



# Renewable energy phase-in and fossil fuel phase-out strategies for transport

December 2021



# Overview of key messages for fossil fuel phase-out/ renewable energy phase-in in the transport sector (click [link](#) to jump to slide)

- Fossil fuel subsidies [distort transport behaviour](#), threatening climate/sustainable development goals.
- Fossil fuel reform in transport [must be accelerated](#) and commitments/national plans must be aligned.
- Transport oil [subsidies have rebounded](#) during the last decade after a period of low global oil prices.
- Transport energy use is dominated by fossil fuels, with [renewable energy contributing a minor share](#).
- 50 countries reformed fossil subsidies in 2015-2018, but significant [inefficiencies in fuel pricing remain](#).
- A growing share of countries, cities and companies are [committing to phase out](#) internal combustion.
- National policies create a [typology framework](#) based on fossil subsidy trends and transport targets.
- [Varied country typologies](#) share a need to balance fossils/renewables and increase transport ambition.
- [Fossil fuel and renewable energy subsidies and demand trends](#) vary widely across focus countries.
- Targets on renewable, electric vehicles, biofuels and fuel efficiency can [reduce transport oil demand](#).
- [Threats to fossil subsidy reform](#) arise from lack of equity in policies and lack of alignment of actors.
- [Opportunities for fossil subsidy reform](#) increase efficiencies and catalyse sustainable development.
- [Building blocks for transport decarbonisation](#) must be embedded in just transition and global targets.
- A policy framework on transport energy reform requires [several key elements](#) to be effective.
- Different country types need [differentiated strategies](#) to align energy and transport goals.
- [Integration of subsidy reform and renewables scale up](#) will deliver a just transport transformation.

# Fossil fuel subsidies distort transport behaviour and threaten achievement of climate and sustainable development goals



**Fossil fuel subsidies incentivise unsustainable transport investments and behaviour.** These include direct subsidies for oil producers and consumers, and indirect subsidies for aviation and shipping. Consumer fossil fuels subsidies reached 5.2 trillion in 2017, [equal to 6.5% of global GDP](#).



**Indirect costs of fossil fuel subsidies** (e.g. respiratory disease, traffic crashes) are estimated to be [10 times greater than direct financial costs](#). Yet, many governments find subsidies difficult to abandon due to vested interests, which range from powerful industries to dissatisfied voters.



Fossil fuel subsidy reform and renewable energy scale up in the transport sector can help **reduce global CO<sub>2</sub> emissions, avoid air pollution deaths, increase tax revenues and generate economic benefits**. Subsidy reform alone could reduce an estimated [6-8% of global GHG emissions](#) by 2050.

# Efforts in fossil fuel reform for transport require acceleration, and transport commitments require greater alignment with national plans



Global fossil fuel production must decline immediately to meet Paris Agreement targets. Yet the [production gap](#) remains largely unchanged since 2019. This sends conflicting market signals and slows uptake of renewable electricity, which is a critical element of low-carbon electric mobility.



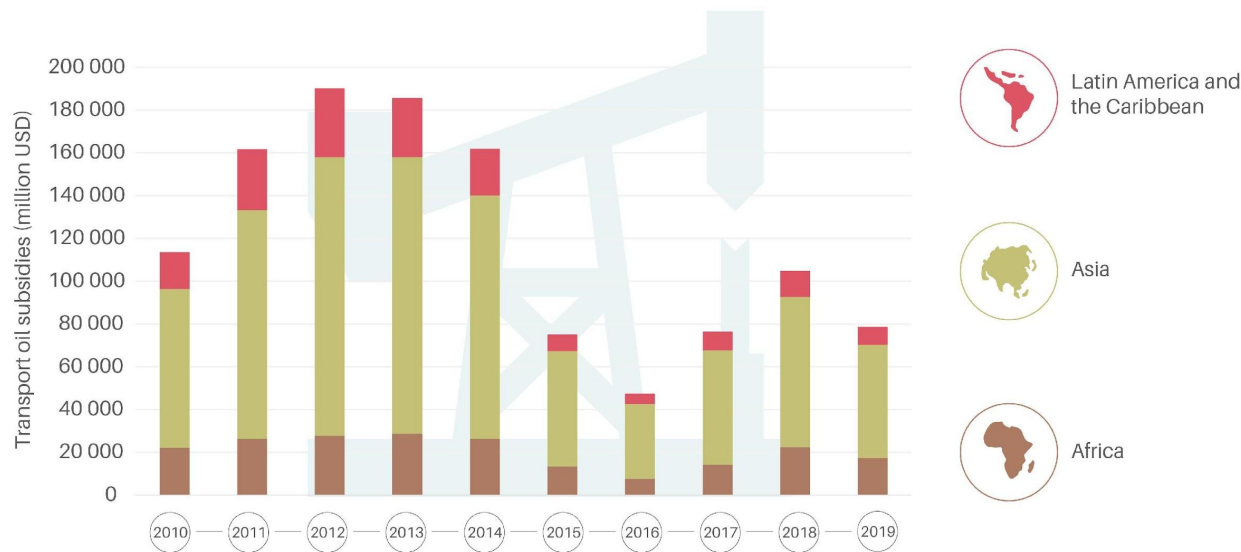
The [Glasgow Climate Pact](#) makes a clear call for countries to reduce fossil fuel use. The outcome document of the 2021 UN Climate Conference (COP26) calls for “accelerating efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies,” an historic first.



