Energy Institute

What’s the Future for Diesel?

Oliver Griffiths MEI
London and Home Counties Branch
Who we are

The Energy Institute:

We are the professional body for the energy industry delivering good practice and professionalism across the depth and breadth of the sector.

- A registered charity, we are completely independent and receive no funding from government

- We develop and disseminate knowledge, skills and good practice towards a safe, secure and sustainable energy system

- We celebrated our centenary in 2014
Knowledge, skills and good practice

Energy Institute

Membership Organisation

Recognition

Networking

Professional development

Facilitation

Training and events

Publications

Good practice

Learned Society
London and Home Counties Branch

- The largest of 13 local branch networks in the UK
- 7 Overseas branches: Ireland, Hong Kong, Nigeria, Middle East, Malaysia, Singapore, Caribbean (in development)
- Currently 6 Young Professionals Networks (YPN) including the London YPN
Get Involved

EI branches and YPN

- Attend events, join the committee, offer a venue.

Committees

- Join a professional committee or EI Council.

Magazines

- Editors are always on the look out for relative, informative, objective commentary on markets and topical issues.

EI Champion

- Tell others about us.
What’s the Future for Diesel?

Chris Hunt – UKPIA
Oliver Lord – Transport for London (TfL)
Future of Diesel
First, the adverts! UK Petroleum Industry Association

- Trade Association for the UK oil refining industry and its marketing activities
- Cover legislation on: conventional fuels, biofuels, air quality, climate change, safety, other environmental issues
- Communications
- Emergency planning

- BP
- ExxonMobil
- Essar
- Petroineos
- Phillips 66
- Shell
- Total
- Valero

Marketing/Retail – No refining
Refining and Branded wholesale
Refining and Marketing
Refining and limited Marketing

ASSOCIATES: Certas Energy, Dragon LNG, Greenenergy, National Grid and Puma Energy
UKPIA

- Our members source 86% of all UK inland fuel demand
- Operate all 6 UK refineries – 5th largest capacity in Europe
- Supply over 33% of UK primary energy demand needs
- 88,100 jobs supported across the UK directly and indirectly
- Our members own and brand 55% of filling stations in the UK
- Operate 36 distribution terminals
UK Refineries

- Vital to UK’s mobility, economy and growth. UK refineries rank upper quartile for innovation and skills against other industries.
- Around £5.6 billion invested in fixed assets over the last 5 years, mostly to meet tighter fuel and environmental standards and to enhance process safety. Further £11 billion to 2030 on compliance alone.
- Value of refining to UK economy estimated at over £2.3 billion annually.
- Each large refinery estimated to inject ~£60+ million locally. In 2015/16, the downstream oil sector collected £36 billion in duty and VAT on fuels.
- Supply important feedstocks for other industrial sectors and processes - petrochemicals, lubricants and greases, heating fuels, solvents, carbon electrodes.
Key fact - oil is not running out!

Distribution of proved oil reserves in 1995, 2005 and 2015

Percentage

World proved oil reserves at the end of 2015 reached 1,697.6 billion barrels = 50.7 years of global production

Dilemma *1: There are a lot of diesel vehicles out there!...

Europe new passenger car registrations

Europe passenger car stock fuel efficiency

Source: Wood Mackenzie
UK new car registrations by fuel type 2000-2015

Percentage

Source: SMMT, 2016
Licensed cars in Great Britain by fuel type 1995-2015

Percentage

Source: DfT, 2016
What's that done to demand?

Total road fuel sales

Billion litres

Source: DECC, DUKES, 2016
Dilemma *2: Refinery output is fairly fixed...

Refinery production 2015

Source: UKPIA Statistical Review 2016
So, too much petrol/not enough distillates!
UK net product flows

Units: Mte / year

Source: DECC (DUKES) 2015
Dilemma *3: Alternative fuelled vehicles need seismic shift to make impact!...

EV/PHEV share of car stock by key markets

Oil demand displaced by EVs/PHEVs

Source: Wood Mackenzie
Things are improving, but...

EU projects feed the OEM development process for innovations to improve exhaust emissions.

30 new diesel cars in 2014 emit less PM* than... 1 new diesel car in 1994

35 new heavy duty diesel engines in 2014 emit less PM* than... 1 new heavy duty diesel engine in 1994

*Diesel particulate matter Euro 6 v Euro 1 standards
Source: Eucar
Retail fuel not just about cars – HGV has no viable alternative to diesel...

EU road freight tonne km

Europe road diesel consumption by vehicle type

Source: Wood Mackenzie
Distillate shortfall - Energy security and resilience risk for the UK

Due to legislative and other pressures, severe rationalisation of UK refining has occurred since 2009. During this period, three refineries have closed and overall UK crude oil processing capacity has declined by nearly a third. A further capacity reduction of nearly 9% has been announced for 2016.
Overcoming the dilemmas – some issues?

