Economic and Social Commission for Asia and the Pacific

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Building resilience to crises through regional economic cooperation and integration: strengthening resilience through seamless and sustainable connectivity

Enabling resilience through sustainable and seamless connectivity

Note by the secretariat

Summary

The present document contains highlights of recent achievements in the areas of transport, energy and information and communications technology, and it serves to underline initiatives in these areas and the persisting challenges that have come under the spotlight during recent crises. In this context, members and associate members of the Economic and Social Commission for Asia and the Pacific participating in the Third Ministerial Conference on Regional Economic Cooperation and Integration in Asia and the Pacific may wish to welcome the new developments in regional energy and digital and transport connectivity, including the Regional Road Map on Power System Connectivity: Promoting Cross-border Electricity Connectivity for Sustainable Development, the action plan for implementing the Asia-Pacific Information Superhighway initiative, 2022–2026, and the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026). Members and associate members may also wish to acknowledge the synergy between these initiatives in addressing the persisting connectivity shortages, enhancing resilience and supporting climate change responses, and also acknowledge ongoing national and regional digitalization and decarbonization efforts. Furthermore, they may wish to share updates and highlight national, bilateral and multilateral policies and initiatives aimed at enabling resilience through sustainable and seamless connectivity.

I. Introduction

1. Since the adoption of the Bangkok Declaration on Regional Economic Cooperation and Integration in Asia and the Pacific in December 2013, in which priority areas for enhanced regional economic cooperation and integration in Asia and the Pacific were identified, there has been significant progress in the second priority area, namely the development of seamless...
connectivity across the region in the areas of transport, energy and information and communications technology.

2. The Asia-Pacific Information Superhighway initiative, the regional transport network, composed of Asian highways, trans-Asian railways and dry ports, and the Regional Road Map on Power System Connectivity: Promoting Cross-border Electricity Connectivity for Sustainable Development have gained traction as major vectors of regional connectivity and integration. These achievements, but also the persisting connectivity challenges in the areas of transport, energy and information and communications technology, came under the spotlight during the coronavirus disease (COVID-19) pandemic, the crisis in Ukraine and the urgency of the climate change response.

3. Against this background, the present document serves to highlight the role of energy, digital and transport connectivity in responding to multiple crises facing Asia and the Pacific, and matters for consideration by members and associate members of the Economic and Social Commission for Asia and the Pacific (ESCAP).

II. Energy, digital and transport connectivity in Asia and the Pacific

4. Seamless connectivity in the areas of transport, energy and information and communications technology is a priority for the Asia-Pacific region, which accounts for two thirds of global seaborne trade, more than 40 per cent of global surface freight transport flows, half of the world’s total primary energy supply and final energy consumption and 60 per cent of global broadband subscriptions.

5. The COVID-19 pandemic and the crisis in Ukraine represent major connectivity shocks, amplifying the pre-existing gaps in access to transport, energy and telecommunication services with a notable impact on countries in special situations in particular.

6. In the telecommunication sector, broadband services in 2021 were less affordable globally (especially for fixed-broadband service in least developed countries) due to the global economic downturn triggered by the COVID-19 pandemic.\(^1\) In the Asia-Pacific region, broadband service was considered affordable only in East and North-East Asia and North and Central Asia. Internet speeds differ considerably between rural and urban areas (see map), and access to mobile-broadband subscriptions per 100 inhabitants in the region is higher (80 per cent) compared to fixed broadband (16 per cent).\(^2\) Access is significantly lower in Pacific island developing countries at 29 per cent for mobile broadband and 2 per cent for fixed broadband. There is also a considerable gender divide. In 2019, in Asia and the Pacific, the Internet was used by 55 per cent of men, but only 41 per cent of women – and the gender gap is widening.\(^3\)


\(^2\) Ibid.

Fixed-broadband download speed in Asia and the Pacific

Note: Map prepared by Gispo Limited based on Speedtest by Ookla Global Fixed and Mobile Network Performance Map Tiles for the Economic and Social Commission for Asia and the Pacific (ESCAP).

