Title: Public electric mobility in Portugal: past lessons and present learnings

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Public electric mobility in Portugal: past lessons and present learnings

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ABSTRACT
The public electric mobility is a priority in many countries. However, in Portugal there are mixed feelings about so different projects in study or implemented. The present paper reflects on the paths and strategies adopted in Portugal and also points around some experiences around the world.

Keywords: Public electric mobility, urban planning, sustainable transportation, energy mix, regional investment

1. Description
1.1 Reflections
When there’s decarbonisation strategy and combat climate change and when the budget of the Republic, the government gets only the tax on the consumption of fossil fuel and does not begin to structure the energy and ecological transition, something is wrong. More serious for these tax revenues will not serve to create an alternative to the private car dependency. It should be through the public collective transport that populations, economic activity, cities and regions to take advantage of the sustainability of these networks. In this case, in Australia, the budget gives priority to public mass transit, with a planning program. As in many countries and cities / regions from different continents, we have already realized that it is necessary to create public mass transit networks, correctly applying the methodologies of evaluation of projects. In the case of France, for example, over 20 cities have built electric networks. As in Bordeaux at the end of the 90s, they decided to build 45 km of light rail transit instead of 9 kms Metro and today the city has more population served directly and the network, however, grew out of its boundaries. [1] Announces a light rail transit (300 seats) moved to H2. [2] it was announced that Germany is the first country to implement a passenger train powered by hydrogen. Examples of technological innovation applied to public transport objective and advantageously in reducing local pollution and fighting climate change. Being that can be done with H2030 urbanism, transport, the fight against climate change. Plan and organize the cities is important for the future of public electric mobility. In Portugal, they want to build 1.9km between Rato and Cais do Sodre, instead of 27 km between Algés and Loures, directly serving 300,000 inhabitants.

It is important to be consistent with the existing system and encourage good practice by political economy. A good example is the UK, where Employers with more than 10 parking spaces for staff are paying £ 402 per year and space. [3] Nottingham Council reinvests the income in public transport development, such as its tram network, the city train station and local bus services. Since 2012, £ 44 million had been raised by the levy and spent. The acceptance levels from Employers seem to be high, since Nottingham Council states full compliance with the scheme. Taking seriously what is done in their counties, the Scottish Parliament not sidesteps good practices and moves forward with this legislative proposal before going on vacation. In Portugal dominate those who see in BAU the answer to everything instead of creating alternatives to the...
car. And if tax the companies offering cars and parking in the city center? And if public policy car was made taking into account the fight against climate change?

The subject of climate change may be controversial in the scientific community, but may be a connection point between areas of knowledge in dialogue. Indeed, the debate on climate change is fundamental to understanding a set of measures of cities and their transport plan, particularly as it relates to the collective passenger transport. You have to be strategic in relation to this sector and we need to have a coherent program with justice and social cohesion. The urban public transport networks continue to have failures of information at stops and respect of waiting times transmitted by the SAE and the level of service. To make network and public transport services is necessary to know the cities and work with the people but, above all, respect those who always dedicated to public transport and know present alternatives to the networks of neighbourhoods instead of promoting local and urban accessibility of the municipalities where the integration, justice and social equity is done precisely with the increased connectivity of networks, i.e. interconnecting the various geographical cities that exist.

The work is incomplete if urbanism does not give their contribution and if there is a coherent program to combat the hidden costs caused by urban sprawl. Not in terms of spatial planning, cities and regions, or in transport, this program exists, with the aggravating circumstance that it runs the risk of having a H2030 that does not respond to these challenges. On the contrary, it may exacerbate them. For all this, indeed, public transport might well enjoy the "golden era" during the transition period. Significantly lower operating costs could open the door to much higher densities route, more frequent services, and the flourishing of innovative feeder services, it enabling to compete more effectively with private vehicles than at present. While private vehicles - both autonomous and human controlled - struggle in congested areas, it could be the heyday of buses and light rail.

While in some countries there are demagogues and populists, in other countries the institutional organization of the transport of passengers and goods is transparent and consolidates knowledge and knowing. This is the case of the VDV (Germany) where the strong institutional organization allows to acquire knowledge in the technical and scientific field. The issues that this association promotes have a professional attitude to the sector. About 600 companies performing public passenger transport and rail freight transport in Germany are organized in the "Verband Deutscher Verkehrsunternehmen" (= VDV Association of German Transport Companies). The VDV advises and supports its member companies and politicians, supports the exchange of experience and know-how between the members and prepares technical, operational, legal and economic principles.

