Non-OECD GDP growth is assumed at 5% p.a. and reflects increasing energy efficiency / demand mangement.**

Tightening global crude availability would re-establish $100-200/bbl prices and dampen both global and SA demand

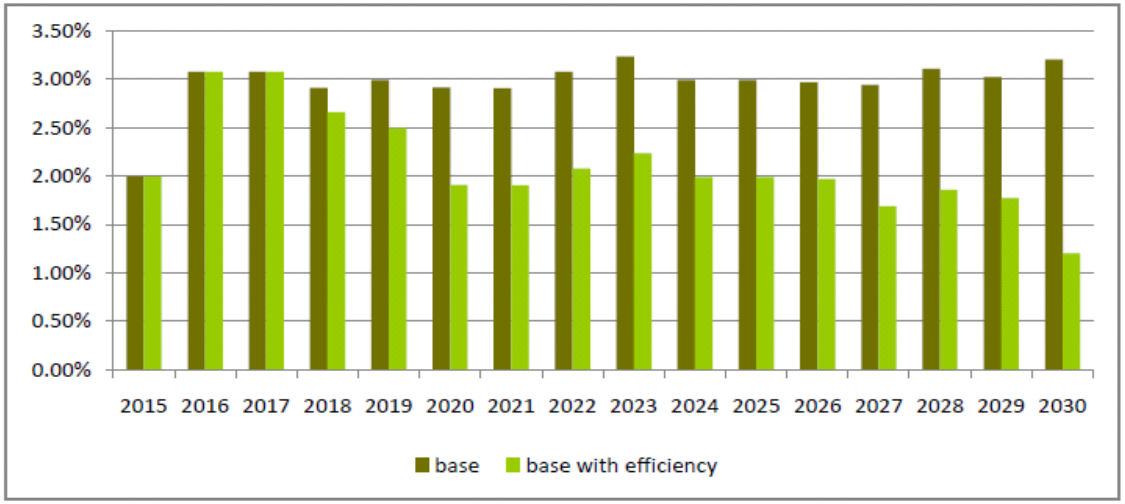
- We have consulted reputable SA economists, working with BER models, to forecast demand using EIA price forecasts.
- Their forecast is that petrol demand growth will decline to under 2% p.a. from 2020.
- Whilst diesel growth outstrips petrol is still expected to decline to 3% p.a. by 2020.

Figure 28: Growth Rate Scenarios for South African Diesel Fuel Volumes (Alternative Quarterly Model) with Efficiency Savings, 2008-2030



