VERBATIM OF THE PUBLIC MEETING IN ARROMANCHES-LES-BAINS
The 12th June 2013, 10 pm to 11pm, Festival hall

At stage:

Special commission for public debate:
Claude BRÉVAN, President
Laurent PAVARD, Member
Jean-Louis CHEREL, Member
Roger SILHOL, Member
Mireille LETEUR, Member

Authority contractor:
Bernard GUITTON, Project Director, EDF EN
Jean-Philippe PAGOT Director marine environment, EDF EN
David LEMARQUIS, Project Manager, EDF EN

Interveners:
Anne d'ORNANO, vice-presidentof the general Council of Calvados
Pierre BRUNET, Honorary Professor of geography
Franck DAVID, Géophom
Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS
Gérard DEBOUT, president of the Normand ornithological group
François LEBOULENGER, president of the Normand mammalogical group
Morgane REMAUD, the Marine Protected Areas Agency of Le Havre
Jean LEMOINE, Member of the Board of Directors of the CREPAN
René MAFFEI, president of the GRAPE

Claude BRÉVAN, President of the CPDP

If you may take a seat. I hope everyone has a chair. If not, it seems we can find some for you. Good evening Ladies and Gentlemen. First of all I am going to hand over to the Mayor of Arromanches who has been kind enough to land us this room, make it available to us. And so he is going to say a few words to welcome us.

Patrick JARDIN, Mayor of Arromanches-les-Bains

Thank you lady President, thank you Ladies and Gentlemen. Welcome Mr President of the Region, Madam d'ORNANO, Vice-President of the General Council.

First of all I am delighted that Arromanches has been chosen for this 8th debate on wind energy. I'm very pleased to welcome you and I think it is necessary that consultation and discussion should take place in order to inform you and to allow everyone to become aware and have no prejudices on the hearsay. So ladies and gentlemen of the Committee, I thank you to take time this evening to answer our questions, to understand our worries, our concerns, but also our hopes just perhaps to see a wind farm as an economic progress. But also to be sure there are no repercussions, which might be non negligible in the impacts on tourism and above all on the duty of memory in sites such as Arromanches.

So Ladies and Gentlemen, thank you for your presence. I notice there are a lot of people here. That means you are very much interested and involved. Mrs President, thank you for being here.

Claude BRÉVAN, President of the CPDP

Thank you Mr the Mayor. I am going to explain, if you allow me, how this meeting will take place. I'd like to welcome you all. First of all, welcome to all of you, welcome for those of you, who have never participated in one of these debates. There are some faces that we recognize, so there are regulars. Some people have already a good knowledge of the subject matter, others not so well. Welcome to our foreign guests, who are interested in this project and have accepted to participate to this debate. For that purpose, we have decided to organize this meeting in a very specific place in Arromanches, at the specific date, immediately after the week when there have been a lot of memorial ceremonies. But we also wanted there to be a translation into English in order to permit everyone to understand our debate and speak up, if and when they wish to. This is a rather specific meeting. In previous meetings we talked about technical aspects, innovation, the innovation aspects of these wind farms at see. We've talked a lot about fishing.We've talked a lot about employment. We haven't talked much about environment in the widest sense. We've talked a little bit about various sites, but relatively little and very little about this problem, which is very important here, which is so symbolic and that is the issue of memory.There are 4 sites for wind farms, which have been predefined around France. This one is specific, very strong specificity, in that it has to conjugate if possible both sustainable development and technical innovation and at the same time conserve and sustain,or in any case doesn't affect a site, which is highly emblematic for many people. It remains a site of pilgrimage more than a simple site for tourism. And so we wish to conduct this exercise respecting those who are concerned, most particularly this very sensitive aspect.

We, as a committee, we have no prejudices. What we want is everyone to be able to express themselves as freely as possible and explain how they feel about this cohabitation that is envisaged and the way the project could be improved if it appears necessary and possible.

So this meeting will be divided into several phases. The 1st phase will be a kind of description of the site and the questions brought up by the historic and memorial aspect of this site. And we'll start with a geographical exposé about the site and by Pierre BRUNET who is an emeritus professor of geography and who will present the landscape, its characteristics, and the way landscape has evolved because this is a landscape, which has been evolving over the last 70 years. It hasn't remained as it was. Perhaps in people's imagination landscape is fixed. But in reality the landscape has demonstrably evolved. Mr LEDRAN, the Mayor of Ouistreham has been kind enough to come and speak as a witness because he was a small boy during the D-Day landings and we thought it was interesting to have the point of view of a French man who lived in Oustreham. And so how the population experience, how that episode was told and recounted in families' histories, how this event has evolved. It's a shame he will not be here. Roger SILOHL, who is here and who is one of the members of the commission, will have the task of giving a rapid presentation of these sites involved and what happened there. We have no doubt that there will be people in this room, who are highly competent and who will be able to complement and supplement the information Roger SILOHL has collectedat rather short notice. Of course none of us are completely ignorant of what happened here.

Then Madam d'ORNANO, it's so kind of her, she's the Vice-president of the General Council of the Calvados and who has dealt a very great deal with the question of memorial sites and the organization of the ceremonies, of theses events around memory. She will talk to us more precisely about the return of our former allies to these sites, what they expect from them, the experience when they were here and what they feel about them. Of course then there will be a debate after these three initial presentations. And I think the president of the Regional Council wishes to speak in order to address the question of the registration of the D-Day landing sites on UNESCO World heritage list. I forgot to tell you, before that first phase and for those of you who do not have a very exact knowledge of the nature of the project, the contracting authority, who I will present a little later, will tell you what it's all about in order to be sure that there is no misunderstanding and that everyone is sure about what we are talking.

A second phase, and this of course is directly linked to the first subject, we will tackle the question of the visualisation of this farm: how we will see it? Will it be visible? At the entrance of this room, there is a dynamic presentation, which enables you, by clickingon different points of views from different places along the beach and the show line, showing what this wind farm will look like. The question of visibility and simulating visibility has been a focal point if you like. The reality and the sincerity of which these images have been produced, has been tackled and questioned several times by participants, who considered that we are minimizing the visual impact. And it is for this reason that the engineering design office is working for the consortium who is running the project, will explain how they have developed those images. And Mr VEZIEN who is research engineer with the national research organization in France, an independent academic, he will give us an appreciation about the reality of the pictures in order to conclude the debate around trickery or dissimulation of the impact of these turbines. Those are the two first phases of this meeting.

And of course in between there will be opportunity for questions and answers, questions, which will be answered.

The 3rd phase is rather a different register. Of course it's question of environment, it will concern the impact on the natural milieu. It's not the contracting authority, who will talk about that, questions with regards to which he is not a specialist. And so the Committee decided to call on individuals who know these domains perfectly and who can talk intelligently on them. Notably there presentations will be made by the Normand ornithology group, by the Normand mammalogical group, because there are also marine mammals, theMarine Protected Areas Agency of Le Havre.. There is someone from the CREPAN, C R E P A N, which is a regional organization for the protection of environmental nature in this region, who will intervene. And finally, somebody will intervene who comes from the GRAPE, G R A P E, which is a regional federation of organizations involved in environmental protection. But, those two last presentations will be made by experts, but they will also be made by associations, who are activist, militant in one direction or another.

And I should make it clear for those of you, who have never participated in any of these reunions previously, I would remind you how we run these debates. A commission organizes these debates. I'm the president of that committee. The others are here. There are four of them. We have a hydrologist, Mr CHEREL who is a general in the gendarmerie, Mr SILOHL who is a governor prefect and Mr PAVARD who is a director engineer from the Ponts et Chaussées. We are all independent. We are not linked to the contracting authority. We will not give any opinion. Our job is to ensure that everyone gets the chance to speak and to relate as faithfully as possible what is being said. We also have a duty of requirementtowards the contracting authority to obtain sufficient replies to questions that are asked. That's what we set out to do and sometimes it does tend to annoy the contractor authority. But that's another thing.On my left you have the people responsible for the project. Mr GUITTON who is the director of the project, Mr PAGOT who is a specialist in environmental questions, Mr LEMARQUIS who is the project manager. And in this room you have other people from the project who will be able to answer your various questions.

I don't think there are any questions to be asked with regard to what I have just said, which is very liminal. Mr GUITTON, over to you to present very rapidly, within 5 min in order that no confusion can be made and that nobody thinks that you are going to be building 75 turbines on the beach between Utah and Omaha. Over to you, to present the project. Thank you.

Bernard GUITTON, Director of the project, EDF EN

Good evening Mr President, Mrs d'ORNANO, Mr the Mayor of Ouistreham. Ladies and Gentlemen, good evening, I'm André GUITTON. I'm the director the Courseulles-sur-Mer's project for the consortium. The president has asked me to give you a presentation. It will be a very quick presentation just to have an idea of what the project consists of.

As you can see here on this slide, the project consists of 75 turbines, which will be distant each from the other to about 1 km and covers an area of about 50 km2, which is located a little beyond 10 km from the coast, from the nearest turbines. Here on the map you can see for the Arromanches site, the closest turbine will be 12 km from the beaches here in Arromanches. The site is located in a zone, which is in dark blue, with a navy blue line,which was the site made available by the State at first sight with regard to a tender of call launched

in July 2011. So we have used the smallest possible area within this zone in order to limit the area covered by the wind farm and the way it occupies both, the view and the shoreline.

I would like to add that we have an exclusive agreement with the Alstom group, which has profited of the huge massive benefit of offshore wind farm development in order to develop turbines, which are dedicated to this type of use. And also it has created an industrial subsidy in France.A few of the characteristics of this machine. As I was saying earlier, they have unitary power of 6 MW so 75 x6, the 450 000 MW, which were displayed earlier. They will be 100 m above of the surface of the air. The diameter of the rotor concerning of the three blades is 150 m. So each blade is about 73,5 m from the axis. So those are the main characteristics of the wind farm. As the president has said, they are situated at sea 10 km from the nearest beach.

These are the principle characteristics of this wind farm. As Madam President was saying, these wind turbines are effectively sea based at 10 km from the closest beaches. And I think it is important to say that because I was interviewed some 10 days ago by people, who thought that they were going to be land based. So I thought it was necessary just to make that it clear before we get stuck into the main debate. Thank you. Mr SILOHL is going to run the first part of the meeting, so over to you. I think it is Mr BRUNET who will be the first to speak.

Roger SILHOL, member of the CPDP

Mr BRUNET, an emeritus professor in geography, whom we have introduced to you earlier, is going to present the Normand landscape, the coast landscape and the inland landscape.So please Mr BRUNET over to you.

Pierre BRUNET, Honorary Professor of geography

Thank you very much. The region involved in this wind farm, marine wind farm is a place, which brings together all the emblematic aspects of the Low-Normandy landscape, inland as well as around the coastal area. Inland we find headwall country and uncovered countryside. To the west, the Bessinaristocratic headwall country with its big fields surrounded by hedges and trees with clean trunks and with a large head of leaves at the top is a landscape closed on itself without any depth of vision where buildings made of limestone are concealed. These limestone buildings introduce a lighter element in a landscape, which is mainly green. This landscape has evolved very little recently because it has been protected from an agricultural redistribution property by the nature of their plots. Elms have disappeared but ash has replaced it, then oak and maple trees. Pruning is probably not so common.There are some corn and maize fields, which are followed on from prairies, but that doesn't really affect the nature of this very traditional landscapeTowards the east, open landscapes that formed a narrow branch along the shelf break invade all the intermediary spaces between the big villages, which are often inserted within a clearing, in a consisting of orchards.And between these villages, there is a cleared spaceanimated with very changing colours depending on the season and the stage of the growth of the different crops growing there. The big change in this recent evolution is that we have seen the multiplication of very banal groups of houses and they become more and more evident as we approach the area around Caen.

The second element in these landscapes is the shoreline. There we see a succession of rocky and sandy coast. The first of these have straight cliffs from Asnelles to Grandcamp. There are

just a few gaps in this,Arromanches, Port-en-Bessin, Omaha Beach, which has been classified by a decreeadopted on the 27th August 2006. It's a classified site. These cliffs, which are difficult to access, only evolve thanks to maritime erosion. And the pointdu Hoc will probably disappear very soon due to this erosion.The landslides, relatively rare, do occupy space of the base of the cliffs but they quickly disappear thanks to the action of the sea. On the contrary, west from Asnelles, along on north south axis, we see, beaches, dunes that are rather flattened, marshlands and wetlands, and finally the edge of the shelf sloping gently. With the exception of the marshlands, which are already protected, seaside tourism has invaded this coast and so there are a number of resorts between which we find natural areas but which are still under threat.The sea offersa last peace of landscape, which is much greater than the open landscape, this is a huge bare landscape, which is all the most huge as it touches on the left and the right the far off cliffs of the Plain and the Pays d'Auge and the Pays-de-Caux at the other side.

As it is the same with all similar landscapes it has a spiritual value because it places the humanity in a very relativized space. But also on the D-Day landing sites, which we have commemorated recently, the maritime landscape acquires a heritage value because it combines the remains of that operation, the Winston Churchill's port, the memory of all the soldiers at the liberation who lay for ever in cemeteries near here or at the bottom of the sea.

The question that has been asked is: "how a maritime land farm integrates this landscape, which has so many elements combined in such a small area?" They will form a kind of orchard of 75 metal pillars of 150 m high, at a distance of 1 km one from another on about 5500 ha. They will be five times taller than the biggest vegetable screen trees or architectural, those churches belfries of the landscape onland, three times taller than the cliffs of the Bessin. And so they will be visible. We can't deny that. It will be impossible not to see them when we can see from this coastcargo container ships, that are only 40 m high, which navigate along the channel 25 km away so twice as far away. So the question we will be debating in a short time is more how will we see these turbines.It seems to me that the question that will be debated later, before I got to know the program, it will be on the way that they are organized in space and the place from which we will observe them. I'm not going to tackle that question because it will be tackled later this evening. Thank you very much.

Roger SILHOL, member of the CPDP

Thank you professor for this description. Ladies and Gentlemen, some of you in the room are certainly by personal taste or by habit more familiar than I am myself with the landing. But as Mrs Claude BRÉVAN has indicated to you earlier it is up to me to present to you this evening the military operations in the 6th of June 44, which took place in this territory. So here it's the 1st slide, which basically outlines the breakdown in the Seine bay in the north of Carentan, between Saint-Vaast-la-Hague and Carentan to the Orne estuary and in the various sectors that were allocated to the west sector with the American troops, the east sector under British command with the Canadian troops. I'll get back to that. And either side in the two extremities of the battlefield we have interventions by the American airborne units near Saint-Mère-Église. I think many people recall this name and the sacrifices of the Americans in that village. And on the other side the British troops intervention in the Orne estuary and on the Orne bridge both in Ranville and Bénouville.

The map includes the French flag. There was a French participation under British command and a French participation under the Kieffercommando, which we don't need to present this evening. But that was not the only French participation. There was also participation under power of the resistance within the land and in Normandy, which interfered all transmissions in the area in Brittany, in Picardie, in the Nord-Pas-de-Calais, so that it would be impossible for the Germans to identify the landing area. And also deep within the national territory, the resistance attempted to and succeeded significantly disturbing land based communication. They also interfered with sending reinforcements to combat in the pocket edge towered by the allies during the 6th July 1994, and which slowed doing the sending of reinforcements. No presentation would be complete without other French participation, the French navy, which was present in the warships that were there to support at the time of the landing.

The 2nd slide I wanted to show you, is this one. This is the eastern sector under British command. Now this is the sector, which is facing the project and these three beaches, Gold, Juno and Sword where the main effort of the troops under British command was directed. The Courseulles beach is the beach designated by Juno. I'm taking about Courseulles because it is the name of the project and it is the closest point of the project with respect to the coastline. You can see in this chart the penetration access, which corresponds to the combat, not the first day, but the first days of combat. Now these land operations were preceded by naval operations. Perhaps we could see the 3rd slide now, which shows the roading of the ships. As you know there were 5000 ships mobilised in the landing to provide transport of troops and troop support at the time of the landing.

You can see, I have a hard time seeing this here, but we can see the front comprised by the fleet and that's this actual landing craft left from. The cruisers destroyers and warships were battering the coastline. And this was intended to both destroy part of the fortifications built by the Germans, the defensive facilities and the blockhouses on the coastline and also to disturb all the communications behind the lines. So in this huge concentration of ships in one part of that, coincides with the geography of the project that a certain number of shipwrecks linked to naval operations are still there, even if the ships were less impacted than the men that actually performed the landing.

I don't think we have anything to add about the naval operation. But if you have other contributions, certainly that would be welcomed.On the Gold and Juno beaches the ones that are the closest to Courseulles and that are facing Arromanches down to Luc-sur-Mer and the project, the Gold part at the west of Courseulles it's a British area. During the first day the progress was difficult and they were finally able to reach, to come down to Bayeux the 6th June and they liberated Bayeux on the next day. For the Canadians, the sector, which corresponds to Juno today and which is right next to Courseulles. The Canadians on that day wished to make up for the setback that they had suffered in Dieppe a few months before and the losses they had in that landing. They demonstrated that day that attacking a port was something that was extremely difficult so they had to rather orient the landing towards beaches, even if you have to create an artificial port later on so that reinforcement and munitions could be sent as well as fuel. And this is the reason for which following the experience in Dieppe the command decided to use the Seine bay and Normandy as the area for the landing. With respect to the Canadians their progress to Courseulles was difficult. During the day they actually suffered exactly 950 deaths and their advances subsequently

beyond Courseulles enabled them to get closer to Carpiquet and the edge of Caen when they stopped at that point on the first day on the month of June 1944.

