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Hello On The Way, my name is Aurélien Bigo, I'm a researcher on the energy transition in transport. I got into working on the transition in the transport sector after a period of working in other areas. I've been very conscious of environmental issues, energy and climate issues for a long time now, and concerned about them too. But originally I studied geology.

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So I studied geological engineering and then environmental economics, and through those studies I was able to do a final internship and then a thesis on the transport sector. My thesis was on France specifically, and the aim was to look at what levers we have in France to allow us to successfully limit CO2 emissions in the transport sector.

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And more generally, I try to look at the various challenges of the energy transition, which are linked to the climate of course, but also to other transitional issues, whether that's other environmental impacts, social impacts, health impacts, etc. And after my thesis, which I finished at the end of 2020, I spent a little over a year at ADEME (the French Agency for Ecological Transition) working on the Transition 2050 prospective scenarios, so looking at the different paths we could take in France to achieve carbon neutrality by 2050.

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And now since the beginning of 2022 I've been a freelance researcher, you could say, although I'm never quite sure how to present myself, and I am associated with a research chair called the Energy and Prosperity Chair, which was one of the partners in my thesis. And so I still do some research, and I also try to make it accessible and disseminate it, whether that's on social media, at events, or talks, or when I'm invited on podcasts.

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I think I've always been conscious of these issues, because my parents were, and they passed that on to me, to a certain extent. I'm very into nature, and for example I love hiking, in the countryside, in the mountains, etc., and I think that contributed to my awareness of the issues. I'm also very aware of the inequalities that are likely to increase in the world, inequalities in access to water, food, etc.,

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which I see as a major threat, and which are on the increase, through climate change. That is part of it too. And then over time there have been different things here and there that have increased my awareness of these issues, and my investment in them. I would say it's something that I've been invested in for quite a few years now.

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Travel has accelerated considerably over the last few decades, or the last few centuries. Basically, two centuries ago, in France, travel was still mainly limited to walking speed, because people moved around mainly on foot, or on horseback, but that was at a relatively limited speed too.

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Then, over the decades, particularly from the 1830s onwards in France, there was the development of the railway, which began to accelerate and develop longer-distance travel. Then, at the end of the 19th century, there was the development of the bicycle too. And then basically between the end of the 19th century and the beginning of the 20th, there was the development of the car, then the development of air transport, and so on.

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There were a number of technical innovations which led to the development of new modes of transport, but for a long time, these modes of transport were not widely available to the general population. It was essentially from the 1950s onwards, with the so-called "30 glorious years", that rapid travel spread much more widely to a large section of the population, in particular via the car.

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For example in 1950, there was an average of one car for every 25 inhabitants in France, whereas now there is more than one car for every two inhabitants. And it's this car usage, this increase in car ownership, which has also led to an increase in distance travelled, because we've been able to take advantage of the speed gains made possible by the car

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to extend our travel over a wider area. Hence the enormous increase in the distances we travel day-to-day, but also the development of longer-distance travel by car, train, plane and so on. And this has been a major trend historically, with increasing access to fast modes of transport, and consequently greater distances travelled as a result of the new possibilities offered by the speed gains.

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What's quite interesting when you look at historical trends is that people still make around three to four journeys a day. That's been pretty stable historically, we travel for about one hour per person per day. On the other hand, the distances have increased enormously as a result of this increase in speed. And whether you look in terms of number of journeys, time spent, transport method or distance covered, the car always comes out on top, it accounts for almost two-thirds of travel.

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And then, for every hour of travel, the second mode of transport is walking, followed by public transport and then cycling, which currently accounts for 3 to 4% in terms of the number of journeys, or in terms of transport time. And then, if we look at the figures in terms of distance covered, basically two centuries ago, if we walked for 1 hour a day, we would have covered an average of 4 to 5 kilometres per day per person.

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And today, with our much faster travel, if we add together short and long distance travel, we're at almost 50 kilometres travelled per person per day. The car is the predominant mode of transport, accounting for almost two-thirds of all kilometres travelled. And the second mode of transport after the car in terms of distance travelled is air transport, which accounts for just 0.1% of journeys.

