

CLEAN BUS EUROPE PLATFORM

FEBRUARY | 2025

EXECUTIVE SUMMARY

The Clean Bus Europe Platform (CBEP) is a European Commission (EC) initiative that aimed to boost the introduction of clean and zero-emission buses in European Union (EU) member states. Framed under the Clean Bus Deployment

Initiative launched by the EC in July 2017, it has been the strategic line of action supporting the EC Clean Vehicles Directive that entered into force in August 2021.

While this supportive policy framework has been driving the market and cities towards clean and zero-emission bus deployment, it poses a



▶ <https://cleanbusplatform.eu/>

challenge to operators, the ultimate makers of the transition, as the investment needed to deploy clean and zero-emissions fleets is still higher than that for conventional fleets. Moreover, the learning curve of any new technology can be steep. Rolling out clean and zero-emission bus technology entails developing a solid deployment strategy and a strong empirical approach, along with the will to learn, test, adjust, and iterate until the technology fits the purpose.

With this in mind, the CBEP designed a programme to facilitate capacity building and foster peer exchange in all relevant stages of clean bus deployment, from initial planning to procurement and operations, bringing together all stakeholders related to clean buses and fleet renewal: cities, transport authorities, operators, industry, associations, and many others.

Starting in July 2019, and with different levels of knowledge and experience among platform members (learning cities were called Target Cities and experienced were called Host Cities), the CBEP helped peers in the bus sector learn from and share experiences with each other on what worked and what did not work in their fleet renewal projects.

The CBEP became a reference point for learning and knowledge exchange on clean bus deployment for cities, transport authorities, and bus operators, not only in EU member states, but also across Europe, and even extending to India, the United States, and Canada, where the efforts to deploy zero-emission buses have intensified in recent years.

During the project, cities benefitted from the numerous project activities and tools, which enhanced their knowledge and know-how: webinars, study tours with technical sessions and site-visits, market places with industry players and funding and financing institutions, and the creation of the clean bus toolkit, including an online library, market monitoring section and matching tool.

Finally, the project pioneered a new field, “social dialogue and the impacts of clean bus technologies

on the workforce”, the learnings from which were compiled in a report. The report, elaborated in cooperation with the European Transport Workers’ Federation (and in exchange with the International Transport Forum), provides key recommendations on how to manage change and the transition to clean and zero-emission fleets, based on interviews with labour and management representatives.

CBEP’s ambitious programme was possible thanks to close cooperation with the UITP committees, EU-funded projects, key industry stakeholders and the financial sector.

Similarly, the collaboration with relevant initiatives in the field like CIVITAS CIVINETs (Romania, Cyprus, & Poland), SUMP-Central, trolley:motion, EAFO, ASSTRA, VDV, and UCLG helped expand the project’s outreach and impact, facilitating the dissemination of results and material on the website.

Throughout the project, CBEP members had access to a wide range of knowledge, activities, and experiences; however, in our mission of spreading the message and supporting cities and operators across the world, UITP strived to make the project activities accessible to any city interested and willing to participate. This enabled a richer exchange among peers, often bringing together cities and operators from outside the EU-27 and even from other regions around the world.

INTRODUCTION

The decarbonisation of urban transport is crucial to the development of clean, liveable, and vibrant cities. One major strategy in this regard is to promote a modal shift from private vehicles to public transport and thus reduce congestion and air and noise pollution. As buses are one key component of public transport, the deployment of zero-emissions and low-carbon bus fleets not only reduces emissions but also improves the overall public transport service and makes it more attractive.

WHAT IS A CLEAN BUS?

When it comes to clean buses, there is a wide range of available, mature technologies. According to the fuel supplied to the powertrain and emissions generated, these technologies can be categorised as either clean (low-emissions) or zero-emissions.