• Important not to demonise diesel – it’s done well in CO2 reduction and fuel efficiency
  – a lot of consumers have invested in good faith

• Options to reduce demand?
  – alternatively fuelled vehicles may not be the answer and will cannibalise both petrol and diesel as well as have national budget implications?
  – Scrappage scheme? Expensive, but has merit?
  – Air quality low emission zone charges? Implications for 50% of the motoring public and will disproportionately impact lower earners

Consider a longer term adjustment of fuel duty to shift towards petrol, plus mixture of above?....
LONDON’S AIR QUALITY CHALLENGE

Oliver Lord
Deputy Air Quality Manager
Greater London Authority
AIR QUALITY IN LONDON

• London now meets legal limits for eight of the nine pollutants regulated by the European Commission.

• Even though we are reported compliant for Particulate Matter, it is commonly accepted there is no safe limit and further reductions are being sought to protect health.

• NO$_2$ remains a serious challenge. In some places London exceeds the limits by a factor of three. The Government has a plan to meet legal limits in London by 2025, which will require further action over the next ten years but this has been criticised for being too slow.
AIR QUALITY IN LONDON

'Oxford Street pollution levels breached EU annual limit just four days into 2015'
Putney High Street breaches annual diesel pollution limit eight days in to 2016
AIR QUALITY IN LONDON

Want to find out how toxic your air is? Ask me. A pigeon. Tweet just your London area to @PigeonAir #PigeonAir
PARTICULATE MATTER

- London has met legal requirements for PM$_{10}$ since 2011. However, it remains a localised issue requiring a targeted approach.
NO$_2$ CHALLENGE IN 2013

Legal limit
NO$_2$ CHALLENGE IN 2020

Legal limit
NO$_2$ CHALLENGE IN 2025

Legal limit
## NO$_2$ – LEGAL LIMITS

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Concentration (µg/m$^3$)</th>
<th>Averaging period</th>
<th>Permitted annual exceedences</th>
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<td>Nitrogen dioxide (NO$_2$)</td>
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<td>1 hour</td>
<td>18</td>
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<tr>
<td></td>
<td>40</td>
<td>1 year</td>
<td>n/a</td>
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</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Average (µg/m$^3$) (2016 to date)</th>
<th>No. of hourly exceedences (2016 to date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putney High Street</td>
<td>129</td>
<td>886</td>
</tr>
<tr>
<td>Brixton Road</td>
<td>116</td>
<td>378</td>
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<tr>
<td>Oxford Street</td>
<td>90</td>
<td>163</td>
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</table>
NO$_2$ – A EUROPE WIDE CHALLENGE
HEALTH AND EQUALITIES

Health
• We estimate an equivalent of around 9,400 deaths were caused by long-term exposure to air pollution.
• A baby born in 2010 and exposed to that same level of air quality for its entire life would lose 2.2 years (if male) and 2 years (if female) of life expectancy.

Fairness
• The health impacts associated with air pollution fall disproportionally on our most vulnerable communities, affecting the poorest and those from minority ethnic groups more acutely.
• Tackling air pollution is about social justice and there is an urgent need to do more to tackle public health inequalities.
NO\textsubscript{x} EMISSIONS IN 2013

- Road transport: 50%
- Domestic and Commercial other Fuels: 3%
- Gas - Domestic: 12%
- Gas - Non-Domestic: 8%
- Non Road Mobile Machinery: 7%
- Industry: 7%
- Avition: 8%
- Resuspension: <1%
- Rail: 3%
- River: 1%
- Other: 1%

- Petrol Car: 6%
- Diesel Car: 12%
- TfL Bus: 10%
- HGV: 11%
- Van and Minibus: 6%
- Motorcycle: <1%
- Taxi: 2%
- Non-TfL Bus and Coach: 3%
DIESELISATION

New UK car sales 2003 – 2014

Year

Source: SMMT
DIESEL PERFORMANCE

- Euro 3: 2000
- Euro 4: 2005
- Euro 5: 2009
- Euro 6: 2014

- On-road measured value (Carslaw, 2011) / (ICCT, 2014)
- Euro emission limit
‘BENDING THE RULES’...

