

# **SLOCAT**

## **Transport, Climate and Sustainability**

### **Global Status Report - 3rd edition**

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**Module 4 Transport and Energy**

**Key Insights**

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## Transport Energy Sources

Despite increasing electric mobility and global renewables uptake, the transport sector continues to depend heavily on fossil fuels.

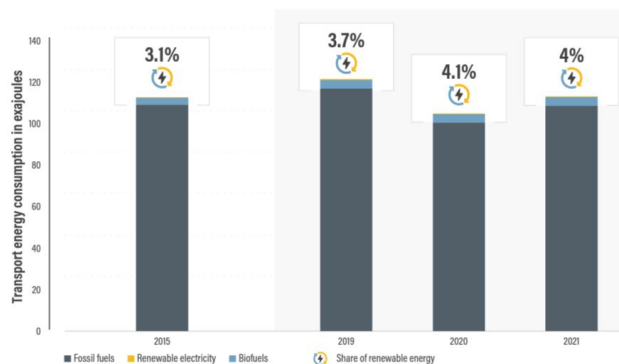
Fossil fuels continued to account for nearly all (96%) of energy used in transport in 2021 – a share that has barely changed over the past decade, due mainly to rising transport demand.



In 2021, the growth in transport energy consumption rebounded (although it did not yet return to 2019 levels), showing that the 2020 decline was related to the COVID-19 pandemic and not to policy action.

**FIGURE 1** Energy consumption in transport, by energy source, 2015, 2019 to 2021

Source: See endnote 8 for this section.



Russia's invasion of Ukraine led to fuel price spikes in transport, underscoring the need to decouple transport from fossil fuel dependency.

→ Global cost inflation settled in the range between 5-10% towards the end of 2022.



The transition to clean energy sources in transport is critical to combat air pollution.

→ Air pollution related to transport activity contributed to **4.2 million premature deaths** in 2019.

## 4.1 Transport and Energy Sources



**Energy efficiency savings continued to be outweighed by rising transport emissions** due to the overall growth in transport demand and modal shift towards higher-emitting transport.

→ **Better engines, hybrid powertrains and electric vehicles led to an 8.2% increase in energy efficiency of cars and vans** from 2015 to 2021.

→ The **increased popularity of sport utility vehicles (SUVs) and trucks** poses a huge challenge to reducing energy consumption and emissions in transport.



**To align with a scenario of keeping global temperature rise below 2°C** compared to pre-industrial levels, **transport energy consumption would need to peak between 2030 and 2035** and then decrease. A **1.5°C scenario** would require **earlier peaking and steeper reductions in energy use** from the sector.



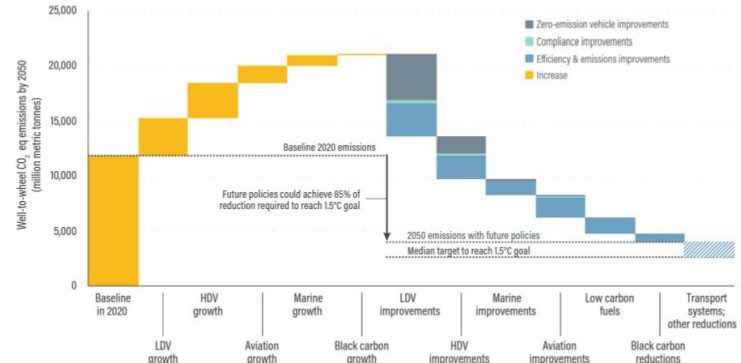
**Policies to decarbonise transport need to ensure an equitable and just transition to more sustainable jobs.**

→ The required renewables shift in transport will have negative employment effect in regions highly dependent on fossil fuels, however **globally, shifting to renewables in transport is expected to result in a net gain in jobs.**

**Top 5 countries achieving just transition:** Costa Rica, Portugal, Sweden, Argentina, and Spain - **Leaders in renewable energy jobs:** China, Brazil, India, the USA and Europe (region)

**FIGURE 7** Baseline emissions from transport in 2020, and the mitigation potentials from different sectoral activities to 2050

Source: See endnote 62 for this section.



