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**"Fuelling Climate Change?"**

**Automotive Regions Taking Up The Sustainability Challenge**

Wednesday, 19 May 2021, 10:00-12:00 – virtual

**Autogenerated Subtitles**

**LR Drexler**

ladies and gentlemen allow me to welcome you and say a very good morning to you to this virtual conference of the automobile group of the committee of the regions

so those who are either in the cockpit or at the helm when it comes to the future of the automobile and automotive industries are present this morning so politicians from the main automobile regions of europe those who are leaders within industry who will give us a look behind the scenes experts from automotive clusters research and development will be giving us recommendations and what we hope is that they will really hit home on what the most important points are for this topic the entire world is at a crossroads there are some major challenges that we face and there's a race against time to win and to to save the climate by 2030 a 50 drop in carbon gases and that's against a backdrop of a particularly challenging time as a result of the crisis that was triggered by the pandemic

so despite that pandemic and the fact that household budgets are under pressure we shouldn't pull the handbrake what we need to do is continue to work with great energy and commitment for that process of transformation so this conference intends to give some direction some orientation we know what the main questions are we're looking at what the drivers are for technology what energy sources we will be able to use for this future in our sector enabling us to facilitate that transition to electronic mobility so that's moving from today to tomorrow looking at the production of batteries what's happening there what role will be played by hybrid vehicles what about the transition technologies that apply how do we see the competition that exists within these different technologies we all know within the automotive inter group that there's a technological openness then that's a very important issue what about the future of hydrogen and fuel cells and those who are very closely linked to one another in this tire mark in austria we have a motto for our industry which is growth through innovation and it strikes me that against the backdrop of the challenges that we face as a result of the climate crisis we have to be open to innovation and look at all solutions that might come out of research and development in order to enable us to overcome that crisis because that's what's needed we know that the european commission is working hard to provide framework conditions for european industry

and i'm therefore very pleased that we have a highly informed insider with us today maive rute a very warm welcome miss Rute she's a deputy general director for in internal market industry entrepreneurship small and medium-sized enterprise enterprises um you your teams are working hard on future weak carbon dioxide standards on manufactures average co2 emissions for fleets on low carbon fuels in order to achieve the new 2030 climate target and so the question for you today is what role will low emission vehicles and low carbon fuels play how can europe meet this challenge we're looking forward to your keynote the floor is yours and you got 10 minutes

**Low Emission Vehicles and Low Carbon Fuels –**

**How Europe Can Meet This Challenge**

**Maive RUTE**

thank you mr drexler for the uh friendly show good morning and thank you mr drexler for those very friendly words of welcome i'm very pleased to have the opportunity to speak with you today unfortunately ms young was not available to attend in person and that's why she asked me to replace her

it's a particular honor for me to be addressing you this morning as we all know the european automobile industry plays a decisive role in the efforts that we are undertaking in order to achieve those 20 30 climate neutrality goals and switch to english in my short intervention today i will touch upon indeed the impact of the crisis that we are still going through and then look into how the investments that we are promoting at european level as well as at member states national level and regions level how this will help us pave the way towards this climate neutral future and as we all realize the decarbonization of transport presents huge challenges on top of the unprecedented shock that we are still witnessing um a through you call it we have seen europe's automotive sector hit by dramatic force both in terms of production and in terms of sales more than 20 percent drop has been reported uh due to uh kovac impact um we also have seen that there has been a substantial substantial disruption in the supply uh lines semiconductors being one of the most recent example and of course job losses have occurred recent industry estimates show that there were hundred thousand jobs have been lost and these are significant numbers however coffee has not only highlighted the need to address the the impact of this crisis but also the the trend to uh go towards climate neutrality is accelerating and commission has certainly also stepped up our own ambition towards the greenhouse gas reductions in 2020 we have seen more than one million electric chargeable vehicles being sold in europe and by the fourth quarter of 2020 nearly one in six passenger cars registered in eu was already electrically chargeable vehicle so the trend is indeed accelerating and this is an important trend transport emissions need to decrease by 90 percent uh by 2050. let's not forget that the road transport segment is responsible for a fifth um total eu greenhouse gas emissions and the recovery of the automotive sector from the pandemic offers the opportunity for a green transformation where the innovative zero emission technologies as well as the development of infrastructure uh will be key uh as mr minister trexler has mentioned the co2 standards an important role they have been a driver for innovation already the stricter targets applying since 2020 have triggered a surge in the uptake of battery electric and plug-in hybrids across europe and as part of the fit455 package the commission will propose to revise the co2 emission standards for cars and lands in order to ensure a clear pathway towards zero emission mobility however uh successful decarbonization of our industry will require that commission member states regions and industry create really a more concrete we call it a pathway a concrete agreed way forward that would help this shift towards greener more circular production modes in the last years the commission has proposed a number of measures to support our economy to meet the challenges of the transition and especially in strategic sectors such as automotive i would like to particularly highlight the industrial alliances as one way of tackling the challenges ahead of us this is certainly a very useful way a useful tool to accelerate the activities and to attract private investors as well as focus the public sector investor investments a very good a very good example in this regard is the battery alliance which was launched in 2017 the european battery ecosystem is economically strategic as you well know it is at the heart of our ambition for zero emission mobility and energy storage and thanks to very strong cooperation between the commission member states and industry we have really made substantial progress over the last uh two or three years an important element also in generating a new momentum has been the so-called deep says or these these important projects of common european interest where we have now also projects on batteries and these two there are two project two ipsas they involve enterprises from 12 member states which is a good achievement represent something like 20 billion of private and public investments and thanks to these initiatives these ipsas europe has managed to attract either magnitude of 60 60 60 billion um euros of investments so it's really substantial that we see these large new factories being uh built in several parts of europe so this is success but it also highlighted a shortcoming a bottleneck for further growth and this in the area of access to raw material our industry depends on a number of raw materials that are mostly imported from from third countries we import hundred percent of refined lithium for electric cars platinum to produce clean hydrogen silicon metal for solar panels 98 of the rear earth elements which we need come from a single supplier from china so this is not sustainable and europe needs to diversify its supply chains while investing also in circular technologies so that we could reuse resources instead of constantly only extracting so with this in mind last year the commission launched the european alliance on raw materials to mobilize um industrial and innovation actors member states again regions of course but also the european investment banks bank investors from private sector civil society and to really bring it together in in such a way that we address the whole entire value chain similarly on hydrogen we have a european clean hydrogen alliance which was also launched last year and hydrogen as you well know um potentially has a key role in decarbonization of heavy heavy duty vehicles and currently we are in the process of assessing considering more than 1 000 projects proposals that we have received in the field of hydrogen particularly and we are building on hydrogen we are building on these success stories um in batteries and in similar beam we have now in the new industry strategy update proposed an alliance for processors and semiconductors which as you know is also a critical area so while these alliances provide a powerful framework for collective action we also see that of course funding is essential the recovery and resilience facility will make more than 670 billion euros of loans and grants available to the investments and reforms in the member states and as you know we are just in the process of getting the first national um recovery and resilience plans in we are assessing what's was in there but we can already see that in a number of member states a good attention is also put on the needs of automotive sector and the whole value chain that comes with it and there are of course also other sources especially from the cohesion policy which are essential for this transition among the objectives of the european regional development fund and the just transition fund are also issues such as reskilling and upskilling workers offering help with economic diversity education and industrial modernization the also supporting technological research and helping conversion of post-industrial sites and all of these are directly supporting transition of automotive sectors in in our regions decarbonization will only be possible if there are sufficient recharging and refueling infrastructure in place across the whole eu and uh in this this is in my commission will adopt a proposal for the revision of the directive on the deployment of alternative fuels infrastructure this will be part of the fit455 package which will then address the situation with the charging stations and necessary infrastructure the proposal will be accompanied by a strategic rollout plan to further support the accelerated deployment of the infrastructure we also need major and sustained investment to support the re-adopt skilling as i already mentioned of the workers in new technologies manufacturing practices and with this in mind we are working very closely with other department teacher employment on the impactful skills uh which is looking also and zooming in in the needs of automotive skills alliance which was then announced last year in november and then we see um that a need for regional dedicated pilot pilot training schemes is something that we should be putting forward and um finally a point perhaps on on green steel as well which is an element for poco industry we see another a wider decarbonization agenda we see a wider tick organization agenda actually also looking into the steel sector and we see that of course automotive industry is one of the major consumer of green steel if you haven't yet looked i suggest to take a look at our industry policy update which was announced on 5th of may and among the papers that were published there is also an analysis on steel industry and what it takes for the steel industry to be going towards zero emissions and decarbonization and allow me now to take use of our good translation to spanish as well so i would conclude in a few words in spanish

uh estimated dear colleagues as you can see the challenges that are moving towards us are immense but there has never been as much support coming out of the european union

so there should be no doubt about the fact that as part of this collective effort the european commission will be by your side we have the european industry strategy and the updating thereof provides a framework and also a toolbox which will be indispensable when it comes to facing the challenges of the future

this will also help us to work hand in hand with industry and other interested parties to navigate this transition and that will determine the action that we take in terms of the the double transition thank you very much

thank you females thank you very much for giving us this overview and also the point of view of the commission

