11 October 2017

HSBC Global Research

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Oil Things Considered

Why we still need (plenty) more oil supply

EQUITIES
OIL & GAS

Global

- We look at sensitivities of global oil demand to EV penetration
- Despite a likely peak in LDV demand in 2025-30, the peak in total oil demand still looks much further off
- We see a looming shortage of supply as a more pressing issue, pointing to upside in prices from current levels

The rate of climate policy progress and technological advances in alternative transport means the outlook for global oil demand has become subject to an unusually high level of uncertainty.

In this report, we examine the sensitivity of long term oil demand to differing rates of Electric Vehicle (EV) sales penetration of the light duty vehicle (LDV) fleet. Our model indicates that on most scenarios, a combination of higher EV sales and improving fuel efficiency in the internal combustion engine (ICE) fleet leads to a peak in LDV demand for oil in the period 2025-30, albeit with limited demand erosion before 2030 or so due to the scale of the existing LDV fleet.

Total oil demand has the potential to continue growing for much longer, driven by more durable growth in demand for heavy goods freight, aviation and petrochemicals. As a result, scenarios point to a most likely peak for total oil demand in the region 2030-35. For context, at 40% EV sales penetration of the LDV fleet by 2040, we see 2040 LDV demand ~3mbd below 2016 levels, but total oil demand 10mbd above it.

The model also highlights that the sensitivity of demand to changes in efficiency of the ICE fleet is at least as important as changes in rates of EV penetration.

While our analysis points to an inevitable peak in global oil demand, we think the availability of adequate supply will become an issue a long way before this - possibly around the end of this decade. On our estimates even a highly progressive scenario from a climate perspective (i.e. consistent with global 2°C ambitions) still leaves a substantial supply gap to be filled, given the inevitable effects of long term decline rates and the lack of major new growth projects on conventional supply.

Short-cycle production such as US tight oil can meet some of this shortfall, but the last few months' slowdown in US activity is clear evidence that the recent momentum of US growth won't be sustained at prices around current levels. We think higher prices are needed to generate an adequate scale of short-cycle supply response (in the US and elsewhere), and to have a meaningful dampening effect on global demand growth. So almost whatever the uptake of EVs and other alternatives, the dynamics of the oil market point to upside in crude prices in the next few years. We continue to assume an average Brent price of USD70/b from 2019 onwards.

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Demand isn't the only issue

- We look at sensitivities of global oil demand to EV penetration
- Peak oil demand is out there, but probably around 2030-35
- We see a looming supply shortage long before this

Synopsis: this is the chart that matters

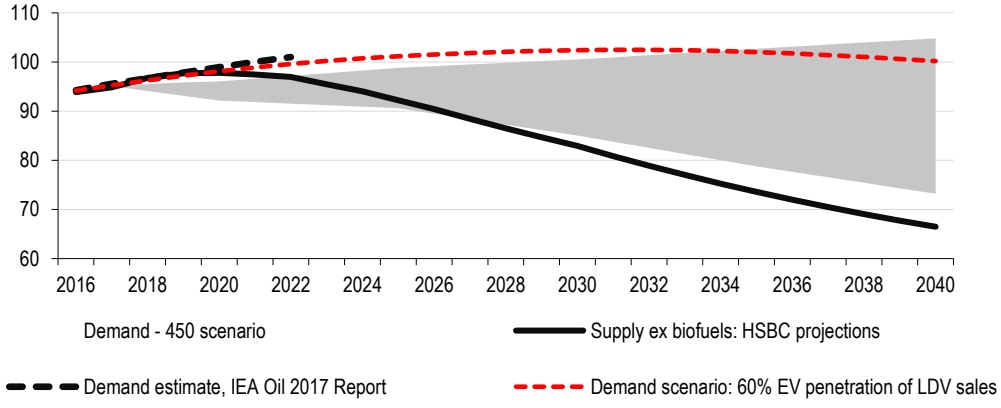
Take a look at the chart below. This sums up why we see a looming supply shortfall, even if we take a progressive view on the erosion of global oil demand.

A high degree of uncertainty reflected in a wide range of demand estimates

Global oil demand: there is a huge degree of uncertainty at present over the direction of oil demand, and particularly the impact of Electric Vehicles (including hybrids) on Light Duty Vehicle (LDV) demand. However, there are several areas of long-term, sustainable growth – notably in aviation, heavy goods vehicle (HGV) transport and in petrochemicals. For illustrative purposes, we highlight below a wide range of possible demand outcomes bounded by:

- At the upper end, the IEA's New Policies Scenario (its central case, which assumes energy policies and measures currently in place, and a degree of progress towards stated country intentions and goals. This scenario sees continued demand growth through 2040 - albeit at a slowing pace - and aggregate 2040 demand (ex biofuels) >10mbd above that of 2015.
- The IEA's 450 Scenario, an outcome-driven view based on policies consistent with limiting the rise in long-term average global temperatures to 2°C. In this scenario, 2040 global oil demand is ~20mbd below 2016 levels, excluding a surge in biofuels from ~2mbd to ~9mbd.

