The Future of Automotive and Industrial Lubricants

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Definitions & Cautionary Note

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this release "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. ''Subsidiaries'', "Shell subsidiaries" and "Shell companies" as used in this release refer to companies over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations" respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.

This release contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as ''anticipate'', ''believe'', ''could'', ''estimate'', ''expect'', ''goals'', ''intend'', ''may'', ''objectives'', ''outlook'', ''plan'', ''probably'', ''project'', ''risks'', "schedule", ''seek'', ''should'', ''target'', ''will'' and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this release, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. There can be no assurance that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this release are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell's 20-F for the year ended December 31, 2015 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward looking statements contained in this release and should be considered by the reader. Each forward-looking statement speaks only as of the date of this release, 20 March 2017. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this release.
With respect to operating costs synergies indicated, such savings and efficiencies in procurement spend include economies of scale, specification standardisation and operating efficiencies across operating, capital and raw material cost areas.

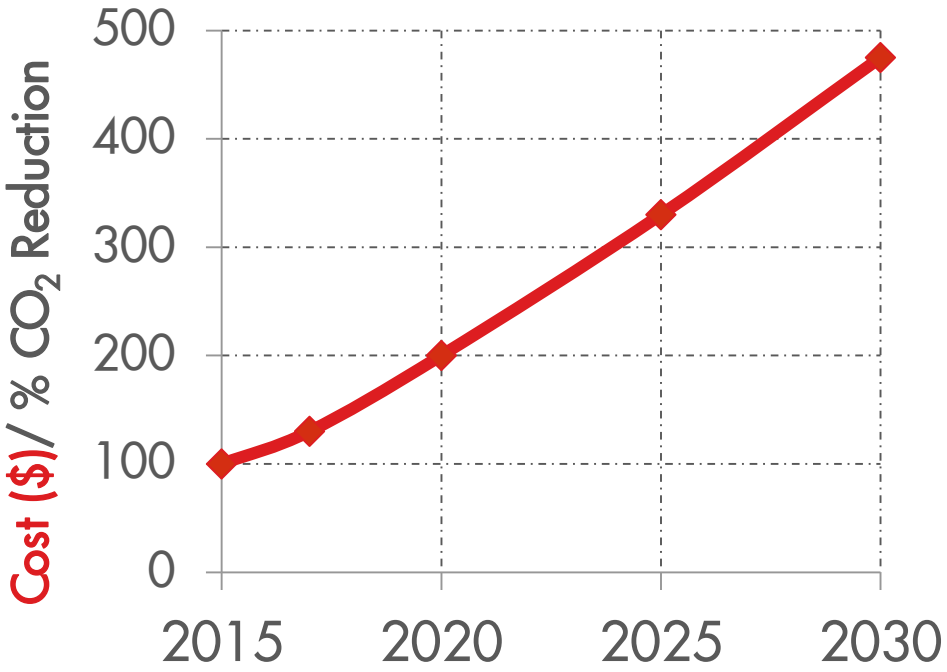
We may have used certain terms, such as resources, in this release that United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. U.S. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website www.sec.gov.

WE ARE IN AN ERA OF ENERGY AND MOBILITY TRANSITION

- Mobility is the life-blood of our society – number of vehicles globally forecast to double by 2050
- Megatrends include Global warming, Urban air quality, Waste reduction, Changing customer expectations
- Approximately 20% of CO2 emissions are from the Transport sector –
  Lubricants can provide solutions for the Automotive industry to enable this transition

OEMS FACE SIGNIFICANT CHALLENGES TO ADDRESS CO2 EMISSIONS

Auto Industry faces significant and increasing costs to reduce CO2 emissions



Fuel efficiency options - Lubricants can provide low cost, large scale, high impact benefits

OEM Options

- Downsizing, Turbo-charging
- Gasoline direct injection
- Cylinder de-activation
- Advanced thermal management
- Friction reducing materials
- After-treatment devices to control regulated emissions.
- *Fuel economy engine oils*

Costs to deliver incremental fuel economy benefits through engineering design are increasing over time.
0W-20, 0W-16 and lighter grades – **co-engineered** to help maximise the fuel economy potential of the engine – can deliver fuel economy benefits at a fraction of the cost of other technologies.

