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Circular economy in inland water transport

Introducing the circular economy principles in inland water transport

Note by the secretariat*,**

I. Mandate

1. This document is submitted in line with the Proposed Programme Budget for 2021, part V, Regional cooperation for development, section 20, Economic Development in Europe. Programme 17, Economic Development in Europe (A/75/6 (Sect.20), para. 20.51).
2. At its sixty-fourth session (ECE/TRANS/SC.3/213, para. 32), the Working Party on Inland Water Transport (SC.3) decided to include the circular economy on inland water transport in the agenda of its sixty-fifth session and asked the secretariat to prepare a working document.
3. This document provides an overview of the circular economy principles relevant to inland water transport. A valuable input for this document has been submitted by the World Maritime University.

II. Topics and activities in the inland water transport sector that are relevant to circular economy

4. At the workshop “Circular economy in inland water transport” held at its sixty-fourth session (ECE/TRANS/SC.3/213, para. 30), SC.3 noted that the following activities were directly linked to the circular economy principles:
 - Greening of the fleet, use of sustainable fuels and decarbonization
 - Waste management
 - Digitalization and transition to renewable energy

* The present document was submitted late due to delayed inputs from other sources.

** The present document is being issued without formal editing.



- Green supply chain management
- Improving of environmental performance of inland water transport
- Building up a future-proof infrastructure compatible with digital and automation developments and resilient to climate change
- Role of maritime and inland ports as essential elements of the circular economy.

5. The Sustainable Development Goals and the Paris Agreement require the transport sector to move towards becoming fossil-free. Therefore, there is now a strong focus in the sector on electrification and other fossil-free energy sources. By making essential transportation as efficient and cost-effective as possible, the total transportation energy consumption and thereby carbon emissions could be reduced in relation to transport volumes. Optimizing resource use also positively addresses other drawbacks of transportation, for example, by reducing particle emissions, accidents and congestion. Physical transport infrastructure, energy infrastructure and digital infrastructure need to work together in order to facilitate resource-effective transport solutions.

6. At the sixty-ninth session of the Economic Commission for Europe (ECE) held on 20 and 21 April 2021, the high-level segment was under the overall theme “Promoting circular economy and sustainable use of natural resources in the region of the Economic Commission for Europe”. The document “Circular economy and the sustainable use of natural resources: Trends and opportunities in the region of the Economic Commission for Europe” (E/ECE/1495) highlights critical issues for a circular economy and contributions of ECE in these areas: (a) designing and planning; (b) dealing with waste; (c) traceability, transparency and reliable data; (d) innovation and (e) the preservation of natural capital. Information and some of the conclusions in this document, which are relevant for infrastructure, waste management and assessment of the circular economy performance, are included in the present document.

A. Infrastructure

7. Infrastructure has a major impact on sustainability through its influence on patterns of resource use. Shifting to a more circular and green economy requires an increase in targeted infrastructure investments, in particular in parts of the region where gaps are larger. Many of the core characteristics of infrastructure, which will determine its environmental impact and overall contribution to sustainability, are defined at the design and planning stage. The Ninth Environment for Europe Ministerial Conference (Nicosia, 5–7 October 2022), which is serviced by ECE, will consider the theme “Greening the economy in the pan-European region: working towards sustainable infrastructure”, as one of its major focus areas.¹

8. The design of infrastructure and the way it is used determines its longevity and the overall needs for materials through the lifecycle. The European Agreement on Main Inland Waterways of International Importance (AGN), as well as other ECE transport infrastructure agreements, provides a coordinated plan for the development and construction of the E waterway network and establishes key parameters for the construction, maintenance and modernization of the network. An important way to ensure smooth operation of inland water transport is anticipating factors that could affect the lifespan, operability and condition of the waterway structures. In particular, climate change could pose significant challenges for transport infrastructure.²

B. Waste management

9. An appropriate classification of waste is the foundation for addressing safety issues and identifying the potential economic value of various types of waste. Ensuring the safety of secondary raw materials, without harmful elements, is critical to the emergence of markets for these products. The ECE framework in the field of inland water transport is the European

¹ E/ECE/1495, para. 33.

² E/ECE/1495, para. 35.

Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) that includes provisions for safe transport of waste containing dangerous goods for recycling or disposal, including when used or damaged. Moreover, ADN provisions envisage a “cradle-to-grave” approach regarding containment systems for dangerous goods, as they address not only their design, construction, remanufacture, use, reuse and repair but also the transport of damaged or waste packaging for recycling or disposal.³

10. The work on the classification of types of waste generated on board vessels, its separate collection and delivery to reception facilities under the framework of the Convention on Collection, Deposit and Reception of Waste Produced during Navigation on the Rhine and Inland Waterways (CDNI), the Danube Commission and SC.3 is a significant step towards the effective waste management, recycling and reuse.