**LR Drexler**

i'm very grateful to you for those words

just a quick appeal to all speakers if you could please be quite disciplined when it comes to timing we have a very packed program for today plenty of topics on the agenda and that's why i would like to invite you to stick to the time as much as you can and indeed i will do so myself i won't make any further comments let's turn now to the topic of E-mobility

**The E-Mobility Challenge**

**Thomas SCHMIDT**

in the state of saxony a tremendous number of initiatives have already been undertaken with respect to e-mobility and there is also a fabric of industry in saxony already dealing with this topic and i'd very much like to invite thomas schmidt federal minister for regional development in saxony

and another very interesting guest speaker from saxony stefan laut who's the chairman of the board of volkswagen saxony i'd like to give the floor first to the minister mr schmidt let's hear from you sir love you and dunk hello yes thank you very much mr drexler chairman dear colleagues

a very good morning to you from saxony a very important place when it comes to automobiles a lot of the things that miss ruta talked about to the framework conditions the goals the major challenges that we face moving forwards are very important and also she talked about the fact that europe is more than willing to support the member states in this whole transformative process within the automobile and mobility sectors

i'm happy that i'm not the only person speaking to you from saxony dr stefan laut will also be speaking to you specifically about the experiences of volkswagen in saxony and they chose saxony to focus on developments in e-mobility and e-vehicles and so i'm really delighted that we were able to win him over to come and speak to us this morning

in saxony we don't just have volkswagen of course that is the biggest player but for many years now we have been very active within this industry when it comes to e-vehicles electronic cars

we've got a very strong robust supplier industry the local authorities of course are involved in all of this end users drivers and we don't take this lightly because in saxony this is our strongest sector one quarter of industrial turnover and over a third of a regional gdp is attributable to this sector we've got about a hundred and thousand people employed in this sector

about 80 of those outside of oem so mostly in the supplier industry chemnitz dresden leipzig and suicao are the big urban centers that are involved chemnitz this week out in dresden we have factories volkswagen porsche bmw in leipzig we also have and a daimler bence subsidiary in addition to that 780 supplier companies and every eighth passenger car built in germany is built in saxony so these transformations that are taking place within the mobility sector are going to affect saxony in particular alongside traditional cars we've been building lightweight vehicles and e-mobility vehicles going back to 2013 in leipzig and a lot of that relies on the power supply coming from all of those different factories leipzig produces leipzig intends to produce the battery cells that's their goal going forwards for 10 years now in leipzig we've already been producing hybrid models and in the future pure e models porsche will also be invested there so that's going to be an investment of an additional 600 million euros in order to promote the production of these new vehicles in comments going back to 2012 production of lithium-ion batteries for smart and mercedes-benz so that's a 100 subsidiary of daimler-benz uh gay and going back to 2006 500 million euros have been invented and finally let me refer to bosch which has a plant in dresden a billion euros have been invested in that plant and very much in the offing because production is already underway tests are going to be carried out for chips and sensor technology in e-cars so volkswagen are in a pole position and we're very pleased about that and suica oh step by step we've moved towards a 100 shift to e-mobility and i'm particularly delighted about that and and i'm also very happy that dr stefanot is here with us this morning to talk to us about that i'm very much looking forward to his presentation and uh i was happy to present an overview of the automotive industry in saxony to you before we hear from him

**Lars THIELEMANN**(as representative of Stefan LOTH)  
Head of Planning, Volkswagen Saxony (DE)

thank you very much mr schmidt for your introductory comments unfortunately dr Loth was unable to attend he's still at a meeting of the board my name is lars tilemann and i'm representing him and i'm responsible for the entire planning sector the transition the transformation and i've helped to shape that as we've gone along

first slide please

are you sure next is that thank you in the next one please

thank you so first of all let me just introduce you very briefly to volkswagen in saxony germany has 16 individual federal states one of those is saxony and there are more than 10 000 employees working for volkswagen in saxony so it's one of the biggest employers in that bundesland we have three locations dresden a plant in dresden that's the capital about 400 employees working there in a capacity a production capacity of up to 16 000 vehicles per annum the id-3 which is our first meb-based vehicle is being produced in that location at this moment in time their next plant is located in chemnitz where we produce components more than one thousand seven hundred employees and up to eight hundred and sixty thousand engines are produced there on an annual basis and then we have three cal which is our main site it's the biggest one

over eight thousand employees are located at the three-car plant

and we have a production capacity there of up to three hundred thousand vehicles per annum

has a rich transit tradition as mr schmidt already said in the past more than 3 million trabant vehicles were manufactured there so it has a very rich history which we have succeeded in transforming as we've gone along next slide please

let me now talk about the electric transition of the volkswagen group

we're talking here about investments of over 60 billion euros in electric mobility and digitization

35 billion euros of which earmarked for electric cars alone so you can see that's a very clear testimony to the fact that we're moving towards e-mobility and our target date is 2029 by that time we want 75 bev plus 60 phev new electric cars within the group brand each of the 300 models that we currently manufacture well by 2029 we want each of those to have an electric version

and from 2025 as was just announced we will no longer have any solely fossil fuel models so that's a massive change in our product portfolio shifting towards e-mobility and it's our assumption that across europe about 70 of all authorized vehicles will be purely eve vehicles by 2030 in china and the usa the figures will be a bit lower we would see probably about 50 in those two states in addition to that

batteries volkswagen is going to be investing in that sector as well

worldwide we are going to be manufacturing on six sites we have the norfolk site in sweden by way of example there are two further sites spain or portugal will be one of the regions concerned and somewhere in eastern europe will be the other region concerned and then there are two sites as to where those giga plants will be located we don't yet know exactly what those locations will be next slide

please so as i was saying this is a worldwide transition volkswagen has eight different plants that have already been earmarked for production of m e and there are five of those located in europe now unfortunately

two are in red speak out and dresden those have already been networked up in anting and foshan in china those have also already been linked up to that global network so fortunately i should have said and chattanooga in the usa will be next for next year so you really see that we are pushing forwards when it comes to e-mobility

no

coming back to saxony our mission here in suica and dresden involves first of all

in 2020 we built something like a six million combustion vehicles and as you can see here the last combustion pure combustion vehicle left the assembly lines on the 26th of june of 2020. and our first sop based vehicle was inaugurated together with chancellor merkel on the 4th of november 2019 which represented the full changeover and transformation

so here you can see the transformation 2015 still had a large number of combustion engines and over the years we drove the transformation to meb so that by 2021 we had moved completely to ev eagles and we invested a total of 1.2 billion in zwika and by 2022 we will be producing 330 000 vehicles next slide so the transformation we're talking about doesn't just involve volkswagen but also all of the downstream or ancillary industries here you've got a number of new locations for our subcontracting partners a total investment of over 130 million euro has been activated and by involving the ancillary industries from very early on we've been able to basically experience the transformation together

we've managed to maintain 2 500 jobs unchanged so we've managed not to sacrifice in terms of jobs we've managed to do that by increasing the capacity of our plant on the one hand but also because of the fact that we've got a higher complexity across our range three brands six models as opposed to three models originally

and we've expanded our assembly line here and that has a given rise to additional jobs as well also in the ancillary industries

zero co2 production

it's quite a serious matter as you can see here vw was originally purely a car manufacturer that's no longer the case we now obviously do have a certain influence on the production and the downstream industry but we've got a partnership with our clients as well as the recycling sector so we can open up new types of job offering green electricity and others and we're going to continue in this vein next slide

as part of all of this transformation it was very important in particular it's a major challenge to ensure that we could bring the personnel with us in this change and you can see the figures on the slide we had a number of quite a large number of training days with which we've uh invested in change for our staff this training effort has been very very useful and i think all of these staff here in saxony are very proud to have been part of this transformation process next slide please

okay that seems to be all the slides we've got well that's it then i'll leave you there that was a very very brief overview of what vw saxony has been doing the challenges transformation and the road ahead from here thank you

**LR Drexler**

thank you for this overview of the way things are looking in saxony and the transformation which is going on there in particular in the context of volkswagen many thanks for your presentation let me just point out that the next conference of the automotive intergroup of the committee of the regions will in fact be dealing specifically with and focusing on the whole idea of qualification and skills because of course as part of the transfer motion transformation process there will be a lot of effort put into training and qualifications as you've seen just now we're going to move on now to talk about hydrogen and the question we'll be tackling here is within the mobility and automotive industry what kind of a role is hydrogen set to play we've got a total of four speakers on this topic and i would like to welcome first of all mr michel schneider who's minister of state for regional development in saxony anhalt

then we'll have recommendations from the research and the economy from Ms Macherhammer who is from styria in austria fabrice lemon from the grand est the east of france and **Eduardo Rivero** from galicia in spain once again please attempt to stick to the time we've done so pretty well so far but it's important so i'll give the floor to minister of state mr schneider straight away

