Transportation in a Net Zero by 2050 Scenario

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Acceleration of national net-zero emissions pledges

As of April 2021, 44 countries and the European Union have pledges to meet a net-zero emissions target: in total accounting for around 70% of global CO₂ emissions.
Establish milestones to get on track for long-term targets

- **Buildings**
  - No new sales of fossil fuel boilers
  - Most innovative low-emissions technologies in heavy industry demonstrated at scale

- **Transport**
  - Electric cars are 60% of sales
  - Electric heavy trucks are 50% of sales

- **Industry**
  - No new ICE car sales
  - Net zero electricity sector globally
  - Net zero electricity in advanced economies

- **Electricity**
  - Most appliances and cooling systems are best in class
  - Half of existing buildings retrofitted to zero-carbon ready levels

- **Other**
  - All appliance and cooling systems are best in class
  - All industrial electric motors sales are best in class

**Key Milestones**

- By 2025:
  - Phase-out of unabated coal in advanced economies
  - 1020 GW annual solar and wind additions
  - More than 90% of heavy industry production is low emissions
  - More than 85% of buildings are zero-carbon ready

- By 2030:
  - 435 Mt low-carbon hydrogen; 3,000 GW electrolysers
  - 150 Mt low-carbon hydrogen; 850 GW electrolysers
  - Almost 90% of existing capacity in heavy industries reaches end of their investment cycle
  - Half of existing buildings retrofitted to zero-carbon ready levels

- By 2040:
  - Net zero electricity from solar PV and wind
  - More than 90% of heavy industry production is low emissions
  - Net zero electricity sector globally
  - Phase-out of all unabated coal and oil power plants

- By 2050:
  - All new buildings are zero-carbon ready
  - Almost 90% of existing capacity in heavy industries reaches end of their investment cycle
  - Half of heating demand met by heat pumps
  - Almost 70% of electricity generation globally from solar PV and wind
  - More than 85% of buildings are zero-carbon ready
Addressing CO₂ emissions from transport

Global CO₂ transport emissions by mode and share of emissions reductions to 2050 by technology maturity in the NZE

Passenger cars can make use of low-emissions technologies in the market, but major advances are needed for heavy trucks, shipping and aviation to reduce their emissions.
Almost all vehicle sales must be electrified by 2050

Global share of battery electric, plug-in hybrid and fuel cell electric vehicles in total sales by vehicle type in the NZE

Sales of battery electric, plug-in hybrid and fuel cell electric vehicles soar globally across all modes of road transport.
Driving distance is a key factor in truck powertrain choice

Based on total cost of ownership, fuel cell trucks become competitive at 400-500 km/day ranges by 2050.
All-electric approach to decarbonising road transport

In the All-Electric Case, annual battery capacity additions in 2030 would be almost 9 TWh, requiring an additional 80 giga-factories compared to the NZE.
Fossil fuels represent 10% of transport energy in 2050

Electricity and hydrogen-based fuels account for more than 70% of transport energy demand by 2050