1. Where to start: Understanding transport energy use and the impact of modal choice

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Paris, 15 May 2018

IEA #energyefficientworld

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Understanding transport energy use

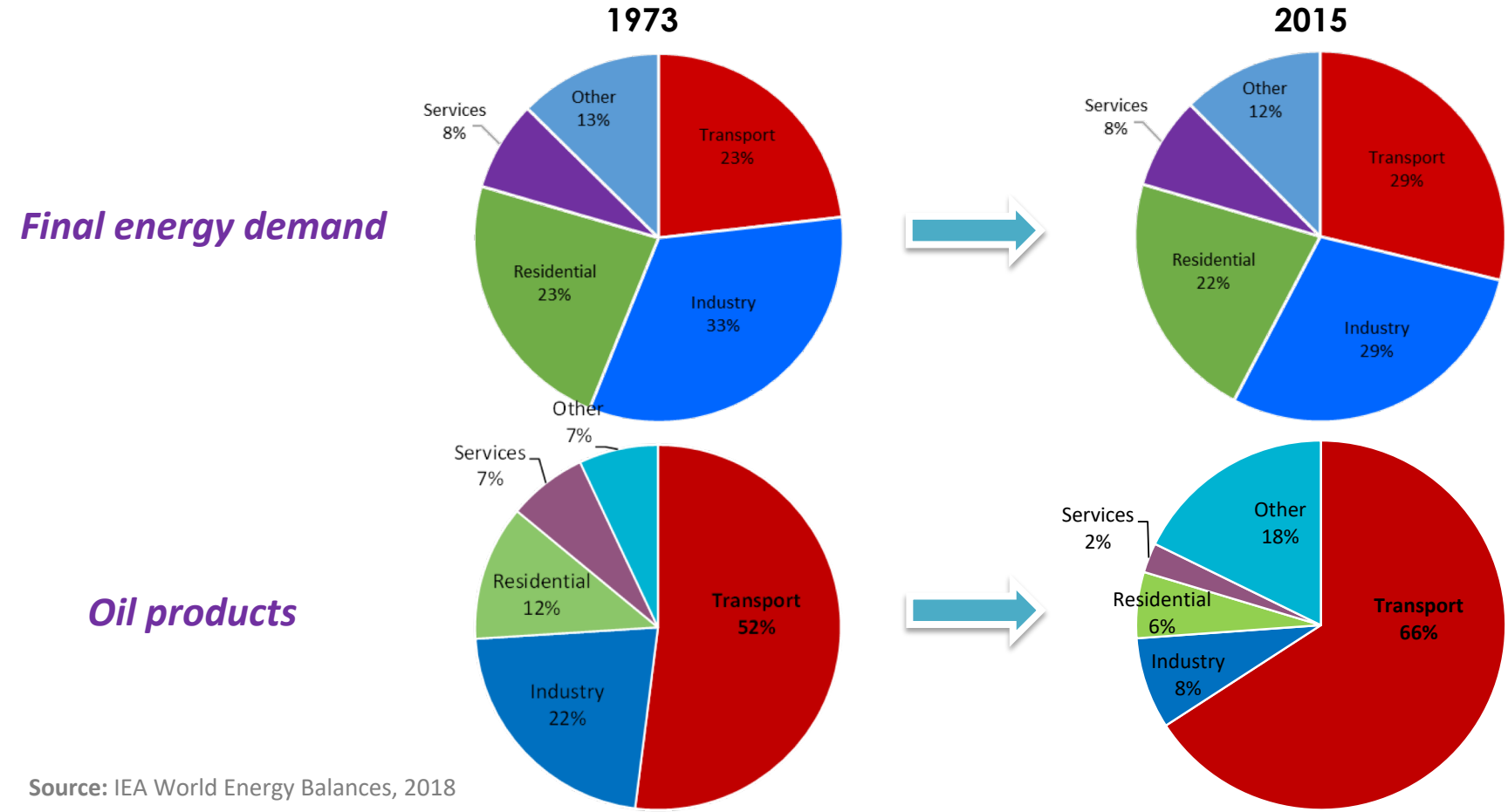
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- Global and regional trends in transport energy consumption
  - Transport relies overwhelmingly on products of oil
  - Road transport modes account for the majority of transport energy use
  - The developing and emerging world is consuming more energy
  - Vast disparities remain in terms of average energy use per capita across countries

- Mode matters
  - Introduction to metrics of transport activity and useful services
  - Historic trends in useful activity
  - The impacts of modal choice on energy demand