Following the COST Action TU1103 (2012-2015) about tram urban safety, the team of 14 European countries experts, decided on its own initiative to continue the work that was presented in 2015 in Frankfurt. The work of the COST Action TU1103 is published in CEREMA site, through a new body dedicated to the planning of public transport utility (electric mode). One focus was how to put the safety of insertion of the electric mode in urban areas is continuing to study the various networks and problems of planning and circulation with other modes of mobility, avoiding the accident. This team entered new elements other continents, continuing to deepen methodologies (definition of areas and critical factors in the direct catchment area of the shaft or the station / stop; regulations; law; economic evaluation; impacts, indicators, etc.) to avoid the accident, contributing to the reduction of negative externalities and increasing the
comfort of electrical networks. The axis of the study "Algés <> Loures" in 2002 was the definition of tracing with this objective of circulation planning and parking for the circulation of the electric mode to be safe and not have any accidents with people and vehicles. One of the themes was to analyze the distraction that pedestrians invade the circulation axis electric mode. In Lisbon the lack of regulation on driving conditions of the collective public transport service in the RoW and the trivialization (RoW C) should be cause for a local authority pay more attention to this situation. Hence, it depends on the reduction of externalities and increased accessibility of electric mode and upgrading its network and the city's way of life and its people. In Lisbon the lack of regulation on driving conditions of the collective public transport service in the RoW and the trivialization (RoW C) should be cause for a local authority pay more attention to this situation. Hence, it depends on the reduction of externalities and increased accessibility of electric mode and upgrading its network and the city's way of life and its people. In Lisbon the lack of regulation on driving conditions of the collective public transport service in the RoW and the trivialization (RoW C) should be cause for a local authority pay more attention to this situation. Hence, it depends on the reduction of externalities and increased accessibility of electric mode and upgrading its network and the city's way of life and its people. In Lisbon the lack of regulation on driving conditions of the collective public transport service in the RoW and the trivialization (RoW C) should be cause for a local authority pay more attention to this situation. Hence, it depends on the reduction of externalities and increased accessibility of electric mode and upgrading its network and the city's way of life and its people.

While in Portugal it despises the railways to serve public policy in support of road transport and restructure cities and regions, other countries take seriously their rail plans and invest in urban, suburban and regional networks. One rail in the strategic improvement of living and working in planning and a strategic vision about alternatives and solutions for cities and regions is important. The fact that these solutions can be the main tool to retrain and restructure the urban planning and to combat the reduction of the negative effects of urban sprawl responsible for the deficit and the debt accumulated in the various budgets, starting with personal and ending in the country's administration. The railway question raises several issues in relation to PNPOT and PNI2030. The main question is why both PNPOT as PNI2030 not have a strategy to combat urban sprawl. Does this geography of the territory is unimportant? It is time to correct the way of life and society of the cities of consumption and waste. This aims to bring better living conditions and work. It also aims to be an alternative to the territory of waste, energy, the environment and social segregation caused by such territorial fragmentation. This aims to bring better living conditions and work. It also aims to be an alternative to the territory of waste, energy, the environment and social segregation caused by such territorial fragmentation. This aims to bring better living conditions and work. It also aims to be an alternative to the territory of waste, energy, the environment and social segregation caused by such territorial fragmentation.