The CBEP adopted the definitions provided in the Clean Vehicles Directive (EU Directive 2019/11610):

A clean bus is fuelled by:

- Electricity
- Hydrogen
- Natural gas (compressed natural gas (CNG) or liquefied natural gas (LNG))
- Most biofuels not blended with conventional fossil fuels
- Synthetic and paraffinic fuels not blended with conventional fossil fuels
- Liquefied petroleum gas (LPG)

A zero-emission (tailpipe) bus is a vehicle:

- Without an internal combustion engine
- With an internal combustion engine emitting less than 1 gramme (g) of carbon dioxide (CO₂) per kilowatt-hour (kWh) or less than 1g CO₂/km

THE ROLE OF THE EC CLEAN BUS DEPLOYMENT INITIATIVE AND CBEP

The momentum for clean buses in EU-27 has been fostered through supportive policy and financing frameworks, as well as various initiatives and projects. The Clean Bus Deployment Initiative, launched by the EC in July 2017, foresaw three main pillars to support and boost clean bus technologies. The initiative established the policy framework for future clean bus deployment in Europe through the Clean Vehicle Directive (CVD), which sets mandatory targets for the public procurement of clean and zero-emission buses and entered into force in August 2021 for the next 10 years.

Other policies supporting clean bus deployment include the Alternative Fuels Infrastructure Directive (AFID), which defines the term “clean technology” and sets targets for the deployment of alternative fuel charging and refuelling infrastructure, and the EC Green Deal, which establishes the framework for a climate-neutral Europe by 2050 and includes the Fit for 55 Package.

The funding and financing framework was secured through the creation of dedicated mechanisms like the “European Green Deal Investment Plan and Just Transition Mechanism”, which aims to mobilise public investment and help unlock private funds through EU financial instruments – notably InvestEU, which should lead to at least €1 trillion in investment.

Against this backdrop, the EC launched the CBEP project to enable knowledge and experience exchange. The platform is the strategic line of action to facilitate and support the implementation of the CVD targets, as well as boost clean bus deployment across EU-27. To this end, the platform brings together cities, transport authorities, and operators to exchange know-how and expertise. Together with industry, financing and funding entities, and associations, the platform was the reference point for any stakeholder interested in clean bus deployment.

THE PROJECT

Coordinated by UITP and its consortium (FIT Consulting, Polis, Rupprecht Consult, and Sphera), on behalf of the EC Directorate-General for Mobility and Transport (DG-MOVE), the CBEP brought together cities, transport authorities, and operators, along with other relevant stakeholders like social dialogue partners and industry, to facilitate clean bus deployment across EU member states by fostering the exchange of knowledge and best practices.

Following a twinning approach, the project brought together over 70 learning cities (Target Cities) pursuing their energy transition plans and 11 experienced cities (Host Cities), which acted as mentors, to enable learning and exchange with peers (operators, transport authorities, and cities) on clean bus deployment.

The CBEP developed a dedicated work plan for cities, with different services and levels of support: webinars, study tours, marketplaces with the industry and financing entities, technical assistance, etc. Many of these resources are available on the project website (www.cleanbusplatform.eu), under the Clean Bus toolkit section.

The project was launched in July 2019 and ran until July 2023.

THE PLATFORM MEMBERS

Host Cities

Host Cities were cities that had already integrated or were in the process of integrating clean buses into their regular transport operations. A Host City had already gained solid experience in the operation of at least one clean bus technology, in one or more lines, and was beyond the piloting phase. Host Cities fostered knowledge transfer and capacity building on clean bus deployment by hosting the study tours for learning cities, where they shared insights on their respective systems.

The project engaged Host Cities, each of them focusing on one or more technologies: battery electric (BE); fuel cell hydrogen (FCH); Compressed Natural Gas (CNG); and trolleybus in-motion charging (IMC).

- › Denmark: Copenhagen (BE, CNG)
- › France: Paris (BE, CNG)
- › Germany: Cologne (BE, FCH), Münster (BE)
- › Italy: Cagliari (IMC, BE)
- › The Netherlands: Eindhoven (BE), Amsterdam (BE)
- › Spain: Madrid (BE, CNG), Barcelona (BE, CNG, FCH)
- › Sweden: Gothenburg (BE, CNG)
- › United Kingdom (UK): London (BE, FCH)

Target Cities

Target Cities were cities interested in learning about and willing to deploy clean buses.