At COP26, many countries, cities and companies joined [transport initiatives](#) to phase out internal combustion engines and to scale up electric heavy-duty vehicles and electric vehicle charging networks. Yet, the NDCs of signatory countries are not generally aligned with these commitments.

# Transport oil subsidies have rebounded during the last decade following a period of decline coinciding with low global oil prices.

Figure 9. Transport oil subsidies, 2010-2019



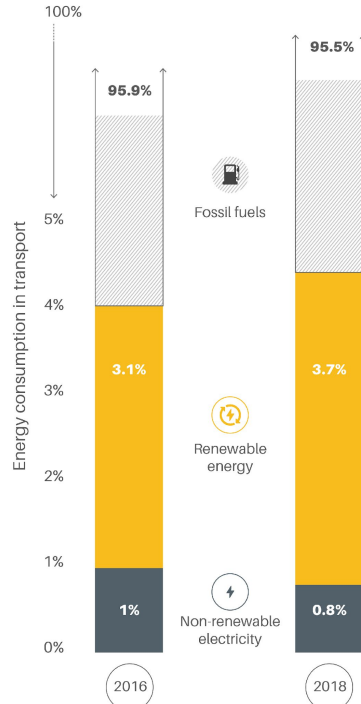
Global subsidies for transport oil **dropped in 2015-2016** (coinciding with a drop in global oil prices) **but have risen in following years.**

This trend may continue due to **significant funding for fossil fuels in COVID-19 recovery packages.**



# Transport energy use remains dominated by fossil fuels , with renewable energy making a small contribution with little growth.

