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THE EU ON THE PATH TO A SUSTAINABLE, SMART AND RESILIENT TRANSPORT SYSTEM

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EDITORIAL

THE EU ON THE PATH TO A SUSTAINABLE, SMART AND RESILIENT TRANSPORT SYSTEM

The EU is committed to being climate-neutral by 2050. Mobility has emerged as one of the major challenges of the energy transition.

As such, means of transport and travel need to be optimised to preserve the environment.

Introducing its "Fit for 55 package", the European Commission is now speeding up the transition towards low-emission mobility that is both inclusive and accessible to all. This should enable the EU to meet the climate goals of the European Green Deal and includes a series of proposals to revise EU legislation.

An action plan for the wider use of alternative fuels for all modes plays a significant role in the decarbonisation of transport.

The aviation and maritime sector are given a strong political impetus/signal through the revision of the rules on infrastructure as well as legislations on the deployment and use of alternative fuels, with the new ReFuelEU Aviation and FuelEU Maritime initiatives. It introduces for the first time ever measures to consider the whole life cycle of fuels used by ships in a hard-to-decarbonize sector. For cars, the Commission shows even a stronger ambition, with a de facto ban of internal-combustion engine vehicles by 2035.

A number of large intermodal infrastructure projects are currently underway (rail, aviation and maritime) and can provide solutions in terms of reducing our carbon footprint, optimising our logistic chains for freight or decongesting our cities.

It is important to emphasise that the Sustainable and Intelligent Mobility Strategy lays the foundations for a green and digital transformation and for greater resilience to future crises. Creating an ecosystem to optimise and digitise the supply chain is a key component of sustainable mobility.

Greater digitalisation as well as sound data management will play a vital role in the transformation of mobility and the transport industry in Europe.

The transport sector is a driver of the European economy and will need to adapt quickly and find ways to increase its efficiency through technological innovations and investments for a swift roll-out of low emission transport. New mobility models will entail a safer, multimodal, inclusive, more efficient approach.

The aim of this issue of The European Files is to highlight the growth opportunities within the mobility sector and the implementation of an ecosystem of available and efficient infrastructure, while enabling cleaner and more convenient means of mobility for its users.

Editor-in-Chief
LAURENT ULMANN

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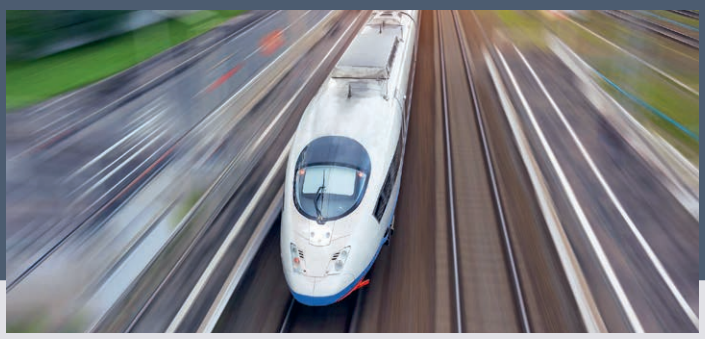

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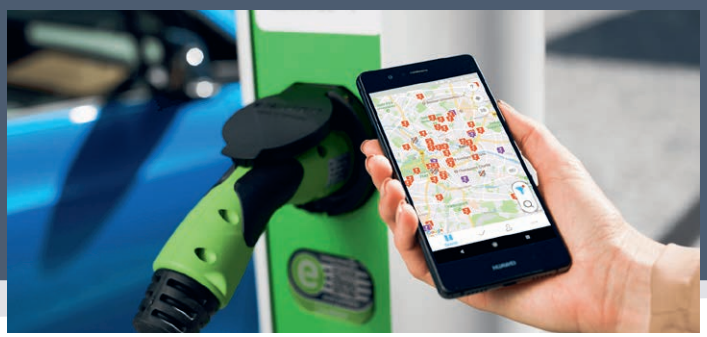


How could the **EU transport system** achieve its **green** and **digital transformation**?

ADINA-IOANA VĂLEAN

Commissioner for Transport, European Commission

Modernising our transport system so that it contributes to the EU's overall emissions reductions, takes advantage of the very latest technology – and meets our citizens' expectations – is a huge task. I will not claim otherwise. But we have a plan in place, and we have already moved from the planning to the implementation phase.

Sadly, there is no silver bullet to make our transport system greener and smarter. We need to approach mobility from every angle. This is why our Sustainable and Smart Mobility Strategy – our roadmap for cutting transport emissions by 90% by 2050 – contains as many as 82 concrete measures. Alongside increasing the digitalisation of transport, they are intended to make all transport modes more sustainable, to ensure sustainable alternatives are widely available in a multimodal transport system, and to put the right incentives in place.

I presented the Strategy in December 2020, and this July I was proud to follow up with a first set of proposals. Part of the Fit for 55 package, two proposals are designed to boost the production and uptake of sustainable alternative fuels for aviation and maritime transport, and a third will ensure we have the right infrastructure in place to support the use of alternative fuels.

It is on this third proposal, for an Alternative Fuels Infrastructure Regulation – AFIR, that I want to focus here.

We know that we need to get more emission-free vehicles on our roads. In fact, our Strategy contains the milestone of having at least 30 million zero-emission vehicles on European roads by 2030. But today we find ourselves in a chicken-and-egg-situation – while the sales of electric vehicles have increased (sales more than doubled between 2019 and 2020, and we expect this trend to continue), some are still reluctant to invest because of a lack of infrastructure. Meanwhile, investment in infrastructure is disappointing, because demand is still relatively low.

I completely understand the consumer's perspective. Who would buy an electric car if they are not sure that they will be able to recharge it when required? The same reasoning stands for planes, ships and trains. Whether running on electricity, hydrogen, or synthetic fuels, no business or individual will buy a vehicle if they are not 100% confident that they can refuel or recharge it with ease.

Our AFIR proposal will ensure sufficient, interoperable and user-friendly recharging and refuelling infrastructure throughout the EU, taking us out of this vicious circle.

As we are currently far from where we need to be, our proposal contains mandatory deployment targets. On recharging points for cars and vans, we propose a combination of fleet-based targets that ensure a needs-based rollout in line with real fleet uptake, and distance-based targets for fast chargers on the EU's Trans-European Network. For each battery electric light-duty vehicle registered in an EU country, the country must provide a power output of at least 1 kW, through publicly accessible recharging stations. And along our TEN-T core network, from 2025, we must have at least one recharging pool of at least 300 kW every 60km for cars and vans, including at least one recharging station with an individual power output of at least 150kW. By the end of 2030, this must increase to one recharging pool of at least 600 kW (including the 150kW recharging station).

In addition, we have proposed targets for the comprehensive network, for heavy-duty vehicles, including specific targets for safe and secure parking areas, where lorries can recharge overnight.

We have also proposed targets for hydrogen refuelling stations. I want to see one every 150km along the TEN-T core and comprehensive networks by the end of 2030, as well as at least one publicly accessible hydrogen refuelling station in each major transport hub along the TEN-T.

The targets will help us build an internal market for recharging and refuelling services. They will provide the long-term investment certainty needed to secure a competitive future for Europe's automotive sector.

But we need to do more than simply install recharging and refuelling stations. We also need to ensure full interoperability and user friendliness. One way to do this is to ensure a common payment method. Another is full price transparency. For both, we are proposing minimum requirements.

AFIR also covers maritime transport and aviation. We want mandatory targets for shore-side electricity supply for passenger and container ships at maritime ports, and minimum shore-side electricity supply infrastructure for inland TEN-T ports. This will reduce emissions, but also help improve air quality in port cities. And we are also proposing targets for electricity supply to stationary aircraft.

Such ambition comes with a cost – there is no ignoring that. We expect private investment to play a large part in meeting the targets, although public financing will be required in the initial phase, and also in areas with low demand. At EU level, we are supporting investment through the Recovery and Resilience Facility, InvestEU, the Structural Investment Funds and the Connecting Europe Facility.

I believe that our proposal sets the right balance between mandatory targets and market mechanisms. It will create the legal certainty that the automotive, maritime and aviation sectors need, and give all drivers the confidence to consider switching to an alternative fuelled, zero or low-emission vehicle. I am looking forward to discussing it with our co-legislators – the Council, and the European Parliament.

How can we make the **European transport system** more **resilient** to **future crises**?

JERNEJ VRTOVEC

Minister of Infrastructure of the Republic of Slovenia

Transport systems are complex and respond to crises in ways that are difficult to predict. In recent decades, transport has been heavily burdened with the stigma of being the biggest polluter. The growth in traffic levels has resulted in rising greenhouse gas emissions, which in turn contribute to the climate change that is causing a climate crisis. Slovenia has not joined the calls to officially declare a climate emergency. Instead, we have taken a series of measures at the political level in line with the transport development vision adopted by the Slovenian parliament in 2015, which envisages that Slovenia will "develop sustainable mobility of the population and sustainable supply for the economy by 2030". Our transport policy is rooted in our values, which we want to preserve and live by as citizens of Slovenia and the EU. Sustainable transport development, population mobility, supply to the economy, and safety and security of road users are the values we have taken into account in formulating the transport policy of the Republic of Slovenia.

How can individual countries and the EU prepare for future crises? As is the case for individuals, the transport system also has to respond in the event of a crisis. As an old piece of Oriental wisdom is said to say, a crisis represents both a danger and an opportunity. It is therefore vital to strengthen the system when there is no crisis. That is why the climate policy focuses both on climate change mitigation and adaptation. This involves investing in resilient transport infrastructure, hubs and terminals to enable intermodal transport and rapid responses to crises, strengthening the low-carbon transport and transport logistics, and developing and optimising the management of short supply chains. In order to address time requirements, the best response would be investing in research and development of new alternative techniques and technologies, liberalising and modernising transport, and creating a single transport market supported by digitalisation.

In recent years, Slovenia has adopted an ambitious national energy and climate plan, which will be upgraded next year to fall in line with the higher targets introduced by the FIT for 55 package. This plan is based on a long-term climate strategy that covers not only transport and energy, but also other areas affecting a society, such as environment, spatial planning, the economy and finance. The Government of the Republic of Slovenia has developed a programme to phase out harmful subsidies that encourage the use of fossil fuels in transport. Slovenia has also been very active in the development of infrastructure for alternative fuels and has become the first country in Europe to set up fast charging stations for electric vehicles across the entire motorway network. In addition, the Slovenian private sector is also at the forefront of the research and development of new technologies for both vehicles and charging stations.

Problems will not be solved if we do not change our way of thinking and remain stuck in the mentality that has caused the climate crisis in the first place. We must internalise the danger and, as individuals, take responsibility. We need to stop putting the blame on other people and the state. The climate crisis is not the only crisis we currently face, and we need to remember that crises are part and parcel of life and evolution. The COVID-19 crisis has put us to the test both at the individual and societal level. It has accelerated some processes and exposed certain shortcomings in society. COVID-19 has led to a significant increase in work from home and remote schooling. Both have a major impact on reducing the need for transport. In the transport of goods, similar results could be achieved by stepping up localisation, i.e. the use and purchase of local products and produce. What we need is a change in mentality, new paradigms of economic decision-making, and education, training and awareness-raising in the area of sustainable development. The latter is helped by events such as the following two, which are to take place in the week I am writing this. From Wednesday to Friday, Slovenia will become the European hub for the development of green technologies. The cross-border Hydrogen Valley project, which brings together Slovenia, Croatia and Italy, will be presented in Nova Gorica, and at the end of the week the European Commission and the Ministry of Infrastructure will hold a free conference in Bled on promoting the development of low-carbon technologies.

The values of society shape the world and create the conditions within which – in the sustainable development context– we address the threats posed by crises that demand action be taken in the search for a global optimum in the economic, environmental, social and ethical spheres.

As it is a small country, Slovenia is aware that with its lean bureaucracy and highly qualified R&D staff, it can set an example in introducing positive changes in society, which will first be reflected in the transport and energy sectors.

Decarbonization isn't the end of **mobility**— it's a new **beginning**

JEAN-BAPTISTE **DJEBBARI**

French Minister Delegate for Transport

There is no better time to build a new, cleaner, better house than after a hurricane passed. In the aftermath of COVID, this statement can apply to many segments of our economy—and the European transport system is one of them. Decarbonizing it is a top tier priority on the road to carbon neutrality.

Some argue that the best way to achieve it is to restrict our mobility, our freedom, our openness to the world. It is probably the easiest way, but we can all agree that this does not sound like a desirable future. We chose a different, more ambitious path: transforming more-emitting transport while developing less-emitting transport.

First, we must free ourselves from fossil fuels. Replacing them by alternative fuels supposes deploying adequate infrastructures and creating new industries.

Owning, driving and refueling an electric car should be as easy and reliable as owning, driving, and refueling a petrol car. Some are reluctant to EVs by fear of not finding any charging station. We have to put an end to this fear, by deploying charging stations everywhere.

Because road transport accounts for three-quarters of transport emissions, its decarbonization is our number one focus. But alternative fuels are also relevant to air and maritime transport. Sustainable aviation fuels (SAFs) must be generalized: France will seek to introduce ambitious obligations for their use. Not only should we act at EU level, we must also defend this position at the ICAO, and through measures to prevent carbon leakage at EU borders. As aviation and shipping are globalized, they are subject to strong competition from third-country carriers. Hence a strong risk of carbon leakage, which would be detrimental to both our economy and our planet. To mitigate it, we need to secure a level playing field. Europe must not be naïve.

Second, we must encourage modal shift towards clean transport. And rail is one of the cleanest of all. The Trans-European Transport network is a great asset—the Connecting Europe Express has reminded us so.

Rail freight can take hundreds of thousands of trucks off of European roads. To do so, we must develop European infrastructures and set up a new European support for rail freight operators, as we called for with 16 other member states.

As for passengers transport, night trains prove an efficient and popular alternative to plane. In France, their new start arouses enthusiasm: the Paris-Nice and Paris-Vienna night trains are back, and many more are coming.

Last but not least, we must ensure this transition does not prove to be a burden, but an opportunity for our citizens, our industry, and for Europe as a whole.

I am optimistic about it: turning our transport green means new skills, new jobs, new competitive advantages. By anticipating this inevitable transformation and taking the turn early, European industries can become world leaders of tomorrow's sustainable economy. I want our youth to think of transportation as one of the jobs of tomorrow. Together, we will have to take action at European level to make it more appealing. This requires improving transportation workers' social conditions.

Turning our transport green requires massive public funding. We know it—which is why French President Emmanuel Macron recently unveiled a €30bn investment plan in new technologies (independent from the previous recovery plan): small modular reactors, green hydrogen, low-carbon aircraft, electric vehicles, biotech, small satellite launchers… And the EU knows it as well, as demonstrated by the Green Deal.

To make this transformation true, we need citizen support. Despite the awareness that making our transport cleaner and sustainable is necessary, it can be costly. The most impacted households should therefore be supported.

The "Fit for 55" package currently under discussion embodies our European ambition : it must take into account these considerations. France will make good use of its EU presidency to push all of these ideas forward.

As a land of inventors and the cradle of so many world industry leaders, Europe has a special responsibility in imagining the transport of tomorrow. Let's be true to Europe and its history. Let's pave the way to green mobility.

TIMO HARAKKA

Finnish Minister of transport and Communications

Put the **right incentives** in place **to drive the transition** to **clean mobility**

Well-functioning transport and communication services are a cornerstone of modern society. People need to get to work, to go shopping and to meet friends and relatives.

The main aim of a transport system is to satisfy the mobility needs of every person in an easy, safe and affordable way, both in urban and rural areas.

Nevertheless, as we all know, transport causes a wide range of environmental and health problems. The main impacts are climate change, lower air quality and noise.

Transport also consumes staggering amounts of energy every year. Even nowadays, this energy need is met mainly by burning oil-based fossil fuels such as petrol, diesel, fuel oil and kerosene. Currently, transport is fossil-fed.

I believe we all want to make good and sustainable choices, but often there are obstacles. I do not want to use a car or own one, but without public transport, I have no choice. I want to buy an electric car, but there is no convenient place to recharge it. I would like to cycle to my destination, but the roads are of poor quality or unsafe. My transport company wants to use alternative fuels, but the scarce distribution network makes it hard. The list goes on and on.

As policy makers, it is our duty to tackle these obstacles because they can prevent individuals and companies from making good choices. We must create, develop and offer incentives. We must provide lucrative and appealing alternatives. We must provide proper infrastructure. And we must provide a transport system in which all its parts – infrastructure as well as services – are compatible with and complement each other.

In the transport sector, the first steps towards a climate-neutral transport system have been taken through measures such as the electrification of road transport, improvements in railways and other modes of transport, and reductions in the carbon footprint of logistics.

The phasing out of fossil fuels in the transport sector is a prerequisite for achieving ambitious climate goals. Electrification is the number one choice when replacing fossil fuels with renewables, followed by a range of storage options and alternatives to electricity that include hydrogen and other *power-to-x* production, synthetic fuels, biomass and biogas, as well as biofuel in a conventional internal combustion engine at the tail end of the list.

Alternative fuels, and a distribution infrastructure for them, are needed to enable people and goods to move around. We see the recharging and refuelling infrastructure for alternative fuels as a key enabler of climate-friendly mobility.

Even though electric vehicles do not produce emissions, we cannot sustainably base our transport system on an increase in mostly single-user vehicles. Multimodal mobility chains consisting of public transport, active mobility and first- and last-mile solutions are the backbone of a transport system based on the circular economy.

This is where Mobility as a Service, MaaS, comes into the picture. MaaS is a more comprehensive alternative to our current transport system, which is built on heavy car dependency.

For me, Mobility as a Service is such a powerful vision because it combines sustainable public, shared and on-demand transport with private convenience. MaaS is attractive precisely because it understands and adapts to behavioural preferences of us people on the move.

Decarbonisation actually gives companies competitive edge. Proactive actors can use their imagination to innovate, those who come later, have to meet obligations and rules set by first movers.

I often say decision-makers can act either with foresight or with hindsight. Making decisions before they are absolutely necessary gives you an array of choices. You may make the wrong choice, but it was your choice. Acting when there is no alternatives is not really a decision, but coping to crisis.

At this point of time, we have an array of policy alternatives, incentives and ideas at our disposal. Now is the time to act.

A **pathway** for **green investment** in **transport**

KRIS PEETERS

EIB Vice-President responsible for transport operations.

Our planet is at a crossroads. We must act immediately and swiftly if we want to ensure a sustainable transition to a net-zero emissions economy and avoid catastrophic tipping points in our climate system. We already need rapid change now, but if we wait longer, we run the risk of having to make even more abrupt changes and of taking drastic action, which would be more disruptive for our economies and our financial markets. Even worse, we may fail altogether and face existential consequences for the human race and many forms of life on our planet.