There is a general unpreparedness visible from several statements of government experts, perhaps explaining why public transport is so badly treated in Portugal and realize the point reached by the various services (rail, metro, tram and bus) the various networks to to understand how the planning and management is done. There is no comparison with other parliaments, the treatment is prepared with loose technical report, no information is collected regularly (there is a statistical yearbook on the networks and services of Portuguese cities, for example) and there is no technical structures of the various levels of dedicated administration to public transportation. In Portugal the difficulty to develop the transport sector there is also the bureaucratic level curiously. For example, there is no establishment of the Integrated Internal operator (e.g. the case of Lisbon where it is desirable that public operators are together in a single company, mini-RATP model) because it was boycotted their training because of privatization in the
transport sector.
In 2016 there was the Strasbourg meeting with the theme "Effectiveness of urban public transport networks", with the case study the new tram line between Strasbourg and Khel, passing the two bridges over the Rhine. This line was very helpful to understand how to make urban enrolment of a stroke, for which sustainability has no boundaries. This year, the theme is dedicated to urban mobility in European cities, in relation to planning and regulation practices of AOTU (Organizing Authorities for Urban Transport). France passed to another stage: AOM (Mobility Organizing Authority), which is nonetheless important to note therefore, pass the optical accessibility to the prospect of mobility also coincides with political developments to want to commodify the public service, in compliance with the Directive EC / 1370/2007. The investment intensity and distribution networks in electric mode by region (light rail transit / tram / Tram-Train) is on the site STRMTG[7]. As can be seen by the dates of entry to the service, most of these networks are initiated from 2000, confirming the desire to create alternatives to the excessive use of auto mode, resulting in a clear schedule a sustainable development strategy.
In Portugal replace the railway line by Ecopistas, such as the continuation of a project started long ago in Viseu. After the construction of Ecopistas of Sever do Vouga and Dan has now approved another new Ecotrail, which form the bulk of the Iberian Peninsula. It approved the application of the Community inter municipal Viseu Dão-Lafões Portugal to Enhance Program 2020 for the renovation and conversion of the old railway line of the Vouga in Ecotrail. This project, which represents a total investment of 3.3 million Euros, will be implemented over 55 km, with the construction of a path that starts in Viseu, goes through S. Pedro do Sul, Vouzela and ends in Oliveira de Frades. In S. Pedro do Sul this intervention includes wooden walkways, a bridge, street furniture, equipment and drainage of rainwater over a length of 6.4 km and accounts for an investment of 500 000 Euros reimbursed at 285 thousand Euros, 60% of total investment. The new Ecotrail Vouga will be connected to Ecotrail Dan (old line of rehabilitation of Dan) and Sever do Vouga (part of redevelopment of the old line of the Vouga). Lack of political initiative to connect the Ecotrail the municipality of Aveiro. Between 2017 and 2018, Agueda will receive 10.6 million Euros through the H2020 of the Coordination Center and the Committee on Development (CCDRC). One project would be the construction of cycle and pedestrian routes from the city center to Assequins, Ameal, walls and industrial areas of Travassô and Barrô. The new Ecotrail Vouga will be connected to Ecotrail Dan (old line of rehabilitation of Dan) and Sever do Vouga (part of redevelopment of the old line of the Vouga). Lack of political initiative to connect the Ecotrail the municipality of Aveiro. Between 2017 and 2018, Agueda will receive 10.6 million Euros through the center 2020 of the Coordination Center and the Committee on Development (CCDRC). One project would be the construction of cycle and pedestrian routes from the city center to Assequins, Ameal, walls and industrial areas of Travassô and Barrô. 6 million through the center 2020 of the Coordination Center and the Committee on Development (CCDRC). One project would be the construction of cycle and pedestrian routes from the city center to
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Elsewhere, projects are lines recovery. Recently, hundreds of people were given the composition of the second edition of Aveiro Train-Sernada-Espinho Historic Macinhata for a visit to the Railway Museum. The CP has engaged on the path and promises new next year: If the weather and security conditions allow, in the future, there will be a steam locomotive to be used on the line.

An intermediate stage, we have the example of Lisbon and its periphery, where it spent millions to build tunnels, viaducts and parking for cars. Instead of Municipalities articulate with the Infrastructure Portugal, CP (Portugal Train), the metropolitan and CARRIS to implement solutions. One project under consideration is the Tram-Train at Cascais line and branch lines, which has the following advantages: 1. Increase the acceleration of the rolling stock by reducing the travel time between Lisbon and Cascais; 2. Increase the number of stations shortening the stations to access time and so privileged to walk and bike to the stations; 3. Increase the frequency and capacity. Broadcast stations in remote locations of urban areas based on travel and car parking is a concept dysfunctional and wrong, because it continues to focus on the car and inefficiency. In Tram-Train model, the train is built on the farm. Prevents the construction of the Metro at a cost of about five to ten times larger than the light rail transit and resolves the geography of travel and geography of sustainability, both demanding more interoperability of public collective transport networks to greater cohesion, integration and territorial justice, social, environmental and energy.