Last word to be said about Courseulles and the neighbouring beaches is that on the 14th June this is the site that was chosen for De Gaulle's landing, which also have reached Bayeux on the same day. And you all know the pictures and these iconic photographs taken in the first prefect in the free France and the first sub prefect, who both shared the Bayeux prefectures. One set up his office in the dining room and the other one in the desk room. And the sub prefect, Raymond TRIBOULET, and some of you and many of you actually knew the gentleman when he was the mayor of Bayeux andthe political man who had a political career, which we are all aware of. The front by the end of June 1944 looked a lot like this. It started from the Orne estuary on both sides and it deployed right down to the middle of the Cotentin region roughly on a level with Carentan as you can see on the map. The allies stayed right in front of Caen, which wasn't liberated until August. And based on that line until the end of June that's where the reinforcements sent in by the allies via the Arromanches port and also the landing on the other beaches, enabled to overcome the German panzer divisions that had come into the grove. And after once those panzer divisions had been overcome, they actually liberated Normandy through the south of Saint-Lô and participated, to start the liberation of the whole national territory going through the south of Normandy and extending onwards Paris. But many of you as well as I do know it was the 25th August that the city of Paris was liberated.

That's the information that I just wanted to sketch out in just a few words so we have a better knowledge of what the history is in this area and the landscape that is involved in this construction project for the 75 wind power units that the contracting authority talked about earlier. As you have said I was invited to replace Mr LEDRANwho would have said to you as well what the actual design, was that he had of these events, which I only learnt through books and somefamily hearsay.I now suggest that we listen to Madam d'ORNANO who is going to add to the presentation I made about this and she is going to be speaking about the feeling of that she feels, when she sees the landscape and the commemoration that happens regularly with the allies.

Claude BRÉVAN, President of the CPDP

Congratulations for this presentationbecause it wasn't easy since you only learnt today that the mayor of Ouistreham wasn't going to be able to be here. You did a great job, remarkable. Thank you.

Anne d'ORNANO, Vice-President of the General Council of Calvados

Thank you Mrs Chairman for allowing me for speaking for a few minutes in this public discussion, a very important decision for our region. First of all I 'd like to say I am not a technician of wind power or of power at all. It is something I have in myself. And I'm not a specialist in fishing either. So I will deal only in my discussion with the memorial aspects, dear to the heart of Normands.

I'm not originally from Normandy. I became Normand after years of responsibility and I'm very happy and proud of that. I'm half American and half British, it's the blood I have in my veins. I had a cousin John VERNON and an American uncle Henry LAWRENCEwho landed one by sea and one out of a plane in June 1944. And my first childhood memories are out of John who goodness know how he cut behind the lines. He showed up in the courtyards of the

house where we were with my mother, my brother and myself in Anjou. The first thing I heard in English was him and he said: “I’ve been looking for you.” I’m not sure if it was him or it was the fact that I’ve become Normand I understood that there are places and sites on our land that carry the imprint of pain. Their names resonatein memories and the rain that falls on their image is made of blood, of fire and of tears. And this is a symbol of violence but it is also a symbol of courage, a symbol of terror but also symbol of honour, a symbol of despair but also of hope. There is a flag of sacrifice flying above, the banner of anonymous glory and the breath of the unforgivable. They were used to their climate, to violent storms, to tides and to their birdsongs, to their sunset, to their sunrise, these peaceful places, here childhood landscapes of wonderful holidays became extremely upsetting places. And due to what they saw and what they lived through is engraved into the memory of the world forever. The pontd’York, Omaha beach, Pegasus, Gold, Arromanches, Utah beach, Juno, are part of those. Because of the craziness of Man, the devil, for a few hours, a few days, a few weeks has increased his foothold in the Earth and set up hell on the beaches, on the land and in the sky of Normandy. And it is the grandeur of Man that came to that.

How do these men come? Those who came here, there were so many of them and they came from so far away to die, to suffer. They could never go home again to give us back the freedom that we had lost. I often wonder were they colder, were they more fearful, did they want less to go home, were they less homesick than we would have been? I wonder how they’d say goodbye to their mother, to their fiancées, if they were older, what happened the last time they saw their children, wife before they went off fight for our freedom? Did it hurt? Did they see it coming when they died and were they less afraid than we would’ve been? The memory of their sacrifice has become, for us Normands, our shared patrimony. And that beauty is part of us now. It’s our collective memory that goes all along the coastline in every village, these villages that were so damaged, crosses the hedgerows, our woods, our wheat fields, progresses through the prairies and runs in our streams. This is the battle of Normandy.Obviously nature has taken its breath again, grass has grown, the apple trees have flowered, the cities have been built and in villages clock towers have been rebuilt. Now the beaches have been given back to childhood memories and areeven more beautiful than ever for holidays. Some hedges have disappeared. And through the needs of a construction the landscape has become so much transformed. This is the way history of mankind goes, this is the way progress grows, as well as mankind aspiration and its needs, The roads have been paved, the houses have become buildings and bays have become ports. The landscape perhaps less than elsewhere, however as throughout the world has changed. That’s life, that’s normality and that’s a good thing.

What hasn’t change is the colour of the sky, the wind, the rhythm of the tides, the birds and the emotion. So strong, so heart-breakingthat you feel them in military cemeteries, you feel them every time you try to imagine what that summer was like in 1944. And we need to measure what we owe to these people, men and women, who came to free us, and the infinite recognisance that we owe to them. We celebrate this with flowers, with speeches, with flags, with national anthems every month of June. The survivors are fewer and fewer every year but they are still so handsome, they’re still there. I don’t know them all but I went to see them in Great Britain, in the US, I went to meet them in Sweden, in Canada, in Belgium. They are there and they tell us that they only did their duty, they were lucky, they are happy to see how beautiful Normandy has become. They are sorry they don’t know how

to pronounce the names of the towns. They thank us for the medal for the 50th anniversary and they are very touched by our welcome.

And what about the wind farms? Well we have to talk about that. Is this hope for the future? Is it a way of insulting the past? I've wondered myself about this. In a speech of Omaha beach the ambassador of the US said something that I found striking and I am going to quote that: "They came to dye on your beaches so that you could write the future." The future that for thousands of people stopped. They were in the youth of life. Could this be fixed in the spirit of their minds or could they have discovered the future? The future that they no longer had. What should we do with that future? What should we do now with that future? Should we make more sanctuaries? But how far would we go? And why? Can we reasonably make a sanctuary of the sea, of the horizon, of the whole territory of the battle of Normandy? Should we leave everything at it was with the blood, the weapons, the drama and the tears? It is not in the nature of the nature to do so. The tide erases the traces on the beach, rain cleans the blood, wind dries tears, sea carves thebaseof the cliffs and the grass growths and becomes green.

I was looking on the Internet site and the various opinions about this aspect of our memorial. I wasn't surprised to find there at least the Canadians directly concerned by Juno, a majority of people in favour, which reflects what I felt myself, speaking with those I had known, those who I saw again last week and I believe that some people in this room were able to observe that as well at the dinner that took place in Arromanches. "The turbines in the sea, but why not? On the contrary, yes. We gave you your freedom. It's up to you to do what you will with that freedom." Their fear and that was said earlier, was that a wind farm would be on the beach. This was not possible. It wasthe beaches that they were looking at not the sea. I heard what the wishes were, the hopes were. And on the contrary the kind of astonishment that we should even ask them the question. They are used to this. They have wind farms where they live. They believe in the future. They know. They know as do we, that life always comes back, that men get older and that children are born. Perhaps one wish on their part, that there should be a trace somewhere in this farm, in the wind farm, perhaps a mark of their regiment, something to pay tribute to them.

They think of the children, they fought, so that those children could live in freedom. We have a duty to pass along the memory of the sacrifices, the memory of the freedom, what was dearly brought. It is our duty thus to try to leave our planet in proper condition and wind farm contribute to that. It's our duty to blow into their wings the wind of freedom that pushed courage to us. It is also the wind of modernity, which our ancestors,who lay downforever under our apple trees, will never get the chance to know. And if the sky gets lighter at night, and that's just as well, it will make us think a bit more often of those whose blood is mixed with the stars. Let's not close our eyes to their sacrifice or to freedom. And let's not forget that freedom is light. Thank you.

Roger SILHOL, member of the CPDP

What I suggest now, Ladies and Gentlemen, is that we open the floor to you. Feel free to ask questions, what you feel, your impressions. And I am going to ask the attendance to come round with microphones in order to allow you to speak. Here is a first question or at least a first intervention. Please tell us who you are in order that the report of these proceedings may be complete. Thank you Sir, over to you.

Philippe CLERIS

Good evening. Philippe CLERIS. I'm speaking on behalf of the SPEFF, a national association of the protection of landscape. It is very difficult to start to talk after what we've just heard and I think we are all in the spirit of commemoration, of appeasement and preparing the future. I would just like to talk about what is a landscape this evening with regard of the fact of the universal history that concerns all of humanity? And particularly these beaches deserve to be cited on the UNESCO heritage list. But I would like to go further than that and remind you that landscapes are the identity of Normandy.,It is in Normandy that we invented the notion of landscape and notably seascapes. We invented it for a first time in contemplating the sea for its own sake. It was in Bernières-sur-Mer as early as the 17th century, that the Caennais poet Jacques MOISANTde BRIEUX installed a terrace in his manor house, which is still extent from which he could see the sea and walk along the seashore. It was not really fashionable then. Alain CORBIN the great historian of the cultural history, the history of what is obvious who tells us in his book, who tells us the story of this conquest by the west of shorelines, the conquest of the desire of shorelines.And that happened here in Normandy. What can we see from the viewpoints? What can we see from the beach? Who invented the notion of viewpoints, belvederes? It's Bernard de Saint-Pierre, the great writer who wrote Paul etVirginie, he was a botanist, a naturalist. And the first belvedere with an orientation table that he talks about was the Cap-de-la-Hève in 1800. It's also here that we learnt to paint in the open air. It is for that reason that we have the Normandy impressionists. It is here that COURBET painted the beaches. There is a tableau by COURBET, which represents the beach at Saint-Aubin and so forth.

So all I wanted to do here was to remind you of that without no spirit or argument. I'm not a technician as Mrs d'ORNANO said. That's not the point of the evening. I could talk about how interesting wind energy is. I'm in favour of renewable energy. I'm in favour of a specific industry for the future of Normandy in that area. What I would just want to remind you is, considering the immensity of this memorial landscape, which goes beyond questions of the D-Day landings, which justifies a World heritage classification by UNESCO, not only because they are the place of memory for the last world war, but because the aesthetics, the role that the Seine bay in Normandy has played since the first great travellers from England, I'm thinking of TURNER, I'm thinking of BONINGTON turn amongst them. It was Normandy that invented cultural tourism right from the very end of the 19th century. So in view of all this and on behalf of the SPEFF we are asking that the stakeholders in cultural tourism, for example the regional tourism committee, the historians of cultural history should be consulted in the same way, as well as the memorial might have its opinion with regard to this question of the landscape impact of these wind turbines, which may be considered as an industry of peace. Actually after the industries of war, so a sign of appeasement, I agree completely with that approach. But I think that in the name of the universal history of Normandy both with the D-Day landings and this history, which is less well known, but which it is worth knowing, the history of ideas, the history of aesthetics, we are asking the project to be reconfigured in order to reduce the visual impact to the minimum. Thank you very much.

Claude BRÉVAN, President of the CPDP

So I would like to specify for all the assembly the SPEFF has drafted 4 pages. I don't know if it is available yet. It will be very quickly available and so you will find the main points of what has just been said with a certain number of arguments around it, developing his ideas.

Roger SILHOL, member of the CPDP

There is a second person who wishes to speak here. Sir.

Philippe OZANNE

Philippe OZANNE. I am an engineer. I'll be very quick. I have an opinion, which is radically opposed to what we've just heard. I agree to Madam d'ORNANO's words, paying a tribute to our liberators, that is also moving forward. I go further. Moving forward with the tools they have forged themselves. There were the pioneers in their times of radars that made possible to beat the German armies. Radar that now makes it possible for us to study the sea, study the ocean and meteorological conditions in order to be able to build things at sea. They are also the pioneers in platforms that are developed in offshore technologies. We have examples of that with wind turbines. And the Winston Churchill port, which is emblematic. We are currently developing the technologies of which our liberators were the pioneers. So that's the comment I wanted to make, which seems to be supported by the Canadians who think about this past. I may have a question to ask but I'll keep it for later. I'm going to ask it to Mr Bernard GUITTON a littlelater.

Roger SILHOL, member of the CPDP

Thank you very much for being so concise and for having separate your questions in order to allow us to remain within the notion of historical and memorial landscape sites.

Yes, there is a gentleman here. Sir, over to you.

Jean-Claude LECOUTIRIER

Hello. Jean-Claude LECOUTIRIER. I live in Courseulles-sur-Mer. I retired from television and I now run a restaurant during the summer season. I would just like to say that I remember my mother telling me that on the day of the landings she was walking along the dunes at Ver-sur-Mer where the British troops landed and the bombs were flying over her ears. She was astounded as you can imagine. But she added that the tableau was unreal.The ships appeared out of nowhere stucked between fog and impressive waves. It's her testimony. That is to say that the sky is not always clear in our beautiful region. So now there is a debate around the places of memory and the wind turbines, I would just like to remind you that the establishment of turbines at scale 1 has for at least one year, filmed image by image would give an idea of the impact of these wind turbines on our coasts. Thank you.

Roger SILHOL, member of the CPDP

Have we understood you correctly? You'd like to see one turbine for one full-scale turbine?There is a person at a row or 2 behind you who wants to take the floor. Please, Sir.

Adrian COX

Good evening. Adrian COX. I'm an elected representative here in Arromanches. And as you can guess from my accent I'm British. I've come here without preparing anything to say but I wanted to listen and learn things. I would like to say that I agree completely with these sentiments brought up by Madam. I work with the veterans, I work in tourism, I work a lot

with the Normandy veterans' association, with British veterans. I also work with the royal British legion. This is the biggest organization of former combatants in Great Britain. And I'm completely in agreement that the aspect of duty memory is important. And I completely agree that broadly there are always differences in a group, but broadly. The aspects memorial duty is important, but the veterans, as far as I know, my knowledge is fairly broad. I think it is not really important, the wind farm is not really important for them. The only thing they were scared of, perturbed them, and encouraged them to write, to respond to articles we find on the Internet, is the fear that these turbines would be on the beaches or on the vestiges of the pontoons. And I was obliged to explain that because I am well known in the community of veterans in Britain. I have a lot of members of my family who live in Canada. And so over the last 2 or 3 years I've received emails from veterans angry saying: "what are you doing there? You are going to put wind turbines on the beaches." And I've been obliged to explain to them that this is not the case. These turbines are fairly far away from the sea. I'm saying fairly faraway, I'm not sure, so I'm here to learn a bit more this evening. But I find that many veterans that have been scared, only because of the lack of detail in the presentations that have been made on the Internet.

Roger SILHOL, member of the CPDP

Thank you very much, Sir. I can see a hand raised here. Yes, Sir, we will give you the microphone.

Karel SCHEERLINCK

Good evening. I'm sorry. I'm not either French or English. I am a little limited with regard to my vocabulary.

Roger SILHOL, member of the CPDP

It doesn't matter. I'm sure that we will be able to understand you.

Karel SCHEERLINCK

I will do my best. What worries me is really, how can I say this, the landing beaches, because I was touched by Madam's speech. The landing beaches do not belong to the French. They belong to history, to our ideas, our values, to our lives. Thanks to these people, I have the right to address you freely this evening. It is here that the free liberation of Europe, of the entire world began. This is a place full of memory. It is a historical place. And I do not understand at all why we are choosing the D-Day landing beaches for the purpose of building a wind farm. If you allow me to, I would like to make a comparison. I do not think that the Germans are going to build a wind farm beside the ruins of concentration camps. These are sacred places, which are worth more. That's all I wanted to say. Thank you very much.

Roger SILHOL, member of the CPDP

While you have the microphone, please could you tell us your name? And perhaps tell us, you said you were not a native English speaker, what is your nationality, what is the language you would've preferred to express yourself?

Karel SCHEERLINCK

My name, I will tell you, but you will not be able to pronounce it, Karel SCHEERLINCK. I'm a Belgian. Flemish is my native language.

Roger SILHOL, member of the CPDP

Thank you very much. The Lady here in the middle. Please raise you hand so that the hostess can see you. We are to pass on the microphone to you. Thank you Madam.

Gisèle FORKNALL

Good evening. I am Madam FORKNALL. I'm a honouree member of the 9th British Battalion and my spouse landed here at Pegasus Bridge. How can I say this. I participated in the commemoration. Perhaps, I see people smiling about my age, but there was a 21 years difference of age between my husband, and myself because I saw some people smiling. Having said that, I live in the south of France but every year I come here for the celebrations and notably at the Merville battery and at the Ranville cemetery. And there at Merville-Franceville there are only six veterans of colonel OTWAY's group of commandos. Only six of them are still alive. And I agree completely with what this sir has just said.These veterans who are very tired, they are at least 88 years old and older, they still have the energy and the courage to march through the battery of Merville-Franceville, all being with walking sticks. And I think we have a duty to respect them. Wind turbines, yes, fine, but not here. I am completely against wind turbines. I am going to say this very loud and clear,on the D-Day landing beaches too much blood has been spilt here. It is not possible for our children, our grand children for them to see this wind farm. Perhaps we could put a Canadian flag or an American flag on them to symbolise what took place at those landings. But in fact I think we owe, all those soldiers and those veterans that I saw again this year, them respect for what they did, the freedom they gave us. Thank you.