Figure 1. Share of renewable energy in transport, 2016 and 2018

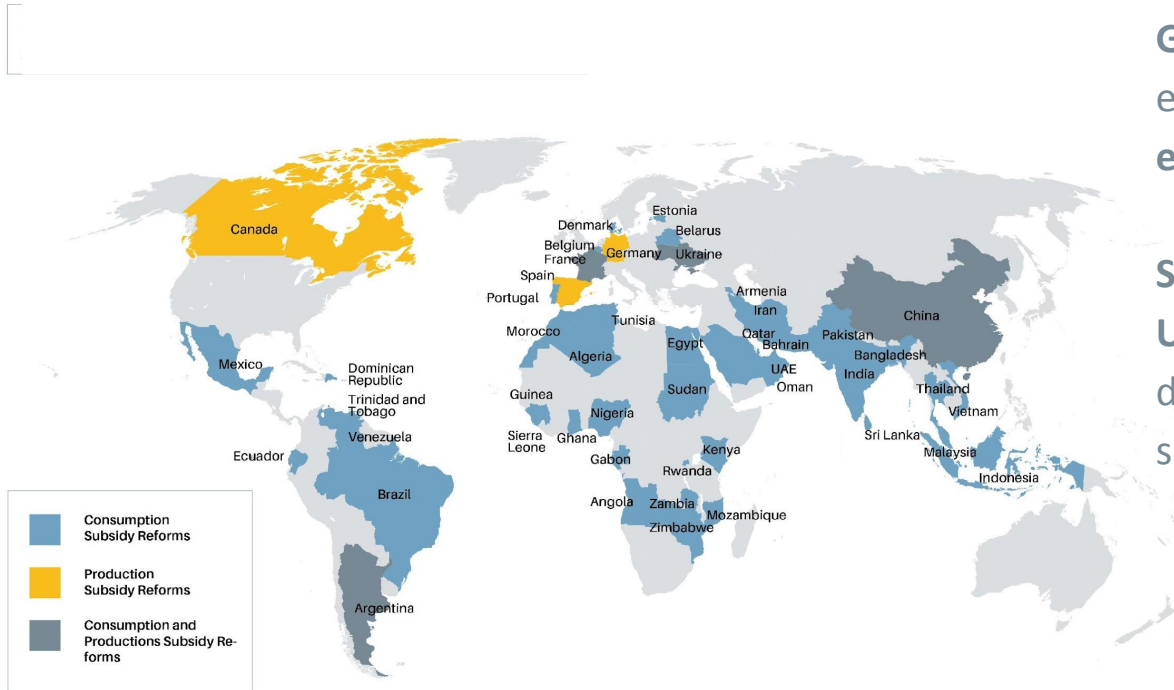


Transport remains the sector with the **lowest share of renewable energy use**, with negligible change from 2016 to 2018.

More than **95% of transport energy comes from petroleum products** and less than **4% from biofuels and renewable electricity**.

# 50 countries reformed fossil subsidies in 2015-2018, but significant inefficiencies in energy prices remain around the world.

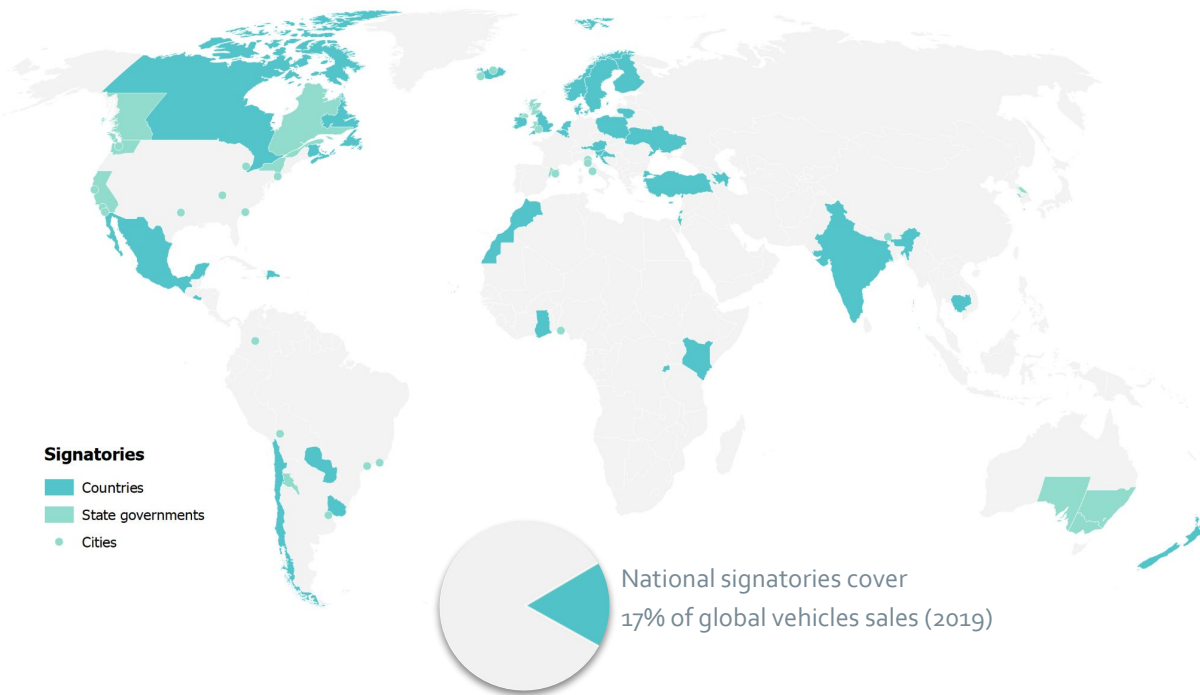
Figure 10. Countries undertaking fossil fuel subsidy reforms, 2015-2018



**Global energy subsidies** reached an estimated USD 5.2 trillion in **2017**, equal to **6.5%** of GDP.

**Subsidies from G20 countries** totaled **USD 584 billion** annually in **2017-2020**, despite a 2009 pledge to phase out subsidies in the medium-term.