There is still much to do on the railroad. For example, poor management of resources in West line, no strategy to support the sustainable development of regions. Funded up too much road infrastructure and despised to train but there is support rail programs and they can be increased in H2030, thinking more in people than in designated corridors of goods. Knowledge of regional rail transport is important but will be even more when you put through the rail interoperability, integration of these services with the suburban and urban service. There are rail systems intermediate capacities that can take advantage of the infrastructure and meet other objectives that the train itself can not.

Lack connect the underground Mouse Alcantara and Reboleira the Algés because undergoes very densely populated areas and hundreds of companies. It would be important to have the Santo Amaro station next to the library because the entire Oeiras East has poor links to third nearest stations (Paço de Arcos and 2 Oeiras) and is the most populated area of the parish if we consider the Quarter Navegantes would be very close. Able to reduce traffic on the A5, also decrease the accident happens due to excessive traffic and better air quality are some of the advantages. The Cascais line to be connected to more subway lines, such as mouse Alcântara-Mar, is more than essential to reduce traffic on the viaduct Duarte Pacheco, Avenida de Ceuta, the entire western part of Lisbon, A5, Axis North- South, among others.

Urbanism in the age of climate change is a current strategy involving a Transit-based system strategy. SATU is not a mode of transport suited to the challenges of Oeiras. The solution is to build light rail transit axis light rail transit / Tram-Train between the Palace section of Arcos / Santo Amaro and Cacém, ordering accessibility alternative to the car and knowing understand
what the geography of sustainability is.
The network of light rail transit / Tram-Train Port is able to develop in the next decade and be an example of better coordination between public policy and urban transport. Between to have an interoperable network and a hierarchical network there is a big gap. The first strategic planning can efficiently decrease the effects of negative externalities and has a positive economic impact. The second penalizes transport with transhipment and infests the territory with large interfaces, eventually not to respond with the same efficiency of the first. The first is equivalent to savings and direct and indirect gains. Second, it introduces losses at various levels.

It makes sense to expand the Red Line to the Amoreiras to complement with a new access mouse in Rua das Amoreiras (2/3 min walk). But it makes sense to call the Star without connecting Ourique field which is right next door; it makes sense to connect this line to Cais do Sodre that is more than saturated transport level. We need an improvement of the Cascais line and expansion of Metro to Alcantara to greatly improve mobility. It is important to invest in the expansion of the red line, except at the airport section - Campo Grande.

Lisbon is the European Green Capital 2020 has great significance and responsibility. First, the recognition of a political strategy that began in 2007 remains today, which aims to take care of the sustainability of the city. That meant a concrete policy in various areas: green areas (in the municipal master plan 2012 had a large increase with a doubling to 400 hectares of green spaces, adding to 200 existing); public spaces (return of public space to citizens); attention to drainage of flood waters (with the approval of a drainage plan is in the execution phase) and the focus on sustainable mobility (with priority to public transport).

The Spanish Square redevelopment project will move forward, turning an arid zone of motor traffic in a large area for public enjoyment. This is the first term that the municipality owns the rails, and from September start coming new buses. In total will be more than 200, about one-third of the current fleet of the company. Buses are more environmentally sustainable and significantly increase the supply capacity. And that will allow us to reduce car emissions and at the same time we improve our competitiveness and our quality of life. At first it will be enhanced and then when you start to get the second wave we replacing older buses. In a second phase, will allow the fleet slaughter those who are now older buses, more polluting and that they should no longer be of service. Carris will be enhanced, meaning less waiting time between buses, more routes, increased service coverage, plus transportation to the weekend and at night. The whole area of Alcantara, help, Bethlehem, and Beato Marvila will be strengthened. The local authority will make an investment in the electrical network. Lisbon had a very comprehensive network that went to many places in the city. It was a big mistake to have destroyed this network, terms abdicated these extraordinary infrastructure. Will make the missing link of 24 Largo Camões to the Cais do Sodre; let’s take the 15 initially to Santa Apolonia and then to the Park of Nations.

And is working with neighboring municipalities to also extend the electrical network. Today, one-half to two-thirds of the active population that is in Lisbon (working or studying) comes from out of town.

