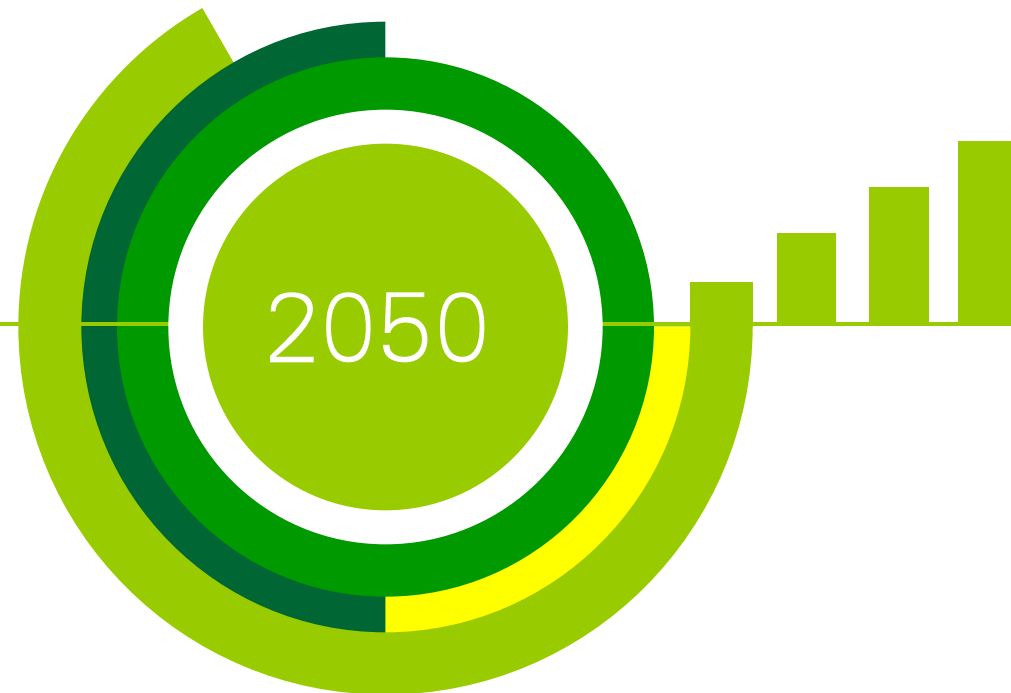




# 5 Windows on Road Transportation

**Robert Spicer**

iTEM4 - 30<sup>th</sup> October 2018

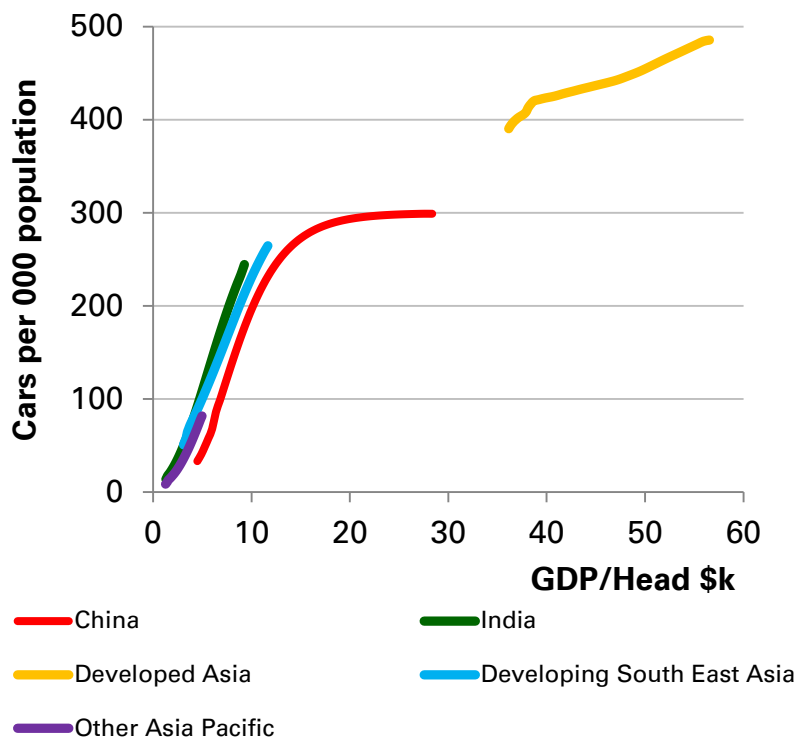




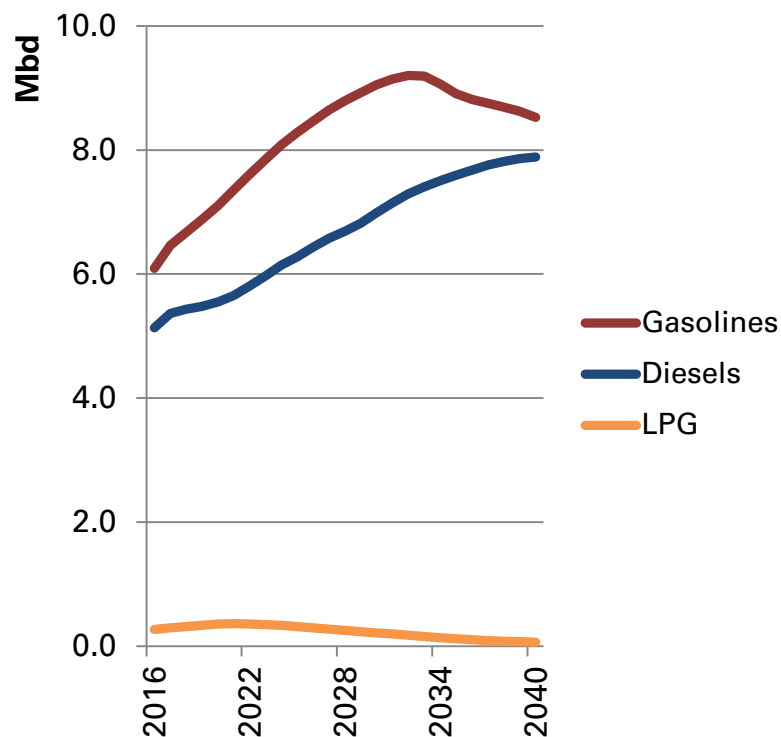
# Evolving Transition provides a central case foundation, e.g. for Asia



**Passenger Cars / Head**



**Road Fuels - Asia Pacific - Liquids**



- Growing prosperity will lead to an increasing car population, China is likely to saturate by