Global liquids supply/demand balance, 2016-40e, mbd



Source: IEA, EIA, BP, Company reports and HSBC estimates. All figures exclude biofuels demand/supply

In practice, the demand range looks like it has shifted up a fair bit since last year's IEA World Energy Outlook – the dotted black line above represents demand forecasts from its Medium Term Oil Market Report (*Oil 2017*) published in March 2017.

Global supply: the solid line in the chart above represents our base case view of visible future global liquids supply. This encompasses our view on declines from existing supply, and all sanctioned and (in our view) likely major developments. Beyond visible projects, our supply total also assumes:

- growth in US tight oil ("shale") to a plateau of ~9.5mbd, vs ~6mbd in 2017e
- ~4mbd growth in Middle East supply (principally Iran/Iraq)
- ~3mbd from a combination of oil sands and refinery process gains.

Even in a transition to a 2°C world, there's an oil supply shortfall…

The point of this chart is to illustrate that **even in a highly progressive scenario from a climate change perspective (**i.e. where change is sufficiently rapid to allow the World to progress towards meeting the 2°C target), **mature field declines and a lack of visible new projects leave a significant supply gap still to be filled**.

This is not just a longer term issue either. We think the supply gap starts to become evident before the end of this decade. On the progressive 2°C demand scenario above it looks like there's no shortfall until later this decade, but more recent shorter term forecasts of global demand (such as the IEA's five year projection, *Oil 2017*) point to structurally much higher demand in 2017-22 than was envisaged in this scenario. It seems more likely to us that we could see a prospective shortfall of at least 10mbd by 2025 – and that's after assuming a continued sharp rise in US tight oil supply by then.

By 2040, the theoretical gap looks very substantial on most scenarios. Even in a scenario assuming policies consistent with meeting the 2°C limit, it is still around 7mbd.

….and this shortfall will become apparent soon

What does this tell us? Most of the more progressive demand scenarios now point to a peak in global oil demand somewhere between 2025 and 2035, and a peak somewhere in this range looks quite possible to us. However, **we think the availability of adequate supply will become a visible issue a long way before this** – potentially before the end of this decade.

On the supply side:

- we expect continued emphasis on efforts to maximise recovery rates and facility uptime, but we don't think these go anywhere near fully addressing the scale of the shortfall
- a resurgence of spend on major conventional developments (if it happened) would help mitigate the shortfall, but only in the longer term given typical long lead times on projects
- beyond this, we think materially higher crude prices are needed, in order to drive even greater response in short cycle supply (in the US but also beyond) than we currently envisage

On the demand side, barring a shock to global economic growth or another paradigm shift beyond even current progressive views on alternative energy, the most likely mitigating factor is once again higher prices. Much of the non-OECD world has used the period of low crude prices to deregulate end-user fuel prices. This should bring with it the higher level of price elasticity which could dampen global demand and further hasten the move to alternatives if prices rise significantly.

Global demand outlook

The current outlook for global transport fuels in particular is currently subject to a high degree of uncertainty as a result of the rate of climate policy progress and technological change, notably in the field of electric vehicles (EVs). This is illustrated by just a range of scenarios from some of the major forecasting agencies:

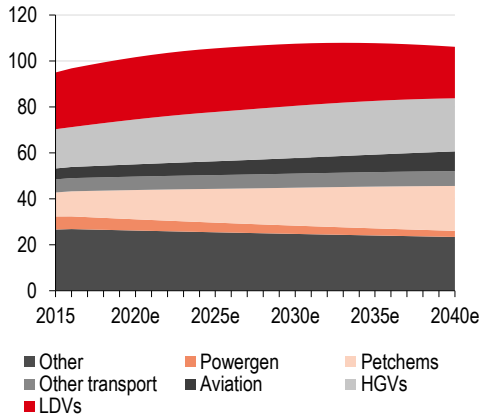
- International Energy Agency (IEA): 2030 total stock of EVs of 56m under its Reference Technology Scenario, or 120m under its Paris Declaration Scenario (consistent with the COP21 Declaration on Electro-Mobility and Climate Change) and 155m on its 2D Scenario (its scenario consistent with a 50% probability of limiting global warming to 2°C). By 2040, the IEA's 450 scenario (its 2°C scenario) sees the EV fleet at around 710m by 2040.
- OPEC: non-conventional vehicles to represent 22% of the passenger car fleet by 2040
- Bloomberg New Energy Finance (BNEF): EVs to represent 54% of new car sales by 2040
- PIRA: EVs comprise 20% of global on-road vehicles by 2040
- HSBC global autos research: EVs/hybrids to represent 55% of new car sales by 2030 (see **Global Autos:** Disruptive threats – Carmakers versus new entrants, 20/9/17) (*report link*)

Because of this uncertainty, we have looked at the demand outlook in terms of scenarios. Below we show indicative estimates for Global oil demand for Light Duty Vehicle (LDV) use and for all uses.