The Intergovernmental Panel on Climate Change (IPCC) has clearly indicated that the current decade until 2030 is our last window of opportunity to avert disastrous climate change. This is also true for the protection of biodiversity and ecosystems. The investments we make over the next ten years will change the face of our economies and our societies. They must.

CO_2 emissions from aviation and shipping have been rising rapidly over the past two decades, along with those from motor vehicles, which account for about 75% of transport demand and emissions today. Since 1990, transport emissions in the European Union have grown by 33% overall, even as other sectors taken together have reduced emissions by 32%. During the first phase of the coronavirus pandemic, we saw passenger and commercial vehicle travel grind to a halt and aviation, rail and to a lesser extent maritime activity plummet. This reduced greenhouse gas emissions, improved air quality and gave a glimpse of what a cleaner world could look like. However, many transport sectors have now returned to pre-COVID emissions levels or reached even greater heights.

To achieve a permanent reduction in CO_2 and other polluting emissions will thus require sustained policy actions to reduce travel, a move to cleaner modes of transport and enhanced efficiency and electrification across the board. Vital transport technologies and alternative fuels — like advanced biofuels and sustainable hydrogen based e-fuels — remain at the demonstration and prototype stages and their development needs to be accelerated. Priorities also include anticipating and managing demand by shaping new mobility developments in cities and by formulating long-term technology and policy visions for heavy-duty subsectors such as road freight, shipping and aviation.

There is also an important economic dimension to the challenge that lies ahead. Europe's highly competitive automotive and transport industry plays a key role in driving economic growth and employment. If Europe falls behind in developing and adopting sustainable technologies within the next decade, it will pay a high price.

A pathway to green investment

Our latest EU-wide business survey, the 2021 EIB Group Survey on Investment and Investment Finance, shows that uncertainty about the regulatory environment and taxation are seen as the main barriers to climate-related investment by businesses from all sectors. The clear message from those surveyed is that for them to make the investments we need them to make, they need a clear decarbonisation pathway, advice on financial assistance and technical support.

That is why the European Union has been at the forefront of international efforts to fight climate change through close cooperation with international partners. It is showing leadership through its ambitious climate action policies.

A clear, EU-wide pathway for transport is being shaped with the launch of the European Commission's Sustainable and Smart Mobility Strategy, which sets clear targets and milestones for all transport sectors.

Moreover, the green taxonomy is taking shape and CO_2 pricing and emission standards are being prepared. The post-2021 light-duty vehicle CO_2 standards, for example, are currently being reviewed by the European Commission, and a review of heavy-duty standards is planned for 2022.

The European Union and national governments clearly have a crucial role to play in minimising obstacles to climate investment: by minimising regulatory uncertainty, communicating climate policy goals and developing a comprehensive climate action framework.

However, while much remains to be done by policymakers and the public sector, firms must be aware that the path to combating climate change only leads in one direction: net-zero emissions by 2050.

In June 2021, the European Union adopted the European Climate Law, which aims to

slash its net greenhouse gas emissions to zero by 2050. The law sets an intermediate target of reducing these emissions by at least 55%, compared to 1990 levels, by 2030.

Overall, our research shows that most firms are not yet taking into account the foreseeable physical and transition risks associated with climate change. Firms may believe that climate change will impact their country or region to a lesser extent than more distant places. In that case, they underestimate the indirect risks to which they are exposed through their global supply chains and markets. Their failure to take such risks into consideration reduces their perceived incentives to invest in adaptation and mitigation measures. It also puts their own long-run prosperity at risk and leaves the European Union's climate objectives in jeopardy.

The climate emergency leaves firms with two pathways: plan today and gain a competitive edge, or risk losing ground to more forward-thinking competitors. Prudent steps taken to address climate change now can improve a company's competitive position relative to its national or international peers. With more climate policies coming from national governments and increasing scientific clarity, now is the time for businesses to design corporate strategies that address climate change.

Supporting businesses on their green journey

As the EU climate bank, the EIB Group is committed to supporting the transition towards a low-carbon and climate-resilient future. Since 2012, the EIB has provided €197 billion of finance supporting over €670 billion of investment in projects that protect the environment, reduce emissions and help countries adapt to the impacts of climate change. In regard to the transport sector, following a public consultation with companies, the public sector and civil society, we will adapt our transport lending priorities. But more than that, we also help climate projects get the technical advice and investment support they need to make a difference.

Under the PATH framework, launched this year, the EIB has begun working with companies that are willing to align over time with the goals of the Paris Agreement — namely to transition towards a low-carbon and climate-resilient economy. The EIB Group is the first multilateral development bank to address the wider activities of clients and help them to decarbonise their businesses or manage physical climate risks in this way. It will continue to share this experience with other institutions.

Access to finance

Access to finance is not always easy for innovative companies, including those investing in the new technologies required to effect the green transition. The EIB has therefore developed climate and environmental finance instruments to address market failures and support investments that are economically viable, but do not receive sufficient commercial finance due to perceived risks.

We have been successfully bringing nascent technologies through technical advice and investments to commercially competitive stages, such as offshore wind farms, or more recently our support for home-grown European battery production.

The EIB Group also plays an active role in crowding-in other investors: the Bank typically only finances up to 50% of total eligible project costs, meaning that we are working alongside other partners to finance projects. Often, the EIB's robust appraisal process for its investments is recognised by these partners and is what gives them the confidence to participate in the investment.

The EIB is a strong partner for the transport sector's green transition.

The EIB has been steadily increasing its share of transport investments related to climate mitigation over the past few years. Between 2016 and 2020, the EIB signed finance contracts with a value of €56.5 billion in support of transport, of which €36.7 billion was related to climate action. This represents 65% of total EIB transport lending. Last year alone, we lent over €8.1 billion towards climate action in the transport sector.

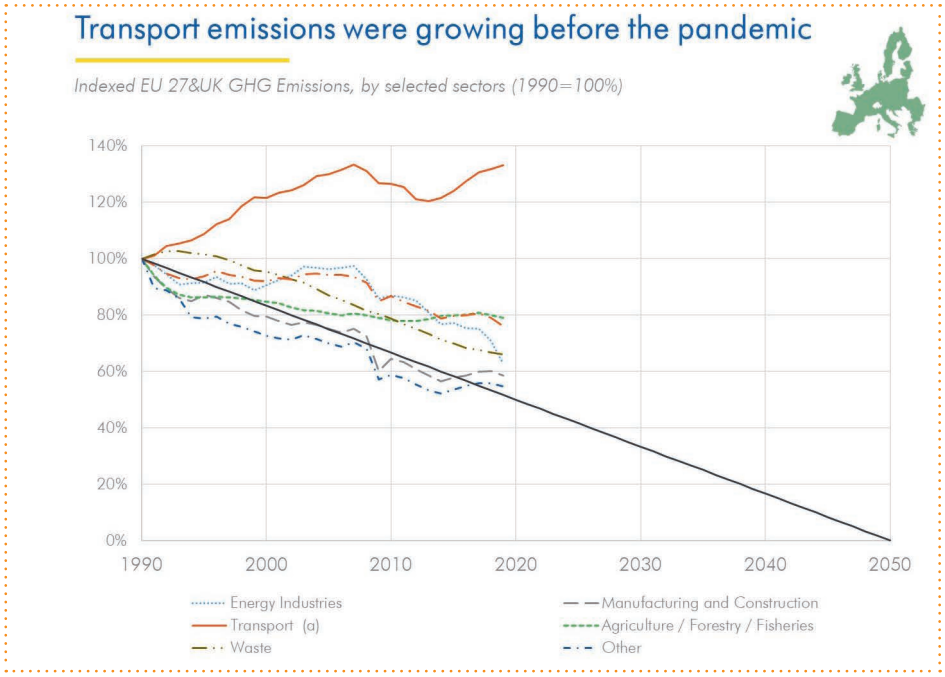
To us it is clear that meeting the long-term objectives of the European Green Deal will require sustained long-term investment in green innovation. In particular, technologies that provide a green pathway in aviation, maritime and heavy-duty transport are often still in their pilot phase. The EIB engages with the front-runners to see how it can support them both through existing finance products and through developing specific products such as the Future Mobility initiative, which is supported by the European Commission. This instrument enabled us to support Cargobeamer, which is deploying a technology that makes it possible to smoothly interconnect rail and road transport. It involves specially designed pallets that can be carried on a road trailer; the pallets are fitted on top of flatcars but can slide sideways to allow trucks to drive on and off smoothly at intermodal terminals.

Markets can change more quickly than businesses expect

Markets move quickly, and companies can and should act now.

The share of green investment on the capital markets is skyrocketing. The EU taxonomy will improve the climate-related information that investors, lenders, insurers and other stakeholders have about firms. This will increasingly guide them in their investment decisions.

Institutions such as the EIB Group can support the transport sector's transition. But the fact remains that there is not enough public money in the world to finance the transition to a low-carbon future. Ultimately, the private sector must take the lead. Major industrial players, entrepreneurs and grassroots organisations must adopt a more agile, daring and even revolutionary approach. The EIB will be there every step of the way, offering guidance and sharing the risk.



Source: European Environment Agency (EEA), June 2021

The **role** of the **Alternative Fuels Infrastructure Regulation**

ISMAIL ERTUG

MEP (S&D Group - Germany), Member of the TRAN Committee European Parliament, Rapporteur for Deployment of alternative fuels infrastructure, and repealing

After the Commission has presented its regulation on the development of a Europe-wide infrastructure for alternative fuels, I highly welcome the political decision to replace the originally foreseen directive with a regulation as time is pressing. We had already suggested such an upgrade, i.e. from a directive to a regulation, in our EP-Resolution "Deployment of infrastructure for alternative fuels in the European Union: time to act!" in 2018 with me as the S&D Rapporteur.

If the transport sector as a whole, which is responsible for more than a quarter of all CO_2 emissions in the EU, should be entirely free of emissions by 2050, road transport in particular must make a decisive contribution to reach this goal. A Europe-wide infrastructure, especially charging stations and hydrogen filling stations, is the best way to finally break through the "chicken and egg" discussion, which has been going on for years. As already noted: time is running out and we need to act now!

We have lost so many valuable years. In 2013, an ambitious proposal was already on the table. Had it been adopted as proposed by the Commission at the time, there would be more than 677.000 charging stations on Europe's streets today, spread across all EU Member States.

The proposal back then set binding targets for all Member States - and yet, it was watered down, particularly by the Council of Ministers, to an extent that only non-binding national action plans remained. It is obvious that these non-binding plans have not produced the desired results. Today, there are roughly 220,000 charging stations installed in the EU, and over 70% of the latter are concentrated in three countries: France, Germany and the Netherlands.

The Commission's new proposal provides binding targets for all Member States. These targets no longer relate to individual charging points, but to the actual capacity installed. In the future, for every registered Battery Electric Vehicle, a Member State must provide an electric power output of at least 1 kW in the charging system, as well as 0.66 kW for every Plug-in Hybrid vehicle. In addition, a "charging pool" needs to be created at least every 60 km on Europe's TEN-T core network from 2025, with the minimum capacity gradually increasing. From 2030, this should also apply to the entire comprehensive TEN-T network.

For Heavy Duty Vehicles the situation will be slightly different: there will only be a distance-based target for the TEN-T core and comprehensive network. Here, we have to make sure that the charging power output must be sufficient to ensure that vehicles can be charged up during rest times, and that charging stations are placed adjacent to rest facilities during the drivers' night time rest.

The Commission have also included minimum shore-side electricity (SSE) supply for seagoing ships in seaports and for inland waterway vessels in their proposal. Furthermore, obligations are introduced for electricity supply to all stationary aircraft in TEN-T core and comprehensive network airports. In concrete terms, this means that there would be an obligation for Member States to provide electricity supply for airplanes and ships.

Specifically on hydrogen: According to the Commission proposal, it is still too early for the full deployment of hydrogen infrastructure for road transport, but for 2030 Member States will have to ensure that there are publicly accessible hydrogen refuelling stations along the TEN-T core and its comprehensive networks. Major truck manufacturers, however, suggest that fuel cell trucks will not be ready for series production until the second half of this decade, and hence I think it is worth having a discussion around the binding targets for 2030.

An important topic for me personally is the harmonisation of payments, which will be key to ensure that the electrification of road transport can be achieved in an accessible and democratic way. All users should have a possibility to recharge their vehicles at any charging point. The Commission is also aiming for a more user-friendly charging infrastructure, confirming that such ad-hoc payments should be possible. Better price transparency and easier payment options, including the ability to pay by card without authentication shall be implemented at all charging stations.

I think what we need to strengthen here is the obligation to ensure that it will be possible to use card payments at all charging points, and we should not merely rely on the latest technological paying methods such as applications or QR codes. Those technical solutions are fine, sure, but card payment must always be a possible option for payment. So let us press for it!

Overall, the Commission's proposal makes a solid impression incorporating many elements of what the European Parliament in particular has been calling for years. Given that this regulation will decide on the deployment of the alternative fuels infrastructure in our Union, it will be important to ensure that the provisions we set for this infrastructure also correspond to the targets, which are set in other files in the Fit-for-55 package. Notably, this means that we will have to work in close cooperation with the Commission and the Council.

ANGELIKA NIEBLER

MEP (EPP Group - Germany), Member of the ITRE Committee

Investing in a **sustainable future of mobility**: Why the EU must remain open-minded to the various technical solutions

Slowing down global warming might be the greatest challenge for our generation. To this end, the European Parliament passed an unprecedented climate law this year committing the Union to climate neutrality by 2050 and setting the very ambitious goal of achieving a reduction in carbon emissions of 55% by 2030. A transformation of unparalleled scale and scope. On the way to net-zero the European Union must ensure that its economy remains strong and robust by setting the right legislative incentives. Especially our European SMEs - hidden champions of global significance - must remain competitive against external players.

A large driver for emissions is the transportation sector. However, it is in nobody's interest to limit our mobility. Consequently, the EU needs to reduce the emissions among the entire mobility portfolio, leaving no stone unturned. Boosting the uptake of low- and zero-emission vehicles, coupled with the mass-scale production of renewable and low-carbon fuels, should be our number one priority. While it is evident that electric vehicles will play a key role on the road to carbon-neutral mobility, it is important to remain open to all possible technological solutions.

While the mobility sector is growing rapidly, the current proportion of low- and zero-emission vehicles remains very low. Therefore, the EU proposes various measures to accelerate the growth of the low-emission sector. One crucial step is building the necessary infrastructure of EV-charging points. But we must insist on technology neutrality, giving hydrogen, synthetic fuels, and e-fuels a chance. Above all, life-cycle assessments should be taken into consideration more closely as vehicles' carbon impact should be determined based on the entire value chain and not only based on the expulsion.

Railroads need to be part of the solution in Europe as well. Therefore, the EU declared the year 2021 the "European Year of Rail," placing the spotlight on the most sustainable and safest mode of transport to date. Rail is largely electrified and emits far less CO_2 compared to road and airborne transportation. With the EU`s successful program "*Discover EU*", that the EPP has been supporting for years, thousands of young Europeans were empowered to explore the fascinating diversity of Europe by making use of a free 30-day train ticket. These young people, became true ambassadors of the European railroad system and low-emission mobility.

However, trains are not the answers to all environmental challenges. Especially for citizens living in rural areas, individual mobility, e.g., cars, remains the only feasible solution. The EU must take the social impact of the transformation for citizens in all parts of the EU - be it rural or urban - duly into account. The proposed Social Climate Fund, supporting the citizens most affected by energy and mobility poverty, is a welcome step to ensure that no one is left behind. However, more thought needs to be put in how to counter the social consequences of the green transition.

In any case, the mobility transformation should follow the principle of innovation - not limitation. Therefore, the EU should remain open-minded to the various technical solutions. An Innovation Fund will provide up to 20 billion Euros until 2030 to support the necessary breakthrough solutions in the areas of, e.g., renewables, energy storage, and carbon capture to unlock Europe's carbon-neutral future. The first 118 million Euros have been awarded to 32 innovation projects in 14 member states. Here, we need to pick up the pace.

Another crucial tool on the road to carbon neutrality is the Emissions Trading System (ETS). The ETS is a proven market-driven mechanism that should be extended to both the mobility and buildings sectors. The ETS is a cost-effective tool that can serve as a blueprint for other nations around the globe. At the same time, the ETS system ensures openness to all technology, as the cleanest technology prevails.

In conclusion, the success of the European Green Deal is inextricably linked to the transport sector, which needs to become truly sustainable. At the same time, the social dimension is essential and should not be forgotten. The European Union can only succeed if the EU citizens unite behind a common agenda based on clean and affordable mobility. And we are only able to achieve that if we stay open-minded to all the various technical solutions available.

Shifting to Europe's Rail

CARLO **BORGHINI**

Executive Director, Shift2Rail

The rail sector renews its partnership with the European Union to deliver the next generation of railway

With the launch of Europe's Rail, the Shift2Rail Programme is gradually phasing out with projects still running until 2023. While the focus remains on delivering the Programme and its key results, the European rail community is looking to deliver, with Europe's Rail Joint Undertaking (EU-Rail), even more ambitious objectives. S2R has supported an unprecedented convergence of the rail sector and Europe's Rail will build upon its legacy and the need to speed up the shift to carbon neutral mobility and transport, to deliver the next-generation of railway, for passengers and freight in Europe and beyond.

Europe's Rail JU will be one of 10 European Partnerships under the Horizon Europe research initiative between the European Union and industry with an objective to accelerate the green and digital transition.

With a significant increase comparing to Shift2Rail's budget, estimated at almost 50% excluding the funding absorbed by UK entities under the previous programme, EU-Rail started officially on 30 November[1], for a period of ten years, with a total amount of activities of EUR 1.2 billion to be delivered by its Members and other stakeholders under Open Calls, funded by EU-Rail with the resources provided by Horizon Europe up to EUR 600 million. The objective of Europe's Rail is to deliver a high-capacity integrated European railway network by eliminating barriers to interoperability and providing solutions for full integration, covering traffic management, vehicles, infrastructure and services, aiming at faster uptake and deployment of projects and innovations. This should exploit the huge potential for digitalisation and automation to reduce rail's costs, increase capacity, and enhance its flexibility and reliability, based on a solid reference functional system architecture shared by the sector, in coordination with the European Union Agency for Railways (ERA). By improving competitiveness, it will support Europe's technological leadership in rail, with a leverage effect of each 1EUR invested by the Union, creating more than 2EUR of Research and Innovation added value.

In addition to the European Union, represented by the European Commission, the new partnership consists of 25 industry Members, selected through a transparent process started by the European Commission in August 2020, ensuring a balanced representation of the rail sector, including the operating community, rail and infrastructure managers, the supply industry, research centres and small medium enterprises, creating an opportunity for the sector to join forces and work together.

Lastly, as already indicated, the previous eligibility criteria to access to the calls are now eliminated under Europe's Rail, which will build upon the concept of Open Calls fostering sector integration with a shared vision.