the 2030s. For Developing Asia, there is little prospect of saturation in the next 2 decades.
- Industrialisation & increasing consumption will lead to growth in Commercial Transport.
- As a result we anticipate a growing gasoline & diesel requirement. In time gasoline growth is likely to stall as a result of fleet turnover, greater efficiency, and penetration of electric vehicles.

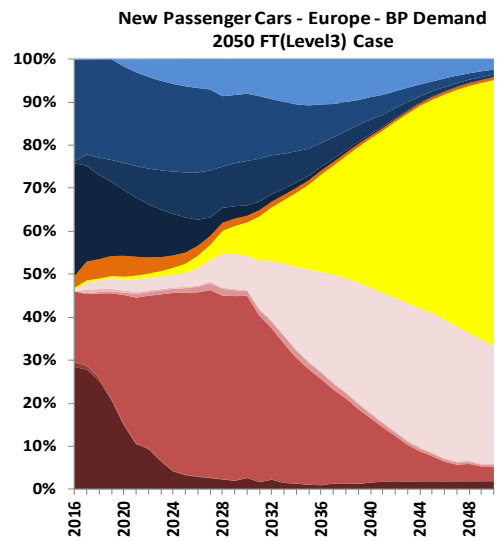
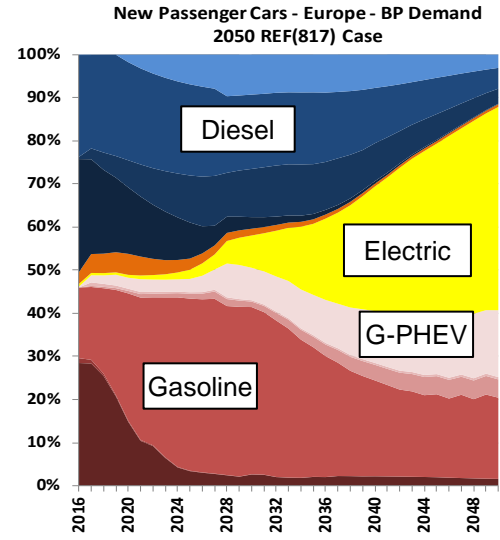