## 4.1 Transport and Energy Sources



**Only about 1% of transport energy comes from electricity; only 1/3 of that is from renewable sources.**

**Biofuel blending mandates remain the most popular measure for increasing renewable energy in transport.**

- 56 countries and EU established obligation as of 2022.
- 6 countries mentioned biofuel blending in their updated Nationally Determined Contributions.



**Railways are already significantly electrified**, allowing for a quick uptake of renewables.



**Fuel economy and GHG emissions standards for heavy-duty vehicles are critical for freight decarbonisation.**

- In 2022, 70% of trucks sold were covered by fuel economy or vehicle efficiency regulations, but only 7 countries or regions adopted such standards.



**Despite immense EVs growth, electricity demand in road transport is still low.**

- EVs: around 1% of vehicles globally in 2022 and 0.14% of total global electricity consumption in 2020.

**Hydrogen can play a role whenever direct electrification is impossible.**

- Plausible for road transport (heavy-duty vehicles for long distances) and for aviation and shipping. In road transport, direct use of electricity is most energy efficient.



**Sustainable aviation fuel (SAF) still accounted for only 0.1% of all consumed aviation fuel** in 2022.

- Nevertheless SAF **production increased 200%** in 2022 compared to 2021.



Many countries adopted **labelling schemes** to help consumers understand **life-cycle costs of vehicles**.

Increasingly countries have established vehicle standards or other **instruments to enhance imported vehicles efficiency**.

## Vehicle Technologies

Electric vehicles (EVs) are only one part of the broader transformation needed in transport and mobility systems worldwide to achieve decarbonisation and sustainability goals.

This transformative change requires an integrated multi-modal, multi-level approach.



Electric cars, the fastest growing sector of the clean energy industry.

→ **Global sales of electric cars surged 55% in 2022.** Nearly every 7th car sold was electric.

→ The global electric car stock totalled 26 million units in 2022.

→ 40,000 more EVs than in 2020 were deployed in company fleets in 2022

→ However, **EVs are still only around 1% of vehicles globally and only 1/4 of power fueling EVs is renewable.**



Electric 2-wheelers dwarf numbers of other electric vehicles.

→ 275 million units globally in 2022.

→ However, global sales of electric 2- and 3-wheelers dropped 18% in 2022.

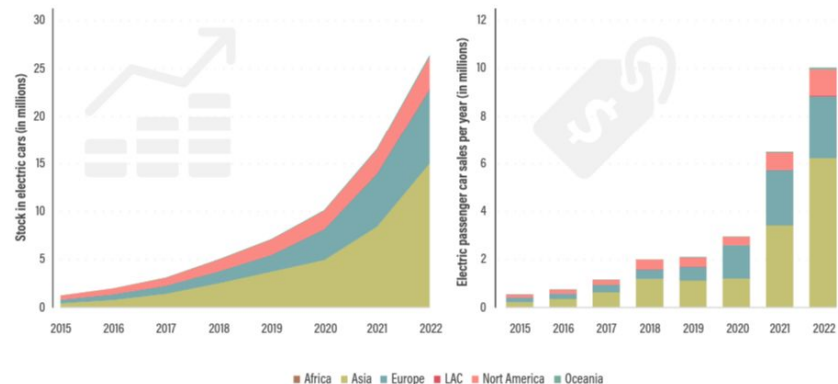


**Sales of electric mid- and heavy-duty trucks grew rapidly by 50% from 2021 to 2022.**

→ However only accounted for 1.2% of total truck sales.

**FIGURE 1.** Electric passenger car stock (left) and sales (right), 2015-2022

Source: See endnote 7 for this section.



## 4.2 Vehicle Technologies



### Global energy consumption for electric mobility grew 22% in 2022

consuming around 110 terawatt-hours of electricity.

59% from cars  
21% from buses  
12% from motorcycles  
8% from trucks



EV infrastructure are becoming more accessible.

→ Charging facilities grew 55% in 2022.



Surging battery prices could slow global e-mobility uptake.

→ For the first time since 2013, EV batteries prices rose 7% in 2022 due to higher material and energy costs.

→ However, battery swapping systems continued to grow globally.



