

# MONITOR

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## Decarbonising the transport sector in the Global South

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### Possibilities, challenges, and reciprocities on the road to climate-neutral mobility

*Lukas Lingenthal and Alex Aung Khant*

- › The transport sector is responsible for nearly a fourth of global CO<sub>2</sub> emissions, making it a major contributing factor for climate change.
- › Until now, relatively little attention has been paid to the transport sector in the Global South. More focus should be placed on this sector in development cooperation and international energy partnerships.
- › A large number of countries in the Global South have no national strategies or action plans to reduce the CO<sub>2</sub> emissions emitted by the transport sector.
- › Strategies and measures to decarbonise the transport sector in Europe can have an impact on countries in the Global South, as these strategies and measures rely on raw materials and green energy sources for electromobility.
- › The international market for used cars creates direct connections between the transport sectors in the Global North and South.
- › Decarbonising the transport sector is therefore of (geo)strategic importance in terms of climate policy and industrial policy, as well as with regard to China's Belt and Road Initiative and how the G7 countries intend to respond to it.

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### The role of the transport sector for climate change

In the discussion on achieving the Paris climate targets, the transport sector plays a prominent role, as it is responsible for nearly a quarter of global CO<sub>2</sub> emissions<sup>1</sup> and is the only sector that has not significantly reduced its greenhouse gas emissions since 1990. In Germany, where the transport sector accounts for nearly a third of domestic greenhouse gas emissions, the debate on mobility very much revolves around electromobility, digitalisation, and the shift in individual mobility behaviour away from private cars to more environmentally friendly modes, i.e., public transport, cycling and walking.

But what can we say about the decarbonisation of the transport sector in the countries that expect to see the largest population growth and whose need for mobility will consequently steadily increase in the coming decades? This applies, in particular, to Africa, South and Southeast Asia and parts of Latin America, i.e., regions of the Global South. What will future transport concepts look like in these regions? To what extent are there links to what is currently being implemented in Germany and Europe?

What role does the transport sector in the Global South play in international climate negotiations? And what does the cooperation look like regarding raw materials and renewable energies, both of which are urgently needed to decarbonise the German transport sector?

### Transport models in the Global South

Generally speaking, private passenger vehicles play a less significant role in the Global South than in certain regions of the Global North. The motorisation rate (number of cars per 1,000 inhabitants) in countries of the Global South is a fraction of that in Europe and North America. In 2015, the EU (at that time, still including the United Kingdom) and the four EFTA states posted a rate of 581, while the three NAFTA states (USA, Canada and Mexico) had a rate of 670. In South and Central America, on the other hand, the motorisation rate was only 176, in Asia and Oceania 105 and in Africa 42 vehicles per 1,000 inhabitants.<sup>2</sup>

However, these regions will experience high population growth in the coming decades, and the motorisation rate there is already rising annually. Over the ten-year period from 2005 to 2015, this rate increased by 60 percent in South and Central America, by 35 percent in Africa and by an extraordinary 141 percent in Asia; the global average during this period was 27 percent. The number of vehicles in operation worldwide is expected to more than double from around 1.4 billion today to an estimated three billion by 2050.

Nonetheless, when discussing efforts to reduce CO<sub>2</sub> emissions from the transport sector in the Global South the focus has been placed thus far on means of transport that are currently most widely used and for which a renewal of the vehicle fleet can probably be conducted most quickly. This applies, in particular, to public transport as well as small two- and three-wheelers. The rail network is underdeveloped in most countries and is unable to meet a large proportion of transport needs.

#### Info box – What does Global South mean?

The Global South refers to the group of developing and emerging countries. The term has existed since the late 1980s and has been increasingly used by institutions and in literature in recent years to avoid evaluating countries as underdeveloped. It therefore does not refer to geographical location but rather the level of a country's development. The term Global North, accordingly, describes the group of industrialized countries.

### Overview of the transport sector in three regions of the Global South

#### Latin America

In Latin America, where the transport sector is responsible for 15 percent of greenhouse gas emissions according to the United Nations Environment Programme (UNEP), numerous national strategies are aimed at electrification, with a clear focus on public transport in urban areas.<sup>3</sup> This is significant since Latin America is the region with the highest degree of urbanisation in the world, with 80 percent of the population there currently living in urban areas. Until now, no country in the region has implemented a national strategy that addresses the phasing out of the internal combustion engine in private transportation.

