

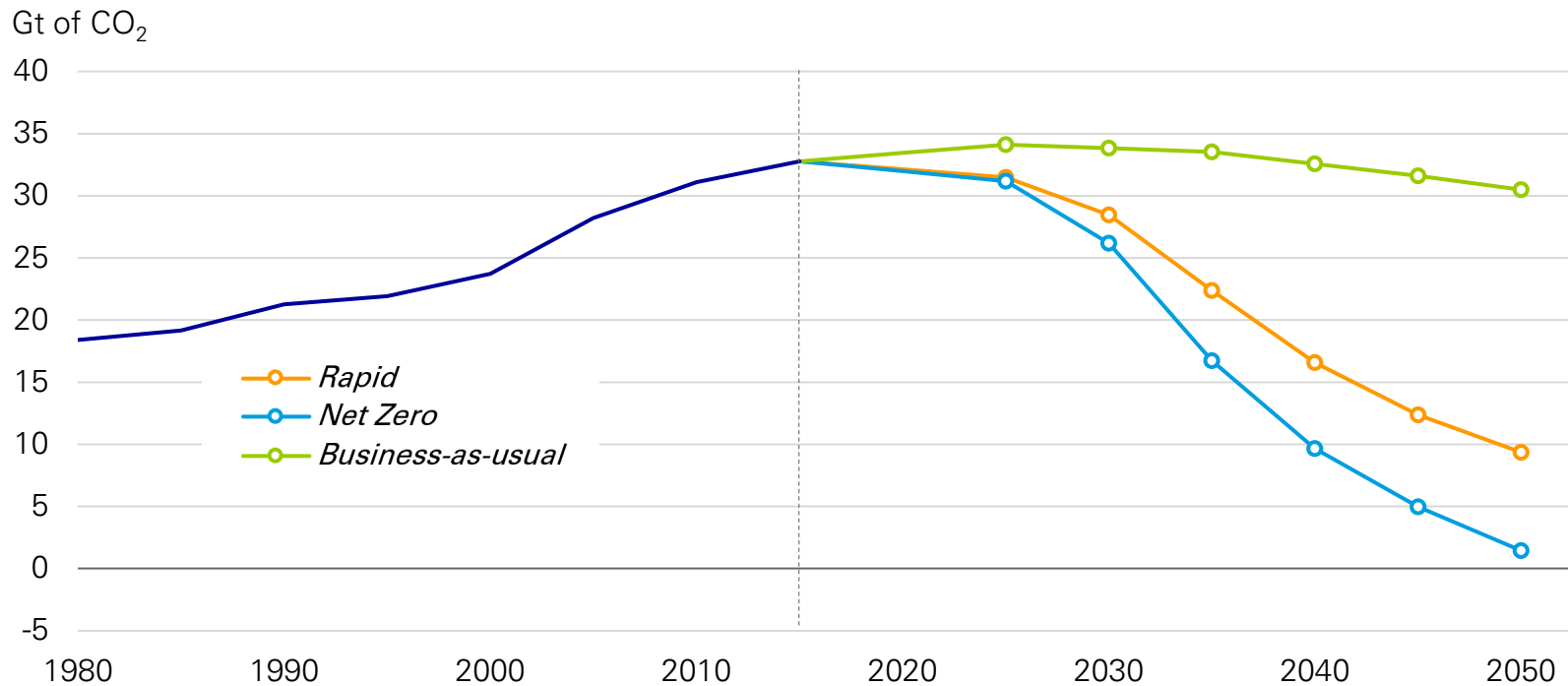
## Energy Outlook 2020 edition

**ITF Workshop - 23/24 February 2020**  
Scenarios & Policy Strategies for  
transport decarbonisation in India

**Robert Spicer**  
Head of Transport & Future Mobility  
Economic & Energy Insights, BP plc

# Three scenarios to explore the energy transition

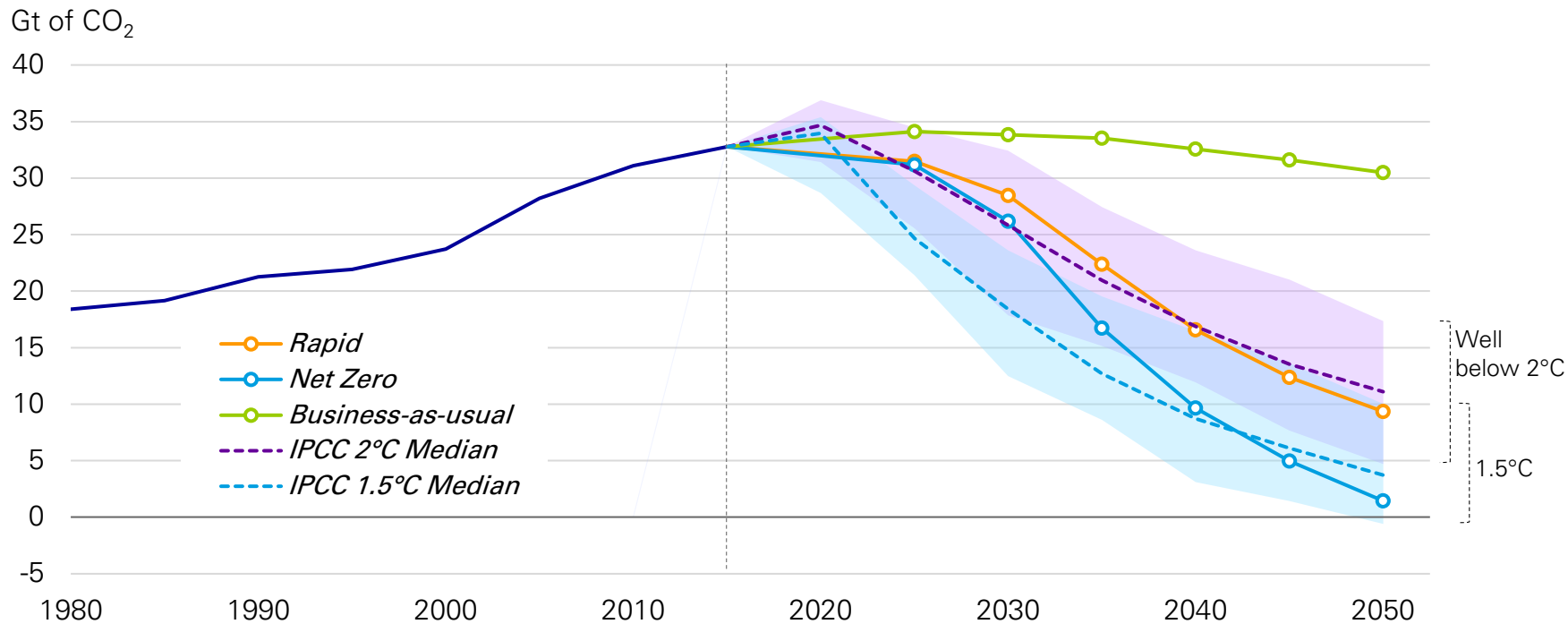
## CO<sub>2</sub> emissions from energy use