Roger SILHOL, member of the CPDP

There's a hand being raised over here. Yes, Sir, we will bring you a microphone and there are two other peoples over here.

Peter HEERLY

Good evening. I'm a former colonel, Peter HEERLY in the American army, so another voice of the allies. I'm the president of the American association, which supports the memorial days every year in many military cemeteries around France. I've also been for 12 years the director of the program, which brings a lot of couples of American officers to these coasts in order to allow them to study the history here. Speaking on my own behalf but I know I'm very close to people who live here and the three regiments, which I had the honour of commanding of course after the war. I'm not that old, but the three regiments landed here. The sea was not empty on the 6th June. The 4500 ships and barges have really disturbedyourbeautiful seascape. And I can imagine the first reaction of some Americans, who are close to this history, some people would say: "Oh that's a sacrilege!" I don't agree with that point of view. And I think that it will be possible to lighten the strength of those sentiments if you go a little further. Maritime history is not part of what we are saying. And that's what people said, it's on the beach. But I insist on maritime aspect and the exploits of the allied marines. So out of here the USS Nevada. The battleship of BULOLO commandment and the GeorgesLEYGUES. And there is one missing from the free French navy in August. Very often I point outto the group: "Look at this cargo ship at sea. Just imagine 850 ships from the force coming into Gold or Omaha or Juno". And if you pay attention, in Trouville there are some big panels, which show thebelfry as it was and just before the current belfry. Why not set up panels along the beach, show a perspective on the allied fleet, which could

be combined with a perspective of the wind farm, the offshore wind farm.For me it will be an asset. But above all, it will respect what every one else has said. That is how I appreciate tremendously appreciate, the nature of the sacrifices that have been made here. Thank you.

Roger SILHOL, member of the CPDP

Thank you. I saw some people who have asked to speak. Please raise your hand so the hostesses can see you. I can see a hostess bringing you the microphone, Sir. Then there is someone behind you who has asked to speak. No, no. Over to you, Sir.

Guillaume GICQUEL

I'm not used to speaking in public.

Roger SILHOL, member of the CPDP

Please tell us, who you are in order to record it in the report?

Guillaume GICQUEL

I'm Mr GICQUEL. I have several questions. The number of jobs…I prefer sitting down.

In short I had a motorbike accident 10 days ago. Bu I'm ok. Well... anyway.

Roger SILHOL, member of the CPDP

We can here you even if we can't see you. Please speak directly in the microphone.

Guillaume GICQUEL

I would like to know how many jobs will be created by this project during the construction phase and then during the maintenance operations? I've heard of a depth of vision. I've seen on the maps. That does look like a lozenge. A lozenge why is it that shape? And why is it not something different? And why it doesn't represent… I don't know what, something else. I think we've been establishing many links with the war. I don't know how many shipwrecks there are on the seabed. Perhaps we can put as many wind turbines as there are wrecks and we could put one on the others. Somebody's mentioned of having a full-scale turbine 1 just to have a perception of what it is. I think it's a good idea to start with. And then the wind turbines could float, so we could perhaps move them, one or two, we can move them to… And personally, if…. And also with regard to the tourism aspect, with regard of a view from the sky that can represent something, which could be commemorative with regard to the war or something to do with ecology. I don't know. We align 3 wind turbines and the north will be in front. There are lots of ideas that perhaps could be tackled. Personally I'd like you to explain me the lozenge, the geographical shape of the park.

Roger SILHOL, member of the CPDP

So we'll been talking later about the visual aspect, which could complement your questions. There was a meeting in Caen where there were a certain number of responses to the questions with regard to job creation, notably in the construction phase. Concerning the establishment of the park and the operation of the park, the meeting will take place in Ouistreham next week on the 20th June. You will have all the answers necessary there. And you will find the answers on the website if you cannot come to the meeting, including on the aspects linked to job creation of course.

Guillaume GICQUEL

Okay.Are there training aspects, which are linked to these job creation?

Roger SILHOL, member of the CPDP

All the human resources' aspects will be addressed by the contracting authority for that meeting, in which he will mobilize his team who has already took part in one of the debates. Over to you there are people, who wish to speak.

Guillaume GICQUEL

Just a last question.

Roger SILHOL, member of the CPDP

As you want. I'm quite happy to give you. Over to you. But other people want to express themselves.

Guillaume GICQUEL

There a several documents in the entrance hall, several disparate documents. If it's possible to make a pile for each person with full documents, it would be easier.

Roger SILHOL, member of the CPDP

Thank you very much for your suggestion, Sir. Now over to the gentleman with the hat.

Guillaume GICQUEL

And last suggestion. Perhaps we could have a power point presentation because not everything is easy to understand in the graphics you have provided.

Roger SILHOL, member of the CPDP

Very well. Thank you Sir for your observations, which will enhance the debate. Are there any other questions? A question here, if we could bring the microphone at the 3rd row. This man who wears a cap.

William JORDAN

This is not a question it's an observation. My name is William JORDAN. I'm the president of the France Great Britain association in Caen. I've been guiding visits on the landing beaches for the last 23 years. I would like to call on your historical imagination. In the film "The longest day", we created at Longues-sur-Mer, Helmut PLUSKAT, who is looking out from the firing command post something which is getting nearer and he says in English: "Incredible, incredible, there are at least 5000 ships out there and they are all heading for me!" And I think he fainted. "Incredible there are 5000 ships coming towards the coast." Whereas shortly before there was nothing. There was an empty horizon. And I think for the purpose of recreating that moment we need a tabula rasa, like an artist who needs a piece of paper or an empty canvass in order to allow us to evoke what we want to say, what we want to allow people to imagine about this momentbecause it's through surprise that success will be guaranteed. The anticipation of this colossal flotilla, this colossal fleet containing tens of thousands of propellers on planes, on ships, the battleships and the landing barges. And those propellers were getting closer to the coast. They were moving. And the surprise was total. We do not have the right to have Helmut PLUSKAT saying: "Incredible, incredible, there are 75 propellers stuck in the sea, 75 props grounded to the seabed set forever. We have dared to fill up our D-Day landing horizon with something, which we can perhaps

justify. But it is not up to us to do it, like some other spokespersons have said. We must leave the horizon open for our imaginations. And here I would like to quote Winston CHURCHILL, who came to Arromanches on the 12th June. He observed on the right and on the left. The water seemed covered with a prodigious mass of vassals of all sizes as far as the eye could see. Never this type of image had seen previously in the history of the world. And I doubt it will be seen again. Thank you.

Roger SILHOL, member of the CPDP

Thank you very much. There is a hand raised here. Then I will hand over to President BEAUVAIS if there are no more comments from the floor.

Christophe COLLET

Good evening. My name is Christophe COLLET. I'm the president of the Westlake Brothers Memory association. We promote the duty of memory to our Canadians. It's specific because we are interested in young people for whom we organize some 15 or 20 events every year. I've been asked to come here by my board of directors in order to assert that the wind farm does not pose a problem for us to the young members of my association. They think that it is not the problem. For them the duty of memory is something that people carry in their hearts. And they have no concerns with regard to these turbines at sea. They would have had indeed, should they have been planned on the coast, but the fact that they are off the coast is not a problem for them.

But if you allow me to conclude, two years ago I was at Courseulles-sur-Mer and I met a veteran, I talked with him and he looked inland and he said: "This is not my beach. When I landed here these marina were not here. These blocs of flats were not here, the buildings, which interrupt the landscape. I have friends who died here under those blocks of flats." But we've never had a public debate around the use of marinas. Thank you very much.

Roger SILHOL, member of the CPDP

Several times and not just this evening but on other occasions we have talked about the problem of listing the Normandy beaches on the UNESCO world heritage list. I would like to conclude this phase with some remarks by the President of the Region, who has been carrying this project to have the beaches registered on the world heritage list. Over to you, Mr President.

Laurent BEAUVAIS, President of the Regional Council

Thank you very much for allowing me to speak. Greetings to each of one of you. You're very numerous. That was the case in Bernières. Recently these meetings interest everyone and the comments that have been made show this interest. So I am going to have a rather more prosaic intervention. Having said that I can't prevent myself from making two introductory comments. The first one is that Jean-Karl DESCHAMPS, the first vice-president, here at Bernières reminded that the Basse-Normandieregion as a territory authority of course, supports this wind farm project for reasons that are related to a national energy policy, the energy transfer policy but also with regard to territorial development because earlier there were questions about jobs and the meaning relative to what does it stake in the region, which have been partly mentioned by Mrs d'ORNANO. But also for a second reason,through

this UNESCO project. And my speech will be a little less touching than what has been partly presented earlier by Madam d'ORNANO, which is that, as well as for our beaches, for this event this 6th June and for our local authorities, which have just celebrated the 60th anniversary and who are on the point of celebrating the 70th anniversary, I think that through this UNESCO project, we should give it all it significance in the most global sense, but also with regard to what does it stake with regard to the development of this territory. And I think the two projects are compatible.

And I would not wish to instrumentalise, as indistinctly as possible maybe, but even so, to instrumentalisethe UNESCO project in order for it to be presented as an obstacle to thewind farm project. And I read here and there some interpretations, which could allow people to think that UNESCO deal might set back the wind farm project. I'm going to try to demonstrate with some precise facts or calendar items that, that's not the case and that after this last intervention in the name of young people that the duty to memory and the perception towards young people on the past, is completely compatible with the future, with this future that this wind farm can represent well beyond our own territory, respecting veterans, their families and the allied countries who have celebrated the 69th anniversary with us just a few days ago. I have also met veterans and I think that we should not over interpret what can be said or that we should make a well consideration in this area.

AsI can't see anything on the screen here I hope that everything will be properly synchronized. For us it is a question of insuring that these beaches, this D-Day landing site can be classified on the UNESCO world heritage list. There is a very specific procedure. It's related to our convention from 1972 establishing the conditions under which a site can be classified for cultural and natural reasons. There are 962 areas, which are registered in the world, 38 in France. The Mont-Saint-Michel, which is so famous and so beautiful, is one of the things in our region, which is on this list.The Tour Vauban at Saint-Vaast-la-Houguehas also been classified some time ago on behalf of all the Vauban towers around French territory. It's a very specific procedure and it refers to criteria because UNESCO and its convention have established 10 criteria very precisely for a property to be listed and for us to inscribe it as an exceptional universal value. For us we will use 2 criteria from those 10. The 1st is a criterion, which is a material dimension. The 2nd represents a symbolic dimension. And of course it's freedom, liberty. I'm going to read those two criteria because they speak for themselves. The 1stone, criterion 4 says that we have to offer an eminent example of an architectural or technological ensemble or landscape illustrating a significant period in human history. And I think that in itself I've almost said everything that needs to be said. The 2nd criterion is directly associated to events or ideas that have a universal and exceptional significance. Of course bringing liberty in a way it was done on the 6th June in the extension of this exceptional fact, which was the D-Day landing, correspond to our minds exactly to those 2 criteria.

With regard to the process, which will be triggered from that starting point. We've been working on this project for 3 or 4 years. Thereforewere working on this project before the beginning of the wind farm project. But the national approach was developed downstream from that. But I think you know the different calendars can be specified. We must work on the elaboration of a file because this question of classification has a 2 phase process. People often confound these two processes. I have even seen written somewhere: "quick, quick we have to get world heritage classification and that we will be able to get rid of the wind farm."

I heard that, I'm not inventing. It's much more complicated than that. I'm sorry for those who oppose wind farms, but it's a bit more complicated than that. When a country, when a territory has a project there is first of all a national phase, an upstream phase. You have to be registered on an indicative list. Every country, which is a member of UNESCO, every year proposes on a list a classification of projects and establishes, the country, the government establishes a choice, priorities and then that is transmitted to the UNESCO and they say:" My proposals are thus classified: Priority 1 is this, priority 2 is another project with." In general we stick to that. Then the procedure takes place in the entire scope of theUNESCO, exceeds the country,which has made proposals and another procedure is undertaken, which ends up with a definitive decision by UNESCO. All this takes a certain amount of time obviouslywith regard to what concerns.

As far as we are concerned here on this classifying project of the beaches in the UNESCO world heritage, we are working on the elaboration of this file, in order to the classification on the indicative list and of course hoping to be at the top of that indicative list. When the President of the Republic invited us last year during the celebration, invited us to persevere,we were looking at a deadline, which could be a possible step, of next year on 6th June 2014, as a moment when the government could express its opinion and could decree – I'm talking in the conditional – that this project is the number one or number two project that it will present to UNESCO. But in order to get to that point it's not a matter for the President of the Republic or a few ministers, it's up to us. It depends on the work that we will be doing in order to ensure that this project can be classified. This subject is in our hands and the objective for next year or maybe the year after is for us to be classified. Therefore, at the moment we hold the project in our hands and our target is to obtain next year, or if it's not next year, the year after, the classification of our project in the UNESCO world heritage.Then there will be a long period. First of all the government of our country continue to working on the territory involved. From that point it becomes a national project. That takes time as well. And when the government decides that everything is well prepared it transmits the file to the UNESCO. There is a minimum 18 months for UNESCO to study the file. And then the world Heritage within UNESCO takes its decision. So when we see the countdown, we can see when are the wind farm going to be built? 2017.

Roger SILHOL, member of the CPDP

Yes the beginning of the construction will be 2017 and they will start operating between 2018 and 2020.

Laurent BEAUVAIS, President of the Regional Council

And so this question of classification on world Heritage it would be good for it to go fairly fast. But I have the impression that the procedure with regard to the wind farm will have been decided upon. The project will have gone into development. Obviously we will develop our project in parallel with the wind farm project. But the region and all its partners, it is obvious that it is important for the Region and its partners to present a project including from the outset the offshore wind farm. We have a contact with the Ministry of environment, the investigating Minister. We have the name of an investigator who was involved several times here. And so we have elaborated this file, we have worked on the definition of universal value. We worked on the comparative analysis of the different sites and properties, which are potentially in the indicative classification. And we are also

establishing what we call a management plan because as you will understand constraints are numerous, in order to maintain the classification and the rank, which we attain within this promotion and enhancements through the UNESCO.

So in this respect we have followed procedures and things are going very much as we would wish in order for that to be established. We are not working alone on the procedure that we have defined, when I say we, I mean the Region. Of course we work through with a state representative, which represents us in different local committees across the Department. We even have enlarged the meetings on a few occasions. Not too long ago we worked' with Mayors, the Mayors of the 5 beach towns who are involved. And we also have a completely scientific approach with experts, historians, but not only, who work beside usand who have already worked upstream, on the preparation of the file that many people know and can find in a small presentation. And this scientific committee of course is continuing to work with us and they have a very important role and will continue to have that role until the end of the procedure. With regard to the debate this evening, as I was saying a little earlier, it is important that we in the region, in the regional Council and our partners… I think I'm not on the right slide, I'm sorry, it is a little complicated to see where we are with regard to this slide. I'm lost. This is not exactly what I wanted to show you. I'm sorry. What I can say, it's much easier to read it. So I'm a little embarrassed, sorry. What I wanted to indicate in our approach… I'm trying to find the right slide. I don't think we are going to get there. So I think I'm going to have to stop furthering around with my remote control.

Claude BRÉVAN, President of the CPDP

There are big signs at the back of the room. If you could just say what you wanted to say with your…

Laurent BEAUVAIS, President of the Regional Council

So the approach by the people, who are running this project in the region, is to ensure that we can make the site compatible, these sites that we want to involve in this classification exercise and also the human activities. And I thank the person who spoke earlier whom was talking about town planning issues and these fantastic beauties that we find in some beaches built in the 1970s, which were built without a murmur of protest. I was a little young so I don't remember, but it's good to bring back rationality sometimes on certain facts. Over time these things evolved and the arrival of this wind farm is part of the evolution of this human activity even in their impact on the beaches and on the environment. And we are keen on emphasising the constraints that the UNESCO file will involve. The Mayors who are here, the Mayor of Arromanches, they know what I'm talking about because for a long time Region throughits action with the Conservatoire du littoral, but also through operations on differentsites that have been launched over the past few years with the county council of the Calvados, we know how constraining it is to maintain these sites. And if the classification is obtained there will be more constraints and we will have to delimitate very precisely these zones in order to reduce constraints. The wind farm will represent constraints. And of course I believe that one should know that environment today generally also means constraints. We have to assume this. And we want to make it compatible with these two aspects.

We are currently launching a study in order to finalise things more specifically, in order to provide answers to UNESCO. In anticipating the questions of UNESCO will be asking itself

with regard to our approach at that stage at the national level, in order to have all the information necessary here again with regard to the visualisation, the virtual visualisation at that stage, but also scientific and technical as possible with regard to this future wind farm, when we see the sea, but also the view of the land of the sites today, what they are and the evolutions that have been conceded, in order to define a perimeter precisely, identify assets and through these perimeters and assets, enhance the values, which I was mentioning earlierin this article, which is for us the value of liberty of course. And so you would understand that in these debates our position is to seek this kind of ideological vision, anti-wind farm that some promote in their lobbies and on the contrary to evoke the subjects and to be interested in the questions that veterans are asking themselves. To our mind this work within the context of the UNESCO file has to be run in a spirit of dialogue, of communication. We do know that the turbines will not be on the beaches. But it is true that sometimes, in some cases nowadays, the information has not been translated very precisely and so it is necessary to do that again.