# An increasing share of countries, cities and companies are committed to phasing out internal combustion engines (ICEs).



Signatories to the **COP26 Declaration on Accelerating the Transition To 100% Zero-Emission Cars and Vans** include:

38 countries

44 city/state governments

11 auto manufacturers

27 fleet owners/operators

13 auto manufacturing investors



# National policies create a typology framework based on current fossil fuel subsidy trends and low-carbon transport targets.

**Fossil fuel subsidy trends per capita (or \$GDP)**

	Growing / 'rebound'	Decreasing
Ambitious targets	<b>Determined</b> Antigua & Barbuda	<b>Front runner</b> India, Norway
Moderate targets	<b>Mixed</b> Chile	<b>Progressive</b> Pakistan
Unambitious/ no targets	<b>Dormant</b> Nigeria	<b>Latent</b> Egypt, Indonesia

**Ambition to reduce transport oil demand**  
(e.g. EV targets, ICE phase-out plans, biofuel mandates)

**Fossil fuel subsidy trends** as indicator for policy direction - Decreasing subsidies generally linked to subsidy reform measures (*X-axis*)

**Low-carbon transport policies** to reduce demand for fossil fuels and meet targets aligned with the Paris Agreement. (*Y-axis*)

**Country selection** considers subsidy reform effort; mix of net importers/exporters; mix of regions, geographies, and income levels.

# Varied country typologies show a common need to balance fossil and renewable energy and increase ambition of transport targets.

(see [this folder](#) to view full country factsheets)

## Antigua & Barbuda

Share of transport in total energy demand (%) (2019)

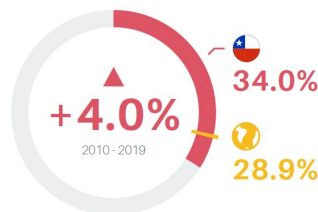
(Source: IEA)



## Chile

Share of transport in total energy demand (%) (2019)

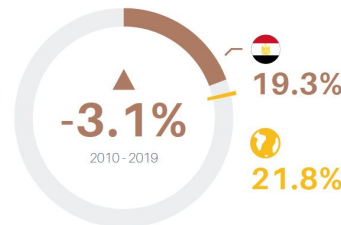
(Source: IEA)



## Egypt

Share of transport in total energy demand (%) (2019)

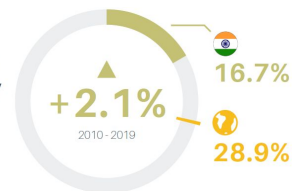
(Source: IEA)



## India

Share of transport in total energy demand (%) (2019)

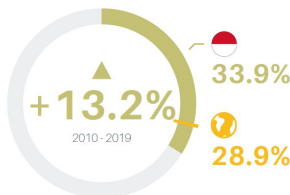
(Source: IEA)



## Indonesia

Share of transport in total energy demand (%) (2019)

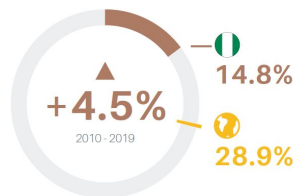
(Source: IEA)



## Nigeria

Share of transport in total energy demand (%) (2019)

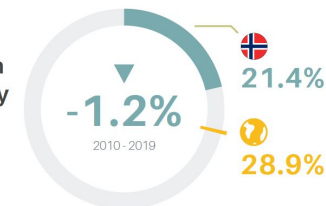
(Source: IEA)



## Norway

Share of transport in total energy demand (%) (2019)

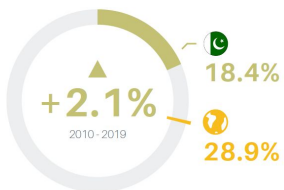
(Source: IEA)



## Pakistan

Share of transport in total energy demand (%) (2019)

(Source: IEA)



