# Three scenarios to explore the energy transition

## CO<sub>2</sub> emissions from energy use

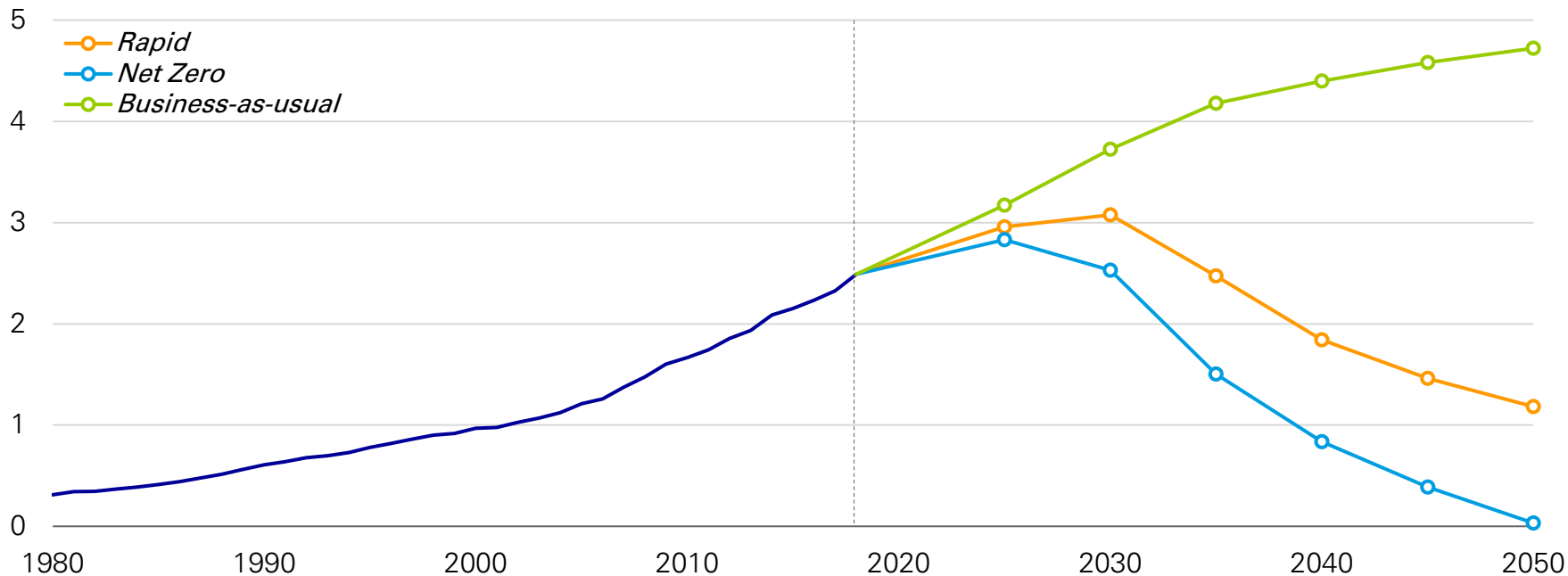


# Three scenarios to explore the energy transition (India)



## CO<sub>2</sub> emissions from energy use

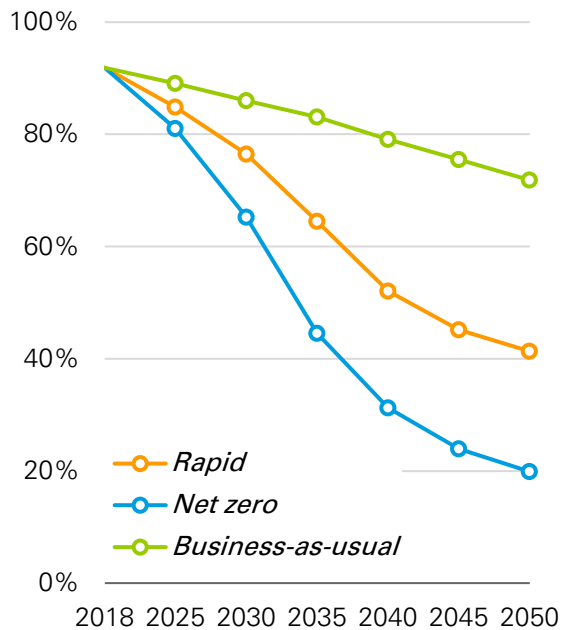
Gt of CO<sub>2</sub>



# Changing structure of Indian energy demand

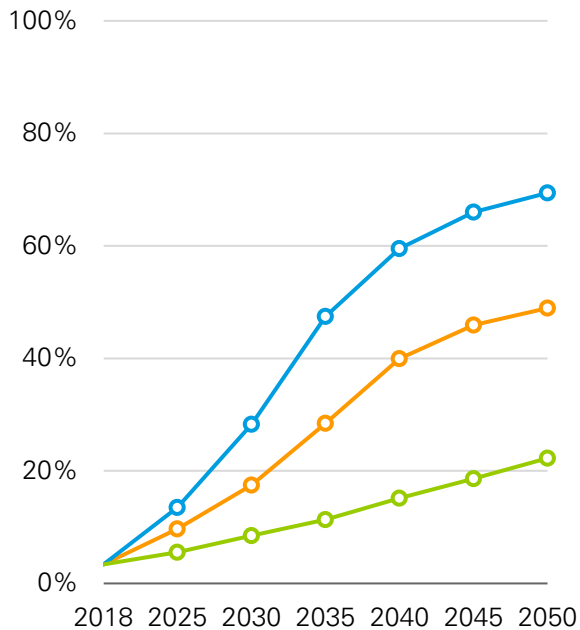