Europe's Rail's project cycle will begin at the end of the first quarter 2022, with projects kicking off in the last quarter of 2022; a second wave of calls for proposals is estimated in 2025 and a final call in 2027-2028. In addition, it is expected that on a yearly/regular basis calls for proposals will be published to complement ongoing projects, to explore new areas of interest, and perform studies and/or, for example, to fund PhDs. The phasing out of Shift2Rail projects largely in 2023 will create an optimal transition with the phasing in of the new EU-Rail projects, preventing existing research teams to have to integrate new partnerships and/or ensure the necessary handover to the new structures. For instance, the transition between the results achieved in S2R on ATO GoA2 and the activities of EU-Rail to reach demonstrators for GoA4 with a short-term market uptake ensure a seamless transition.

Europe's Rail will focus on developing the new technological and operational solutions to deliver the railway system meeting the expectations of the Sustainable and Smart Mobility Strategy. The Strategy aims to double highspeed rail traffic by 2030 and, double rail freight traffic by 2050. For this to become a reality, rail needs to transform itself, re-invent itself, leverage its strengths – rail being a land guided system, iron on iron – and cost effectiveness. This transformation process shall be driven by the rail sector with an integrated system approach, involving technologies, operations but also the staff working in the rail system and its training to new functions and roles. Digitalisation and automation are key enablers of such transformation and are at the heart of EU-Rail as they are expected to contribute to substantially increasing the performance of rail and creating opportunities for the deployment of future proof technologies. This transformation aim to deliver new rail services to its clients – passengers and business – while attracting new ones.

To deliver on its objectives, Europe's Rail has identified five key areas. Starting with a European Traffic management layer, to set the ground for dynamic capacity and traffic management, to operate the European network with seamless operations. Secondly, operating on a performing network, EU-Rail will support projects that will improve the digitalisation and automation of train operations building upon the necessary evolution of the relevant systems, starting

1 Council Regulation published in the Official Journal https://eur-lex.europa.eu/eli/reg/2021/2085

from radio-based ERTMS as a baseline and considering the named CCS+, next-generation ATC, and another number of key technologies. The third key area will finance research on improving sustainable assets, a holistic approach to energy management, alternative energy solutions for diesel rolling stock, sustainability and resilience of the rail system in a global approach to asset management, delivering more value. This area also focuses on the improvement of electro-mechanical components and sub-systems for the rolling stock, contributing to the overall attractiveness of the rail system for passengers.

Crucial to the green transition, rail freight will be a key focus area of EU-Rail. This fourth key area will contribute to delivering a seamless rail freight system, integrating information and data for all the actors involved, and pushing for fully digital rail freight operations, breaking down existing barriers that undermine the performance of rail freight, such as coupling, brake controls, language issues, and other technologies or operational processes. Successful stories such as the DAC (Digital Automated Coupler) technology, to be adopted as an EU standard by all Member States show the added value of the integrated system approach to make efficient use of the new technologies.

Lastly, a fifth key area will contribute to connecting remote regions in Europe, with an integrated system of solutions to revitalize capillary lines and regional lines, addressing aspects related to operations, vehicle, energy solutions for a sustainable capillary network.

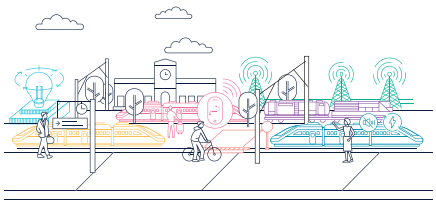
In order to achieve its ambitious targets and work on the aforementioned key areas, Europe's Rail is structured around three main pillars: The System Pillar, the Innovation Pillar and the Deployment Pillar, all complementing each other and incorporating the legacy from S2R.

The System Pillar will look to deliver the future concepts of operations and the underpinning system architecture, the Innovation Pillar to research, design, create, test and demonstrate at large scale innovative technological and operational solutions, and the Deployment Coordination Group to ensure that future solutions are deployed in a coordinated and consistent process at European level. With these three pillars, the innovation programmes of Shift2Rail will be re-organised in a more integrated approach within EU-Rail.

Many innovations and technologies have already seen the light through Shift2Rail. To encourage their market up-take, there need to be solid and convincing business cases designed since the beginning to demonstrate how the investment brings a clear return on investment socially and economically.

The success of the rail system convergence towards a seamless, safe, interoperable, sustainable and efficient network will depend on the capacity of the sector to reinvent itself, and on adequate policy decision to phase out obsolete systems, currently hindering the growth of rail market share. The competitiveness of the European rail industry and its excellence remain a key objective too. The European Year of Rail has boosted the attention to the rail sector, and it is now the moment to capitalise on this momentum to deliver and make rail the mobility lifestyle of passengers, the transport choice of logistic.

ROADMAP TO INNOVATION



Innovation Programmes

Guided by its Strategic Master Plan, the R&I activities of Shift2Rail JU are structured around 5 key Innovation Programmes (IPs), Cross-Cutting Activities (CCA) and a new IP on System Architecture and Disruptive Technologies, bringing together the evolution of the future rail, covering the relevant railway technical and functional subsystems and actors, as well as interactions between them.

Innovation Capabilities

Shift2Rail projects are delivering twelve Innovation Capabilities, essential to meet the needs of railway operators and network managers and pave the way to the digital railway system and multimodal European mobility.

- #1 AUTOMATED TRAIN OPERATION
- #2 MOBILITY AS A SERVICE
- #3 LOGISTICS ON DEMAND
- #4 MORE VALUE FROM DATA
- #5 OPTIMUM ENERGY USE
- #6 SERVICE TIMED TO THE SECOND
- #7 LOW COST RAILWAY
- #8 GUARANTEED ASSET HEALTH & AVAILABILITY
- #9 INTELLIGENT TRAINS
- #10 STATIONS & "SMART" CITY MOBILITY
- #11 ENVIRONMENTAL & SOCIAL SUSTAINABILITY
- #12 RAPID & RELIABLE R&D DELIVERY

BRINGING TANGIBLE BENEFITS TO EU ECONOMY

The benefits below are in reference to the period 2015-2030. Source: Impact assessment: Proposal for a Council Regulation establishing the Shift2Rail Joint Undertaking SWD (2013) 535

- CREATION OF **ADDITIONAL EU GDP** UP TO **€ 49BN**
- UP TO **€ 9BN** **INDIRECT LEVERAGE** ON INDUSTRY R&I (BY DEVELOPING H2020-FUNDED INNOVATIONS) (2017-2023)
- **CREATION OF EXTRA 140 000 JOBS**
- **€ 1BN** **LIFE-CYCLE COST SAVINGS** IN FIRST 10 YEARS, THEN VIA CONTINUED IMPLEMENTATION- € 150 MILLION/YEAR
- **ADDITIONAL EXPORT** WORTH UP TO **€ 20BN**

Horizon 2020 European Union Funding for Research & Innovation

www.shift2rail.org @Shift2Rail_JU Shift2Rail Joint Undertaking @shift2rail

Driving the **EU towards sustainable automotive mobility**

DOMINIQUE RIQUET

MEP (Renew Europe – France), Rapporteur on CO_2 emissions standards for cars in ITRE (Committee on Industry, Research and Energy), Founding President and co-chair of the Sustainable, long-term investments & European competitive industry intergroup

With the "Fit for 55" package, the European Union (EU) is set to embark on its ambitious goal to achieve carbon neutrality by 2050. Making up nearly one quarter of total emissions, the transport sector alone will need to achieve a 90% reduction from today's levels in greenhouse gas emissions (GHG) over the next 30 years. With cars and light commercial vehicles accounting for three quarters of total transport emissions in Europe, the proposed revision of the Regulation setting CO_2 emissions performance standards for cars and light commercial vehicles deserves close attention, not least with regards to its environmental, industrial, social, infrastructural and financial implications. In particular, the target set to zero emissions for all new passenger cars by 2035 could have disruptive consequences, as it implies in practice the ban of internal combustion engine (ICE) vehicles. Setting high targets is one thing, paving a realistic way to achieve them is another. Beyond strong political announcements, sound and coherent policymaking is more needed than ever. How can Europe decarbonise its transport sector without jeopardising its industrial competitiveness? How to guarantee a fair access to clean mobility to all EU citizens?

Delivering on those objectives will be crucial to answer Europe's environmental sustainability imperative. This is about ensuring the automotive industry's fair contribution to the fight against climate change. At the same time, minimising hazardous externalities and addressing potential undesired effects should be part of wider considerations around this proposed revision, and the "Fit for 55" package more generally. This is even more true when considering the potential ramifications for the economic and industrial competitiveness of Europe's leading industries, of which the automotive industry constitutes a perfect example. In the EU, the automotive industry contributes to 7% of GDP with 14.6 million jobs at hand. It is also at the forefront of technological innovation relevant to the EU's twin transition with no less than 60.9 billion euros invested annually in R&D. With the help of significant investments, it is already embracing cleaner and leaner solutions, including zero- and low-emission technologies as well as connected vehicles. At the same time, it faces increasing regulatory hurdles in the context of fierce international competition. As the EU's automotive industry is set to embark on its own transformation, it is crucial to be mindful of the important repercussions for this industry's competitiveness and resilience as preconditions for the future mobility of European citizens.

The bigger picture

The global objective is to reduce the CO_2 emission from cars. As new solutions enter the market, tail pipes' contribution to emissions will lessen whilst other emission generating activities are likely to perdure. The proposed revision should reflect this reality if it is to retain its relevance in addressing future sustainability challenges.

However, as it stands, the proposed revision only focuses on the reduction of vehicles' tail pipe emissions. This so-called "tank to wheel" (TTW) approach fails to take into account an essential subrange of emission-generating activities. These include the production of the energy source (be it fuel or electric), as well as the supply of this source to the refuelling or charging point. It also does not account for emissions generated through the production of vehicle components and the transport emissions generated through import activity. Excluding these factors yields a skewed picture of real generated emissions as measured across the lifecycle of a vehicle. Moving away from TTW in favour of the so-called "well to tank" (WTT) measurement,

alongside with a life-cycle assessment (LCA) of the vehicles' emissions approach, would ensure a coherent and holistic approach to the issue of emissions reduction, while avoiding distortive effects and possible contradictions or loopholes. This methodology would guarantee to monitor and reduce the complete emissions of the sector under one single framework.

Avoiding critical dependencies

The transition towards cleaner technologies should be welcomed and encouraged as part of the EU's wider decarbonisation agenda. In a context of growing scarcity of fossil fuel resources, reducing Europe's dependency on fossil fuels is particularly welcome, not only in terms of emissions reduction, but also with a view to mitigate current trade imbalances and vulnerabilities.

Nevertheless, a premature bet on one single technology, as suggested by the European Commission, entails many risks. Batteries represent a case in point. First, the supply-chain is not secured for the EU market, particularly for raw materials. With battery production expected to be multiplied globally by 20 over the next 30 years, the current trends may end up looking very different amid increasingly uncertain geopolitical trends, with all of what this entails for the pricing of materials. Access to raw materials has already become a major subject of international competition. The current shortage of batteries and their subcomponents should lead Europe to think twice. In a worst case scenario, a radical and precocious shift to one technology such as electric cars without ensuring the appropriate level of European industrial maturity and development would result in increased reliance on imports and dependence on third states, ready to defend their own strategic interests. In such a scenario, relying on one single green solution would amount to a mere temporary illusion, while in reality entailing grave consequences for the EU's objective of reducing its carbon footprint and enhancing its strategic autonomy.

The principle of technological neutrality

With this in mind, what can be done for the EU to go ahead with the transition without falling into the dependency trap amid looming uncertainties? Europe will need to accompany industry's transition through the development of competitive and resilient supply chains and competitive industrial ecosystems. Similarly, alternative decarbonising technologies such as advanced biofuels or synthetic fuels exist and can be used in a complementary way to electricity. A "one size fits all" approach will not work for the Union considering its wide economic, social, geographical diversity within and between Member States. With a basket of different solutions, each region and situation should take advantage of the most fitting solutions to tackle emissions. Therefore, it is important for the Union to defend a technologically agnostic approach, focusing on reducing emissions across the life cycle of the automotive industry but leaving the means on how to do so to manufacturers while ensuring sufficient diversity of technological alternatives is available. Such a technologically-agnostic approach would ensure the most cost-effective solutions by letting market mechanisms determine which technologies drive optimal market adoption, while guaranteeing affordable access to all rather than the few.

The challenge of infrastructure deployment

Infrastructure deployment should reflect the need for a technologically agnostic approach, making full use of all complementary solutions rather than solely relying on one technology. The European Commission aims to have 1 million public charging points for electric vehicles by 2025. The rollout of electric vehicles requires a simultaneous deployment of accessible charging infrastructure. However, it's a chicken and egg issue since their development goes hand-in-hand. Simply setting unrealistically high objectives risks not achieving the desired effect, particularly in Member States with less means. There is a substantial risk of missing the mark, even in large Member States like France who are already lagging behind on existing targets. The availability of charging stations varies greatly between Member States, putting the objective of achieving a fair and inclusive transition towards clean mobility into jeopardy. At the end of the day, this is about ensuring that mobility is available to every European citizen, regardless of their nationality nor income.

Funding the transition

There can be no transition without funding. The automotive sector is already actively investing in its own decarbonisation; but the burden of new, far more ambitious targets should not fall exclusively onto manufacturers. A case in point concerns the reskilling of workers due to the abandoning of thermal combustion in favour of electric solutions. Phasing out the production of fossil fuel vehicles will require institutional backing for reskilling programmes to help manufacturing workers adapt as the industry makes a tremendous shift. Furthermore, appropriate funding should be made available to boost research and innovation programmes in order to speed up the sector's green and digital transition, while preserving Europe's industrial competitiveness.

Europe has the ability to be at the forefront of a smart and ambitious industry decarbonisation roadmap. By mobilising all relevant policy tools and appropriates levels of funding, the EU can take a big step in shaping the automotive industry's future competitiveness in a net zero emissions future. In doing so, we should be careful not to steer all efforts into one solution and instead develop balanced and viable policy alternatives able to guarantee the future mobility of all EU citizens.

The ever **changing European Transport system**

BARBARA THALER

MEP (EPP Group – Austria), Member of the TRAN Committee

The ever changing European Transport system

The European Union set itself unprecedented goals in in order to become climate neutral by 2050. I stand behind those goals, but I came to the conclusion, that decarbonisation alone will not do the trick. A sustainable transformation of our economy, which is a sustainable success in the long run, will only be possible if it provides concrete benefits for citizens, for the economy and for the environment. If we do not succeed to address all of these three key variables, support for the measures will fade inevitably.

Having said that, the beginning of the COVID-19 pandemic already provided us with a valuable lesson. Decarbonisation through simply cutting transport activities does not work, it just creates plenty of additional problems. So safeguarding not only a healthy environment but also passing on a prosperous future for our children and grandchildren needs a more refined approach.

However, its easier said than done. Transforming our entire economy in order to become the world's first prosperous and carbon neutral society was never an easy task to begin with. And the sheer size of "Fit for 55" package shows the magnitude of the task ahead.

The most promising way forward from my point of view is to acknowledge, that free, deliberate, choices of individuals must not be seen as problems that need solving. Instead, politics job has to be to address, to mitigate and even to solve the problems individual actions inevitably cause for society. To put it in a nutshell: We must not treat transport as problem, we need to solve the problems created through transport.

440 Million Europeans make deliberate, informed choices for themselves every day. No administration in the world is able to foresee and address all those unique and highly individual circumstances as well and as efficiently as the individuals for themselves. Therefore, the EU needs to put its efforts into improving the efficiency and sustainability of every transport mode, mainly through stimulating technological progress.

Consequently, regardless which choice individuals keep making, the negative impact on society will be smaller and smaller, from year to year, from decade to decade. Having in mind how fundamentally road borne air pollutants have been reduced during the last two decades, we are well advised to stick with the very same approach, to follow the same logic.

Our strength is, that in a free market economy one's person gain is not another person's loss and vice versa. The very foundation of the European Union rest on the logic of win-win solutions between its Member States. Market-based approaches provide such solutions at the lowest cost possible, from individuals up to whole nations.

Just swapping the reliance on petrol with a reliance on batteries will not do much good in this regard. Therefore, we need to shift our attention towards biofuels and synthetic fuels, since they do not only decrease our dependencies but also tick all of the three boxes. Environmental, economic and individual benefits. Also when we want to keep an eye on the entire transport value chain. Just one example to illustrate how interlinked everything is. With the proposed further tightening of the Emission Trading System, the metal industry is forced to replace coal directly with electricity or with hydrogen. This will drive down CO2 but green steel is considerably more expensive than conventional steel, so export is not an option and in Europe the problem is, that one of the biggest markets, the automotive industry, has no incentive to use green steel. This will not change as long as CO2 for cars and trucks will be measured only at the tailpipe. This measurement becomes even more a problem since the European Commission also proposed to introduce an ETS for road and buildings. But at the same time the tail pipe measurement is eliminating the market for biofuels and efuels, So fuel suppliers have no incentive to make big investments in order to substitute fossil fuels with biofuels and Efuels.

On another note, and almost needless to say, making transport more sustainable needs a more prominent role of rail. Rail has almost zero emissions but sadly also almost zero competition within the sector. This need to be addressed rather urgently in light of our climate targets, since the sector would be able to support our policy goals to quite an extend.

So getting more market into rail is key. A competitive environment needs to be in place in 2030 at the latest. Once a modern, high-performance rail infrastructure from Scandinavia to Sicily is available, freight trains have the infrastructure to easily outcompete long haul road transport.

However, it will take enormous efforts from all actors, the will to encourage competition of modes and technologies and to foster technology neutral innovation to name just a few.

In order to not get lost in the details, we should always have in mind, that transforming our society towards a carbon neutral one is a massive endeavour. It needs to build on the uniquely successful principles which once helped transforming Europe from a war and poverty ridden continent to the most prosperous and human regions in the world. Policies centred on the individual and its intrinsic needs. This way will ensure, that we will achieve the climate targets and keep everyone on board.

Aviation Fuels in Europe **ReFuel EU Aviation**: A **route** to **net zero European aviation**

MARIAN-JEAN MARINESCU

MEP, speaker of the EPP Group in TRAN Committee and chair of the European Parliament's Sky and Space Intergroup

As president of the European Parliament's Sky and Space Intergroup (SSI) I have a constant concern about the aviation sector and on almost monthly basis I host multi-stakeholder discussions on the European aviation sector's decarbonisation roadmap.

There is a common point of these debates that we have been organizing for almost 2 years: despite the very difficult situation of the European aviation industry - simultaneously affected by the Covid-19 crisis and the obligation of decarbonisation - all stakeholders support the environmental targets of the Green Deal and they are optimistic that we can achieve the green goals. However, the European aviation industry needs help.