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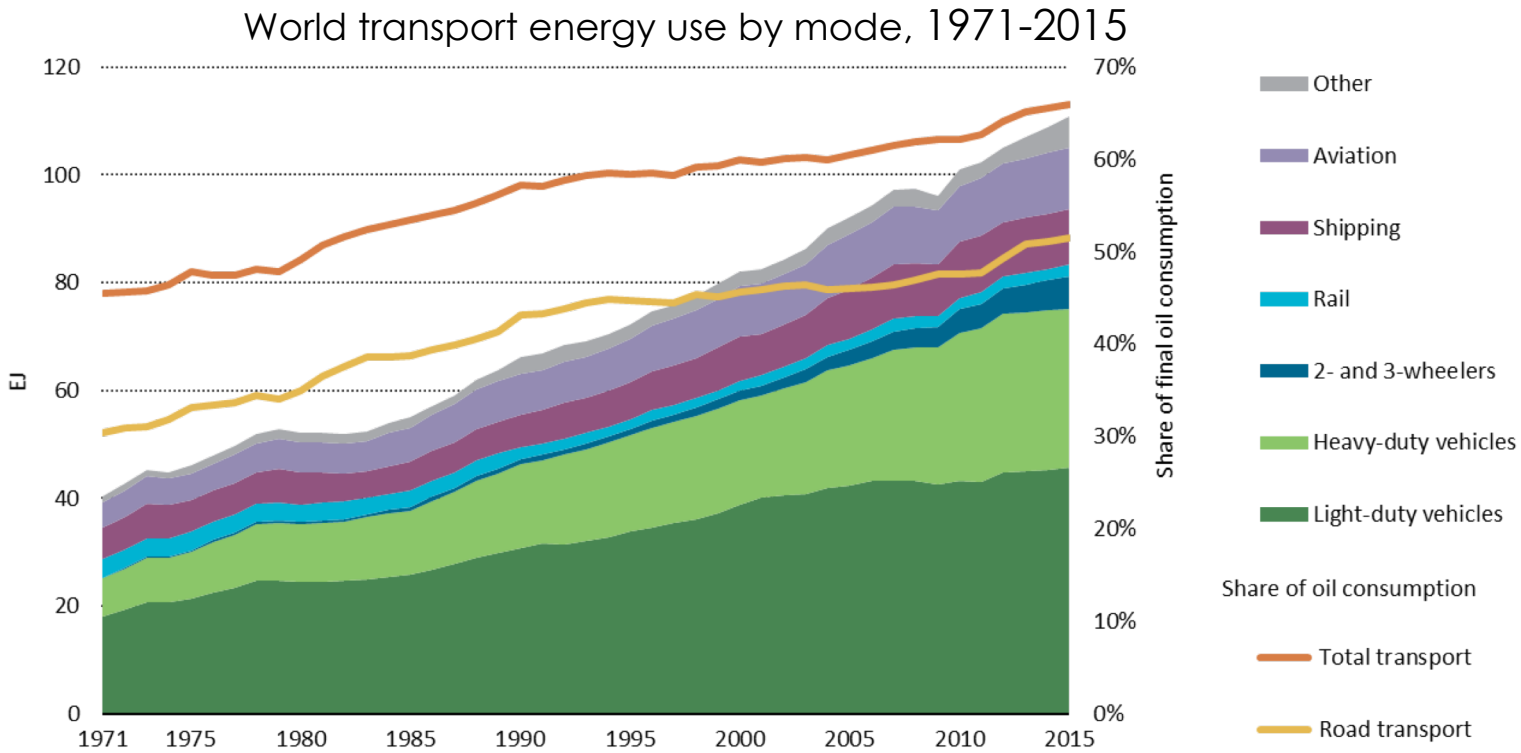
Energy Consumption in Transport – three decades of progress?



Source: IEA World Energy Balances, 2018

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Energy Consumption in Transport – breakdown by mode