Public transportation makes up 68 percent of all passenger movement in Latin America's cities, with the bus the most used means of transport. Latin America has the world's highest per capita rate for bus travel.<sup>4</sup> This makes it a good starting point to implement strategies for decarbonising

the transport sector. Cities such as Bogotá in Colombia and Curitiba in Brazil have set an internationally recognised example, each having introduced a network of express bus lines. This initiative serves as a model that is being copied across the globe. The electrification of the bus fleets in urban areas is the next logical step. From 2025, Latin America is expected to add 5,000 buses with electric transmission every year.<sup>5</sup> Traditionally, Latin America's energy mix has also strongly relied on renewable energies, with the lion's share coming from hydropower. This means at least a large part of the energy required for this expansion is already generated from renewable energy sources.

Electrifying bus fleets in large cities with logistics offered by public transport companies is one thing. The corresponding charging infrastructure can be organised centrally and charging can be synchronised with the operating times of the buses. A much greater challenge, however, is the decarbonisation of private vehicles. Despite the aforementioned importance and scale of public transport, this should not be underestimated. Although the number of charging points in the region is increasing every year, it still remains at a marginal level.

In addition to the electrification of (local) public transportation in cities, it is also worth taking a look at national strategies for decarbonising the transport sector in the areas of road freight and construction machinery. Outside the major urban areas, the transport routes usually lead through very sparsely populated areas with at times challenging terrain and a lack of well-developed infrastructure. The vast majority of heavy goods transport operations are performed by lorry over distances of up to several thousand kilometres. There are few examples of national strategies in this regard. Argentina and Chile are two countries that have recently started using green hydrogen. Biofuels also play a major role, especially in Brazil, the region's largest and most populous country.

## Africa

In Africa, primary energy consumption increased by a third between 2010 and 2020, driven in large part by the transport sector. The demand for fuels for transport increased by 50 percent during this period, and an increase of another two thirds is expected by 2040.<sup>6</sup>

Public transportation systems are the most important mode of passenger movement. The largest share is accounted for by the informal sector, i.e., motorcycle taxis, tuk-tuks, shared taxis and minibuses, which are privately operated and often unregulated. A growing number of cities are now making efforts to introduce more formal transportation systems with new bus lines run by the public sector.<sup>7</sup>

Small two- and three-wheelers are likely to play a major role in the electrification of the transport sector. They are more affordable than cars and require significantly lower battery power. This means they can be charged anywhere using small solar energy systems, which are becoming increasingly common. One of the obstacles to large-scale electrification of the transport sector is the power grid, which is unstable in many places. In a number of countries, it does not even serve half of the population. Only six countries have an electricity grid that provides power to at least 90 percent of the population. These include the Mediterranean countries of Algeria, Egypt, Morocco and Tunisia, as well as two countries in sub-Saharan Africa: the small island states of Mauritius and Cabo Verde.

According to the UNEP database, only two countries, Cabo Verde and South Africa, have an official national action plan for electric mobility. In Cabo Verde, the target for 2030 is to ensure two percent of the overall vehicle fleet are electric vehicles. In South Africa, much larger in size and

population, the targets are to have 20 percent of the total fleet in the form of hybrid or electric vehicles by 2030 and to have 2.9 million electric vehicles on the roads by 2050. The example of South Africa makes it clear that increasing the number of electric vehicles is only one side of the coin when it comes to decarbonising the transport sector. The other side pertains to the sources of energy, which hold more potential in reducing CO<sub>2</sub> emissions, and coal has a disproportionate share of South Africa's power generation, contributing 83.5 percent.<sup>8</sup>

## Southeast Asia

Southeast Asia is one of the most populous regions in the world. It has over 682 million inhabitants, which is about 8.6 percent of the global population. Since 2014, it has also been ranked by the Asian Development Bank as the fastest growing economic region in the world, with an annual growth of seven percent. These two factors alone point to an increasing demand for mobility in the coming years.

In the region, the vision of development for mobility and decarbonisation in cities can be summarised as shared mobility, with smaller micro-mobility alternatives to fill the gaps in the last mile. This is not a new concept, as it has been a development milestone since the mid-20th century, when countries in Southeast Asia started looking toward other Asian success models such as Japan, South Korea and China. The success of mass transit systems and high-speed rail infrastructure in these countries was seen as synonymous with national economic prosperity, and countries in Southeast Asia have been striving for this ever since. In recent years, it has been extensively implemented in larger, wealthier cities such as Singapore and Bangkok, while other cities are still trying to catch up.

