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Major issues in transport

Environmentally sustainable transport systems and services

Note by the secretariat

Summary

In the Asia-Pacific region, the transport sector accounted for more than 50 per cent of the total oil consumed in 2019. The sector contributes nearly 14 per cent of the total carbon dioxide emissions in the region, with road vehicles continuing to account for the majority of the sector's emissions. The sector's total final energy consumption and carbon dioxide emissions have doubled since 2000 due to the rapid growth in population and economic development, as well as motorization, and will continue to increase in a business-as-usual scenario.

There is a need to accelerate the transition of the transport sector in the Asia-Pacific region to environmentally sustainable transport infrastructure, systems and services, as well as a need for policy and other measures on low-carbon transport, including the decarbonization of the regional supply chain, energy efficiency in transport, the transition to electric mobility, integrated urban transport development and the digitalization of transport in the region. The present document provides background information on potential mechanisms relevant to the establishment of a regional cooperation mechanism to promote low-carbon transport and to an initiative on electric mobility to contribute to transport emissions reductions.

The Committee on Transport may wish to provide feedback on the way forward for the establishment of a regional cooperation mechanism to promote low-carbon transport and support the Asia-Pacific initiative on electric mobility, which would help to reduce greenhouse gas emissions from the transport sector. The Committee may also wish to share updates and selected highlights with regard to national, bilateral and multilateral policies and initiatives related to environmentally sustainable transport systems and services, consider the policy directions, actions and activities described in the present document and provide further guidance to the secretariat on the ongoing and planned activities in support of environmentally sustainable transport infrastructure, systems and services.

* ESCAP/CTR/2022/L.1.

I. Introduction

1. The Asia-Pacific region continues to witness a rapid increase in demand for both freight and passenger transport. After bottoming out from the impacts of the coronavirus disease (COVID-19) pandemic, merchandise trade growth in Asia picked up rapidly in 2021. Trade growth reached 19.7 per cent by June before settling down to 9.7 per cent in September.[1] The total population of the Asia-Pacific region is projected to grow by 14 per cent between 2020 and 2050, with the urban population expected to experience a growth rate of nearly 50 per cent. In 2050, 66 per cent of people in the region will live in cities, compared to 51 per cent in 2020. These increases in trade and population will also mean an increase in the demand for transport.

2. The International Transport Forum (ITF) has estimated that, under the current trajectory, passenger transport demand in Asia is estimated to triple between 2015 and 2050, while the demand for surface freight transport is projected to increase by 200 per cent during the same period. Nearly half of the world's surface freight transport (measured in ton-kilometres) will be concentrated in Asia. The growing levels of transport demand will result in a rapid increase in carbon dioxide emissions. Furthermore, in a business-as-usual scenario, transport-related carbon dioxide emissions in Asia will increase by 47 per cent between 2015 and 2050, while developed economies are expected to see reductions in emissions in the same period owing to the relatively constant demand for transport.[2]

3. The rapid increase in transport-related carbon dioxide emissions can be explained by the dependence of the sector on fossil fuels. In the Asia-Pacific region, oil products accounted for 84 per cent of transport consumption in 2019.[3] The International Energy Agency (IEA) estimates that oil products will still account for around 75 per cent of transport consumption in 2030 due to the limited uptake of alternative fuels in the transport sector.[4] Only a handful of countries in the region use renewable energy for transport; that share accounts for 2 per cent of all the energy consumed in the transport sector in Asia and the Pacific.[5] The role of alternative fuels in the decarbonization of the transport sector must therefore be strengthened and fuel options must ultimately be based on renewable energy sources.

4. The transport sector contributes to nearly 14 per cent of all carbon dioxide emissions in the Asia-Pacific region. Road vehicles are major contributors to transport-related carbon dioxide emissions. In 2019, in the majority of the members and associate members of the Economic and Social Commission for Asia and the Pacific (ESCAP), the final energy consumption share of road transport was over 70 per cent.[6] According to IEA, road freight

[1] Asian Development Bank, *Asian Economic Integration Report 2022: Advancing Digital Services Trade in Asia and the Pacific* (Manila, 2022).

[2] Organisation for Economic Co-operation and Development (OECD) and ITF, *ITF Transport Outlook 2021* (Paris, OECD Publishing, 2021).

[3] Statistics Division, Department of Economic and Social Affairs, "Data visualization portal", Energy Balance Visualization. Available at https://unstats.un.org/unsd/energystats/dataPortal/ (accessed on 1 September 2022).

[4] IEA, *World Energy Outlook 2021* (Paris, 2021).

[5] Statistics Division, Department of Economic and Social Affairs, "Data visualization portal", Energy Balance Visualization.