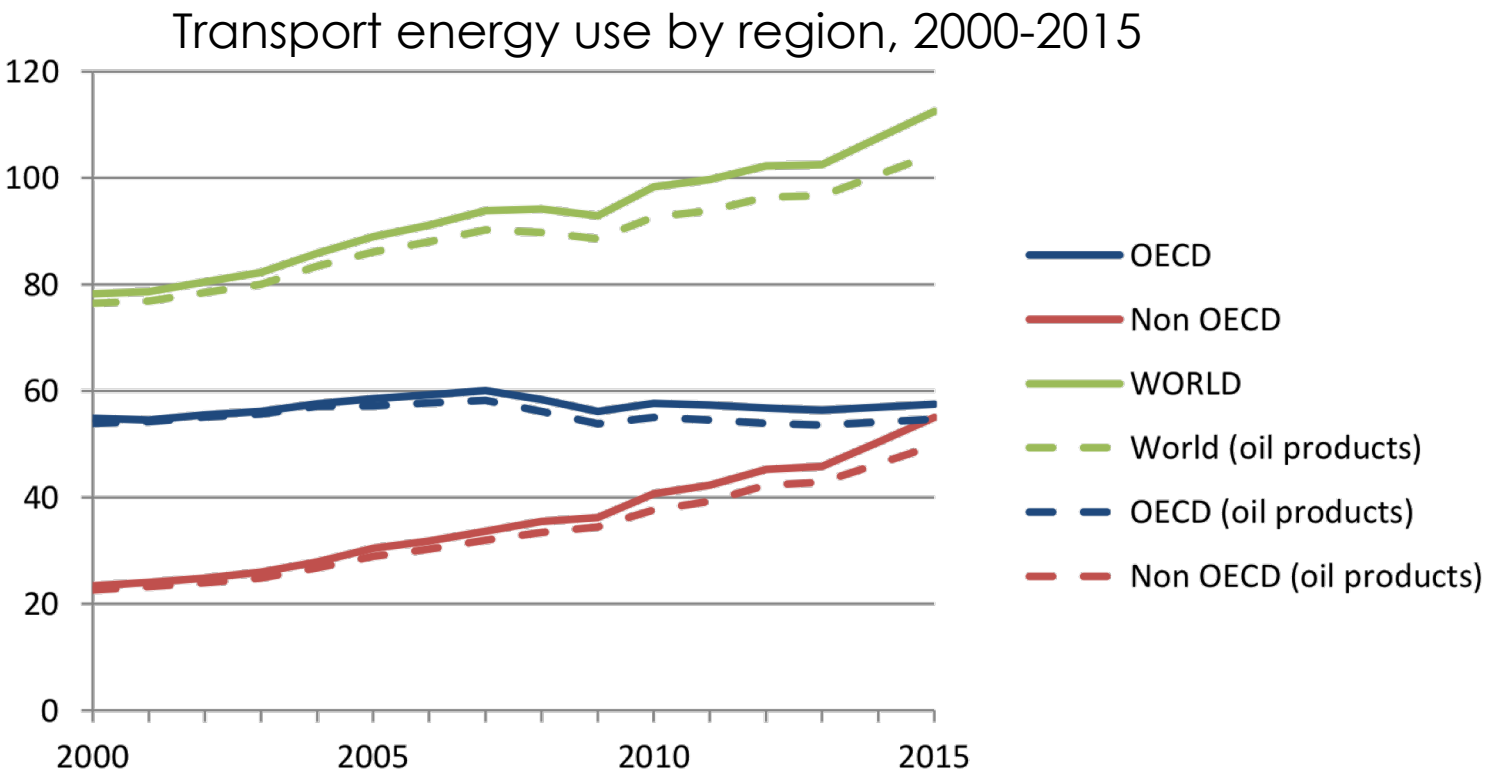


- Road transport modes account for most (about 75%-80%) of transport energy consumption.
- The share of road in total final energy use from oil products grew from 30% in 1971 to more than 50% in 2015.

Sources: IEA World Energy Balances, 2018; IEA Mobility Model, Spring 2018 version

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Energy Consumption in Transport – breakdown by global region



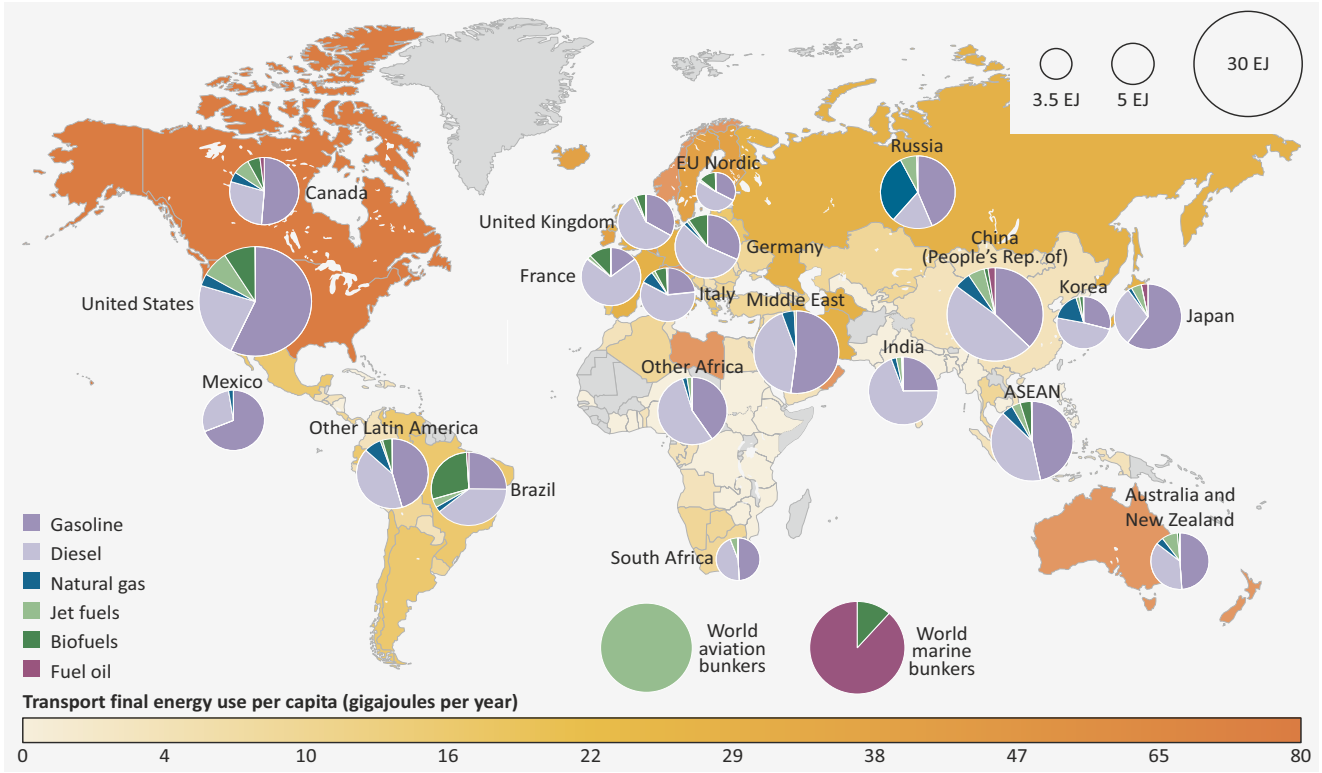
- Final energy demand from the transport sector demand grew by 44% between 2000 and 2015.
- The share of global energy demand among non-OECD countries increased from 30% to more than half.