**The Hydrogen Challenge**

**Michael SCHNEIDER**

thank you chair thank you dear governor uh greetings to uh beautiful gratz i hope you'll be able to travel there again very very soon uh just a word from saxony unhealth with regard to our hydrogen strategy maybe i could begin by giving you an overview just the main message i wish to transmit to you today saxony unhealthy is already a pioneer when it comes to producing a green hydrogen economy we want to ensure that the center of germany and our region in particular now that we're moving away from brown cola lignite and we're moving to a structural transformation that we're going to be we hope to be a model hydrogen zone and here along with industry the automotive sector has a key role to play our objective would be easier to achieve if the framework conditions provided by the eu can be improved better and there are two points i will make on that first of all i would refer to certification we need robust and practicable criteria for certification for both manufacturing and the use of green hydrogen fuel and here we've got to include also emissions advance or intermediate emissions only if we achieve this can we achieve a genuine hydrogen-based economy and second the state aid rules to be able to allow us to promote hydrogen fuel technology more directly we would need support in terms of state aid rules to be able to produce clean hydrogen that's essential to ensure that we can build up a genuinely competitive market now a few details ladies and gentlemen 2021 first of all as we've been told is a key year a crossroads year for the eu because in the coming weeks and months a total of 12 draft pieces of draft legislation will be adopted in this area allowing the eu to set the way or to pave the way internationally 65 55 co2 by 2030 and by 2050 complete climate neutrality those are the objectives and it's a major challenge you can see that if you take a look at the fact for example that the traffic or vehicle sector is responsible for a total of 27 percent of greenhouse gas emissions in the eu now what i would like to stress here is that the discussion on enhancing climate objectives it involves taking a closer look at all the social and economic consequences of this in saxony and health we intend to deal with these consequences in the following way first of all we are a pioneer when it comes to the energy transformation we've got renewables accounting for over 58 of gross electricity generation already however the use of renewables in the other sectors and that applies to transport in particular it's still relatively modest also in our region now there is an increased electrification in all sectors but a green hydrogen-based economy is one of the main strands of transformation for sex in the adult we are already a pioneer when it comes to building up a green hydrogen economy using hydrogen fuel as a fuel is an everyday occurrence already in the south of our region there is a significant hydrogen-based industry in the north german chemist chemical triangle if you like there are a lot of major users of hydrogen as well as a hydrogen hydrogen-based infrastructure we've got all the prerequisites in place in other words to build up a green hydrogen economy to move away from the previous gray hydrogen economy now building this up gives us an opportunity for the country to develop economically as well as to create new high-value jobs it will also of course contribute to climate protection and a successful energy transformation as a direct consequence so the center of germany and saxony and health now that we're moving away from lignite and the accompanying structural transformation will allow us to be a model hydrogen economy so industry and automotive industry will be key here we think hydrogen is particularly appropriate for road freight transport as well as rail transport intra-logistics air transport as well as public passenger transport we can assume that most motorized individual passenger transport will be electrified in the future as well now there is to be a study for saxony and health which should clarify the actual need or demand in terms of hydrogen for the future now the european directives to promote clean road vehicles means that public authorities need to create their own fleet of clean vehicles now just recently in saxony anhalt in our regional government we've adopted a hydrogen economy plan so that by 2030 we want to be a key locality for production of green hydrogen for the eastern part of germany and we hope that this will consolidate our role as an industry location we have quite a number of projects here and uh you know in both industry and road transport e-mobility is booming in eastern east of germany not only where tesla is building its giga factory but also in saxony anhalt here where we are there's a lot of investment in e-mobility one example of this would be the american chinese company pharisees which is one of the world's major battery producers and in bitterfield wolf and it's going to invest 600 million euros so that from 2022 on it'll be producing batteries for daimler then there's haribo the japanese company which is the leading company in test systems for hydrogen cells and for 30 million euro that's b it's building a plant in magdeburg to build on its production there so you can see insects neon health we're already setting the pa setting the way for mobility in the green hydrogen economy in a final word

how can the european union help us by improving the framework conditions well first of all there is a clear need an urgent need to help with certification we need robust and practicable certification criteria as i've said for the manufacturer and use of green and low carbon hydrogen all along the chain including intermediate and advanced emissions they must be included only in this way can we achieve a genuine green hydrogen economy then the other one state aid law to ensure that we can target our assistance for the transformation so state aid legislation needs to support us in producing clean hydrogen that's absolutely essential for a rapid and competitive market to emerge and i'll leave it at that ladies and gentlemen thanks for your attention and i look forward to the coming addresses from speeches from austria france and spain thank you

**Marie-Gabrielle MACHERHAMMER**

thank you uh thank you secretary of state schneider i can only fully uh support everything you've said i'm Ms mackerhammer i work and work in hydrogens and austria in styria and i i will just talk about our work on hydrogen here in styria in austria could we have my slides on the screen please

okay hydrogen century austria is a research center which deals only with hydrogen technology now i don't see the slides on the main screen can we have them can we have the slides projected onto the main screen thank you okay that's that's fantastic could you move on to page two next next slide please

now the transformation to a hundred percent renewable energy system is only possible with hydrogen as we can see here green or renewable electricity can be produced

via water wind and solar energy and can be used directly in households and industry but because of the fluctuations inherent in renewables in other words in other words not to be able to store electricity hydrogen is needed the advantage here is that you can store it in liquid form and then feed it directly into the gas network or you can use it for mobility in industry or it can be used in households hydrogen can be used in households for example to to produce thermal energy

now you can also use feedback loops with hydrogen to produce green electricity next slide

here you can see see

that of the global energy usage a significant amount goes to hydrogen already now the hydrogen cancer says that by 2050 this will increase by about eight times and will be used in all of those sectors you can see on the right so you're talking about something like 20 to 30 of global energy use then to achieve this increase in order of magnitude we've got to start on investing in r d right now so that on the one hand the technology can be brought onto the market at this order of magnitude but then you need the specialized staff and experts need to be trained and um prepared for these missions next slide yeah now on the x-axis you've got the average number of miles per day on the y-axis the weight in tons in addition you can see the various categories of vehicle and the average energy consumption per year which is reflected in the size of the bubble or the diagram of the vehicle now we think there won't be direct competition we think the various different types of propulsion will exist side by side and you can see the different colors show the different types of use for these various types of propulsion bottom left urban mobility small cars short distances here battery power is best

the further you go the heavier the vehicle the more useful hydrogen will be i can only con con occur with what previous speakers have said right up to trucks buses trains but also ships and the aviation industry here we feel that synthetic fuels will have a future as you can see clearly there are no strict dividing lines where the the the the transition is rather fuzzy as to whether battery or hydrogen is more appropriate so research will i think home in and be able to decide which of these is more appropriate in those marginal zones

now to use fuel cells most the most promising sector is heavy duty trucks here we're talking about 40 ton trucks with about a thousand kilometer range top left you can see that if you've got a battery driven truck more than 50 percent of the transport capacity is taken up by the battery

one can conclude from this to be able to transport the same amount of goods you need twice as many trucks compared to hydrogen powered trucks

and here the increased efficiency of batteries takes well basically is is cancelled out obviously because if you need twice as many trucks that cancels out and obviously you end up using ultimately more energy per kilometer you've also got to remember that when it comes to when it comes to hydrogen

it's very similar to convention conventional propulsion and the increased power means that you will need more charging stations and they would have to be charged basically twice as often because of the weight moving on to the next slide here i would summarize what i've said so far and i'm happy to say that my recommendations fit in very well with what deputy director general mrs ruta said these are the important points for the future first of all hydrogen is essential to be able to

move towards a neutral energy system investment in hydrogen must start now to allow for the scaling up of production as rapidly as possible so that hydrogen will become available very very quickly and guaranteed for all sectors activities for hydrogen implementation need to be bundled or combined to enhance their impact that's been mentioned hydrogen europe and the clean hydrogen alliance already working on this and in particular research and development need to be strengthened to ensure that we have a rapid and smooth market introduction of hydrogen clean technologies that's it many thanks for your attention and i look forward to the rest of the event thank you very much we're going to move straight on now to france

thank you very much once again mrs mohammed for this very very interesting overview now our next speaker could you please take the floor mr Fabrice Lemoine i think from france so can you believe