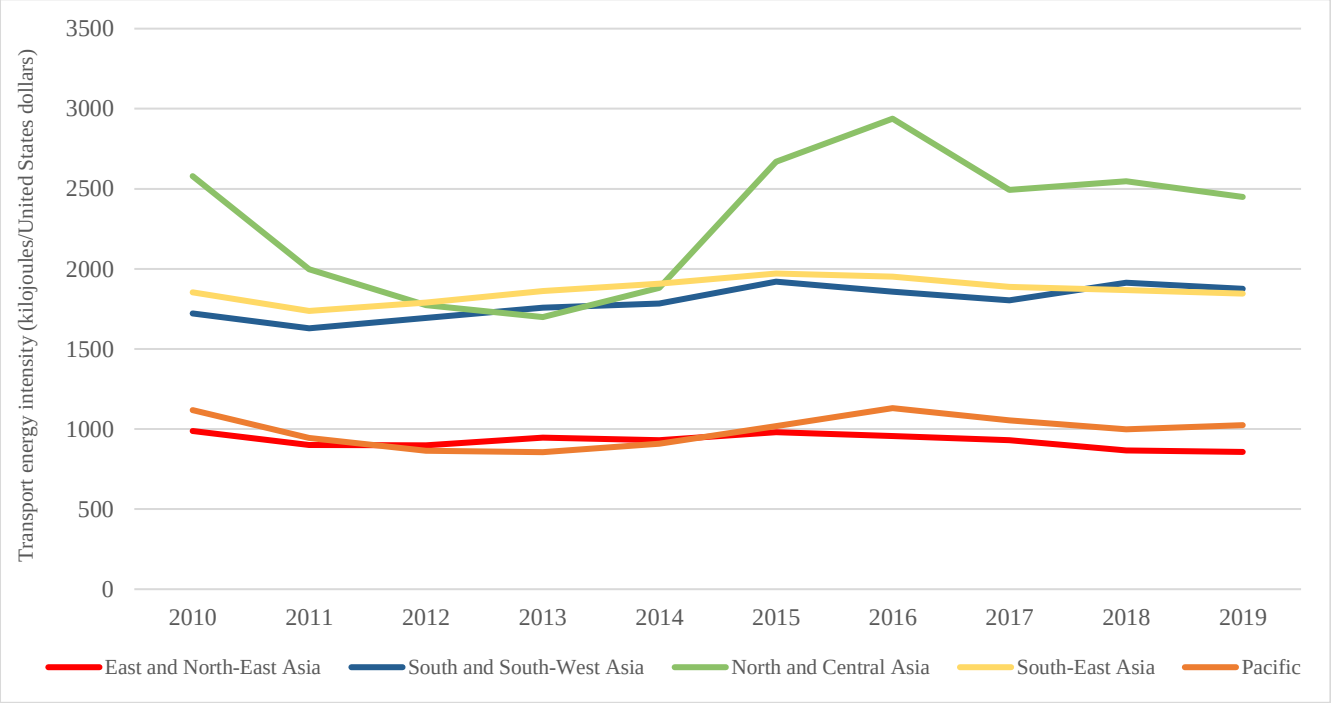
[6] Ibid.

transport accounts for much higher levels of carbon dioxide emissions than road passenger transport.

5. In the passenger transport sector, the highest share of emissions from urban passenger transport comes from private vehicles. In 2015, around 60 per cent of urban passenger carbon dioxide emissions in Asia were emitted by private vehicles.[7] During the period from 2011 to 2021, the number of passenger cars sold in the Asia-Pacific region increased each year by 3 to 9 per cent (although it decreased between 2018 and 2020 due to the COVID-19 pandemic).[8] IEA estimates that the global private passenger vehicle fleet will grow by more than 30 per cent between 2020 and 2030.

6. The dominance of road transportation described above has been slowing down the improvement rate of transport energy intensity in the Asia-Pacific region. Transport energy intensity levels in the ESCAP region were flat during the period between 2000 and 2019, while global transport energy intensity levels improved steadily during the same period (see figure I). To meet Sustainable Development Goals 7, 9 and 11, the rate of improvement needs to be expedited.

Figure I
Transport energy intensity in ESCAP members and associate members, by subregion, 2010–2019



Source: IEA and World Bank.

[7] OECD and ITF, *ITF Transport Outlook 2021*.

[8] Statista, "Number of passenger cars sold in the Asia-Pacific region from 2011 to 2021".

II. Accelerating the transition towards environmentally sustainable transport infrastructure, systems and services: the race against climate change

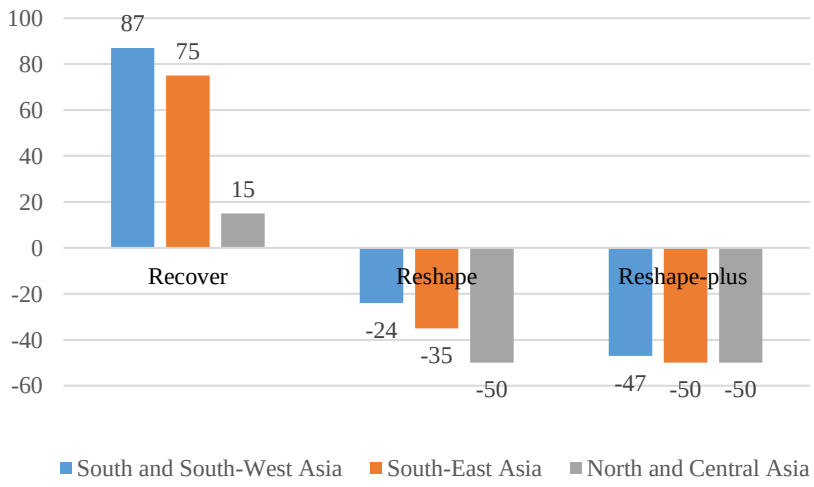
7. The above-mentioned accelerated increases in demand for transport and associated emissions are threatening the decarbonization target of the Paris Agreement by 2050 and the achievement of transport-related Sustainable Development Goals. Policies must be developed and actions must be taken to promote the transition towards environmentally sustainable development. The present section contains information on measures taken and interventions made in focus areas, in line with the priorities identified in the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026).