Sources: IEA World Energy Balances, 2015; IEA Mobility Model, Summer 2016 version

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Energy Consumption in Transport – breakdown by country and fuel

Per capita transport energy use by country and by fuel, 2015



- The average national ratio of transport energy use per capita varies widely across countries

This map is without prejudice to the status of or sovereignty over any territory, to the delineation of international frontiers and boundaries, and to the name of any territory, city or area.

Source: IEA Energy Technology Perspectives 2016.

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Key parameters: vehicle-kilometres (vkm)

Number of vehicles × kilometres per vehicle

(Stock) (Mileage)

Vehicle kilometres (vkm)





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Key parameters: passenger-kilometres (pkm)

Vehicle kilometres x passengers per vehicle

(vkm) (Occupancy rate)

Passenger kilometres (pkm)



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Transport activity: what else do we get out of it?

Key parameters: tonne-kilometres (tkm)

Vehicle kilometres x tonnes per vehicle

(vkm) (Load factor)

Tonne kilometres (tkm)



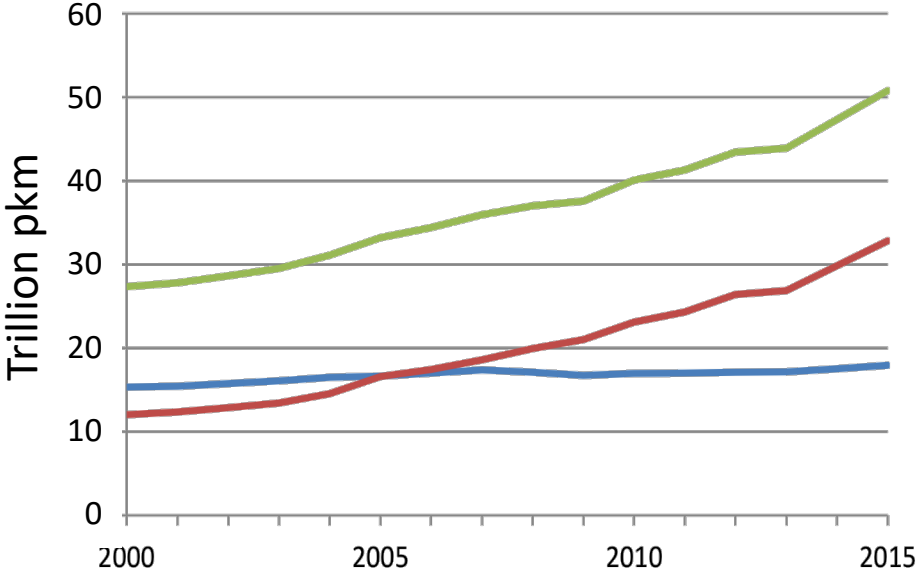


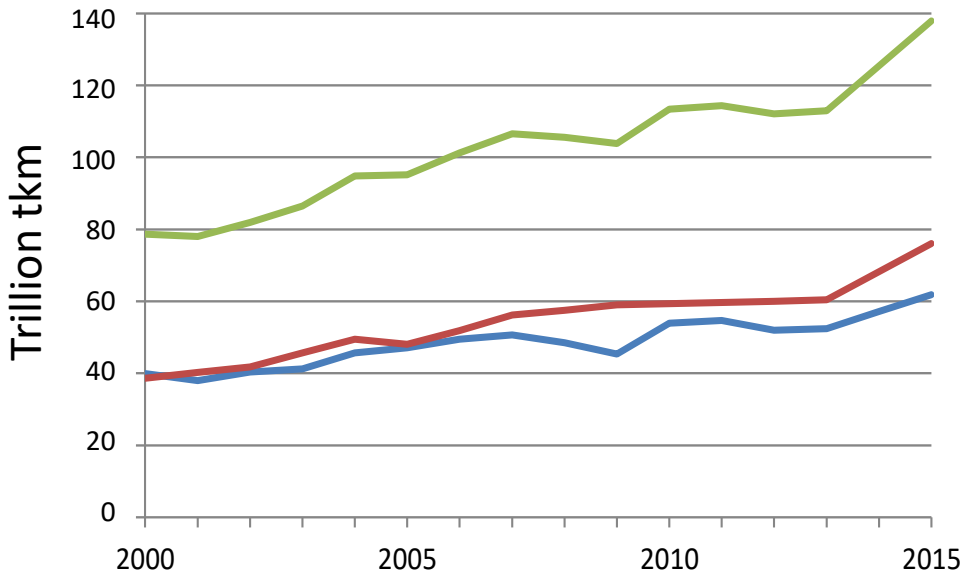


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Transport activity: Travel growth