Therefore, along with the legislative proposal on SAF (Sustainable Aviation Fuels), the European Commission should come with an incentive plan for the aviation sector. Given that the prices of green fuels (whether biofuels, synthetic fuels or hydrogen) are much higher than those of fossil fuels, in order to decarbonise but at the same time remain competitive, the aviation industry must be supported.

I have an ongoing dialog with the aviation industry and I can tell you that at this time, hydrogen is the great hope for reducing emissions.

Obviously, we need to design and to product hydrogen-powered aircraft. But the European Commission needs to understand that this is an endeavour that requires great financial investments, both public and private, in research and innovation.

However, in order for the demand for hydrogen not to be overwhelming and not to lead to blockages, it is necessary to continue our research for the development of alternative fuels, other than hydrogen, as is for example the case of synthetic kerosene. In addition, we must also consider the infrastructure needed for alternative fuels, mainly hydrogen, if we take into account the fact that hydrogen is part of all other alternative fuels.

Since the EC launched the Fit for 55% package, I kept on asking the Commission if they know what will be the total amount of electricity needed in 2030 and what will be the energy mix for generating this amount of energy. In its answer the Commission informed me that the projections in the MIX scenario, considered the central scenario by all impact assessments, indicate the gross electricity production of approximately 3,150 terawatt-hours (TWh) with the following proportions: 4% solid sources, 13% natural gas, 16% nuclear sources and 65% renewable sources, including biomass.

If we want the aviation industry to be able to develop all these solutions that aim to ensure a zero-emission target, we have to provide two essential things: a good regulation at Union level and strong funding for research and innovation. As regards the regulation, the first and easy step to take is to adopt the Single European Sky Regulation. As rapporteur of the European Parliament in the SES file, I can assure everyone that SES is a simple and safe way to reduce aviation emissions. All studies show that the implementation of SES can lead to a reduction of about 10% in CO_2 emissions.

Unfortunately, this simple possibility of reducing emissions is not supported by some Member States. Where does this opposition come from when everyone says in chorus that we are working together to reduce emissions, it is for me, as an SES rapporteur, incomprehensible. At the time this piece is being published a pilot can choose the direct route between two destinations or can use the new software that indicates the least polluting route. This system already exists in the Member State therefore, I do not understand why some Member States declare that this violates national sovereignty.

As previously highlighted, aviation solutions come through innovation. With the adoption of the Union budget for 2022, one of my pilot projects which is directly related to this topic was accepted for funding. ***The EU Clearing House for Sustainable Aviation Fuels (SAF)*** proposes the creation of a database on sustainable aviation fuel consumption. This proposed pilot project supports the objectives within the Paris Agreement, the EU Green Deal, the EC Sustainable and Smart Mobility Strategy and the EASA Sustainable Aviation Programme. It aims to facilitate the uptake of Sustainable Aviation Fuel (SAF) within the aviation sector and the subsequent reduction in both CO_2 and non-CO_2 emissions.

It is in the interest of all of us, legislators, industry and passengers, for the aviation to remain one of the handy options available when it comes to exercising our right to mobility in the EU.

Regulatory and financial **environment** to support the **decarbonisation** of **aviation**

NATHALIE ERRARD

Senior Vice President,
Head of Europe and NATO affairs at Airbus

"Given the number of ruptures and changes that we are going to bring to the aviation sector, we need to on-board the regulators"

Airbus and the whole aviation industry have to face two major challenges: recover from the COVID crisis; and engage in the digital transformation and the decarbonisation of the aviation sector, which will require an unprecedented effort in innovation and investment.

The EU has a critical role to play in the recovery and to create the conditions for this major transformation. This means setting objectives and regulations to enable change, but also supporting innovation and investments in the new technologies, new energy ecosystems, and the new infrastructure that will be required to achieve these objectives.

Airbus, together with the whole European aviation industry, supports the EU Green deal objectives of carbon neutrality in 2050 and a 55 per cent reduction in CO2 by 2030. The recently announced Destination 2050 initiative provides a clear roadmap for aviation to achieve these objectives. Airbus welcomes those initiatives and policies which encourage efficiency and innovation, including ambitious targets to scale sustainable aviation fuels.

Alongside these important policies, breakthrough innovations and in-sector emission reductions will play an important role in the decarbonisation of the sector. They will also help the European ground, maritime, and energy sectors to become world leaders in a decarbonised world.

Airbus has the ambition to develop the world's first zero-emission commercial aircraft by 2035 through its ZEROe initiative. In parallel, Airbus advocates for a wider use of sustainable aviation fuels (SAF).

To deliver these ambitious objectives, a close **cooperation and alignment** is needed, both with manufacturers, airlines, airports and air navigation service providers on the industry side; and with the EU authorities and Member States to change the global ecosystem and support investments.

The road to a decarbonised aviation industry is already mapped out, but there are still significant challenges. Too much regulation and taxation in the short term could slow down the aviation sector's – and the wider European economy's – recovery from COVID-19. It will hamper investment in new technologies, new fuels, and the improved operations necessary to reduce air transport's carbon emissions. At Airbus, we strongly believe **incentives** to encourage investment – *not* taxation – are the solution.

Indeed, we *can* decarbonise aviation, but only if we invest sufficiently today. Specifically, we need major **investment** in hydrogen, SAF (including synthetic fuels), and Direct Air Carbon Capture and Sequestration (DACCS) technologies. All of these technologies will play a critical role in our journey towards net-zero aviation, and we must accelerate their development simultaneously to reach our targets within the ambitious timeline we have set out. But investment in technology development alone is not enough: we must also encourage investment in the new energy ecosystem for aviation to ensure we will have an adequate supply of these new fuels to meet the demand for climate-neutral air travel. Europe can become a hub for climate-neutral aviation – if the right political framework is set now. This is why developing a hydrogen infrastructure should be a priority for the EU and aviation will need to be fully integrated within it.

At the same time, we require a **regulatory framework** that can keep pace with rapid technology development. We advocate for collaboration on and harmonisation of new hydrogen regulations, as well as clear, long-term support on emissions regulation in the form of mandates. The current SAF mandate included in the ReFuelEU initiative is a welcome addition in this context. However, all mandates must come with added economic measures – which can help absorb inherent extra costs along the value chain – to support airlines in remaining competitive.

Ultimately, a level playing field is at the heart of a decarbonised aviation industry. A new regulatory framework endorsed by all Member States will help to lift barriers to market uptake. **Alliances** on Recycled and Low Carbon Fuels and Zero-Emission Aviation as well as Important Projects of Common European Interest (IPCEIs) on Hydrogen are also useful tools to avoid fragmentation at the European level. **Standards** endorsed at the international level (ICAO) are also needed to avoid distorting the market and putting European airlines at a significant disadvantage.

100% Sustainable fuel tests on A350MSN1 FlightLab

Airbus-ZeroEmission-For-mation-Flight

Decarbonisation of Aviation - Will the EU ETS Aviation proposal fly?

JAN-CHRISTOPH OETJEN

MEP (Renew Europe – Germany), Vice-Chair and Member of the Committee on Transport and Tourism (TRAN), Member of the Committee on Development (DEVE)

The European aviation industry is currently facing enormous challenges. On the one hand, travel restrictions, border closings and the concerns of passengers due to the corona pandemic are leading to falling passenger numbers and airline revenues. On the other hand, the industry is facing the challenge of decarbonisation with possible solutions like fleet renewal, sustainable aircraft fuels, operational changes for CO^2-neutral airport operation and more efficient flight management in European airspace of air traffic.

The European Green Deal sets the standards for the transformation of the European Union into a modern, resource-efficient and competitive economy. These mutual agreed ambitions follow the aim to achieve climate neutrality by 2050 and to reduce economy-wide greenhouse gas emissions by at least 55%, until 2030 (compared to 1990 levels). This would correspond to the Paris climate goals and was underlined again at COP26 in a declaration by the International Aviation Climate Ambition Coalition[1].

International aviation accounts for 2-3% of global CO^2 emissions[2] and is contributes to climate impacts from emissions other than CO2[3]. A forecast by Eurocontrol on the future development of air traffic (progression of the vaccination campaign, coordinated inter-regional approach, looser travel restrictions, assuming the recovery of business aviation) assumes that the level of 2019 could be reached in mid/end 2023 and will continue to grow thereafter.[4] The Commission's Fit for 55 program consists of a bundle of measures to implement the climate targets. In addition to targets, regulations and support measures, the revision of the EU-ETS will above all send a stronger price signal for carbon that is necessary to face the challenges of decarbonisation described above. From my point of view, the use of price instruments is associated with little disadvantageous distributional effects. Airlines and other operators can consider these climate costs in their business decisions. Certificate trading such as the EU-ETS and offsetting schemes such as CORSIA[5] at ICAO[6] level are currently the best solution.

As part of the Fit for 55 program, the European Commission proposes a tightening of the EU- ETS for air traffic as well as the formal implementation of CORSIA and its application on extra-EEA routes. Basically, the previously active system will remain in effect and will be fully restored with the end of the exemption for emissions from extra-EEA flights by December 31, 2023[7]. CORSIA is used for application on extra-EEA routes[8]. The revision provides for an annual lowering of the European Aviation Allowances by 4.2% and an expiry of the free allocations by 2027.

In this early stage of negotiations, it is of utmost importance to me to scrutinise the proposals in details. The proposed changes will result in cost increases mainly for intra-EEA flights and for routes via EEA hubs directly affecting the European aviation industry. Certain routes are currently exposed to carbon leakage. Taking a flight from Porto via Munich to Seoul, the feeder flight with European airlines from Porto to Munich is subject to the EU-ETS, whereas a feeder flight by a non-European airline from Istanbul to

1 see: https://ukcop26.org/cop-26-declaration-international-aviation-climate-ambition-coalition/.

2 see: IPCC, 2018, IPCC special report on the impacts of global warming of 1.5°C.

3 see: COM(2020) 777 quantifies these impacts, while COM(2020)747 and associated documents analyse these effects in detail.

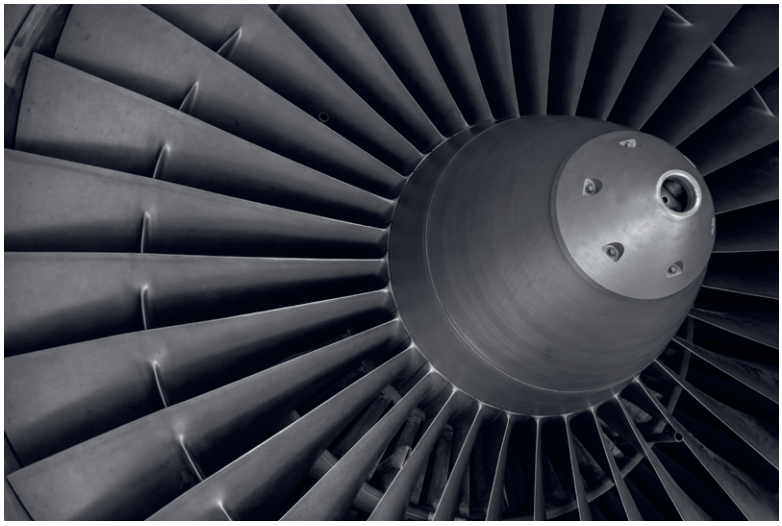
4 see: https://www.eurocontrol.int/publication/eurocontrol-forecast-update-2021-2027

5 Carbon Offsetting and Reduction Scheme for International Aviation

6 International Civil Aviation Authority

7 see: COM (2021) 552 final

8 see: COM (2021) 567 final



Porto would be not. In the end, the customer decides on the price which route to choose. Flight tickets and routes that are not subject to the EU-ETS are correspondingly cheaper, so that hubs outside Europe (Istanbul, Doha, Dubai) have a competitive advantage in this case. For me, the principle "same conditions on same route" has to apply.

In addition, we need to take a look at the interaction with other measures from the Fit for 55 package. An admixture rate of SAFs, as suggested in RefuelEUAviation[9], must ensure that not only intra-EEA flights are affected. By making an obligation to refuel before departure from an EU airport, carbon leakage could be avoided. I reject the taxation of kerosene in accordance with the proposal of the Energy Taxation Directive[10]. The risk of double taxation through the EU-ETS, CORSIA and a tax would weaken the competitiveness of European carriers. The effect of such a tax would have no steering function, because it is not linked to a reduction in emissions, nor is the revenue earmarked for the research and development of SAFs[11].

Some big polluters as China, India or Russia do not participate in CORSIA yet. It is important to me that these countries are also convinced to voluntarily participate in the offsetting scheme, before its mandatory application from 2027 to all states. Aviation is international and efforts to protect the climate and burdens must be shared internationally as well, enabling fair competition in the sector. I will closely monitor developments at ICAO level and work for an ambitious offsetting scheme that does not fall short of the expectations of the climate targets.

In terms of research and investment, the auction revenues should be used on climate and energy purposes. Member States can furthermore make use of the increased Innovation Fund for the production of low and zero-carbon fuels in aviation or the increased Modernisation Fund.

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9 see: COM (2021): 561 final
10 see: COM (2021): 563 final
11 Sustainable Aviation Fuels

Clean Aviation soars to new heights

AXEL KREIN

Executive Director of
Clean Aviation Joint Undertaking

The European Partnership for Clean Aviation has taken off!

With the support of the European Union and in line with the European Green Deal's objectives, the new Clean Aviation Joint Undertaking will pave the way towards climate-neutral aviation in Europe by 2050.

Building on the foundations already laid by the Clean Sky Joint Undertaking, Clean Aviation will develop ground-breaking, innovative technologies before 2030 in order to produce a new breed of aircraft, ready to enter the global fleet by 2035.

As one of ten new European partnerships between the European Union and industry, these public-private partnerships will speed up the transition towards a green, climate neutral and digital Europe, and make European industry more resilient and competitive.

Under Horizon Europe, nearly €10 billion in funding will be provided by the European Commission, a sum which will be matched by at least the equivalent amount of investment by participating partners.

Aviation has an impressive track record in terms of efficiency and is now 80% more fuel efficient than when mass travel first began in 1970.

Nevertheless, in pre-pandemic times, emissions from aviation continued to grow in absolute numbers, because, even though aircraft became more energy efficient year on year, the sheer number of aircraft in our skies increased by 4.5% each year. So although the aircraft in our skies are much cleaner than ever before, the aviation sector as a whole is still emitting unsustainable amounts of pollutants.

Aviation's share of manmade CO_2 emissions – while still modest – has risen to ~2.5% globally from around 2.0% in the early nineties. If no countermeasures are undertaken, this share will increase in the coming decades.

Overall, aviation emissions account for 3.8% of total CO_2 emissions in Europe, however, taking non-CO_2 effects – such as NOx – into account, aviation's impact on global warming effects in Europe is considerably higher.

The three thrusts

Clean Aviation aims to curb those effects and emissions with the development and demonstration of technologies for a totally new generation of aircraft. We are focusing on three main areas – three main thrusts, if you will.

These three main thrusts will form the pillars of the new Partnership: hybrid electric and full electric concepts, ultra-efficient aircraft architectures, and disruptive technologies to enable hydrogen-powered aircraft.

Hybrid-electric and full electric concepts will become very important for regional connections up to 1000km. Air vehicles operating in this range (including regional aircraft with a capacity of up to 100 seats) will be the first to benefit from an air transport system that will adopt hybrid-electric propulsion technologies and associated complementary solutions for reducing the environmental footprint of aviation.

Hydrogen in particular will be a game-changer for aviation, but effective hydrogen deployment will require several new technologies and innovations to adapt to the specific needs of this energy carrier. For example, hydrogen requires more than three times the tank volume of kerosene, and liquid hydrogen must also be stored at temperatures of -253C.

The three thrusts will culminate in a new breed of regional, short haul and short/medium haul airliners which we anticipate being ready for commercial launch by 2030, followed by entry into service by 2035.

Why short-haul flights? Why not larger passenger aircraft?

This is a strategic decision, taken to maximise the impact of the work performed by Clean Aviation and Clean Sky.

Approximately 2/3 of emissions are produced on city-pairs and routes below 4000km in length, and 1/3 on flights of less than 1500 km alone. For this reason, the sustainable technologies developed within the new Clean Aviation partnership will target this highly relevant market sector and radically reduce emissions overall.

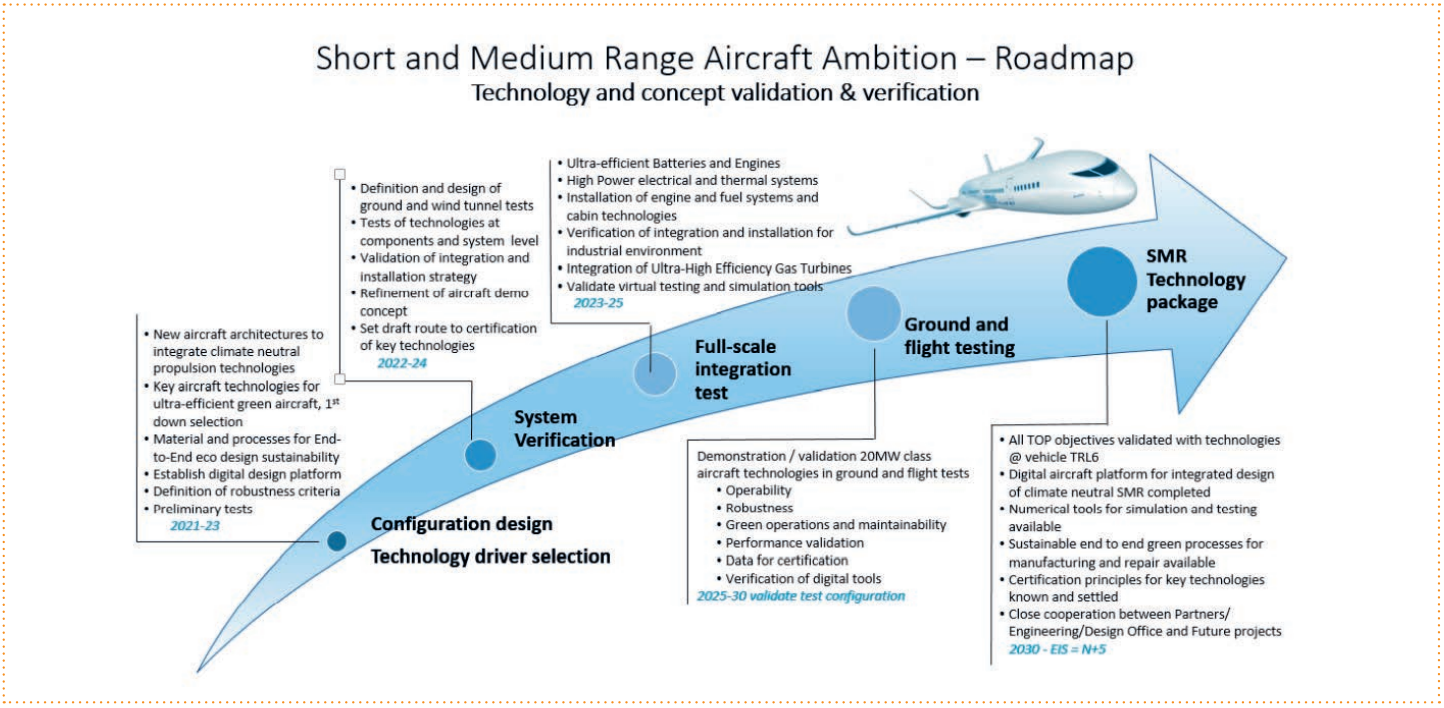
Today, regional aircraft-operated routes and connections account for over 12% of world available seat kilometres. Regional aircraft currently serve roughly 38% of world city pairs and perform about 40% of the total departures and around 36% of total hours flown. In terms of regional connectivity, 36% of existing airports are relying exclusively on regional turboprop-operated services. We believe that regional aircraft can be the launch pad for new low or zero-emission technologies and bring enhanced networks, while drastically reducing environmental and climate impact with an efficiency increase of up to 50%.