A. Decarbonizing the regional supply chain

8. The COVID-19 pandemic is not expected to reverse or stop the projected growth in freight transport in Asia and the Pacific during the coming decades.[9] If no action is taken, this growth will come at an increasingly high environmental cost. At the same time, the latest analysis shows that, with proper policies in place, there is a way to decouple economic growth from a further increase in carbon dioxide emissions.

9. Recent joint analysis carried out by the ESCAP secretariat and ITF for selected subregions, namely, South and South-West Asia, North and Central Asia and South-East Asia, shows a tremendous potential for decarbonizing freight operations in the region by 2050 (see figure II).

Figure II
Estimated change in non-urban freight transport-related carbon dioxide emissions, 2015–2050, by scenario
(Percentage)



Sources: ITF, *ITF North and Central Asia Transport Outlook; ITF Southeast Asia Transport Outlook; and ITF South and Southwest Asia Transport Outlook* (Paris, 2022).

[9] See also ESCAP/CTR/2022/2.

10. In the recover scenario (business as usual), all three subregions will experience a drastic increase in carbon dioxide emissions: 15 per cent in North and Central Asia, 75 per cent in South-East Asia and 87 per cent in South and South-West Asia. The situation changes drastically if Governments implement policy measures that encourage changes in the behaviour of transport users, uptake of cleaner energy and vehicle technologies, digitalization to improve transport efficiency and infrastructure investment to help meet environmental and social development goals (reshape scenario). Such policies could lead to reductions in carbon dioxide emissions of 24 per cent in South and South-West Asia, 35 per cent in South-East Asia and 50 per cent in North and Central Asia. Emissions could be cut by almost 50 per cent in all three subregions if the decarbonization opportunities created by the pandemic were seized, if any of the reductions in demand observed during the pandemic were to continue and if a more ambitious decarbonization policy package were also to be implemented (reshape-plus scenario).[10]

11. Decarbonizing freight transport would require multiple interventions on all fronts: economic and regulatory instruments, infrastructure enhancements, operation management improvements and the stimulation of innovation and development.[11]

12. The existing institutional framework for regional freight operations, which includes the Asian Highway network, the Trans-Asian Railway network, dry ports of international importance and maritime and integrated transport connectivity between port and hinterland, can be further leveraged to decarbonize transport operations. Furthermore, countries are encouraged to improve their newly constructed road and rail transport networks.

13. The use of rail in international freight is another significant opportunity for decarbonization. While increases in the use of rail already contribute to decarbonization, it is also possible to decarbonize rail itself, making it a practically zero-emission mode of transport. Since railways in the Asia-Pacific region transport varying volumes of freight using various levels of infrastructure, there is no single solution for achieving decarbonization. To that end, the ESCAP secretariat has developed a maturity assessment matrix as a strategic tool for mapping the maturity and capabilities of individual railways for rail decarbonization according to four parameters: sources of electricity supply, supporting infrastructure, financing availability and management priorities.[12]

14. In the area of maritime transport, implementing global goals to achieve decarbonization requires stronger national and regional efforts. The secretariat is working with ESCAP members and associate members on disseminating information on the best and most innovative initiatives and practices for decarbonizing shipping, such as the green shipping corridors.[13]

15. Finally, recent changes in first- and last-mile delivery within the logistics network, including those due to the impact of e-commerce and the COVID-19 pandemic, have encouraged logistics operators to create new ways

[10] Detailed descriptions of all three scenarios are available in OECD and ITF, *ITF Transport Outlook 2021*, pp.184–186.

[11] For examples of measures implemented in the reshape and reshape-plus scenarios, see ESCAP/78/16, table 2.

[12] ESCAP, "Enhancing shift towards sustainable freight transport in Asia and the Pacific: opportunities through railway decarbonization" (Bangkok, 2021).

[13] See also ESCAP/CTR/2022/2.

of mitigating the adverse environmental effects of their operations by expanding their warehousing network, improving the environmental performance of delivery vehicles and optimizing trips.[14]

B. Energy efficiency in the transport sector

16. Globally, energy demand for the transport sector has been rising faster than for any other sector. This results in an increase in energy consumption in the transport sector that is set to continue to grow, predominantly in countries not members of the Organisation for Economic Co-operation and Development (OECD), with the greatest growth in Asia.[15] In the Asia-Pacific region, the transport sector accounts for 19 per cent of the total final energy consumption. In 2019, 33 million terajoules of energy were consumed; that amount has tripled since 2000[16] due to the rapid growth in population and economic development.

17. In the Asia-Pacific region, oil products accounted for 84 per cent of transport consumption in 2019.[17] At the same time, 80 per cent of ESCAP members and associate members rely on imports to meet their oil needs: while most Asian member States import between 15 and 70 per cent of the oil they consume, the proportion is 100 per cent among the Pacific island States.

