BP Energy Outlook
2017 edition

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7th IEA-IEF-OPEC Symposium on Energy Outlooks

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Contents

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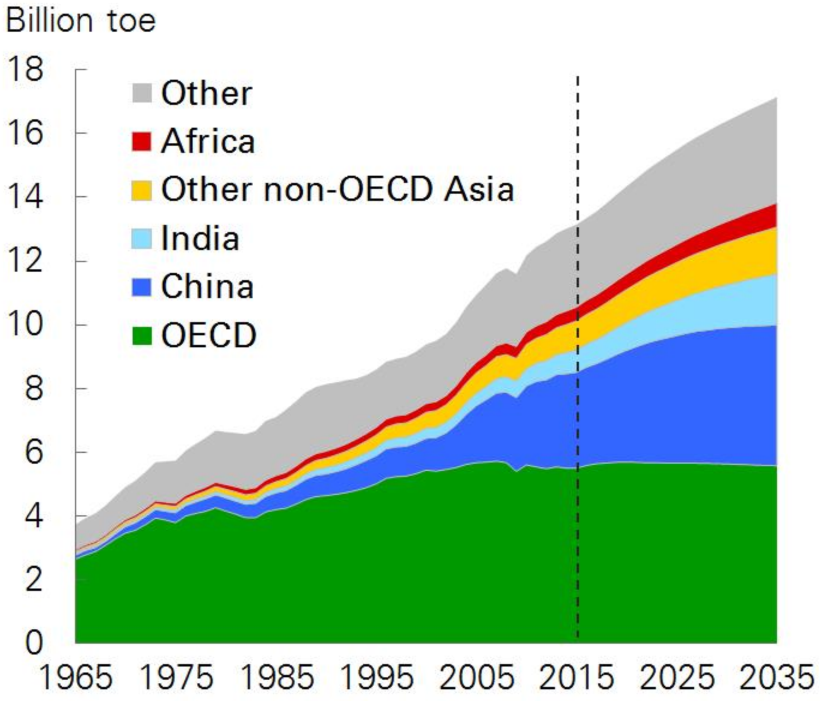
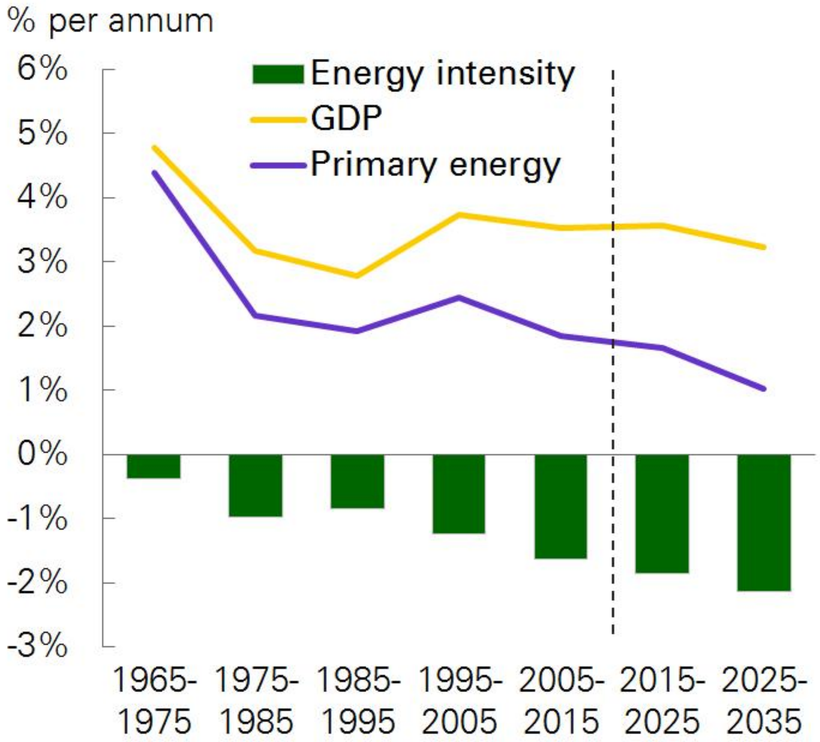
Reference case