## Fossil fuels

Shares of primary energy



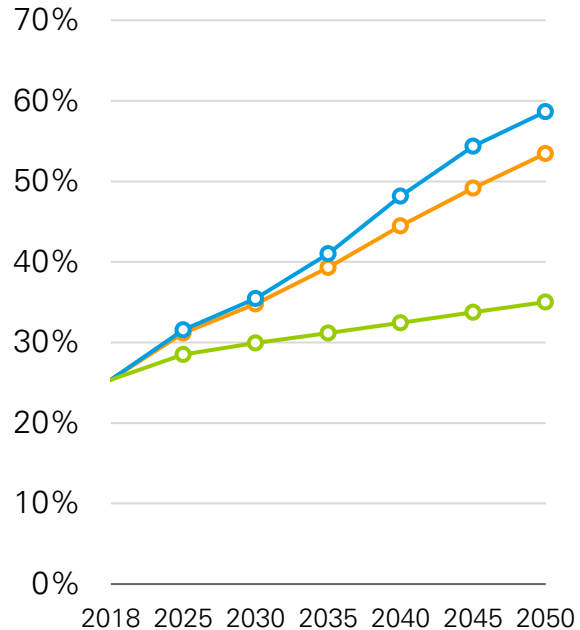
## Renewables

Shares of primary energy



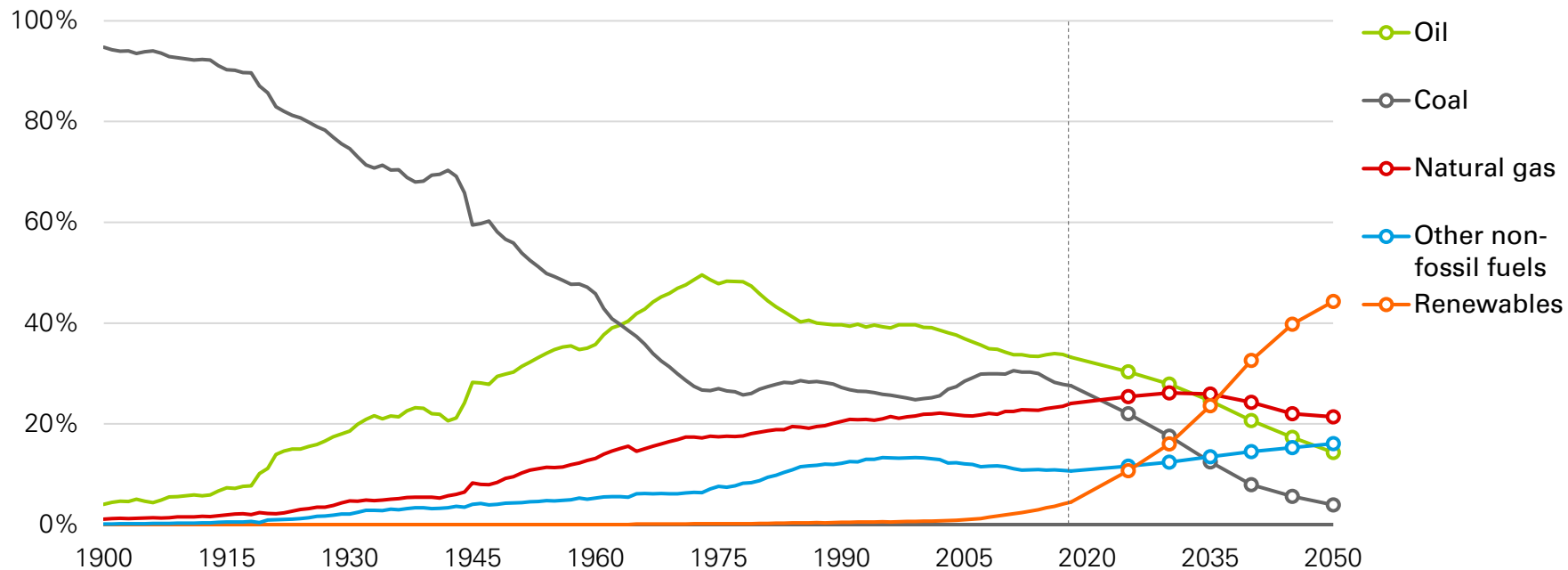
## Electricity

Share of total final consumption



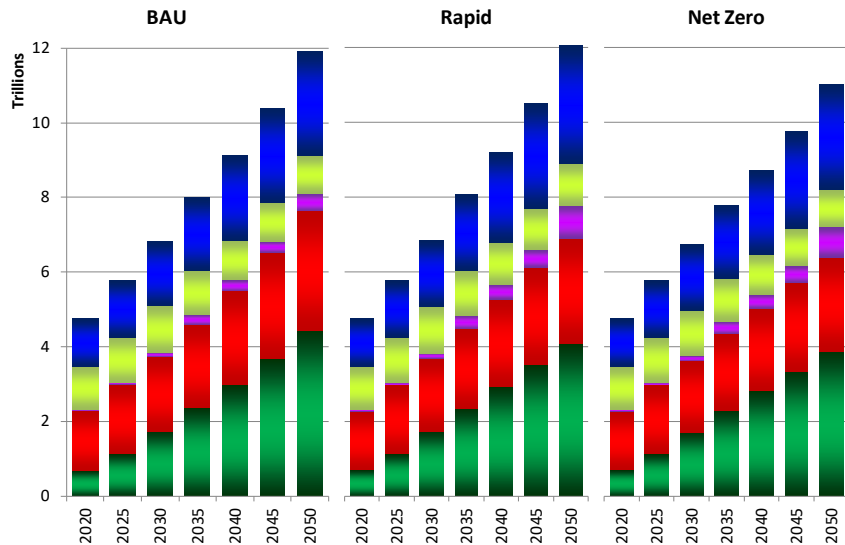
# Changing structure of global energy system

Shares of primary energy in *Rapid*

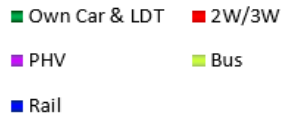
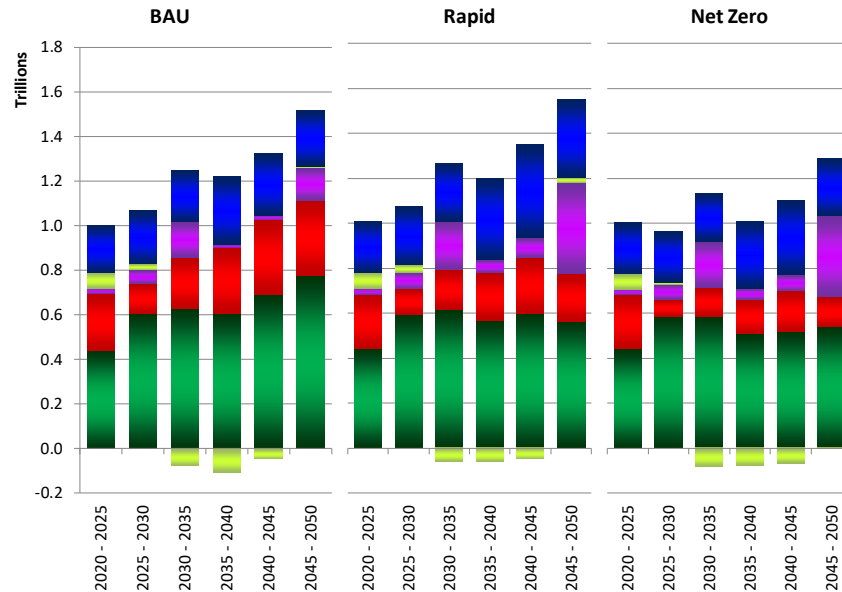