18. The continued increase in energy consumption for transport makes the sector dependent on the availability of oil and vulnerable to price fluctuations. Considering the significant and growing share of the final energy consumed for transport, as well as that sector's dependence on imported oil, shifting to renewable energy will address macroeconomic issues linked to energy security and the balance of payments, for example. In 2018, only 11.3 per cent of the total energy supply in Asia and the Pacific was renewable, down from 15.4 per cent in 2000.[18] At the same time, the use of renewable energy for electricity generation nearly tripled during the same period, demonstrating the region's vast renewable energy potential to fuel electric mobility. This is especially important in view of the recent global fuel price fluctuations. Increasing energy efficiency is therefore critical, particularly for the many ESCAP members and associate members that are highly dependent on imported fuels. At the moment, however, renewable energy makes up a small share of the mix used by the transport sector.

19. Energy efficiency is recognized as the most cost-effective means of reducing emissions. The cost of every unit of energy saved is less than the cost of generating the same amount of energy.[19] Energy efficiency improvements can lower final energy consumption and therefore support the increased use of renewable energy. A 25 per cent reduction in energy intensity by 2030 will increase the share of renewable energy by a further 7 per cent without any

[14] ESCAP, "Green and sustainable logistics network: micro mobility in the first-last mile", policy brief (Bangkok, 2021).

[15] United Nations, "Interlinkages between energy and transport", Accelerating SDG 7 Achievement Policy Brief No. 16 (New York, 2018).

[16] Statistics Division, Department of Economic and Social Affairs, "Data visualization portal", Energy Balance Visualization.

[17] Ibid.

[18] ESCAP, Asia Pacific Energy Portal. Available at https://asiapacificenergy.org/ (accessed on 1 September 2022).

[19] *Energy Transition Pathways for the 2030 Agenda in Asia and the Pacific: Regional Trends Report on Energy for Sustainable Development 2018* (United Nations publication, 2018).

additional investment in renewable energy.[20] But the use of renewable energy in the transport sector will only increase if countries also introduce robust energy efficiency measures at the same time.

20. Some examples of energy efficiency measures are given in table 1, which includes best practices mainly from the Asia-Pacific region.

Table 1
Example of best practices of energy efficiency measures

Measure	*Context*	*Environmental impact*
Improvement of fuel economy standards	Increasing the average fuel economy through regulations that set limits on vehicle fuel consumption or carbon dioxide emissions.	Fuel consumption reduction, and consequently carbon dioxide reduction, in the order of almost 50 per cent can be achieved through vehicle technologies, without the introduction of costly vehicle powertrain configurations such as in hybrid and electric vehicles.[a]
Fuel blending mandate	Mandatory blending of low-carbon fuels, focusing on liquid and gaseous fuels.	Pure biodiesel reduces lifecycle greenhouse gas emissions by more than 50 per cent, while fuel that is 20 per cent biodiesel reduces them by at least 10 per cent.[b]
Reduction in motorway speed limits	Reducing motorway speed limits reduces engine and brake wear, which cuts down the cost and frequency of maintenance service.[c]	Lowering the speed limit for cars to 80 km/h can reduce transport carbon dioxide emissions on highways by 30 per cent in the longer term.[d]
Autonomous driving technologies	Incorporating varying degrees of automation to promote smooth driving, improve traffic flow and save fuel.	An innovative programme in Japan carrying out large-scale operational tests for automated driving indicates a 0.3–0.8 per cent carbon dioxide -emission reduction. [e]
Green logistics programmes	Encourage businesses to take measures that reduce the environmental impact of their activities, for example through eco-driving training programmes	Fuel savings for truck fleets can range from 3.5 to 30 per cent. A project in Japan in 2013 shows fuel-economy improvement of 8.7 per cent immediately after training.[f]

[20] Ibid.

Capacity utilization of logistics systems	Online platform to promote logistical collaboration between companies through the sharing of assets such as vehicles and warehouses.	In China, an online logistics information platform that provides freight information exchange services has helped trucking companies in Anyang city to reduce the empty mile percentage from 53 per cent in 2006 to 38 per cent in 2008. [g]

[a] Association of Southeast Asian Nations (ASEAN), *ASEAN Fuel Economy Roadmap for Transport Sector 2018-2025: With Focus on Light-Duty Vehicles* (Jakarta, 2019).

[b] United States of America, Environmental Protection Agency, *How to Develop a Green Freight Program: A Comprehensive Guide and Resource Manual* (Washington, D.C., 2014).

[c] Ibid.

[d] Matthijs Otten and Huib van Essen, "Why slower is better: pilot study on the climate gains of motorway speed reduction" (Delft, CE Delft, 2010).

[e] ESCAP, *Using Smart Transport Technologies to Mitigate Greenhouse Gas* Emissions *from the Transport Sector in Asia and the Pacific* (Bangkok, 2019).

[f] Leticia Pineda and Yihao Xie, "Truck eco-driving programs: current status in Latin America and international best practices" (Washington, D.C., International Council on Clean Transportation, 2021).

[g] *Review of Maritime Transport 2012* (United Nations publication, 2012).

C. Integrated urban transport development and public transport

21. Public transport systems and services play a key role in connecting people to places where they work, live, play and learn. As the economies of the Asia-Pacific region grow, the demand for urban transport is expected to double between 2015 and 2050. Countries and cities are facing challenges as they try to expand their public transport systems and improve the efficiency of their services to meet this increasing demand. Only around 34 per cent of the urban population of Central and South Asia and around 38 per cent of the urban population of East and South-East Asia has convenient access to public transport services. Moreover, urban mobility is challenged by a high level of congestion. For instance, in 2021, many Asian cities experienced severe traffic congestion, with a 21 to 62 per cent increase in overall travel times compared to a free-flow situation.