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But because they are particularly long-distance journeys, they represent around 15-20% of the distance covered. Then comes public transport in terms of distance travelled. These days, the car is by far the predominant mode of transport, and that applies over a wide range of distances. Basically, the car doesn’t come first for journeys of less than one kilometre.

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For those journeys, walking is the most common mode of transport. And it doesn’t come first for journeys of over a thousand kilometres. In those cases, planes are most common. But basically, between one and one thousand kilometres, the car is still the most widely used mode of transport, although there are also other competing modes. But even on relatively short journeys, for example, between two and five kilometres, 70% of journeys are made by car.

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These are the types of journeys and distances that are perfectly suited to cycling, for example, which is currently relatively underdeveloped in France. Only 4% of those types of journeys are made by bicycle, whereas other countries demonstrate that, over that sort of distance, it is possible to get to 30% or 40%, provided, of course, that we have a travel system designed to encourage cycling.

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Obviously, it’s not just about whether the French want to cycle as much as the Dutch or as much as people who live in Denmark. It's about the extent to which public policies have encouraged the infrastructure, services, etc. which encourage that sort of practice. But in any case, it's clear that at the moment cars are by far the predominant mode of transport over a very large range of distances. Of course, they are even more dominant in rural areas than in densely populated areas, where walking and public transport are more widely used. But cars are very dominant even in areas where other more fuel-efficient alternatives could be developed in the future.

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And that's where there is room for manoeuvre to move towards travel that requires less energy and that is also less expensive than the private car. There are quite contrasting feelings about car use, because there are advantages to the car in itself, it’s very practical and quick, which is exactly what has led to its rapid development, and there is the comfort of maybe being alone, and of being able to make a journey from home to your destination without having any breaks in the journey, as you might have with public transport, where you have to get to a station, a bus stop, etc..

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So there are all these advantages to the car that have made it so popular, and that make it by far the most used mode of transport at present. But there are also a whole host of disadvantages to using a car. In particular, the expense, which means that many people would rather have other forms of transport than the car, because it's an expensive mode of transport.

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It's also a mode of transport with significant environmental impacts. What we see when we do surveys about the car is that there are many people who are happy with certain aspects of using a car, and at the same time they would like to use a different mode of transport but don't necessarily have the option to do so, they are pretty much in a situation of dependence on the car, because there aren't necessarily other forms of transport available to them to make the same types of journeys.

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In France, the transport sector is the biggest emitter of greenhouse gases. At the moment, around a third of all our emissions are linked to transport, and of the more than 30% of transport-related emissions, roughly half are car-related. So more than 15% of greenhouse gas emissions in France are car-related.

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So it's a major issue, because if we don’t succeed in this transition, particularly on cars, it could be significant enough for us to miss our climate targets more generally. Basically, it's a big enough sector to jeopardise our climate objectives if we don't make the transition quickly enough and in the right direction.

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So the climate issue is really important, and it means that our cars need to be petroleum-free by 2050. That’s both by going more electric - we can come back to that - and also by changing our habits as much as possible to try and use cars less, or use vehicles more sparingly or in a more shared way.

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It's also important to bear in mind that cars have many other impacts, environmental impacts, health-related impacts, as well as social impacts, because of their high cost, so the inequalities linked to access to travel that can result from either not having access to a car when you'd like to, and therefore being in a situation of travel insecurity because you don't have access to travel solutions, or because you do have access to a car

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but it's very expensive, and that leads to a whole host of other vulnerabilities. And then, from a health point of view, there are the impacts of the air pollution which is produced by cars. There are impacts related to noise pollution, and that also has a significant impact on health, through the stress that exposure to high levels of noise can have on the body,

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that can cause possible sleep disorders. There are also impacts in terms of public health due to sedentary lifestyles and physical inactivity, because travel in a car is inactive travel, whereas doing more walking, cycling and indirectly also using public transport, which can mean a fair amount of walking before or after it’s used,