The return of electrical will involve a significant investment in the acquisition of rolling stock. The electric has a dual capacity: medium heavy at getting carry many people per hour with quality and efficiency, if the channels are well designed, and at the same time, it is more environmentally friendly.

The Lisbon Metropolitan Area (as well as the Port) assumed that the issue of mobility,
environmental sustainability and transport should be a major priority of the next Community Support Framework at a summit we had with the government. It is demanding to have to adapt the city’s systems to increased tourism and increased employment that tourism generates. It is a very demanding challenge, whether in waste or transport. This challenge is already very present today. Have is to also take advantage of what is of great value. Obviously tourism brings great value in employment, openness to the world, international recognition, and we must take advantage of this dimension. The cause of sustainability is central to all communities.

Without a coordinated strategy with regional planning, urban planning, environment and energy, the government said, again, that is to accept what was PETI3 + and the previous government GTIEVA proposal. It has an overview of the different human geographies; regional priorities are subject to background at a time when speaking of both demographics. There is talk of climate change but is allowed to drop the main antibiotic in the fight against these same changes. In fact, this only happens because the methodology of analysis and assessment does not pass the scrutiny of the regions that today should be provided with technical teams and greater democratic participation, or there was a bottom-up work (sustainable transportation) and contract-level State/Region.

About PNI 2030 interests focus on the coherence and consistency of what should be a public policy agenda and climate change program and its decarbonisation of society.

Portugal is a poor country? Maybe it’s a country that systematically lays out opportunities in a heartbreaking way. What’s up with the abandoned Beja Airport with two parallel tracks 3 km each, with a capacity equivalent to two terminals of Portela, is part of a country with a lack of airport capacity in Lisbon and the Algarve. The Beja Airport is a project of the German Luftwaffe, when they wanted to install a strategic military base within NATO and studied the land access to the airport that they would build. The Luftwaffe and its planning for the Beja Airport, came to the conclusion which the airport would have to get to 110/150 km from Faro and 110/160 km from Lisbon (which in turn is the same distance from Monte Real / Leiria, which in turn is in the same range away from Ovar base, which is 100 Km from Rubras stones). And this is at 150km of Vigo-Peinador, which is also a similar distance Santiago-Lavacolla. The Germans devised Beja as part of a network. But other criteria on which it supported to materialize the airport was the railway line, built by the British South & South Eastern Railway of Portugal and supplemented by the State Railway Track in the XIX century. They looked at the immensity of the lines that have that route, interrupted here and there by a large radius curve, with a huge angle of low-flying, and concluded that it was in fact the railroad, enabling them, in case of war, quickly mobilize resources land to support their air base. Here is a teaching of integrated mobility heritage of the Germans and the British. The Germans, They offered us a gigantic airport capacity that simultaneously solves the chronic problems of ability to Lisbon and Faro. The British, equipped us a railroad that thanks to its characteristics and proximity to the airport is able to project its hinterland or area of influence for well over 150 km to the north, south and to the east to Extremadura Spanish (and in this case instrumental to the construction of the Euro-region of Peninsular Southwest). The Beja airport allows gain scale and integrates markets in a borderless Europe. It has ability to project its hinterland or area of influence for well over 150 km to the north, south and to the east to the Spanish Extremadura (being instrumental in this case for the construction of the Euro-region of Peninsular Southwest). The Beja airport allows gain scale and integrates markets in a borderless Europe. It has ability to project its hinterland or area of
influence for well over 150 km to the north, south and to the east to the Spanish Extremadura (being instrumental in this case for the construction of the Euro-region of Peninsular Southwest). The Beja airport allows gain scale and integrates markets in a borderless Europe.

What most local rail lines needed was comfortable train two floors, as most stations does not allow the use of long trains as in the Sintra line and make the Metro connection to Alcantara demand will grow considerably, operating result will always be positive and investments in railway could now be paid in 50 years, being paid every month / semesters very low amounts. There is the challenge of studying from the Minhio to the Algarve multiple subnets in Tram-Train from the Valley Câvado, AM Porto, Aveiro, Coimbra, West, AM Lisbon and Tagus Valley, Algarve. In this challenge, the geography of displacement is crossed and integrated with the geography of sustainability.