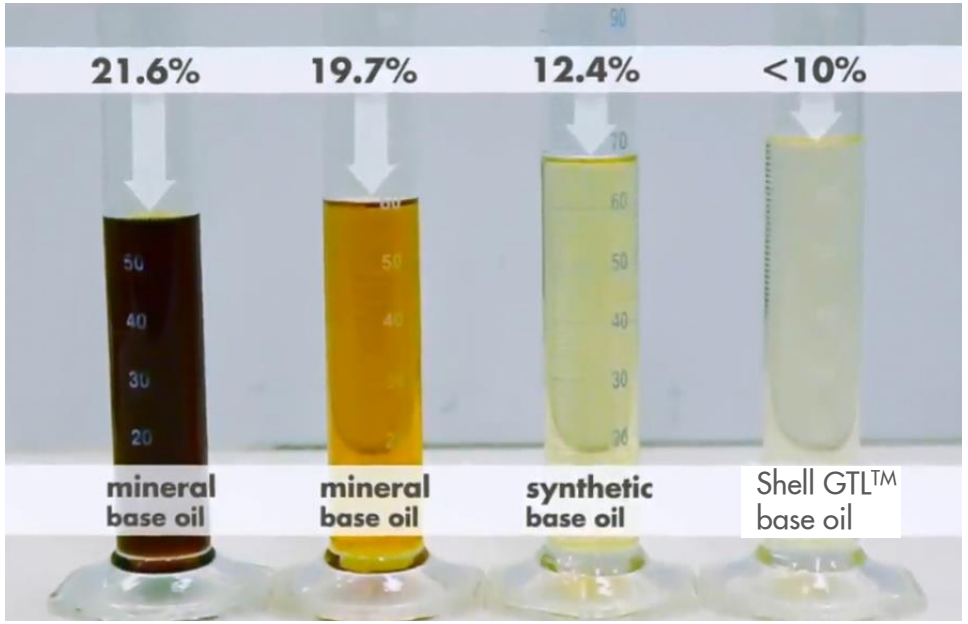
MODERN FUEL-EFFICIENT ENGINES - CHALLENGES FOR LUBRICANTS

FORMULATION CHALLENGES

- Turbocharger Deposits
- Low Speed Pre-ignition
- Inlet Valve Deposits
- Fuel in Oil Dilution
- Increased Soot, Wear, Oil Consumption
- After Treatment Compatibility
- Extended Service Interval
- Variable Fuel Quality

Sophisticated engine technologies are enabled by the use of **high performance synthetic base oils** such as Shell GTL™ base oils and poly-alpha-olefins that provide:

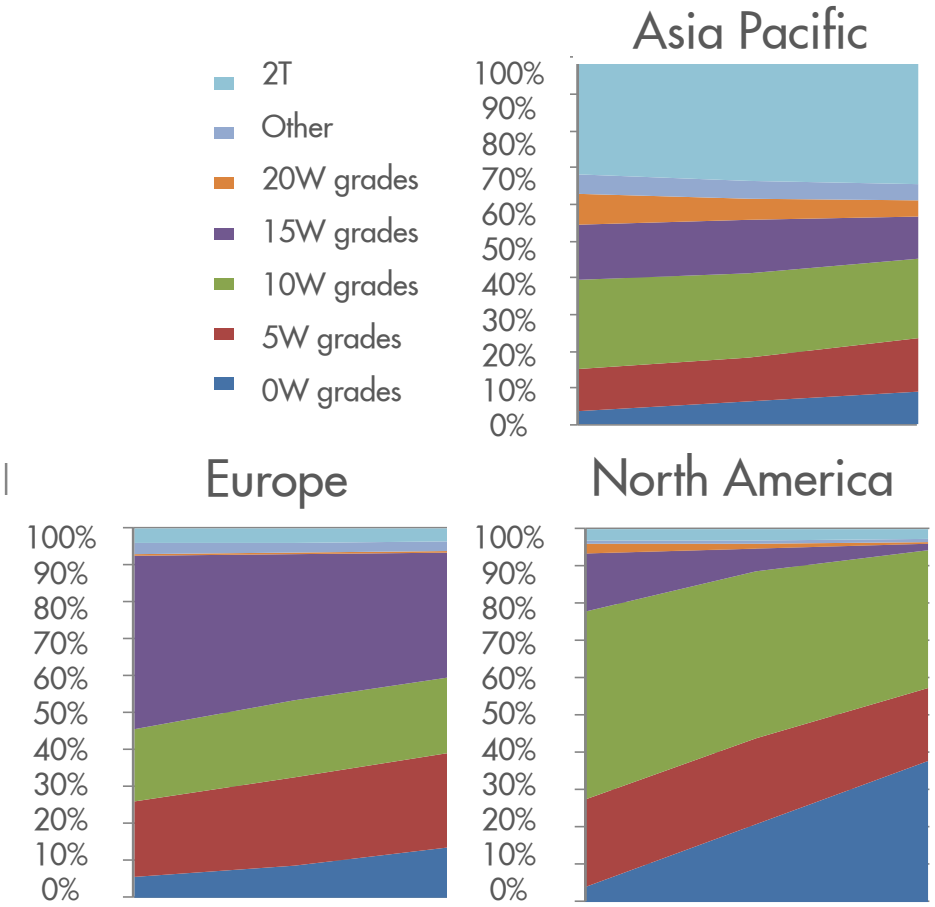
- **Better resistance to oxidation at high temperatures**
- **Better control of deposits eg in turbochargers**
- **Better volatility and hence viscosity stability.**



FUTURE AUTOMOTIVE LUBRICANTS - OPPORTUNITY TO MAKE A STEP-CHANGE IN USE OF FUEL-EFFICIENT LUBRICANTS

- CO_2 and regulated emissions reduction can drive increased use of fuel economy (eg 0W) engine oils providing benefit to OEMs and Customers alike.
- Modern engine designs pose lubricant challenges for the formulator that drive use of high performance synthetic lubricants and a collaborative design approach.
- Opportunity exists in all regions to increase penetration of fuel economy engine oils and hence make a further contribution to reducing fleet fuel consumption.