Although the electrification of private road transport has become the focus of decarbonisation strategies in the European mobility sector, it does not yet play a major role in Southeast Asia, where cities still have to cope with other challenges in many areas. Road infrastructure and the electricity grid, demographics, transport needs and climate are just some of the important factors influencing the move towards decarbonising mobility.

The conditions of the roads in many of the region's cities are unsatisfactory for a variety of reasons, from poor construction to frequent flooding during the annual monsoon periods. Electricity grid coverage is still sparse, especially in the outer urban areas, and power outages are frequent. Here, too, the low reliability of the power grid poses an obstacle for the electrification of private transport.

## Interdependencies between Europe and the countries in the Global South Raw materials and green energy

An important factor regarding the sustainable decarbonisation of the transport sector is the origin of the raw materials and energy required, as expanding electromobility calls for a high demand for raw materials. It does not matter whether the focus of such expansion is in Europe or elsewhere. The raw materials required for the production of batteries – lithium and cobalt are the two most prominent examples – are largely extracted in countries in the Global South.

There are two important questions to ask in the case of promoting and building partnerships to decarbonise the transport sector in the Global South. The first question is "Under which conditions are raw materials extracted in the Global South?", and the second is "Could the extraction of these primary raw materials have positive socio-economic effects in the countries of origin or will the situation remain simply a one-way street?" Although these issues existed before

demand for raw materials for electromobility increased, they should be addressed in both this and other areas.

Another similar reciprocal effect between countries in the Global South and Europe will be encountered when meeting the high demand for energy from renewable sources in the future. Regardless of whether this energy is used for battery-powered electric motors or for hydrogen-powered motors, if the electricity and hydrogen are not generated from environmentally friendly sources, the process cannot be referred to as a decarbonisation of such drive technologies. The same applies to synthetic hydrogen-based fuels, also known as e-fuels. In the future, the demand for green hydrogen will not only be driven by the mobility sector. Use of this fuel in industry and for heat generation should also help to reduce the use of fossil fuels. The possibility of substituting natural gas with green hydrogen has now garnered more attention in the public debate due to Russia's invasion of Ukraine and the resulting gas shortage. However, green hydrogen must first be produced, traded and transported in large quantities.

Energy partnerships with countries whose natural resources allow them to produce large quantities of green hydrogen (many of which are in the Global South) will play an important role in these circumstances. The question is, will these countries only produce green hydrogen in the future because it will be a worthwhile export product, or will they also benefit from it in their own energy mix?

### The used car market

Another factor influencing the decarbonisation of the transport sector in the Global South is the used car trade. Between 2015 and 2020, Africa imported 5.6 million used cars and light commercial vehicles. This figure was 2.9 million in the Asia-Pacific region and 2 million in Latin America.<sup>9</sup> The EU is the largest exporter of used cars, followed by the United States, Japan and South Korea. 4.9 million cars were exported from the EU alone during this period.<sup>10</sup> These vehicles are often older models that are no longer in demand on domestic markets. Taking into consideration that a car owned in Germany is driven on average for around 17 years, a subsequent export means a further extension of the lifetime of relatively outdated technology with low fuel efficiency levels.

Countries in the Global South are now responding with stricter import regulations for used cars. Some African countries only allow imports of cars that meet at least the Euro 4 standard. Peru has tightened its import regulations to only allow engines with the Euro 6 standard. In many places, high import duties are put in place to make purchasing older vehicles less attractive.

At the same time, the export of newer used vehicles to the Global South can help to accelerate the modernisation of the vehicle fleets in those countries. Despite customs duties and other import regulations, it is still more affordable to buy a used car than a new one – especially since countries in the Global South do not subsidise the purchase of modern vehicles as other countries such as Germany do. After all, there is now a still small but growing global used car market with vehicles that have hybrid, plug-in hybrid or battery-electric motors. Between 2017 and 2020, 13,751 such vehicles were exported from the EU to Africa, 2,709 to Asia-Pacific and 841 to Latin America. The latter two regions, however, have a much more intensive second-hand car trade with the United States, Japan and South Korea than with the EU. Overall, the Asia-Pacific region is the largest importer of used hybrid, plug-in hybrid and battery-electric cars with a share of 52 percent.<sup>11</sup>

## Importance of the topic in international politics

Reciprocities between the Global South and the Global North in the areas of mobility exist on many levels, including economic relations and partnerships. However, decarbonising the transport sector in the Global South is still a niche topic in development cooperation. This is certainly reflected in the availability of information as well as the low number of articles and sources that can be found. This is not surprising given the relatively small contribution of the transport sector in the Global South to total CO<sub>2</sub> emissions and the urgency of other issues in the context of international development cooperation.