Global energy demand

Energy consumption by region

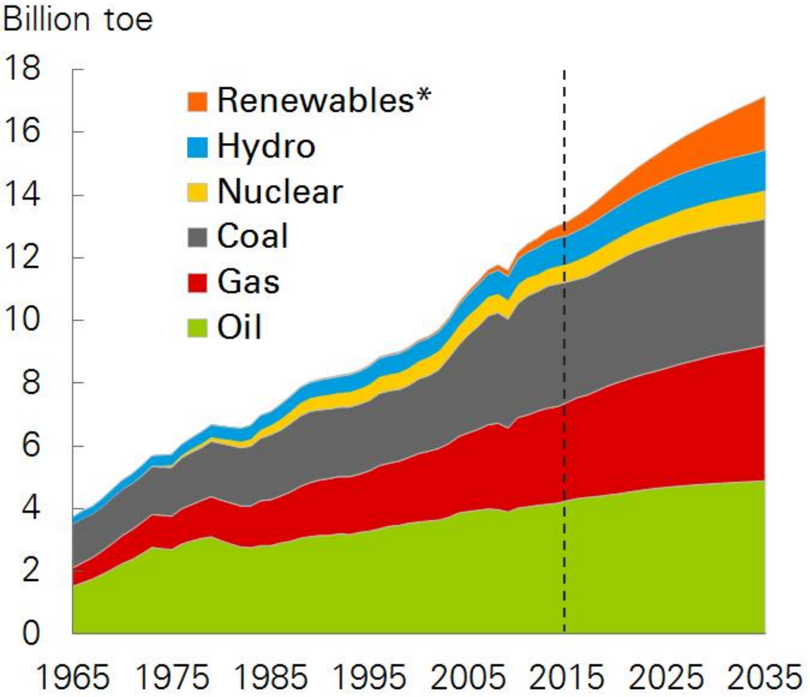


Growth in GDP and primary energy

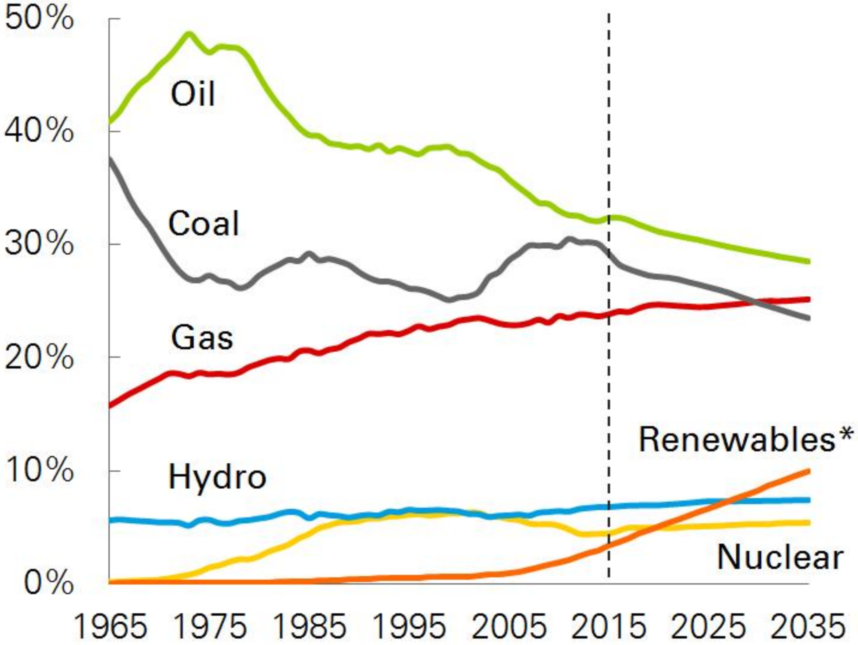