**Fabrice LEMOINE**

so my name is fabrice lemoine i'm professor in the university of Lorraine in the grand Est region of france could i have my slide on the screen please okay thank you very much so in first i will do a short introduction about the research we are carrying out in the university of loren okay thank you so we are starting from a green hydrogen production and especially via innovative roots and it is targeted to green hydrogen production and we go to fuel cells and especially pem fuel cells at low temperature for mobility application light and heavy mobility and compression of hydrogen and also storage uh we did also with microgrids and multi-energy multicarrier microgrids where hydrogen is used to use to store renewable energies produced by synonyms and finally to societal issues like an economy dedicated to hydrogen and user perspective to design new products and services and also education of the youngest the other important access is education and training in higher education system at the technician and also master level so we have an approach that comes from materials to components to systems and to to society so just to be concrete uh represent the first project as an hybridized hydrogen car it is a new concept for an urban personal vehicle which is clean energy efficient dedicated to a particular usage like a second family vehicle and that may be produced at a competitive cost the technical part is based on hybridization not with a battery but of a fuel cell hybridized with a super capacitor and the fuel cells manage the energy and the super capacitor manage the transitory due to power and power requirements in a car the fuel cells is unprotected by the super capacity and it allows mitigating the aging of the fuel cell

next slide please okay we are also performing research on core technologies and the objective is to enhance performances and durability and realize all the physical phenomena and the components of the pm fuel cells and also electrolyzers we start from material basic material like membrane catalyst people are plates we go to engineering for fuel cell architectures 3d thermal management and finally to electrical engineering in order to apply these two systems and just an example we have a partnership with the company bosch in germany for development of model and experimental validation of new concepts of fuel cells for mobility application next slide please we are also dealing with ev mobility using hydrogen as an energy source and here one of the main challenges is energy management onboard and the challenges are the following to to reduce the cost to increase the reliability and to increase the life span especially of the electrochemical systems which are the more costly in the system so we have to find new strategies for smart energy management of fuel cells mainly using power electronics to optimize the life spans of the system by this smart management so next slide please

okay could i have the next slide

and the last one please

okay so um i go oh okay thank you very much so just uh i will finish by some recommendations uh the first one is to foster innovation and emergence of new concepts based on perspective and especially oriented to future usage to to involve any other conception uh my second recommendation in tools is to avoid two techno push approaches and and prefer an approach based on need seekers also to take into account social techniques concern to to ensure global and overall acceptance and development of the hydrogen products and to ensure this point by developing living labs involving researchers users industrials and deciders to develop systemic analysis and modeling of hydrogen ecosystems especially for mobility concerns based on hydrogen and green hydrogen production compression at the pressure service distribution social economics actors and end users needing to be involved in the process and last but not least encourage and fund an active research development and innovation on core technologies on the fuel cells hybridized fuel cells smart management of energy power electronics and tool prof cost issues aging performances and also energy performances like power density thank you very much for your attention

**LR Drexler**

hurtling dunk thank you very much for that presentation a very impressive overview that you gave us there let's move on now to mr rivero you have the floor

**Eduardo RIVERO**

hello good morning thank you for giving me the opportunity of being here today and i hope this next presentation will be of your interest then the purpose of today's presentation is to discuss about the hydrogen strategy in the automotive industry first i will introduce ctid and our key numbers then i will summarize the current state of the hydrogen in the automotive industry i will explain the activities that ctid is working and finally a few conclude concluding remarks ctid is a non-profit entity a private and independent development center focused on the automotive and mobility sector transport sector currently we are divided in four operative divisions with a strong experience in the fields of new materials manufacturing processes product development development including hardware and software and strong testing capabilities i i will show you some figures about our center 800 people are currently working in ctid and 80 of them are engineers 60 million euros of accumulating investment so far international customers mostly french and german companies represent 70 percent of our activity and the 50 of our turnover comes from automotive constructors such as estellantis group renault nissan volkswagen group please next slide if hydrogen is an alternative energy vectors that allow us to store the surpluses produced by renewable energies mainly green and solar energy and it's already used in some industrial processes building mainly heating and air conditioning and electric regeneration but has minor penetration in the transport industry in the future hydrogen generation cost will drop significantly but taking profit of this will depend on the research performing on transport applications and more specifically in in fuel cell electric vehicle the graph in the left side shows the the wall sales of the battery electric vehicle that will experience an unrelenting increase unstopable increase while the hybrid technology will keep stable and the full cell electric vehicle will be in this time frame next 10 years 15 years insignificant here's some in the rush in the rust side in the right side some initiatives of constructors hyundai group toyota and honda have a passenger car prototypes in the market and some constructors with heavy and light commercial vehicles but we need to increase the necessity the necessary infrastructures recharges extensions uterolyzer electro hydrolyzer to allow the penetration of this technology in the market the success of the fuel cell vehicle will be possible thanks to the synergies with the current development of hybrid and battery electric vehicle an increase in the rnd effort in full cell technology please the next slide in the next slide i will show you the the specific facilities that we have in ctid to guarantee the reliability and characterization of the complete electric power train of the battery electric vehicle and full cell electric vehicle this this activity started in year 2018 thanks to the continuous support of the regional administration of galicia junta galicia and in this new building we have implemented all the safety conditions necessary to test high voltage battery packs stressed with electrical mechanical and thermal conditions simultaneously current currently ctd is projecting new testing facilities that are represented in pink color that include an e-axial test bench combine it with hydrogen supply that will allow for traditional electric vehicle powertrain testing as well as full cell electric vehicle testing this facility will be composed by four dinos four rotating actuators connected directly to the wheels to reproduce the real drive conditions of the car battery simulators to reproduce the extreme electrical condition existing during the real drive and this equipment will be combined with climatic chamber cooling units to report to reproduce the thermal conditions in the full cell and in the battery pack we are also projecting a refilling station to refill fuel cell electric vehicle that will be used for real drive characterization in open road and before laboratory testing and optimization

in the in the next slide here here's the activities of our laboratory and we will include the study of new age two power trace course concepts with special attention attention with validation of performance and energy consumption in powertrain modeling and dimensioning optimization of control strategies and electric power strain calibration including in motor inverter and battery pack for instance for for niche applications especially special vehicles and the thermal management will be a challenge to optimize the reliability and the efficiency of the systems and to conclude in the in the last slide

thanks to the electrification the automotive industry has for the first time a clear approach to two historical aspirational goals zero emissions thanks to the clean energy and zero accidents zero deaths thanks to the connected intelligent autonomous and electric vehicles the the battery electric vehicle approach has never less significant drawbacks mainly related with to the needs of the huge battery packs the big battery packs and the material and processes required for its manufacturing the hydrogen it presents important advantages in terms of key parameters for electromobility such as charging time weight performance in cold temperature scaling power mileage but are behind in technical maturity and fuel cell costs the killer argument is the the poor efficiency and we must research in invest in this new technology to conclude regulation will play a major role in order to increase penetration of this technology in the market as well as the improvement in the number of recession stations and infrastructures thank you for your caring attentions and regards from galicia

thank you phil mart thank you very much

overall that was an extremely interesting overview when it comes to the state of play in hydrogen technology when it comes to fuel cells let's move on then to our next subject matter

plug-in hybrids now on this particular block of presentations i would like to welcome the vice president of castilla leon francisco igea as well as the minister for industrial development and sustainable development from the basque country georgia isabelle de souture will be giving us some recommendations she's from brittany and i'd like to start by inviting vice president IGEA to give his presentation please go ahead sir

**THE Hybrid Vehicle Challenge**

**Francisco IGEA ARISQUETA (Renew Europe)**

very good good morning thank you very much it's a great pleasure to be here

everyone here this morning agrees on how important the automotive sector is it's a strategic industry for europe and it's a strategic industry for our community as well it has been fundamental in terms of our economic development it's one of the greatest sources of wealth and one of the greatest generators of employment in the european union as a whole and it's one of few sectors that has kept stepped with globalization over the last few years and has made sure that relocation elsewhere outside our continent has actually been kept to a minimum so we have new production technologies we have the ability to adapt to the market we're exporting vehicles as well and we really need to study in depth what the right strategy is and pull out all of the stops in order to make sure that we are not penalizing in any way european workers in the automotive sector now to that end we have to be very careful that we don't damage our competitiveness we have to maintain that phased with other international players now europe has talked about a fair transition a green transition and that's quite right and that will of course affect such a major sector as automotive but we can't just think about the final goal and the uh objectives which of course we can't do without but we have to have an overview of this industry and all of the people who depend on it the jobs that exist there which we think we have to strengthen the automotive sector is a big industrial ecosystem it has tremendous capacity for wealth generation and employment generation as well and we mustn't lose sight of that societal role that it plays let's strengthen that so when it comes to hybridization this i think is the most uh appropriate solution going forwards from many points of view hybrid vehicles are an excellent solution in terms of their technological maturity these are vehicles that are already ripe they're already ready reliability is one of their strengths there's a global supply network there they have great autonomy low emissions so those are basically the main advantages of these new technologies so they have the advantages of electric vehicles without the disadvantages when thinking about the green transition we shouldn't just be focusing on the needs of urban consumers we have to be realistic and within our community in my region we have a lot of experience on that the network for the charging stations is still quite sparse