# Fossil fuel and renewable energy subsidies and demand trends vary widely across focus countries.

Country	Importer/ exporter of oil products (2010-2019)	FF subsidies as share of GDP (2019)	RE share of electricity generation (2019/2020)	Total per capita FF subsidies (trend 2011-19)	Transport share of energy demand (2010-2019)	Transport share of fossil fuel CO <sub>2</sub> emissions (2010-2019)
<b>India</b> (Front runner)	Net importer	0.35%	22.22% (2020)	\$7 (-35%)	16.7% (+2.1%)	11.9% (+8.2%)
<b>Norway</b> (Front runner)	Net exporter	0.09%	98.79% (2020)	\$70 (-36%)	21.4% (-2.1%)	27.6% (-13.2%)
<b>Pakistan</b> (Progressive)	Net importer	0.59%	37.26% (2020)	\$8 (-88%)	18.4% (+2.1%)	23.4% (+6.5%)
<b>Antigua &amp; Barbuda</b> (Determined)	Net importer	2.15%	4.39% (2019)	\$368 (+260%)	N/A	39.7% (+14.0%)
<b>Chile</b> (Mixed)	Net importer	0.49%	48.65% (2020)	\$72 (+317%)	34.0% (+4.0%)	30.8% (+3.5%)
<b>Egypt</b> (Latent)	Net exporter > net importer	4.73%	9.99% (2019)	\$143 (-55%)	29.6% (+1.5%)	19.3% (-3.1%)
<b>Indonesia</b> (Latent)	Net exporter > net importer	1.08%	16.95% (2019)	\$45 (-64%)	33.9% (+13.2%)	22.9% (+3.5%)
<b>Nigeria</b> (Dormant)	Net exporter	0.39%	18.97% (2020)	\$9 (-78% (2010-16) (+2,686% 2016-19)	14.8% (+4.5%)	50% (+59.6%)

# Targets on renewable, electric vehicles, biofuels and fuel efficiency can help reduce transport oil demand among focus countries.

(Level of ambition: High / Medium / Low (see Annex))

Country	RE targets	EV targets	Biofuel mandates & targets	Vehicle fuel efficiency/ GHG standards	Other transport targets
<b>India</b> (Front runner)					Indian Railways 5 GW solar by 2025
<b>Norway</b> (Front runner)					Reduce transport emissions 40%/2030
<b>Pakistan</b> (Progressive)					
<b>Antigua &amp; Barbuda</b> (Determined)					Ban on ICE vehicle imports by 2025
<b>Chile</b> (Mixed)					Top three hydrogen exporter by 2040
<b>Egypt</b> (Latent)					
<b>Indonesia</b> (Latent)					
<b>Nigeria</b> (Dormant)					25% CNG trucks and buses by 2030

# Threats to fossil fuel subsidy reform arise from a lack of equity in government policies and a lack of alignment among actors.



**Political backlash:** Governments face public protests where fossil fuel subsidy reform increases prices for essential goods and services (e.g. electricity, fuel, transport, food).

*Country examples:* Ecuador, France, Nigeria



**Equity and development concerns:** Reforms affect socio-economic groups differently, and in general, higher-income households use more energy and benefit more from subsidies.

*Country examples:* India, Indonesia



**Vested interests of actors benefiting from current systems:** Some individual actors gain substantially from maintaining the status quo and often have significant political influence.

*Country examples:* Nigeria, Norway



**Disconnect between energy and transport policies:** Decision-making processes on energy, transport and fossil subsidies often cut across ministries, leading to a lack of policy alignment.

*Country examples:* France, Indonesia, United States

# Opportunities for energy subsidy reform increase economic efficiencies and catalyse sustainable development objectives.



**Aligning market signals:** Using lower energy price phases to reform the fossil fuel subsidy system has enabled a number of countries to implement successful reforms.

*Country examples: Indonesia, Nigeria*



**Gradual phase out of subsidies:** Removing subsidies gradually while phasing-in measures to mitigate effects has the potential to increase public buy-in.

*Country examples: Egypt, Thailand*



**Reallocating subsidies to social services:** Successful reforms demonstrate the benefits of redirecting subsidies to health and education services or direct transfers to low-income households.

