Oil industry role in a low carbon future world

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Oil will continue to play a major role in mobility, but there is no “business as usual”.

A “Business as Usual” mobility future ...

- Return to Long-term trend GDP Growth
  - ✔
- Trend efficiency improvements
  - ✔
- Global mass substitution of liquids
  - ✗

.. leads to infeasible liquids demand growth
Both Shell scenarios imply a transformation in light duty transport by 2030, to balance liquids supply. Heavy duty transport remains liquids dependent.

Mountains:
“Centralized authority, Mass electrification”

Oceans:
“Customer power, radical efficiency”

Mountains: 
“Business as Usual” 2030 Oceans

- Rail Passengers
- Ferries
- Rail Freight
- Freight planes
- Passenger planes
Regulation drives vehicle + fuel + infrastructure solutions to compete on Cost and Carbon. Consumer preferences remain unclear.

TOTAL COST OF OWNERSHIP
Lifetime (12 year) Vehicle TCO Cost $2030 (Taxes Excluded)

WELL TO WHEEL
WTW gCO₂/km 2030

Shell International Petroleum Company
Each combination has significant uncertainties that complicate the investment case.

- **Can Renewable H2 reduce its cost? Can it help balance the future Energy System?**
- **How realistic is the mass market value proposition for the BEV?**
- **Is low-CO2 fossil H2 acceptable?**

**Will advanced bio deliver on cost & sustainability targets and be material for passenger cars?**

**Will hybridisation maintain the competitiveness of Combustion?**

**TOTAL COST OF OWNERSHIP**

(Taxes Excluded)

**WELL TO WHEEL**

WTW gCO₂/km 2030

- **H2 RENEWABLE ELECTROLYSIS**
- **H2 GRID ELECTROLYSIS**
- **2G BIOFUELS**
- **2G BIOFUELS + CCS**
- **BEV RENEWABLE**
- **H2 SMR + CCS**
- **H2 SMR**
- **BEV GRID**
- **DIESEL**
- **GASOLINE**
- **BEV 100% COAL**
- **ELECTROLYSIS**
- **COAL**

**Lifetime (12 year) Vehicle TCO Cost $2030**

**Each combination has significant uncertainties that complicate the investment case.**
The Mobility transition is broader than alternative fuels and drive trains

**DRIVING BELIEFS**

- Higher Energy Demand
- More Urbanisation
- Oil is Constrained
- New Technology Options
- Lower CO2 & Emissions
- Diversity of Energy Supplies

Changing Customer Values & Social Acceptance

**Mobility Transition**

**Existing Vehicles & Fuels**
- Better ICE, efficiency improvements, reduced emissions
- New Fuels - Hi Octane
- New Engines - Dual Fuels

**Alternative Fuels & Drivetrains**
- Biofuels
- Hydrogen Mobility
- Electric Mobility
- LNG, GTL …

**Data Connectivity & New Business Models**
- Digital touch points with customers
- Fleets, Ride Share, Co-parcelling
- Driverless Cars
- Mobility as a Service

*Shell’s focus*