- › Austria: Klagenfurt, Graz
- › Belgium: Antwerp, Namur, Charleroi
- › Bulgaria: Sofia, Burgas
- › Croatia: Zagreb, Split
- › Cyprus: Nicosia (& island)
- › Czech Republic: Ostrava, Prague

- › Denmark: Aarhus, Tallinn
- › Estonia: Tartu, Tallinn
- › Finland: Greater Helsinki, Turku
- › France: Nantes, La Rochelle, Dijon
- › Germany: Tübingen, Marburg, Aachen, Dachau
- › Greece: Piraeus, Rethymno, Thessaloniki
- › Hungary: Budapest, Debrecen
- › Ireland: Dublin, Athlone, Galway, Balbriggan, Limerick, Cork, Navan, Drogheda, Sligo, Dundalk, Waterford
- › Italy: Milan, Monza, Cagliari
- › Latvia: Riga
- › Lithuania: Vilnius, Klaipeda
- › Luxembourg
- › Malta: Valletta (& island)
- › The Netherlands: The Hague, Rotterdam
- › Poland: Gdynia, Poznan, Warsaw
- › Portugal: Aveiro, Coimbra, Caldas da Rainha
- › Romania: Arad, Suceava
- › Slovakia: Bratislava, Košice
- › Slovenia: Maribor, Ljubljana
- › Spain: San Sebastian, Zaragoza
- › Sweden: Jönköping, County of Västmanland, County of Örebro
- › UK: Tyne & Wear, West Midlands Region

Follower Cities

Follower Cities were able to learn from the project activities and have exchanges with city peers:

Vienna, Austria; Brussels, Belgium; Larissa, Greece; Hamburg, Germany; Torres Vedras and Lisbon, Portugal; Bistrița, Bucharest, and Ploiesti, Romania; Jaworzno, Zielona Gora, and Gorna Oyahovitsa, Poland; and Manchester, UK.

Other stakeholders

Successful fleet electrification requires strong partnerships and collaboration among key stakeholders. Thus, in addition to the cities, the project involved relevant stakeholders in the field of clean bus deployment, like industry, funders and financial institutions, social dialogue actors, and other associations related to public transport.



► Industry stakeholders



► Funding and financing stakeholders



► Social Dialogue stakeholders

PROJECT ACTIVITIES



CAPACITY BUILDING & KNOWLEDGE TRANSFER

This pillar focused on providing cities with the necessary knowledge and expertise to carry out their deployment plans. Activities included the organisation of webinars and study tours conducted by Host Cities.

Webinars on clean bus technologies and relevant topics

The project held 18 webinars with a total audience of over 600 participants, covering key topics related to clean bus deployment (technology, procurement, planning, funding and financing, deployment and operations, etc.). Some of these webinars were held in cooperation with partner projects and organisations, e.g. H2020 EC-funded projects ASSURED (www.assured-project.eu), JIVE/JIVE2 (www.fuelcellbuses.eu/projects/jive-2), and Sustainable Bus (www.sustainable-bus.com).

Recordings are available on the CBEP YouTube channel: <https://www.youtube.com/@cleanbuseuropeplatform2877>

Study tours: Capacity building missions to Host cities

The study tours proved to be a key tool to facilitate direct exchanges between transport authorities, operators, and Host and Target Cities, as well as other relevant stakeholders involved in clean bus deployment in the respective cities (e.g. bus manufacturers & charging infrastructure operators).

The tours were divided into two main modules:

- Classroom sessions focusing on the solutions and experiences of the Host Cities, including a detailed description of the bus system deployment experience
- Technical visits to the bus depot(s), charging network, and other relevant sites

A total of 7 STs to 11 Host Cities were organised by UITP and the local hosts.

1. Amsterdam & Eindhoven, The Netherlands

9-10 June 2022

In cooperation with partners Provincie Noord-Brabant (PNB), Vervoerregio Amsterdam (AML), Transdev/Connexion, and VDL Bus & Coach.



2. Madrid, Spain

19-20 October 2022

In cooperation with partner Empresa Municipal de Transportes de Madrid (EMT Madrid) and hosted by the city of Madrid, as part of the 75th anniversary week of EMT Madrid.



3. Paris, France

10 February 2023

In cooperation with Régie autonome des transports Parisiens (RATP) and IVECO.