Passenger and freight transport by region, 2000-2015



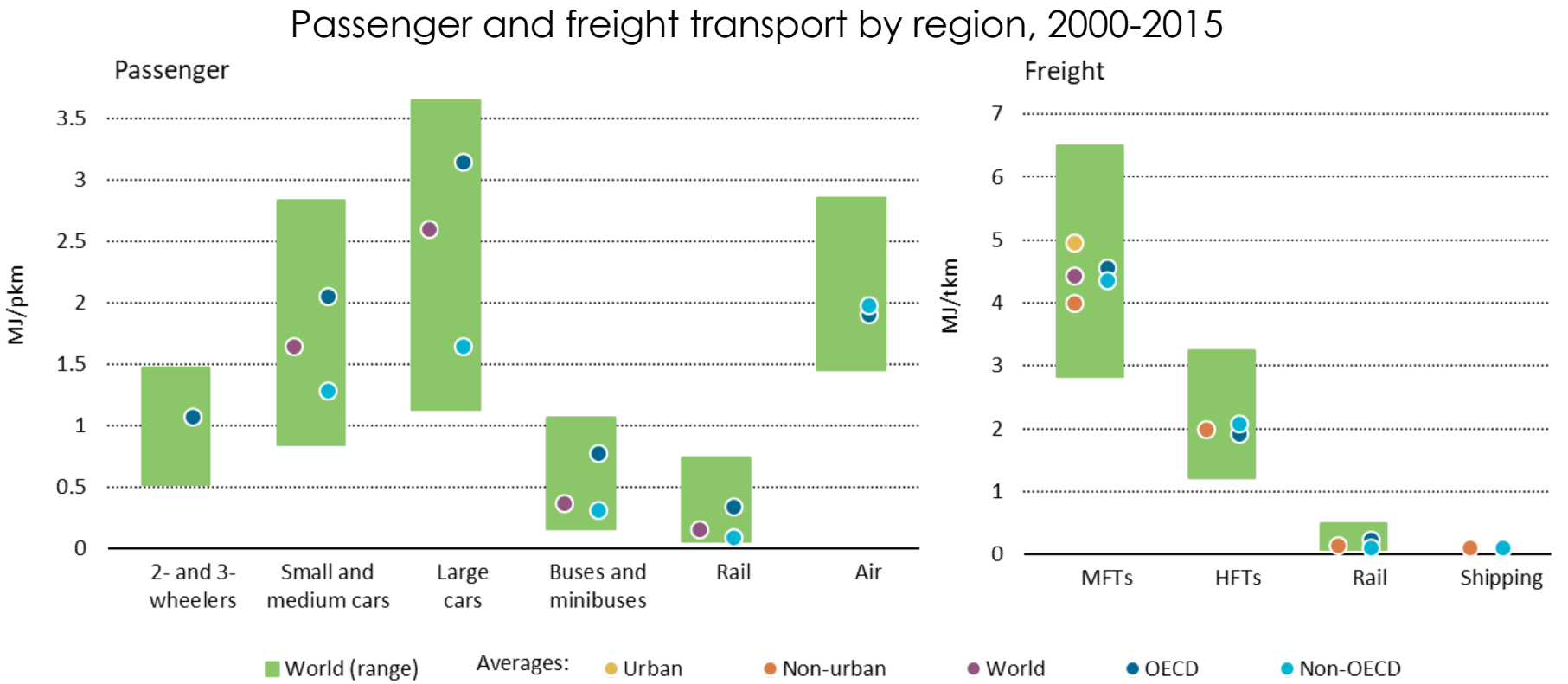


- Transport activity grew by 86% (pkm) and 75% (tkm) between 2000 and 2015.
- Growth in non-OECD countries is faster than in the OECD.

Source: IEA Energy Technology Perspectives 2017.