# Faster Transition offers the opportunity to look at CO2 scenarios, and to consider the challenges on pace of transition

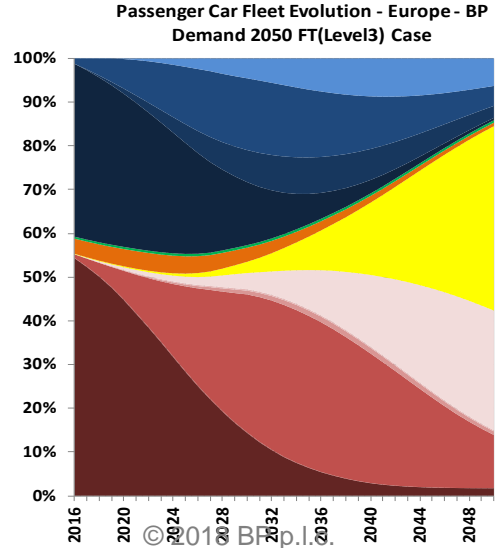
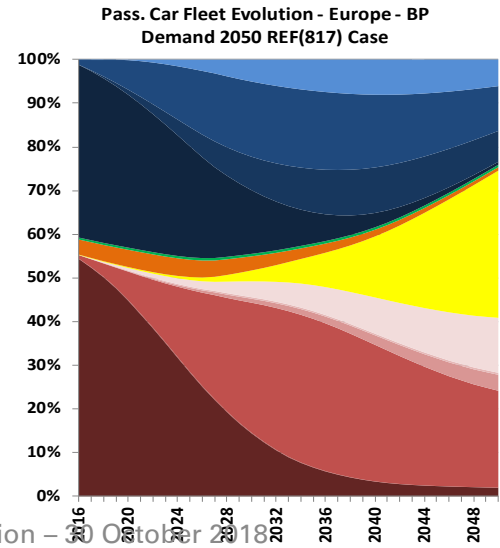
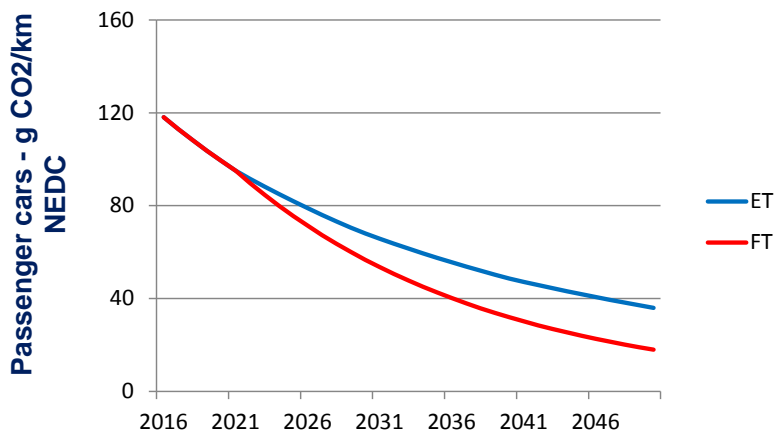


## Case Elements

	2021	2025... 30 ?	2030 ... 40 ?	...?	...?
New Car CO2 Emissions	95g CO2 per km	70g	50g	30g	0g
New Car Fleet Mix					
Biofuels Penetration					
Reduced Mileage					