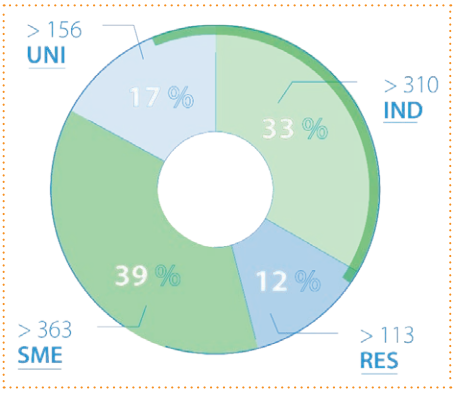
Short/medium-range air transport is another area of focus for Clean Aviation. A 'clean sheet' aircraft design in the short/medium range segment can not only make a hugely positive contribution to reducing aviation's climate impact, but these segments are also where the biggest opportunity lies. The roadmap aims to improve the energy efficiency of a new generation of short/medium-range aircraft by 30%.

Time is of the essence

The new aircraft developed as a result of Clean Aviation and Clean Sky are likely to constitute 75% of the world's commercial airline fleet by 2050 and thus will have a major positive effect on aviation emissions and climate impact. In order to get to that figure by 2050, clean aircraft need to be entering the commercial fleet by no later than 2035.

We have no time to waste – rapid, revolutionary innovation is needed immediately if we are to reach that goal. Bold investment





is needed to steer aviation firmly on a course towards climate neutrality by 2050.

Fortunately, we are not starting from scratch, thanks to the innovative technologies already developed as part of the Clean Sky programme.

Clean Sky's success to date

Clean Sky is ongoing until 2024, and we are now entering the final delivery phase of this programme. This is possibly the most exciting stage in Clean Sky's lifeline, as it is now that we can see the fruits of seven years of commitment from engineers and scientists throughout Europe. During the next two years, Clean Sky will deliver more than 100 demonstrators and more than 1000 technologies overall.

To discover our demonstrators and innovative technologies, we highly recommend you visit our online stand, where you can get a taste of the work that Clean Sky is doing to foster sustainable aviation. You can also read about our results – for example, the UltraFan project which targets fuel-efficient and more environmentally-friendly engine performance and achieves this by incorporating a raft of technologies and innovative materials; and the Multi-Functional Fuselage Demonstrator which is a unique 8-metre-long fuselage barrel that serves as a platform for examining the full potential of thermoplastic composites and to thereby help future European airliner production to become faster, greener, and more competitive.

Working together, building connections

The Clean Sky Joint Undertaking nurtured a high-performing innovation eco-system of more than 940 entities in 30 countries with more than 5000 scientists and engineers participating in our programme.

Clean Aviation will follow this best-practice model – we aim to include expertise from all across Europe in order to maximise our success.

Our collaborative approach does not only apply to participants. It is vital to connect with national and regional authorities which are also working on sustainable aviation initiatives in order to develop complementary technology roadmaps within an integrated Innovation Architecture.

Green skies ahead

The benefits of aviation are manifold: increased employment opportunities, connecting businesses, enabling us to visit relatives on the other side of the globe, or to travel and expand our horizons. In 2019, 4.5 billion people were passengers on the world's airlines, and nearly 88 million jobs existed thanks to aviation.

Looking to the future, we must retain the many socio-economic benefits that the aviation sector brings, whilst removing its unsustainable impact on the environment.

Our ultimate vision – a world where everyone can fly without worrying about their carbon footprint.

Better mobility, better city, better life

DARIO NARDELLA

President of Eurocities and Mayor of Florence

As the place where most people live, and where most emissions are produced, the engagement of urban municipalities is paramount to successfully addressing climate change.

Mobility, including public transport, stands out as one of the most powerful instruments to introduce environmentally-friendly measures and to improve city residents' wellbeing, health and living conditions.

In fact, it's an area where a lot is already being done. Cities are promoting cycling and walking, offering shared e-mobility services, greening public transport solutions and introducing pedestrian areas and car-free zones, making better use of the public space.

Improving air quality literally brings visible results, and in London, for instance, where the local authority has recently extended the ultra-low emission zone, drivers are getting rid of diesel cars six times faster than in the rest of the UK.

In my city, Florence, we have developed a "green shield" - a large Low Emission Zone, which aims to regulate the access of the most polluting vehicles into the city, including by encouraging the use of public transport and bans on certain vehicles.

With COP26 only a few weeks behind us, sharing and strengthening successful models like this is how international goals will be achieved in practice.

In September we marked the 20th anniversary of European Mobility Week, which helps people to become more conscious of their mobility-related carbon footprint. Culminating, as it does every year with car-free day, the 2021 campaign to promote sustainable and active mobility focused on health.

Despite such efforts, 74% of urban inhabitants are still exposed to harmful air pollutants at concentration levels above the recommended World

Health Organisation guidelines.

This is not where we should be - urban transport is still a major source of air pollution and the only sector where greenhouse gases haven't decreased in the past decade.

This situation has to change: in a recent Eurocities position paper – the cities network of which I am President - we called for a full stop on fossil-fuelled mobility in cities through actions such as an accelerated switch to zero-emission mobility and by phasing out new fossil-fuelled vehicle sales in the EU by 2035. While actions like these will not lead to overnight change, they will nonetheless be vital to achieving climate neutrality by mid-century

Getting smarter on mobility

I believe public transport should be put at the heart of sustainable urban mobility planning. In Florence, after having put three tram lines into operation, serving around 38 million annual passengers, we are currently creating a fourth line, and linking to neighbouring municipalities.

Moreover, we're completing around 10 km of new cycle paths, meaning that by 2024 we'll have around 120 km in total. We've also deployed 3,000 bikes, of which 1,000 are e-bikes, adding to our public service offer, and have constructed other cycling specific infrastructure, such as cycle bridges.

Shared, connected and automated shuttles and robotaxis are the next step, the new frontier of mobility, and are one of the developing trends in the urban mobility landscape and can ultimately work in tandem with the current public transport infrastructure, if the right conditions are set.

Smart mobility promises to bring benefits such as a reduction in car trips. However, on the downside, it also threatens to disrupt local transport systems, challenge existing traffic regulations, and generate unintended societal and environmental changes.

To be effective, all automated mobility innovations will need to face a real-life test in specific urban contexts. This is why I believe that, looking ahead, it will be crucial to ensure that automated transport services can be deployed safely and sustainably, if they are to provide concrete benefits for cities and their residents.

Beyond smart vehicles, the boom in e-commerce in recent years has also led to new tests for cities, mainly driven by a noticeable increase in the transport of goods. Some projections show that the growing demand for e-commerce will result in 36% more delivery vehicles in inner cities by 2030.

Already, local officials are coming up with solutions: Stuttgart, for example, is researching and supporting alternatives to conventional delivery solutions to cope with this growing demand. Rotterdam, on the other hand, will use fully electric vans from 2025.

I am convinced that cities are perfectly able to stand up to e-commerce's challenges but they won't be able to go it alone, without help from the EU to set, for instance, the right conditions for the supply of zero-emission vans or to deploy recharging and refuelling points.

International efforts

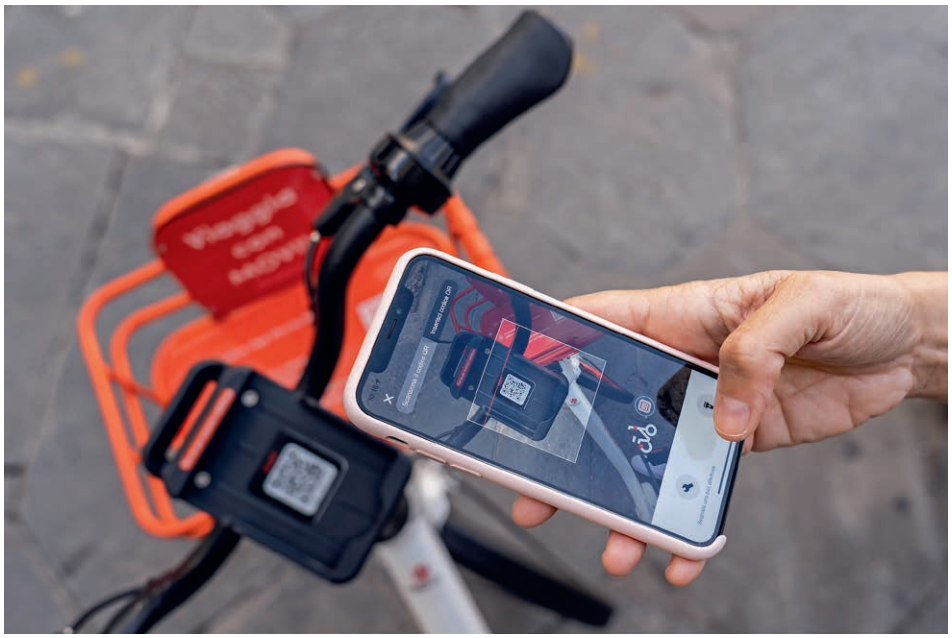
Local governments need the tools to ensure that public transport is accessible, attractive, affordable for all citizens and can survive unpredictable challenges.

Many urban public transport systems have suffered a decline in passenger numbers, and therefore revenue, throughout the Covid19 pandemic. As a result, many cities are reassessing how public transport can be financially sustainable in the long-term.

At the same time, cities are international transport hubs. As such, we need to constantly work at different levels and with different partners to ensure the viability of our mobility systems. That's why we're asking for further EU support – for example to provide local officials with the tools to integrate long-haul transport into urban mobility planning – and for other actors in the mobility field to work closer with city governments by, for example, increasing our representation in the governance of major connective infrastructures on our territories, such as airports and depots.

Ultimately, this is valid for all other aspects of urban sustainable mobility: only through a concerted approach and through the cooperation of national and EU authorities will cities be able to introduce safer, more sustainable and affordable mobility models.

We can only succeed when cities are on board, when local leaders have a seat at the table where decisions are made. International action is absolutely vital for cities because so often we are the ones that translate words into action.



DIEGO PAVIA
CEO of EIT InnoEnergy

Micromobility "Made in Europe" to Achieve our Climate Targets and Make our Cities More Sustainable

Micromobility, in the form of e-scooters, e-bikes and other purpose-built vehicles for urban logistics, is a thriving market with the potential to create 1Mn jobs in the EU and to reduce emissions by 30MtCO2eq by 2030. This makes it one of the key drivers to transform and decarbonise the EU's transport system. To seize this opportunity, the effort should go towards innovative micromobility solutions "Made in Europe". To this end, the EU should adapt its policy and regulatory framework and support investments.

Mind the Gap ! How Micromobility Can Support the Decarbonisation of Transport

The decarbonisation of transport remains a major challenge in Europe's endeavour to become the first climate-neutral continent. Domestic transport represents 23% of the EU's GHG emissions and, contrary to other sectors, is trending upwards.[1] Even with measures currently planned by the Member States, its emissions in 2030 are expected to remain above 1990 levels.

It is therefore critical to step up our efforts to meet the objective of the Sustainable and Smart Mobility Strategy to reduce emissions of the transport sector by 90% by 2050. To achieve this, road transport, which accounts alone for 20% of our GHG emissions, will need to reach net-0.

Green electrification for cars and vans is a no brainer. However, the uptake of electric vehicles is insufficient to tackle the projected increase in demand for mobility[2]. In a recent study, McKinsey estimates that electrification will fall short of delivering 165 MtCO2eq emission reduction for transport to make a fair contribution to the 2030 target[3]. This gap could be addressed by reducing the kilometers travelled with ICE vehicles and accelerating the ICE park turnover: both can be achieved through modal shift i.e. replacing cars and vans by more climate-friendly solutions.

In cities, the need for sustainable mobility intersects with the need to increase the livability of urban life by reducing congestion, air pollution, noise, and land usage for streets and parking. Micromobility, comprising light electric vehicles like e-bikes, e-scooters, e-mopeds, as well as an increasingly rich offer of purpose-built vehicles, offers an ideal alternative. Indeed, the GHG emissions of 1 average ICE car is equal to that of 2 electric cars and of 7 to 12 e-scooters. The space needed for 1 car is roughly that needed for 12 e-scooters.

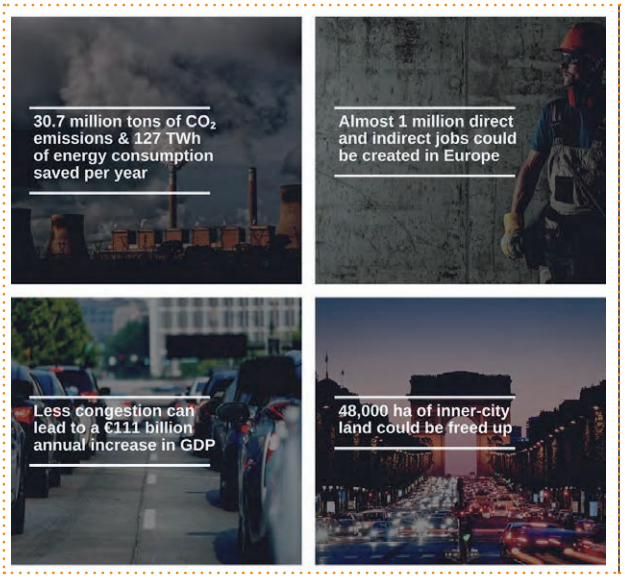
By switching from cars and vans to micromobility for about 10% of the trips less than 8km in just 100 large European cities, about 30MtCO2eq could be avoided, up to 130TWh of energy consumption could be saved, and up to 50.000 ha of inner-city land could be freed up.[4] This represents abating about 6% of all GHG emissions from road transport, with immediate results, as the solutions are readily available.

Harvesting the Micromobility Economy with a Value-Chain "Made in Europe"

It is not a matter of whether micromobility will happen but rather how (and how fast). It is already largely present in our cities. However its anarchical development - accelerated by the pandemic - has raised concerns about micromobility being a truly sustainable solution, seamlessly integrated into public transport, socially and economically inclusive, and aligned with the EU's economic interests.

Nearly all of these vehicles today are provided by Asian manufacturers (China alone accounts for more than 60.000 e-bikes manufacturing companies). This means that we are currently "using" micromobility but not benefiting from the associated value-chain: the EU is missing out on a substantial economic opportunity with the potential to create up to 1Mn jobs by 2030. In addition, the products (including the batteries) we import are not sustainable and we run the risk of piling up these short-lived vehicles in our cities without the promised climate gains.

With the right incentives, this can change, and Europe can capture a sizeable share of this economy. As a matter of fact, the



1 European Environment Agency "Greenhouse Gas Emissions from Transport in Europe" (2021)

2 The km-travelled for people and for goods is expected to triple by 2050.

3 McKinsey Center for Future Mobility "Why the Automotive Future Is Electric" (2021)
This fair contribution would be a reduction of GHG emissions from transport by 55% by 2030.

4 EIT InnoEnergy "Examining the Impact of a Sustainable Electric Micromobility Approach in Europe" (2021)

competitiveness of these vehicles comes down to their total cost of ownership, which can be reduced in the case of high-quality, locally built, and fully sustainable vehicles, as they are more durable than the products currently on the market. The European battery industry, prompted by the European Battery Alliance, has adopted a similar approach with very successful results in attracting investment and reshoring the value-chain. In addition, the majority of use cases for micromobility are not yet covered, especially in the B2B segment, and the exploration of new business models is just starting, with potential around the provision of vehicles (e.g. models of asset ownership), the operation of fleets (e.g. recharging, relocation, maintenance) and other related services.

Micromobility "Made in Europe" is well-positioned, especially when considering the dynamic innovation ecosystem throughout the value-chain, with companies like ONO, Kumpan, Swobbee, DUCKT, GetHenry, etc. Strong synergies could be reinforced with the automotive and battery supply-chain. For instance, the demand from manufacturing in micromobility could require the production of about 2.5 battery Gigafactories.

Europe could start with the low-hanging fruit of last-mile logistics, sustained by a long-term trend of rising demand for delivery services, a sector especially interested in purchasing purpose-built vehicles with a longer lifespan (improving both sustainability and profitability). Scoobic, a Sevillan start-up manufacturing electric three-wheelers, can be cited as an example. Earlier this year, it entered a contract with Correos, the national postal service, to tackle emissions associated with freight transport.

Accelerating the Uptake of Micromobility with the Support of the European Union

Cities (and a few pioneering customers) have so far been in the driving seat to structure and accelerate the deployment of micromobility solutions. However critical, the support of local authorities will not be enough to ensure the emergence of a strong European value-chain and the associated benefits in terms of revenues and jobs, thus the European Union should step up.

First, financial support from European instruments is needed to accelerate and de-risk projects, and the available funds should be streamlined towards the most impactful solutions. The Future Mobility Facility of the European Investment Bank should be spot on in that regard and will provide the necessary support for European companies (especially in the manufacturing segment) to successfully scale-up. For smaller or less mature projects however, for instance in the "downstream" part of the value-chain, which could represent up to 75% of the value created, a better understanding of the value proposition of micromobility seems needed, starting with the EIC Accelerator which should prioritise this high-potential area in its future work. Additionally, Member States should be encouraged to use the Recovery and Resilience Facility to deploy micromobility at a larger scale.

Then, micromobility should become an integral part of the European regulatory framework for transport, and be recognised as a serious alternative to cars and vans in cities. This entails an acknowledgement of the contribution of micromobility in our climate targets and a better alignment of the current deployment with the objectives of the Green Deal. The Fit-for-55 Package provides a most welcome boost to electric mobility but does not foresee much in terms of modal shift. Explicitly including micromobility in the target for the decarbonisation of transport in the Renewable Energy Directive and in the roll-out of recharging infrastructure in the Alternative Fuel Infrastructure Regulation would constitute a first step in this direction. What's more, the pending Urban Mobility Strategy offers a perfect opportunity to assert the role of micromobility and encourage its growth from the current 0.1% of trips in cities to between 10% and 15% by 2030.