11. ECE Environmental Performance Reviews (EPR) include analysis and recommendations on waste management and related issues in the country under review. They also assess the existing infrastructure for waste management and offer recommendations to improve the conditions for private sector participation to address identified shortcomings.⁴

C. Greening and decarbonization of the inland fleet

12. The White Paper on the Progress, Accomplishments and Future of Sustainable Inland Water Transport has set out Policy Recommendation No. 4, Encouraging the modernization and greening of the fleet and infrastructure to better tackle environmental challenges. The main fields of action under this policy recommendation include the harmonization of rules and promotion of innovations such as new propulsion systems and fuels as well as a deeper cooperation in the field of ongoing digitalization of the sector. This issue is regularly addressed at the sessions of SC.3 and SC.3/WP.3 under the agenda item dedicated to the fleet modernization and international projects in this field.

13. The European Green Deal and the Smart and Sustainable Mobility Strategy adopted by the European Commission lay out priority policy areas, including sustainable mobility, and actions to be realized to achieve climate neutrality by 2050. The Inland Waterway Transport Action Plan for 2021–2027 NAIADES III, adopted by the European Commission on 24 June 2021, determines the activities for transitioning to zero-emission inland waterway transport, greening inland waterways infrastructure and ports.⁵

14. The Central Commission for the Navigation of the Rhine (CCNR) is coordinating studies assessing alternative fuels technologies for inland vessels and the most suitable financial instruments for supporting those technologies. The study on the financing of the energy transition for a zero emission European inland navigation sector is an important first step in this field, setting the objective, to the extent possible, of ending emissions of greenhouse gases and other pollutants by 2050 and instructing CCNR to encourage the development of new financial instruments for achieving this objective.⁶

D. Ports

15. The main barriers for the development of the circular economy model can be summarized as a cultural and appropriate/customized business model. Cultural barriers can be mitigated with the inclusion of the relevant port community stakeholders and the direct involvement of circular economy strategies developed by ports. Due the complexity nature of ports, such barriers especially need to be addressed and properly taken into consideration in line with the circular economy model and the port environmental and energy strategy.

³ E/ECE/1495, para. 44.

⁴ E/ECE/1495, para. 54.

⁵ <https://ec.europa.eu/transport/sites/default/files/com20210324-naiades.pdf>.

⁶ <https://www.ccr-zkr.org/12080000-en.html>.

16. There are various circular economy initiatives in European ports, aimed to reduce waste from ships and port activities and convert waste to a resource (biomass, biogas, recycled road materials etc.). In this regards, policy and regulation can facilitate the transition to circularity in the port context. An example of this approach is Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment. Ports could be therefore a starting point and a good example for other transport modes. Other strategies are transition to sustainable fuels, renewable energy and digitalization, which are pursued in different ways, such as alternative fuels, alternative power systems and renewable energy systems. Each potential option can be suitable for different actors of the maritime supply chain and boost the decarbonization process of the maritime sector.

17. NAIADES III highlights the potential of inland ports to become zero-emission nodes and the need for identifying and implementing environmentally-friendly and sustainable solutions in support of the transition to renewable energy and zero-emission operations.

III. Measuring circular economy performance

18. One of the challenges for introducing circular economy is monitoring and measuring of outcomes and enablers. Various approaches have been proposed in this field, however, this issue may require further investigation to develop appropriate methods and tools that could be applied in the inland water transport sector.

19. In the field of waste measurement, progress has been made in recent years, however, the quality and availability of statistics in countries vary greatly depending on the priority given to waste management and on the financial and human resources available for statistics. To improve international comparability, an ECE Task Force on Waste Statistics developed a framework on waste statistics aimed to improve availability of internationally comparable waste statistics. The ECE Working Group on Environmental Monitoring and Assessment supports member States in improving their waste monitoring systems, among others, and the use of data and indicators for improved policymaking. The ECE Environment and Statistics Divisions also service jointly the Task Force on Environmental Statistics and Indicators with the aim to support countries through capacity development, guidance and experience sharing in enhancing environmental data, statistics and indicators, including on waste.⁷

20. Availability of and access to reliable information are important for the advancement of a circular economy and the management of natural resources. This includes agreed classification systems and mechanisms to track and report related data. New technologies are opening new possibilities to address these needs. Ultimately, the aim is to facilitate the collaboration between different stakeholders, a major driver of the transition, and to gain a sound understanding of progress. ECE contributes to this goal through its normative work on traceability along supply chains, classification and reporting on resources, access to data on products and activities and measurement of a circular economy.⁸

⁷ E/ECE/1495, paras. 55–57.

⁸ E/ECE/1495, para. 59.