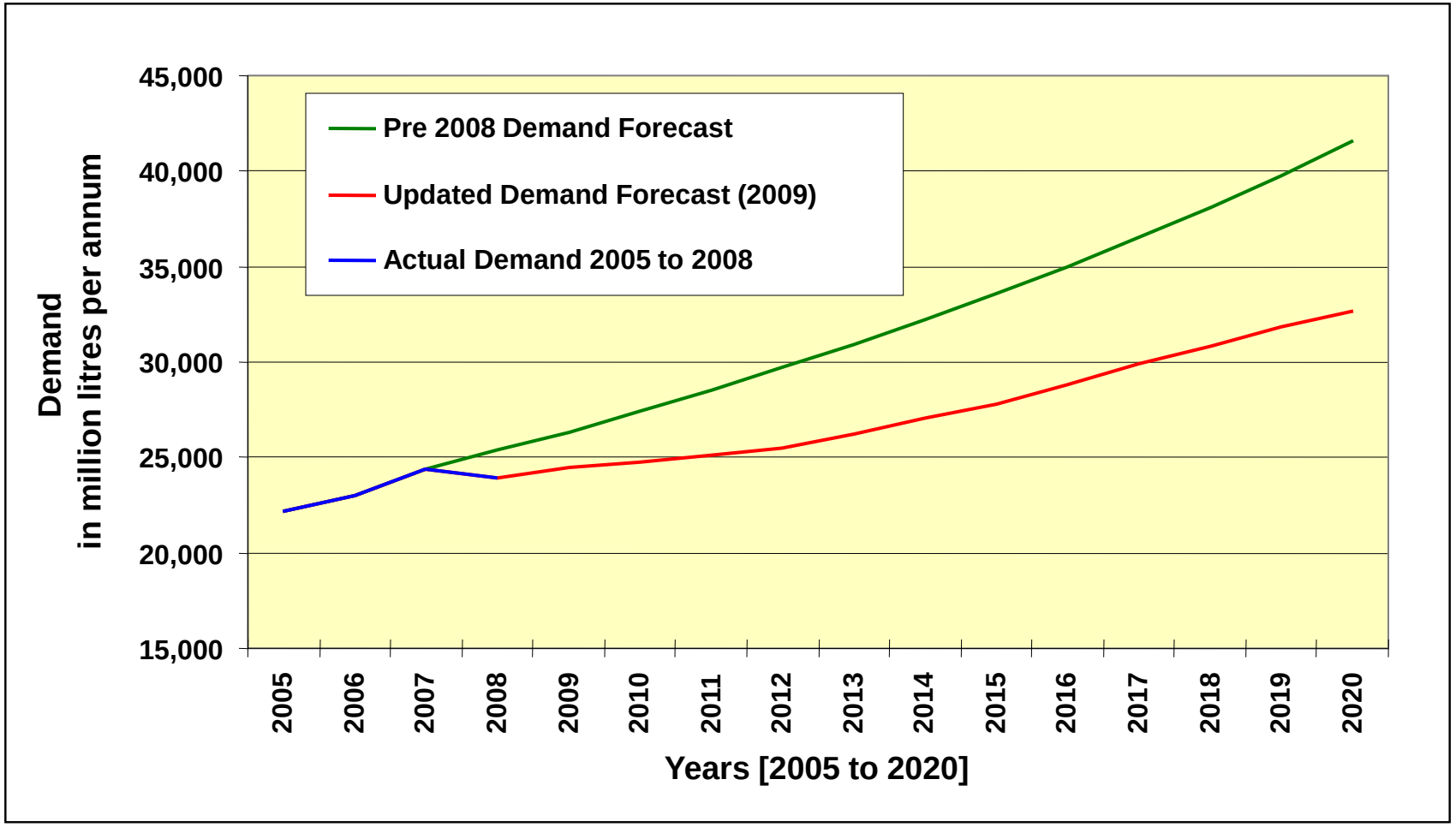
Source: Econex

Figure 20: Impact of Efficiency Improvements on Petrol Volume Growth, 2015-2030



Source: Econex