so this given the circumstances in our region was not a process that could happen at any great speed being realistic considering the population and also the square kilometers so making sure that we have a proper network of charging stations is going to be made of major importance in making sure that we push forward that transition towards an automotive industry that is more respectful of the environment some technologies are highly disruptive as i said we were talking about maturity we talked about the power supply networks we talked about the ease of use as well so practically speaking a lot of us here this morning in particular those who live in rural areas would it would be impossible for those people to depend on a purely electric vehicle because there are simply not enough charging stations in certain rural areas and that's why we need an effective uh solution for rapidly bringing emissions down that's the unavoidable point so it's not so much that we're giving priority to one technology over another it's it's really we're considering how appropriate they are the european union is strong when it comes to fossil fuel-based technologies the ones that we had in the past a lot of progress has been made that gives us a platform a technological platform and tremendous potential for developing these new forms of vehicles now hybrid vehicles in addition to what i've already said also bring down our dependency on lithium let's not forget that europe does not have sufficient access to that raw material and so if we become dependent on that we will have to develop our battery industry tremendously and that brings with it costs and that's a big share in the overall cost of producing that type of vehicle let's not forget one further important point which is a point of risk that there may be too much supply of these sorry there may be too much demand for these batteries as compared to our capacity to actually produce them and what about the risk of job losses as well this is something that we have to take into account it's extremely important if we shift towards solely e vehicles there would be a very sudden loss of jobs because these vehicles are produced in a smaller number of hours hybrid vehicles require greater numbers of workers they take longer to produce so they create more jobs so that means that the transition would be less traumatic less dramatic it would be more gradual and would not hit employment quite so hard when it comes to shifting towards these new models of low pollution mobility vehicles so the hybrid vehicle will get rid of that uncertainty about autonomy it would be based on the existing combustion technologies that we have and also it would take us towards an electronic solution in our urban centers air quality is a problem as well and in an urban centre the vehicle can run as an e-vehicle 100 for example so i think this will help the transition in letting our citizens become used to this new situation and what we need is a very rapid rollout of of charging stations and they need to be

exhaustive so we've got the electric potential the fuel potential the charging stations it's possible to make best use of the energy that is not used to actually drive the vehicle to charge up the battery in this type of hybrid vehicle so as i said right at the start this hybrid vehicle allows us to capitalize on the advantages of the electronic technology that we have

it will enable us to bring emissions down on the one hand and improve autonomy on the other hand will boost capacity of engines and so you've got a much better ratio of usage to respect for the environment now there's a there's a long way to go and this brings with it tremendous opportunities

we should make best possible use of the technological advances that have already been made so just to sum up i think we need to really go for this type of vehicle this will require manufacturing adaptation of course and it will allow a lot of our workers to keep their jobs it's a lot of money it's a major investment and we think that the european union should assist our industry not least to protect our workers as well this will contribute to creating jobs as part of a new model of sustainable smart and safe mobility let's not forget that this is a sector that was hit very hard over the course of the last year during the covid corona virus crisis because of a drop in demand and because of the semiconductors crisis as well and the the sector is still not out of the woods and we're also suffering as a result of the environmental crisis so the automotive industry has to remain a priority industry and that's why we believe that european funds must be earmarked to help us to modernize so that we can move towards hybridization digitization of our plants and really transforming all of our different production and manufacturing units so that we adapt these to these new types of vehicles that are in line with the demands and requirements that are set out in the european green deal these vehicles do fantastically well already they have the energy efficiency practically the same as a 100 e vehicle

and when they run as 100 electric vehicles they reduce emissions to about 80 percent of a vehicles so in cassidy and leon for our industry this is one of our pillars of our economy and so our goal is to make progress on this we have plants renaut and ibiko in particular and we have a lot of suppliers as well who generate in an indirect manner 40 000 jobs and that's 25 of our gdp so it's a whole system as you can see as i said before it's an ecosystem

and what we have essentially here is an automotive cluster

we have 75 members in the cluster and more than 30 000 workers the autonomous government in castilla leon is in contact i do apologize says the chairman i have to invite you to get to the end of your presentation because we are running to a very tight schedule yes thank you i'll finish

so i think it's quite clear that we need to move towards this type of vehicle we need to prioritize these technologies and as part of the next multi-annual financial multi-annual financial framework and the next generation we need to make sure that funds are set aside for this strategic industry for our future it's important for the future of europe thank you

thank you thank you very much let's move on now to minister tapia

**Arantxa TAPIA**

good morning uh thank you very much for the for the opportunity if we can start with uh with the presentation it would be fantastic thank you okay we have to say that our mobility sector as a whole is part of the solution of the bus bringing that means that we have to achieve a sustainable and economic development based on a whole industry related to to to the mobility sector in the sense starting with our science technology and innovation strategy we have a whole universe of research centers that work on areas that push our economy but we have a transversal sector which is immobility which is totally aligned with emissions in the european union and we consider in this sense all types of vehicles of course the electric vehicle based on batteries the hybrid vehicle center on the hybrid vehicle which has to be placed on the electric network and the fuel cell sector which is nowadays coming something important so we are trying to to analyze with this universal research centers technologies are based on of course motors electronics power electronics for all the batteries we consider for instance our autonomous and connected vehicles we are considering the materials that have to be analyzed in the future more likes lighter than the the ones that we are using nowadays and batteries new batteries new generation batteries and hydrogen as a as a strategy next slide please

in the sense we are sorry it is in spanish okay we are considering two areas the electric traction and the charging infrastructure because we need the infrastructure the charging infrastructure both for electric vehicles totally based on batteries and for their hiv ones they are using batteries they are using the charging system and we have to consider how we work with our research centers with the research and development areas and how we can analyze the infrastructures and the the motors and the electronics we need next slide please so we are working with this universe of technology centers and of course universities but with our companies based on uh first of all analyzing the software we need the companies that are working with us on software for the autonomous and the connected vehicles we are working with uh charging services and for instance the vast government has established a new company together with uh repsol which is even the first one in the in the slide for this charging system both for slow charging systems and for a rapid very very rapid charging systems based on the power electronics on our companies that are on the next side which are the ones who are producing manufacturing their recharging units together with that we have all the power electronics and storage we need on batteries or on hydrogen and we have all their rich researchers and knowledge agents and we have companies that today are working on storage systems are developing storage systems we have integrators of all these areas and of course we have oems on the automotive sector but together with that on the bus sector and on training sector so we are working as a whole in this sector next one please

for that for that reason the the best government has started with our own hydrogen strategy and we have established our objectives our our goals for 2030 in order to work together with our companies and to have the whole strategy for the automotive sector but for other sectors also next one please

okay so we are working with a hydrogen strategy both on industry because we have some industries that need a lot of energy and we have to be with them and users in buildings and of course on transportation and mobility but both for automotive sector but for freight vehicles and for other kind of big vehicles in this sense we are working in three important projects with our companies next one please

the first one is the hydrogen corridor the vast hydrogen corridor that starts in the past country that goes through our border to the french site with the leadership of repsol petronas with a lot of companies working together nowadays we are working with 78 companies involved in different projects that are going to to establish new jobs and new projects in in the area and with the other company ibertrola which is joining in the russian country with three hydro hydro generators in the port of bilbao and

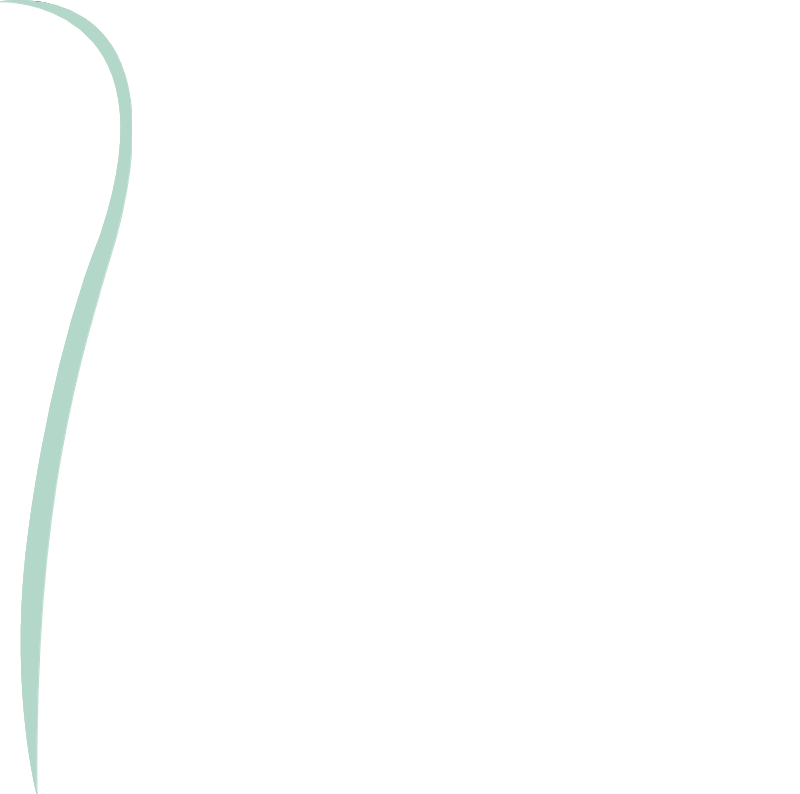
trying to connect them so we have two big companies working with us in this strategy and which is one of the most important train developers in the in the west country railway uh company which has already developed uh hydrogen uh train and also buses with uh the solaris company so we have a strategy and we have projects both on automotive sector but on the railway sector also this one please