Last Saturday I met somebody from the embassy of Canada, I don't know if he's here this evening, he said he might be there this evening in order to relay the comments that someone was making earlier. He said to me: “communicate better, explain better why is for you the UNESCO project possible and compatible and why the wind farm…”. He knew they weren't going to be on the beaches, but he had heard that maybe… So we have I recon a hard job in explaining things. SO we are going to continue to work, to finalise this impact study on the landscape of the project, but also the impact of the park, but also what we want to express with regard to this concept on universal value of liberty. And we're going to work on the delimitation of the buffer zones, which are necessary zones… beside assets and places, which have been identified, and intermediate zones, which make it possible to provide support to the project, and of course to work on a management plan because it's very important. In one word, let's not compare what happened to the Mont-Saint-Michel with the current subject. The Mont-Saint-Michel was classified before there were any wind farm projects. The problem of the Mont Saint Michel is that the management plan was not established and UNESCO let us know that it was necessary to have a management plan but it also had to be applied. With regard to the Mont-Saint-Michel when it was classified it seems it would be incompatible with any wind farm project. And besides that project was shelved and today it has been abandoned.

I hope I've been sufficiently precise. By the way I would to end by a reference. I must do it after what everyone has said, following on from Madam d’ORNANO and what other people have said. The image of our region is at stake in what we are dealing with this evening. The image of ourcountry probably, but I remain modest. The image of our region is at stake. The collective determination through these beaches to emphasize the values the Landing represented and established here in the minds of Normands, but in the minds of people all around the entire world. But again to ensure this image through the wind farm project is an image of modernity, an image of the future. We can’t remain stuck in the past. And I have great pleasure on conjugating these two exercises, the UNESCO project and the wind farm project, which I believe to be entirely compatible. Thank you very much.

Roger SILHOL, member of the CPDP

Thank you very much Mister President. Communicating, facilitating the expression of the wind farm and what goes along with it is the topic of our debate this evening. Mr LECORNU

would probably like to speak. Sir, Mr LECORNU, because the meeting is quite far along, but we are happy to listen to you Sir.

Gérard LECORNU

Thank you Mr Chairman. I'm going to be very brief. I know that time is precious. In this room I have many friends. I've lived in Arromanches for 17 years. In 1988 our association was born here. And I can't help thinking here in Arromanches about the person who designed our artificial port of Arromanches. In the framework of the preparation of the 50th anniversary of the landing I was fortunate enough to go to Great Britain and to meet the designers. We have developed some very close ties including with their families. They came here. We went to London and elsewhere. They left me a message. The message that was left for me was to save the port of Winston, to do something for the port, that they were the designers of and that they built, and that havelived. And I can't help thinking in Alan HARRIS and Alan BECKET, John LUCK and others. These people are forever engraved in memory. And this evening I would like to launch a call to all the decisions makers so at long last we can start saving this place of rememberings and recognition to our liberators.

Roger SILHOL, member of the CPDP

Thank you Mr LECORNU. I know that earlier in one of the projectors used by President BEAUVAIS that the regional Council wishes to have everything, all the elements of impact on the landscape. Perhaps we can deal with that particular sequence on the impact on the landscape. We'll have a master of ceremonies here and I will hand him over the floor.

Jean-Louis CHEREL, member of the CPDP

A master's ceremony is a big word. Mister Loyal, maybe. Good evening Ladies and Gentlemen. After the beginning of the meeting, which was very well held and very moving and strong testimony we are going to change topics and we are going to look at a question, which interest you all. Professor BRUNET talked about it in his speech: what will we actually see ? How will we see these turbines? So we will try - these kinds of things are always limited in time - we are going to have to look at how the designer has designed the project to attempt to limit, if he says so, he says this, to limit the visibility of the wind turbines. And then he will hand over to a specialist in visualisation of photographic evidence, who is here, a representative fromGeophom. They've put together photographic projections that you can see on your way in, in the entrance hall, but also on the Internet site, which are interesting. They are interesting but are they true? Are they sincere? Are those photomontages, I was going to use the term "phoney"? We've heard people say this. And we are fortunate enough to have with us here this evening an expert, as the Chairman said, Mr VEZIEN, who is on the side and who will come to say what he thinks of it. He has analysed the photographs that have been put together and he will give his own conclusions. I would like to hand first over to the prime contractor to say how he is going to limit the visibility of these wind turbines. Sir.

Bernard GUITTON, Director of the project, EDF EN

Perhaps you could project… thank you very much. OK. I'm going to present very quickly because as Mr CHEREL says the time's short, what were these ideas that prevailed when we where designing the wind farm. First of all the consortium who has been allocated to project is EDF New Energies, which is…

Claude BRÉVAN, President of the CPDP

You can go faster with this, but first of all it is interesting to say that this is not the consortium that has chosen the site. It is the government that created a call for tender to a certain number of sites. They were all already determined. But if you could go faster than this on these presentations because most people here knew this. They know this part. And we have to get to the questions about the visualisation. Thank you Mr GUITTON.

Bernard GUITTON, Director of the project, EDF EN

Dong Energy, a Danish company andWpd present in the region since 2007, which is a player in our offshore wind. And we have a unique partner, which is Alstom, which is going to be supplying the turbines.

As the chairman said the choice of the sites is a result of a consultation that took place on all the coastlines between 2009 and 2010, particularly with the Channel coastline and in the North Sea.And so at the end of this consultation process, which was carried out by the aegis of maritime prefects and the region prefects, five areas were selected following the process: one is in the Tréport, one in Fécamp, one in Courseulles-sur-Mer, one in Saint-Brieuc and one in Saint-Nazaire. And this enabled to launch in July 2011 a call for tender, which concluded by the attribution of 4 zones in order to create wind farms. The Tréportwas declared not fructuous. And so Courseulles-sur-Mer was part of the zones that had been selected in April 2012.

So when the government indicated the area that was made available, we have in parallel with territorial authorities, tried to understand what the issues were and what were the wishes, in particular with the users of the sea to design the wind farm in this place that was indicated. One of the first things that came out of it was to limit the appearance on the horizon of the wind farms and notably from the Arromanches site. The fishermen asked us to keep out from 5 nautical miles from the CussyBouée, because that was a major source of scallops. And also to be to the south of La Caracasse ship wreck, to facilitate the transit of fishing ships to the North of this. And to privilege an alignment of wind farms along the lines of the current, in the same direction, as the marine currents are oriented at 100 degrees in order to preserve then the fishing opportunities inside the farm.And finally, reducing the right-of-way involves reducing the surface of the field. So we have. And for the project today we've only used 50 km² out of 77 that theState had made available i.e. roughly 2/3 of the surface.

This map shows the superposition after various issues. We have the fishing areas and the scallop area around the Bouée de Cussy. We have intense trawlablefishing areas, the Parfond and le Creux. You can also see the maritime traffic coming in and leaving the ports of Ouistreham and Le Havre. There is one green area along the coastline because we are asked to be more than 10 km from the coastline. So there is a blue-sky zone which remains and which is basically the area made available by the government, which is the so-called least constraining area.

So several configurationswere studied in this zone, this kind of lozenge that Sir was talking about earlier. And finally the configuration that was selected was the one in the lower round at the right hand corner in green, which made it possible to reduce the surface area to 50 km² with the alignment parallelwith the current and, which limited the right-of-way from the site of Arromancheto 49° on the horizon, with a kind of a symmetry because there is a whole

line from the orientation table, where all the wind turbines are aligned behind one another. And either side of the line, there is a kind of symmetry of the wind farm. So back to the view I showed you earlier, which symbolises the France blue area where the wind farm is located and the navy blue area which represents the total area made available by the government within the framework of the call for tender, with the purple spot,which is the Carcacasseshipwreck that I was talking about earlier.

So what does this field can produce? This field would enable us to produce1 500 GWh per year, which represents roughly the electrical consumption of 630,000 inhabitants i.e. There are 686,000 inhabitants in the Calvados area.Just a bit of information of financial nature. The construction represents an investment of 1.8 billion euros and the cost of our operation is estimated at €50 million per year. I went a bit over but that's about it. Now I will hand over to the expert in photography.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr GUITTON. You would have noted the conditions under which the wind farm is envisaged, the facilities are envisaged because nothing is yet been decided. We will move on to the questions after. But I would like to first ask the representative of Geophomwhose done the photomontage to explain how he did it.

Franck DAVID, Géophom

Ladies and Gentlemen, good evening. Geophom, there is no ‘r’. Geophom not Geophorm. Can we show pictures? I am Franck DAVID. I do photomontage and have done so far for roughly 10 years of wind farms. I first started to work in design offices for offshore wind farms and since 2010 as an independent under the name of Geophom. So I worked on many projects from 2010 roughly 30land based projects, and notably for the 4 offshore of the call of tender, part 1.

So First of all, before we talk about the method to produce the photomontage for the Courseulles project, which you actually saw in this room or in the Internet, I would like to go over and redefine what photomontage is, what is the tool like. You can understand that it's a tool to assess the visual impact of a project. You must understand that photomontage is an assessment tool of the visual impact of the project. You're actually staging the project in its environment scene from different points of view in the landmass. All of the photomontage have to offer a sampling, a representative sampling of the visibility of the wind farm from different points and under different conditions of visibility, under good conditions of visibility and not so good. And to do so, they have to be very realistic and precise. The presentation should be properly framed so it doesn’t falsify the interpretation because in terms of interpretation, we can see everything and it needs to be made based on the recommendations of the State. There are limits to this, you have to be aware of those. It's not a miracle tool. There is an impact under certain specific meteorological conditions, which are those of the shooting, of the lighting. It's the lighting at the time the picture is taken, the position of the sun. It's a certain time of day. So it is at a precise moment of the day, at a given point, as I said earlier, with a specific orientation of the rotors, which is determined in advance. So this is really a snapshot. It doesn't take into account the depth of field. It doesn't take into account the movement of the blades or of the landscape in front of the view. It's a static picture.

I am going to detail the various steps, the photomontage process. The first step is to choose the viewpoints. I didn't choose these. The actual prime contractor did that.

Jean-Louis CHEREL, member of the CPDP

Sorry to interrupt you. Could you indicate at this point the points of view that were chosen precisely? Without listing them, but say, how many points of view you have chosen and that we find in the photomontage.

Franck DAVID, Géophom

I was going to say that actually. There are some 30 points of view that were selected by the contractor and the landscape manager, from the island of Tahitou up to the Cap de la Hève, but mainly on the coastline of Calvados. Therefore we have 26 points, I think,on the coastline of Calvados and 2 in the English Channel side and 2 in the Seine-Maritime side.

So the choice of the viewpoints, as I said, is a matter of the contracting authority who hands me over the positions. I go to the site and I take the photographs. And based on that I come out with a panoramic view, as we see over there, but at 360 degrees. Then I insert the turbines in those pictures. And then we think about a support for the presentation that would respect the proper conditions for observation.

So I'm going to detail this. It can be kind of technical, be brave. On this slide we see the points of view that have been selected for the photomontage. We have here concentric circlesat every 10 km away around the proposed area.

Jean-Louis CHEREL, member of the CPDP

The concentric circles represent the distance, right?

Franck DAVID, Géophom

Yes. The distance to the closest turbine, around the park.I went to this site in August 2012 in suitable weather, where there was good visibility. I went back on September and then lately in May to have 2 additional points of view at the request of the CPDP. The weather wasn't as good. So I go to the field. I take pictures, moving with the sun in order to have a solar orientation, which is quite strong towards the wind farm. The shooting consists in coming on site, choosingthe point of view that is designated but not precisely designated by the contracting authority. So I take the initiative of choosing a point of view, which will be most revealing or open up to the park, which will enable us to have elements on the foreground. Once you know the dimensions such as people and various items, they can enable us as an observer to have an idea of the scale of the photomontage. It is very important to have that. If you only have the sea you don't know exactly where to place yourself, which scale to select. And you need closer objects that help to put in perspective, it's a good thing. The equipment I use here on the photograph, where you can see the topside…, obviously there is a tripod, which is stable. I have a leveller, which enables me to have a totally horizontal position. So that's the blue thing there with a nob on the base. And there is a bubble level to find tuning. And above there is a panoramic head, which enables us to rotate every 24° and to avoid parallax issues between two subsequent photos. I can explain that to you later if you like. And above, a camera full format reflex very high resolution, 36 mega pixels.

Claude BRÉVAN, President of the CPDP

If you allow me , you might be surprised at such very, very, very technical explanations but this was contested by many interventions. The method on taking the photographs was contested. So perhaps you could go a bit faster and we will make a written answer to the protesters, because I don't understand a thing basically. I have no doubt that the assembly understands everything, but we want to respond and explain very precisely to those who, in writing, have called this into question your methods and the technics.

Franck DAVID, Géophom

Okay. So I'm going to sum up a little bit then. The idea in general was to take 15 pictures that will enable us to put together the 360 over view. As you can see on the slide, on the bottom, you have a representation of the camera with those 15 photographs, which overlap and which will enable the future connection.Once the photograph is taken from one point of view, ON RELEVE LES AMERS, that is to say welook at all of the identifiable items which would enable us to put the pictures into perspective, whether any kind of tower, bell towers, water towers, pillars, anything which would enables us to geolocalise on an aerial view. So that is identified as well as obviously the position of the point of view it self.

Then we create the panorama based on these photographs. I use specialized software to assemble panoramic pictures called Hugin, which is an open source software. And you can clearly see in the picture in the bottom, in red and in blue, 2 of the 15 pictures that are overlapped. And therefore you can perhaps as well see the green crosses, which are the points where they glow together and the points that are present in both successive images. The image is kind of sewn together based on those points that I chose myself. So we get a 360° picture, very high resolution with very big pictures. I don't know,it may not be intelligible for everyone but over 66 000 pixels wide and 5000 pixels high, that's is huge. The size of the file is 2 10 Giga bits, which is pretty weighty. The brightness of these pictures has beendigitally altered.Weclean up the picture basically. We also hide out, you know, licences plates and peoples' faces and things like that so they cannot be recognized.

Now based on this 360 panorama, the contracting authority chooses one part of it to present in the photomontage. So basically they choose 180 degrees, which of course is in view of the site, but which can also use interesting parts of the picture to put in co-visibility with the photomontage.

The 3rd step is to create a 3D model of the environment itself. We create a model of the whole area under study, the Digital Terrain Model bought via the IGN (National Geographic Institute). It's the topographywith a 50 m step. Therefore the topography is modelised, integrated in the 3D software. We add the actual turbines that were based on the features of the Alstom unit, Haliade, the diameter of the masts, the size of the blades, the height of the hub, the pod, the colour of the beacons at daytimeas well. We will also include the points of references, the day marks that had been identified while shooting. And we will integrate the cameras, one camera for each point of view, through which we will be able to look at the landscape in 3D. And this will then serve to fit the real picture to the virtual picture.

So then we get to the step of the reconstruction, the transformation. So the idea is, you can see in this picture taken at the Place du 6 Juin in Arromanches, you have in the background, in fuchsia, the turbines of the project that don't actually exist in the real landscape. And the points of reference, the blue crosses there, which are geolocalised in the 3D picture

andwhich correspond to the ends of the caissons of the floating port,enable through modification of the rotation of azimuth of the camera, to have the real view correspond with the synthetized view.

Once we've done that, we move on the rendering part. There in the 2 pictures you can see 2different renderings because the rendering software, the engine used in the software is specialized, it's theWindFarm 4 software by Resoft, a software specialized in wind energy, which has a photomontage module. So this particular software makes it possible to produce rendering depending on the position of the sun. So we adjust digitally depending on the parameters, you know, to the same position the sun was in at the time the picture was taken. And various parameters can be adjusted such as lighting, type of lighting, specularaty, ambient light, etc., we adjust the light. So basically it corresponds to, you know, a lot of sun, cloudy, whatever, the conditions we want to see. We take into account the height of the water, the curve of the curvature of the Earth. And we can also start the rendering process. Now weactually create the picture of the wind farm in a photo realistic way. So the rendering will turn in 3 layers, in 3 different distances so that it could be adjusted to each of these areas more or less distant from the project. You can see it very clearly in the top left hand, between the closest wind turbine and the furthest one. The one on the left and the one on the right, we have a slight variation in visibility. You can see in the pictures down below, the fact of the curve of the Earth down on the right hand side.

Jean-Louis CHEREL, member of the CPDP

Now at this level could we ask you a question? You're showing us turbines whatever the colour because it depends on the lightning and on the meteorological conditions. Will we see them when they are located between 33 and 40 km from the place you are observing from at that size? Will that be the size?

Franck DAVID, Géophom

No. This is an extract ok. We have written, "zoomphotomontage". That does not mean anything. This is not representative.If the screen is three times bigger.

Jean-Louis CHEREL, member of the CPDP

Okay. Not but you have to indicate that.

Claude BRÉVAN, Présidente de la CPDP

You are really frightening everyone.

Jean-Louis CHEREL, member of the CPDP

Yes, because we are really asking ourselves questions.