Fuel mix

Primary energy consumption by fuel

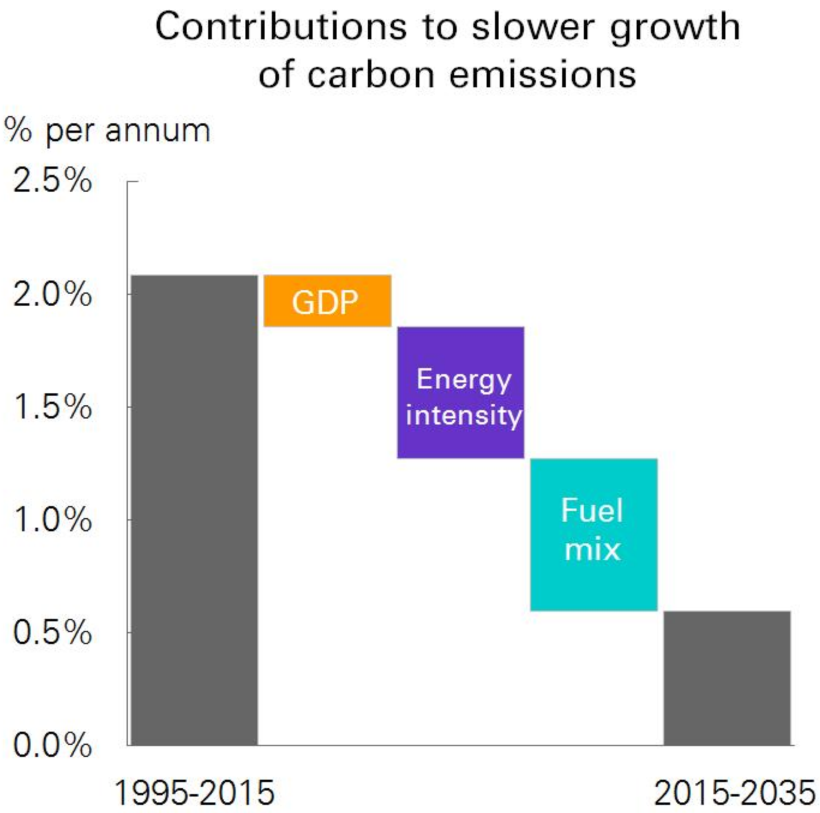


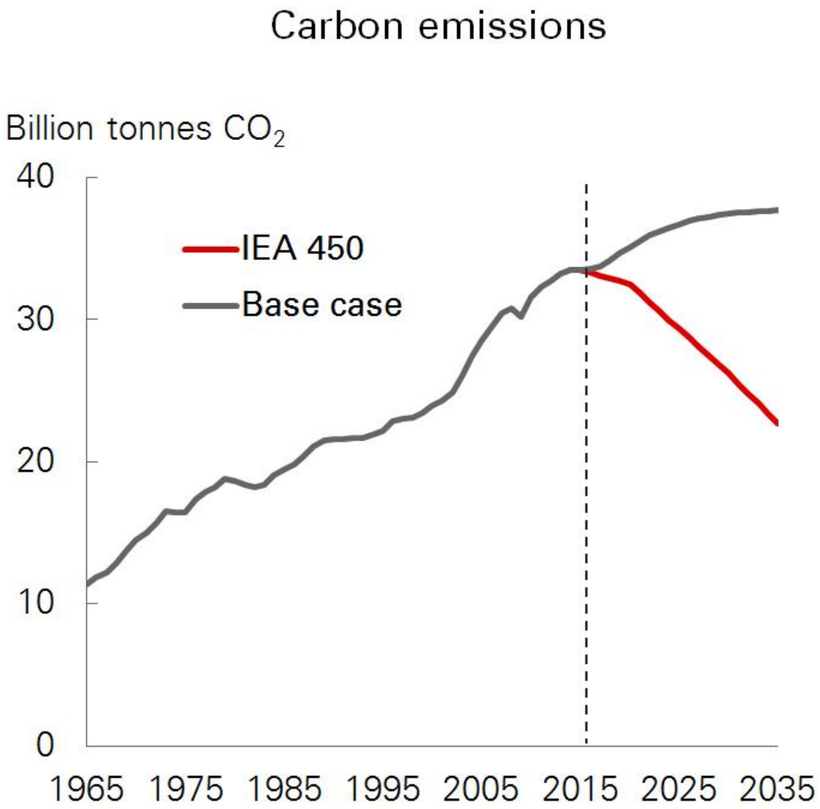
Shares of primary energy