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those can have very important health benefits, because we don't get enough physical activity to be healthy. There are also challenges in terms of mentalities, of course, there are issues in terms of consumption of space, consumption of resources, etc.. So there isn’t just one reason to limit the role of the car in our travel in the future. For public health reasons, for social reasons, for reasons relating to other environmental impacts,

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there are a number of signs encouraging us to try and prioritise more energy-efficient alternative forms of travel in general. France's national low-carbon strategy lists five different levers that can be used to reduce the emissions from transport in general, and passenger travel in particular, which can be applied to the car. The first of these levers is to limit and moderate the distances travelled, because distances have increased considerably over time.

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The second lever is to switch to modes of transport that emit less. This means limiting the use of planes and cars, and making greater use of walking, cycling and public transport. Then there's a third lever that applies specifically to the car, which is using carpooling, so that cars in general take more passengers. Bear in mind that at the moment, particularly on the home-work commute, nine out of ten motorists are alone in their cars.

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This means that, in general, 80% of the seats in a five-seater car are unoccupied. So we can move towards more shared vehicles. Another alternative, which is the fourth lever to reduce vehicle energy consumption, is to switch to lighter, more fuel-efficient vehicles. There could potentially also be vehicles that don't necessarily have five seats, vehicles with one or two seats, much lighter, more aerodynamic vehicles, and more electric vehicles too, which will help limit energy consumption.

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The switch to electric vehicles will also enable us to use the fifth lever in the national carbon strategy, which is decarbonising energy, as we call it, meaning moving away from petroleum and towards other types of energy that emit less CO2. For cars, electric is the best technology we have for moving away from petroleum

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for this type of vehicle. It's the best or rather least bad technology, because of course it's not perfect either, but in any case, it's the best technological lever that we will have in the future to reduce CO2 emissions from cars. There are different types of technology that can be used to power cars, and different types of energy that we can imagine in the future to get us off petroleum.

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We might think of electricity, we might think of hydrogen, we might think of biofuels, which are already mixed in to the petroleum fuels that can be found at service stations currently. We might also think of biogas or synthetic fuels, which are sometimes talked about. But basically, of all these alternatives, the one that's really most relevant for the car is electricity.

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First of all, because in terms of carbon footprint, it really is better than the combustion-engine car, which isn't necessarily the case with all the alternatives on offer. Roughly speaking, when you look at the entire lifespan of a vehicle, an electric car will produce two to five times fewer emissions than a petroleum-powered car.

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That depends a bit on the research, there are about ten studies in France, but whichever study you look at, there's a very clear gain when you switch to electric: at the very least, you halve your fuel consumption, and in the best case, you can divide it by a factor of five. So there's a clear advantage to going electric from a climate point of view. And when we look at the prospective scenarios, to think about how we can reach our climate objectives, what we see is that we cannot reach our carbon neutrality objectives in France in 2050 without massively electrifying cars, and

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potentially also a number of other road transport methods. So it's going to be essential to go electric, also because the other alternatives aren't up to the job or aren't as good. For example, hydrogen is often cited as another alternative, but the problem is that 95% of hydrogen is produced from fossil fuels.

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So from an environmental point of view, from a climate point of view, it doesn’t really make sense in the short term to switch to hydrogen, and then in the longer term, if we can produce low-carbon hydrogen, we are going to need electricity to produce the hydrogen element. And since electricity is used to produce hydrogen, and then the hydrogen is generally converted back into electricity in the vehicle so that the vehicle can be driven by an electric motor, there are significant energy losses, meaning that a hydrogen vehicle consumes 2.3 times more electricity than a battery-powered electric vehicle.

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So in terms of saving resources and energy, it makes much more sense to move to electric rather than hydrogen. On top of that, there are other very important issues concerning

hydrogen. Hydrogen vehicles are much more expensive, there is no recharging infrastructure, and there's no real potential for massive growth in that area. So hydrogen is pretty much disqualified in that respect.

