# Methodology

## Transport Sector research

October 2021

# Transport Sector

## Methodology and approach

Four use cases for transport-related technology were analysed that covers connected fleets (Heavy goods vehicles (HGV) and maritime), electric vehicles (EVs), and working from home – an indirect but nevertheless material carbon saving from the reduction in commuting journeys.

There was a three step process:

1. Forecasts were used from Exponential Roadmap[1] to determine the aggregate amount of $CO_2$ savings a given industry will need to make over the next 10 years to ensure it remains on track for net zero by 2050. For all sectors, this reduction is equivalent to 50% of 2020 $CO_2$ emissions

2. In each of the fleet management categories – HGVs and commercial shipping – assumptions were made on the level of telematics penetration and resulting fuel savings before extrapolating to a regional level. For EVs, a figure was estimated for current EV charging points, forecasted forward, and then fuel savings and associated $CO_2$ reductions were calculated based on the reduction in journeys using petrol and diesel cars. Working from home (WFH) uses estimates for the average WFH days per year per eligible worker, alongside GSMA forecasts for mobile and fixed line internet access in households as a pre-requisite for productive remote working

3. The use case savings over a 10 year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share

Research by – GSMA Intelligence and Carbon Trust

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[1] J. Falk, O. Gaffney, et al. Exponential Roadmap. 1.5.1 (2020) www.exponentialroadmap.org

# Key assumptions

| Vertical | Use case | Indicator | Trajectory | Supporting data/sources |
|---|---|---|---|---|
| Transport | EV's | EV charging points | Assume that EV charge points represent 1% of smart city IoT connections in 2021, rising to 10% by 2030 | GSMA Intelligence, Machina |
| Transport | EV's | Electricity consumption | A total of approx. 3700 kWh is used per charge point per year | Various |
| Transport | EV's | Electricity emission factors (EEFs) | 2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS) | IEA; UK BEIS; carbonfootprint.com |
| Transport | Smart routing and fleet management (HGVs) | HGVs in operation | Of the approx. 360 million commercial vehicles in use, we assume that 60 million (17%) are HGVs. Of these, we assume 50% are fitted with IoT telematics sensors, equating to 30 million connected HGVs | GSMA Intelligence, Statista |
| Transport | Smart routing and fleet management (HGVs) | Fuel savings | Assume an average 5% fuel savings for connected HGVs based on range of studies reporting figures 5-20% | Various |
| Transport | Smart routing and fleet management (maritime) | Shipping emissions | An average of 17,700 kg $CO_2$ per ship per year is derived from estimates for total ships in operation and associated aggregate fuel consumption using data from the IMO | International Maritime Organisation |
| Transport | Smart routing and fleet management (maritime) | Fuel savings | Assume an average 2% fuel savings for commercial ships fitted with IoT telematics sensors | Carbon Trust |

# Key assumptions

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|---|---|---|---|---|
| Transport | Working from home (WFH) | Workforce enabled to work from home (WFH) | Annual FTE days WFH estimated based on propensity for certain occupations to WFH, with a downward adjustment to be conservative | McKinsey |
| Transport | Working from home (WFH) | Employed population | Assume 70% of the working age population in each region is employed | World Bank |
| Transport | Working from home (WFH) | Internet connectivity | LTE and forecast 5G mobile subscribers taken as proxy for having internet access of a sufficient quality to permit WFH | GSMA Intelligence |

Source: GSMA Intelligence & Carbon Trust