Source: Explaining road transport emissions, EEA
TRUSTING DIESEL

• Only 1 in 6 of all new diesel cars have been shown to meet the Euro 6 standard in ‘real world’

• We believe the new EQUA index created by Emissions Analytics can help consumers make an informed choice and strengthen our procurement practices.
## Passenger Car Drive Cycle Average Results

<table>
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<tr>
<th>Mkt segment</th>
<th>Fuel</th>
<th>NOX</th>
<th>PM</th>
<th>CO2</th>
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<td></td>
<td></td>
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<td>limit g/km</td>
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<tr>
<td></td>
<td></td>
<td>Test average</td>
<td>Test average</td>
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<tr>
<td>Compact</td>
<td>petrol</td>
<td>0.06</td>
<td>0.018</td>
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<td>Supermini</td>
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<td>0.08</td>
<td>1.173</td>
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<td>Small family 1</td>
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<td>0.316</td>
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<tr>
<td>Small family 2</td>
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<td>Family/MPV 2</td>
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<tr>
<td>Prestige/sports 1</td>
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<td>0.007</td>
<td>0.005</td>
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<tr>
<td>Prestige/sports 2</td>
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<td>0.08</td>
<td>0.287</td>
<td>0.005</td>
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<td>SUV/4x4</td>
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<tr>
<td>Hybrid HEV</td>
<td>Petrol</td>
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<td>0.001</td>
<td>0.005</td>
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<tr>
<td>Hybrid REEV</td>
<td>Petrol</td>
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<td>0.001</td>
<td>0.005</td>
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# Goods Vehicle Cycle Average Results

<table>
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<tr>
<th>Market Segment</th>
<th>Fuel</th>
<th>NOX</th>
<th>PM</th>
<th>CO₂</th>
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<td></td>
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<td>Test average</td>
<td>Test average</td>
<td>Test average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0% payload</td>
<td>100% payload</td>
<td>0% payload</td>
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<tr>
<td></td>
<td></td>
<td>kg</td>
<td>g/km</td>
<td>g/km</td>
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<tr>
<td>N1 class III LGV</td>
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<td>3500</td>
<td>0.494</td>
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<td>N2 rigid HGV</td>
<td>diesel</td>
<td>7500</td>
<td>0.71</td>
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<tr>
<td>N3 rigid HGV</td>
<td>diesel</td>
<td>18000</td>
<td>2.714</td>
<td>0.511</td>
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<tr>
<td>N3 Artic HGV</td>
<td>diesel</td>
<td>40000</td>
<td>1.407</td>
<td>1.188</td>
</tr>
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</table>
NEW MAYORAL PRIORITY

• The Mayor held a consultation on a number of measures within weeks of coming into office.

• Over 15,000 people responded and we will start a second stage in the autumn with more detailed information.

“...we need big, bold and sometimes difficult policies if London is to match the scale of the challenge.”
NEW PROPOSALS

- The Mayor expects TfL to lead by example and has proposed a number of improvements to the bus fleet:
  - Only procuring hybrid or zero-emission double-decker buses from 2018
  - Euro VI compliance in central London by 2019
  - New low emission bus zones – tackling pollution hotspots by concentrating cleaner buses on the dirtiest routes
  - Expanding the ULEZ retrofit programme to 3,000 buses outside the central zone (over 5,000 buses in total)

- No longer licensing new diesel taxis from 2018.

- London boroughs are also starting to phase out diesel through their fleet procurement and parking tariffs.
ULTRA LOW EMISSION ZONE

Exempt but new licensing requirements

Euro 4 petrol (<13-14yrs old in 2020) ...or £12.50 a day
Euro 6 diesel (<4-5yrs old in 2020) ...or £12.50 a day

Euro 3 (<13yrs old in 2020) ...or £12.50 a day
Euro VI (<6yrs old in 2020) ...or £100 a day
NEW PROPOSALS

• Implementing an emissions surcharge (T-charge) on the most polluting vehicles entering central London from 2017

• Bringing forward the ULEZ in central London by 2019;

• Extending the ULEZ beyond central London in, or around, 2020:
  – For motorcycles, cars and vans, to the North and South Circular roads
  – For lorries, buses and coaches, London-wide

• Starting work on a diesel scrappage scheme as part of a wider national scheme to be delivered by Government and lobbying for a reformed Vehicle Excise Duty.
NON-TRANSPORT MEASURES

Air Quality Neutral

Local

Mayor’s AQ Fund

Health

Retrofit programmes

Construction
We have supplementary guidance to support the policies in the London Plan:

- the Air Quality Statement;
- the identification of the potential scale of dust emissions for each stage of work;
- the identification of the level of risk due to the scale of dust emissions;
- best practice methods for controlling dust on-site and to prevent trackout;
- recommendations for monitoring;
- emission standards for non-road mobile machinery.
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- recommendations for monitoring;
- emission standards for non-road mobile machinery.
TOWARDS A NEW LONDON ENVIRONMENT STRATEGY

CCMES
CCAS
MAQS
MANS
MBS
MWMS

London Environment Strategy
Thank you

oliver.lord@london.gov.uk