# India – Passenger Km in Land Transportation Modes

Absolute Level



5 Yr Growth

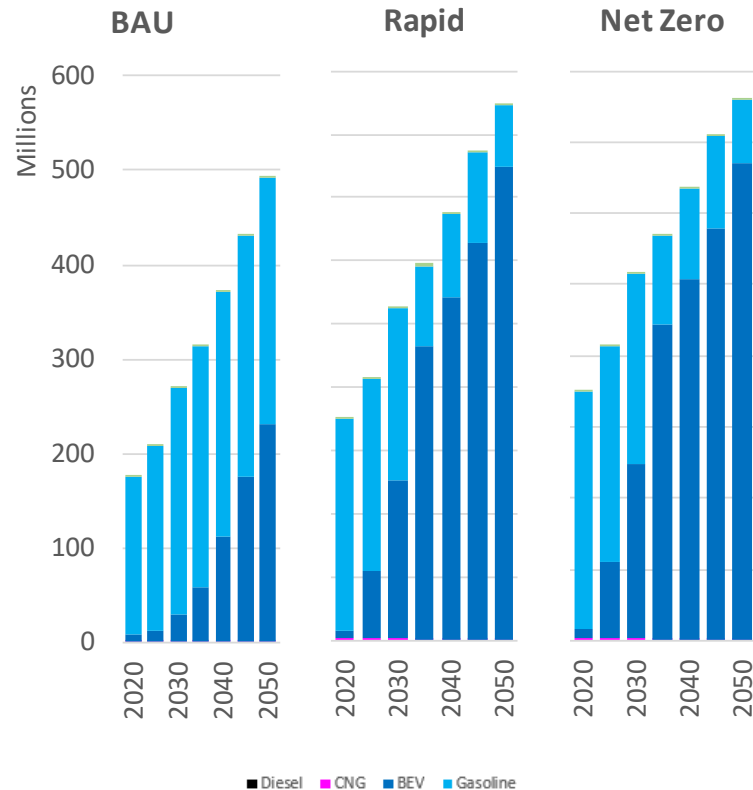
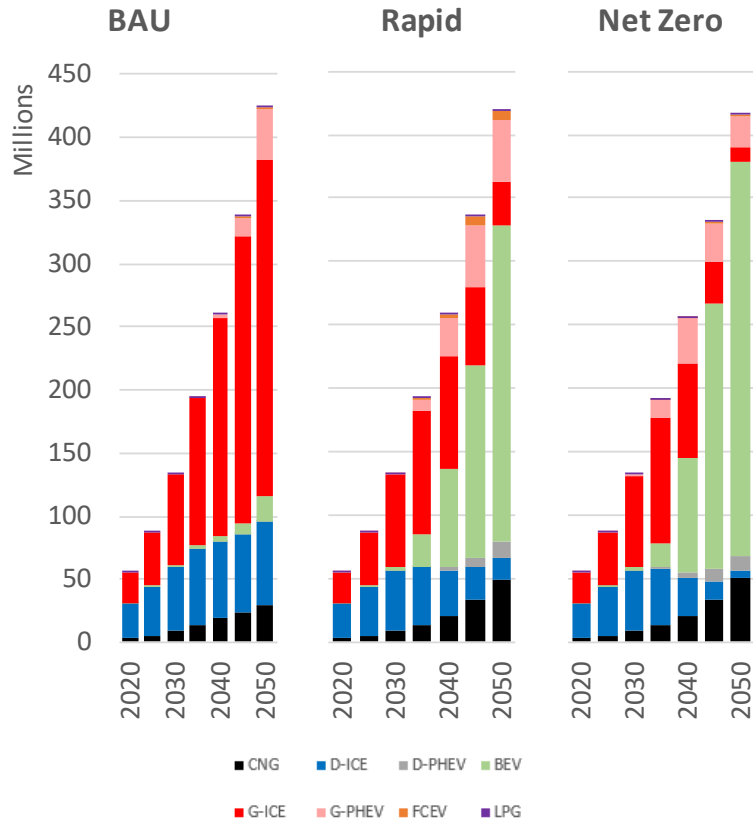


# India - Vehicle Parc



----- 4W -----

----- 2/3W -----

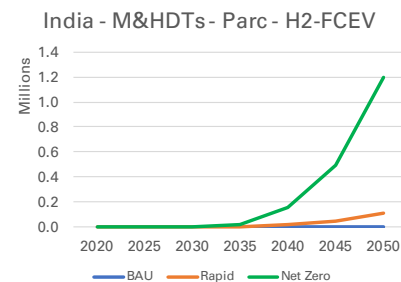
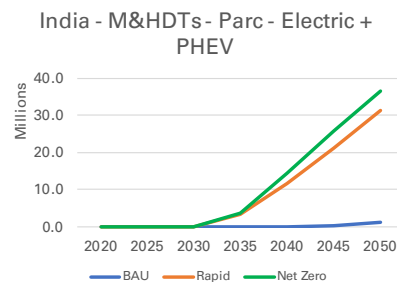
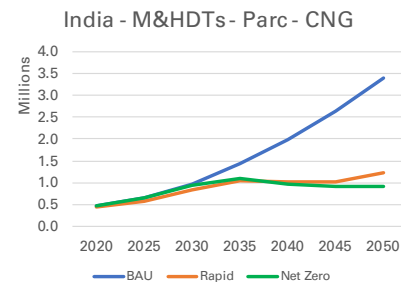
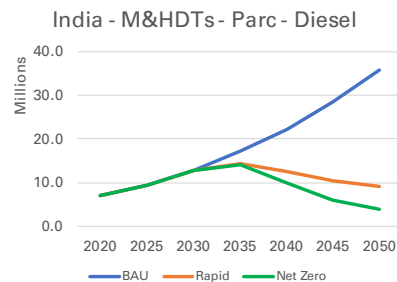
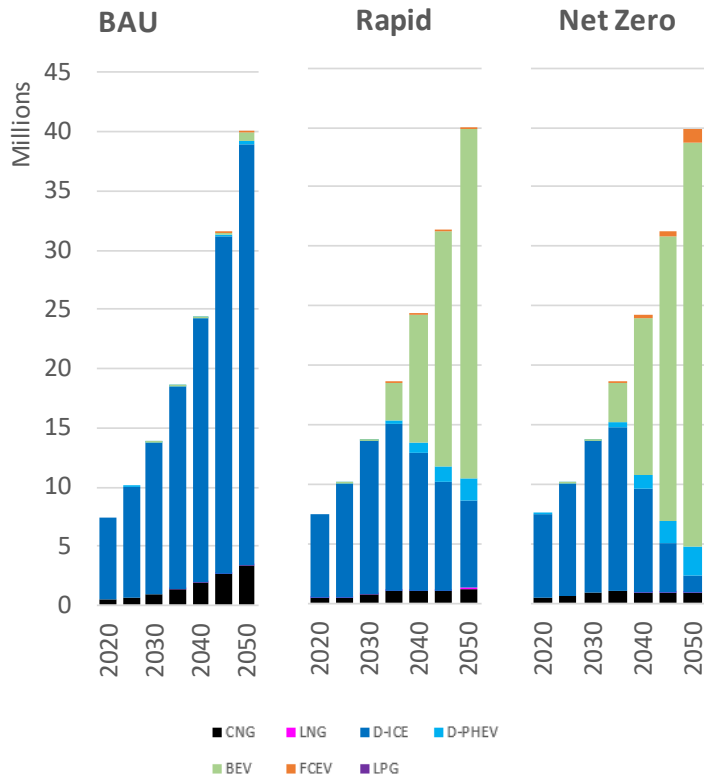