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Transport activity: useful energy intensity, by mode

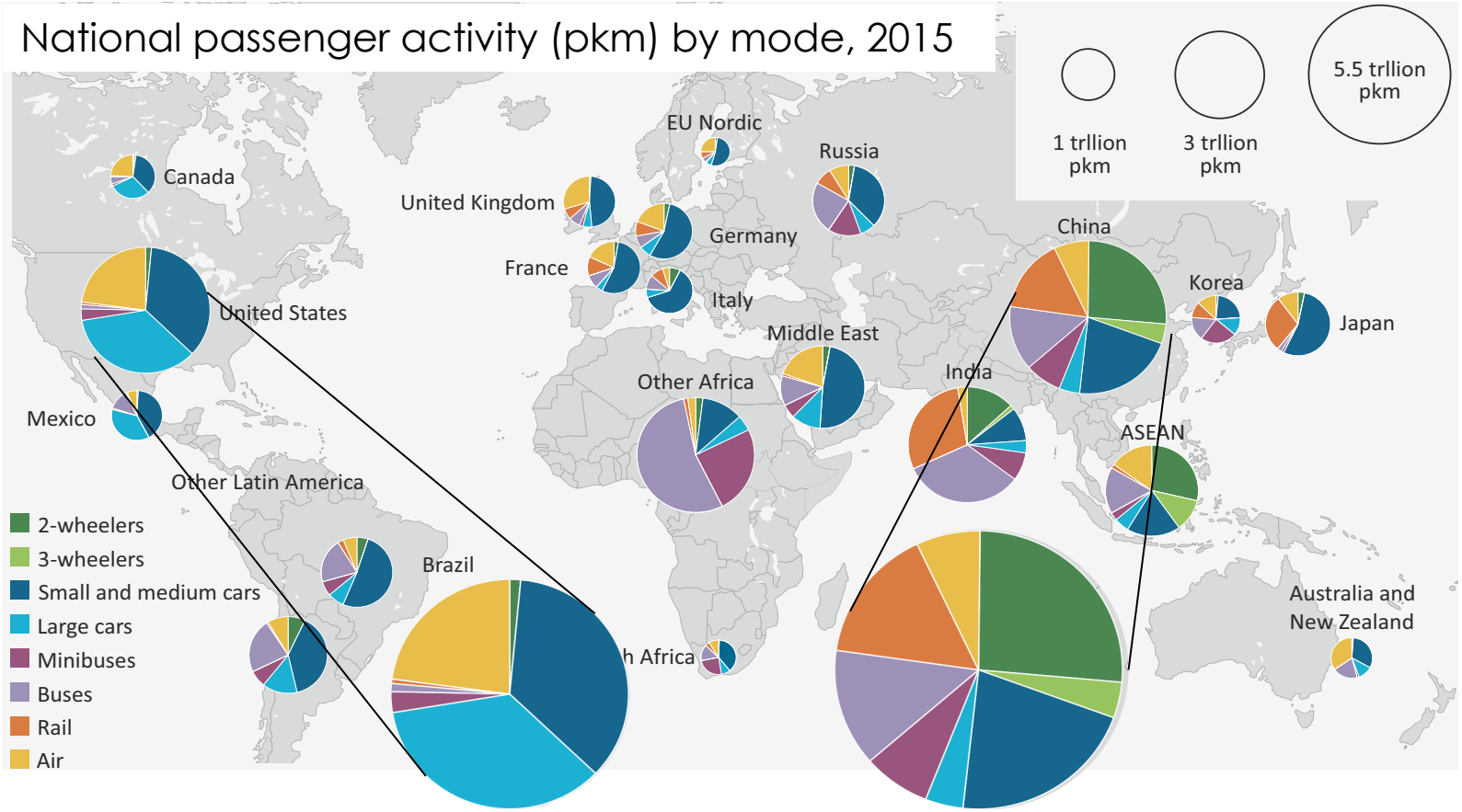


- Air and light road passenger modes (cars) are more energy intensive than public transport.
- Light road freight is more energy intensive than large road vehicles, rail and shipping.

Source: IEA Energy Technology Perspectives 2017.

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Transport activity: mode matters