Disclaimer: The designations used on this map do not imply official endorsement or acceptance by the United Nations.

7. The crisis in Ukraine is reported to have disrupted Internet access in Ukraine and increased cyberattacks. The disrupted supply of raw materials as inputs for semiconductor chip manufacturing from both Ukraine and the Russian Federation is expected to have a far-reaching impact on the global digital economy. Online payment platforms have suspended operations in the Russian Federation, affecting banking services for individuals and businesses and leading to a higher use of cryptocurrencies.4

8. The increased digital divide undermines progress towards seamless connectivity in the transport and energy sectors.

9. While the region was successful overall in preserving transport connectivity during the pandemic, the crisis disrupted freight transport and led to increased delays and costs, as shown by the unprecedented rise in shipping

freight rates by the end of 2020. These negative fallouts disproportionately affected landlocked developing countries and small island developing States. Operational barriers, resulting from the lack of policy coordination between countries, highlighted the importance of regional cooperation in times of crisis and the need for strengthened regional action, paying particular attention to countries in special situations.

10. Due to the ongoing crisis in Ukraine, the transit of goods through the Russian Federation has become more difficult, either from a compliance, reputational or safety perspective. The growth of Europe-Asia rail traffic had been a major positive development along the Trans-Asian Railway network, even during the pandemic, but the crisis has been detrimental to it. Port closures in Ukraine and cancellations of vessel calls to ports in the Russian Federation by global shipping companies have increased congestion in ports in Europe. The situation is affecting landlocked countries in North and Central Asia, due to their strong economic and transport links to the Russian Federation, leading them to intensify their efforts to strengthen connectivity to other subregions, including South and South-East Asia.

11. In the energy sector, the pandemic reinforced the importance of uninterrupted supplies of energy. Initially, the response to the COVID-19 pandemic led to a decrease in overall energy demand, in particular for oil and natural gas, but also for electricity. Electricity supply was important in particular for hospitals and health-care services, teleworking and remote learning, and a significant focus of Governments at the time was on ensuring the resilience of power systems. During this period of relatively low demand, renewable energy generation remained resilient, with the relative share of renewable energy increasing during the periods of the most severe lockdown measures. At the same time, however, access to clean energy declined, as resources were focused primarily on recovering from the COVID-19 pandemic.

12. The importance of energy security has been underscored by the crisis in Ukraine. Since the beginning of the crisis, oil prices have remained above $100 per barrel, resulting in an increase in revenues for oil exporting countries, but at a significant cost to import-dependent countries. Some have estimated that, if oil prices remain at these levels until the end of 2022, gross domestic product growth in Asia will decline by 0.2 percentage points, while inflation will increase by 0.5 percentage points. High energy prices have incentivized Governments to invest in cheaper energy sources, including coal, where domestic supply is available at a low cost, and in renewable energy sources, which are increasingly considered for their energy security benefits as well as environmental and cost benefits.

6 See ESCAP/CE/2021/1.
13. Propelled by the pandemic and the crisis in Ukraine, resilience and connectivity concerns have heightened awareness of the pressing need to decarbonize the Asia-Pacific development path. A recent analysis of the freight and passenger outlooks for selected subregions of Asia, carried out by the secretariat in cooperation with the International Transport Forum, has shown a tremendous potential for transport decarbonization as part of the pandemic recovery efforts. Under the most ambitious policy scenario (Reshape+), despite the significant rise of freight volumes by 2050, emissions from the non-urban freight sector are projected to decline by 47 to 50 per cent (compared to 2015 levels) in South and South-West Asia, South-East Asia and North and Central Asia (figure I).

Figure I
Estimated change in carbon dioxide emissions of non-urban freight between 2015 and 2050, by scenario

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

14. The energy and transport sectors together account for more than two thirds of total carbon dioxide emissions, and decarbonization of these two sectors is increasingly interlinked, as exemplified by the trend of the green corridor initiatives in energy and transport.