and i have to say that something important for the past country is that for hybrid vehicles but for battery-based electric vehicles we need batteries we need four generation batteries based on solid state cells that are going to work in the best country with all these consortium public private consortium and based on this strategy and the leadership and the technology that has been developed in our research center cooperative research center

and which with this consortium we are working in a past gold the the first gigafactory in uh based on the solid state in europe so we are going to start with the first line of uh manufacturing on next year on 2022 next year 2023 we will have the first first scale up in manufacturing and for 2026. we hope to have our gigafactory with 10 gigabytes hour in order to cope with all the needs that our companies automotive sector but also buses and trains will need for the future and we hope to have this basketball in the universe of uh factories that are being developed in europe so for that we are working with uh inno energy and we try to be present in all the sectors that our company needs to develop this strategy based on immobility so thank you very much for the opportunity and let us know if we can work together in the next future thank you very much thank you phil miles thank you very much for that presentation

**[Isabelle DUSSUTOUR]**

**Batteries Challenge**

**Ammar ALKASSAR**

i'm grateful for this opportunity to be able to contribute to this meeting ladies and gentlemen battery technology is one of the key technologies of the coming decade it's a horizontal technology which determines the mobility of the future and a lot of other technological uses as well now and in the future global production capacity for lithium-ion batteries will go from 160 gigawatt gigawatt-hours and 218 to over 1 200 gigawatt hours by 2030 an increase of over 700 percent now most of this will be for the car industry more than 60 percent of lithium-ion batteries are for vehicles already and by the beginning of the next decade that proportion will increase to 80 percent in economic terms the battery cell technology and ancillary technologies are key for the car industry there are about 40 percent of the added value of an e-car at the moment now we've got flanking measures such as battery management electricity energy and thermal management as well as the construction of the battery cells which brings us to something like sixty percent of the value of a future e-car

which sixty percent directly linked to the battery and the rest of that of course involves subcontractors and oems now whether those ratios will remain in the future is something we cannot tell at this time the fall in prices will be significant for lithium-ion batteries in the future but in the coming decade as well i mean over the past decade but prices for these batteries have fallen by about 90 and the prices will fall further so it's going to be an important technology now at the same time electric propulsion will have a significant proportion of the future profits from the automotive industry future technical applications are ready to go and take over a significant added value of cars so we're talking about future electric propulsion and here it will be important to differentiate between the various brands the consequences of all these developments and i'm not speaking from the automotive industry point of view but quite specifically from the point of view of industrial location policy and oems will benefit from this as well they will be able to take their business models and develop them further and adjust them accordingly first consequence only indirectly linked to battery production but at the same time a key element which is linked to the shift of added value because of the change in propulsion systems this is why i had at this point business models in the car industry must be reviewed fundamentally so that the sector has got to have a broad starting position so mobility services network driving and car sharing will all be part of this new business model question is whether everybody will have their own car at some point in the future or where they will tend to share vehicles in the future then you've got driverless cars and the development there autonomous driving or driverless cars and key competencies and skills for a region like Saarland are university level education in computer science as well as ai based and cyber security training and education because cyber security will be key for driverless cars in the future now when it comes to r d the location doesn't have to be the same as for actual production in the past quite often we've seen for example that r d was uh housed in the headquarters whereas production was distributed across a number of different centers now when it comes to r and d things will change on this as well i think it will be more focused upon where you've got a key excellence cluster zaland is a good example where we've got set f which is one of the biggest subcontractors which has decided for the first time in fact

not to have the competence center in its own headquarters for r d but rather specifically here in Saarland in zarbrucken they're working on ai and cyber security the reason they did was because it's closer it's easy to to to share a cup of coffee for example and to get together with people in the r d center the two centers for ai and cyber security so one of them is very close to the university campus where you've got all the main german research centers faunho for max planck and so on so this kind of development means that the companies will have to continue to develop their innovative capacity now moving from here to back to the concept of batteries themselves developing battery management is very very closely linked to computer technology and electro technology and here the companies will need these regionally distributed skills more and more another important point will be the competitiveness of production uh production of lithium ion batteries is highly automated already quality assurance visual recognition all of these use ai these are very very important just as important as highly skilled engineers and highly skilled personnel in the production so there will be different standards applied here in the future as well now production tomorrow needs to be competitive so skills from the digital world and the world of mechanical engineering will need to be merged so asphalt is one battery producer we saw this on the original slide they are working here in uber here and in Saarland and that means that our land has been very quick out of the blocks on this we've got a center for mechatronics and digitalization we're working together with the r d institutions and the other innovative centers

one further concept is sustainability of production and getting our hands on commodities and raw materials recycling because clients are not just looking at the technical aspects of a product they want to know where it comes from what the standards were for manufacturing what requirements were set of commodity suppliers is it made in germany made in europe that's still a very very good label and when it comes to the production of batteries these labels need to be used in Saarland for example we'll have co non-cobalt batteries very very soon and with etcest we've got another institution which is developing research and development with a view to sustainable production using international expertise in the future and finally a location which builds on this excellence and makes it available for companies and which gives priority to technically highly qualified staff is in the best position to try to meet the challenges of the future so e-propulsion will be playing a dominant role not only in the car industry but in a lot of other sectors as well in the future so i would call for other regions i'm sorry could i ask you to finish up please yes i will one final sentence mr Drexler excellence and innovation need to be made practicable for companies in Saarland and europe so that we can politically meet these challenges for e-batteries in the future i'll leave it there and i look forward to the ongoing discussion thank you mr drexler thank you very much for that we'll move straight on to mr bruno jamie mr bruno JAMET you are next

**Bruno JAMET**

okay thank you good morning everyone i'm really happy to take part in this event and put into perspective the challenges of mobility and energy in a more global energy climate and environmental context and then i will push a focus on energy storage and especially patrice the vehicle of future cluster is a french automotive cluster pool of competitiveness active throughout the northeast of france which has 500 members like you can see on the left of this slide and the target is 600 members at the end of 2022. in the central part you can see the markets where we are active on and on the right you can see our five strategic areas and i will discuss today about energy and propulsion topic next slide please

thank you

in terms of energy and protection we cover four areas um electrification is a major trend and we can consider in 2030 100 of the vehicles could be electrified not electric electrified pure electric can be either with battery storage or energy or hydrogen storage so here you can see hybrid and electric proteins fuel cell hydrogen proteins also the recharging stations both for batteries or hydrogen and also in case of hydrogen non-automatic use that can create synergies and make the market emerge faster next slide please

i just want to have 30 seconds about hydrogen because it's a very important topic in our cluster this is a dynamics project in a grandest region the goal is to develop the h2 sector in the region to make projects emerge and create jobs the name is dynamize and this is the operational implementation of the region's strategy and the construction you can see here is a team that is representing all links in the value chain from production and storage to the usage like mobility stationery and industry globally for pvf regional hydrogen clubs already have more than 100 members and 3 000 regular contacts next slide please

an electrified traction chain and in particular battery storage is a complex system including many functions and components not only cells with however an important part which is electrochemistry the cells european support is very strong about batteries and ipsa is a key however we should also take care of considering the world ecosystem from the small company to the international groups as the ipsec approach could be considered that not easily accessible to mid-sized players our members are manufacturers of electronic components systems for cooling electrical power transmission composite metallurgical experts or complete battery pack integrators as i said in the paul vehicular future our vocation is to stimulate economic development through innovation and industrial performance we call our members to innovate or even participate in innovative innovative projects by ourselves finally we also organize working groups and also operational meetings such as recent german french meetings of the lithium-ion battery in partnership with the cleb the german lithium-ion battery cluster last meeting two took place last week on may the 12th with more than 50 participants and speakers including german and french ministries as well as large companies that opened the day last slide please thank you from my point of view we could propose four recommendations about batteries the first is to support and encourage diversification in favor of batteries where possible and often it's possible since the value chain is quite worse and it is a fast growing market the second recommendation is uh to encourage the market itself to accelerate its vibration for example vr zero emission zones whereas oppositions could say it's too fast which should not change so fast the third recommendation is circular circular economy it's an often discussed topic we should be convinced that the circular economy is not an issue about batteries because before discussing at the end of life of batteries from our vehicles we must consider that their lifespan tends to be higher than initial expectations then once the battery is not convenient for mobility use you can use it for second and third life like energy grid fast charging business strategy depending on the needed autonomy etc and once the battery is really end of life you can test it disassemble it and reuse some components and send the others to recycling streams raw materials for batteries from recycling will be an increasing reality because of the amount of end of life batteries that will increase however many experts see a major recycling industry in the next decade not now only because for the moment end-of-life batteries are quite rare compared to what it will be in 10 to 15 years and the fourth and last recommendation is linked to two main characteristics of battery systems uh the first is the quite moderate energy density which progresses but with which will remain limited and then the fact that it is charging through electrons not glass or liquid and in many cases batteries will be a good idea or in some cases it won't be a good idea because of those limitations in political future we are techno neutral and our goal is to help every innovation addressed in a coherent way in terms

i'm going to have to ask you to we've read the recommendations perhaps i could ask you to round off now okay just just one sentence it's okay okay so as a conclusion we can uh summarize four macroscopic objectives in the battery area first is technology then the investment for the future the independence and the sustainability thank you very much for your intention and i leave the floor to the next speaker thank you