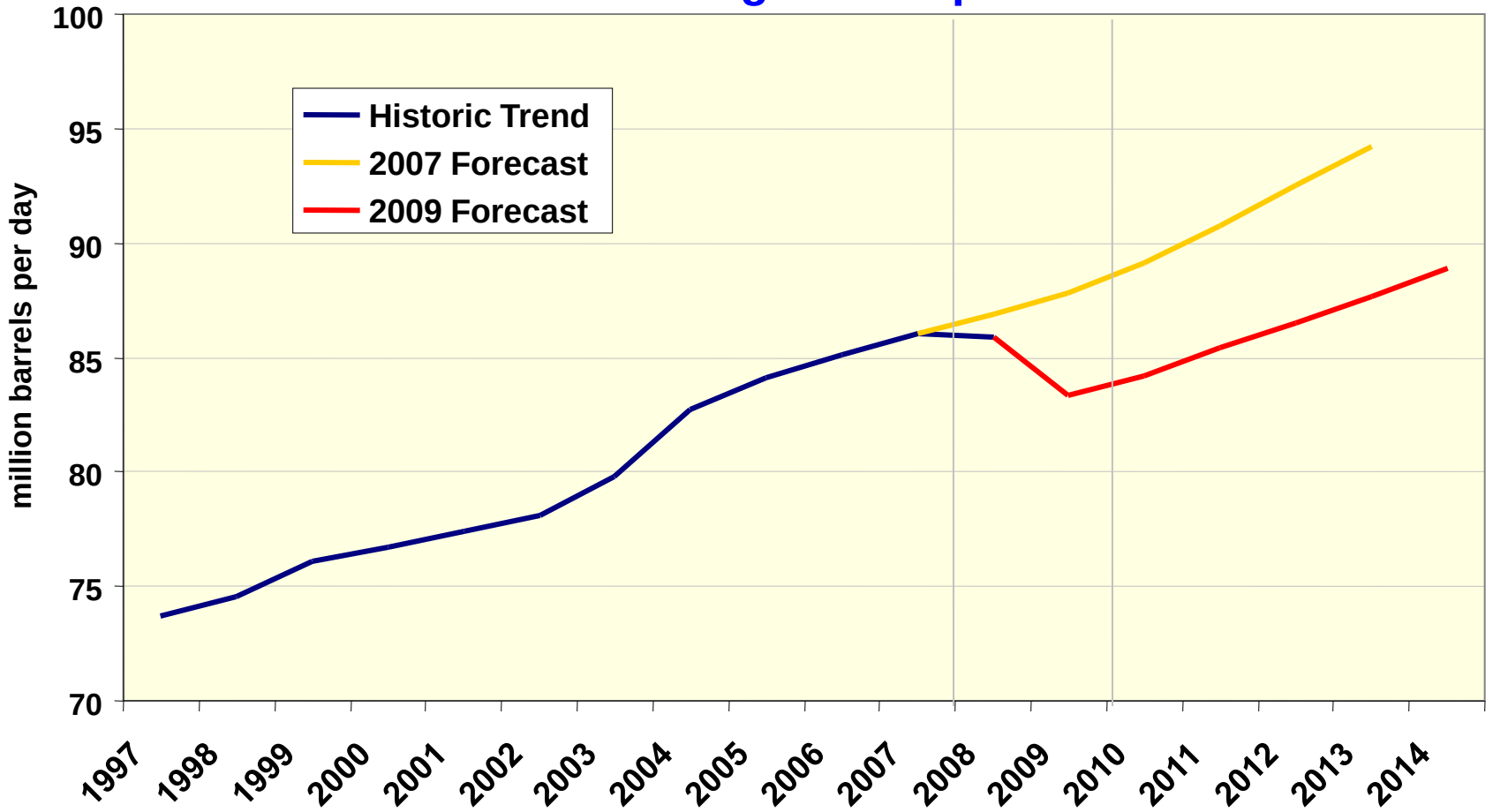
Demand in SA is likely to be very different from what was originally forecast – even at 4-5% economic growth forecasts