22. The region still needs to focus on the development of integrated and environmentally sustainable public transport systems to improve accessibility and reduce congestion and emissions. Some of the policies that can be employed to enhance the environmental sustainability of the transport sector are those aimed at reducing travel demand, developing mass public transport systems, increasing the vehicle occupancy rate, improving the energy efficiency of transport, promoting electric mobility and carbon pricing.

23. An integrated transport and energy modelling exercise can help to understand the impacts of representative policy scenarios for emissions reduction. Six representative policy scenarios were selected for analysis. They aimed at promoting: a reduction in transport demand, mass-transit

development, car-sharing, energy efficient improvements, electric mobility and carbon pricing.[21]

24. The car-sharing scenario showed a reduction of 20 per cent in carbon dioxide emissions by 2050. In contrast, a reduction in transport demand resulted in a decrease in carbon dioxide emissions of less than 10 per cent by 2050. This suggests that avoid-and shift policies would have a moderate effect on emissions reductions. However, these strategies would require lower investments than would be needed for behavioural interventions.

25. The electric mobility adoption policy scenario offered the most significant potential for emissions reductions, equal to a reduction of 72 per cent in carbon dioxide emissions by 2050. The energy efficiency improvements policy scenario showed a reduction of 66 per cent in carbon dioxide emissions by 2050 compared to the business-as-usual scenario. While these policies are most effective, they are technology-dependent, need more investment and are usually constrained by national and local capacities to adopt technologies.

26. To encourage the adoption of electric mobility in the Asia-Pacific region, the secretariat has initiated activities to provide policy support on transitioning to electric mobility in public transport and proposed the Asia-Pacific initiative on electric mobility as one way to address the challenges faced in the implementation of policies and actions aimed at increasing the adoption of electric mobility (see also paras. 37–46 below).

D. Wider deployment of sustainable smart transport systems

27. The utilization of digital technologies can also contribute to increasing the efficiency of transport systems. In fact, transport systems have been significantly transformed during the past few decades. For example, digital technologies were utilized in the Association of Southeast Asian Nations (ASEAN) Smart Cities Network to address urban traffic issues and provide cost-effective mobility options. Furthermore, the application of bus management systems, the automatic collection of fares and passenger information, the automatic location of vehicles and automatic passenger counter systems can streamline and enhance the efficiency of travel by providing real-time information on arrival and departure times and location.

28. Although carbon dioxide emissions from the transport sector decreased by over 10 per cent in 2020 as a result of the impacts of COVID-19-related measures, the demand for transport in 2021 rebounded and is expected to continue to increase. Private vehicles continue to account for the largest share of transport-related carbon dioxide emissions because they enjoy the comparative advantage of providing a convenient door-to-door service, which public transport cannot do. For this reason, smart mobility has emerged, under the umbrella of smart transport systems, to provide customized and user-oriented services to satisfy the needs of travellers and encourage commuters to reduce the use of private vehicles. To promote the advantages of smart mobility, ESCAP has described this concept as “integrated user-oriented transport systems and services that can make travelling safer, smarter and

[21] *Review of Developments in Transport in Asia and the Pacific 2021: Towards Sustainable, Inclusive and Resilient Urban Passenger Transport in Asian Cities* (United Nations publication, 2021).

greener using innovative technologies".[22] A variety of services, including car-sharing, ride-sharing, car-pooling, ride-hailing, mobility as a service, personal mobility and demand-responsive transport, fall under the concept of smart mobility.

29. Smart mobility restructures the traditional paradigm by disrupting the legacy of private transport, public transport and paratransit. Although smart mobility is a relatively new concept, some countries have already introduced related initiatives. For example, in Australia many private companies are competing to provide car-sharing and ride-sharing services. One major ride-sharing company is operating services in 40 cities. Since 2017, 36 demand-responsive transport projects have been carried out across Australia, to positive responses. In one project, in South Australia, more than 4,000 riders used the service in its first month. Smart mobility services are also quite popular in China. As of July 2018, there were 49 ride-hailing companies and 20 car-sharing operators with more than 40,000 vehicles in China, located in major cities.

30. Countries in South-East Asia too have introduced the concept of smart mobility. Singapore is a global leader in smart transport initiatives and is striving to develop various smart mobility services under the strategic plan Smart Mobility 2030. In 2020, in Klang Valley, Malaysia, more than 300 vehicles were being used by over 20,000 registered users for car-sharing. Thailand legalized ride-hailing services in March 2020. Furthermore, e-scooter-sharing has been introduced in major cities in Thailand: in 2019, around 200 e-scooters were used in 500–600 daily trips in one particular high-end residential area in Bangkok. Similar trends have been witnessed in North-East Asia. In Seoul, for example, e-scooter-sharing services have been made available near over 100 subway stations, resulting in over 50,000 e-scooters and e-bicycles being operated by more than 20 companies. A couple of private companies have also tried to roll out the concept of mobility as a service in the Republic of Korea by signing a business agreement with public transport authorities.