# India - Truck Parc



----- Medium & Heavy Trucks -----



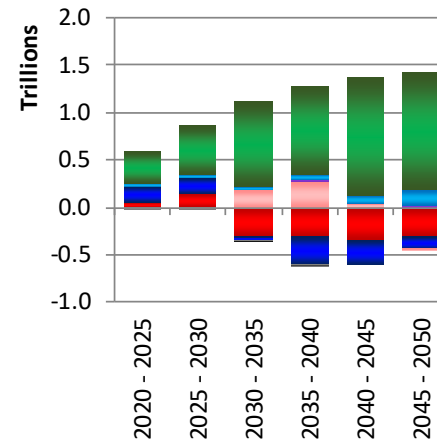
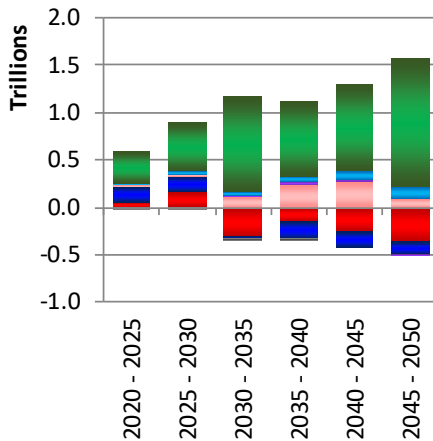
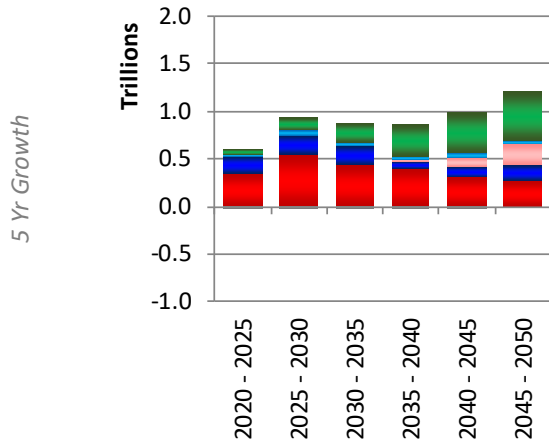
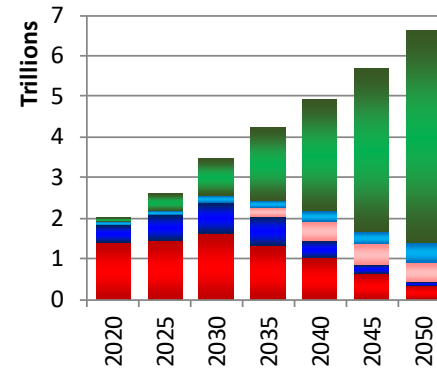
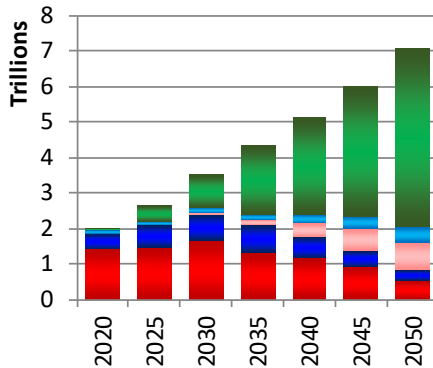
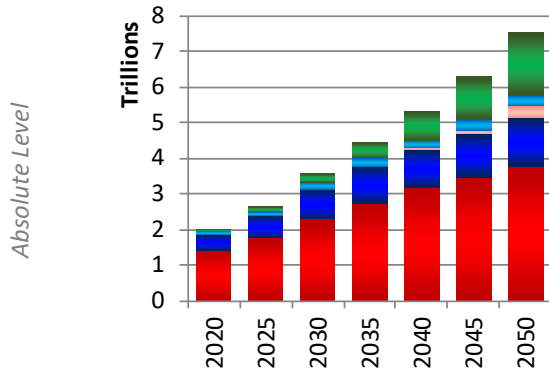


# India – Vehicle Km by Fuel Type

**BAU**

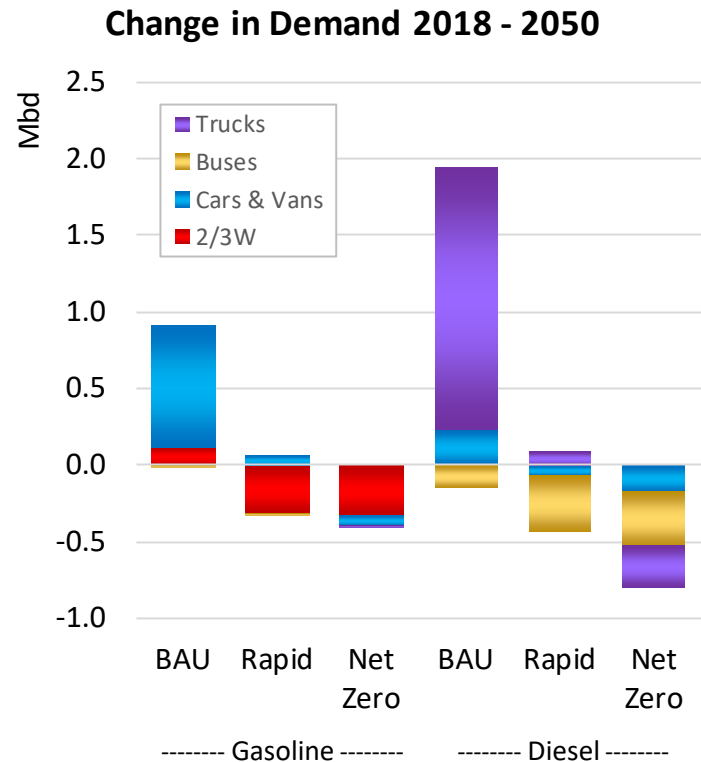
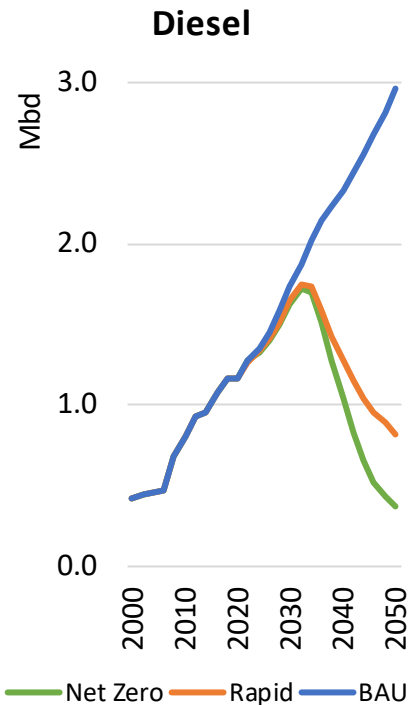
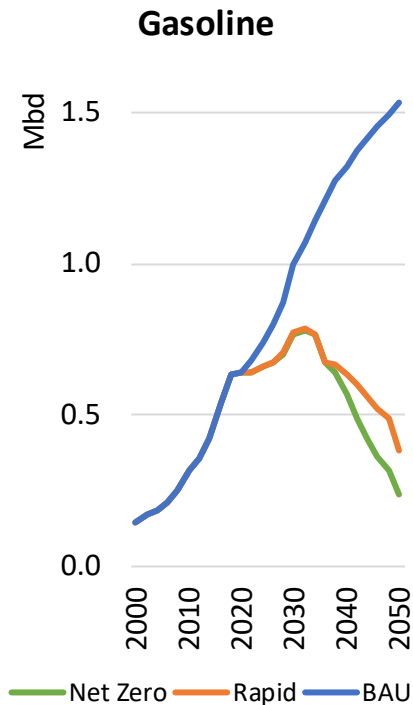
**Rapid**