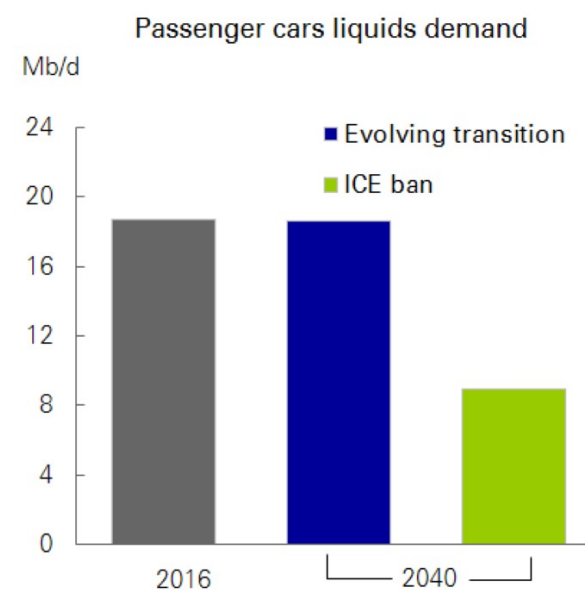
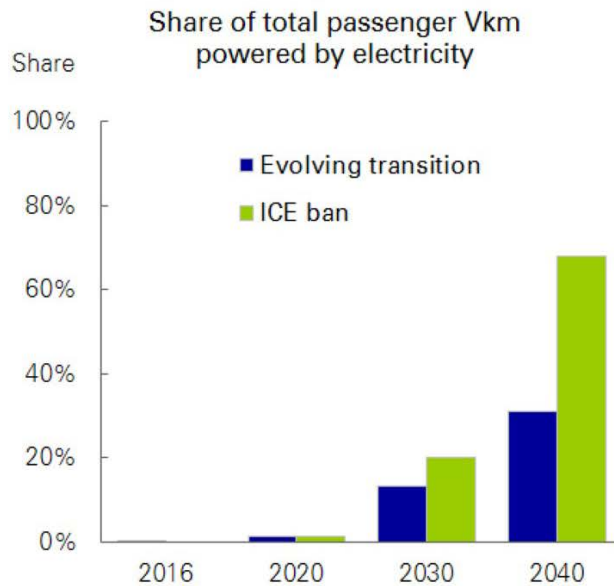
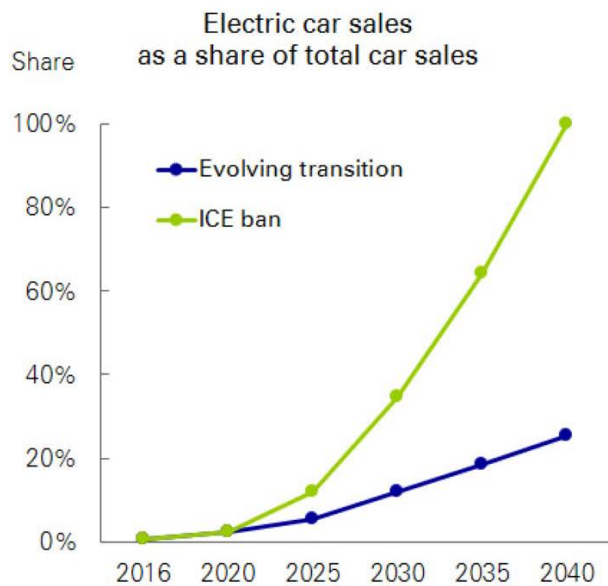