Franck DAVID, Géophom

No, but you can't identify the scale. You could be on the moon it would be the same thing.

Jean-Louis CHEREL, member of the CPDP

So we carry on. There you go.

Franck DAVID, Géophom

No, no.Don't draw conclusions from this. I'm going to get there.There are some other parts of the presentation that are important. If you take the curvature of the Earth, you see the

picture on the right, the part, which is below the horizon, is normally not visible and I forced it to be visible. And that's the part that is hidden by the curve of the Earth. And you can see on machines that are further away, 30 to 40 km, that the curve of the Earth has a significant effect. On closer machines from 12 to 18 km the affect is lesser.

Now after the rendering, this postproduction, which you can concatenate the layers of rendering of the pictures, masking the turbines in various situations, where there is an obstacle between the observer and the image, like that person you have, whose head is hiding the turbine. So we see the mask of the adjustment in black. You can see in white it enables the picture to appear. And you can see, behind the head, we have hidden the turbine because it would be hidden.It would be invisible because of the obstacle. And then we add into the left hand picture the electrical unit at sea.

One word about night-time photomontage. There are 3. They are basically produced based on the same principles as the daytime photographs. We use a fusion mask that's created based on Windfarm software. The rendering is not based on physical orders of grandeur. The rendering is based on, the photograph and real observations.

Claude BRÉVAN, President of the CPDP

Sir, we are going to have to stop. These are very technical explanations. People need to be able to ask questions you know. I think you've lost a good number of us.

Franck DAVID, Géophom

Let me finish on this point because this is one very important point. It's the presentation of the photomontage.

Jean-Louis CHEREL, member of the CPDP

Go on. We allow you to finish, but try to be concise please Sir.

Franck DAVID, Géophom

Yes. The photomontage presentation is an important aspect to properly read the picture. The idea is to provide the observer with a view that corresponds to his scale to what he would really observe in reality. Every point can be superposed with real life, though you're holding it right in front of you. Here you can really judge the scale. And to reach that objective you have to have a curved representation as we saw with the curvature of theEarth, as you see out in the hall. This is really a good principle behind photomontage observation. And you obviously have to provide recommendations for the observer. There is a distance of observation you should be looking at to observe the photomontage in order to be in the right proportions.

So what we've done is to produce several presentations. This is the paper based one.

Claude BRÉVAN, President of the CPDP

Could you… please wait. I think we are going to have to move a bit faster on a more operational basis. Could you explain why we can't project on to the screen the photomontage visibly? Because you have explained that to me. Besides, wewere quite surprised to see that when you projected you couldn't see much, but when we were on your computer at a short distanceyou could really see them very clearly. In the same way, in the project managers file, the representation that was made was actually quite optimistic

because you couldn't see anything. It was quite suspicious, I found. There was no bad intention but it just depends on how it is being reproduced. If I understand this correctly, we won't be able to project the actual views because you can't see anything, because of the quality of the grain and the definition of the image. We have to actually send people on their computers or in the entrances. Is that it or have I misunderstood?

Franck DAVID, Géophom

I'd like to go to that next. You've understood the principle and the problem.

Claude BRÉVAN, President of the CPDP

I'm not asking you to go to that next. We have to conclude now.

Franck DAVID, Géophom

The bestthing is the support on the way in. It hasto be lid up properly.

Claude BRÉVAN, President of the CPDP

Is it not the case?

Franck DAVID, Géophom

Not enough to me. No, but the problem is the image reproduction characteristics whether it is a printer, a video projector or a computer's screen, iIt has its technical limits. And we are way below the capacity of the photomontage or the resolution of the photomontage. So it's kind of looking through a sieve if you know what I mean.

Jean-Louis CHEREL, member of the CPDP

Okay. I think we should remind everybody that the photomontages are available on PC on the debate's site. You have very good quality photomontage and you can see that the wind farm is really visible. You have to be aware of this.

The question that arises.Geophom is answering to questions later when we will hand it back over to you. You really have to realize that. So the question now being asked, because Geophom's representative will answer your questions later on, when you will be given the floor.But first I'd like to ask to Mr VEZIEN… Are there any questions already that cannot wait? Because I was going to give the floor to… Yes, Sir.

Jean-Louis BRAUD

Not about the working methods that Mister has produced. Is this credible or not that's the question? That's the only thing we are interested in.

Jean-Louis CHEREL, member of the CPDP

Okay. We'll get to that.

Claude BRÉVAN, President of the CPDP

Sir. There are a lot of people who asked questions about the methods that were used to put these together those photos. So it would correspond to that. This maybe...

Jean-Louis CHEREL, member of the CPDP

That's why we are here. That's why we had the presentation made by Mister of the method that was used to do the photomontage. What you are interested in and that's why we asked

an independent expert, and I insist on that, independent of the prime contractor to analyse the conditions within the photomontage have been created. And that's what Mr Jean-Marc VEZIEN who is a researcher at CNRS, is going to explain to us. And he is aware, he said to me, that you need to be very brief. Right, Mr VEZIEN?

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I've understood that. Could we start my presentation please? Could you project my slides please?

Just to present myself briefly. I'm not going to do my biography. I'm an engineer. I did a thesis on 3D imaging in 1995. I'm a specialist in mixing real and virtual images. I've done this for 20 years. I've done a lot of specific work for the realism. I published in world-renowned reviews on photorealism, I think, on specific works about photorealism. You see those 2 images there, you can't distinguish them one for the other. One of those is true and one was done on a PC. As to photorealism I think that I have quite a bit of experience. And for instance since 2002 I'm an engineer at CNRS. I have joined a virtual reality team and I work, I'm here as a totally independent expert on the project to give you my conclusion with respect to what was done.

Therefore I was asked to provide an expert opinion. There were 2 main objectives of the expertise, which were to validate a method used in the photomontage. And I think, I know it's a very technical topic but you need to know how you create a photomontage to be able to analyse the approach, examine the tools, the methods and to be able to compare those with what exists. And then to be able to say is it good or is it bad. Then I didn't stay with a purely technical aspect of how to create photomontage. I also analysed what was specific about the visual impact of the park de Courseulles in its location, where it is, with this outstandingly subjective character that visual impact can sometimes take on.

Methodology. Veryquickly: charactering the panorama position, followed by the wind farm photocomposition and then we will present it to you. Now for charactering the panorama there is a very codified procedure you have to, you know, precise, with specific equipment, it's the state of the art technique to create panoramas. For photocomposition, to put the virtual wind farm turbines on there you have to use a very specialised software and of course know how to use it. This is not just, for those who use and there are a lot of them, fixingit with Photoshop of wind turbines. You don't just put them in your way. No. You usetechniques and a very precise methodology, a 3D incrustation methods in a photomontage to have a result that is fully credible and that it respects the physical properties. And then this is extremely important, the final rendering in the conditions of who and which the pictures were taken are very important to judge the impact. If you take only one or two points you've done nothing. So be careful of the choice of the image processing software for creating the panorama, the software that sews the pictures together. The choice was fine. There are several choices but this choice was fine. As to the photomontage you need to include lots of data, 3D, topography, modelling. There aresoftwares, there are three on the market. One of the best one was used. No problem. So there are difficulties in presenting turbines in terms of atmosphere rendering. That is a well-known issue in this. In fact I'll get back to that. And the difficulty for night-time views is very difficult even to obtain any kind of correct visual rendering. You often go through a phase of 2D postproduction. We

fix it in based, on existing images because we know basically what these types of lights look like.

So watch out, the correct impact is a loyal photomontage and a strict respect of the conditions of observation of the supports. That's why I will not present you a photomontage on the screen. It's not possible. You're at different distances from the screen and the screen is flat. It is fundamentally poorly adapted to a view on horizon, which ideally has to be down at 360°. In practice we often do 180° facing the wind farm and that's enough. Here you have two examples, a gentleman looking closely to try and see the wind farm. Oftenly he is going to see them but he's not going to see them in a realistic way. What you need to do is to get to the right place provided for and then you will have rendering that will be as objective as possible. I'm not guaranteeing it will be perfect. We saw with Geophom there are limits to photomontage but we are doing our best.

So what did I do in terms of the methodology? I looked, I did a deep analysis of tools and procedures. And I can as an expert… this expertise is my own responsibility. You can always criticise and give me counter assessments, why not. But personally, I validate the method that was used. It's compliant to the recommendations of the government. I guarantee the good faith of the design office chosen by the prime contractor who faithfully tried to produce sincere representations and that are compliant with the state of the art in photo realistic photography. You don't have to take my word for it. I've written a 50-page report that you can read on the Internet. You should also know that we are not just acting on something that's virtual. There are already wind farms out there and we are actually able to compare them before and after. And that before and after comparison is really faithful in terms of the truth picture and the photo realistic rendering that was done before the actual construction of the wind Park, particularly here, this is Lillgrundpark in Sweden.

Beyond the methodological aspects if we are looking at Courseulles right here. This can be valid for any wind farm, as I have explained to you so far. What's happening here? Well, topographical factors, heritage factors have led me, and it is an analysis that is closely following the recommendations here of the landscape study that is based on topography, heritage issues. And your region can be divided into three areas. Here is where the impact is the maximum. That's the little pink rectangle around Courseulles from Arromanches on the one hand and over to Luc-sur-Mer roughly. The disappearance due to the curvature of the Earth, the fact that the wind turbines could disappear, is almost nothing. And the whiff of the view, it's roughly what you can see 55° at 10 km. And the closest turbine would correspond to 60 arc-minutes, which is twice the full moon. It's basically half of your thumb nail when you are holding it out. That's the size of a wind turbine. And it's like to take a little stick and on the little stick it does 1,5 cm and you hold it at a meter right out the front of you. That is the actual size of a turbine at that distance. The closest ones, you can look at visibility, meteorology and at various things, at this point they will be visible roughly 3/4 of the time. I'm not saying you will see the whole thing 3/4 of the time. Sometimes you may just see the closest ones and the other ones will be lost in the fog. This will be very variable. This is the biggest impact in this area. Then you have concentric circles. The closest one is the 10 km one, whichintersects this area on thestrongimpact area. And there are 2 other areas, one at 20 km, it's the second circle and the last circle is at 40 km. And I can tell you that after 40 km you can give visibility parameters but there is zero impact basically.

When you talk about impact you're not only talking about visibility as such. You're talking about visual references. What you have in front of you when you will be seeing these turbines? What serves in guise of comparison? In fact in Courseulles you are very lucky. There are little visual references towards the north horizon, where the wind farms are going to be from the coast. There is no sunrise, there is no sunset along those lines. Here you can see where the sun rises and sets depending on the time of year. I'd say it's the shape of two butterfly wings. And the sun will never rise or set on the wind farm. That's important.Samefor the moon. These elements will strongly modify the impact. So these considerations lead us to say that there will be a decrease, I think,of the subjective impact. The only visual references of importance we can find in the area are the Havre's big chimneys, which are in fact 255 m above the sea level, which can be seen 60 km away theoretically. So you can see them from very far away that we can see in this area. And in fact when you look at the photomontage they have an adequate resolution to see these chimneys. You have to look for them, they are not that easy to find. And if you see them all the time, you've got really good eyesight. You can see two examples here, one is at Tracy-sur-Mer with a little bit of attitude, 50 m. We have chimneys that are at 60 km away. And because of the curve of the Earth you can seesome at 60 km away. And you compare them to the wind farms that are at 13 km. Be aware that here you have the zooms. These are not the way you will see them. There are zoomed enough. To have the real impact I've just measured before I showed it to you. The wind turbines you see here… none of you can see them correctly. People sitting in the front row havezoom by a factor of 5. That is to say that they are five times bigger than they will actually be. I'm not saying they are invisible, but you see them with a zoom that it's totally out of proportion. On the other hand what I've put in comparison was the visibility of the chimneys compared to the turbines. What do we notice? We are looking at Tracy and Saint-Aubin, it's roughly the same. With a factor of 5, the wind farms will be between 4 and 5 times bigger than those chimneys. If you can see the chimneys now in this critical area, the turbines will roughly be five times taller.

Thereare a lot of other factors that increase or decrease the relative contrast issues depending on the time of the day, the atmosphere conditions. They can be very different. Things might happen depending on that. Here you have a view of a tanker at roughly 30 km from the coast. It's visible but the contrast is very low. And the wind farms is what that it's going to be. You will rarely see them very clearly and well shaped because the sun will never be behind them in this zone. Another important factor is dominant wind. In fact the turbines, you will see them, if I may say so, in profile. Here you see I've put 36% of the time. Those are the statistics over a year at a particular moment. Well you'll see them roughly twice more often in profile than in a full front view. So it's the same. You will see them front view. But you won't always see them front view.

In conclusion I was asked to assess the visual impact based on these standards. I believe that the analysis that was done and was presented by the photomontage is compliant with the standards extent. And there is a reference framework that is objective and solid. You've seen it in the preceding presentation. The method is right. Similar studies have already been done and that corroborate this. The critical area of observation is well identified and the impact is measurable. The impact is obviously subjective but it is founded on physical principles or psychophysical principles that are well known. The specific factors in the area would tend to decrease the actual real impact. So you are lucky in that respect. In other areas it could be the opposite, by increasing the actual real impact. I'm honest with you. They could be more

impacting but not here, not in Courseulles. My recommendations would have been to add a few various additional terrestrial views. I'm giving the list in my report, but having observed the area and taking into account the sampling, which is already quite exhaustive throughout the area, I don't really think that it would call into question the conclusion I presented here to you today. Thank you for your attention.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr VEZIEN. The applauses are explicit. And I thank you as well. Are there questions with regard to this photomontage and the visualization? You've understood it's very difficult to see what we will see. You can see that theyare photomontage available for your examination in these premises that have to be seen according the indications that have been given. On the website they are photomontage with high quality, which we allow you to appreciate what we will see. Over to you, the gentleman in the front here.

Jean-Louis BRAUD

Jean-Louis BRAUD. I've discovered these photomontages on the Internet this afternoon because we've been talking about them since yesterday in Paris. This gentleman has just told us that he validates the work that has been done. I'm confused because the wind farm as it is described in the plans is North Northwest with regard to Arromanches. That means that when we are on the square outside the museum, we will see them slight to the right. But when we see the photomontage based in Tracy we have the impression that the wind farms go as far as Manvieux. And that obviously is false. So I don't understand. I'm not too bad in geometry, so I don't understand the photographs I've been seeing on the Internet or what we see in the entrance hall. And I'm extremely worried about that.

Jean-Louis CHEREL, member of the CPDP

Can Mr VEZIEN respond to that question?

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I don't have the photomontage in front of me.

Claude BRÉVAN, Présidente de la CPDP

We will have to look at that together.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I can answer at least partially. In the critically impact zone, basically towards the wind turbines, the field is opened, the angle of opening is 55 degrees. It covers degrees off the horizon. It's far from being non-negligible 55 degrees. If you give the central direction but you can see it's pretty big both left and right. So the extremity of the wind farm could be in the position, which might surprise you. That's the only thing I'd like to say.

Jean-Louis CHEREL, member of the CPDP

Professor BRUNET wishes to take the floor. Yes, Miss. Thank you.

Pierre BRUNET, Honorary Professor of geography

Thank you very much. I would have liked for us to be able to have this type of montage, that sort of thing you have done but from different points of view of observers. Observers can be on the beach at level of the sea. That is perhaps the least favourable position to be able to

see them. But often in this region people are up in the inland plateau, which means they would be about 35 or 50 m above the level of the water. And towards the East it's perhaps a bit less, roughly 15 or 20 m above the level of the water.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

This is the question of the representatively of photomontage. We are confronted with technical constraints and constraints of creation. It's impossible for different reasons to create500 photomontage taken at all altitudes and from all points of view. And so we are obliged to operate a restriction. That is clear that there are panoramas from highest points of view like in the Point du Hoc. There are some on the observation turret.

Fortunately, not all points of view were developed from the beach of course.

Pierre BRUNET, Honorary Professor of geography

My second observation in the same vein is that establishing perspective in the way you have done the introduction of the perspective. For example the chimneys at the power plant at Le Havre, But there are other elements that we could have introduced and that we see very frequently in this panorama. One is the ferry, which leave and dock at Ouistreham. They are not very high above the water line. But all the container carriers sailing in and out of Le Havre, which is twice far away, 25 km away roughly that are 40 m high above the surface of the water., that would have been good.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I will be very clear about that with regard to that those elements that cannot be chosen. Those elements cannot be chosen because the people who can see them do not know how far away they are and how big they are. You know they are 40 m high. Okay. But do you know how far away they are? Impossible. Maybe you know that. But the average observer is incapable of assessing the transit of objects, whose height he does not know and whose distance he does not know. That's whyhonestly from an objective point of view those elements cannot serve when you're comparing impact. They could be put in place, but they cannot serve as points as reference.