**Net Zero**



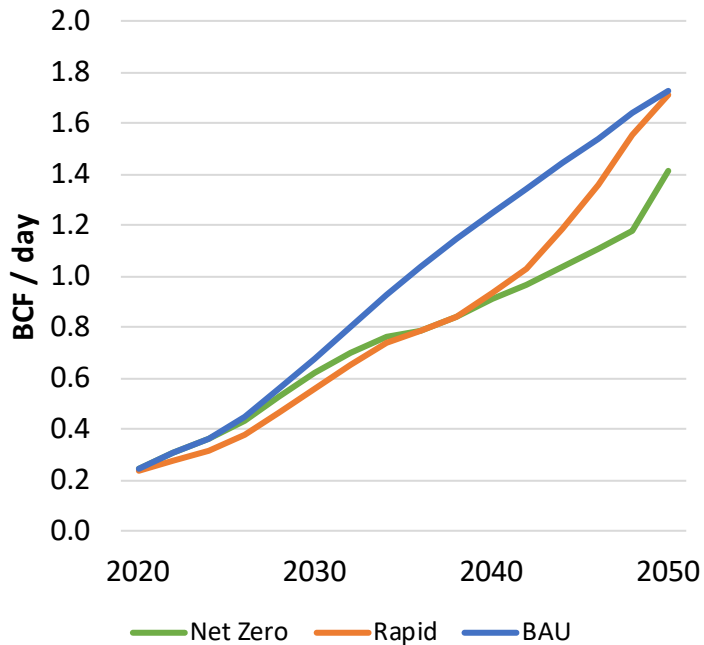
- Gasoline
- Diesel
- PHEV
- LPG
- Hydrogen
- Natural Gas
- Electricity