31. By popularizing smart mobility options, carbon dioxide emissions can be reduced by having fewer private vehicles on the road. A cost-benefit analysis carried out in Australia suggests that the use of one car-sharing vehicle equals to taking approximately 13 private vehicles off the road annually, resulting in a positive contribution to the achievement of environmental goals. In Singapore, an electric car-sharing service helped to reduce carbon dioxide emissions by 480 tons in 2018. Bicycle-sharing also has environmental benefits. In Shanghai, China, bicycle-sharing resulted in a decrease in the use of petrol by 8,358 tons and in a decrease in carbon dioxide and nitrogen oxides emissions by 25,240 tons and 64 tons in 2016 respectively.

32. Recent advances in digital technologies have also contributed to data being used in new ways in transport services. Transport-related big data is the representative example that has rapidly gained interest. Precise data is critically important in providing efficient transport services to travellers. Furthermore, in order to decide which type of traffic management strategies should be adopted to mitigate carbon dioxide emissions, a variety of detailed information on travel patterns, segments of traffic flows and socioeconomic factors need to be analysed. Multi-data analyses can be used to identify weaknesses in accessibility and connectivity in public transport services. In recognition of the

[22] ESCAP, *Increasing the Use of Smart Mobility Approaches to Improve Traffic Conditions in Urban Areas in South-East Asia: Policy Guidelines* (Bangkok, 2022).

fact that transport-related big data can provide unprecedented advantages to improve the quality of services, some trials have been carried out in the Asia-Pacific region (see table 2).

Table 2
Examples of transport-related big data utilization in Asia and the Pacific

Cases	*Primary use of big data*	*Main objectives*
Australian Urban Research Infrastructure Network (Australia)	Project evaluation	Increased efficiency
Urban traffic management system (China)	Traffic monitoring and operation	Increased efficiency and convenience
Demand-responsive transport with taxi data (Japan)	Line design	Increased efficiency and accessibility
Seoul Night Bus (known as Owl Bus) (Republic of Korea)	Service design	Increased efficiency and convenience
Bus Service Enhancement Programme (Singapore)	Line design	Increased efficiency and convenience

Source: ESCAP, *Increasing the Use of Smart Mobility Approaches to Improve Traffic Conditions in Urban Areas in the South-East Asia: Policy Guidelines* (Bangkok, 2022).

33. Given the great potential offered by smart mobility and transport big data to address transport issues, timely policy interventions need to be encouraged to maximize the advantages and contributions to sustainable development. The need for smart mobility in a country should be identified and specified; then, services should be prioritized, national plans and strategies should be established and transport-related big data should be used to support those plans and strategies. At the subregional and regional levels, overarching road maps, including strategies, should be developed to encourage cooperation, collaboration and the harmonization of strategic directions among countries.

III. Towards environmentally sustainable transport systems and services: the way forward

34. As already mentioned, the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026) sets out multiple entry points for accelerating low-carbon transport and mobility in the region, ranging from decarbonizing freight transport, enhancing energy efficiency in the transport sector, integrating urban and public transport development and applying smart mobility approaches and other applicable technologies. Concerted efforts must be made to implement these measures and to support regional and multi-stakeholder collaboration through relevant data and policy analysis and technical assistance tools.

35. Among the key priorities identified in the Regional Action Programme is the establishment of a regional cooperation mechanism to promote low-carbon transport and the provision of assistance to members and associate members in formulating policies and strategies that will accelerate transport-related actions to meet regional and global environmental commitments, including accelerating the transition to electric mobility. These actions would lay the foundation for fostering synergies among members and associate members and key stakeholders to achieve environmentally sustainable transport systems and services.

36. With the aim of deepening regional collaboration to promote low- and zero-carbon transport in Asia and the Pacific through the sharing of experiences, information and best practices, as well as to identify common interests and policy priorities, the secretariat is facilitating the establishment of such a regional cooperation mechanism and developing a concept for an Asia-Pacific initiative on electric mobility. The relevant context, objectives and planned activities, as well as updates on progress, are described below.

A. Asia-Pacific initiative on electric mobility

37. The potential of electric mobility has been recognized at the global, regional and national levels. At its third session, held in Glasgow, United Kingdom of Great Britain and Northern Ireland, from 31 October to 13 November 2021, the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement adopted the Glasgow Climate Pact, in which it recognized that limiting global warming to 1.5°C required rapid, deep and sustained reductions in global greenhouse gas emissions, including global carbon dioxide emissions.[23] Also at Glasgow, calls were made for speeding up the switch to electric vehicles.[24] At the regional level, the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026) includes activities related to urban public transport policies on electric vehicles and a shift to electric mobility and clean energy technologies to contribute to transport-related emissions reductions. The shift to renewable energy sources brought about by electric mobility and the improvement in public transport are two of the key transport strategies listed in the nationally determined contributions of Asian countries.

38. The electrification of urban public transport systems can accelerate the reduction in transport-related emissions. Some Asian countries benefit from strong advantages due to the large share of renewables in their energy mix, which can support the adoption of electric mobility, increase energy security and contribute to foreign exchange savings by reducing imports of fossil fuels. Accelerating the development of electric public transport while utilizing renewable energy will immensely contribute to meeting the decarbonization target by 2050. Doing so is also seen as “picking low-hanging fruit”, not only because public transport vehicles cover large distances every day, but also because public transport is often controlled or regulated by the Government, which offers opportunities for influencing its development.