Finally, the adoption of more stringent sustainability criteria for products should boost micromobility "Made in Europe". This could be achieved through regulation, as the inclusion of light electric vehicles in the scope of the Battery Regulation proposed by the European Parliament would achieve for batteries, but also through supporting cities and public entities in reinforcing the focus on sustainability and inclusiveness when procuring micromobility solutions.

This enhanced support should contribute to the emergence of a European value-chain in the coming years, unlocking up to 1Mn jobs, and adding a further 30MtCO2eq to our decarbonisation effort by 2030.

EIT InnoEnergy has invested about 20Mn€ since 2018 in high-impact decarbonised solutions for mobility, as part of 560Mn€ invested since 2010 in sustainable energy innovation. EIT InnoEnergy is supported by the European Institute of Innovation and Technology (EIT).

Consumer policy can help clean up transport in Europe

MONIQUE GOYENS
Director General - BEUC

As I started to write this article, the COP26 climate conference was just beginning. Twitter was abuzz with people tweeting about terms such as "just transition" and "net zero".

My mind drifted to the question: How do such macro climate talks play out beyond the negotiation room and grand press statements? I will argue here that consumer policy plays a major role as it turns climate ambition into reality. Across our daily life, the sustainable choice should be the affordable, convenient, and trustworthy choice.

Breaking out of fossil-fuelled mobility

Our choices as consumers can lower CO_2 emissions and help us reach the Paris Agreement. BEUC, a network of 46 consumer organisations from 32 European countries, sees however that people are locked into a mobility system that is still heavily dependent on fossil fuels. This is bad for the planet, our health, and our wallets.

In theory there are alternatives: We could use public transport, take the train, switch to an electric vehicle, or go by bike. In many cases, however, these alternatives are either unavailable, unaffordable, or inconvenient.

Let me illustrate how consumer policy can help.

Consumer policy solutions to benefit drivers

Many depend on a car. As CO_2 emissions from cars must go down, the likely scenario is that we'll drive electric sooner or later. BEUC research shows electric cars are already an affordable option for many people today, and will be for everyone by 2025. Second-hand buyers in particular stand to save money. The EU can help people make these savings by strictly regulating CO_2 emissions, which encourages carmakers to bring more, and more affordable, electric cars to market.

CO_2 emissions regulation is only one part. Our members have noticed it can be difficult for drivers to know what a charge might cost: Germany's Verbraucherzentrale Bundesverband has already warned three operators about using non-transparent pricing. We therefore advise the EU to set charging prices in kilowatt-hour, mirroring the price per litre logic drivers are accustomed to.

Payment isn't always straightforward either, as people are required to have an array of apps or cards to use charging point networks. Why can't I simply pay using a debit card or an app equivalent? The good news is that the EU can easily tackle these problems by addressing it in the ongoing reform of its so-called 'alternative fuels' law.

Easier ticketing and better passenger rights

Not everyone has a car, wants a car, or can afford one. Rail seems an obvious alternative – but falls short in consumer convenience and protection.

If I wish to travel hassle-free by train across Europe, I should have an easy overview of journey options, schedules, prices, and conditions. But If I am to travel from the Netherlands to Italy, I am in reality probably going to need to book separate tickets using different apps and websites to find the best offer.

The problem lies in the lack of common booking and ticketing systems, and rail providers do not necessarily share data about travel options between themselves. That's why we urge EU policy makers to require rail operators to make their ticketing available to third parties. Consumers can then more easily compare prices and book a trip with multiple companies, or even combine different means of transport – such as train and coach (so-called 'multimodal' travel).

Buying a ticket is one step. Another difficulty is when something goes wrong during a trip. Despite a recent update of rail passenger rights legislation, protection on a cross-border, multi-leg journey with different rail operators still falls short. I won't delve into technicalities but the issue is people are not protected throughout their whole journey, unless train companies are 100% owned by the same parent company.

People on multimodal trips similarly lack continuous protection throughout their journey, but because no EU rights legislation exists at all! So which operator to contact in case of travel disruption? Who is in charge of rerouting or compensation in case of a missed connection? Such questions are likely to make people perceive rail, a sustainable way of travel, as less reliable.

Trusting that what gets billed as 'green' is really green

Whatever decision we make as a consumer, we should be able to trust that 'green' choices presented to us are, in fact, environmentally sound. I find myself surrounded by suggestions I can be carbon neutral by paying a bit more or making use of technologies that are still based on fossil fuels. Think about commercials for hybrid cars, 'offsetting' a plane trip or – if you allow me to go beyond mobility – a banana labelled as 'CO_2 neutral'.

BEUC is urging EU decision-makers to only allow such claims if they are backed up by scientific evidence. 'Green' claims must be verified and pre-approved by authorities.

Once this article is published, COP26 will be long over: The question is whether governments will turn buzzwords into regulatory action that improves our daily lives. Luckily, the EU is making good progress through its Green Deal. Consumer organisations will encourage decision-makers to stay on track – no mobility pun intended.

Thanks to my colleagues Steven Berger, Robin Loos, and Laurens Rutten for contributing to this article.

Comfortable, Clean, Autonomous: The Transformation of Public Transport

TORSTEN GOLLEWSKI

ZF Group, Executive Vice President Autonomous Mobility Systems

Individual and personal mobility have so far been at the heart of our transport system. Today mobility is changing, and with it the entire industry and its players. Our company, ZF, has developed over the past 100 years from a gear supplier to the Zeppelin into a foundation-owned, globally active technology company automating and electrifying all vehicle categories. Whether transport operators, manufacturers or suppliers, the mobility industry is facing numerous and fundamental transformation processes.

One of the biggest is the urgently needed reduction of CO_2 emissions in the fight against climate change. The mobility sector, including public transportation, must make a significant contribution: the European Commission's "Green Deal" calls for a reduction in CO_2 emissions in Europe of at least 55% by 2030 compared to 1990, and for Europe to be completely climate-neutral by 2050[1].

Increasing the quality of urban life

Sociopolitical reasons are additional drivers behind the transformation of public transport and public space as a whole. Half of the world's population already lives in cities; by 2050, this figure is expected to rise to two-thirds. Inner cities are overcrowded, traffic jams occur regularly, and more and more motorized vehicles occupy public space. It is necessary to reduce the number of vehicles to avert constant traffic congestion and to use the spaces in urban areas differently[2].

Another factor is the inadequate connection of suburbs and rural areas to urban centers, which further drives the use of private transport. The increasing shortage of drivers for conventional forms of public transportation means that the necessary frequency of trips can be mapped less and less adequately, resulting in a further growing discrepancy between mobility supply and demand. Finally, the Corona pandemic shows that more intelligent forms of mobility are needed to avoid overcrowded buses and trains.

Autonomous transportation systems (ATS) offer an effective solution to these current mobility challenges: safe, affordable and comfortable mobility on a continuously serviceable and sustainable basis. At the heart of the ATS are driverless shuttles operating on predefined routes completely autonomously.

The market is moving in this direction: With a projected demand of up to 170,000 shuttles worldwide and 51,000 in the EU per year in 2030[3], we have an opportunity to reduce significant traffic congestion in cities and potentially avoid driving bans. This not only reduces emissions, but also frees up land that can be used for other purposes (e.g., additional green spaces, bike paths, etc.), increasing the quality of urban life.

Autonomous shuttles already operate today

Is this technology ready for deployment? Driverless shuttles are already in operation today, able to drive in urban traffic at up to 40 km/h, which is in line with the average speed in large German cities[4]. This enables new, economically viable mobility concepts such as improving connections between rural and suburban areas and city centers. Tapping into this potential would revolutionize public transport with timetable-free and demand-responsive routes, supporting equal transport opportunities for urban and rural areas.

We are about to enter a period of technology leaping in the operation of driverless public transport. The tried and tested ATS on segregated lanes have been running in Dubai and Rotterdam since the end of the 1990s –without a driver. The advantages of segregated lanes structurally separated from other road users are well known: Shuttles pass the congestion, so users are not held up. As a result, high levels of availability and swifter travel speeds can be achieved. This is a highly effective way to solve the traffic chaos in crowded inner cities. Compared to robotaxis, autonomous public transport leads to a reduction in the number of vehicles in inner cities and a reduction of carbon footprint in the short term.

We are on the brink of seeing the first ATS in mixed traffic. This opens up a wide array of use cases enabling expansion of flexible public transport offerings, using existing traffic infrastructure on a variety of routes in both urban and rural areas. Over the next few years, the system's technical limits will be gradually expanded so that more complex routes can be served. For example, the maximum speed may increase from the current 40 to 80 km/h.

Reactivate railroad tracks to connect rural communities

An application case with significant potential is the reactivation of disused railroad tracks, of which there are currently about 280 in Germany – it is a similar picture across Europe. Often deactivated due to lack of economic viability, these tracks can be operated economically again due to the advantageous cost structure of autonomous shuttles. Here the ATS complements the existing public transport (e.g. rail). Unlocking this use case would be a triple win: for connecting rural and suburban communities, for today's commuters stuck in traffic and for air quality. Public authorities can help public transport operators with funding to kick-start projects and provide financial support to municipalities to install the necessary intelligent road infrastructure (e.g. smart traffic lights).

1 Delivering the European Green Deal | European Commission (europa.eu)

2 https://www.berylls.com/wp-content/uploads/2017/12/Berylls_Studie_Mobilität.pdf

3 ZF internal market prognosis

4 https://www.adac.de/der-adac/aktuelles/studie-verkehrsfluss-in-staedten/

Efficient **roadworthiness tests** will **improve road safety** on **Europe's roads**

BENOÎT LUTGEN

MEP (EPP Group – Belgium), Member of the Committee on Transport and Tourism

The European Parliament adopted the report on the implementation of the road safety aspects of the roadworthiness package in 2021. As a rapporteur, I was able to improve the text on several points, and therefore, I would like to highlight the efforts that have already been made.

In 2019, 22,800 people were killed in road accidents across the European Union. These lethal accidents have many different causes. One of these causes is a technical failure. Vehicles with technical defects are responsible for about 5% of road accidents and poor maintenance for 4%.

To achieve its "zero" objective (for zero road victims by 2050), the European Union must work on all aspects of road safety, such as harmonising the technical inspection of vehicles. To achieve this goal, the European Union adopted the "Roadworthiness" package in 2014. This package consists of three directives:

1. periodic technical inspections,
2. vehicle registration documents,
3. technical roadside inspections of commercial vehicles.

After adopting the package, the European Parliament analysed the harmonisation in the transposition of this package. One of the main questions is to which extent the implementation has led to common standards and comparable levels of road safety.

In this report, we noticed that the Member States made significant efforts in this sense and improved the harmonisation of procedures between the Member States, which is undeniably a positive evolution.

However, specific issues still need to be tackled. For example, Member States need to improve the exchange of information to protect consumers and to improve road safety in Europe.

Moreover, Member states should tackle the coordination of European countries in road controls and the training of the inspectors in the new technologies in new vehicles.

If we want to reach the 'zero' objective in 2050, we must work on all causes of lethal accidents. However, we cannot neglect that many measures should be taken at the national level, such as the fight against excessive speed, drink-driving and distractions.

Currently, the regulations which apply to two-wheelers stipulate that the "technical inspection" to vehicles with speed greater than 25 km/h and belonging to the categories referred to in directives 2002/24/EC, 2003/37/EC and 2007/46/EC, in particular, from 1 January 2022, two- or three-wheel vehicles - vehicles in categories and subcategories L3e, L4e, L5e and L7e, with an engine capacity greater than 125 cm^3. Nearly twenty countries have already introduced this motorcycle CT for vehicles over 125 cm^3. Others have also implemented it for motorcycles under 125 cm^3.

By establishing an exceptional regime, the Member States may exclude from the application of this Directive vehicles, registered in their territory, of categories L3e, L4e, L5e and L7e, with an engine capacity of more than 125 cm^3, where the Member State has put in place alternative road safety measures for two- or three-wheeled vehicles. But only if they take the relevant road safety statistics for the last five years into account.

Member States may also introduce national requirements for roadworthiness tests for vehicles registered in their territory which do not fall within the scope of this Directive and for the vehicles referred to in the previous paragraph. For this reason, two-wheelers of all categories are already tested in some countries. However, in analysing the implementation of the roadworthiness directives in Europe, the request to include new types of vehicles in these periodic checks emerged. All the other political groups called for the automatic inclusion of all 2 or 3-wheelers, regardless of their engine capacity.

Even if the Parliament wants this type of control to be harmonised throughout the country for those over 125 cm^3 and even if I think that periodic controls are not the most appropriate response to road safety (I have defended the proposal for reinforced roadside checks for two-wheelers over 125 cm^3), we have fortunately succeeded in having the issue of controls for those under 125 cm^3 studied on the basis of data on road accidents and cost-benefit factors.

This year, Parliament has looked at the overall road safety policy in the Union. In the future, more investment will also be needed in infrastructure that would improve road safety, focusing on the areas with the highest number of accidents.

Safe vehicles and infrastructure will be the basis for sustainable and intelligent transport.

True climate neutral mobility beyond the tailpipe – decarbonizing supply chains

THOMAS INGENLATH
CEO of Polestar

Electric cars are the future

This has been known for some time now, and carmakers have year after year ramped up EV production to meet booming consumer demand. EVs look the part for an environmentally friendly future, however, producing cars is not a CO2-free process. While electric cars offer a genuine route to climate neutral mobility, producing EVs is not the solution – it is a starting point. It's time to look beyond tailpipe emissions and consider how we source our materials and how we manufacture those materials into sustainable vehicles.

Businesses need to take substantial actions to reach the 1.5 degree target. We can no longer sit idly by, waiting for others to fight the 'future problem' against climate change. The future is now, and radical change is needed. Recent research has revealed that relying on the current trend of offsetting by planting trees is not sustainable in the long run. We cannot continue delaying true climate action. We must invest in climate innovation, reduce emissions, and bend the curve towards zero – all within this decade.

At Polestar, we set ourselves a moonshot goal: producing a truly climate neutral car by 2030. A car that leaves the factory gates with a 0 CO_2e burden. This means that all parts of Polestar's supply chain are to reach our targets without resorting to the aforementioned offsetting by tree planting. It's an unprecedented challenge for such a complex product as a car. We call it: the Polestar 0 project.

As a company focused on creating climate solutions, Polestar will design towards zero. Zero emissions, zero pollution, zero corruption, zero human rights violations. Design is the beating heart at Polestar, and we believe that sustainability starts at the drawing board.

Transparency

Our mission is to improve society by accelerating the shift to sustainable mobility. We believe transparency is a key driver for sustainable development. That's why we're aiming to be the world's most transparent car company and pushing the automotive industry to embrace transparency in carbon footprint reporting, supply chain ethics and materials traceability.

We publish Life Cycle Assessments (LCA) of all our cars, starting with Polestar 2, along with the entire methodology we used – because the method one uses matters. LCAs consider a range of factors in a car's life cycle, from supply to manufacture, to recycling, and summarise this climate impact in one easily understood number.

Our LCAs do not only guide us in our moonshot goal by pointing out the big emitters and where we must focus our efforts – they clearly prove that EVs are a climate solution.

By being completely transparent about our methods and progress towards a climate-neutral future, we aim to set a standard that others who want to make similar claims can follow and empower customers to make informed, ethical choices.

The roadmap to zero

The Polestar 0 project will involve three phases: research, advanced engineering, and product development. Collaboration with suppliers, research institutes, schools, NGOs and other companies, will be key, making it a project that will not only impact the automotive industry – but go far beyond.

An internal task force dedicated to the mission has been created, and is now focusing its efforts on five strategic initiatives:

1. What we can impact on our own, through our design choices and engineering, is the use of climate-neutral materials. In the process of sourcing components for our cars, we will search for climate-neutral or even climate-positive materials. The latter can actually be possible through different techniques, for example, carbon capture. Along with using new and climate-neutral materials, implementing circular techniques, and utilizing renewable and recycled materials will play a central role in cutting waste.
2. For our overarching climate goals, we must also look to our suppliers and collaborate with providers that use 100% renewable energy. Beyond that, we must ensure that every partner, from sub-suppliers down to the raw material extraction, do the same. We will prioritize those who share our vision, and advocate the increase of renewable energy capacity in our industry.
3. The next obstacle that must be addressed is developing a climate-neutral platform for every vehicle. We will need to find solutions for developing and sourcing batteries and structure components that have a zero-carbon footprint.
4. In the pursuit of climate-neutral use of our cars, efficiency and design refinements will be key. Weight, tyres, aerodynamics, and efficient electrical systems all play pivotal roles when maximising the energy optimisation of our vehicles.
5. Finally, climate neutral manufacturing must utilise completely renewable electricity and commit to circular production methods to maintain the wider climate vision throughout the fabrication process.

Let's not waste another minute

It is the biggest challenge we could set for ourselves. And it will become even harder the closer we get to zero. Do we already know how we will archieve it? Certainly not! But if we don't put all our strength towards this one goal, we will never figure it out. And if we don't manage to put one climate neutral car on the market by 2030, we will have failed collectively as an industry. So, let's not waste another minute.

@jasperbosma

Towards future-proof inland **waterway transport** and ports

CAROLINE NAGTEGAAL VAN DOORN

MEP (Renew Europe – Netherlands)
Member of the TRAN and ECON committees.

Waterborne transport is not a new territory for me. As a Rotterdam citizen having worked at the Port of Rotterdam, I can say that the Maas River flows through my veins. I still enjoy the big tankers and ships that enter and leave the city and I am proud of my city and of what we have accomplished together.

This pride is not limited to Rotterdam or to the Netherlands. I talked a great deal with people from every corner of the inland waterway sector over the past year and one thing really stands out for me: the sector is fully energised to take on the challenges of tomorrow hands on - both in view of the energy transition as well as claiming their central role in the multimodal transport system and innovative business development. I admire that a lot. That is why I took the initiative to come up with a report in Parliament including recommendations for the path towards a future-proof inland waterway transport sector in Europe.

My report shows the clear potential and added value of inland waterway transport and ports specifically for further development of synchro modal transport as well as for the TEN-T core and comprehensive networks. This is often forgotten about in the transport debate. We need an efficient and smoothly running transport system, in which the modal shift plays a role.

The recently published Smart & Sustainable Mobility Strategy sets a target to boost the modal shift and increase the share of inland waterway transport by 25% in 2030 and by 50% in 2050. Important prerequisites for accomplishing these goals are a clear focus on digitalisation, efficiency improvement and sustainability. That way, the inland waterway sector will become a strong competitor to other modes of transport. The developments in the road sector are going fast, so we need to take a sprint starting today.

For this modal shift to succeed, we need data on the European logistics system and the flow of goods and containers entering Europe. This could provide valuable insights for effectively implementing new modal shift policy (think of the Combined Transport Directive review coming up) and it leads to more efficient planning and use of physical infrastructure. River Information Services (RIS) also plays a role here, which needs to be further harmonised.