## Europe





# “ICE Ban” is a focused case designed to make a point about liquids demand



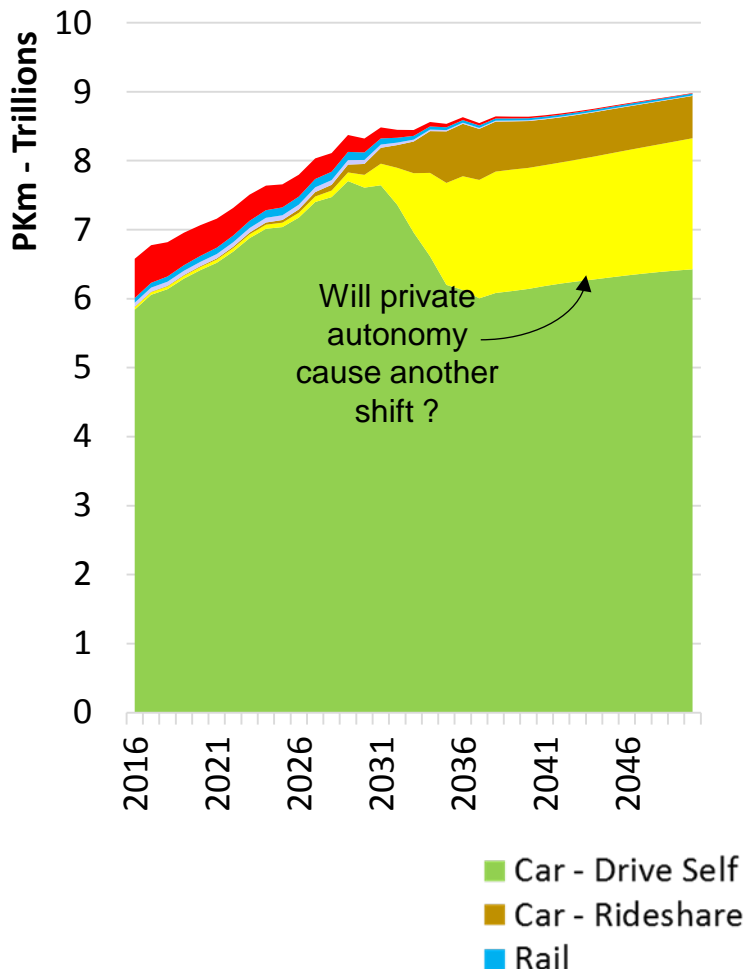
- NB ICE ban as a case is not designed to represent an achievable scenario
- It is designed to make the point that we do not believe that oil demand will disappear even if all new cars sales were battery electric (BEV) in 2040
- Cut off points are important, as oil demand from passenger cars in this case would continue to fall rapidly beyond 2040



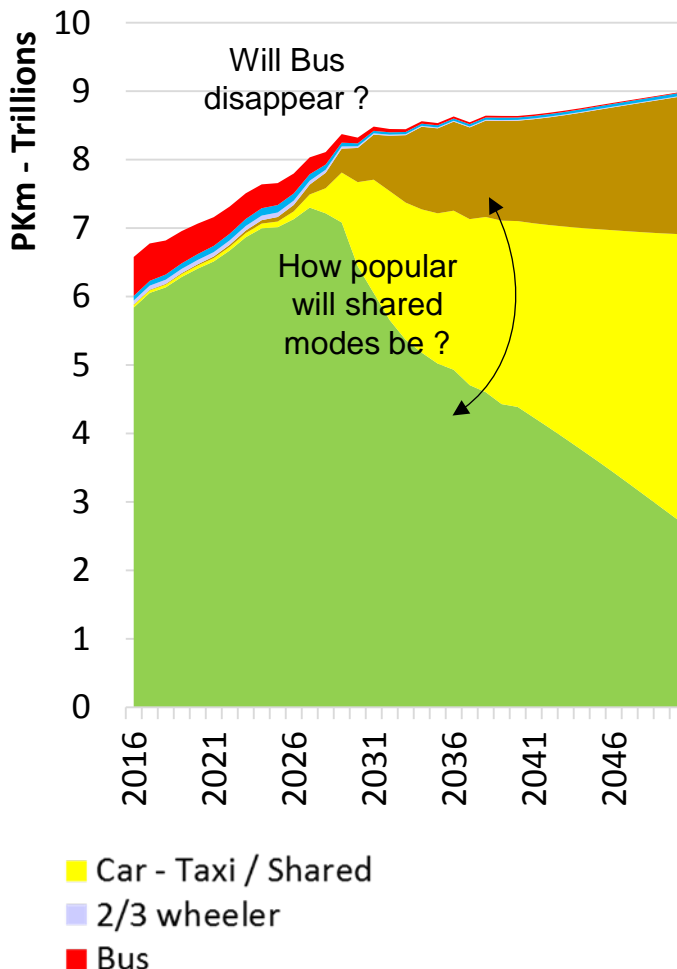
# Our Mobility Model has allowed us to think beyond CO2 targets, and to consider mobility transitions that will be shaped by consumer choices, e.g. for USA...



Reference



Accelerated



This “accelerated” scenario is designed to emphasise autonomous driving & shared LDV modes.

The outcomes suggest a more revolutionary journey rather than the evolutionary one in the reference case and in some geographies quite dramatic shifts are observed.

The scenario clearly tests the limit for Private ownership of LDVs and depends on significant changes in consumer behaviour.