III. Enabling sustainable and seamless connectivity

15. Faced with multiple connectivity disruptions, Governments in the Asia-Pacific region continue to enhance their energy, digital and transport connectivity with increasing focus on reducing related environmental costs.

A. Energy connectivity

16. Cross-border power system connectivity, including connectivity within countries, enables access to lower-cost renewable energy sources, which are often located far from demand centres. Connectivity can also improve energy security and resilience by increasing resource diversity, demand diversity and flexibility, and it can be a cost-effective tool for increasing energy access, for example, by connecting hard to reach rural areas to power systems across a
border. In this way, power system connectivity contributes to all aspects of achieving Sustainable Development Goal 7.

17. For energy connectivity to support sustainable development, it should be linked directly to the integration of higher shares of renewable energy into the power system, while strengthening energy security and resilience. Connectivity efforts must therefore place a strong emphasis on flexible power system operations. This includes power contract structures that are more responsive to market conditions and system operation needs, increased multilateral cross-border electricity trade through flexible arrangements and the electrification of end-uses. For example, at present, most cross-border power trade in the region is done using unidirectional, fixed contracts, with payments disconnected from system needs. On the demand side, the electrification of the transport sector raises both challenges and opportunities. It has the potential to rapidly increase electricity demand in the region where demand is already growing faster than the global average, and electrification of the transport sector can be a significant contributor to power system flexibility by shifting consumption to match variable renewable energy production. Flexibility can be supplied by cross-border electricity trade, which is relatively limited in the Asia-Pacific region compared to other parts of the world.

18. All of these examples of flexibility require the deployment of information and communications technology and access to transparent and reliable data (figure II). As power systems are increasingly integrated across borders, the need to share data will also increase.

Figure II
Role of data in energy connectivity

19. The energy transition also leads to the decentralization of power sources, including distributed solar photovoltaic systems and batteries. Operating power systems that are both larger (extending across borders) and more complex (with thousands or potentially millions of additional power system participants) require greater visibility of power system conditions and increased reliance on machine learning and artificial intelligence.
20. Power systems across the region are also facing an increasing number of exogenous risks driven by climate change. Changes in weather patterns may affect the availability of hydropower. Increasingly frequent and severe weather events will strain grid infrastructure and could disrupt fuel transport routes. Connectivity in transport, digital infrastructure and the power sector – for example, increased diversity and redundancy across all these sectors – can help to mitigate these risks while also bringing a range of other benefits, such as resource sharing, increased reliability and shared emergency procedures. Reaping the full benefits of connectivity, however, requires increased coordination of planning efforts across countries and sectors.

21. There are currently several subregional initiatives to advance power system connectivity as seen in figure III. The Association of Southeast Asian Nations (ASEAN) Power Grid, for example, aims to integrate the power systems of all 10 ASEAN member States, while also enabling multilateral power trading. With funding from the United States Agency for International Development, the South Asia Regional Initiative for Energy Integration is working to do something similar in South Asia. The Central Asia South Asia Electricity Transmission and Trade Project is being developed to bring hydroelectric power from Tajikistan and Kyrgyzstan to Afghanistan and Pakistan. Increasingly, these initiatives take into account potential sustainability benefits by studying how increased cross-border power trade can facilitate the secure and low-cost integration of higher shares of variable renewable energy, such as wind and solar photovoltaics.

Figure III
Selected energy connectivity initiatives in Asia and the Pacific
22. For least developed countries, landlocked developing countries, and small and vulnerable countries, cross-border power system connectivity can bring a range of potential benefits. Countries such as Bhutan, the Lao People’s Democratic Republic and Mongolia have significantly more potential renewable energy resources than could be economically developed on the basis of domestic demand alone. Cross-border power system connectivity can unlock the development of these resources by enabling their export to other countries, creating an economic development opportunity through the construction of large-scale renewable power systems, and an opportunity to earn revenues from exported electricity. Cross-border connectivity can also improve the security and quality of power systems in countries in special situations by increasing overall resource diversity and enabling technical cooperation, such as sharing reserve power or keeping power generation on standby in case of an outage or unexpected spike in demand.