4. Berlin – Munster – Solingen – Cologne, Germany

29-31 March 2023

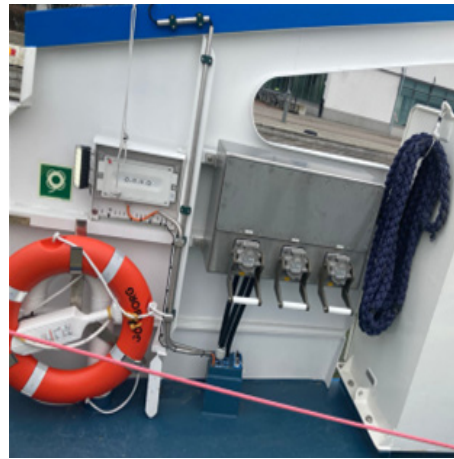
With the support of Host City partners Stadtwerke Münster and Kölner Verkehrs-Betriebe and external partner Stadtwerke Solingen.



5. Copenhagen, Denmark & Gothenburg, Sweden

13-14 April 2023

In cooperation with Movia and the local operators Anchersen and U-move (Denmark) and Västtrafik and local operator Transdev (Sweden).



6. Birmingham – London, United Kingdom

26-28 April 2023

In conjunction with the UITP Bus Committee, SOLUTIONSplus, JIVE/JIVE2, and eBRT2030 projects, hosted by Transport for West Midlands (TFWM) and Transport for London (TfL).



7. Cagliari, Italy

4-5 May 2023

In conjunction with the UITP Trolleybus committee and hosted by CTM Cagliari Spa.



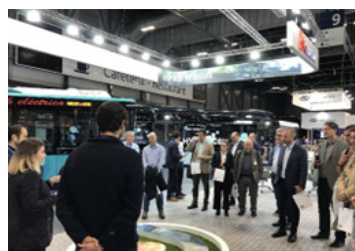
MARKETPLACES WITH INDUSTRY STAKEHOLDERS

The industry marketplaces, where bus OEMs showcased new vehicles, including specific design features, provided CBEP participants the opportunity to experience the new applications available on the market first-hand.

The first industry marketplace took place on 20 October 2022 in Madrid, as part of the FIA 2022 (International Bus and Coach Trade Fair) and in cooperation with the JIVE project and the UITP Bus Committee meeting hosted by EMT Madrid. The event followed the two-day

Madrid study tour. It lasted four hours and was divided into two parts: 1) keynote speeches to set the scene and 2) a guided tour for selected exhibitors.

The second industry marketplace took place on 28 March 2023 in Berlin, as part of the ElekBu 2023 (Electric Bus Conference and Trade Fair) and in cooperation with VDV. This edition of the ElekBu provided the perfect opportunity to explore a more consolidated offer of new vehicles and applications, some of them showcasing the use of new materials and interior design solutions with innovative services like battery analytics, planning software, and hydrogen solutions to reduce the currently high cost of hydrogen.



MARKETPLACE WITH FUNDING AND FINANCING STAKEHOLDERS

The financing marketplace was organised on 16 May 2023 as an online seminar and provided a broad overview of the available funding and financing mechanisms. The seminar brought together funding and financing institutions and CBEP members (bus operators, transport authorities, and city administrations).

Moderated by UITP invited institutions included EIB/Jaspers, KfW, EBRD, and the World Bank. In the first part of the seminar, speakers presented a selection of their funding and financing products targeting vehicles, infrastructure, and depot upgrading/building. The second part was dedicated to a roundtable discussion focused on the main challenges faced today by funders/financiers and receivers of funding/financing.

The seminar recording can be found [here](#).

TECHNICAL SUPPORT AND PROGRESS FACILITATION

Through the CBEP initiative, Target Cities got assistance from local experts to figure out the next steps in their transition plans.

The project engaged a network of local experts in each member state who held meetings, collected information (e.g. on the status of clean bus deployment - they filled out questionnaires on clean bus deployment-related willingness, strategies, and actions put in place), identified gaps in the transition plans by cross-checking the information gathered, verified the ongoing progress of Host Cities, and facilitated the development of consolidated deployment roadmaps.