We need to connect existing digital transport policy frameworks and to make sure that transport data are available through one single point of access. An action plan for multimodal transport data sharing is needed, with the goal of achieving a synchro-modal transport system by 2035 at the latest. This will help to transfer cargo more easily to rail for example in case of low water periods.

Furthermore, a transition towards greening transport and infrastructure is needed. We should not be seeing this as a 'must', something that we simply 'have to do'. Because it offers plenty of opportunities, and everyone will benefit from it! We have all the ingredients, all the abilities and knowledge to make this a success.

Ports play an indispensable role in achieving our green ambitions in the European Green Deal and a circular economy approach plays a big role in this regard. The world's population is expected to peak at 10 billion in 2050 and our resources are not limitless. A circular approach helps us to prevent exhausting our resources and creates business opportunities that can offer new ways to mitigate these risks and allows ports and business to grow. Ports are an ideal location to develop circular economy projects. In fact, they can be the matchmakers, because both the presence of industry and the proximity to large urban agglomerations make them ideal places to turn waste into products. And it creates jobs!

Finally, ports have the potential to become the clean energy hubs of tomorrow. They can really be the backbone of the future energy networks, think of fuels such as hydrogen or electrification. These alternatives are being researched in the CLINSH and RH2INE projects, and it became clear that there is enormous potential for further growth here. Lessons must also be learned from the past, as with LNG, where we waited too long with building the infrastructure and the commercial uptake and use started therefore slowly. The role out of an alternative fuels infrastructure for multimodal use should be focussing on a network approach. That is why I am glad to see the focus on the TEN-T core and comprehensive networks in the currently revised Alternative Fuels Infrastructure Regulation. This way we can effectively decarbonise the transport of goods in Europe. An efficiently planned, tailor-made infrastructure, based on demand and market characteristics of sea and inland ports is important here, so that oversupply is avoided. The Port of Rotterdam is simply very different from the Port of Strasbourg.

In conclusion, the time is now to take fate into our own hands and show leadership. Only then, we can make the Green & Digital Dream a reality. By working together well, we can achieve it. To the benefit of the inland waterway sector, of ports, of the entire transport system: to the benefit of us all. If we do that, the corona crisis and our task to become a fully digitalised and zero-emission sector will also become much easier to navigate.

The ets extension to maritime: finally contributing its fair share

PETER LIESE

MEP (EPP Group - Germany), ETS Rapporteur incl. Maritime, Member of the ENVI Committee

In the EU, shipping accounts for 13.5% of all European Union greenhouse gas (GHG) emissions from transportation. For too long the maritime sector has not been covered by any EU climate policy instrument, however. The revision of the European emissions trading system (ETS) will change that. On July 14, the European Commission proposed to extend the EU's effective carbon pricing tool to the maritime sector as part of its Fit for 55 package. By this, maritime traffic will finally play in its part in the decarbonisation of the EU's transport sector.

International shipping is a large and so far untackled source of greenhouse gas emissions. Around the world, it is responsible for 940 million tonnes of CO2 each year corresponding to 2.5% of global greenhouse emissions. As if this was not motivation enough, the emission numbers from this sector are still growing. Without further actions, IMO studies expect a dramatic increase of emissions from maritime transport between 50% and 250% in 2050. That is entirely contrary to all our efforts in the EU so far to reach climate neutrality. Therefore, it is more than obvious that the maritime sector has to finally cut emissions and contribute its fair share to the decarbonisation of Europe.

The inclusion of the maritime sector in the ETS is necessary to achieve the ambitious climate targets. The European Parliament has emphasized this necessity for many years and urged the Commission repeatedly to finally put a proposal on the table. It is unfair that all parts of the economy and the transport sector are subject to ambitious standards but the maritime industry is not really contributing. In addition, carbon pricing only works flawlessly if the coverage is seamless. Introducing maritime transport into the ETS hence will strengthen the whole system.

In the past years, the EU has put in place EU-wide data collection measures (MRV) as a first step. On this basis, the Commission has now proposed to set up a route-based ETS. This means it will be independent from the ownership and the flag of a ship. Instead, it will be subject to the ETS if it starts or arrives in a European port. This is a very important detail because it will prevent companies from avoiding the carbon price by simply putting a non-EU flag on their ship.

As there have been no climate measures in place so far, there is a great and so far untouched potential to pluck the low hanging fruits in this sector and achieve significant cost-efficient achievements on the way to climate neutrality. By introducing all sectors of the transport sector into the ETS, we will additionally create a level-playing field. This will ensure that the least polluting means of transportation will become the cheapest means of transportation. Through market-based measures, we can consequently accelerate the EU's transition to green mobility making it clean while keeping it affordable.

The challenge however is to regulate the system in such a way that EU shipping companies and EU ports will not suffer a serious disadvantage. We must respect the competitiveness of the EU ports and the EU shipping industry. An important tool will be the generated revenues. In the past, the Parliament has demanded to set up a dedicated Ocean Fund. Creating targeted funds for the shipping industry is important to accelerate the innovation of ships and fuels. The introduction of Contracts for Difference will give further incentives to invest in greening this sector and the industry behind it.

On top of intra-EU shipping, the Commission intends to cover 50% of emissions from trips from and to third countries. In fact, this is a good compromise with the international partners. Of course, a global solution would be preferable but like in aviation, the efforts of the international organisation, in this case the International Maritime Organisation (IMO), are far from being sufficient.

We can certainly expect criticism from third countries at the global level. However, the international discussion on climate change has changed dramatically in the last two or three years. In 2019, at the COP25 in Madrid, the EU declared its objective to become climate neutral and was almost alone in the world with this decision. Today, enshrined through the COP26 in Glasgow, climate neutrality is the new normal and a shared goal of many states around the world. Therefore, unlike in the case of aviation a few years ago, it is clear that the EU now has partners in the IMO that support strong climate action and would help to avoid any kind of opposing action at the IMO level. That is why I am optimistic that the 50/50 approach is a realistic and fair one. However, this should not hinder more ambition at the global level. The EU must further work with its partners to strengthen the negotiations at the IMO and find solutions for the other 50% of international shipping from and to European ports.

The overall objective is to enable safe, secure and **sustainable maritime transport**

MAJA MARKOVČIĆ KOSTELAC

Executive Director,
European Maritime Safety Agency

Maritime transport is essential to our collective well-being. It is often said that without it half the world would starve while the other half would freeze. The figures are worth repeating: 90% of world trade, and 77% of EU international trade is moved by the sea. Within the EU, 35% of intra-European trade is served by maritime transport. Even throughout the COVID-19 pandemic, shipping continued to demonstrate its importance as it kept vital supply lines open delivering essential commodities, including food, fuel and medical supplies.

Our work at the European Maritime Safety Agency was mandated back in 2002 as part of the so called Erika II package in response to the disaster which polluted hundreds of km of EU coastline. This coming year we celebrate twenty years working in the field to deliver on our regulatory mandate of ensuring a high, uniform and effective level of maritime safety, maritime security, prevention of and response to pollution caused by ships as well as response to marine pollution caused by oil and gas installation.

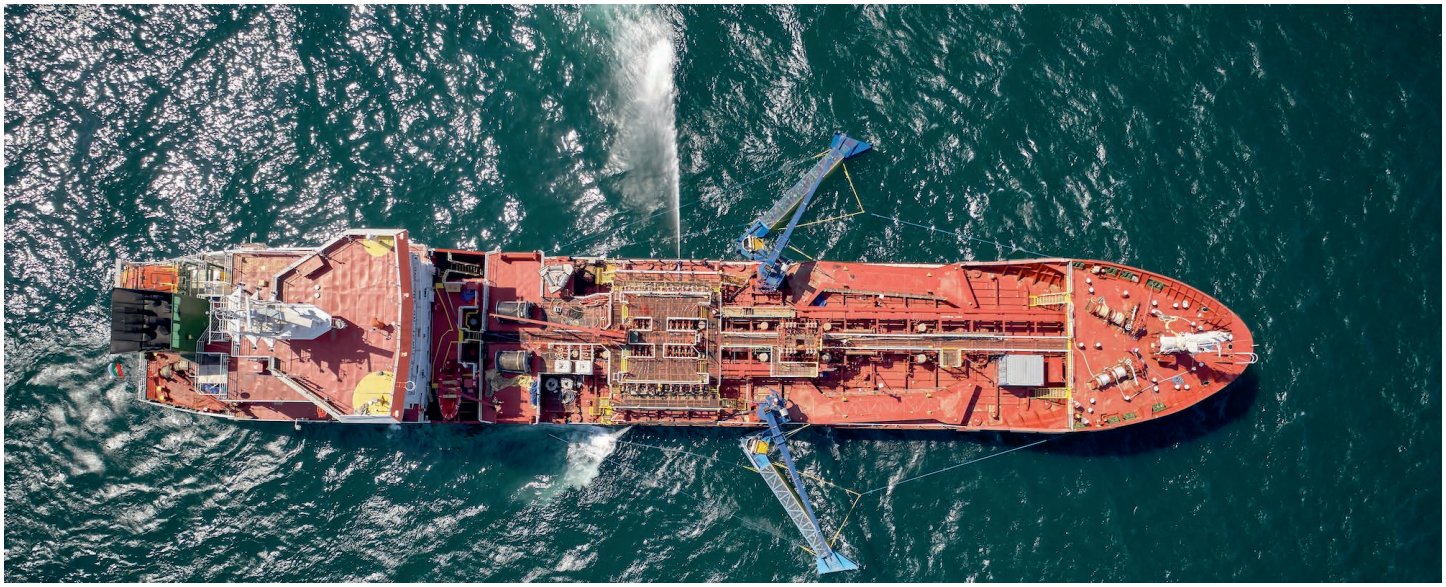
The European Green Deal is a very clear priority for the EU and our work is contributing in a very tangible way to its aims and ambitions both in terms of prevention and response. EMSA is supporting efforts towards zero emission shipping by: harmonising the implementation and enforcement of relevant legislation; developing and providing tools supporting ship inspection; and providing operational support.

As a decentralised agency of the EU, we are tasked to assist the European Commission in the development of new legislation and in ensuring the harmonised implementation across the EU and internationally of relevant EU legislation; we carry out visits to member states to monitor the implementation of EU maritime safety, security and environmental laws; we carry out inspections to classification societies; and, we inspect the maritime education training and certification systems for seafarers of non-EU countries.

We also develop knowledge through studies. In particular, we have been looking at the issue of fires on the vehicle decks of ro-ro passenger ships, the regulatory side of ships' steering and manoeuvrability as well as autonomous ships and we are carrying out a series of studies on alternative fuels thereby supporting their up-take and looking at the safety aspects of their introduction.

On the operational side, our contingency plan can be activated at any time, giving the requesting state access to a whole host of services – from remotely piloted aircraft to satellite imagery, oil pollution response to vessel tracking. The plan has been activated 17 times so far this year, ranging in geographical scope from the Black Sea to the Mediterranean, and the Atlantic to the Indian Ocean.

When it comes to our remotely piloted aircraft systems, we have become the largest provider of RPAS services in the civilian domain in Europe. These services support national authorities and other EU agencies in a huge variety of coast guard related tasks from maritime surveillance, search and rescue, and fisheries control to emissions monitoring, pollution prevention and law enforcement.



Ten of our oil spill response vessels are also now equipped with drones, to support national authorities in case of emergency, as happened in Greece recently when the Sea Bird tanker struck Karavi island off Crete. The RPAS was able to quickly identify areas of pollution and make clean-up operations more efficient. These services are becoming increasingly regional with a multipurpose approach to better maximise the service and bring added synergies.

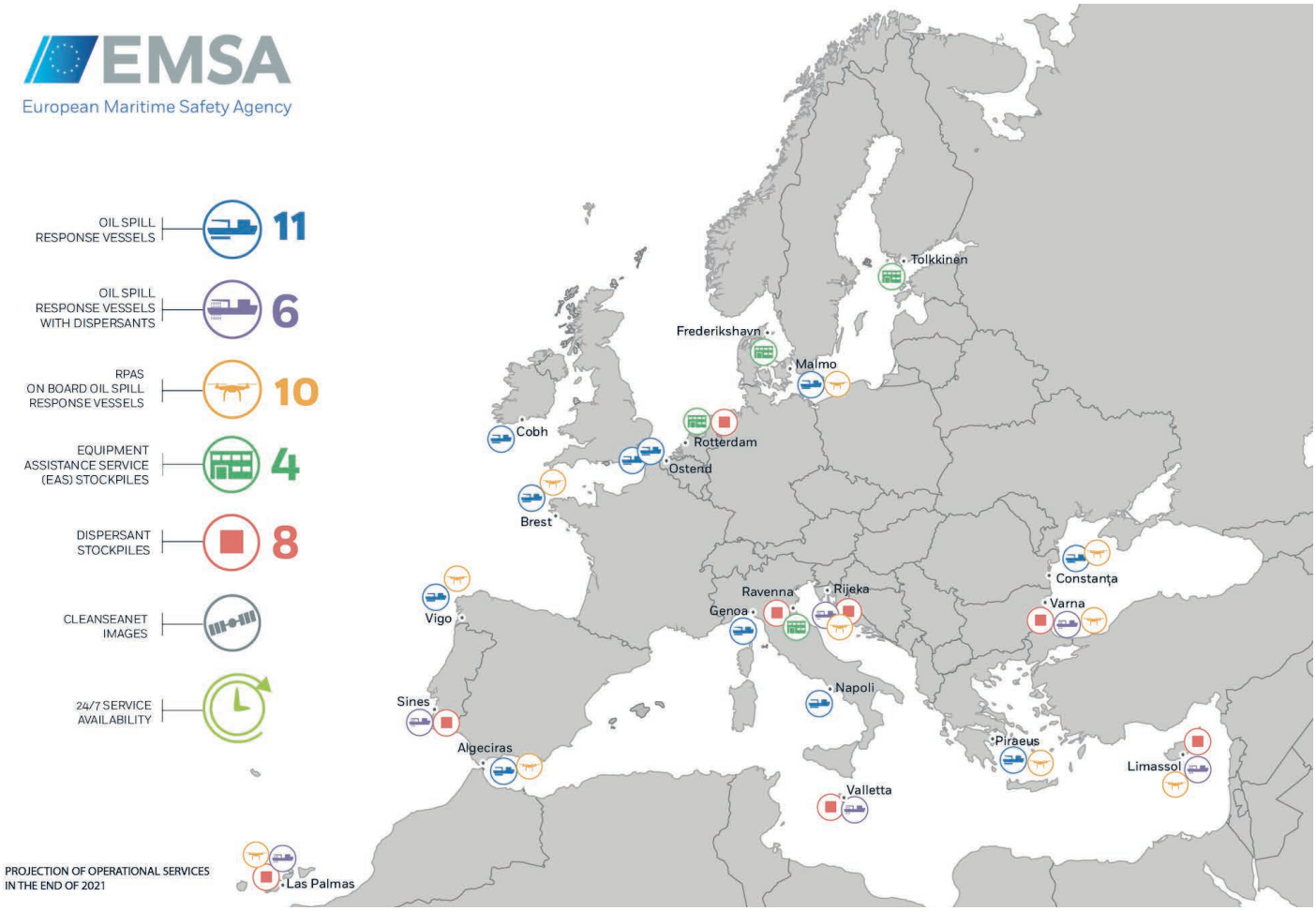
Security is a growing area of concern for the EU and EMSA can and is making a difference there. First and foremost by assessing the level of implementation of the relevant EU and international legislation. But also by sharing information services with the EU's naval forces as part of the Common Security and Defence Policy in order to address security threats such as terrorism, armed robbery and piracy, and in doing so to help protect the EU merchant fleet worldwide.

Day-to-day, we work to provide a comprehensive real time picture of the maritime domain to our European maritime stakeholders. Our integrated maritime services are based on 45 million individual ship messages a day, encompassing over 6000 users served by us 24/7, 365 days a year. We deliver 1200 satellite images per month to support EU efforts to reduce pollution and increase maritime safety with strengthened surveillance capacities. And, so far this year, around 8000 automated behaviour monitoring alerts were sent, identifying targeted behaviour in the maritime domain, thereby raising safety and security in our waters.

As part of our capacity building activities, we have been offering training to the staff of national authorities to ensure harmonisation throughout the EU and beyond. In the past year we have trained remotely nearly 1000 officers, leveraging new technology like virtual reality to ensure immersive training experiences, this is being housed in the recently formed EMSA Academy.

While 2021 saw two major report releases of the COVID-19 Impact on Shipping Report on the one hand and the European Maritime Transport Environmental Report on the other, safety issues will be firmly in our spotlight in 2022 as we launch the first edition of the European Maritime Safety Report to coincide with our twentieth-year anniversary. Data from all across the various systems hosted by our agency will come together in this report to provide insights into the current state of maritime safety in the EU.

As our sector arrives at a crossroads in many aspects, it will be more important than ever for us to foster cooperation at European level to ensure safer, more secure and sustainable maritime transport.



Data: the fuel that feeds digitalisation

MAJA BAKRAN MARCICH

Deputy Director General, DG Mobility and Transport (MOVE), European Commission

The potential benefits of digitalisation for the transport sector are immense: for safety, efficiency and sustainability. This is particularly important at a time when we are looking for ways to cut transport emissions by 90% by 2050, as pledged in our Sustainable and Smart Mobility Strategy, which followed the publication of the European Green Deal.

The way we produce, share and use data plays an integral role in this transformation.

To give a few examples:

- Better and more complete information, combined with greater automation, can make mobility safer and more secure. As a reminder, one of our strategic targets is to achieve 'Vision Zero' – zero fatalities across the different transport modes by 2050.
- Data also contributes to sustainable mobility, for instance by optimising traffic through better information and planning, and by informing users of their carbon footprint.
- Data is also crucial to leaving no-one behind as we make the transition – such as passengers with reduced mobility or disabilities.

However, as the term suggests, 'data-sharing' requires cooperation. And seamless, cross-border multimodality will only be possible if we succeed in connecting users, operators, infrastructure managers and service providers. The same is true for automation, while data also fuels artificial intelligence.

Both our Data Strategy, and our Sustainable and Smart Mobility Strategy of December 2020, make a case for greater cooperation.

Data Strategy

Published in February 2020, the European Data Strategy sets out the Commission's vision, which includes a single market for data to ensure Europe's global competitiveness and data sovereignty. A Data Governance Act followed, while a Data Act and new rules on high-value datasets are in the pipeline.

We are also developing common European data spaces in strategic sectors such as health, energy and mobility. These will ensure that more data are available for use in the economy and society, but keep the companies and individuals who generate the data in control.

Mobility initiatives

For mobility and transport, the Sustainable and Smart Mobility Strategy lays the ground for a green and digital transformation and greater resilience to future crises. It lists over 80 measures for adoption in the coming years that will help us achieve these goals.