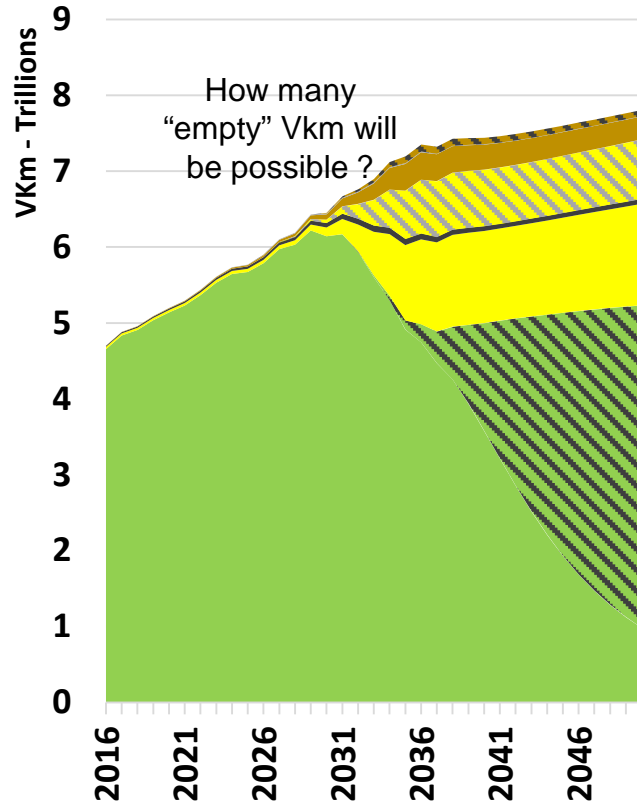
Shared LDV modes grow significantly to not only minimise private car use but also reduce transit modes



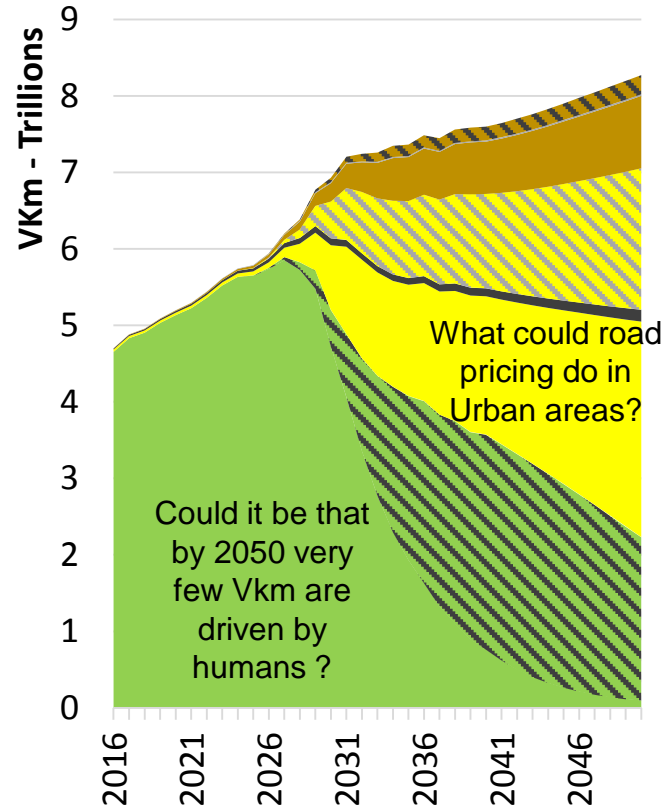
# Accelerated Mobility cases allow us to explore further concepts...