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At best, it will be a bit of a niche solution. Then there's biogas and biofuels. The big drawback is that they rely on biomass resources, and so for the moment they are in competition with food crops.

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And then the last thing, which came to the fore a few months ago, was the question of synthetic fuels. That was driven in particular by certain manufacturers who wanted to preserve the combustion engine car by saying that

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in the future we'll be able to make combustion engine cars that run on synthetic fuels. The disadvantage is that if you want to produce them in a low-carbon way, well, you need even more electricity than for hydrogen. Basically, these synthetic fuels need to be produced from hydrogen and also from CO2, which ideally will be captured from the atmosphere. And it takes roughly 4 to 5 times more electricity to run a vehicle on synthetic fuels than a battery-powered electric vehicle.

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So that is why electric cars are the obvious choice, because they have a better carbon footprint, but also because the alternatives are not at all up to the task of getting cars off petroleum by 2050. So it's not a perfect technology either, but it's very clearly the best we've got.

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And that's why, in the future, by 2035, there is this planned policy to phase out sales of combustion-engine cars altogether. That means that after 2035, there will still be combustion-engine cars on the road, but there won't be any new ones for sale. It's in our interest to go electric as quickly as possible if we want to succeed in meeting our climate challenges and targets.

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There are also hybrid vehicles, which were getting more and more developed, but which aren't really being developed any more currently. What you need to bear in mind is that there are two types of hybrid vehicle. Some hybrids are non-rechargeable, meaning that all the energy put into the vehicle is petroleum, or liquid fuel, so essentially petroleum, with a little bit of biofuel, but it uses this petroleum a bit more efficiently, in particular because it can recover some energy, for example during braking.

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We see savings in terms of energy consumption of around 15%, 20% at best, but basically, we're still talking about vehicles that run predominantly on petroleum, which from a climate point of view, at best, means a slight reduction compared with non-hybrid combustion engine vehicles, but it is by no means a long-term solution. It could possibly be a bit of a transition to reduce a little in the shorter term.

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Then there are plug-in hybrids, where there are two types of engine power: combustion and electric. As a result, in theory, the electric can be used for short journeys, and then for less regular longer-distance journeys, you have the combustion engine power for those longer journeys.

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The downside of this technology is that it hasn't been developed with energy efficiency in mind. For example, for three quarters of these plug-in hybrids, the technology has been applied to SUVs, so quite large, heavy vehicles, which means that we have plug-in rechargeable hybrids that weigh more than 1.8 tonnes, which is far more than electric vehicles, whereas electric vehicles need to have a larger battery for greater range than plug-in hybrids.

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But since plug-in hybrids are large vehicles with dual engines, they're going to be particularly heavy vehicles. On top of that, one of the disadvantages we've seen in their usage is that these vehicles are often not charged enough, meaning they are often running

in combustion mode, so you have very heavy vehicles that are often running in combustion mode,

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and in terms of emissions, you have a result which is far from ideal, in the short term. That's why they're not really promoted any more, and why by 2035 plug-in hybrids won't be allowed to be sold either, because they still consume too much liquid fuel, even though there is an electric component to the vehicles.

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We can come back to this, but we need to try and make electric vehicles with a reasonable battery size if we want to avoid them having too great an environmental impact. In any case, the technology has become very popular, not only from an environmental point of view, but also because increasingly it is powerful and versatile enough to replace the use of combustion-engine vehicles.

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In any case, that's one of the aims for these batteries. At the same time, we have to try to limit their cost. We also have to try and ensure that they have a good energy density, so that we can have more autonomy, and so they are safer, etc. So there are a lot of issues there, we can't have the perfect battery either, but the idea is that over time we'll be able to move towards better batteries, or at any rate batteries that have less impact than what we have at present.