# India - outlook for liquids demand in road transport

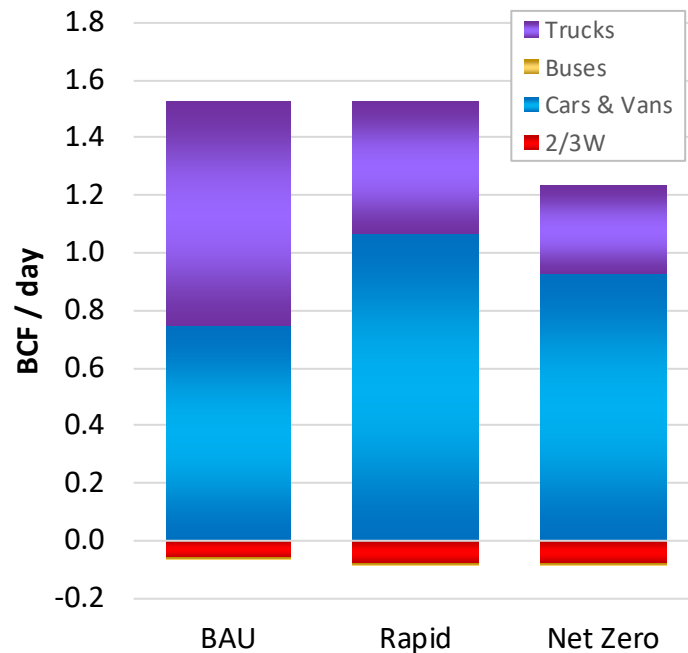


# India - outlook for gas demand in road transport

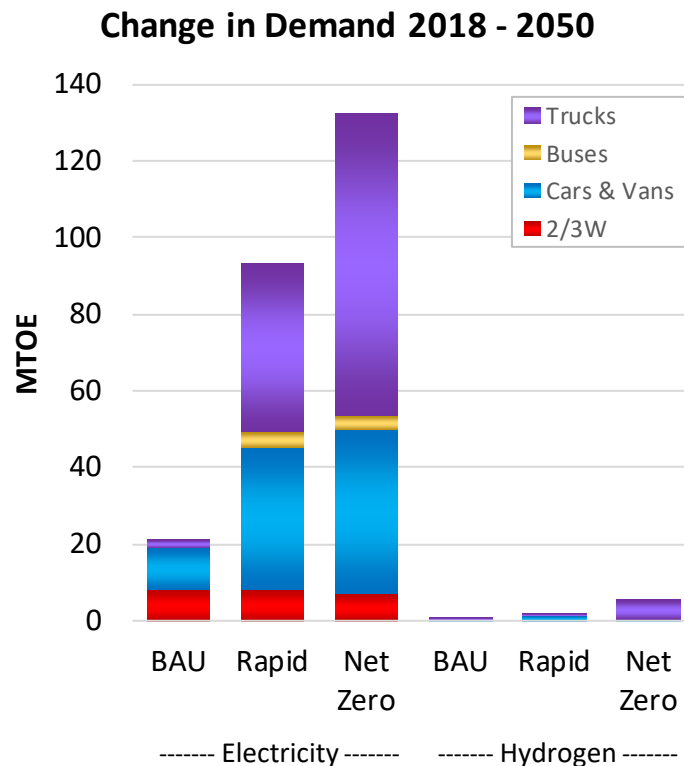
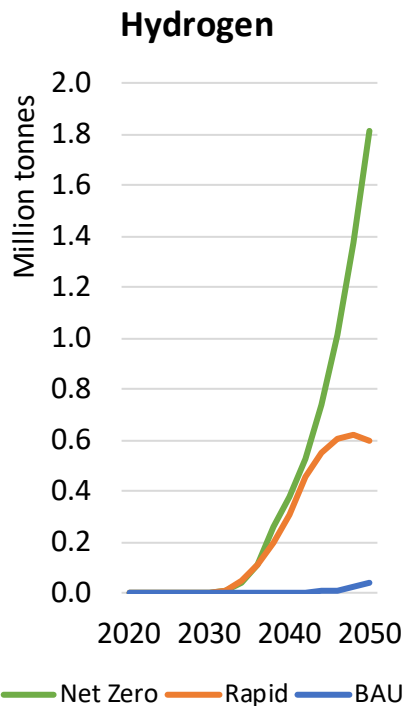
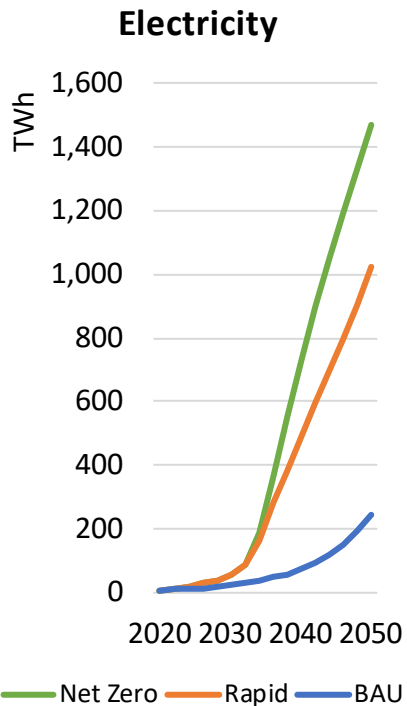
## Natural Gas



## Change in Demand 2018 - 2050



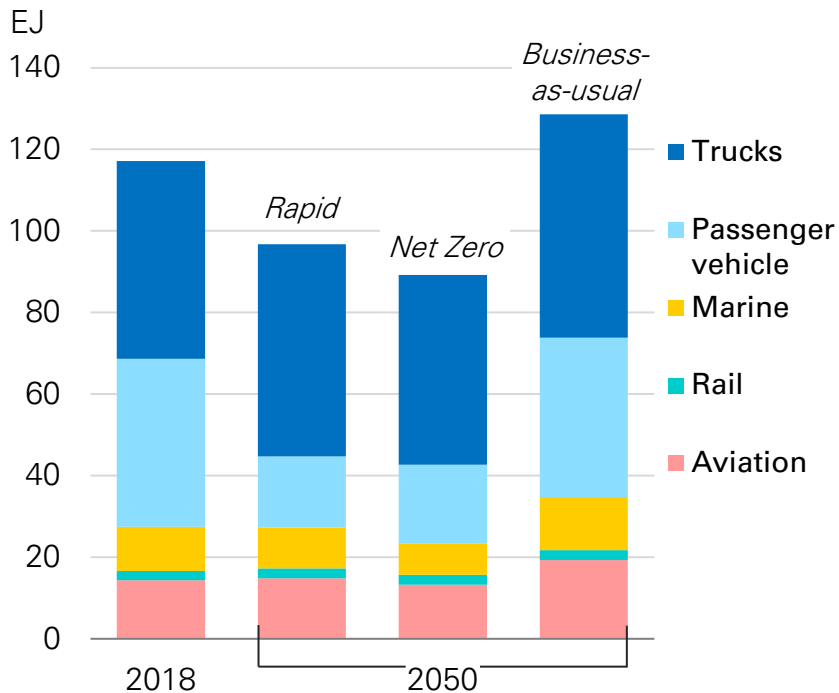
# India - outlook for electricity & H<sub>2</sub> demand in road transport



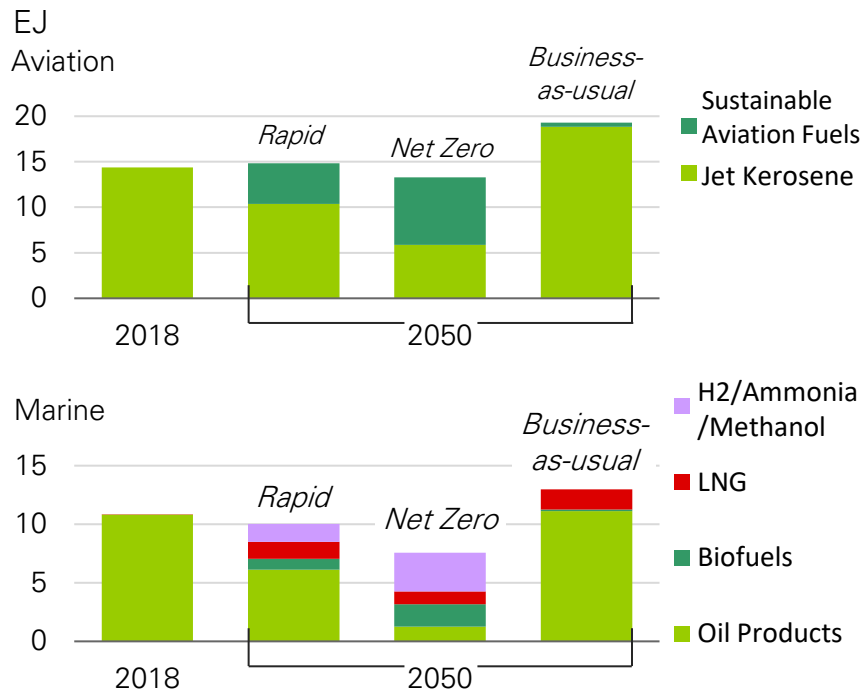
# In our global view, biofuels and hydrogen play a key role in decarbonizing aviation and marine