Pierre BRUNET, Honorary Professor of geography

My 3rd observation is that the image we can have of this wind farm with the visual density of the turbines will be different depending on the point of perspective, which we have. In Arromanches we have the best position because we are in the axis of most, of the largest number of alignments of turbine. So along an axis of 7 wind turbines that succeed each other, they will conceal the one behind it. And so we will only be able to see 10 alignments from the coast here. But when we are towards Ouistreham for example, more to east there, our point of view is oblique with regard to the arrangement of the machines. And then instead of seeing 2 we will see 4. And so from that moment on, it is not 10 turbines that you will see but 20 just because of the question of alignment.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I have several responses to give. I've considered that these factors haven't tackled that question here for reasons of concision. On one hand you should note that the field is fairly deep. They are spread over 5 km. The parallax means as well that the alignment is often broken up. Alignments are valid from certain points on the coast. Generally there will be a

distribution but above all, not all of them are at the same depth in the field of vision. And so there will be a difference in the rendering and some of them will not be seen in the same way as others. They will be seen as being lower on the horizon compared with those, which are nearer because of the curvature of the Earth. On the other hand this has to be balanced. Alignments are not perfect. Instead of having just one wind turbine, and these are not soldiers who are standing straight in line to battle. In fact, as soon as you are going to move a little bit, let say 500 m, 1 km, you'll see little clumps of machines. In other places the alignment will be completely broken and they will be very disparate, they will be more dispersed on horizon. I can assure you that in a way or another the impact globally is pretty much the same. Yes a clump of turbines has a greater impact than one on its own. But in order to understand genuinely and to perceive the panoramas as they are presented that's the best option we have in order to give you an idea.

Pierre BRUNET, Honorary Professor of geography

Okay in terms of psychological impact I agree with you but in terms of landscape, vertical elements on the horizon are defined by a form. This isn't mental this is something substantial.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

Yes, exactly

Pierre BRUNET, Honorary Professor of geography

And when there are 10 mats, let's see, and when we see 20 from a different viewpoint, we are not looking at the same screen. We don't have the same view of the landscape.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

It's true and that's why there is diversity of different points of view in our photomontage, which enable to appreciate different... And that's why we have operated a sample in our photomontage because your perception will not be the same from Arromanches or from Asnelles or maybe from elsewhere.

Jean-Louis CHEREL, member of the CPDP

Thank you very much Mr BRUNET for having launched this debate. Any other questions regarding photomontage and visual perception? There is a gentleman earlier who asked: "Why not build one life-size turbine ? Perhaps the contractor authority scale can answer that right now. It's quite simple, you will…

Bernard GUITTON, Directeur du projet, EDF EN

Today, it's something that has not…?

Jean-Philippe PAGOT, EDF EN

Sorry. This life-size model is the Alstom's prototype exists but this turbine is on land, which is currently being under tested at the Carnet, on one of the coasts of the estuary of the Loire at Saint-Nazaire. And so we can visualise it and the fact that it is on land, it makes it possible for us to move around in order to measure its impact from different perspectives. The question that was then asked is that within the Courseulles project there was an idea that we could build a life-size model in order for us to see what it would mean to get used to it. But we didn't mention the issue. In fact this is a relative new idea. It involves several problems from

an administrative point of view, purely from the point of authorizations. The same work is involved where there will be built 1, 2, 200 or 500 turbines. The problem is not the number. So the process that takes us up to 2018, we would have had to anticipate in order to do it within a fairly decent time frame and under acceptable economic conditions. And now with regards to the administrative approach and the regulatory approach it's not possible to anticipate that and do it only for the purposes of getting an idea of how it will look like.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr PAGOT. Any further questions? Yes, Madam? The hostess will hand the microphone over to you.

Michèle TANNE

I find that your answer…

Jean-Louis CHEREL, member of the CPDP

Please introduce yourself Madam.

Michèle TANNE

My name is Madam TANNE. Your answer surprises me because in despite of everything, there are studies, which have been done with regard to wildlife for instance. So why can't one single prototype be made? Because you've built a wind turbine beside Saint-Nazaire to see how it works. So why not, even if it's in the maritime domain, why not set one up on a barge to see what it will mean in the landscape? Of course it's a question of authorization and so forth. But you've got authorizations for all the pile driving operations and so on. You've been doing tests?

Jean-Philippe PAGOT, EDF EN

Yes. I'm not going into detail here about related regulation, but if we had to place an item. The floating item is a barge, it's not possible for questions of security. We work on problems of floating wind farms and they will be mature in 5 or 6 years' time. Today we don't know how to make these floaters, which make it possible to leave things on site for a certain amount of time. That would pose problems with regard to maritime security as well, but it may be unrelated. The problem is, if we had to ask specific authorization, like we could ask for a mast measurement, supposing that there is one on the site, in the maritime domain, it would take two years of research and of authorisations associated with that research. The state investigates for about a year and we would need to develop it with the impact studies even if it's just for one machine. That is something we can look at. There are not absolutely forbidden to us. But with regard to the deadline in calls for tender, as you're saying, it has nothing to do withone-timestudies, which are subject to declarations and not authorisations when we do testing, make dives, collect biological samples, do current testing. We are not dealing with the same site of regulation when we do on-site physical testing.

Claude BRÉVAN, President of the CPDP

If I have understood you correctly, the interest of building such a wind farm would be in order to provide a real image how…the height, in a way, the space it takesin our field of vision. In any case this wouldn't allow to test the wind turbine because it wouldn't be connected. This wouldn't involve plugging in the turbine to the grid. We surely wouldn't make a phoney connection in a way. So it would be a false wind turbine. So it would be

relatively limited with regard to the interest it would represent. And what has been demonstrated is that now the technology makes it possible for us to perceive the height of an object, which is fairly easy to represent. It's not a very complex object. I don't think that having one turbine somewhere would be sufficient, would contribute sufficient interest. Many times we talked about experimenting several things related to wind farms, and in particular about establishing reefs around wind turbines in order to provide habitat for fish for example. That would be interesting with regard to reduce a limited number of wind turbines. But here this would be asimulacrum of a wind turbine because it wouldn't work.

Jean-Louis CHEREL, member of the CPDP

Are there any questions with regard to visualisation? Yes, Mr FEER

Jacques FEER, Dong Energy

Yes. Good evening. Jacques FEER, I'm an expert from Dong Energy. With regard to the visualisation of the wind farm at sea, Dong Energy has produced several parks, wind farms at different distances from the coast. And it would be possible to organize a journey in order to go and see what a wind farm looks like

Jean-Louis CHEREL, member of the CPDP

Mr FEER, thank you for your suggestion to the extent that it is realistic. I think many people would be interested in your offer. Someone has listed his hand? Madam, yes?

Elsa JOLY-MALHOMME

Yes. Good evening. Elsa JOLY-MALHOMME. I have looked at the photomontages carefully. And it's true that I find them very impressive. I find that the visual impact… I live in Arromanches and the visual impact on Arromanches is considerable. We've already talked about the importance of the artificial port site. And I find it hard to understand why we are setting this up 10 km away and 9 km away from the nearest Phoenix caisson. I've a simple question : why are these turbines white? If they were grey or blue wouldn't we see them less? Can't we put them a little further away? Because I've been really struck by what we've seen on the photomontages.

Jean-Louis CHEREL, member of the CPDP

Thank you for your question Madam. I think we can answer. The contracting authority can answer with regard to the location. Is it possible to establish them further away from the coast? And then the second questionof colour.

Jean-Philippe PAGOT, EDF EN

With regard to the position of wind farms 10 km from the nearest coast, this comes from a bid for tender by this date within the context of the new energy policy, which in this area was established by the state. We are not able to put them further away or to put them closer together simply for technical reasons. If we could put them closer together a little further away that would not be as interesting with regard to the generation of energy because they would be interference between them.And so our current configuration of 1 km between the turbines is necessary with regard to the distance to the coast that has been mentioned earlier. Their height, their size defines the unit power of theses machines and the choice we have made with regard to a 6 MW machine, it was also to have less of them

because as it happens, the more powerful the turbine is, the fewer we establish. So the number is there, the position is there, we were constrained with regard to the bid of tender.

Claude BRÉVAN, President of the CPDP

And the colour?

Jean-Philippe PAGOT, EDF EN

With regard to the colour. Here we have international regulations, which are linked to maritime security and to airspace security. So the white, kind of nuance white, there are several different types of white, - I don't exactly know how many, several dozens I think- that have been defined by an international regulation concerning visibility at sea. And so we cannot, unless we want to change that international regulation, we cannot play around with the colour. There is part of it, the base, which is yellow. It's deliberately yellow. Once again that is due to issues of maritime navigation. And last point, these visualisations that you've seen, there are red dots on their blades. And this red colour, and I'm saying this, is not regulation. It is an indication linked to interventions by air for helicopters, which should need for example to effect a rescue in the field. There is a contrast between the white of the blade and the red marks on the blade.So they need marks,which allow them to assess the depth of field. What I wanted to say about this red colour, which is fairly aggressive, is thatsailors, who know this, red colour is the one that mitigates the best the vision by night. So it's not the most aggressive colour, the vision we could have of the farm, even by day.

Claude BRÉVAN, President of the CPDP

Mr PAGOT with regard to the location of the park, you did not say what you've said in written responses on the website and which you've repeated in several other meetings. The difficulty of setting the park further away, if I have understood what you have written, the difficulty is that beyond the limit, which has been defined by the State, the State perhaps made a mistake, but that's how they have defined it, the sea is much deeper. And so the establishment of turbines would be much more complicated. And moreover and what is not said is that, further away the wind turbine is, the harder it is to transport, transport for going to maintain them. And on costs it's not only more costly, but it also uses more energy. And so there are some reasons, which are objective and I wanted to remind you of them. This site, which can be criticized with regard to their choices and you've shown this when you started, it's a site, which is very constraint. And this is one of the difficulties involved in this project that there are apparently very little leeway to have it moved north site, east or west. We are looking at the site, which is extremely constraint, where there really is very little leeway if I have understood all the work you have done.

Jean-Philippe PAGOT, EDF EN

Exactly. I'd like to add that with regard to the distance and time that we would take to get there as well is one of the constraints.

Claude BRÉVAN, President of the CPDP

It's a question of cost but it's also a question of the carbon footprint.

Jean-Philippe PAGOT, EDF EN

Exactly. But it's not the reasons why the State has chosen this area that hasn't integrated these elements. However there is connectivityat north of this zone, which is a fishing

ground. And we talked about that with the fishermen. Then there is another constraint, which is even more critical in my opinion and which requires arbitration and that is with regard to maritime security and the roads into Le Havre port. So there was a buffer zone, a security zone, which was not negotiable in particular with regard to the maritime governorship and the services of the State. As you were saying there are about 80 different layers of constraints, which we have to take into account in order to define these areas. And it's not simple because there are a lot of overlaps between these different constraints.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr PAGOT.Did you get the answer you expected Madam? So what the committee wanted to do is to bring an independent expert to say if the photomontage was real and sincere. Are there any further questions that you wish to ask on this subject because then we are going to tackle questions on environment? Yes. Gentleman, on the left, here.

Jean-Philippe SCHNEL

Thank you. Jean-Philippe SCHNEL. If I have understood correctly there was so many constraints that it was virtually impossible to establish a wind farm in the channel? That's my first question. And as I don't want you embarrass you I'm going to ask you a second question. I see that the angle from which we perceive the turbines is about a fifth of the angle in which we perceive this sea. That means that if we compare that it's absolutely colossal. Next, the angle under which we see laterally 55° degrees, it's huge too and the wind farm will stuff up the whole horizon. And there is a last thing I wanted to say. The turbines move and we are not robots, we are humans and we are drawn by everything that we see as everything that moves and we focus on things that move. Turbines move and it seems to me that this issue has not been tackled and it seems to me that the issue is important. Thank you.

Jean-Louis CHEREL, member of the CPDP

Thank you Sir. With regard to the second question, Mr VEZIEN can you reply?

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

So the wind farm occupies 55° of perspective. So yes that is about a fifth of the total maritime horizon. You're talking about the vertical field is that right? The vertical field of the photomontage that you have here is about 30°, 30° represented by the totality of the photo.

Jean-Philippe SCHNEL

The angle of our perception of the sea is barely 5 times bigger than the angle of our perception on the field. So that's very big particularly. When we are on the sea front, we look at the sea, I'm sorry, we look at the horizon.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

You look at… in fact what I am going to call, it's an abuse of language. You look at the sea, you look straight ahead and you look at the whole maritime landscape. Your eyes are drawn by lots of different things. You look left and right. You don't look straightahead the whole time as you said. We are not robots, we don't look strictly at a specific point of the horizon.

Jean-Philippe SCHNEL

Yes, but you will have 75 wind turbines, which will be moving in the middle of your field of vision, any tourist or Pilgrim who comes to the D-Day landing sites and everyone who lives there.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

Yes. Okay. The movement will only attract your attention, in what we call in scientific language, the peripheral field. When you come to Courseulles, you are going to look straight ahead of you. So the wind turbines willnot particularly attract your regard. You will be looking in that way and in that direction anyway. It's only if you turn your head and you look in another direction that your peripheral field of vision, which is very sensitive to movements, perhaps you'll say: "Ah there is something moving in my peripheral field of vision" and then you will look at that. And that would be significant. But in any case normally when you look at the sea here, you look straight in front of you. And wind turbines will attract your eyes in any case.

Jean-Philippe SCHNEL

I think that there will be many residents on the coast who will see these wind turbines straight ahead of them and they will be ahead of them straight in front of them all the time.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

You've gotthe impact assessment, which shows the area of maximum impact on the coast. I have visualized well. It has a beginning and an end. It's not within one meter of course. But I can say that the impact will be at its maximum in the little trapezium that I showed you. Then it will diminish further where you move from there and areas where you are about 20 km away from the wind farm, the impact will be very very moderate. And they won't be straight in front of you they will be peripheral. So it's true the impact will be maximal for the zones, which are straight in front of you, but we've clearly identified them. We are not trying to draw the will of your eyes, we are trying to be as clear as possible. Anyway it's on this particular point that I wanted to insist on as an expert.

Jean-Philippe SCHNEL

Okay. Thanks for your response. But if I can get back to my first question.

Jean-Louis CHEREL, member of the CPDP

Yes. Could you please wait Sir. The first question it's not Mr VEZIEN. But, Mr VEZIEN, before you leave the stage, there are two ladies that would like to ask you a question. Madam?

Dominique CHEVILLARD

Mrs CHEVILLARD. I came to Courseulles to come to see the sea. I didn't come here to see wind turbines. So when I am looking at sea I'm not going to see the sea I am going to see turbines. Secondly I want to know what will be the visual impact at night because that can bother as well?

Jean-Louis CHEREL, member of the CPDP

Mr VEZIEN, can you answer that? You are still being appealed.

Jean-Marc VEZIEN, Research engineer at LIMSI-CNRS

I am going to answer the second question because it's the simpler question. With regard to the visibility at night, you will have a series of flashing lights, which will be similar to buoys. I don't know if you've seen flashing buoys at sea. You will have a system of 75 buoys, which will be flashing along the same axis. So it's pretty easy to imagine what the field will look like at night.

*It would be possible to make a flash animation. W*e actually haven't reproduced the flashing at night on the website*. It's one of the things that are possible to do.* But you are not going to watch your computer screen by switching of all the lights either. Or you will have to speficy it very clearly. It's very hard to do at night. It's very complicated.

Jean-Louis CHEREL, member of the CPDP

The other lady behind.

Jean-Philippe PAGOT, EDF EN

Please may I add something about the number of lights, which is almost a regulatory information. Currently all state departments are mobilized in sea and this is a novelty because we're doing things at sea, which were initially designed for the land to avoid the flashes on all the turbines. Now we count 4, 5, 10 machines at different heights, which has motivate our regulation and each machine has to have its own light. At sea we'll have a homogenous set of machines and the lighting that we see from far away, is linked for, to airspace and maritime security. Today in the services of the State and we,as project initiators,are thinking about perhaps only lighting the corners and perhaps one in the middle in order to define the geometry of the wind farm from the air perspective and so to limit considerably the visibility at night, which doesn't help, neither for the aircraft, nor for the mariners and even less for the people who are on land, who would go for a walk at night on the seaside.

Claude BRÉVAN, Présidente de la CPDP

For the marines, if they go round inside the park, there will be light signals or not ?

Jean-Philippe PAGOT, EDF EN

Yes. There will be a higher and a lower level of luminosity. But there will be a lower level of luminosity so the level of luminosity will not be perceptible from further a field.

Jean-Louis CHEREL, member of the CPDP

Back to your first question Sir, if you would be kindly enough to re-precise it, please. And the contractor authority will give you an answer. Sir.

Jean-Philippe SCHNEL

My comment was that everything is taking place as if this was unavoidable, that we should set up these wind turbines off these coasts, which are world sites of importance, that there are colossal constraints, you've talked about those same constraints. There are 80 layers of constraints. And at the end of the day we accept to bring the wind farm very close to the coast, something, which will damage the entire coast. I would like to remind you that the environmental laws in Germany obliged wind farms to be at least at 100 km offshore. I'm citing the newspaper Le Monde, the minister for the Environment and if anyone is interested I can give you the reference. So I'm astounded to see establishing a wind farm so close to the

coast. We are talking about the landscapes, the sites, I agree with that. But we have to consider that in the light of benefits that it will bring and we have to say that 500 MW of wind power, which work at about 30% at sea, that represents 150 MW, which would be functioning non-stop. And 150 MW it's less than a 10th of Flamanville. Now Flamanville feeds all Lower Normandy. You see, you need to have orders of grandeur with regard to the damage that we will do to the landscape and to the D-Day landing sites. That's the meaning of my question.

Jean-Louis CHEREL, member of the CPDP

Sir, thank you very much for your questions, Sir. There are a lot of these questions, which have been brought up in different meetings. Answers have already been given with regard to certain points. With regard into this sighting of the park, a certain numbers of kilometers away, you can answer that fairly easily. There are our constraints with regard to the depth.