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Regarding electric travel and the circular economy, the recycling side of things, we often hear that electric batteries can't be recycled. That's basically untrue. At this point, we already know how to recycle electric vehicle batteries. There are even requirements at European level that set minimum percentages. It's a regulation, so it's not just

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about whether it is profitable to do it, manufacturers will be obliged to recycle a minimum percentage of the metals in the batteries in the years to come, bearing in mind that for the moment there are relatively few electric vehicle batteries at the end of their life because

the development is so recent, so the batteries already produced are generally in vehicles which are still on the road.

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But basically, if I give figures for the end of 2031, bearing in mind that before 2019 there were hardly any car sales, so in 2031 there won't still be that much volume to recycle, but by the end of 2031, 95% of nickel, cobalt and copper will have to be recycled, for example.

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For lithium, it's 80%. Those are the minimum requirements for recycling the metals in these batteries. They're pretty high figures. And actually, what's quite interesting is that even electric travel is much more in line with a circular economy logic than travel with combustion engine vehicles.

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What I mean is, this criticism about recycling is mentioned a lot for electric power, whereas the resources most under pressure in electric power can largely be recycled, as I mentioned. 80%, 95%, etc., those figures are pretty high. Whereas at the moment, with the petroleum-based travel we have, the most under-pressure resource is the petroleum, and we recycle exactly 0% of it every time we use it.

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In other words, over the lifetime of a petroleum-powered car, it uses something like 10 tonnes of petrol, and of those 10 tonnes of petrol, nothing at all is recovered, just CO_2 and air pollution when the petroleum is burnt. With the electric car, yes, there are a few hundred kilos of battery to be made at the start, although when compared to the ten tonnes, it's not the same orders of magnitude, but afterwards those resources will largely be able to be kept within the system. With a circular economy system, the metals from batteries at the end of their life can be reused.

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There are also advantages in terms of noise pollution, they make less noise too. But they don't tick all the boxes; if we want to tick all the boxes and reduce all environmental impacts, then we need to be more sparing and efficient in our use of energy. For that, just

going electric isn't enough. As much as possible, we also need to try and limit car use and have more fuel-efficient vehicles, etc., the other levers of the energy transition.

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Of course, electric cars produce more emissions during the production stage. It depends on the study, but it's somewhere from 20% more emissions during production up to double. On average, it's around 50% more, which is a result of the production of the battery. So there is definitely a climate impact on other environmental aspects as well.

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And of course, the more the car is used afterwards, the more it will compensate for this extra impact made at the start. The research results on this subject are quite varied as to how many kilometres have to be driven for the impact to be offset, it might be around 30,000 kilometres in France, some figures are lower than that, others are higher, bearing in mind that a vehicle's lifetime is more like 150,000 or 200,000 kilometres.

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In any case, it's easy to see that you're offsetting the extra impact from the production stage fairly quickly, and it might be that after two or three years you will have offset the excess CO2 impact from production. You can also look at the vehicle's whole lifespan, and then you're at least dividing it by half, up to dividing it by 5.

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And the longer the electric car lasts, the greater this difference will be. Because since the vehicle's impacts are much lower during use, it makes sense to extend their lifespan as long as possible, which isn't really the case for combustion engine vehicles. Sometimes we tend to think that it's environmentally friendly to prolong the life of combustion-engine cars as long as possible.

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In fact, that's not really the case, because the main impact of the combustion engine car is when it's used, when fuel is consumed, and so prolonging this use for as long as possible means prolonging these major impacts for as long as possible. And so, from a climate point of view at least, it's in our interests to replace the combustion engine

vehicles we currently have as quickly as possible, because it will allow us to stop these major impacts from combustion engine cars as quickly as possible.

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Of course, there are also other things at stake in terms of consumption of resources, metals, etc. But what is certain is that we won't be able to achieve our climate targets, or significantly reduce the environmental impact of our travel, by keeping combustion-engine vehicles for as long as possible, as they have a major impact as they are used.