However, both the significance of the transport sector in the Global South given a growing population and an increasing number of development projects targeting the transport sector indicate that the topic will become more important in the future. Again, this is hardly surprising considering the fact that the transport sector is responsible for a quarter of global greenhouse gas emissions and relatively little has been done to counteract this compared to other sectors. Climate protection ultimately cannot be achieved without considering the transport sector.

## Development cooperation

The United Nations Environment Programme carries out projects in this area and is also a good source for facts and figures collected on the subject. The German Federal Ministry for Economic Cooperation and Development (BMZ) is increasingly involved in partnerships on sustainable mobility, in particular through the Transformative Urban Mobility Initiative (TUMI), which is a central implementation partnership in this area. Partners in this initiative include the German development cooperation institutions the GIZ and the KfW, as well as the Asian Development Bank (ADB) and the Development Bank of Latin America (CAF). Since 2016, the initiative has been used to finance sustainable transport infrastructure. A partnership for environmentally friendly urban mobility was concluded with India in 2019. The ministry has also been involved in the World Bank's Sustainable Urban Mobility for All (SUM4All) partnership and the Action towards Climate-friendly Transport (ACT) umbrella initiative since 2019.<sup>12</sup>

## G7

The question remains as to what extent the partnership for global infrastructure announced at the G7 summit in 2022, which is supposed to function as a response to China's Belt and Road Initiative, can and should be used to specifically promote infrastructure that benefits the decarbonisation of the transport sector. However, no further details have been given since the announcement in June that the G7 countries will spend 600 billion US dollars for this purpose by 2027.

## International climate negotiations

In the days before COP26 in Glasgow in 2021, a detailed paper entitled *Electromobility in the Global South: An equitable transition toward road passenger transport decarbonization*<sup>13</sup> was published by a number of renowned institutions. The paper starts by asking the question whether the electrification of mobility can actually be a successful model for all countries or whether this trend opens up a new – green – divide between industrialized countries and the least developed countries.

It identifies six key issues crucial in determining whether decarbonising the transport sector in the Global South can be achieved while presenting economic and social opportunities for the population in the region, as well as whether there is a real chance to leapfrog (i.e., skip certain development steps) the Global North in the transport sector. First, it mentions the availability of reliable electricity grids fed by renewable energy sources. Second, in terms of economic policy, it



calls for enabling new business models and adapted tax models that provide incentives for decarbonising the transport sector as well as eliminating subsidies for fossil fuels. The third issue relates to financing, which, like the transfer of knowledge, the paper considers to be a responsibility of the Global North. Fourth, the paper identifies the need to address social components to make environmentally friendly transport affordable, accessible, safe and inclusive in order to increase acceptance among the population. Fifth, it suggests that governance and regulation are needed to ensure that minimum standards are met, including those for imports of used vehicles. Last, the paper calls for the inclusion of the supply chains for electromobility, starting with the extraction of raw materials and the social and environmental effects of this extraction in the countries of origin.

The transport sector in general will play a role in the debate on preventing and reducing CO<sub>2</sub> emissions at COP27 in Sharm El-Sheikh. Discussions are likely to continue to focus on the countries and regions that are among the largest emitters. The extent to which the transport sector in the Global South will play an explicit role will only be seen in the specific negotiations on financing decarbonisation. The topic will certainly come up in discussions at the large number of side events; however, it is not expected to play a prominent role.

## Conclusion

The relevance of the decarbonisation of the transport sector should not be underestimated. After all, nearly a quarter of global greenhouse gas emissions can be attributed to it. The fact that the focus has thus far been placed on the industrial nations of Europe, North America, Japan, South Korea and the major emerging economies of China and India is understandable. At the end of the day, this is where the majority of traffic emissions are generated. However, the countries of the Global South should also receive appropriate attention in this regard.