LDV demand could peak in 2025-30 but total oil demand is set to peak much later

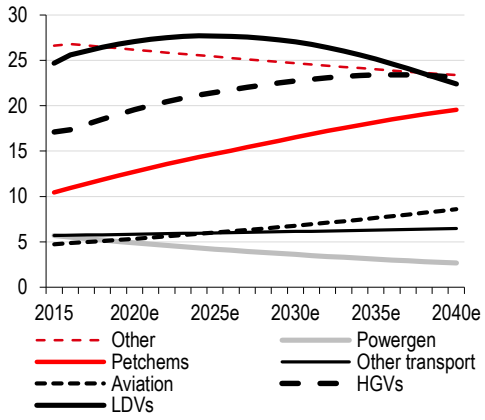
The chart below shows one possible outcome, based on the following assumptions for the global LDV fleet: 1) EV penetration of the fleet rising to 40% of new sales by 2040e; 2) average annual improvement in LDV fuel efficiency in new sales of Internal Combustion Engine (ICE) vehicles of 2.5% pa vs a recent history of 1.2%pa (see p.8 for further comment on this).

Oil demand by end-use, 2015-40e, mbd



Source: IEA, EIA, BP, Company reports and HSBC estimates

Oil demand by end-use, 2015-40e, mbd



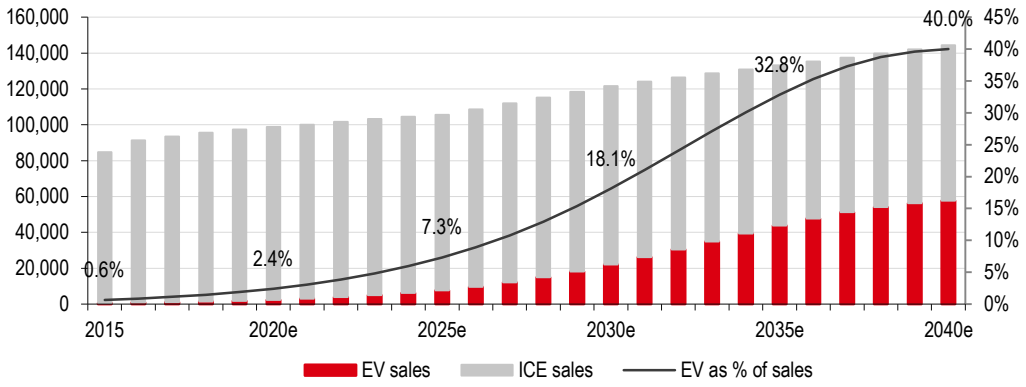
Source: IEA, EIA, BP, Company reports and HSBC estimates

A few key points emerge from this scenario

- A combination of EV penetration of LDV sales, and improving ICE fuel efficiency would result in a peak in global LDV demand for oil sometime in the period 2025-30e, but with limited erosion in LDV demand before 2030 or so – largely due to the scale of the existing ICE fleet
- However, oil demand in total looks set to continue growing for considerably longer. This is mainly driven by a combination of continued growth in demand for 1) Heavy Goods Vehicle (HGV) freight, 2) aviation and 3) petrochemicals. We believe aggregate demand from these three sources could add well over 15mbd to global demand by 2020, albeit oil demand in other areas such as power generation and industrial/other uses is likely to decline slowly.

Our base case is equivalent to absolute annual EV sales of around 20m in 2030 (vs ~1m in 2017), rising to ~55m by 2040. This is equivalent to a total EV fleet size growing from ~3m at present to ~100m in 2030, rising to around 470m in 2040.

Annual global LDV sales in this scenario ('000 and % penetration by EV sales)

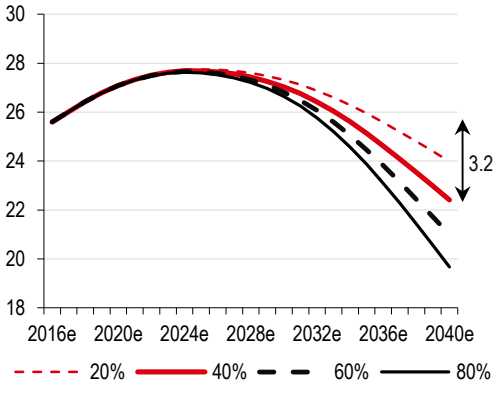


Source: IEA, BP and HSBC estimates

Light Duty Vehicle (LDV) demand

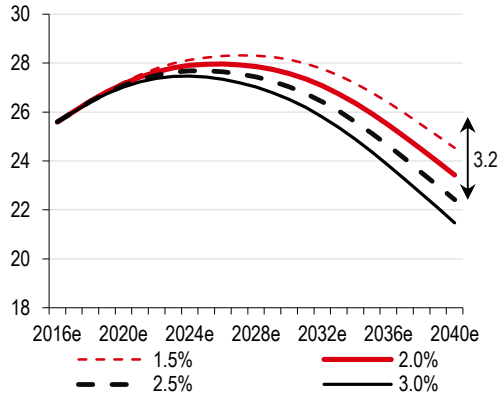
The charts below shows a simple sensitivity of this base case scenario for **LDV oil demand** to 1) different rates of penetration of new LDV sales by EVs, and 2) different rates of improvement in ICE fuel efficiency, vs our base case of ~2.5%pa. It is interesting to note that **the sensitivity to efficiency gains is potentially at least as material as the sensitivity to EV penetration** because of the base effect of the large global fleet of ICE vehicles.