David LEMARQUIS, Project manager, EDF EN

The constraints with regard to the depth, which we've already talked about earlier, what we can say in addition is that in the channel there are a lot of constraints because the sea is not a virgin space. There are two projects, which are currently under elaboration in the channel, which are Fécamp and Courseulles-sur-Mer. What I'd like to underline is that the State has applied a 10 km minimum buffer zone in order to reduce the visibility of the turbines as much as it's possible because the technology would have… We have broken wind but on the contrary the sea is deeper when we get closer to the coast.And beyond 10 km, why is that a problem? It's because the seabed dives very steeply. We get close to the main rail, the channel roads for shipping, so potential problem of maritime security. And if we get close to the limit of maritime jurisdiction of France that would generate complimentary problems from the administrative problems.But even if there wasn't this administrative problem on the Courseulles wind farm, going beyond the buffer zone of 10 km, is unfortunately not possible.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr LEMARQUIS. There is another lady and it will be the last question. You have the microphone so you have the floor.

Sylvie MANAUTINES

I just want to get back to what this gentleman was saying. We have the impression that we've been presented with a "fait accompli".This is a debate but it's already been decided. The president BEAUVAIS has been talking about the image of his region. The image of the region already has a nuclear power plant, a future EPR, a gigantic reprocessing facility in order to round everything off. And additionally we are going to have 80 wind turbines with visual constraints, noise constraints, because we are going to have to dig in these 80 pylons into the seabed for I don't know how long. And so we are punished triply in Normandy. I live in Ver-sur-Mer, I didn't come to Ver to have this park in the middle of my field of vision.

Jean-Louis CHEREL, member of the CPDP

Thank you,Madam, for your opinion with regard to the project. I'm going to hand over to this lady and then we must move to the environment chapter of this meeting because it's getting late.

Pascale CAUCHY

Thank you. Pascale CAUCHY. I'm vice president of the Region. I'm responsible for culture and Heritage. I didn't want to intervene because Laurent BEAUVAIS spoke earlier. I was very touched by madam d'ORNANO's vibrant pleading. But I'd like to get back about this question of the usefulness of wind farms. Look at the nature of opposition. There is a great resistance to change and varies work for sociologists on that subject on the resistance to change. There is a second reason, a lot of those who oppose wind farms think that it's neither useful nor efficient. Renewable energies are not just a question of hyper technologies. It's not in the head of technocrats that it has been developed. It's a choice by our society. Right now if we don't ask where electricity comes from, because for too long we've been using electricity without asking ourselves where it comes from, if we look at this question, you see wind turbine as an attack on the landscape. We've heard that several times. Earlier Laurent BEAUVAIS was saying we can'tinstrumentalise the UNESCO beaches in order to attack the offshore wind farm project. But we see that there are other ways that have been expressed today. Of course we are going to see them. We can't deny that. We are going to try and ensure that we see them as little as possible and the impact on environment as little as possible. But we need these wind farms. Humanity needs this energy transition. This transition is based on three points. First of all the energy economy because the least polluting energy is the energy we don't use and so we have to promote that everywhere. Energy efficiency is also vital. We need to reduce our use of energy to heat our private and public buildings. France uses more than half its consumption. But 40% of its electricity is used for heating. It's colossal. But this is an advantage because we can progress greatly. The third pillar is the development of renewable energies and wind turbines are part of this. It's not the answer but it's part of an answer. And it is an essential response. We are one of the best placed region for this. We have a lot of wind here, a lot of wind potential. We know there are questions and constraints. But Laurent BEAUVAIS said earlier that the region is playing with its image. We are the most nuclearized region in the world. Madam has just reminded us of that. My neighbour was saying: "Flamanville, we've got it". We've got nuclear energy. The cost of nuclear energy, currently EDF is wandering if it should increase the cost of electricity because the amount we pay doesn't cover the cost. So we are in a pivotal moment here. We are looking at moving from nuclear in order to head into the domain of technological progress, and this is another way of saving humanity. Because what young people, who died in our beach, what they came for? They came to liberate a whole continent from our horrible barbarism. But today the causes of peace, the causes war. What menaces peace right now? Of course they raise a risk of totalitarian states and terrorism, but the biggest threat to peace currently is the threat against the environment, that's to say the land that makes it possible to feed ourselves and to live, because coastline populations they are also menace by sea level rise. There is also a lack of fresh water. We are threatened by a lack of energy. And it is all these issues, these are planetary challenges that we have to tackle. Of course I know Lower Normandy can't provide energy for the whole world. But we have to play our part as some people have said. And it's going to involve wind farms, offshore wind farms, it will also involve tidal park, because the Raz Blanchard is one of the sites, which represents one of the most powerful tide in the world.

Jean-Louis CHEREL, member of the CPDP

Madam, thank you very much. So we have come to the end of this part of the meeting, which was devoted to visualisation. It's already 11 o'clock. Normally we should have finished the meeting at 11 o'clock. But we provided for the eventuality that we would extend this meeting. So now we are going to tackle the third part of this meeting because there are speakers who have prepared presentations. And we are going to hand over to them and then back to you in order to allow you to express yourselves.

So now we're going to look at the environment. We are going to hear successively, Mr DEBOUT who is president of the Normandy ornithological group. Please Sir if you would like to come up to the stage. Then we will hear Mr LEBOULENGER who is the president of the mammalogical Normandy group, Madam REMAUD who works for the protected maritime areas agency. And all three they will be talking about the problems with regard to damage to the environment due to the establishment of maritime wind farm. And then we will have two Normand associations, the GRAPE and the CREPAN. So, Gentleman, over to you.

Gérard DEBOUT, President of the Normand ornithological group

Thank you. I'm in charge of the Normand ornithological group, which is an organisation which studies birds and which seeks, if it's possible, to protect birds in both regions of Normandy. Now in so far is the Courseulles project, we've performed a certain numbers of studies in advance of this between April 2008 and April 2009 and then from February 2009 to March 2010 for successive sleeping partners. Obviously these studies were performed in calm weather, which enables the observer on a ship to go outside and also it makes it possible to see birds that are on water and that are quickly undetectable if there is swell. That's one way of looking at the method. We are going to be looking at the site only in conditions of calm that will not always be those that will reign at a later time during the actual operation of the wind farm. You need to know that they're 10 km from the coastline and they are way beyond the usual limit that one observes with telescopes. Even though you can see large species up to 5 or 6 km away under good conditions of luminosity.

You need to know as well that during migration these are not the same conditions in the spring and in the fall to simplify things. Prenuptial migration is generally fast and concerns potentially adults that will reproduce in the coming weeks, whereas the postnuptial migration, which is roughly July until November depending on the species is much slower. It concerns a lot more individuals because it concerns not only adults but the young as well that were born in the precedent nuptial season. In order of a magnitude, there are roughly 1 million to 1,5 million seabirds in each fall in the Pas-de-Calais. It's a bottleneck. And then they are going to be following two routes, one to the south of the British coast and one to the north of the French coast and that's the one that we're concerned with. And apparently most birds follow the road that's north of the French coast. So a good part of these birds, I can't say how many, but there are several thousands birds that go to the area in question, either the location of the famous lozenge or the zone between the coastline and the future wind farm. So those are the orders of magnitude.

Our studies have shown that it's closer to the coastline that there are the most birds. That is nothing new. We were expecting that. And so in the actual wind farm area it's in the extreme northwest where there is the biggest diversity, specific diversity and also the biggest number of birds in number of individuals. I don't know if this means much to everybody that's here, but the most frequent species frequently counted are Gannets,

Alcides, the small penguins, the common guillemot, the Great Skua, seagulls, including the black-legged kittiwake, that I will talk about briefly later on, and a bird, a petrel which is called the northern fulmar. So theblack-legged kittiwake and the northern fulmar are two significant species. They usely come from northern countries and they are currently moving north because of global warming. And they are quite interesting here because there are colonies of those two species in the cliffs of the Bessin near here just to the west of Arromanches, from the Cap Manvieux up until the Point du Hoc. Among these significant species we have the Great Skua. It's quite surprising that we can say it's important because we've only seen a few individuals. But you have to realize that some species of birds are present worldwide in very small numbers. For example, the Great Skua, it's a few thousand in the entire world. So if you see a dozen in a ratherlimited area this is an event. It's very important for such a rare species worldwide.

So most of these birds when they fly over the site under the conditions we've observed in a clement weather, they fly over quite low, in other words most of the birds will fly less than 20 m high. There are very few that will go above that height. So usually they will be more likely to be below the movement of the blades. The direction of flight is logically north-east, to south-west, but there is also north-south, which corresponds to the movements of the coastline towards the sea for some species. So that's a brief summary of what we learnt. It's clear that we are far from knowing everything in particular in what the future impacts will be. Now in countries where wind farms are more developed and where ornithology is more developed under these conditions, there are many new technics that are to be implemented, like using radar, infrared, automatic recording of bird cries, etc. and videos, to determine flow, possible collisions and avoidance of collisions, the consequence of the transformation of the environment and so forth.

We obviously can't solve things here but we can contribute to this. There is cumulative effect of the various wind farms crossed over by successive migrators. Imagine a bird that starts from Cape North and goes to Senegal, if he meets a wind farm every 50 km on his way, even if the frequency of collision is low for each of the wind farms, it is possible that the cumulative effect may be of high impact. Seabirds are usually species that live long lives. They have a demographic strategy, which is essentially based on investing in the survival of adults. So it's important for a seabird that adults live a long time. It's even more important than saving the young so that the species can be maintained. And when adults are injured in great numbers, we don't know what the threshold is, nobody knows and nobody can say, it can be important. It's estimated that if the growth in mortality, depending on the species, would increase between 0,5 and 5% normally there will be no impact in a population of birds. But if you go beyond that threshold, depending on the species, it could have very serious consequences demographically speaking for those birds populations. So there's a real problem that's not being dealt with and it's quite delicate to consider that we are going to realize what's actually happening as we build the wind farm.

So to reduce impacts there are international recommendations. In this respect for example thealigement of wind turbines depending on certain directions of flight that have been recorded. There is a problem: the problem of lighting, which can have catastrophic consequences if it's thought out improperly. Even in own region, at the beginning of the 20th century right up until the 60s there were serious problems of deaths on the part of birds and particularly linked to the Gatteville Lighthouse in the north-east of the Department

in the Manche area with the artificial lighting, which led to massive deaths of birds. And you know, there are witnesses to this. And we need to accept that this problem was resolved mainly by changing the lighting, by diffuse lighting and by disseminating sources of lighting along the coastline, because if a bird flew over coastline 50 years ago and therefore was attracted by one single source of light and isolated lighthouse, this is no longer the case. Very probably the bird will be attracted to the coastline, which is very bright and it would just carry on. So basically that is the central of what I wanted to say.

There are compensatory measures that can be envisaged. These measures could be a problem here because the species that are likely to be affected will not be accessible to compensatory measures of a classical nature. If a Norwegian Gannet comes into collusion with a turbine here it's going to be hard to act in Norway. So compensatory measures can have to do with others species in other sites, than that in question, where the problem is being produced. And so it seems clear to us that the essential is to act on marine birds that nest nearby in the cliffs of the Bessin, in Saint-Marcouf islands an inTatihou, in a reasonable perimeter around the wind farm. I went over…

Jean-Louis CHEREL, member of the CPDP

Thank you Sir. It was very good Mr DEBOUT. You see you have received applauses. You remain here because we are going to be asking Mr LEBOULENGER to give his presentation. Then we will hear from madam REMAUD. And then after those three presentations you can ask whatever questions you like about all these species, birds, sea mammals and land mammals as well. No humans, no. Mr LEBOULENGER, the floor is yours. Thank you.

François LEBOULENGER, President of the Normand mammalogical group

Good evening. I don't have a paper but I have a presentation that should appear on the scree. I am going to be talking about the eventual impact on mammals. The problem of wind farms at sea is it doesn't concern all mammals, only sea mammals and cetaceans, dolphins, whales and pinnipeds,i.e seals, marginally and potentially bats. I'll talk to you about those a bit later, but very briefly.

We have also for the consortium undertaken a study on sea mammals in 2008, 2009 for the project with three complementary approaches. First of all an inventory of available data on prior observations in the period 1980 – 2009;complementary prospections in the field of nature over an annual cycle, April 2008 to March 2009; and also a bibliographical analysis on potential impacts and proposals to limit the intensity of such impacts in the offshore wind farms.

And so far as the analyses of previous data available in our data bank on the area… we've done this for Ouistreham – Pointe du Hoc. There are 292 data concerning 9 identified species and a certain number of data of indeterminate marine mammals. Almost 50% concerns seals. I'm talking about which broadly concern all the area. It doesn't necessarily only concern the areas where the wind farms are intended to be. 50% of the seals.The harbour porpoise, 25%.And the bottlenose dolphin, various type of cetaceans mammals and other species that are seen occasionally, grey seals, pilot whale, etc.

Jean-Louis CHEREL, member of the CPDP

Mr Chairman, what is anodontocete?

François LEBOULENGER, President of the Normand mammalogical group

An odontoceteit's an undetermined type of dolphin. It's a dolphin group. There are mysticetes and odontocetes. Mysticetes are whales. Odontocetes are more like dolphins and other types of whales. I carry on.

So this is the actual location based on our observations of previous sightings. Mainly our observations on the coastline including as well grounding because a lot of observations come from grounded animals. Now the wind farm, they only have basically two values so a low number of sightings. That's due to the fact that the sightings are not very numerous offshore. Most of the sightings are on the coastline. We don't have actually access to the data in that area that's why complementary observations were performed during the period of study from March 2008 to April 2009 or the opposite, which gave rise… and here there were 15 observations tours during this period and some of them one a month during a certain period and twice a month during the summer period and the beginning of the fall because that's where the observations are the most significant. You can see the number of observation is quite limited. I'm not going to cite them but you can read them for yourselves. And there were in fact only two individuals, one dead harbour porpoise that was recovered from the northwest of the area of study.

I forgot to say that,but it was rather visible, most of the observations were located in the southwest area, outside the area between the coast and the project area.

So what are the most potentially impacted species by the project? For us the main one are the harbour porpoise, which are coming back. They'd almost disappeared from the Seine bay and over the last 15 years, 20 years they have come back in force with a growth in population, especially this year for example. It doesn't show here on the chart. But since the beginning of the year, we have 32 groundings on the coast of Calvados between Trouville and Grandcamp for the harbour porpoises. This illustrates the significant increase, and the resettlement of this species that was very common in the area before, with indices of local reproduction, in particular gestating females in some of the groundings and young ones as well. It's a species that can be considered as really local to the area.

Another species, probably for which the impact will be less, would be the bottlenose dolphin. We have examples of the bottlenose dolphin mainly in the west coast of the Cotentin, in the Normand Breton coast. But there's also regular presence of groups of 2to 10 bottlenose individuals and sometimes more, on the east coast, mainly around the Saint-Marcouf islands with observations basically during the summer. But what we don't know is if this population is actually local to the east of the Cotentin or if these are just brief incursions of the general population, which comes more from the west Cotentin for food reasons, therefore the east side.

Another species that I wanted to cite was the common seal. This species lives in estuarial areas. There is a reproduction colony in thebay des Veys with regard to the sector. Common seals are present more and more regularly of 7 to 10 individuals in the bay d'Orne. You can see them quite often in the bay d'Orne. And there are regular observations in the north coastline. These are individuals that probably move around between the bay de Somme where there is a colony. And you can see some in theSeine bay.

To asses the potential impact, essentially mainly for the sea mammals, the disturbances due to the increasing traffic in shipping of materials during the actual building of the wind farm

and also due to noise impact. But also in Courseulles where the choice was made to use single piling units to reduce sounds nuisances during the actual installation, because sound is propagated very powerfully under water. It propagates very far indeed, more than 80 km or even more. So this is very frankly a big source of disturbance. There is also the possibility of sounds of lesser intensity but they continue over a long period during actual operation. This would be more vibrations. And the aspects on modification of habitat are difficult to asses the impact of. It should be quite limited.

For bats, just two seconds for the bats. One thing is sure, that's some migrator species and at least one, the Noctule, fly over the channel coming from England. Now what we don't know - that was true for birds it's even more true for bats - it's the intensity of flow, how long is the migratory period extend, what species are involved? So is the Noctule the only one concerned or the other two or threemigratory known species? And what is the flight of height and so forth.So it's difficult to assess the impact when we lack this knowledge. We consider it might be a modest impact.

So the conclusion now. For sea mammals, this concerns mainly harbour porpoises and to a lesser extent bottlenose dolphins and the harbour seal. But the harbour seals are closer to the coastline, they don't go out to sea very much. Very strong sounds, related disturbances during the work phase, which might be avoided by removing the harbour porpoises from the area. That's what has been done in other countries. So low or moderate disturbances depending when the wind farm is the actual operation. But to try to monitor these evolutions we have to obviously track these populations during the work and subsequently. And for chiropters the impact would probably be quite modest but here again there are a lot of unknowns. Thank you.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr LEBOULLENGER. Now we are going to hand over to Madam Morgane REMAUD, from the Marine protected area in Le Havre, who is going to give her expertise on all over the top that we've just spoken to, including Mr LEBOULLENGER and the chairman of the GON.Over to you, Madam.

