

Circularity as a driver of the energy transition in public transport - a look into the future

On 21st November 2024, as part of the ‘**European Week of Regions and Cities**’ side events, a discussion on the transformative role of the circular economy in public transport took place with the participation of leading experts from Europe. The webinar, **organised by the CE4CE Interreg CE project initiative** and entitled ‘Circularity as a driver of energy transition in the public transport sector’, presented pioneering projects, technologies and strategies that could make public transport more sustainable and revolutionise resource consumption.

A paradigm shift is urgently required: away from a linear and towards a circular way of thinking.

The webinar focused on the need for a paradigm shift: away from linear processes characterised by the ‘take, use, dispose’ phases and towards circular approaches in which resources are minimised, reused and recycled. The organisers emphasised the essential importance of this change for further reducing the carbon footprint of public transport. Particularly impressive was the presentation of the Circularity Compass, a tool that helps transport operators to assess their circular economy status and develop strategies for increasing their sustainability.

“The circular economy not only enables more resource-efficient use, but also opens up new economic opportunities through extended life cycles and more efficient maintenance,” explained Ana-Maria Baston from Rupprecht Consult.

Technologies were also identified as a key factor, particularly in the field of artificial intelligence (AI) and digital twins.

A highlight of the webinar was the presentation of technical innovations that could make public transport future-proof. The city of Bergamo presented a pilot project for the predictive maintenance of trams, in which sensors and AI-based algorithms are used to recognise problems at an early stage. These technologies enable maintenance work to be carried out more efficiently and extend the service life of both the infrastructure and the vehicles.

Another highlight was the demonstration of the use of a digital twin to simulate energy flows in the city of Gdynia. The model makes it possible to analyse various scenarios in order to find optimal solutions for the electrification of public transport. The efficient use of batteries and the integration of renewable energies are taken into account.

‘The digital twin is a revolutionary tool in urban planning, as it makes it possible to avoid costly mistakes and optimise energy consumption,’ explains Marcin Wolek, Professor at the University of Gdansk.

The focus is on infrastructure!

One aspect of the circular economy in transport that is often overlooked in public perception is infrastructure. The webinar demonstrated how innovative approaches such as shared charging infrastructure or the integration of solar panels in depots, substations and stops can increase sustainability. The participants agreed that infrastructure is not only the backbone of public transport, but also offers great potential for saving resources.

Marta Woronowicz from the trolley:motion association emphasised the importance of modular infrastructure design in order to facilitate its maintenance and adaptation. She highlighted that extending the service life of components and integrating recycled materials can make a significant contribution to reducing waste in public transport.

The challenges and opportunities are discussed below.

However, the implementation of circular principles in public transport is associated with challenges. The lack of expertise, limited budgets and the lack of prioritisation of sustainability in public perception were identified as key challenges.

At the same time, it became clear during the webinar that systematic change goes hand in hand with enormous opportunities. These range from reducing operating costs, waste and emissions to innovative business models such as the reuse of vehicle parts or the monetisation of energy savings.

The key findings and conclusions are presented below, along with an outlook on future developments.

The webinar demonstrated that the circular economy and sustainable technologies are no longer visions of the future but offer concrete solutions that can be implemented today. The findings and pilot projects of the CE4CE project are intended to serve as a blueprint for cities and transport companies seeking to reorganise their systems and make them more sustainable.

A key appeal to politicians, business and society was that public transport must take on a pioneering role in order to drive forward the transition to resource-saving, climate-friendly mobility. Ana-Maria Baston summarised: **'The energy transition in transport will only succeed if we set the right course today.'**

About the CE4CE project

The project is funded within the framework of Interreg Central Europe and involves 11 partners from 6 countries. It aims to develop and disseminate innovative strategies and solutions to promote the circular economy in public transport.

<https://www.interreg-central.eu/projects/ce4ce/>