39. Despite benefiting from the above-mentioned advantages, many countries in the Asia-Pacific region have policies that are focused on either private cars or electric two- and three-wheelers. Moreover, they lack a comprehensive policy and strategy aimed at achieving the commitments made

[23] FCCC/PA/CMA/2021/10/Add.1, decision 1/CMA.3.

[24] See https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf.

in the nationally determined contributions. There remains an opportunity to develop short-, medium- and long-term comprehensive policies and strategies focused on public transport fleets and high-mileage vehicles.

40. Despite the potential benefits of electric mobility, efforts to electrify urban public transport face many challenges, including: high up-front costs, a lack of standardized and interoperable charging infrastructure, imperfect technologies for battery disposal and recycling and a lack of human resources and institutional capacity. For national Governments, electric vehicles also bring new challenges in terms of urban management and fiscal policies. However, some countries in the region have successfully overcome these challenges and made progress in the promotion and use of electric and hybrid vehicles. The Governments of China, India, Japan, the Republic of Korea, Singapore and Thailand, for example, have started to develop policies aimed at promoting the manufacture and use of electric and hybrid vehicles.

41. In order to accelerate the transition to electric mobility, robust fiscal, regulatory and infrastructure policy frameworks will be required, as will the engagement of all those involved in the development of electric vehicle ecosystems, including manufacturers, developers of the charging infrastructure and technologies, financers, human resources professionals and consumers. There is also an opportunity for countries across the Asia-Pacific region to share their experiences and lessons learned.

42. The Global Electric Mobility Programme of the United Nations Environment Programme,[25] the IEA Electric Vehicles Initiative[26] and the Zero-Emission Bus Rapid-deployment Accelerator partnership of the International Council on Clean Transportation[27] are some collaborative platforms on electric mobility. There is a huge variety of public transport characteristics in Asian cities, such as a high share of two- and three-wheeler vehicles, many forms of paratransit, limited public transport options in many developing cities and a high share of active mobility (walking or cycling). Such variety creates a requirement to develop integrated public transport systems that use different modes of transport. Asian countries are also at different stages of public transport development and that provides opportunities to plan for environmentally sustainable public transport systems and initiate reforms.

43. Given the distinct structures of public transport in the Asia-Pacific region, a regional collaborative forum on electric mobility could facilitate the exchange of experiences and peer learning and the provision of policy support to countries transitioning towards electric mobility. Stakeholders involved in planning and operating public transport systems, including the government, the private sector, academia, and international and regional organizations, need to work together to accelerate the transition.

44. In this context, an Asia-Pacific initiative on electric mobility is being proposed with the aim of accelerating the transition to electric mobility for public transport in the region. The initiative would enhance regional cooperation and provide opportunities for peer learning and sharing of experiences among private and public sector stakeholders working in the areas of electric mobility. The following activities, among others, are expected to be carried under the initiative: regular electric mobility forums, the development

[25] See www.unep.org/explore-topics/transport/what-we-do/global-electric-mobility-programme.

[26] See www.iea.org/programmes/electric-vehicles-initiative.

[27] See https://theicct.org/initiatives-partnerships/zebra/.

and dissemination of knowledge products on electric mobility ecosystems and capacity-building support to Asia-Pacific countries on formulating national policies and strategies on electric mobility.

45. Participation in the initiative will be on a voluntary basis. All ESCAP members and associate members and public and private sector stakeholders working on electric mobility will be able to participate in the initiative. Meetings among participants will be held regularly at the regional, subregional and national levels at least once a year.

46. The concept of an Asia-Pacific initiative on electric mobility has been introduced and supported at national workshops on electric mobility held in Georgia,[28] Nepal[29] and the Lao People's Democratic Republic[30] that were organized under the technical cooperation project on accelerating the transition to electric mobility for public transport in Asia and the Pacific. Participants in the Regional Meeting on Just Transition to Low-Carbon Mobility in Asia and the Pacific,[31] held in Bangkok and online on 10 and 11 August 2022, supported the proposal for an Asia-Pacific initiative on electric mobility. Some countries and organizations expressed an interest in participating in and collaborating within the framework of the proposed initiative.

B. Regional cooperation mechanism on low-carbon transport

47. The adoption in 2015 of the Paris Agreement has created a political momentum for climate change mitigation across all sectors and resulted in States submitting their plans for climate action, known as nationally determined contributions. The goal of the Paris Agreement is to limit global warming to well below 2 °C, and preferably to 1.5 °C, above pre-industrial levels. Of the 194 countries that have submitted their nationally determined contributions, 98 per cent have mentioned transport, 81 per cent include references to transport measures and only 17 per cent have set specific transport-related carbon dioxide reduction targets.[32] ESCAP member States' nationally determined contributions, are primarily focused on the promotion of public bus transport, alternative energy sources and electric mobility. As States are expected to make their targets more ambitious every five years, in accordance with the five-year cycle of the Paris Agreement, there are opportunities to enhance mitigation measures in the transport sector. The implementation of the Paris Agreement will require economic and social reforms in all sectors, including the transport sector, which accounts for 24 per cent of direct carbon dioxide emissions from fuel combustion globally.[33] As one of the fastest-growing carbon dioxide emitting sectors, it is currently not on track to meet its decarbonization target by 2050. Despite the significant role that the transport sector could play in mitigating the impact of climate change, transport ministries are usually not directly involved in the process of drafting nationally determined contributions, which can be

[28] See www.unescap.org/events/2022/national-consultation-workshop-transitioning-electric-mobility-public-transport.