LDV oil demand, 2016-40 vs EV penetration rate (% of new sales by 2040 and mbd), at 2.5%pa ICE efficiency gain



Source: IEA, BP Statistical Review of World Energy, HSBC estimates

LDV oil demand, 2016-40 vs ICE efficiency gain (% pa and mbd), at 40% EV sales penetration of LDVs by 2040



Source: IEA, BP Statistical Review of World Energy, HSBC estimates

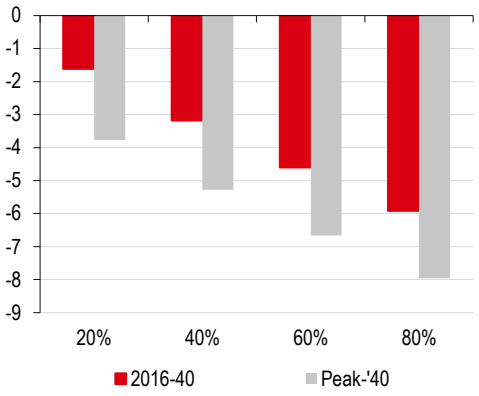
Expressed another way, the charts below illustrate the same two sensitivities, but in terms of the change in LDV oil demand a) over the period 2016-40e in total, and b) from a future peak to 2040e.

LDV oil demand ~3mbd lower by 2040 at 40% EV penetration of sales

In rough terms, these sensitivities indicate that if ICE efficiency gains remain around the 2.5%pa level, LDV oil demand (but not total demand) would be below 2016 levels in 2040 for levels of EV penetration of new sales above ~15% by that stage, largely due to the improvement in ICE new vehicle efficiency. With EVs at 40% of new sales by 2040, our model indicates net loss in

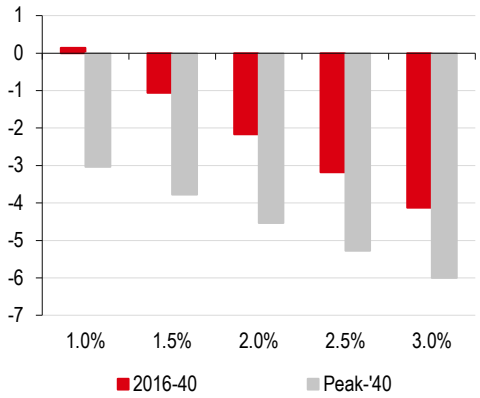
LDV oil demand over the period 2016-40 of around 3mbd (after a peak mid next decade around 2mbd higher than in 2016), rising to 4-5mbd net loss if EV penetration reaches 60% by 2040, and around 6mbd at 80% penetration.

Global LDV oil demand growth change, 2016-40 vs 2040 EV new sales penetration (% and mbd), for 2.5%pa ICE efficiency gains



Source: IEA, EIA, BP, Company reports and HSBC estimates

Global LDV oil demand growth change, 2016-40 vs ICE fuel efficiency gains (% pa and mbd), for 40% EV penetration of new LDV sales

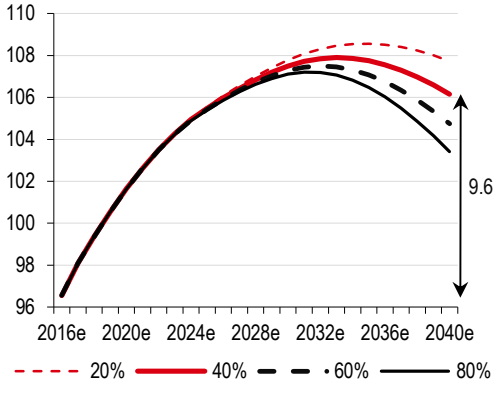


Source: IEA, EIA, BP, Company reports and HSBC estimates

Overall oil demand

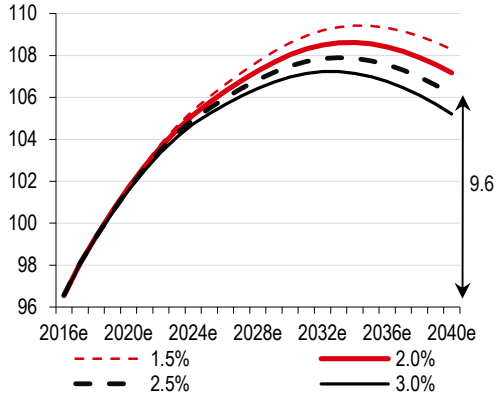
The chart below shows a sensitivity of **total oil demand** to changes in LDV sales penetration by EVs. Because of the more durable growth outlook in non-LDV demand, these scenarios points to a most likely peak in total oil demand somewhere more in the range 2030-35e.