**Empar Martínez Bonafé**

good afternoon well good morning yes

first of all allow me to say that i'm grateful for this opportunity to talk about the opportunity to talk about the initiative of the community of valencia this is a great opportunity to be able to see how things are going and to take a look at which kind of recommendations we can learn from here first of all i represent the industry and energy alliance in valencia our energy policies clearly in line with industry policy it's a key element of this policy to allow us to make use of opportunities

such as the ones emerging now thanks to the european union the european commission the possibility to be able to position oneself in the global battery industry for example this allows us to develop plants uh factories for production in valencia our community has a series of advantages and this is why we felt that this was a useful opportunity the port of valencia for example is the biggest mediterranean port in spain it has the biggest goods traffic in spain and it's also a key

element of the car industry it's got an oam more than 5 000 jobs we work with ford and obviously it's very very important to be part of this initiative there are other clusters as well which are very very promising as we will see to allow us to develop an initiative this type now we've got a significantly well developed science and technology center which works together with other rng centers which we've heard here today from with regard to new materials analysis new lithium new generation of lithium batteries and so on so in the next slide we can see that this has allowed us to work with next slide bleed or to work with a consortium

so as i said our task here our mission here is to take all of the players and bring them together all those players which have something to contribute to meeting this challenge

setting up a gigafactory in the south of europe basically together with other european regions with a view to making genuine headway in developing mobility and the automotive industry in spain and valencia more particular now our battery alliance was presented in february of this year with all the stakeholders together as well as the technology and research centers and of course it's led by the president of our government or generally tat

this is a way of promoting this ecosystem this industrial ecosystem it's a private consortium basically but as you said it has a certain amount of support from the administration next slide please here we can see next slide please you can see that this alliance is made up of three types of stakeholders could we have the next slide shown please that's it yeah

technology players industrial players and of course players from the scientific or university domain now the there are other players market players which i haven't included here but they would be under the heading industrial players now the reason i want to stress this is because when we talk about industry capacity in valencia the aim is to create this gigafactory it's not just a question of the automotive industry i mean it's critical for the automotive industry ford is present in valencia and that's fundamental to provide a driving force to this industry but in our community you've also got other sectors ceramics

99 of the ceramics industry is in is in valencia together with italy we are leaders in ceramic production enamel and so on so we have a leading global position as well so these are critical when it comes to new materials technology and a number of other new components which are essential for battery production development we've got a a a pool of players as well in advanced electronics and in the area of recycling for example we have a national federation of the recycling industry as well which is very active here so as was said these mixed capacities need to be pooled and that's fundamental based on the existing infrastructure the existing clusters and oem which are worked which are used to working in a coordinated coordinated way in the automotive industry the fact that we can

initiate this gigafactory here is crucial linked to an orange d center and of course the development as i said of a whole ecosystem for battery production moving on to the next slide here you can see what we're talking about we're talking about an ecosystem a private ecosystem basically industry-based where you've got leadership and an impetus provided by the government the general attack but it's also important that we have a clear industry leader here in this case it's the company power electronics which produces high technology components photovoltaic charges all of the various components linked to advanced electronics so here for some time now they've been there in the area of storage electronics energy more generally and here we're talking about a company which has a leading role which plays something like 70 in the us as well so internationally it's very very well founded so it's a valencian company which clearly is interested and will be interested in developing this technology but it's also very very present internationally and we've mentioned a number of other what we've called knowledge creators technological energy institutions or institutes which are critical and crucial for the development of the future sustainability of this ecosystem and this coming giga factory

but then we've got in alicante an artificial intelligence institute and a network of technology institutes we've got a motors or engines institute as well and all of these are obviously going to be providing input via their skills r and d and so on having said that

i would just like to focus on that slide again for a moment could we have that slide again the industry industry players stakeholders standard batteries we're talking about autonomous vessels ships hyperloop is one of the six companies in the world which is a leading position in developing hyperloop technology we have this hyperloop in valencia as well and another thing i didn't mention is the development of batteries

for stationary purposes so here in valencia we are meeting the requirements of a whole number of players who are involved in developing this ecosystem coming on now to the recommendations what i wanted to say is that first of all um could you perhaps wrap up very very soon because we're very late we don't have much time we didn't have much time

yeah we need we need you to finish very quickly

could you finish very very quickly we don't have much time could you finish very quickly please because we're behind time

yeah just uh finally recommendations i would stress the importance of pooling capacity in industrial leadership and that applies to leadership from the administration as well we have meeting spaces where we can bring all these stakeholders together leadership from the industry and it's important to be listening and to have a a clear role in converting ideas into projects and providing the necessary support and impetus from the administration okay i'll leave it at that uh sorry for taking so much time i could say more but obviously time has run out for me thank you thank you very much apologies for rushing you but we do have to stick rigidly to the timer a little bit behind time so i move on now rapidly to the second part of the immobility challenge topic and this is the president of navarra María CHIVITE NAVASCUÉS and i would like to ask you now to take the floor

**The E-Mobility Challenge Part II**

**María Victoria CHIVITE NAVASCUÉS**

dear colleagues members of the committee of the regions and the automotive internet group first of all thank you very much for hosting this meeting so that we can think about the future of e-mobility and its impact on climate change i think that the basic message which is underlying the european union's response the response to the member states is is quite clear we're in a crisis at the moment and i think that their line of thinking the idea that all of the different european funds have to be linked together is a change it's a positive change it's a product of change and navarra certainly agrees with the ambition of the president of the european commission indicating that europe should lead the transition towards a healthy clean planet and a digital world so that's one of the main points of leverages in political policy public policy in Navarra we want smart models sustainable models and we also want social and territorial cohesion the different regions of europe cooperating together i think that's a recipe for success we've got a lot of first-hand experiences that demonstrate that and also that will enable us to make best use of governance approaches that exist collective intelligence and i think that's the whole point really of today's meeting pulling our experiences sharing best practices in e-mobility will enable the automotive industry to make progress i think it's a fantastic suggestion and i'm just going to try and relate the experience of our own autonomous community both public and private bodies have been working hand-in-hand in order to move towards e-mobility digital mobility and in particular to move towards sustainability so what have we been doing

the Navarra automotive industry has been in place for over 50 years it's one of our strongest economic pillars and it's one of our most strategic industries as well it's essential to us it's essential to spain as a whole and the automotive industry is essential for the european union as a whole we have many companies in Navarra we export a lot of products as well and this sector the automotive sector accounts for a quarter of our industrial gdp 27 percent of aggregate gdp of the region as a whole 120 companies in this sector in and turnover is 5 500 million euros per annum about 12 000 workers which is 4.3 percent of the overall labor market so as you can see it's very important 45 of all the exports that come out of navarra come from the automotive sector the automotive sector contributes to keeping the region in balance it's present in the different local authority local areas and it also links up with other sectors standardization and also in terms of business management it's uh taking the lead we have suppliers of new technologies manufacturers of vehicles and components creating a type of very diverse ecosystem which overall has decided to modernize and specialize and we've got excellent levels of quality and productivity in 2021 anchored in a long tradition of experience so now what we're seeing is a transformation a renewal of this sector so that we can guarantee its future success the automotive industry is a globalized sector and for several years now it has been facing a series of challenges which will determine what happens over the next few years and this has all speeded up in 2021 now these are challenges that won't just affect this sector from an industrial perspective but also these are challenges for european citizens as a whole citizens are wondering what are we doing about the decarbonization of the economy what about the circular and sustainable use of resources so this requires a new form of mobility in which people and the way in which vehicles are used actually become the core element as part of a digital fabric so this transition towards a new normal has already started