When a city initiates the process of clean bus deployment, the identification of the most suitable funding option to enable the transition to a more sustainable fleet entails a preliminary assessment that may vary depending on the city's specific needs and circumstances. To facilitate this assessment, an "Investment financing manual" was developed, covering the main financing instruments suitable for clean bus deployment, as well as good practices for each member state.

STIMULATING DIALOGUE WITH SOCIAL PARTNERS

The introduction of a new technology requires careful assessment of the needs at the staff level in terms of trainings, upskilling, and acceptance. To ensure the smooth introduction and deployment of clean technologies, it is important that public transport

operators, worker representatives, and trade unions engage in a proactive dialogue that accompanies the transformation process. An analysis of the impact on workers and working conditions in urban public transport is paramount in this context.

To this end, UITP, in cooperation with the European Transport Workers' Federation (ETF), set up an advisory board with representatives of labour and management and carried out a series of workshops to define and reach a consensus on common principles for the introduction of clean bus technologies. The results of the discussions were compiled in a report, along with a general training on the impacts of the introduction of clean buses on the workforce.

The final report, "Social Dialogue on the deployment of clean buses in Europe. Analysis of current practices, added value and recommendations", can be found here: <https://www.uitp.org/news/getting-everyone-on-board-new-report-explores-the-effects-of-clean-bus-transition-on-the-workforce/>.

CLEAN BUS TOOLKIT

The Clean Bus Toolkit was a section of the project [website](#) and included three sub-sections: 1) Market Monitoring, in cooperation with Sustainable Bus; 2) Library & Tools, with relevant material and resources; and 3) CBEP Matching Tool, to help cities find peers with similar contexts.

Market Monitoring



In collaboration with [Sustainable Bus](#), UITP curated a website section dedicated to monitoring and visualising the status of clean bus deployment in Europe. Visitors could browse the interactive map for an overview of a) open tenders; b) bus orders; and c) deployed buses. A newsfeed kept visitors up to date.

Library & Tools

The CBEP Library provided material related to clean bus deployment, including guidelines, publications, legislative documents, and webinars. All material was categorised according to the UITP four stages of clean bus deployment: "if", "when", "what", and "how".

1. IF — KNOW & DECIDE: Material related to the initial stages of clean vehicle deployment, including identification & engagement of bus system actors and identification of the relevant legislative and policy framework.

2. WHEN – PLAN, REGULATE, FINANCE: Material related to funding & financing schemes, ensuring support from authorities, setting up project governance, etc.
3. WHAT – SPECIFY, PROCURE, DEPLOY: Material related to the procurement process, partnership development, processes for infrastructure deployment, etc.
4. HOW – OPERATE & MAINTAIN: Material related to fleet/charging operations and optimisation, worker training, activity evaluation, etc.

The Clean Bus Toolkit knowledge resources and material were taken from key European research projects in the field of clean bus deployment (e.g. ZeEUS, ASSURED, & JIVE/JIVE2), as well as publications developed by UITP bodies and committees and other relevant activities and projects implemented by diverse stakeholders.

Matching Tool

To help cities find peer cities with similar contexts and operational scenarios, the project developed a matching tool based on the Electrification of Public Transport in Cities (ELIPTIC) project's existing e-bus decision support tool.

The CBEP Matching Tool provided information about the existing clean bus cities and lines, like fleet composition and vehicle and battery specifications, as well as a comparative analysis of input data on geographical and operational parameters. This data was collected in the form of end-users' answers to objective questions, to compare the local conditions with operational cases of clean bus deployment across Europe and ultimately generate a similarity score. The tool was built to foster exchange of experiences between inexperienced cities and more advanced cities.

Newsletters

The project produced a series of e-newsletters, which can be found here:

- <http://mailchi.mp/0c1d52f22b98/clean-bus-europe-platform-newsletter-may-9207489>
- <https://mailchi.mp/f498c6835eb7/clean-bus-europe-platform-newsletter-march-2023?e=9aa5339472>
- <https://mailchi.mp/c3fe06c7a576/clean-bus-europe-platform-newsletter-january-9181557?e=9aa5339472>
- <https://mailchi.mp/a69eb8f21a99/clean-bus-europe-platform-newsletter-september-2022?e=9aa5339472>

¹ Not only CBEP members

IMPACT AND CONCLUSIONS

The CBEP project has been fundamental in facilitating the transition of EU cities towards decarbonisation of their bus systems. The project reached out to countries and regions beyond the EU-27 and developed collaborations with India and North America.