Global oil demand, 2016-40 vs EV penetration rate (% of new sales by 2040 and mbd), for 2.5%pa ICE efficiency gains



Source: IEA, BP Statistical Review of World Energy, HSBC estimates

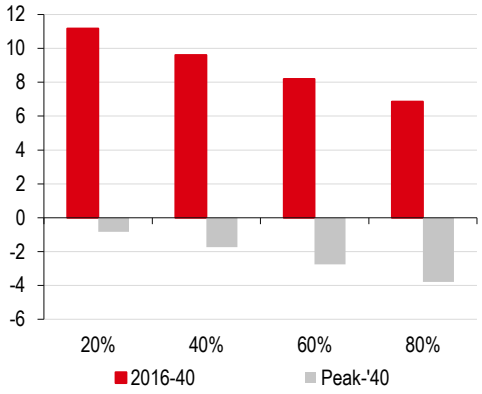
Global oil demand, 2016-40 vs ICE efficiency gain (% pa and mbd), for 40% EV penetration of new LDV sales



Source: IEA, BP Statistical Review of World Energy, HSBC estimates

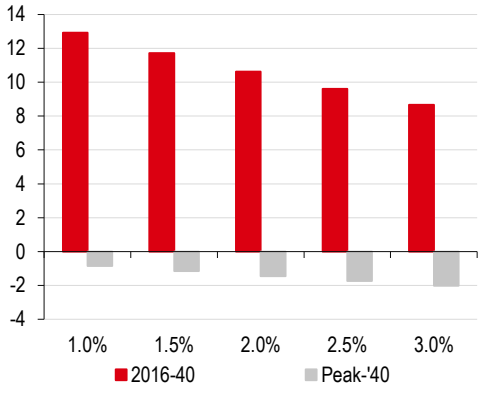
Assuming average gains in ICE fleet fuel efficiency of 2.5%pa, an expansion of EV sales to 40% of the total by 2040 would still see 2040 global oil demand around 10mbd higher than that of 2016. If we increase the EV penetration rate to 60%, net demand over the period still looks like around 8mbd.

Global oil demand growth change, 2016-40 vs 2040 EV new sales penetration (% and mbd), for 2.5%pa ICE efficiency gains



Source: IEA, EIA, BP, Company reports and HSBC estimates

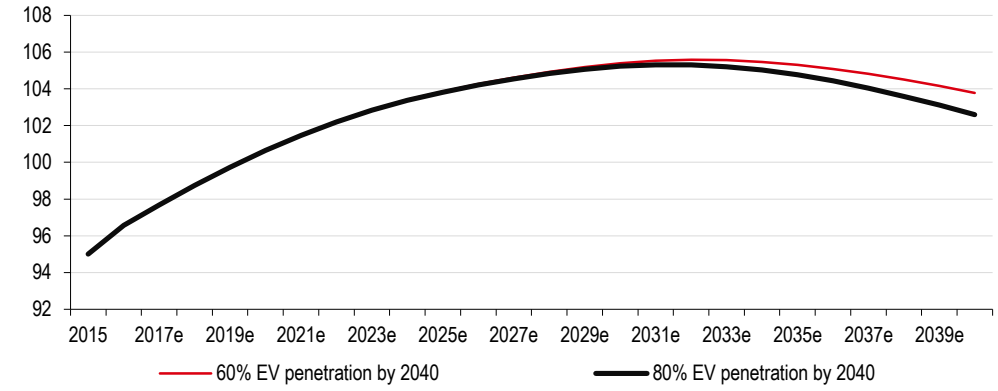
Global oil demand growth change, 2016-40 vs ICE fuel efficiency gains (% pa and mbd), for 40% EV penetration of new LDV sales



Source: IEA, EIA, BP, Company reports and HSBC estimates

For reference, if we combine both a higher rate of EV penetration than our base case, plus a higher rate of efficiency improvements, the effect on fuel demand would obviously be compounded. The chart below shows a sensitivity of global demand for scenarios of 60% and 80% EV penetration of the LDV fleet by 2040, but with both assuming a compound rate of ICE fuel efficiency over the period of 3.0%pa instead of 2.5%. In this case, total net growth in oil demand in 2040 is still more than 7mbd higher than in 2016 at 60% EV penetration, and around 6mbd at 80% penetration.

Global oil demand assuming 3%pa improvement in new LDV fuel efficiency, mbd



Source: IEA, EIA, BP, Company reports and HSBC estimates

Gasoline demand likely to peak around 2025-30

Downstream implications:

- Most plausible scenarios for the outlook for the energy mix point to a peak in LDV demand somewhere in the period 2025-30. With by far the largest amount of gasoline consumed by the LDV fleet, this points to a peak in gasoline demand which is not too far away
- In contrast, the outlook for middle distillates remains strong, despite the current market focus on the "death of diesel" in the LDV market. Competition is coming to the HGV fleet, but non-OECD policy initiatives are far scarcer than for LDVs, and the opportunities for substitution less clear. As a result, we see sustained if gradually slowing growth in demand from heavy freight. Moreover, jet fuel demand growth sees no sight of abating.
- Fuel oil demand is set to be hit by the IMO regulations on sulphur content in shipping bunker fuel. While a portion of the global fleet is moving and will continue to move towards gas as a fuel, a large proportion of demand growth looks set to be satisfied by lower sulphur fuel oils and diesel.
- Meanwhile, the outlook for chemicals as a feedstock shows clear prospects of strong, long term growth driven by EM economies, linked as it is historically with GDP per capita trends.

A note on fuel efficiency

Our base assumption of a 2.5%pa improvement in the fuel efficiency of new ICE vehicles is much higher than recent data which shows that the annual average efficiency improvement in new LDVs slowed from 1.8%pa in 2002-08 to only 1.2%pa in 2012-15 (source: Global Fuel Economy Initiative, and partly down to mix effect). Our forecasts equate to fuel consumption on new LDV sales improving from 7.6litres/100km in 2015 to ~4.0lit/100km by 2040.