- **Forecasts take into account IEA crude price trends and increasing technology efficiencies from 2018.**
- ***Lower demand does not mean less economic growth*..**

Implications for global refining margins

Recall Dislocation of Trend in Global Oil Demand due to recession and high crude prices

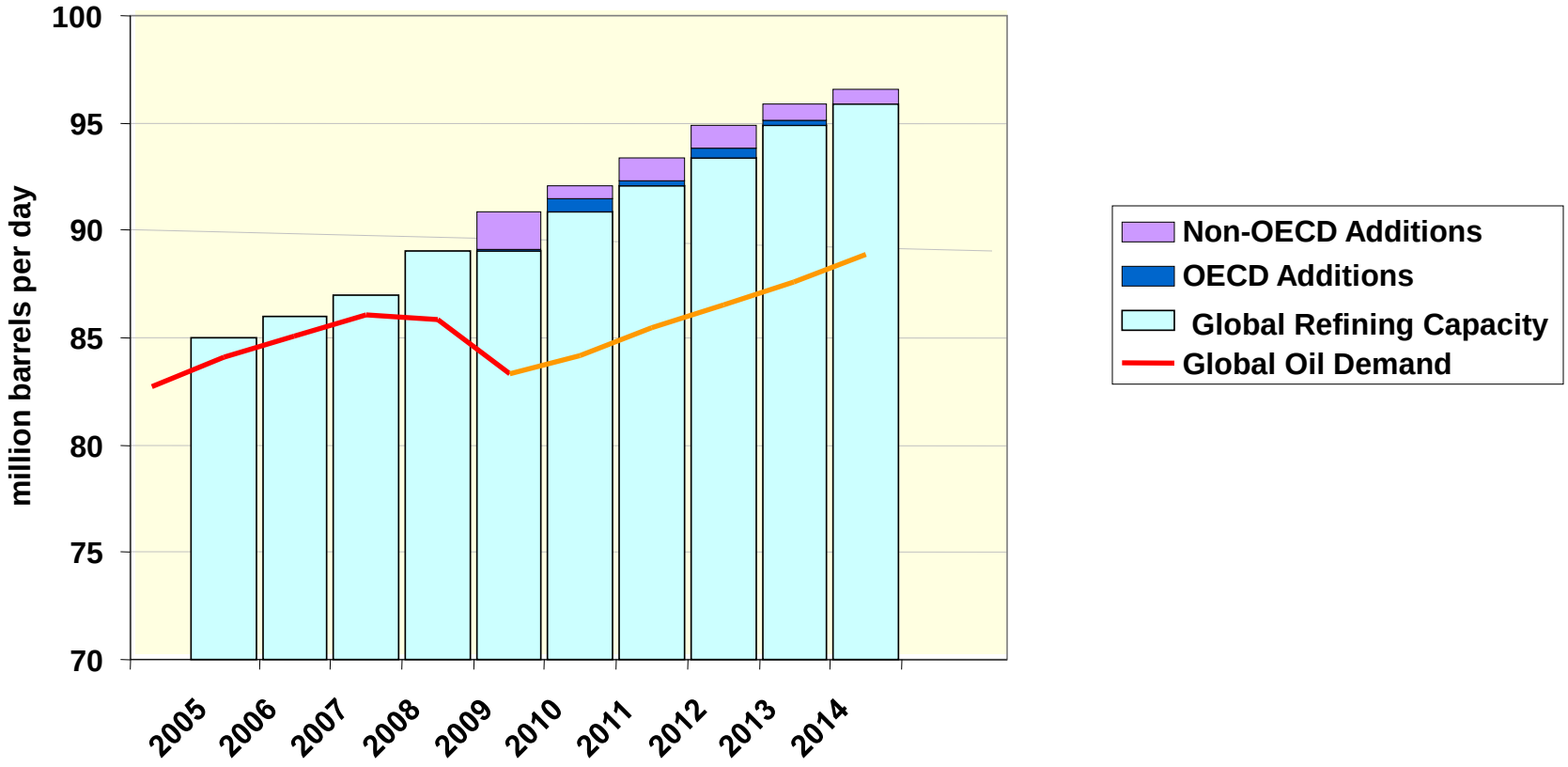


Source: International Energy Agency 2007, 2008, 2009

- 3,5 mbpd decline in dmand due to the recession and by 2014 only 3,5 m bpd above 2008.

"Less intuitively" significant capacity expansion is expected to continue with 7,7mb/d new primary distillation and 6,5mb/d upgrading capacity between 2008 and 2014.

Global Oil Demand vs Refining Capacity



- **OECD refinery capacity will decline from 88% in 1Q2006 to 75% in 1Q2010.**
- **Thereafter the decline will continue to decline about 1% p.a. by 2014**

Table 5
WORLD REFINERY CAPACITY ADDITIONS
(thousand barrels per day)

	2009	2010	2011	2012	2013	2014	Total
Crude Distillation Additions and Expansions[1]							
OECD North America	85	410	115	445	165	15	1,235
OECD Europe	20	165	104		110		399
OECD Pacific	34	35					69
FSU				340			340
Non-OECD Europe			50				50
China	610	360	556	240	200	450	2,416
Other Asia	851	124	270	115	270		1,630
Latin America		38	25	30	220	200	513
Middle East	216	20	130	211	81		658
Africa	20	100	60	82			262
Total World	1,836	1,252	1,310	1,463	1,046	665	7,572
Upgrading Capacity Additions[2]							
OECD North America	145	221	289	250	258	85	1,248
OECD Europe	108	58	145	65	148	65	589
OECD Pacific			73	132	113		318
FSU	107	79	79	361			626
Non-OECD Europe	15		76				91
China	513	285	240	120	90	171	1,418
Other Asia	540	61	220	50	198		1,069
Latin America		63	59	20	215	200	557
Middle East	80		111	94	135		420
Africa	45		8	20	57		130
Total World	1,553	767	1,300	1,112	1,214	521	6,466
Desulphurisation Capacity Additions[3]							
OECD North America	475	311	386	195	195	60	1,622
OECD Europe	92	75	-1	30	76	20	292
OECD Pacific	100		55	66			221
FSU	170	65	54	211			500
Non-OECD Europe		3	38				42
China	547	403	198	96	164	315	1,723
Other Asia	828	167	178	40	180		1,393
Latin America	164	223	171	120	269	40	988
Middle East	195	235	201	171	256		1,058
Africa	20		80				100
Total World	2,590	1,483	1,360	930	1,140	435	7,938