The tram-train is a technology used as an intermediate capacity system and Karlsruhe has three services: urban, suburban and regional, with the advantage of reducing the transfer. Each vehicle has a capacity of 300 seats, that is, to compositions 3x300 lug and I = 5min allows high flows in hp and today does not exist. There are other advantages and they did not stop at traffic engineering since the urban footprint is an integrated view of the entire country and it deserves a town planning strategy and transport, where the tram-train has other socio-economic impacts clearly advantageous in relation to other modes.

While in Portugal, one of the strategic objectives of the urban operator is to combat fraud in other places try to provide networks and services with innovation and integration. [8] The objective and the method are other, greater sustainability of people and economic activity. The investment, therefore, is another and strategic objectives of bringing more people to public transport. Public transport has been badly treated in Portugal and more recently, are placed as a network strategic objectives and services that do not correspond to the demand for sustainability or transportation of people and companies want. In Portugal, urban public transport has been boycotted, but urban sprawl is a serious structural problem and that is not fought with coherence and consistency. Just look at the indicators on the use of public transport: bad investments and poor farm / operation. The fact that the PETI3 + serve the strategy of this government, still puts the situation from bad to worse - government statements about PNPOT and the PNI2030 generate increased concerns. In the urban public transport sector is necessary even reversing the situation and to listen and work with the staff of the companies and not expect to be private consultants central and local public institutions to propose networks and services that do not serve the people. This has only happened because the successive governments of the state have successively emptied the technical staff of various public authorities and which were and are dedicated to the public cause. still puts the situation from bad to worse - government statements about PNPOT and the PNI2030 generate increased concerns. In the urban public transport sector is necessary even reverse the situation and to listen and work with the staff of the companies and not expect to be private consultants central and local public institutions to propose networks and services that do not serve the people. This has only happened because the successive governments of the state have successively emptied the technical staff of various public authorities and which were and are dedicated to the public cause still puts the situation from bad to worse - government statements about PNPOT and the PNI2030 generate increased concerns. In the urban public transport sector is necessary even reversing the situation and to listen and work with the staff of the companies and not expect to be private consultants central and local
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In 1972, then President Giscard d’Estaing approved the law "versement Transport" in which companies began to contribute to the financing of public transport rather than walk to promote individual transport, as they benefitted from having networks transport that gave access to their employees and themselves by their location, you can save accessibility expenses. It is another approach, with more transparency in the Public Accounts. Germany are the operators themselves
who started (1969 in Hamburg) to want to do network and service in collaboration with the municipalities, being transparent in all accounts. Of course it's not really free, since it presupposes a large public investment. However it shows a broader understanding, and perhaps more correctly the Cost / Benefit from the use of public transport. However, if there was the Public Accounts Displacement System as was envisaged in the law 1/2009 of January 5th, get would conclude that you pay more in the health budget and other budgets (personal, family, county, company ...) due to the negative externalities caused by having high volume of motor traffic.

The Government did not include the rail link between Aveiro and Salamanca (Spain) on the national list to submit the financing of European funds 2030. It was with great concern that the rail corridor between Aveiro and Salamanca, serving an important part of the country, connecting the north and central regions to neighbouring Spain is not included in the priorities of the Government. In 2016, the Minister of Planning and Infrastructure defended the connection as absolutely essential for the transport of goods and the competitiveness of the northern ports. Strengthening the Alfa Pendular was the largest ever investment in the railway to be done. However, as of August 5, reduces the supply and no one can reach the harbor before 9:00 if travelling by Alfa Pendular. Only at 9:46 a.m., and Intercity. Entrepreneurs speak of strategic problem.

When you look at what was done in H2020 in research and scientific knowledge by country, the result is not famous and leaves us apprehensive before such inefficiency in projects submitted for funding [11]. In the case of transport, it is disturbing to find the inefficiency of projects submitted for funding and must be sure that this is not repeated in H2030.

Conclusions

In Portugal, there are few examples of accessibility and sustainable mobility that reinforce the public transport and the ordering of stops is done in accordance with the principles of accessibility for all.

The rail system needs to be worked to support the sustainable development strategy of the regions. Funded in excess infrastructure the road and despised to train but there is support rail programs and they can be increased in H2030, thinking more in people than in designated corridors of goods.

Even though some technical and political want to move forward, its action is conditioned by the fact that we have. This theme is easily faced with demagogic speeches. But disseminate and clarify is the only way to combat the demagogy and populism.

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