We assume this higher rate of efficiency gains per annum vs the recent past to take some account of autonomous driving efficiencies, such as sensing technology to smooth flow of traffic and prevent undesirable engine idling. Developments in these types of areas which could lead to even greater efficiency gains in the medium term. However, for the major vehicle manufacturers, investments in further improving ICE fuel efficiency have to be balanced against the scale of their investment in EVs. It is possible that heavy investment towards EVs could limit investment and hence the level of continued progress on their conventional ICE vehicle efficiency.

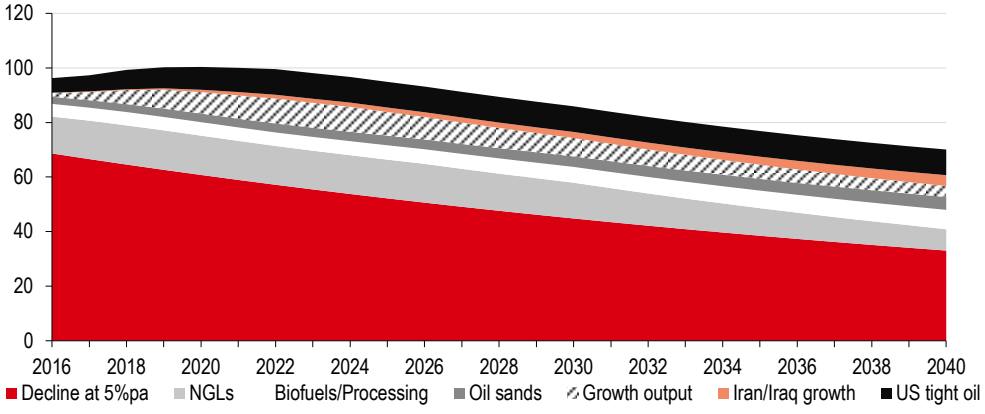
For context, the GFEI calculates that to achieve the global 2°C vision, new fleet efficiency needs to improve at a compound 3.7%pa through 2015-30.

Global supply outlook

The chart below puts a bit more detail on the supply projections given in the chart on page 2, and is driven by our bottom-up model of global supply.

- For conventional production, we have incorporated all the visible significant projects, whether sanctioned or (in our view) likely to proceed, including expansions
- Declines in existing, post peak production are assumed in this case to average 5% pa. This is consistent with the lower end of a 5-7%pa range for declines in the findings from our in-depth study (*Global oil supply: Will mature field declines drive the next supply crunch?* 7 September 2016) – we discuss this further below.
- We assume US tight oil supply grows from around 6mbd in 2017 to 9.5mbd by 2022, and is sustained at this level in the longer term. We believe this is consistent with our long term Brent price assumption of USD70/b, and are convinced that US tight oil won't match such a level of sustained growth without considerably high prices than current levels. Indeed, it remains to be seen whether these levels of tight oil output can be delivered and maintained at all given some of the recent debate in the industry.
- We have also assumed growth from Iran and Iraq – the two OPEC countries where we see significant long term volume upside – of a combined ~4mbd between 2016 and 2040. Growth potential in these two countries is extremely hard to assess, but both have a resource base sufficient to sustain much higher production than at present. Iranian production is back to around pre-sanctions levels but we don't see significant further upside without the major injection of foreign capital and technology which is so far proving elusive. Iraqi volumes grew by 2mbd through 2010-16, but they have largely stalled this year. In our view the major block in Iraq (beyond the unattractiveness of many of the contracts) is the weak crude price, which has forced a sharp cutback in company investment in the past 2-3 years due to pressure on the Government's finances. This is likely to become less of an issue at the higher crude prices we expect to materialise.

Global liquids supply, 2016-40e, mbd

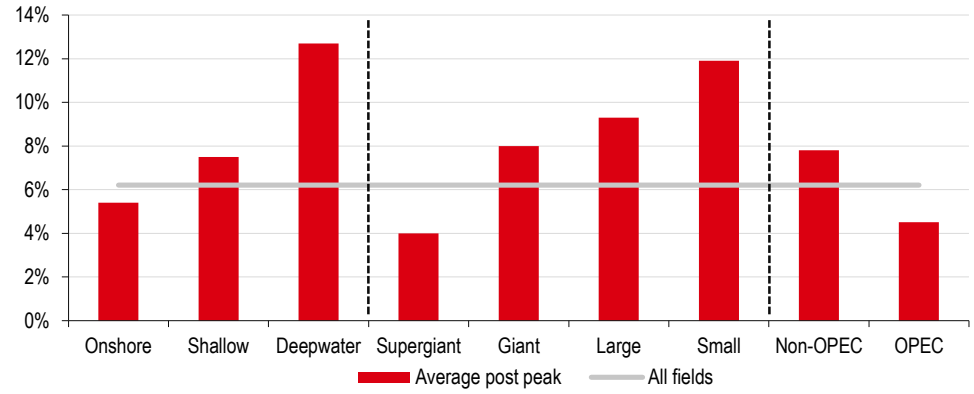


Source: IEA, EIA, BP, Company reports and HSBC estimates

A word on decline rates

The studies we examined in our report – based on an analysis of over 1600 fields across a whole range of geology, size, age and geography – point fairly consistently to an average decline rate on post-peak fields of 5-7%pa. Decline rates are higher for offshore fields and smaller fields – an important conclusion given that the average size of new discoveries and new fields is getting steadily smaller.