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There are many actions relating to energy saving and efficiency that will be necessary in this transition, including trying to use cars less for those who may have other alternatives, be it walking, cycling, public transport, using cars in a more shared way, which can either be carpooling where journeys are shared, or it can be carsharing where a vehicle is shared between several people, either within the family, between friends or via platforms that can organise that,

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in much the same way as for carpooling. And then also trying to move towards more fuel-efficient vehicles for people who need a car, or who need a vehicle similar to a car. And in fact, what you see when you look at travel practices is that the general environment needs to encourage these types of practices.

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In other words, if for example we want to be able to move to other modes of transport, there have to be good enough offerings in place to encourage more walking, cycling and more use of public transport, so that these options are more efficient or more attractive than the car. Very often, the most effective policies are those that both encourage other modes of travel and which also limit to some extent the existing advantages of the car.

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We've built a system which is so designed for cars that sometimes we have to go back on it a little, because for example giving so much free and plentiful parking for cars is a major

advantage and a huge incentive to use the car. That's why transition policies often have to act on both fronts.

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But what is certain is that if we want people to give up their cars, we need to develop the alternatives.

For example, we know that between 35% and 40% of households have two cars, and occasionally more. And we could imagine for example that at least one of those two vehicles could be a more fuel-efficient vehicle, which isn't necessarily a vehicle designed to take the family on holiday. There might be one vehicle which is for that, and another which has one or two seats and which has a range of

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maybe 80 or 100 kilometres, and which is more than sufficient for day-to-day journeys.

That's why we need to change the environment, as well as potentially changing the incentives which might exist. For example in advertising,

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what is often promoted is using a car alone, which is not representative of reality. We could make changes to our collective imagination or to the incentives which are given, which could lead to behaviours that are much more compatible with the energy transition. Also, a significant percentage of the changes to travel practices come about through people trying out new practices, or through people around them encouraging them to try out a new practice or giving them advice on their practices.

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We also know that many changes to travel practices occur at key moments in a person's life, for example when they change jobs, or a child leaves home, or they move house, etc. Those could also be moments when we could be encouraged to change our travel practices, and this needs to be supported by the public authorities or by other structures that can support people to change their travel habits, to see what alternative solutions are best suited to their needs.

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Not everyone has the same travel needs, so the same types of travel solutions will not suit everyone. That's why we need to develop different types of travel which are alternatives to the car in the future.

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In France, on average, we make six journeys per year which are more than 80 kilometres from our home. So that's still a fairly limited number, and there are quite significant inequalities within that, particularly depending on income. Basically, when it comes to long-distance travel, the more affluent will make far more long-distance journeys than the less affluent. For day-to-day journeys,

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it's more our location which will determine the distances we travel, or indeed the modes of transport we use, between rural and urban areas, for example, to simplify things a little. But over long distances, it's six journeys, on average, and there are lots of people who also do less than that.

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And so, ideally, we should try to use walking, cycling and public transport on our day-to-day journeys as much as possible. If we do need a vehicle, it would be better if it’s a fairly light one, and with a range that's not massively over-the-top, for the electric vehicles, which are going to become more and more common. And then, for these six trips, on average, it may be less than that, or more, depending on the person, we can try to do things differently.

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For example, developing the train more over long distances, developing coaches more, developing carpooling over these long distances, as already happens quite a lot. And for people who don't have a car but need one from time to time, for example for those long journeys, that's precisely where carsharing can come in handy. If you don't own a car,

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you may still need one for certain journeys, and in that case, it could be made easier to rent one, whether it's between private individuals, via platforms, etc. We could facilitate different daily travel practices, without needing to buy a bigger car for a few rare long-distance journeys.

In any case, I see the travel of the future as a much more diverse mix of different modes of transport.

So, depending on the type of journey, we can walk when the distances are short enough, cycle when the distances are a little longer, and use public transport for even longer distances.

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Or, alternatively, carpooling, car-sharing, possibly having access to rented vehicles, which may be vehicles that look like bicycles, but potentially go a little faster, or allow loads to be transported with cargo bikes or some type of car bike, vehicles which are an intermediary between the bicycle and the car.