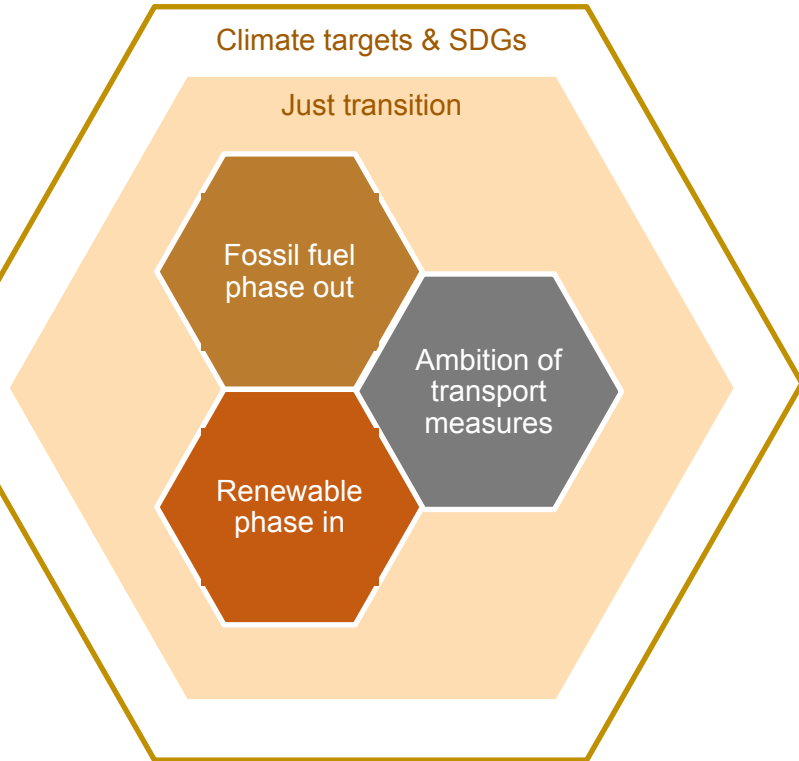
*Country examples: Egypt, India*



**Proactive communication campaigns:** Reforms must be well-communicated to the most affected socio-economic groups to illustrate expected benefits and counteract negative perceptions.

*Country examples: India, Indonesia*

# Building blocks for successful transport decarbonisation must be embedded in just transition and linked to global goals/targets.



Fossil fuel phaseout, renewable energy phase-in and transport ambition must be **aligned** to enable coherent public policy and investment frameworks.

Efforts in these areas must be **embedded** in measures that support a **just transition** and ensure protection for the most vulnerable.

Actions must be linked to **Paris Agreement targets and SDGs** to feed into broader climate change and sustainable development targets.

# A policy framework on energy reform for transport requires several key elements to ensure effective, efficient use of public resources.