PCMO GRADE EVOLUTION 2015-25



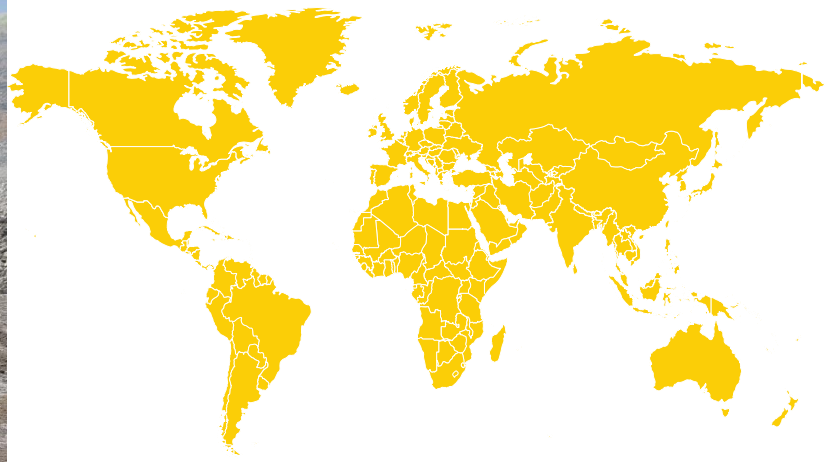
Data courtesy of Kline

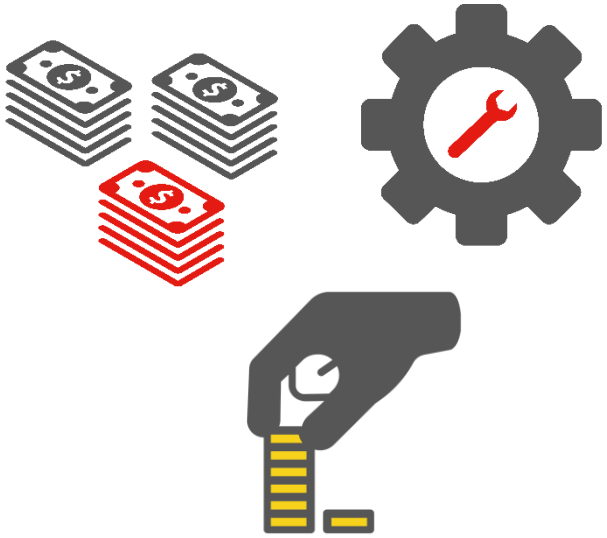
TECHNICAL CHALLENGES SHAPE THE FUTURE OF INDUSTRIAL LUBRICANTS

HARDWARE IS CHANGING TO MEET THE ENERGY CHALLENGE

MORE GLOBAL COMPLEXITY

A FOCUS ON TOTAL COST OF OWNERSHIP





... CHANGING DEMAND FOR LUBRICANTS ALSO DRIVES AN INTEGRATED SERVICE OFFER

INDUSTRY LUBRICANT TRENDS AND CHALLENGES – SIMILAR THEMES ACROSS DIVERSE SECTORS

INCREASING AND DIVERSE EQUIPMENT DEMANDS

- Energy efficiency, extended maintenance intervals, increased thermal stress, reduced sump sizes, higher operating loads and speeds

DELIVERING THE RIGHT LUBRICANT SOLUTION CAN REDUCE COST AND PRODUCT USAGE

- Use of higher performance synthetic lubricants can significantly reduce total cost of ownership. Further benefits are available when lubricant choice is combined with smart service strategy.

- Evidence shows leading companies can cut their lubrication costs. For example a Shell customer achieved a 55% reduction with benefits in equipment up-time.

FUTURE INDUSTRIAL LUBRICANTS TRENDS

- Reducing total cost of ownership through collaboration and co-engineering to provide tailored solutions.
- Greater energy efficiency, extended maintenance intervals, more emphasis on lubricant application and technical services
- Diversification of applications;
  Emerging technology challenges – e.g. off- and on-shore wind turbines, stationary gas engines, large-scale gas turbines
- A diverse portfolio of lubricants for multiple applications will be needed for many years to come.

DIVERSIFYING APPLICATION REQUIREMENTS COMBINE WITH INCREASED INTEREST IN USE OF BIO-DERIVED LUBRICANTS AND WASTE OIL RECYCLING

THE FUTURE OF LUBRICANTS IN AUTOMOTIVE AND INDUSTRY

In a world of rapid technological change, an evolving manufacturing landscape, increasing digital connectivity, rising customer expectations and a revolution in automotive powertrain electrification…

… use of high performance synthetic lubricants designed collaboratively between lubricant suppliers, OEMs and end users is key. Together we can maximize efficiency opportunities and reduce the carbon footprint in automotive and industry sectors.

Q&A