The Global South will see the largest population growth of the coming decades, and this will be accompanied by a rapid increase in traffic volume. Although the vehicle fleets in these countries are not as large as those in the Global North, they are comprised to a considerable extent of end-of-life vehicles imported from industrialized nations, which only prolongs the path towards global decarbonisation of the transport sector. Including the transport sector in development cooperation is important. In the best case, it would allow the Global South to actually leapfrog the Global North (i.e., skip inefficient technology development steps). Ideally, it would also allow climate-neutral transport options to be taken into account from the outset when expanding and initiating new construction of transport infrastructure. It is essential to see the transport sector in context. In addition to support within the framework of development cooperation, the local economic policy framework conditions and the expansion of electricity grids must be such that investment in the sector is worthwhile and positive social effects are achieved. There is also a direct connection between the phasing out of fossil fuels being pursued in Europe and the extraction of raw materials in the Global South that are required for this. This extraction process must meet minimum social and ecological standards in order to contribute to a form of mobility that is truly sustainable. Another aspect pertains to future energy partnerships, especially with regard to green hydrogen. This will play a key role in the decarbonisation of the transport sector, for both vehicle fleets and international air and maritime transport, which this article has not discussed in detail. The topic of green hydrogen also raises the question as to the extent to which the potential future supplier countries, many of which are in the Global South, will themselves benefit from this technology: not only as a new transmission technology but also as a basis for synthetic fuels, which are an interesting alternative to both fossil fuels and biofuels. Biofuels play an important role in climate-neutral mobility in some countries but naturally lead to the



discussion about competition for land with food production. In addition, synthetic fuels open up the possibility of operating vehicle fleets with combustion engines in a more climate-neutral manner. In addition, they could offer an advantage, especially in remote and sparsely populated areas, as the infrastructure for fuel distribution already exists in contrast to stable power grids.

Every aspect of this multifaceted topic signals that mobility and the decarbonisation of the transport sector should always be considered in the context of other relevant topics rather than in isolation. This also applies to the focus of international cooperation. Ultimately, it is an important topic in two regards: first, in terms of climate policy and industrial policy with a view to future key technologies for mobility, and second, in terms of geostrategic policy regarding China's Belt and Road Initiative and how the G7 countries intend to respond to it.

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  - 8 URL: <https://www.enerdata.net/publications/daily-energy-news/renewables-accounted-161-south-africas-power-mix-2020.html> (retrieved on 21/10/2022)
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  - 10 Ibid.: The total number of car exports from all EU countries is 11.5 million, with more than half traded within the EU. 4.9 million corresponds to the number of used cars exported outside the EU.
  - 11 Ibid.
  - 12 Cf. Factsheet Verkehr und Mobilität des BMZ, URL: <https://www.bmz.de/resource/blob/97764/6fea465fe7ce35b78fd704d0fab4abd9/zweiseiter-verkehr-mobilitaet-cop26-de-final-data.pdf> (retrieved on 21/10/2022)
  - 13 URL: [https://www.sum4all.org/data/files/electromobility\\_in\\_the\\_global\\_south\\_an\\_equitable\\_transiti\\_on\\_toward\\_road\\_passenger\\_transport\\_decarbonization.pdf](https://www.sum4all.org/data/files/electromobility_in_the_global_south_an_equitable_transiti_on_toward_road_passenger_transport_decarbonization.pdf) (retrieved on 21/10/2022)

## Imprint

### About the authors

Lukas Lingenthal is policy advisor for mobility as well as for urban and rural development in the Analysis and Consulting Division of the Konrad Adenauer Foundation.

Alex Aung Khant is a municipal electoral candidate for the city of Yangon, Myanmar. He was a Fellow of the Konrad Adenauer Foundation from November 2021 to October 2022, assisting in the Foundation's work, particularly in the field of sustainable urban development and mobility in cities in Southeast Asia.

### Konrad-Adenauer-Stiftung e.V.

#### Lukas Lingenthal

Policy Advisor Mobility, Urban and Rural Development  
Division Analysis and Consulting

T +49 30 / 26 996-3689

[lukas.lingenthal@kas.de](mailto:lukas.lingenthal@kas.de)

*Coordination of the publication series*

#### Gisela Elsner

Policy Advisor Global Sustainability  
Division Analysis and Consulting

T +49 30 / 26 996-3759

[gisela.elsner@kas.de](mailto:gisela.elsner@kas.de)

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