23. In 2021, in response to increasing interest in and need for cross-border power system connectivity, member States of ESCAP endorsed the Regional Road Map on Power System Connectivity: Promoting Cross-border Electricity Connectivity for Sustainable Development. It contains a vision, a set of principles and nine strategies for enabling increased sustainable power system connectivity, with topics of critical importance for accelerating progress on power system connectivity, including the development of subregional and, eventually, regional power system master plans, unlocking sources of financing for cross-border infrastructure, enabling the secure and efficient operation of integrated power systems through regulatory collaboration and standards harmonization and cross-cutting issues, such as the need for political support and ensuring that connectivity projects are aligned with sustainable development objectives. The secretariat is working with member States to implement the Road Map strategies. For example, the aim of the green power corridor framework is to develop a set of principles to ensure that power system connectivity projects support sustainable development while remaining consistent with national policy objectives, including increased access to electricity, meeting net-zero-emission targets and ensuring energy security.

B. Digital connectivity

24. Across Asia and the Pacific, digital connectivity and technologies are changing daily life. The adoption of digital technologies has been accelerated by the COVID-19 pandemic, but this sudden change has left many people behind – in particular those without the assets or the capacities to adopt new technologies – accentuating the digital divide and undermining the resilience of digital society.

25. Over the past five years, the global annual investment by the mobile telephone industry in infrastructure and services was around $1 trillion, of which more than $600 billion was in Asia and the Pacific. As a result, mobile connectivity improved drastically, particularly in low- and middle-income countries, where 87 per cent of Internet connections are through mobile devices. In the Asia-Pacific region, 94 per cent of the population are covered by mobile broadband through fourth-generation (4G) wireless networks (figure IV).\(^\text{11}\)

Figure IV
Investment in and coverage of mobile Internet in Asia and the Pacific


26. Digital technologies can optimize the use of resources, help to reduce greenhouse gas emissions and track progress. Artificial intelligence and additive manufacturing, for example, are part of the next wave of climate change solutions. The Internet of things, blockchain-based authentication, data-sharing platforms and gamified applications all have helped to foster collaboration across the value chain and align participants on common sustainability goals.

27. Fifth-generation (5G) wireless networks have steadily been rolled out across the region, covering 14 Asia-Pacific countries by the end of 2021 and bringing new opportunities and capabilities for innovative public services and business models. Mobile-broadband access has improved for several countries with special needs, including Cambodia (98 subscriptions per 100 inhabitants) and Bhutan (89 subscriptions per 100 inhabitants). Integrated use of digital technologies and geospatial data can contribute to strengthening resilience. Digital systems using satellites and drones with geospatial information systems, geo positioning systems and closed-circuit television cameras, smartphone applications and website portals strengthen the monitoring and tracking of the risk of climate-based and natural disasters, including forest fires, floods and air pollution. The volcanic eruption in Tonga in January 2022, which disconnected the only submarine fibre-optic cable and resulted in a five-week disconnection of the country from the Internet, highlights the importance of Internet infrastructure resilience and the need for backup of different technologies, including satellite communications.
28. As the region is becoming increasingly digitalized, the gaps in connectivity and technology adoption between and within countries are widening at a speed that is leaving many people and businesses behind. As more devices rely on connectivity to the Internet, businesses and people without reliable connectivity and the necessary digital skills will be denied the opportunities of the digital economy unless they overcome numerous barriers, including those related to low levels of knowledge and skills, unaffordability, irrelevance, a poor understanding of safety and security issues and lack of access.