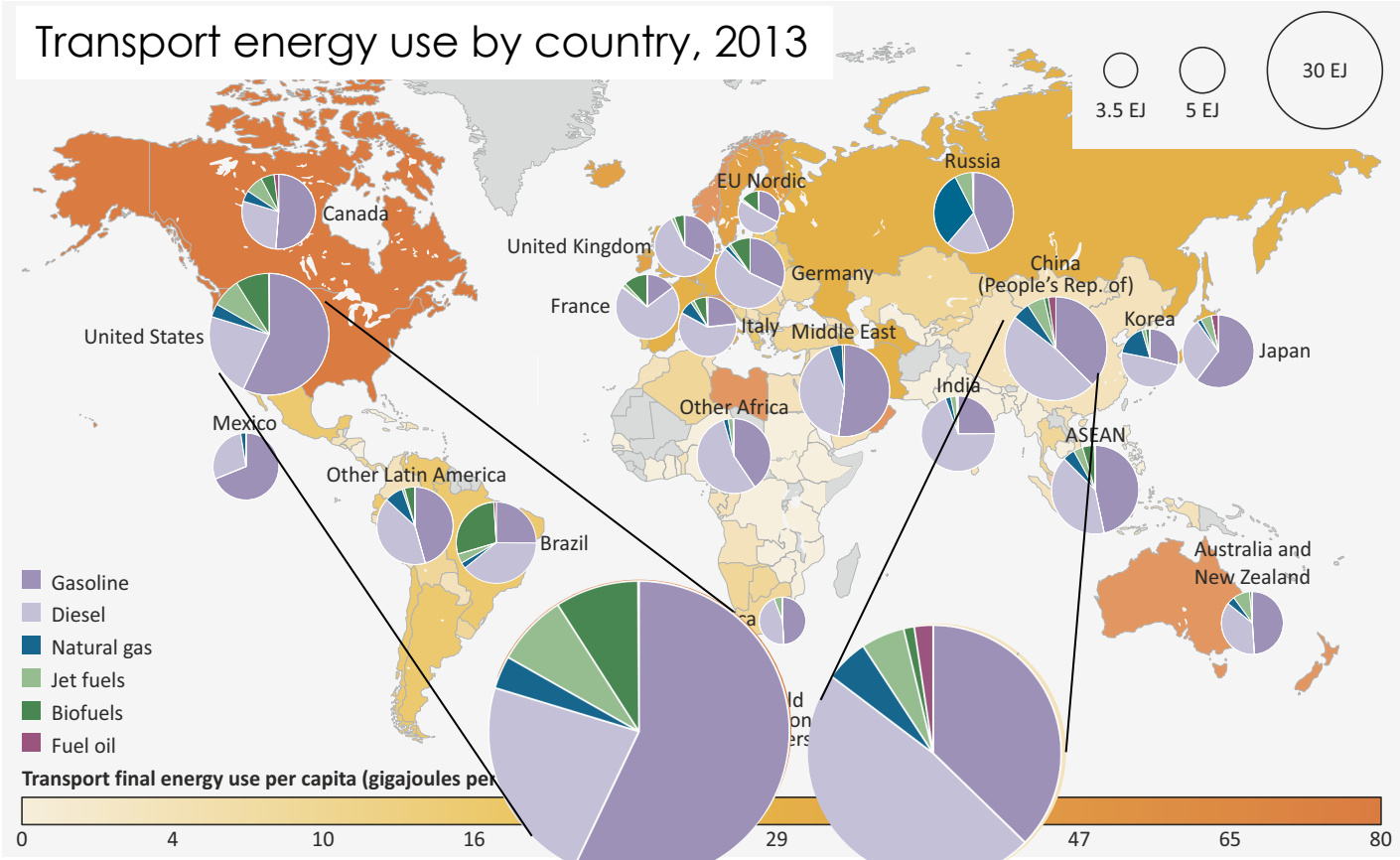


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Transport activity: mode matters



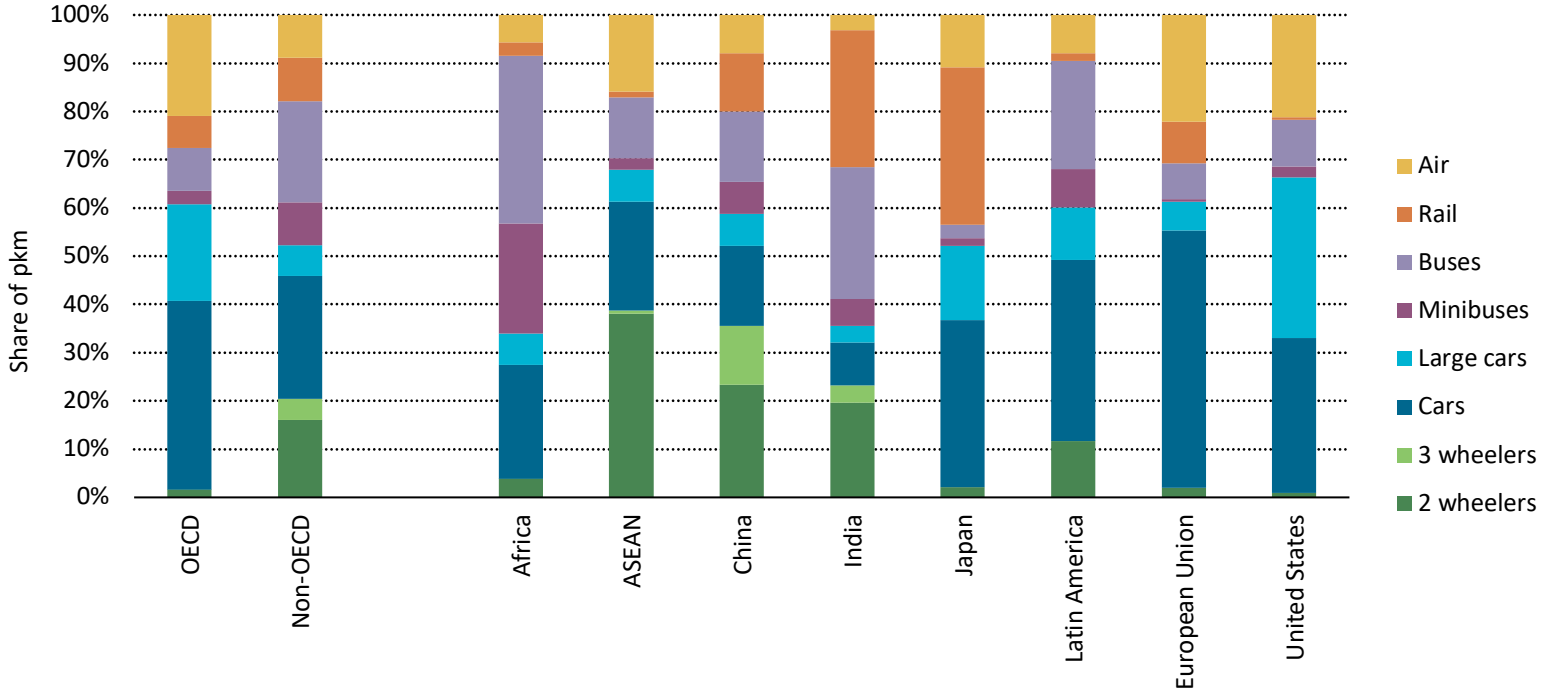
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Source: IEA Energy Technology Perspectives 2016.