Reference



Accelerated



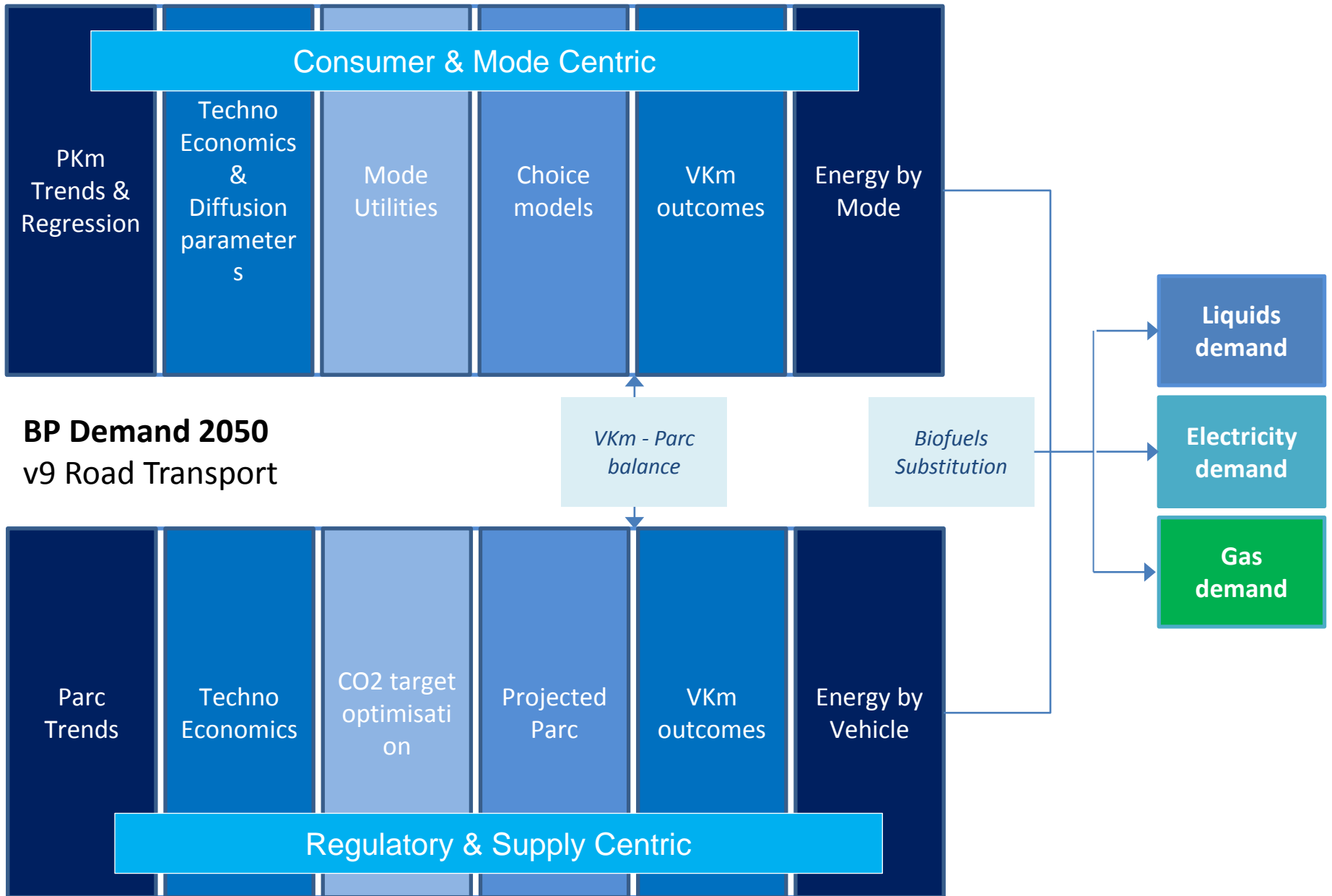
- Own Car Vkm - Human Driver
- Shared / Taxi Car Vkm - Full
- Shared / Taxi Car Vkm - Empty (Autonomy)
- Rideshare Car Vkm - Human Driver Only
- Own Car Vkm - Autonomous, passengers
- Shared / Taxi Car Vkm - Human Driver Only
- Rideshare Car Vkm - Full
- Rideshare Car Vkm - Empty (Autonomy)

The outcomes for LDV vehicle kilometres largely mirror the PKm by mode outcomes.

One striking further effect will be with growth of so called "empty" kms from shared vehicles, potentiated by autonomous driving.

Public policy concerns may seek to limit such empty running but are unlikely to eliminate it owing to the need to economically optimise shared fleet sizings.

The flipside is that sharing also reduces overall vkm owing to higher load factors and so outcome in terms of empty running may be acceptable in an overall sense.





## Takeaways



- We continue to evolve our modelling approaches & objectives
- We are likely to create more scenarios, and test ideas to in turn test case boundaries
- We have integrated our approach to future mobility with our “traditional” Road Transportation model
- Two brains are better than one !