29. The action plan for implementing the Asia-Pacific Information Superhighway initiative, 2022–2026 (ESCAP/CICTSTI/2022/INF/1) serves as a regional blueprint for cooperative actions for bridging the digital divide and promoting digital transformation in Asia and the Pacific through the implementation of 25 actions under its pillars on connectivity for all; digital technologies and applications; and digital data (figure V). The 25 actions include specific support to countries with special needs, including strengthening e-resilience through smart submarine cables, promoting Internet quality through Internet exchange points for Pacific island countries, Cambodia, the Lao People’s Democratic Republic and Viet Nam, and promoting national and regional intelligent data centres for countries in North and Central Asia.

Figure V
Framework of the action plan for implementing the Asia-Pacific Information Superhighway initiative, 2022–2026

- Digital transformation aims at strengthening national competitiveness, boosting the productivity of businesses and manufacturing, and providing people with new values and services while opening up opportunities.
- The challenge now is to shape new regulatory and policy regimes and frameworks for an inclusive digital future.
- The action plan provides an overarching framework and regional platform for implementing actions along three digital transformation pathways.

30. Commission resolution 78/1 adopted in 2022 contains a commitment of members and associate members to improving digital cooperation with the intention of cooperating at all levels, including at the ministerial level, in closing the digital connectivity divide, ensuring digital skills training, strengthening digital connectivity, addressing digital trust and security, and promoting an inclusive digital economy and society. In this regard, the Asia-Pacific Information Superhighway initiative could be one of the useful regional platforms for the promotion of digital cooperation. Thus, the secretariat and the Government of the Republic of Korea are co-organizing the Asia-Pacific digital ministerial conference, under the theme “Shaping our common future”, to be held in Seoul on 9 and 10 November 2022.
C. Transport connectivity

31. Faced with the multiple connectivity shocks during the pandemic and in its aftermath, Governments of Asia-Pacific countries have intensified their efforts to maximize the outputs of the existing infrastructure, close connectivity gaps and improve resilience.

32. After the initial push provided by the pandemic, the adoption of digitalization and smart transport solutions are gaining further momentum. Parties to the Intergovernmental Agreement on the Trans-Asian Railway Network are considering the development of guiding principles on electronic information exchange between railways and among railways and control agencies, which would make rail more competitive and maximize its resilience potential, demonstrated during the pandemic. In countries along the Asian Highway network, Governments are implementing digital and smart highway solutions, making road transport less reliant on physical contacts and less exposed to interruptions and reducing the costs of documentary and other checks. Further progress on digitalization of transport is highly dependent on the applications of new-generation information technologies, such as the Internet, global navigation satellite systems, cloud computing, high-resolution remote sensing and artificial intelligence, and, thus, on the progress in digital connectivity and the availability of energy sources.

33. Freight transport decarbonization is also gaining traction. There are now examples of regional initiatives, such as the COVID-19 Recovery Guidelines for Resilient and Sustainable International Road Freight Transport Connectivity in ASEAN, which positions decarbonization as one of the priorities of the response and recovery policies.

34. The Asian highways and the trans-Asian railways can be further leveraged to support the decarbonization of regional supply chains. While the bulk of the network has been constructed, Governments are continuously adding new routes and improving the quality of the existing infrastructure. Examples of such developments are the recently completed railway line between the Lao People’s Democratic Republic and China and the Padma Bridge in Bangladesh. A new project launched by the secretariat in 2021 is exploring how construction and maintenance of the Asian highways can enable the transition to more environmentally sustainable green infrastructure. There is also great potential for rail decarbonization, making it a practically zero-emission transport mode, as only one third of the rail network in Asia is electrified, indicating substantial use of diesel for traction and non-traction purposes. Likewise, supporting concrete initiatives, such as green shipping corridors, launched at the twenty-sixth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, is a priority for work in maritime connectivity.

12 ESCAP, “Seamless and smart connectivity along the Asian Highway network in the time of the COVID-19” (Bangkok, 2020).

13 ESCAP, Facilitating the Deployment of Highly and Fully Automated Vehicles in Road Traffic along the Asian Highway Network (Bangkok, 2022).