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Transport activity: mobility patterns vary

Passenger travel by mode in selected countries, 2015



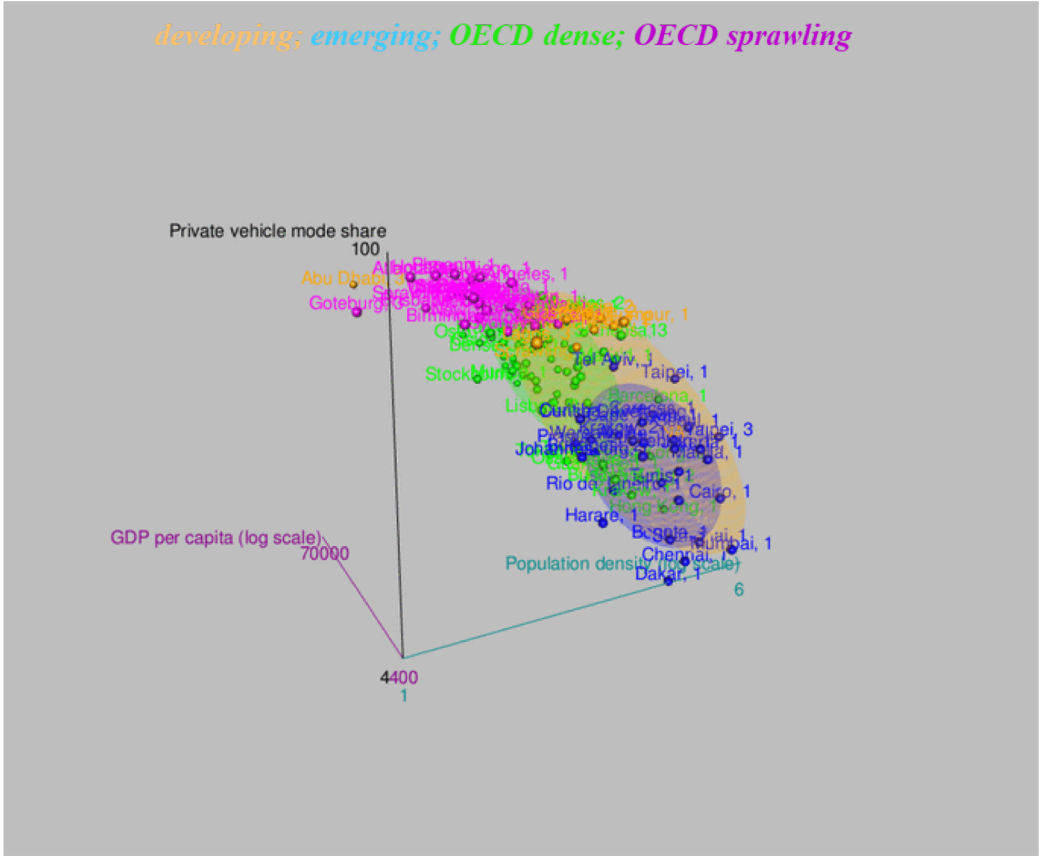
- Modal split varies at the national and regional level

Source: IEA Mobility Model, Spring 2018 version.

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Transport activity: variation is even greater at a city level

- Modal split varies at a city level
- Patterns emerge when comparing modal shares in different cities



Source: IEA analysis using data from the **Millennium City Databases** – Union internationale des transports publics (UITP) (2015), Millennium City Databases for Sustainable Transport, database, UITP, Brussels.

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Key messages

- Transport is among the major energy-consuming sectors
  - Transport relies overwhelmingly on oil products
    - Large shares of oil products go to transport
  - Oil is critical for energy security / energy exports
- Road modes are the major consumers of transport energy
  - Energy intensity varies widely by mode
- Modal split varies widely, both among countries and cities

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