Electricity is projected to become the dominant fuel in transport by the early 2040s.

→ Fossil fuel dependency is a major issue in transport and needs to change quickly.

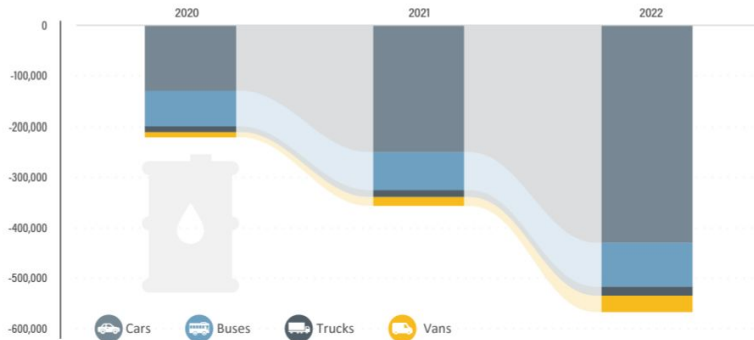


Achieving **1.5 °C pathways by 2050** feature a significant uptake of EVs - → At least **80% of cars and small commercial vehicles being electric by 2050.**

FIGURE 4. Oil displacement through electric vehicles, 2020-2022

Source: See endnote 86 for this section.

Oil displacement (in barrels per day)



EVs were able to displace 567,000 barrels oil per day in 2022, a 59% increase from 2021

## 4.2 Vehicle Technologies



**EV uptake should be framed in a circular economy approach**, including end-of-life battery recycling as well as the re-use and recovery of other material (e.g. electronics, metals, minerals).



**There are more ambition and concrete steps to phase out fossil-fuelled vehicles.**

→ By April 2023, 41 countries or sub-national jurisdictions had targets, twice as many as in 2020.

**International and national commitments for electric mobility are growing significantly.**

→ National climate strategies include electric mobility **much more over other types of transport actions.**

→ In 2021-2022, significant **global initiatives** were launched for electrification of light-, mid- and heavy-duty vehicles, covering all major automobile markets and regions.

→ From 2020 to 2022, at least 20 countries announced **bus electrification** measures in their climate strategies.



**Government subsidies for EVs nearly doubled in 2021, approaching USD 30 billion globally.** Other economic instruments include tax rebates, feebates and bonus-malus schemes to incentivise zero- and low-emission vehicles.



**Leading automakers are projected to spend an estimated USD 1.2 trillion** to deliver up to 54 million electric vehicles by 2030, **accounting for 50% of total vehicle production.**

→ However, in 2023, only two automakers (Tesla and BYD) are seen as leaders in the zero emission vehicle transition.



**There is a risk of an electric mobility divide between high-income countries and low- and middle-income countries**, in the absence of electrification policies tailored at the economic and regional context.

# Check out other key insights at [www.tcc-gsr.com/key-insights](http://www.tcc-gsr.com/key-insights)

## Module 1

Transport Pathways to Reach Global Climate and Sustainability Goals



## Module 2

Regional Trends in Transport Demand and Emissions, and Policy Developments



## Module 3

Climate and Sustainability Responses in Transport Sub-Sectors and Modes



## Module 4

Transport and Energy



## Module 5

Enabling Climate and Sustainability Action in Transport: Finance, Capacity and Institutional Support





# SLOCAT

## Transport, Climate and Sustainability

### Global Status Report

#### 3<sup>rd</sup> edition



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# 5 Modules



**Transport Pathways to Reach Global Climate and Sustainability Goals**



**Regional Trends**



**Responses in Transport Sub-Sectors and Modes**



**Transport and Energy**



**Finance, Capacity and Institutional Support**

# 12 Transport Areas



Integrated  
transport planning



Walking



Cycling



Public Transport



Informal Transport



App-Driven Shared  
Transport



Rail



Road Transport



Aviation



Shipping



Transport Energy Sources



Vehicle Technologies

# 5 Spotlights on cross-cutting issues



**Global Supply Chains**



**Health**



**Small Island Developing States**



**Capacity Building**



**Engagement in UNFCCC**

# 30

## Country Fact Sheets



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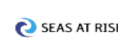
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