35. In both decarbonization and digitalization, there is still great scope for the transfer of knowledge and best practices, and capacity-building support from Asia-Pacific countries in which advanced technological and regulatory solutions have been pioneered. Such exchanges would particularly benefit countries in special situations. An example of a regional mechanism supporting this is the Asia-Pacific dialogue on sustainable maritime connectivity, established pursuant to Commission resolution 76/1 on strengthening cooperation to promote the conservation and sustainable use of the oceans, seas and marine resources for sustainable development in Asia and the Pacific. The regional dialogue aims to address the issues of small island developing States, promote regional cooperation to assist them in meeting their transport challenges and strengthen their resilience to future shocks.

36. Increasing access to comprehensive, reliable data on the status of the regional transport infrastructure network is essential for further progress on connectivity. During the pandemic, the lack of such information undermined the capacity of Governments to respond to the crisis. Measuring progress in decarbonizing the regional transport network also requires adjusting the transport performance measurements. Accordingly, the secretariat is setting up an interactive platform on the Asia-Pacific regional transport network to demonstrate the current extent of the network and some of its operational features. In the long term, the platform will generate visualizations of a wide set of transport-related data.

37. In conclusion, the regional institutional framework for transport connectivity is increasingly being leveraged to support resilient and seamless transport connectivity. Illustrating this, the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026), adopted at the Fourth Ministerial Conference on Transport, in December 2021, establishes progress towards efficient and resilient transport and logistics networks and mobility for economic growth as one of three overarching objectives (figure VI).
### Figure VI
Matrix of the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026)

<table>
<thead>
<tr>
<th>Thematic areas</th>
<th>Overarching objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Towards efficient and resilient transport and logistics and mobility for economic growth</td>
</tr>
<tr>
<td>Regional land transport connectivity and logistics</td>
<td>Direct impact</td>
</tr>
<tr>
<td>Maritime and interregional transport connectivity</td>
<td>Direct impact</td>
</tr>
<tr>
<td>Digitalization of transport</td>
<td>Direct impact</td>
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<tr>
<td>Low carbon mobility and logistics</td>
<td>Direct impact</td>
</tr>
<tr>
<td>Urban transport</td>
<td>Direct impact</td>
</tr>
<tr>
<td>Road safety</td>
<td>Indirect impact</td>
</tr>
<tr>
<td>Inclusive transport and mobility</td>
<td>Indirect impact</td>
</tr>
</tbody>
</table>

**Source:** ESCAP/78/15/Add.2.

### IV. Issues for consideration

38. The multiple connectivity shocks together with the need for an urgent response to climate change require strengthened collective actions by member States, building on the previous achievements in digital, energy and transport connectivity and addressing the growing connectivity gaps in the region. In this context, members and associate members participating in the Third Ministerial Conference on Regional Economic Cooperation and Integration in Asia and the Pacific may wish to consider the policy directions and activities described in the present document, welcoming the new developments in regional energy and digital and transport connectivity, including the Regional Road Map on Power System Connectivity: Promoting Cross-border Electricity Connectivity for Sustainable Development, the action plan for implementing the Asia-Pacific Information Superhighway initiative, 2022–2026, and the Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026).

39. Members and associate members may also wish to acknowledge the synergy between these initiatives in addressing the persisting connectivity shortages, enhancing resilience and supporting climate change response, and also acknowledge the following ongoing national and regional efforts:

(a) To support digitalization efforts along the trans-Asian railways, Asian highways and dry ports;
(b) To leverage transport networks and energy corridors to help global, regional and subregional decarbonization efforts;
(c) To promote regional cooperation to bridge the digital divide for digital transformation in Asia and the Pacific through the implementation of the action plan for implementing the Asia-Pacific Information Superhighway initiative, 2022–2026.

40. In this context, members and associate members may wish to share updates and highlight national, bilateral and multilateral policies and initiatives aimed at enabling resilience through sustainable and seamless connectivity.

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