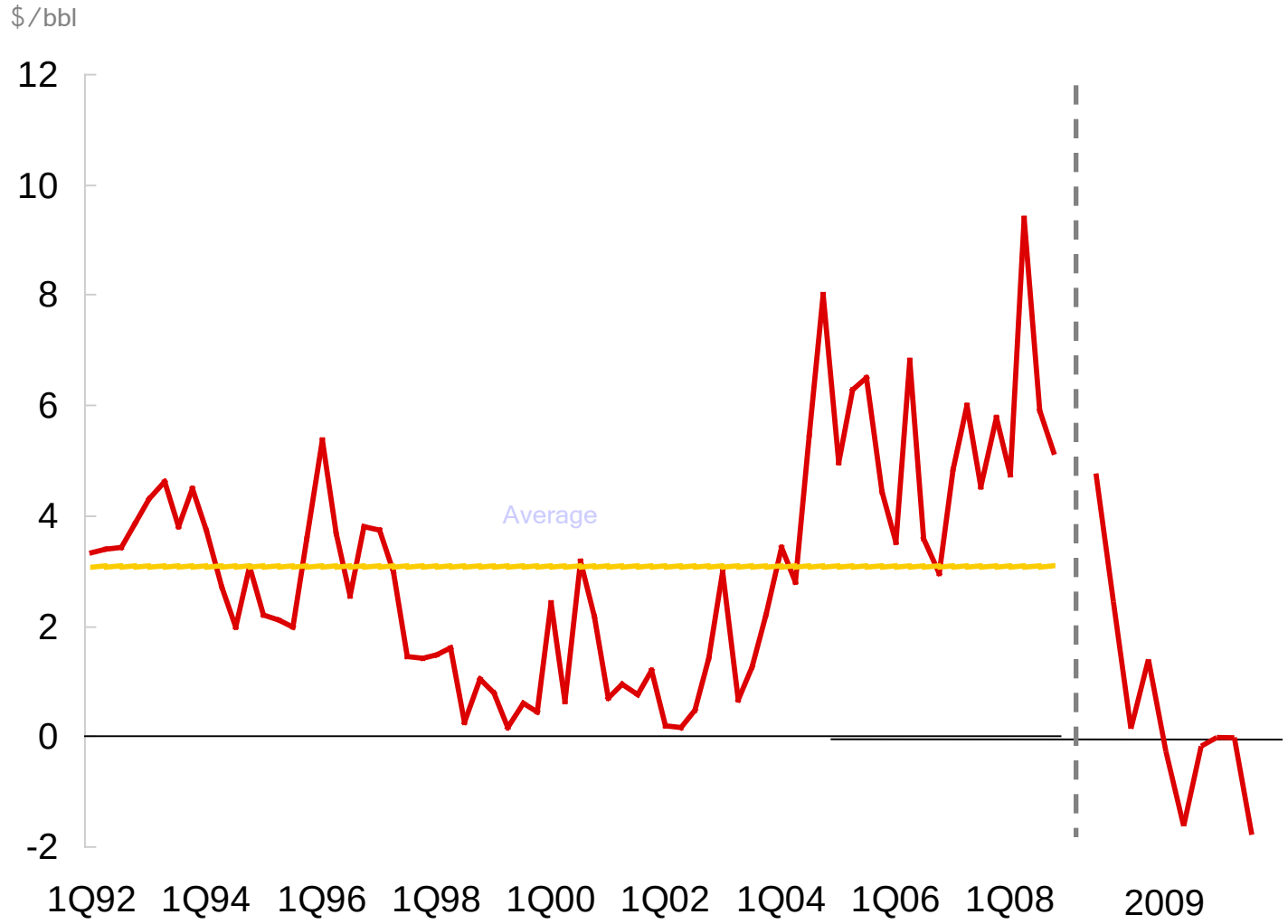
1 Comprises new refinery projects or expansions to existing facilities including condensate splitter additions. Assumes zero capacity creep.
2 Comprises gross capacity additions to coking, hydrocracking, residue hydrocracking, visbreaking, FCC or RFCC capacity.
3 Comprises additions to hydrotreating and hydrodesulphurisation capacity.

Refinery expansions

- IEA indicates planned new capacity in 2010-14 *exclusively* <250kbd upgrades except China.

An economic decision to invest in major capacity takes into account not only the capital efficiency but also the risk of low utilisation rates.

Current trends in refining margins
Singapore Gross integrated margin $/bbl



Source: Platts

Some simple realities to consider

- $100/bbl - $200/bbl crude prices
- Demand will reduce as a result but still grow 3% p.a. in developing economies
- A glut of refining capacity is expected to continue.

Environmental regulations could speed up and entrench the process