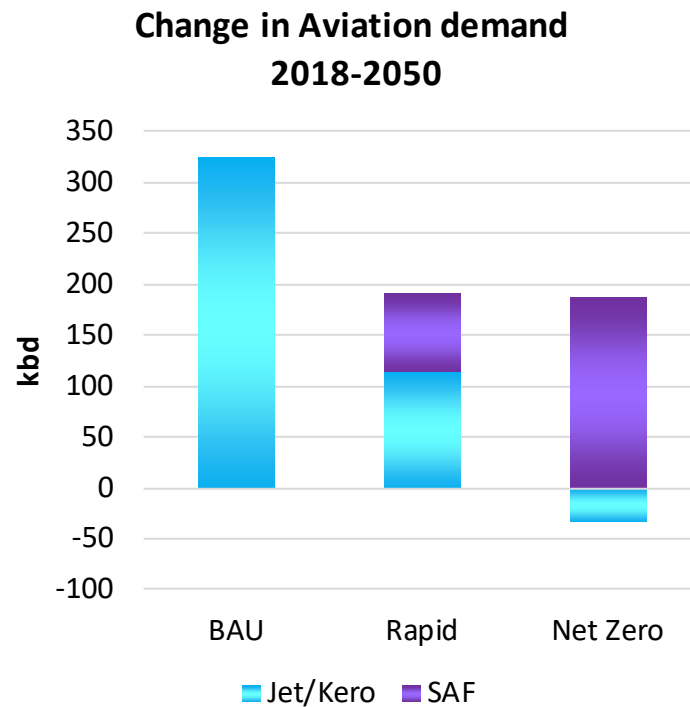
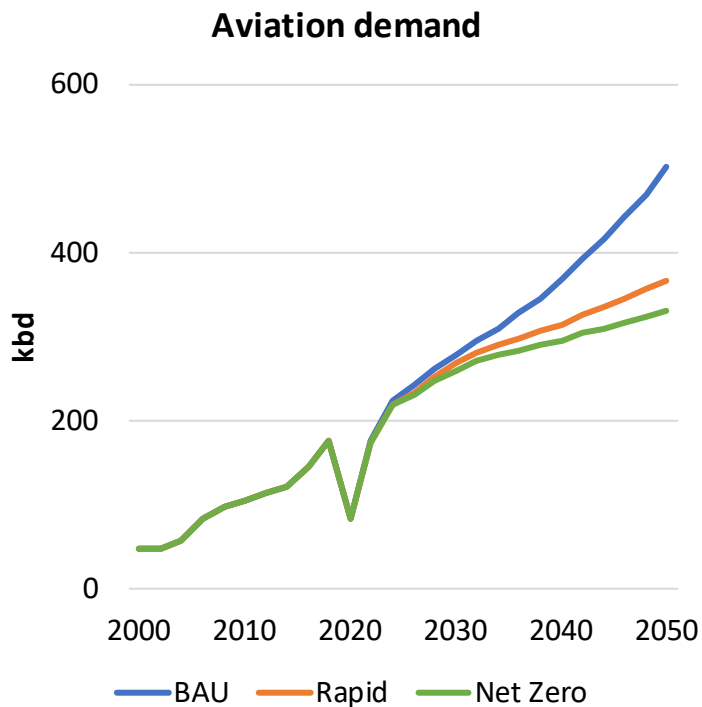
## Total final energy demand in transport by mode



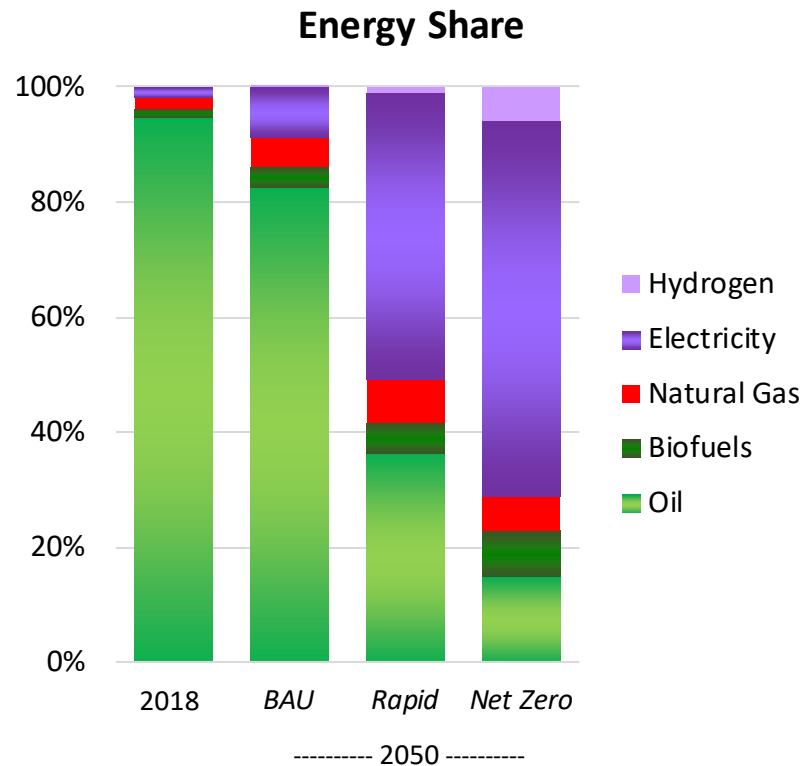
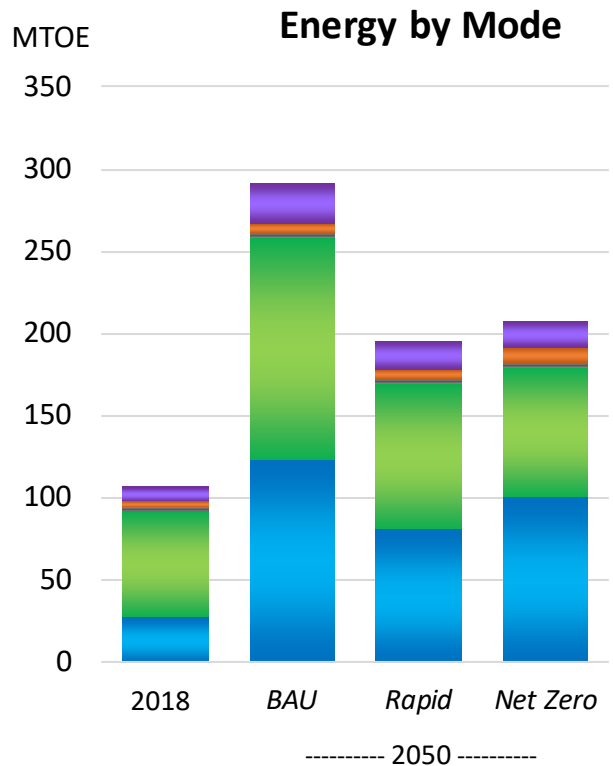
## Aviation and marine demand by source



# India - outlook for product demand in aviation



# India - outlook for energy demand in transport





# Takeaways

- The Energy Outlook scenarios guide our strategic thinking, but we do not believe that they are accurate depictions of the future
- We do believe that climate change is a global issue and will affect all markets
- India is set to grow, and change, and we see elements of the energy transition in all our scenarios for the region
- Fuel mix will change, mode mix will change, new technologies will come to bear...
- Electrification is highly likely, and as result liquid fuel dominance will diminish
- Pace is a key issue, and the development of supply chains and infrastructure is likely to shape the outcome
- Policy development, Macro-economics, Technology development, and Consumer preferences remain the key drivers