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It looks like a car, but it weighs less than 100 kilos, there is a pedal mechanism inside the vehicle which is power-assisted up to 25 or 45 kilometres per hour. So other types of vehicle, too, which are likely to develop and meet needs that today are largely met by the car, but this time in a more fuel-efficient way.

00:40:02:21 - 00:40:27:21

And at the same time, we could be rethinking and calling into question the evolution of our land planning, our lifestyles, to try and recreate more localness in our usage, in terms of access to services, access to different shops, etc., and trying to relocalise our lives to avoid travelling longer distances on a daily basis, and also having different ways of travelling that are potentially a little slower, a little more local.

00:40:27:21 - 00:40:52:03

If you are doing long-distance travel, it could be more exceptional, where you stay a little longer in one place and are less focused on the consumerism of travel and tourism, but a little more focused on the experience, and on taking your time, perhaps discovering or

rediscovering places closer to home that you don't know very well, or that you wouldn’t necessarily have explored if you weren’t trying to change things up a bit

00:40:52:03 - 00:41:12:19

in the way that you travel. There are some changes that need to be very concrete, in terms of the modes of transport that we develop and to which we have access, but there are also changes to be made in terms of our aims. To what extent are we always aiming for speed, to go as far as possible, and as fast as possible,

00:41:12:21 - 00:41:50:03

or are we able to have more local aims, to have travel that has less impact on our health, or even that is good for our health, in the case of physical activity. Travel can be less expensive if we use the car less, and use alternatives that are less expensive too. So it's also a question of changing the reference points, ultimately, in the objectives we set for our travel, both from an individual point of view but also, for lots of people, from a collective point of view. What objectives are we setting ourselves for this transition?

00:41:50:05 - 00:42:08:03

I think that from an individual point of view, in terms of questioning one's travel practices, an exercise that could be interesting would be to try and make a note of the distances of the journeys we make, and how often we use the car, how much we walk, cycle, or use public transport.

00:42:08:03 - 00:42:29:22

You can do a little assessment, first of all, for example over a week, for day-to-day journeys, and then also for long-distance journeys, another assessment of how many long-distance journeys you’ve made over the last few months or over the last year, to try and see to what extent these journeys could be replaced by different, better alternatives.

00:42:29:22 - 00:42:59:08

If there are a lot of short journeys in the car, to what extent can you test out some of these journeys, either walking, or cycling, or, if the classic bicycle isn't enough, trying an electric bicycle, or trying other types of vehicles that might exist if the classic bicycle or the electric bicycle isn't enough, looking at other types of intermediate vehicles that will

develop more and more in the future. Are there some journeys that could have been made by train?

00:42:59:10 - 00:43:18:24

Are there certain destinations where in fact it is difficult to use other modes of transport, perhaps because they are destinations that rely heavily on air or car travel. You can ask yourself to what extent changing your destination could open up new ways of travelling which are just as good without necessarily having as great an impact.

00:43:19:00 - 00:43:37:17

I think the assessment part, asking yourself a few questions about the way you travel, it's a significant first step, to then see how far you can change it, and with what level of difficulty. And then I think that once you've done that and you're willing to change, you really have to try some other ways of doing things.

00:43:37:17 - 00:43:57:14

What we see in travel is that there is a very strong weight to people's habits. In other words, we don't ask ourselves every morning what modes of transport we are going to use that day for this or that journey. There's an automatic reflex which is very significant. It may be the reflex to use the car for those who use it a lot, but it's a reflex that exists for other modes of transport as well, of course.

00:45:04:08 - 00:45:22:22

In any case, that's an example of how if we want to succeed in changing travel practices, we have to try other, less familiar travel options to see how well they might work for us. The same applies to public transport, and indeed to electric modes of transport.

00:45:22:22 - 00:45:39:22

I think there's also some learning to be done, when moving from a combustion engine car to an electric car, and it's the same for that, ideally you have to be able to try it out, or discuss it with other people to see to what extent it might also be suitable for your uses, in order to change practices.