and it's being driven by public sector bodies of course we've got a legal framework which is even more stringent when it comes to monitoring bringing down emotions emissions sorry the engagement of the sector they have had to become a very active player in pushing this progress forwards now navarra from 2018 onwards has been promoting the transformation of the sector moving towards autonomous smart connected e-vehicles this is part of our smart strategy for nevada it's our flagship initiative and so what we want to do is move towards e-vehicles and production of the components there for so that will be uh that will hinge on the development and implementation of these new mobility solutions in navarra as a whole of course we will need the necessary infrastructures for that as well charging stations in particular that's already been mentioned they're part and parcel of that mobility strategy so our community our region wants to be can be a reference point for the transformations within the automotive industry that are taking place across europe as a whole because we're ready nevada is ready we have uh experience going back as i said already more than 50 years we're very aware of the need to take our industry in to the 21st century i would like to call upon colleagues for greater cooperation and unity within this sector i think the work that we have ahead of us will have to involve the public sector but also will involve all of us so we must work hand in hand the automotive industry is based on the work done by lots of different individuals it's the sum of those different parts and efforts both the public and the private sectors and we must work together in order to ensure that the future of the automotive industry is based on a strategy that we all share that around which there is consensus institutional um commitment and also commitment from businesses as well in order to enable us to plan for this transition moving towards digital sustainable and electric mobility in Navarra we are trying to make sure that Navarra is a kind of flagship center so that we generate opportunities for renewing the supply chain that we already have manufacturers and components it also creates jobs and that creates well-being within our community public-private partnerships can generate the measures that are necessary and bring the investment that is needed in order to transform the sector we need to make use of projects which enable cooperation between businesses and centers for technology because education is key as well vocational training centers universities will ensure that nevada remains competitive going forward in the sector and we want to strengthen the position of our companies as part of the global market so this is a very clear proposal which will place the automotive industry at the heart of our economic and societal growth excellency management innovation and technological development will be key and of course this means at the same time that in order to meet this challenge set by brussels that by 2050 europe should be the first climate neutral continent we will have to contribute and we absolutely want to grasp that challenge in order to achieve that the government of navarre will be earmarking 4.5 million euros from european funds for projects that will be testing out the infrastructure required for electric vehicles so that's being done as part of a public private platform in navarra now the technological and testing infrastructures are part of the priority projects that have been presented by navarra for the react funds and the project which is called navea has four main focal points for the companies that are part of the platform first of all designing and building an electric platform in order to experiment with different drive technologies different materials components technologies secondly creating an urban testing zone which will involve sensor technology communication technology for vehicles in real traffic conditions in addition a logistics laboratory for indoor and outdoor tests using industrial and urban logistics and finally test and authorization infrastructures for businesses that are manufacturing components so that's our project naviak now alongside that we also have a project for transformation of this sector we want to update the map of risks and opportunities that exist in this sector and also offer individual advice on diversification competitiveness to those businesses that are interested of course that they could join the fora that we already have focusing on individual technologies etc

i'm sorry to interrupt you says the chairman i really have to invite you to come to the end of your presentation

so the government of navarra and our ministry for industry in particular confirmed last year that nevada will be producing e-vehicles and i'm coming to the end of my presentation in the future and we think that europe has to really jump on board with this production of e-vehicles because it's a sustainable solution so if we have cooperation between Navarra and other regions it's not just that we want to become a flagship region but we also want to work hand-in-hand with others in order to come up with a new model which guarantees the long-term sustainability of the environment and of our societies thank you thank you females thank you very much

let's move on now to pascal strobel who is the head of the automotive sideland network you have five minutes for your presentation please sir

**Pascal STROBEL**

okay thank you very much mr Drexler ladies and gentlemen so just briefly let me present the situation to you in Saarland no mr alcasa has already presented this to you this is a very dense and robust automotive region in germany in third place

we have one million inhabitants so it's as a proportion of the population density next slide please to give you an overview some very well known names some companies present in the tsar land we are the biggest sub we have the biggest supplier bosch we have this and crop tiny co dura magner michelang all well known names within the automobile industry 2500 employees just one million inhabitants in total so as you can see very dense also that creates certain challenges for our region when it comes to the transformations that are taking place in this sector so what's our approach our strategy is to take the innovations of today in order to determine determine the structures of tomorrow

that's our focus so this density of automotive companies and research institutes etc of course we try to make best possible use of that and we're only able to do that because we have a very good network next slide please this gives you just a quick overview of how we've created that network various events these of course are images that go back to pre-corona times so we bring people together in the meantime this has all gone online so these are networking events we have technology marketing to the outer world but marketing begins at home as we say so we make sure first and foremost that stakeholders within the Saarland region itself and get together and make use of shared experiences we offer them that possibility for transformation we also in the cluster are involved in research into the status quo what what is the current structure are we where where are we and this is something that we do on an ongoing basis next slide please here you can see our most recent the outcome of our most recent survey and we'll be updating that very soon so that survey showed the areas in which we are strongest so the general vehicle sector but also and this is generally speaking across the automotive industry in particular when it comes to combustion engines now that is going to be losing market share and step by step it will be replaced by those other technologies we've got hydrogen technology that we talked about today battery electric those are both areas in which our region is involved and it became clear that our point of departure in these new technologies so that was in 2016 was it was quite weak there wasn't a great amount of development there and if we had just left that to sort of run on its own steam there would have been growth in turnover but never the amount of growth in turnover that could have made up for the losses in market share that we experienced coming from the traditional technologies so it was with great intention that we decided to focus our efforts on those particular uh sectors s vault a battery manufacturer has just set up a plant in Saarland and i think that's one main use reason why so many others are investing there as well we've got a development center for cyber security and artificial intelligence a big company that has set up there we also have a university in Saarland which focuses on these areas and in terms of hydrogen which is becoming increasingly important and will be going forwards as well we have our network which brings together all of the different stakeholders and i think if you look at the map you can see that so if you have a network which accompanies the efforts being undertaken in a specific sector then what happens is that instead of companies acting in isolation you create a structure which people can make a sort of common use of and that's the point and that's something that we will be continuing continuing to develop into the future and this brings me to the recommendations for us it's important to make sure that in order to allow that translation to be as successful as possible at regional level we need the right subsidies

low administrative burden so so ease of access let me give you an example in the siren land we have a project focusing on artificial intelligence and it's a ford that's looking into that so how the manufacturing capacity can be improved by a i now the starland it centre is feeding expertise into that project as well and for this type of project

for which funding can be applied for where you have a really big multinational company involved it's quite difficult there's a high administrative burden they have to demonstrate that this is a solvent company uh going concern and as some of you will already know there's a whole procedure that has to be gone through in order to demonstrate that solvency now i think that's a good example of people are aware that ford is is a really big business and so isn't that already demonstrated and i think looking at it through a regional lens that would be my recommendation that in such regional cases perhaps a centralized solution it could be provided one single eu white document that documents that these companies exist and sort of annual accreditation process and then they can act as partners in projects with research centers with ease of access to the relevant funding and that would enable transformation in our different regions thank you very much mr strobel that was concise just very briefly i'm going to give the floor to mrs Kuhn-Theis from Saarland please you go ahead an elected

**Helma KUHN-THEIS**

representative yes hello from this ireland i'll be very brief thank you for giving me the floor i'm delighted that we've heard those reports from my colleagues from this island talking about the very special role that we are playing in the automotive industry

and i think it's clear to you how how well the network is working in zaireland now that's thanks to the fantastic relationship that we have with our colleagues within research and science and we're also uh we have a border with luxembourg we have a border with france the grandest region so there are fantastic opportunities there for cross-border cooperation which i think will enhance the role of our region even further both of the previous speakers from Saarland have stressed that perhaps salon could be taken as a best practice example for other regions across europe and perhaps some previous speakers might draw some inspiration from there and i think that it's worthy of note for us to think about the european level when listening to mr strobel and the point he made about bureaucracy can we reduce that because there are a whole host of different partners that are keen to work together can we allow them to network up with smes and with with the science and research without so much bureaucracy that would be my main suggestion as a politician thank you very much to all of you this was an excellent event and i hope that you all have a lovely day thank you very much thank you very much to you i would like to thank all of these speakers this morning this was a very dense and compact morning event which gave us a very good overview of where we are industry the transformation of industry on the one hand research on the other hand there are major and ambitious goals ahead of us which we must achieve and so i'm very grateful for the exchange against that backdrop there will be documentation on today's event that will be made available to all participants

one further point our next conference will take place in the second half of this year but we don't yet have the final date for that we will get that date out to you as soon as we can and we're not sure what the format of the next conference will be either we'll have to see what happens with the pandemic and whether or not we can dispense with the video conferencing and actually meet perhaps face to face

thank you very much for all of your contributions

now several times we heard this morning about transformation qualifications the labour market

and i think on that subject matter in particular we should hear more when we hold our next interreg automotive industry meeting the chairman very kindly thanks the interpreters you're very welcome thank you for your patience because we did run over time a little bit that brings us to the end of today's conference as i say thank you very much to everyone and i hope to see you soon and greetings from grads­