Weighted average CADR (compound-annual decline rate) to 2012 by decline phase (%)

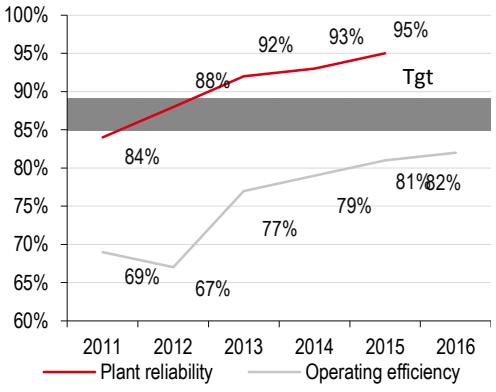


Source: IEA World Energy Outlook 2013

In practice, we haven't seen anything like this level of core decline in the past few years – production in many mature areas has held up better than expected. We think this has led to a widespread perception that decline rates aren't really as much of an issue any more. We think this is a false impression.

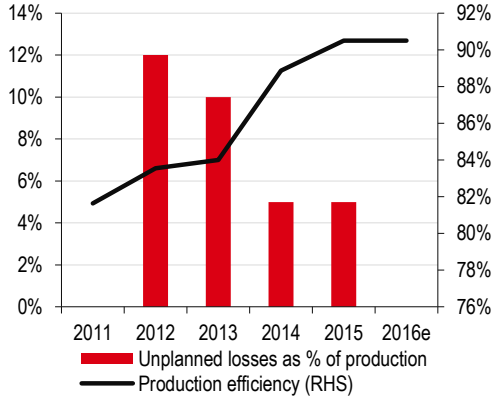
The main reason for this has been the step-change improvement in production efficiency (field/plant uptime) that we have seen in the last few years. Core field declines haven't gone away, but they have been masked by operating facilities working at a higher level of utilisation. Through the crude price downturn most major companies have made step-change improvements in uptime, typically of several percentage points' utilisation (see the examples of BP and Statoil below). We view these improvements as largely sustainable, but they leave the further gains in uptime now much more marginal. As the step-change year on year improvement peters out, we expect to see decline rates become more visible again in the next 1-2 years.

BP: improvements in production efficiency



Source: BP

Statoil: improvements in production efficiency



Source: Company reports

Appendix 1: links to other relevant HSBC research

Oil market reports

- Oil things considered - US upstream productivity trends, September '17 (20 September 2017) (*report link)*
- Oil things considered - What's the latest oil data telling us? (31 July 2017) (*report link*)
- Oil Insights: A tale of two cycles (4 June 2017) (*report link*)
- Global oil supply: Will mature field declines drive the next supply crunch? (7 September 2016) (*report link*)
- Global oil demand: Near-term strength, longer-term uncertainty (25 July 2016) (*report link*)

Alternative transport - thematics

- **Global Autos:** Disruptive threats – Carmakers versus new entrants (Horst Schneider, 20/9/17) (*report link*)
- **Global Sector Playbook:** Lithium – Charging the future (Alexandre Falcao, 19/10/16) (*report link*)
- **The Nomadic Investor:** Transport shock – autonomous today, virtual tomorrow (Davey Jose, 19/10/16) (*report link*)
- **Asia EV and Battery:** Five upbeat signs (Will Cho, 14/10/16) (*report link*)
- **Asia EV and Battery:** How China is helping to crack the cost conundrum (Will Cho, 6/4/16) (*report link*)

Other EV/battery related research

- **Samsung SDI:** Buy – Switching gears to EV (Will Cho, 20/9/17) (*report link*)
- **The Lithium Brick Road** – Market insights from Orocobre Roadshow (Alexandre Falcao, 15/8/17) (*report link*)
- **Samsung SDI:** Buy – Deeply underestimated battery value (Will Cho, 27/7/17) (*report link*)
- **LG Chemical:** Buy – Smooth sailing (Dennis Yoo, 19/7/17) (*report link*)
- **Samsung SDI:** Buy – Proxy for secular growth in EV batter and OLED (Will Cho, 14/7/17) (*report link*)
- **Baidu:** Buy – Launches Apollo Project to reach the next frontier in self-driving cars (Chi Tsang, 20/4/17) (*report link*)
- **Baidu:** Buy – On the road to self-driving cars (Chi Tsang, 9/1/17) (*report link*)

Appendix 2: key modelling variables:

The following is a summary of the key modelling variables in our base case sensitivity model