*Renewables includes wind, solar, geothermal, biomass, and biofuels

Carbon emissions

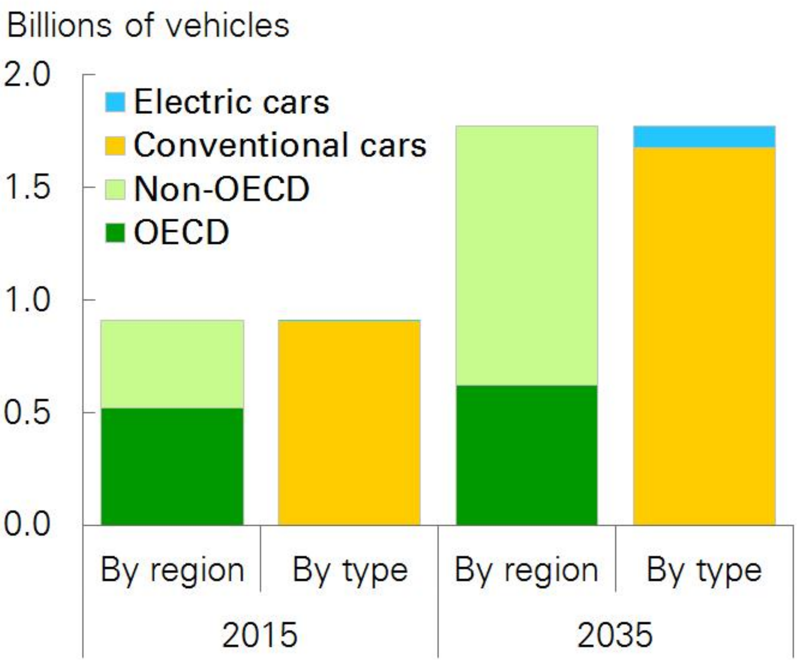




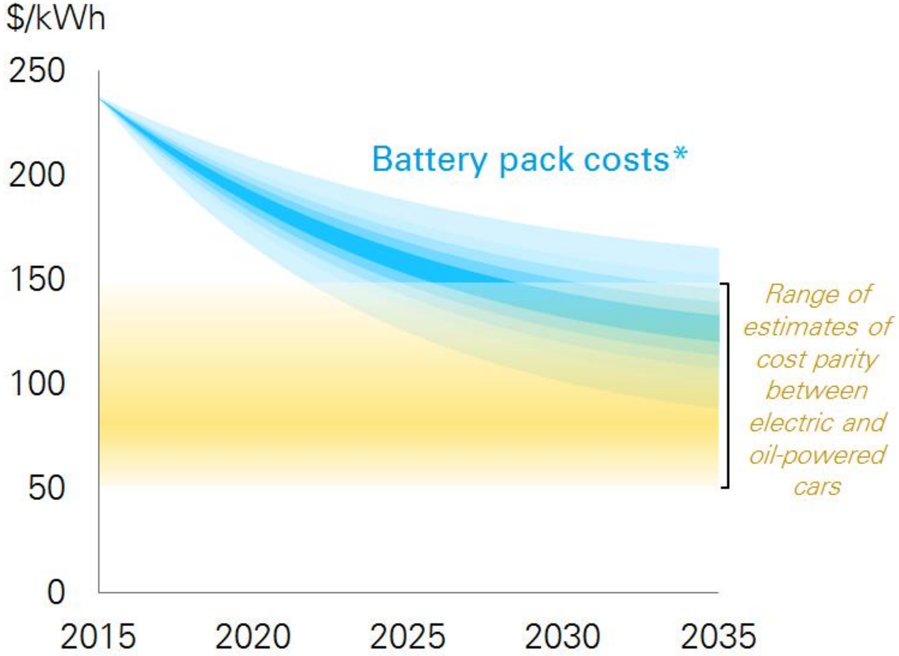