[29] See www.unescap.org/events/2022/national-consultative-workshop-strategy-electrification-public-transport-nepal.

[30] See www.unescap.org/events/2022/national-workshop-transitioning-electric-mobility-lao-peoples-democratic-republic.

[31] See www.unescap.org/events/2022/regional-meeting-just-transition-low-carbon-mobility-asia-and-pacific.

[32] ITF, "How serious are countries about decarbonising transport?". Available at www.itf-oecd.org/ndc-tracker/en.

[33] IEA, *Transport* (Paris, 2022).

attributed to a lack of institutional mechanisms to engage transport stakeholders and policymakers in the process.

48. The demand for passenger transport will grow most significantly in Asia and the Pacific, where population and economic growth are expected to be the highest. In the Asia-Pacific region, there is also high demand for freight transport by road, rail and inland waterways, as well as domestic shipping and aviation transport. Furthermore, urban transport demand is highest in Asia and the Pacific, which accounted for 40 per cent of transport-related activity in 2015, the largest share of all regions.[34] At the same time, non-urban transport demand is projected to triple by 2050. Therefore, without additional policy interventions, this is a region where carbon dioxide emissions are expected to increase over the next 30 years.[35] Despite growing transport demand and carbon dioxide emissions, the Asia-Pacific region has the potential to achieve economies of scale in emerging low-carbon transport technologies and systems.

49. In parallel, stronger collaboration in the Asia-Pacific region can influence global climate action, especially as countries continue to implement the Paris Agreement at the national level through the development of transformational plans. Regional collaboration contributes to the identification of regional and national priorities, while aligning with global decarbonizing transport efforts. Regional collaboration has also been recognized as a key catalyst for global progress and will play an increasingly critical role making progress towards the achievement of the goals of the Paris Agreement. Therefore, a sectoral and regional approach centred on collaboration could harmonize national climate and transport goals while enhancing the influential role that countries in Asia and the Pacific play in global climate change and transport policy processes.

50. The Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026) includes a specific activity to establish a regional cooperation mechanism to promote low-carbon transport, including a shift to electric mobility and clean energy technologies to contribute to transport emissions reductions, that will help ESCAP members and associate members to identity and develop policies for low-carbon mobility, clean energy technologies and logistics.

51. The development of a regional cooperation mechanism for low-carbon transport is dependent upon regional and multi-stakeholder collaboration and supported by relevant data and policy analysis and technical assistance tools. The mechanism will complement existing intergovernmental processes led by ESCAP on transport and strengthen and accelerate collaborative efforts on low-carbon transport made during the period between the sessions of the Committee on Transport, which are held biennially. Such collaborative efforts will not only raise climate ambition in the region but can also help to identify additional opportunities for mitigating transport-related emissions in nationally determined contributions and make progress towards the achievement of global goals at the same time.

52. The objective of establishing a regional cooperation mechanism is to promote low- and zero-carbon transport in Asia and the Pacific and to deepen regional collaboration by sharing experiences, information and best practices and by identifying common interests and policy priorities. The discussions held

[34] OECD and ITF, *ITF Transport Outlook 2021*.

[35] Ibid.

in the framework of the mechanism and its outputs would contribute to the following: (a) the development and refinement of transport-specific targets in nationally determined contributions; (b) the identification of national and regional low- and zero-carbon transport goals and actions; and (c) the strengthening of linkages between high-level regional and global dialogues on decarbonizing transport policies and national policies. Such a regional cooperation mechanism would also provide a forum for multi-stakeholder engagement among ESCAP members and associate members, other United Nations entities, intergovernmental organizations, non-governmental organizations and the private sector.

53. The regional cooperation mechanism's operations would be aligned with the timeline of the Regional Action Programme and would therefore follow a five-year workplan from 2022 to 2026. The specific activities to be carried out in the context of the regional cooperation mechanism include subregional consultations, regional meetings, summary reports on priority transport- and climate change-related action, policy papers and a cooperation framework that will encourage joint work, knowledge transfer and data-sharing on low- and zero-carbon transport for ESCAP members and associate members.

54. The concept of a regional cooperation mechanism on low-carbon transport was presented and discussed at the Regional Meeting on Just Transition to Low-Carbon Mobility in Asia and the Pacific, held in Bangkok and online on 10 and 11 August 2022. Participants in the Meeting supported the proposal for a regional cooperation mechanism. Some countries and organizations expressed an interest in participating in and collaborating within the framework of the proposed mechanism.

IV. Issues for consideration by the Committee

55. The Committee may wish to support the establishment of the regional cooperation mechanism on low-carbon transport as a way to contribute to reducing greenhouse gas emissions from the transport sector. The Committee may also wish to support the Asia-Pacific initiative on electric mobility as a way to accelerate the transition to electric mobility in public transport.

56. Furthermore, the Committee may wish to share updates and selected highlights with regard to national, bilateral and multilateral policies and initiatives related to environmentally sustainable transport systems and services, consider the policy directions, actions and activities described in the present document and provide further guidance to the secretariat on the ongoing and planned activities in support of environmentally sustainable transport infrastructure, systems and services.