## Fossil fuel phase out (oil/ electricity)

**Consumer subsidies:** Ending price stabilisation measures for transport fuels and electricity

**Production subsidies:** Ending support to oil extraction and coal mining

## Renewable phase in

**Biofuel strategies and targets**

**Renewable electricity targets** aligned with future transport demand

**Linked off-grid solutions** for privately-owned and public fleet vehicles

## Transport decarbonisation policies

**Transport CO<sub>2</sub> targets**

**ICE phase out targets/ EV phase in targets**

**Fuel efficiency targets** (LDV and HDV)

Policy measures for **2-/3-wheelers, mini-buses**

Import/export policies on **second-hand vehicles**

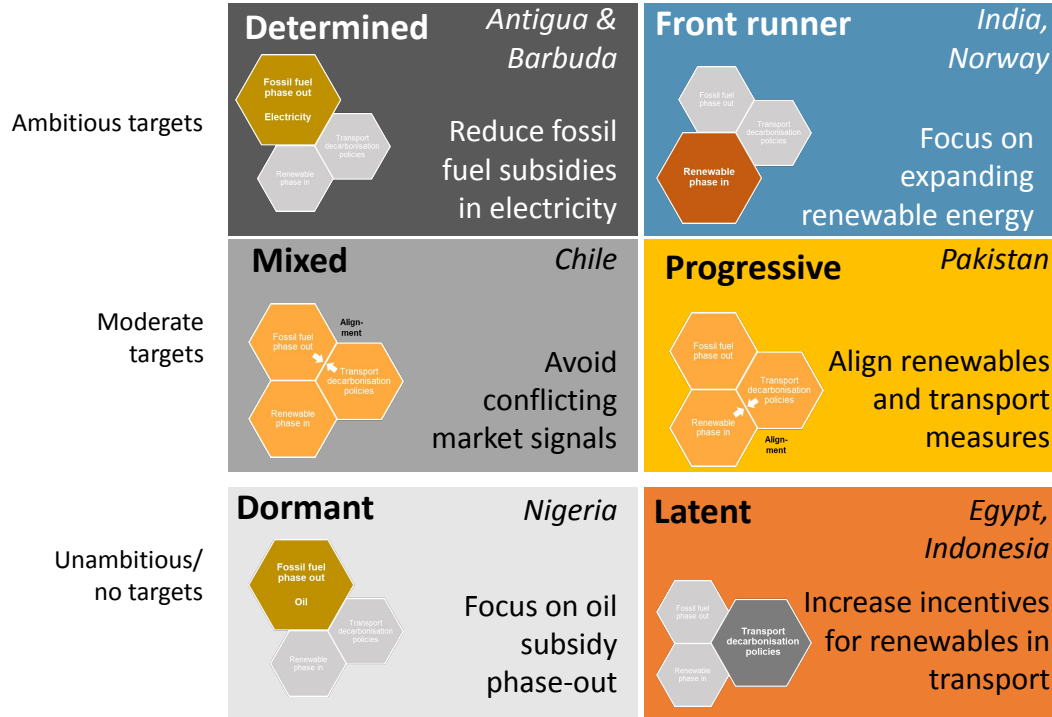


# Different country types need differentiated strategies and priorities to achieve alignment between energy/transport goals.

## Fossil fuel subsidy trends per capita

Growing / 'rebound'

Decreasing



- **Ambitious transport targets:** rapidly decarbonise power generation, subsidy phase-out
- **Moderate transport targets:** increase alignment of transport and renewables measures
- **Unambitious transport targets:** ramp up incentives to reduce transport sector oil demand

# An integrated approach to subsidy reform and renewables scale up in will deliver a just and equitable transport transformation.



**Integrated approaches will send clear market signals for all actors.** Aligning transport and energy supply and demand will deliver win-win solutions to producers, consumers and policymakers.



**Phasing out transport fossil fuel subsidies will enable financing of transport transformation.** Transport demand solutions should provide the best solutions at the lowest generalised cost for individual and the system, accounting for socio-economic, environmental and health impacts.



**A wider reform will require a just transition to address counterarguments.** Countries with growing or rebounding fossil fuel subsidies must pursue phase-out strategies which redistribute saved subsidy expenses to fund measures to reduce negative impacts on the poorest.



**COVID-19 recovery strategies will inform future transport-energy investments.** With recovery packages driving economies, governmental support is integral to wider fossil fuel subsidy reform.



**The road from COP26 to COP27 must build momentum toward urgent action.** The Glasgow Climate Pact has signaled that fossil fuel phase out is central to achieving Paris Agreement targets.

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# Annex: Assessment of transport decarbonisation ambition level

Levels of **transport ambition** assessed through official plans and targets

	ZEV + ICE phase-out targets (cars, trucks, buses, 2-/3-wheelers)	Biofuels targets	Vehicle fuel efficiency or GHG standards
<b>Ambitious</b>	<ul style="list-style-type: none"> <li>100% EV/ZEV sales by 2040</li> <li>100% stock by 2050</li> </ul>	<ul style="list-style-type: none"> <li>Above 20% by 2030</li> <li>System to ensure sustainability</li> </ul>	<ul style="list-style-type: none"> <li>PV/LDV: following EU 2025 standards by 2030</li> <li>HDV: US/Canada 2025 standards by 2030</li> </ul>
<b>Moderate</b>	<ul style="list-style-type: none"> <li>Above 50% EV/ZEV sales by 2040</li> <li>Above 50% stock by 2050</li> </ul>	<ul style="list-style-type: none"> <li>10-20% by 2030</li> <li>Criteria for sustainability defined</li> </ul>	<ul style="list-style-type: none"> <li>PV/LDV: following EU 2025 standards by 2035</li> <li>HDV: US/Canada 2025 standards by 2035</li> </ul>
<b>Unambitious</b>	<ul style="list-style-type: none"> <li>Below 50% EV/ZEV sales by 2040</li> <li>Below 50% stock by 2050</li> </ul>	<ul style="list-style-type: none"> <li>Below 10% by 2030</li> <li>Acknowledgement of need for sustainability</li> </ul>	<ul style="list-style-type: none"> <li>PV/LDV: following EU 2025 standards by 2040</li> <li>HDV: US/Canada 2025 standards by 2040</li> </ul>

Key to icons  
(see [Slide 12](#)):



Renewable energy targets



Biofuels mandates/targets



Light-duty vehicles



Heavy-duty vehicles



Public buses



2- and/or 3-wheelers