Key issues

Growth of electric cars

The global car fleet: 2015-2035



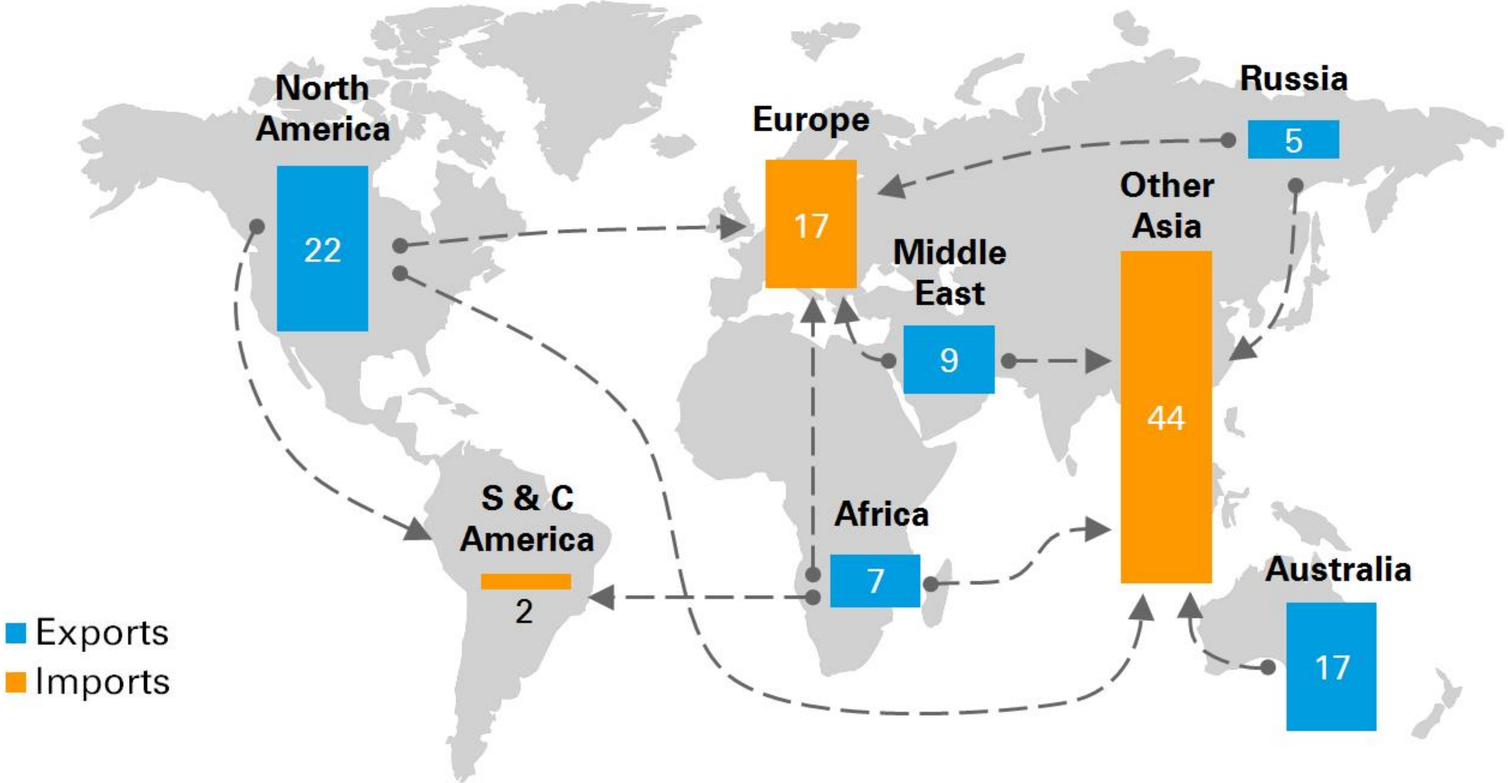
Illustrative path for battery pack costs