LDV fleet

- Growth in total fleet of 75% between 2015 and 2040 (2.3%pa) to a size of 2 billion vehicles by 2040
- EV sales to grow to 40% of total
- Efficiency gains: 2.5%pa improvement in efficiency of new ICE fleet sales, equivalent to a ~2.0%pa improvement in the average efficiency of the whole fleet. This equates to new vehicle average efficiency improving from 7.6litres/100km in 2015 to ~4.0litres/100km by 2040
- A 7.5% increase in total miles travelled per LDV over the period 2015-40 (consistent with BNEF assumptions)
- Scrappage rate of existing ICE fleet: 3.5%pa, rising to 6%pa by 2040
- Breakdown of EVs assumed to be ~50% hybrid, 50% battery EV

Other

- HGV fleet growth from 25m units to 53m through 2015-40 (+115%); the IEA's Future of Trucks report sees the fleet growing to 64m by 2050
- Penetration of the HGV fleet by alternatives (EV, LPG etc) rising from ~1% to 8% by 2040
- HGV efficiency gains: 2.0%pa improvement in efficiency of the HGV fleet
- Aviation passenger km growth of 200% through 2040 – an annual growth rate of 4.5% vs the long run average historical rate of 5.5% (source: IATA).
- Marine demand growing by less than 1mbd, with efficiency gains and fleet substitution offsetting the growth in global marine trade
- Aviation fuel efficiency gains of 2%pa (fleet average). On balance, aviation demand growing by nearly 4mbd through the period
- Petrochemicals demand for oil growing at 2.5%pa, rising to 19mbd by 2040 vs 10.5mbd in 2015 – a figure we believe could ultimately prove conservative
- Power demand for oil falling at 3%pa, losing 3mbd over the forecast period
- Demand for industrial and other uses in gradual decline (-0.25%pa, losing 3-4m over the period)

Global oil demand, 2015-40e; HSBC central scenario (mbd)

	2015	Peak	2040	2040 vs 2015	2040 vs Peak
Demand	**95.0**	**106.7**	**106.0**	**11.0**	**(0.7)**
LDVs	24.7	27.7	22.4	(2.3)	(5.3)
HGVs	17.1	23.4	23.1	6.0	(0.3)
Aviation	4.8	8.6	8.6	3.8	-
Other transport	5.7	6.5	6.5	0.8	-
Petchems	10.5	19.4	19.4	8.9	-
Powergen	5.7	5.7	2.7	(3.0)	(3.0)
Other	26.6	26.8	23.4	(3.2)	(3.4)

Source: IEA, EIA, BP, various sources, and HSBC estimates

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Appendix 3: HSBC summary medium-term global supply/demand projections

Global oil supply/demand balance, mbd

	2013	2014	2015	2016	2017e	2018e	2019e	2020e	2021e
Demand									
OECD	45.6	45.3	46.0	46.5	46.8	46.7	46.5	46.3	46.1
Non-OECD	46.1	47.6	49.0	50.1	51.2	52.6	53.9	55.0	56.2
Global demand	**91.8**	**92.8**	**95.0**	**96.6**	**97.9**	**99.3**	**100.4**	**101.3**	**102.3**
Demand growth	1.5%	1.2%	2.3%	1.7%	*1.4%*	*1.4%*	*1.2%*	*0.9%*	*0.9%*
Supply									
Non-OPEC*	54.0	56.4	57.9	57.2	58.2	59.2	59.3	59.1	58.4
of which US tight oil	4.0	5.1	5.8	5.3	*5.9*	*7.1*	*7.7*	*8.4*	*8.9*
other	50.0	51.3	52.1	51.8	*52.3*	*52.1*	*51.6*	*50.7*	*49.6*
OPEC NGLs	6.4	6.4	6.4	6.6	6.8	7.0	7.0	7.0	7.0
Non-OPEC & OPEC non-crude	**60.4**	**62.8**	**64.3**	**63.8**	**65.0**	**66.2**	**66.4**	**66.0**	**65.4**
OPEC crude	**30.4**	**30.1**	**31.5**	**32.5**	**32.3**	**33.0**	**33.9**	**34.3**	**34.6**
Global supply	**90.8**	**92.9**	**95.8**	**96.3**	**97.3**	**99.3**	**100.2**	**100.4**	**100.0**
Implied inventory build/(draw)	**-1.0**	**0.1**	**0.8**	**-0.3**	**-0.6**	**0.0**	**-0.2**	**-1.0**	**-2.3**
Call on OPEC crude	31.4	30.0	30.6	32.8	32.9	33.0	34.0	35.3	36.9
Annual changes, mbd									
Global demand	1.3	1.1	2.1	1.6	1.3	1.3	1.1	0.9	1.0
Non-OPEC supply	1.6	2.4	1.5	-0.7	1.0	1.0	0.1	-0.3	-0.6
US tight oil supply	0.9	1.1	0.7	-0.5	0.5	1.2	0.6	0.6	0.5
Non-OPEC & OPEC NGL supply	1.6	2.5	1.5	-0.6	1.3	1.2	0.1	-0.3	-0.6
Call on OPEC	-0.2	-1.4	0.6	2.2	0.1	0.1	1.0	1.2	1.6
OPEC crude production	-0.9	-0.3	1.4	1.0	-0.2	0.8	0.8	0.4	0.3

*Includes global biofuels, processing gains, etc.
Source: BP, IEA, US EIA, HSBC estimates

Disclosure appendix

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