Thanks to the project activities and services, some of the Target Cities became Host Cities. For instance, Suceava (City of Suceava, in Romania) electrified its entire bus fleet by the beginning of 2023, becoming the first city in Romania with fully electric public transport. In June 2021, Jönköping (Jönköping Länstrafiken, Sweden) invested in 50 electrified buses and 11 charging stations for its public transport network. West Midlands (TfWM, UK) is currently operating 100 battery and 20 hydrogen buses in the region and has secured funding for an additional 200 battery and 124 hydrogen buses up to 2026, representing a quarter of its regional fleet and the biggest delivery ever outside China.

Throughout the project, Target, Follower, and Host Cities alike benefitted from the numerous project activities, improving their knowledge and know-how: 18 webinars (600+ participants¹), 7 STs to 11 Host Cities with classroom sessions and technical visits, two industry marketplaces with over 20 guided visits to learn directly from bus manufacturers and suppliers about the applications available on the market, and one financing marketplace with four funding and financing institutions, providing a complete overview of the most suitable products and examples of real projects. Furthermore, a wide range of materials were developed as part of the project: a project website with a library including about 90 resources, a market monitoring section with over 100 entries (buses in operation, tenders, & future planning), and a matching tool to facilitate the identification of similar contexts and solutions.

Especially valued was the dedicated technical support and the development of roadmaps for

cities that expressed interest, as well as the provision of advice and contacts for financing consulting (POAS, the Greek association of private bus operators).

Finally, the project explored a new field, social dialogue and the impacts of clean bus technologies on the workforce, the learnings from which have been compiled in a report. The report, elaborated in cooperation with the ETF (and in exchange with the International Transport Forum), provides key recommendations on how to manage change and the transition to clean and zero-emission fleets, based on interviews with labour and management representatives.

The CBEP's ambitious programme was possible thanks to close cooperation with the UITP committees (Bus, Trolleybus, Industry, Business, and Human Resources), other EU-funded projects (ASSURED, JIVE/JIVE2, Solutions PLUS, TUMI e-Bus Mission, eBRT2030), key industry stakeholders (bus OEMs, charging and refuelling infrastructure suppliers, energy infrastructure operators, and IT planning companies), and the financial sector (EIB/Jaspers, KfW-IPEX, EBRD, & the World Bank).

Similarly, the collaboration with relevant initiatives in the field like CIVITAS and its networks, such as CIVINETs (Romania, Cyprus, & Poland), SUMP-Central, trolley:motion, ASSTRA, and EAFO, as well as with organisations like VDV, Metropolis, and UCLG, helped expand the project's outreach and impact, facilitating the dissemination of results and material on the website.

Throughout the four years of project implementation, CBEP members had access to a wide range of knowledge, activities, and experiences; however, whenever feasible, UITP strived to make the project activities accessible to any city interested and willing to participate. This enabled a richer exchange among peers, often bringing together cities and operators from outside the EU-27 and even from other regions around the world.

In our eyes, the CBEP has been much more than a project supporting the decarbonisation of transport. The CBEP has grown to be a big family of peers helping each other pursue their energy transition plans.

We are convinced this collaboration should continue, as we are just getting started! Many more cities and operators currently need and will need in the future to learn from what we have developed and shared in this project. We think of the CBEP as the strong launch of a distributed knowledge partnership that will hopefully continue for many years to come.

The CBEP website will be running until February 2028, to facilitate further outreach and dissemination, especially the Toolkit section.

For further information, you can contact Aida Abdulah: aida.abdulah@uitp.org.

This is an official Project Brief of UITP, the International Association of Public Transport. UITP has more than 1,800 member companies in 100 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

The Clean Bus Europe Platform was an initiative under the European Commission's Clean Bus Deployment Initiative to support the deployment of clean bus technologies across Europe. The Clean Bus Deployment Initiative was launched by the European Commission in 2017 to support the transition to cleaner transport. You can find more information about the Clean Bus Europe Platform at <https://cleanbusplatform.eu/>.