*For a Battery Electric Vehicle with a 60 kWh pack. Cost projections depend heavily on the degree of EV uptake, which is uncertain, so ranges should be treated as illustrative only. Current estimates of battery costs also vary widely, but this uncertainty is not shown

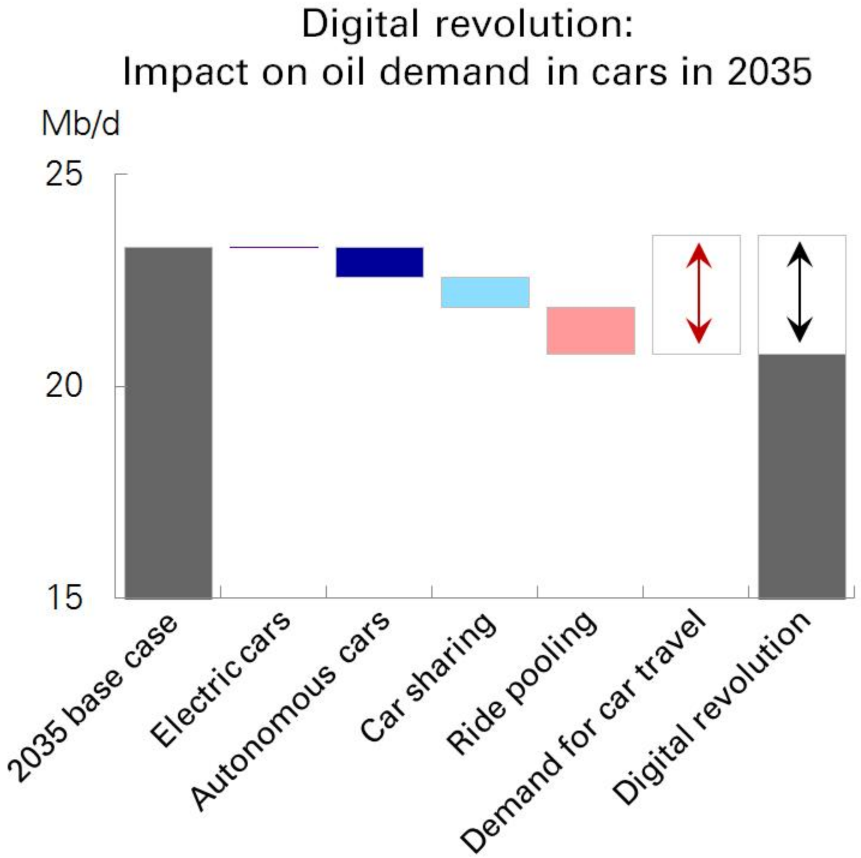
Impact of LNG Trade

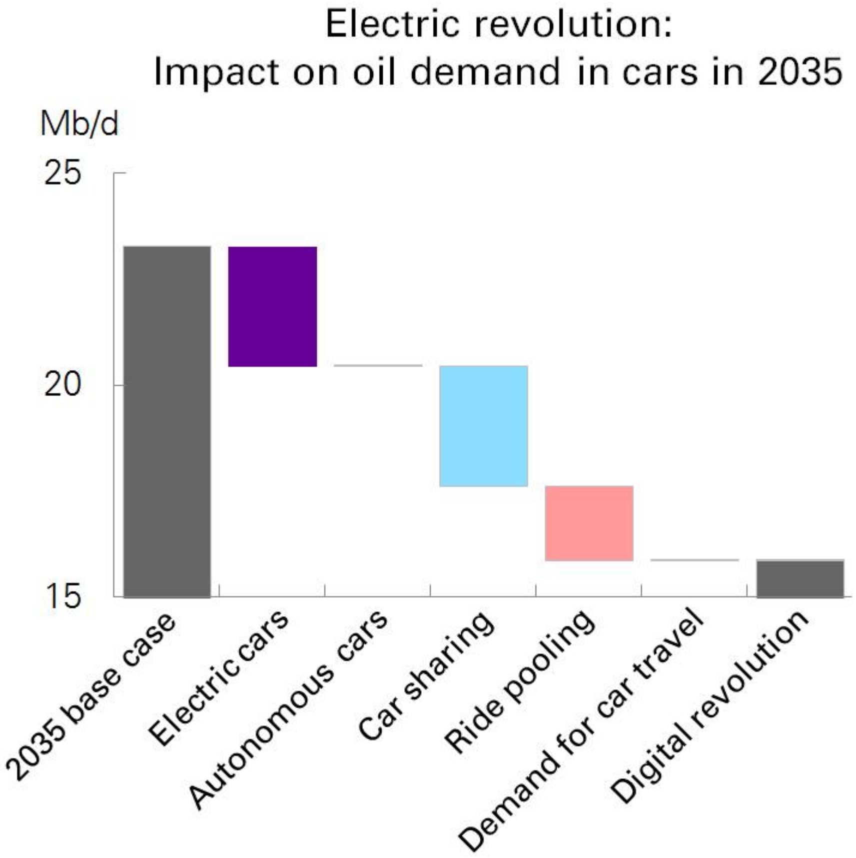
Net LNG exports and imports in 2035 (Bcf/d)



Key uncertainties

Mobility revolution scenarios





Comparison with other low carbon scenarios...

	Faster transition	Even faster transition	IEA 450	MIT 2° Base	IHS Markit 'Solar Efficiency'	Greenpeace 'Revolution'
CAGR (%)* 2015-2035						
Carbon emissions	-0.7%	-2.0%	-2.0%	-2.0%	-2.8%	-3.2%
Total energy	0.9%	0.8%	0.4%	0.5%	-0.7%	-0.1%
Energy intensity	-2.4%	-2.5%	-3.0%	-2.9%	-4.0%	-3.5%
Carbon intensity	-1.5%	-2.7%	-2.3%	-2.5%	-2.1%	-3.5%
Share of total energy, 2035						
Oil & gas	51%	48%	48%	46%	51%	39%
Renewables†	16%	23%	17%	29%	19%	38%
Share of abatement vs. 2015						
Power sector	>100%	89%	77%	74%	58%	35%

* Compound annual growth rate † includes biofuels

See page 101 for a technical note on comparison methodology and page 102 for details of sources

Digital revolution mobility scenario: assumptions

Assumptions are illustrative only and can be scaled up or down to consider alternative calibrations.

Assumptions in 2035:	Impact on oil demand (Mb/d)
Electric vehicles (EVs): No additional EVs relative to the base case.	0
Autonomous vehicles (AVs): 200 million AVs. Each AV is 25% more fuel efficient than a conventional car.	-0.7
Car sharing: Occurs via AVs. On average each AV is driven twice as many miles per year as a conventional car - doubling the disruptive impact of AVs.	-0.7
Ride pooling: 40% of urban car journeys are pooled and 25% of all car miles are urban, so 10% of all miles are affected by pooling. Each pooled ride has twice as many occupants per vehicle, which reduces total mileage by 5%. Pooling occurs via all car types (EVs and ICEs) so the effects are distributed proportionately.	-1.1
Demand for car travel: The range reflects uncertainty about the magnitude of the cost reduction, the sensitivity of demand to any fall in costs, and any additional impact of new technology on demand. The upper bound assumes the cost of digital car travel falls by up to 33% and a price elasticity of demand for travel of up to -1. This boosts miles travelled by digital cars by up to 33%, which translates to an increase in total miles travelled of up to 7.5%. In addition, digital technologies create new sources of demand from new user groups (the old, young, and empty cars driven autonomously), which boost miles travelled by up to a further 7.5%.	0 to +2.8

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