For digitalisation, one of the three main pillars of the Strategy, the focus is on I) making connected and automated multimodal mobility a reality; and II) innovation, data and artificial intelligence for smarter mobility. On data-sharing, it announces:

- The revision of the ITS Directive, which we present in December, to accelerate the coordinated deployment and use of intelligent transport systems in road transport and for passenger multimodality. We want to increase the interoperability and cross-border continuity of ITS services, establish effective coordination and monitoring mechanisms between ITS stakeholders, and solve issues related to data availability and data sharing.
- An update to the current specifications for EU-wide real-time traffic information (RTTI) services. The goal is to expand their geographical coverage, support new data types (such as recharging/refuelling points and low-emission zones) and enable data for business-to-government use-cases (e.g. for traffic and asset management).
- Two initiatives to support multimodal services for passenger mobility, which we will present next year. These include a revision of the multimodal travel information services regulation to support new data types and advance on standardisation, and a new initiative addressing market imbalances when it comes to developing digital services for multimodal mobility. The ultimate goal is to make it much easier than it is today for passengers to buy a single ticket that covers more than one transport mode.

These initiatives tackle specific data-sharing issues, but we also need to see more interoperability and consistency on data access and sharing overall to reap the full benefits and ultimately establish the 'bigger picture'.

We are in the process for instance of launching NAPCORE, a Member State-driven Coordination Mechanism for the ITS National Access Points. The platform will enable Member States to work together on common issues and coordinate their data-related ITS initiatives linked to the National Access Points.

For freight and logistics, the Digital Transport and Logistics Forum (DTLF) is working on a common digital environment (freight corridor information systems) to foster interoperability and transparency in data-sharing between all types of supply chain stakeholders. Optimising logistics operations is expected to reduce congestion and empty runs on our roads, and facilitate multimodal alternatives to road-only transport.

Next year the work will continue, first with the launch of a number of projects to build a common European mobility data space. The space will facilitate access, pooling and the sharing of data from existing and future transport and mobility databases. It will build on existing initiatives and recommend supporting measures to bring those initiatives closer together. It will also make use of the many (infrastructure) building blocks that the Commission will fund in the coming years through the Digital Europe Programme.

For the past two decades, we have worked on the different pieces used by the different transport modes. Now is the time complete those pieces, and start putting the puzzle together to create a future-proof mobility and transport system.

HENNA **VIRKKUNEN**

MEP (EPP Group - Finland),
Member of the ITRE and TRAN Committee's

Reduce CO_2 emissions on **transport** by new services provides by digitalization

The Mobility sector is vital for the EU's economy and society. Mobility is a necessity. Up until the COVID-19 pandemic, people and goods moved across Europe more than ever. Even though it is impossible to predict the aftermath of the pandemic, it is probable that this mobility trend will continue in the future. It is estimated that passenger transport will grow by more than 40 per cent by 2050 compared to 2010, whereas freight transport is expected to grow by 60 per cent.

Simultaneously, the EU has committed to meet ambitious climate targets. Transport sector is amongst the biggest emitters as the sector accounts for 25% of all CO_2 emissions in Europe. 94 % of transport still relies on oil products. Air pollution causes 20 % more deaths worldwide compared to 1990. It is clear that we need significant reductions of emissions, not mobility.

While mobility is indispensable for our society, it does not come without disadvantages. These include greenhouse gas emissions, air, noise and water pollution, road accidents, congestion, and loss of biodiversity.

To address these issues, The Commission introduced a Mobility Strategy in December 2020. The main objective of the strategy is to make the European transport system sustainable, smart and resilient. A 90 % reduction in transport-related emissions is needed to fulfil the EU Climate neutrality target to make the EU the first climate-neutral continent by 2050. The sustainability objective can be achieved through making all modes of transport more sustainable, make such alternatives widely available and create the right incentives to enhance the transition.

The basic premise of the strategy is that mobility should be available and affordable to all, irrespective of their location. All regions should remain connected. Moreover, the transport sector should ensure good social conditions to its workers.

In addition, it lays down milestones for the years 2030, 2035 and 2050. For example, by 2030, at least 30 million zero-emission cars will be in operation on European roads and 100 European cities will be climate neutral. By 2035, zero-emission large aircraft will be ready for market. By 2050, nearly all vehicles will be zero-emission and a Trans-European Transport Network (TEN-T) will be operational.

Digitalisation is the key in achieving these ambitious targets. The EU budget of 2021 to 2027 will allocate investments towards improving infrastructure and digitalisation through the Connecting Europe Facility.

In addition, the Commission introduced the Fit for 55- package in July 2021 that includes demanding targets for all modes of transport. It is important that the result of the negotiations between the EU institutions result in an economically sustainable solution that ensures the competitiveness of European industry and reduces emissions effectively. Digitalisation has a pivotal role in scaling up the whole chain of logistics and the transport system.

New innovations in mobility technologies can be expected in the near future. While such innovations are vital, it is important to concentrate on combining the most effective measures available in order to meet the targets and create the best possible environment for seamless and effective mobility. Digitalisation and automation offer great opportunities for the sector to tackle the challenges as well as boost the competitiveness of European industry. They are crucial for ensuring that the EU maintains its leadership in transport manufacturing.

In the short and medium term, it is clear that EU will still have to rely on conventional vehicles, while cleaner technologies develop. To drive innovative mobility solutions and competitiveness even further and to create platforms for cooperation between stakeholders, further investments in research and innovation are necessary.

The transport sector has been greatly influenced by online platforms in recent years. Many new mobility services have emerged in the form of online platforms. Online platforms are strong drivers of innovation and play an important role in Europe's digital society and economy. They increase consumer choice, improve efficiency and competitiveness of industry and can enhance civil participation in society. More than a million enterprises in EU trade through online platforms. Here also a level playing field, innovation-friendly environment and future-proof digital infrastructure are keys to success. The EU is currently in the process of negotiating a historical digital services package, consisting of the Digital Services Act (DSA) and the Digital Markets Act (DMA), to be finalised in 2022.

Furthermore, there are many questions to be solved regarding the access and ownership of data. Open data is a key to make digitalised mobility services function seamlessly. Cybersecurity is also a challenge to be tackled as the transport system becomes more digitised and connected. The EU can, and in my opinion should, set global standards for big data, artificial intelligence and automation.

What is crucial for the mobility sector to prosper is that we have to make sure that regulation and financing is innovation-friendly. It is important not only to encourage innovation but also give long-term perspective and legal certainty to entrepreneurs and investors. Europe needs to be a place where new ideas can be created and innovations can flourish. With joint action at the EU, Member State, regional and local level in collaboration with industry and stakeholders, Europe can be a global leader in future mobility.

Building an ecosystem to optimize and digitize the supply chain for sustainable mobility

JESPER BENNIKE
Executive Director, Sixfold

Sustainability is hugely important to the logistics industry. Transport accounts for around 20% of global carbon dioxide emissions, while a report from the international organization Paris Process on Mobility and Climate (PPMC) says truck transports specifically account for one-quarter of global transport energy use.

What's more, in Europe approximately a quarter of containers on the road are empty. These empty runs have high economic costs due to the wastage of fuel, time and labor, as well as increasing emissions through congestion. With the supply chain generating such vast quantities of waste and CO_2 emissions, it's incumbent on us as an industry to change before governments force us – or before customers demand it.

The key to unlocking a more sustainable model is to achieve complete visibility through the supply chain, including around emissions data. This data then needs to be shared between all stakeholders, so everyone can get a deeper look at the inefficiencies across their logistics networks and take steps to reduce the environmental impact.

However, doing so isn't easy. So, how do we build an ecosystem that encourages digitization and real-time visibility (RTV) for a more sustainable industry? All it will take is three simple steps focused on the power of data.

Step 1 - Make supply chains visible to everyone

First, we must make sure all transport and emissions data can be gathered, shared and acted upon freely. This requires a level of openness and accessibility that doesn't currently exist in the logistics industry – and has become more of a challenge as supply chain complexity has continued to increase.

Sixfold's open visibility data (OVD) API is one initiative that lets carriers, shippers and logistics service providers (LSPs) share their RTV data across platforms and providers. This removes the issue of data being stuck in silos and enables all parties to share the data they want with who they want, in a safe and secure manner.

Enabling this flow of information between multiple stakeholders is the groundwork to creating a digitized ecosystem for greener and more sustainable logistics. It also maximizes the value of real-time visibility data by removing the data-sharing obstacles that have long hindered global supply chains.

Step 2 - Include emissions information as standard

Next, we need to make sure the data is gathered accurately and can effectively take emissions into account. This is vital to ensuring that supply chain businesses have access to the tangible insights needed to make smarter sustainability decisions.

Transporeon's Carbon Visibility solution is an industry-first and ground-breaking approach to making this happen. It integrates and automates greenhouse gas emissions management across multiple modes of transport. By accurately monitoring the total emissions for carriers, shippers and LSPs, businesses can equip themselves with the right data to deliver the highest quality reports and in turn make better tactical and strategic decisions.

This means they can analyze specific operational elements (e.g. trucks or transport lanes) to immediately improve operations while creating the framework for a market that empowers companies to choose partners based on their emissions history. In addition, harmonized emission data facilitates horizontal collaboration between shippers and establishes more favorable market positioning.

Step 3 - Make the ecosystem attractive to join

The final – and often most difficult – step is to persuade organizations to join this ecosystem. Most approaches are very shipper centric, but we need to treat carriers as equal partners in change and give them the resources to undertake what used to be difficult digital transformation projects.

The key is to provide solutions that allow the low-cost entry into the transformation journey, while more importantly delivering tangible and actionable value to carriers. For example, tools like Sixfold's Fleet Monitor allow carriers to use the RTV data they generate to better manage their fleets in real-time. As a tool specifically designed for carriers and their dispatchers, it encourages carriers to join ecosystems that optimise the supply chain for sustainable mobility.

Ultimately, building an ecosystem for sustainable logistics isn't easy. But there can be no arguing that empowering a greener supply chain is both extremely worthwhile and an immediate concern. According to the International Transport Forum, global transport activity will more than double by 2050 – with freight transport activity predicted to grow 2.6-fold and freight CO_2 emissions predicted to grow by 22%.

Clearly, the onus is on the logistics industry to act before it's too late. We believe that the triple-pronged approach of making data easily visible and shareable, accurately monitoring emissions and making it easier for shippers, carriers and LSPs to adopt greener strategies will be the best way to drive the future of sustainable supply chains.

CINEA, funding infrastructure for a **greener Europe**

DIRK BECKERS

Director, CINEA

With its focus on climate, the environment, modern infrastructure and networks, CINEA is the EU's focal point for funding green infrastructure projects in Europe.

The European Climate Infrastructure and Environment Executive Agency (CINEA) started operations on 1 April 2021 implementing seven different EU programmes on behalf of the European Commission, worth around €58 billion in EU funding between 2021 and 2027. All these programmes are contributing to the realisation of the **EU Green Deal** via the creation of a decarbonised, greener and more sustainable future for Europe.

CINEA is committed to ensuring high standards of **programme implementation**. Our main tasks cover the entire project management: from proposal evaluation, to grants preparation and project monitoring. And finally, to feeding back the results of the projects to the policy makers. The Agency brings innovative ideas, concepts and products to implementation, and helps to build significant economies of scale.

One of these programmes, the Connecting Europe Facility (CEF), supports the construction and upgrade of sustainable transport infrastructure projects along the Trans-European Transport Network (TEN-T). The development of the TEN-T is a main component of European economic and social policy and a key element in the realisation of a resilient internal market. The EU contributes to the development of the TEN-T by providing financial assistance to those projects that demonstrate an EU added value, in particular a strong cross border dimension. In addition, one of the key objectives of the TEN-T is to reduce the environmental impact of transport, which is particularly important as transport emissions represent around one quarter of the EU's total greenhouse gas emissions. This will be achieved by:

- increasing the use of those transport modes that have a minimum environmental footprint
- deploying intelligent transport systems
- fostering the use of alternatives fuels

As of November 2021, the total number of ongoing CEF projects (funding started in 2014) is over 1,000 for a total EU contribution of more than €23 billion and total investment by other stakeholders of over €50 billion.

More than 71% of this EU budget is dedicated to rail, a greener alternative for passenger and freight transport, with a further 13% going to maritime and inland waterway projects. The aim is to improve those environmentally friendly modes of transport and shift traffic away from road transport. In addition, around 7% of the budget supports projects for the optimisation of the air traffic management system, with has a direct impact in reducing aviation emissions. The remaining 9% is funding road projects with a clear sustainability dimension, such as the support of alternative fuels infrastructure, mainly via the deployment of charging stations for electric vehicles.

For the 2021-2027 period, CINEA will manage a further CEF contribution to transport of around €25.5 billion. The bulk of the budget will once again be devoted to the decarbonisation of the transport sector by focusing on less polluting modes, as it has been the case since the inception of the programme. Furthermore the programme will support the goals of the Smart and Sustainable Mobility Strategy laying the foundation for the green and digital transformation of the EU transport system. This will significantly support the EU Green Deal objective of reducing net greenhouse gas emissions by at least 55% by 2030 and will contribute to Member States' efforts to install sufficient charging and zero-emission fuelling points to ensure that drivers are able to charge or fuel their vehicles across Europe.

The other programmes managed by CINEA also share similar objectives than the CEF Transport programme in terms of climate and environment, therefore synergies and complementarities are constantly sought. The CEF contribution to Energy infrastructure aims to support energy efficiency and the use of renewable sources of energy, combined with the Renewable Energy Financing Mechanism, which helps Member States in reaching their renewable energy targets. The Just Transition Mechanism (Public Sector Loan Facility) supports the regions most affected by the transition to climate neutrality. Horizon Europe's Cluster 5: Climate, Energy and Mobility aims at making the energy and transport sectors more climate and environment-friendly, more efficient and competitive, smarter, safer and more resilient. The Innovation Fund is funding the demonstration of innovative low-carbon technologies, while LIFE is the EU's funding instrument for the environment and climate action. The European Maritime, Fisheries and Aquaculture Fund implements actions in the field of the Union's Maritime Policy, the Common Fisheries Policy and the EU international ocean governance agenda.

In a nutshell, CINEA will continue to manage key transport infrastructure projects across Europe, with a clear focus on achieving Europe's ambitious targets for climate and environment. The Agency's motto "*Funding a Green Future for Europe*" fully reflects CINEA's mission for the future of Europe.

The **future** of **electrification** is already here: it's now **time** to **scale-up battery R&I**

PHILIPPE JACQUES

Secretary-General of The Batteries European Partnership Association (BEPA)

The extensive growth of electric vehicle fleets is a catalyst for the achievement of climate mitigation targets under the European Green Deal. Battery-driven electric vehicles are slated to shortly become ubiquitous on European roads, taking over fossil fuel powered ones. Simultaneously, other forms of transports, like rail, waterborne and aviation are developing their use-cases for electric drivetrains based on high-performing battery technology. The stationary storage market is also on the rise, further accelerating sustainability efforts by opening up the market for second life batteries.

Such growth, however, can only be accommodated by a collective and coordinated effort to foster Research and Innovation in the field of batteries; this will lead to new application fields for emerging technologies, and to an upscale of battery production processes in the short-term.

On these grounds, the Batt4EU European Partnership was launched in June 2021 as a specific initiative under Horizon Europe - the European flagship R&I programme - to combine the efforts of the European Commission on the one side, and of the over 180 research and industry partners united under the Batteries European Partnership Association (BEPA) on the other.

Building a value chain in Europe

The European Commission is investing a total of 925 million between 2021 and 2027 in battery R&I through the Horizon Europe Batt4EU calls. BEPA members will match this funding with private investments in complementary activities, as well as give official recommendations on which R&I needs should be covered in the Batt4EU calls. Batt4EU covers the entire European battery value chain, with a specific focus on processing raw materials, developing the necessary advanced materials, designing and manufacturing innovative battery cells, and making sure that batteries are safely handled and recycled at the end of their lives. Inventing here the sustainable batteries of the future will contribute to Europe's ambition of becoming more independent and making progress towards the proposed targets linked to the sustainable mobility sector. BEPA is actively looking for new members from under-represented geographical areas (e.g. Central and Eastern Europe) and industries (e.g. raw materials and recycling).

Working together in the European ecosystem

The Batt4EU European Partnership is working hand-in-hand with other European initiatives to ensure successful delivery of results. Making use of the roadmaps published by the ETIP Batteries Europe and the Battery2030+ initiative, Batt4EU will also work together with the Partnerships involved with the mobility sector, like the 2Zero Road Transport, the Zero-Emission Waterborne Transport and Europe's Rail partnerships, in order to facilitate the integration of batteries in vehicles, ships and trains. Together with the stakeholders involved in the two Important Projects of Common European Interest (IPCEI) dedicated to batteries and other industry partners, Batt4EU intends to establish in Europe by 2030 the best in the world innovation ecosystem to boost a competitive, sustainable, and circular European battery value chain. Batt4EU will also be working with numerous regional initiatives, transferring the knowledge developed within the Partnership, aiming to drive the transformation towards a carbon-neutral society.

Attracting more people and investments

The shift towards electrification of the mobility sector is generating great challenges for Europe, too. In the context of significant shift will lead to a massive creation of jobs and a challenging re-skilling exercise. According to the European Battery Alliance, 3 to 4 million of new jobs are expected to have been generated by 2025, and 800 000 jobs will need to be reskilled or upskilled. In this perspective, a specific set of skills and experience will be required with a specific focus on battery production and there is, therefore, an urgent need to bolster re-/-up skilling efforts that can address the skills gap.

On another note, while the European research community is often portrayed among the strongest at global scale, shaping knowledge and innovative ideas into "business" seems toilsome. Accelerating the uptake of promising technologies currently under development becomes paramount. Addressing the so-called valley of death, also at a more political level, remains one of the top priorities, to ensure a complete and smooth transition.

To tackle these challenges, BEPA will soon launch two taskforces dedicated to innovation uptake and education, and skill development. On the one hand, BEPA will pave the way for projects to cross the "valley-of-death" in coordination with already existing organisations, including EIT InnoEnergy, EIT Raw Materials, the EIC and the EIB. On the other hand, BEPA will strive to boost the upcoming and massive creation of jobs and skills by connecting with relevant initiatives (e.g. the EBA battery academy) and building a detailed action plan that supports education and skill development for battery workers.

It's time to power up

Under the context of the European Green Deal, the role of batteries is now well acknowledged: they are key technologies that support a zero-emission mobility and enable the integration of renewables in the power grid. It will be vital to reinforce R&I in the European battery landscape in order to support industrial and political ambitions in Europe. Coordination and cooperation are the key words. All European battery stakeholders are therefore invited to join BEPA in order to help boosting a competitive, sustainable and circular battery value chain in Europe.

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