Morgane REMAUD, the Marine Protected Areas Agency, Le Havre

Thank you. Good evening everyone. I work at the marine protected area agency and I am going to summarize the two last presentations and add a few things of my own, and present to you the position of the agency and the recommendations made to the consortium. I'm going to start with dealing with the conservation issues for the wind park. The three natural reserves that have a national stature in the Seine bay and also four major Natura 2000 areas that were designated for certain species in need of conservation. Now for sea mammals, the two emblematic species are the bottlenose dolphin and the harbour porpoise. Now the bay de Veys concentrates the second colony of seals and the Norman Breton coast, the first group of the bottlenose dolphins, the number one group. It's the question in fact of the cumulative impact of the various wind farm projects, which concerns us to the extend where we are going to have the project off of Saint-Brieuc, the other one off of Fécamp, which could in fact impact the sea mammals because of the sound issue. And as was presented by the GMN, the hammering of pilings is highly perceptible at great distances and can bring about very big disturbances in terms of the… can actually disturb their auditory system and can bring about a modification of their behaviour by disturbing their communications

system, their orientation system as well and the ecolocalisation, which helps them to find their food. So it would be important in any case to measure these effects and the cumulative effects in the following studies.

Now and so far as marine avifauna is concerned, I've taken the example of the black-legged kittiwake, which is a protected species under the OSPAR convention, an international convention for the protection of the north-east Atlantic**.** Now the rate of observation on those two maps, we observe that the species is highly present around the wind farm throughout all periods of the year. In respect to the impacts of planning farm it's mainly the loss of feeding areas and resting areas they could be impacted. And also the installation of the wind farm could have a barrier effect and modify in fact their trajectories during migration. And it's true that it could also impact the survival of juveniles because the road would be longer. And another important thing to measure would be the cumulative effect.

Now in so far as habitats are concerned, we have a lot of scallops in the wind farm site. And also the foundations could destroy partially the original habitats of scallops. Additionally, setting up artificial reefs it's a good way to compensate for the loss of sea bottoms of this type. But on this soft sea bottom this is not necessarily the best means to protect these habitats. We may have to make sure that compensatory measures will be adapted to original habitats. In addition we also in the area have intertidal mat flats, which are in the OSPAR convention along the bay de Seine. These are important areas in terms of reproducing and nursery areas for many fish species. So we would need to try to avoid these and to take them into account notably when we are laying out the electrical connections.

With the view to these potential impacts on the natural marine heritage the agency is not opposed to project but recommends that you take into account certain points that need to be vigilant about and taken seriously by the consortium. There is a real need for vigilance in studies undertaken in the risk assessment phase right down to the decommissioning phase. Besides as I was saying earlier it would be important to take into account the cumulative effects of other wind farms projects, both French and British because we know that there will be future projects on the other side of the Channel off the coast of Great Britain and to take into account as well the installation conditions and the electrical connections in the marine environment. So the agency recommends the creation of a body for scientific follow-up multi-disciplinary and independent body*at a national level* to ensure that compensatory measures are implemented and that the tracking follow-up process is working properly, also to mutualise environmental data between the different consortiums of wind farm projects. We need standardized studies, we need performance indicators and to be able to ensure comparisons between different sites. Another thing of interest is that it would be also important to make public environmental data to improve more generally the awareness of these factors. And the compensatory measures should be scalable in order to be in agreement with experts and these should be scalable depending on the results that will be coming in from the studies. Thank you for your attention.

Jean-Louis CHEREL, member of the CPDP

Thank you very much Mrs REMAUD for having captured our attention during your presentation. I am going to hand over to members of the public. You can ask questions about the last three presentations with regard to birds, maritime mammals and all the different points brought up by Madam REMAUD. Are there any questions? I am going to

head back to the project manager.Madam REMAUD has made a certain number of recommendations. Sorry, I'm going to hand over to you later. Yes, Sir.

François GALLY

Good evening. François GALLY from the study group of cetacean of the Cotentin. I'm quite curious about this approach to mammals in the Seine bay. We are a structure, we study and we seek to conserve maritime mammals in the English channel. In this area there are some tens species that live here. There are some that are exceptional, some that are resident. The harbour seal for example, the bottlenose dolphin. And then there are species, which are perhaps less important such as the porpoise, which is there here seasonally. So the presence of mammals is quite important there. But you've seemed to have minimised the impact. When you say the impact on the harbour seals are almost negligible, I don't know what you're basing yourself upon, knowing these are sedentary animals. Any impact on sedentary animals, there is nowhere for them to fleet, they can't escape, for example as far as the bottlenose dolphin is concerned. The Normandy Breton Golf has the biggest bottlenose population in Europe. That's been proved. This is part of our main work. This population uses as well the Seine bay. Every year there are migrations, groups of animals that go from the west of the Cotentin into the Seine bay. We have proof of that. We have photos that have been taken from Arromanches, the seals around the Caissons. We identify them regularly, on the west side. And so all these populations will be impacted by the worksite, that's for sure. And I'm interested to hear about your approach prior to construction to evaluate, assess the risks for these populations in trying to determine the area of impact, which species will be impacted, how will they be able to react and how we could diminish the impact as much as possible. And I think there is a lot of work to be done before the construction begins. Then there is a monitoring work to be done. That's inevitable. But before the construction startsI think there is a lot of work to be done. Thank you very much.

Jean-Louis CHEREL, member of the CPDP

Thank you very much Sir. I am going to hand over to the project manager. Do you have an answer to those observations?

Jean-Philippe PAGOT, EDF EN

There were questions that were asked directly to the GMN with regard to its assessment.

Jean-Louis CHEREL, member of the CPDP

Yes, I was going to hand over to Mr LEBOULLENGER because your expert report is contested. But before that,with regard to measures to be taken, do you have an answer?

Jean-Philippe PAGOT, EDF EN

Yes. So with regard to the evaluation of impact during the work, which we know it's an important aspect when we want to… we are going to be setting up monopiles by pile driving. There are a lot of acoustic impacts in the milieu. If we could have a suitable medium to illustrate the impacts of the noise, to visualise the distances thresholds on a map, on which we need to maintain when we work.

If we could go, flip through the presentation please here on the screen. The idea is to give orders of grandeur with regard to these issues. I'm sorry the presentation is rather long…ah yes, there's bonus, just had to wait, the patience pays. So I'm going to get you to the slide

concerning the issues of noise. We've done some detailed research on this. Sorry there are quite a lot of slides here as you can see that we have to get through before we reach the noise related slides… am I out of slide…

In any case the issue of noise at sea is a subject that needs to be taken into account. This is what I wanted to illustrate. It is quite interesting to look at the scale of noise at sea. The noises generated are not all the same here, of different potential sources including our pile driving operations, which are right at the top of the scale, which produce a lot of noise. But there are other activities in sea. You have an out board motor, you have acoustic studies, big ships, a small vessel or a wind turbine, which is pretty near the bottom of this scale. What I mean here is that we are in a context we produce noise as do all ships. Within the context we need to look at the issue of noise. Here I have illustrated odontocetes… we were talking about tooth wales that can bite you. I have illustrated there the thresholds… These are curves showing in the acoustic sensitivity of these animals. And globally the period of pile driving represented in acousticfrequency, you can see there is a limit above which the animals could be constrained during the work phase.

How do we do that? We try to assess the issue of distance because there are distances, which are pretty much recognised today. We are capable of wounding these mammals with noise. There are distances in which we will bother them. There are distances in which they will hear without being bothered. But in any case some levels of noise can involve temporary or permanent deafness for these mammals, reactivity, what we call a masking effect or simply of audibility. So this is a resume with regard to the effect of major species, which we have talked about. Obviously the distances on which we are going to work are not within one meter.

So to answer the question on how we will be able to tackle this problem. The idea here is that when want to start pile driving… and you can there is a critical threshold, which is confined to the sector of the project at least in that sector, we need to be sure that there are no marine mammals when we are piling. So the idea is to obtain initial observations before we start to work. The second possibility is we want to work progressively beforepile-driving as powerfully as possible and by making a maximum of noise. We want to start gently. Species are not a priori attacked by the noise,which causes them harm and in order to encourage them to go further a field and then increase progressively.We are talking about ways of scaring them off as well with dynamic systems. This is not necessarily opportune because they don't all react at the same noises.

Those are the sorts of things we could do when we are doing the work. Pile driving is not 100% noise 100% of the time, but there is accumulate effect over time. And you should know that there is noise involved when you are doing pile driving.We are continuing to sample these species in the Seine bay and we are also looking at harbour porpoises, bottlenose dolphinsthat do come from the west Cotentin into the Seine bay.

A little answer with regard to harbour seals. We are very conscious now that we have a beautiful colony in bay des Veys of this species, which is a pinniped species.And if we should make a comparison, they are submersible whereas dolphins aresubmarines animals, capable of heading out to sea. They have ears. They aren't designed, if you like, the same way as dolphins. They haven't the same system of ecolocalisation, as it has been reminded by the Normand ornithological group these are species dependent on their environment and here

the tracking map of the seals we followed in the bay des Veys with a system of automatic beacon. And you should see they are closely related to the coast outside the security perimeters that we were mentioning. They are much frequently found offshoreoutside the area in front of the bay des Veys. So there is perhaps one element of an answer, which shows there are specific ways of dealing with the issues involving this type of species.

Jean-Louis CHEREL, member of the CPDP

Thank you Mr PAGOT. Mr LEBOULLENGER, do you have an answer?

François LEBOULENGER, President of the Normand mammalogical group

Yes. It will be relatively short. Mr GALLY said exactly what I said. The bottlenose dolphin is mainly on the west Coast. On the other hand he made a mistake when he talks about the porpoise. The harbour porpoise is not just seasonally present in the Seine bay. We consider it to be sedentary. And it's for that reason that we are most worried about the harbour porpoises within the context of this project. But with regards to what's just been said, we did suppose that because the fish are concerned by sound and noise as well, if the food resources of these animals are driven away then there would be an effect on the nature reserves. And so we could presuppose, there are experience feedbacks in Danish wind farms or others, that these animals will move further away during the work and that they could come back again relatively quickly.

With regard to the distribution of species, I think I said the main thing and I'm repeating myself here. And if it was a way of contesting, I would have wanted the difference explained to me.

Jean-Louis CHEREL, member of the CPDP

Thank you Chairman. Any further things you'd like to say on this subject? Yes I am going to give you the floor Sir. But before I'd like to indicate to you, for those who are interested that the public debate committee has put a certain number of resumes on its site concerning acoustic, birds, marine mammals… and landscape. There is interesting information displayed on the website thanks to the project manager. Yes, Sir?

Philippe OZANNE

Philippe OZANNE. I have a question for the project manager concerning foundations. I believe the wind farm will be on a rocky site. And secondly, if I'm not making a mistake, geological studies have not been completed. Is it possible to create foundations by drilling or rather by piling?

Bernard GUITTON, Project Director, EDF EN

Yes, as you have pointed it out, the geological studies are in progress. We have made a first expedition but we don't have all the information concerning the geological nature of the soil. For part of the piles we will be obliged to drill. We are not exactly sure right now what percentage will be represented by that. We need to progress in the development of our technological survey in order to have more precise idea of what we may find in the lower seabed.

Jean-Louis CHEREL, member of the CPDP

Thank you, Mr GUITTON. Time is moving, as you've all seen. We have asked two representatives of major associations here in Normandy to come and express their opinion this evening. We are going to give on the floor. We're going to start with Mr LEMOINE from the CREPAN. This is the region committee for the studies on preservation of environment in Basse-Normandie. And he's going to give his opinion on the subject we've tackled this evening.

Jean LEMOINE, member of the Board of Directors of the CREPAN

Thank you to the committee for having invited the CREPAN to this wind farm debate. We were created in 1968 at the same time as France Nature Environnement, FNE, and I'm going to repeat certain ideas of FNE on energy transition. My statement may seem a little distant from the Courseulles wind park but I will be refereeing back to contents, which have been made in previous meetings. And that seemed to me that we should respond to certain questions, which concern the sources of energy.

I'm not going to present the CREPAN any further. Climate change has been faster than the most pessimistic scenarios predicted. And now an article in Le Monde in May 2013 assessed 32 million the number of people exiled by climate change in 2012. 90% of scientific articles relate this with human activity. Madam CAUCHY presented the three points that make up the position of the FNE with regard to energy transition. I'm going to develop the two complements: getting out of the nuclear energy as fast as possible and the reduction of fossil energy in order to arrive in 2050 to manage to reduce by 4 the production of greenhouse gases.

Getting out of nuclear. Uranium can run out. We extract from different continents. It's not extracted in Europe. The reactors are under foreign companies licence. So the industry doesn't guarantee our independence. We'll be leaving to future generations tens of thousands of radioactive waste for tens of thousands of years. The catastrophes of Tchernobyl and Fukushima have ended the myth of infallibility. I wanted to put in parallel France's electricity production beside our neighbours. Germany has increased its production from renewable sources as of 2000. It started at from nothing and it moved up to 20%. That's the green part at the top of the diagrams. Wind energy represents 40% in 2009 of renewable energy production. During the same period Germany reduced by 15% the use of coal and it shut four or five nuclear power plants, which it had inherited when it incorporated eastern Germany. Spain developed the electricity consumption globally in the country around the year 2000. It did it first of all by using gas and then adding wind power. And we can notice gas is in yellow here, renewable energies are in green. We can see that toward the end of the period depicted as the green area, so renewable increases, gas has been compressed if I can express myself in that way. France has a very original situation. About 80% of its energy is produced by nuclear combustion, perhaps a little more than 10%, which comes from renewable sources and 80% or 75% of this renewable energy comes from hydraulic energy, that means construction, which is done middle of last century. No energy has found favour in the nuclear specialists eyes.

Wind power is an alternative to develop in order to reduce nuclear from 78 to 50%. We hope that the construction of this wind farm, which has a big installed power, will reduce the reticence of a part of the population with regard to wind power. 450 MW, that's half a

classical nuclear reactor. It's a quarter of an EPR, it's a quarter of the EPR that is currently under construction. And the cost of installed megawatts is comparable.

As according to a Danish research, grey energy, and by that I mean energy that we use to make wind turbine, is reimbursed in 6 months and carbon footprint is reimbursed, the carbon debt is reimbursed in 5 years. A survey conducted by FNE in 2010 said 66% of the French are in favour of wind power. As far as FNE is concerned, Biodiversity impact is essential in this regard. The sale price of electricity in France is administrated. It doesn't take account of the real cost of production because reactors were built during the period of the state monopoly, because we don't take account of decommissioning, because we don't take account of waste management. The EPR will establish the price of electricity in parallel with a construction under the new status of our energy producers since 2004, as a result of the fact that our energy producers are now compete. The company that will manage the windfarms, electricity produced will be purchased at a feed in tariff by our electricity distributor. But that distributor of electricity will be compensated or reimbursed by the contribution of the electricity public service contribution, which will be paid by our electricity bills. And so that is a matter for individuals and for businesses. This CSPE it doesn't just involve wind power. It involves all renewable energies. And it's a question of fiscal equalisation for areas for which it's hard to provide with electricity and it also has social purposes. According to the CRE (Commission for Energy Regulation) in 2013 wind power should count for 11% of that contribution. With the increase in power of electrical production from wind farms, this contribution, the share of wind power will increase but we can hope that in future constructions that the maturity of the industry and the return on productivity and the increase in the price in electricity will ensure that this compensation will reduce overtime.

According to a recent estimation done by Lazar bank in the US, nuclear would be more expensive than wind power. Solar power is even slightly more expensive. In France the Court of Auditors assess that the electricity produced by the EPR in Flamanville could face competition from wind energy. The Era of the very costly renewable energy and very cheap nuclear energy is over.

We also hear that renewable energies, because they are irregular, will promote gas consumption. I have talked about the development, about an evolution of the energy production until 2050. In order to diminish greenhouse gas production we will have to develop renewable energies, wind, solar, tidal energy, geothermal. And we are studying now the possibility of stocking hydrogen as CO2, which can react according to the Sabatier reaction to produce methane, or doing energy transfer stations by pumping and to produce electricity closer to places it is consumed by using hydrogen cells. Hydrogen cell is well developed now. It is used overseas. And we would also use generators. We have ahead us an area for innovation, which is thrilling. There are a few innovations, which have already seen the light of day. In Germany,I have found on the Internet, there are three towns that use tramways, which are called 0 carbon tramways, that means they use wind power.

Jean-Louis CHEREL, membre de la CPDP

M. LEMOINE, have you almost finished…

Jean LEMOINE, member of the Board of Directors of the CREPAN

I've almost finished. I just wanted to mention this use alternating between stored energy and wind energy. So it's true for the three German cities, which use that energy for the public transport tramways. Madam the President mentioned the carbon debt that could be generated by the ships working on wind farms. Why not fuel them with hydrogen? That would fit with the current policy on the energy transition.

Jean-Louis CHEREL, member of the CPDP

Perhaps Mr LEMOINE you can conclude. I am going to allow Mr MAFFEI to speak for a few minutes.

Jean LEMOINE, member of the Board of Directors of the CREPAN

Energy transition is inevitable. It's unavoidable. Wind power is part of that. Exemplarity with regard to construction and management will facilitate social acceptability and the development of future wind farms. In the coming century history teachers will still be talking about the D-Day landings. Perhaps they will add that these beaches were the place where we sat up the first maritime wind farm that was decommissioned during the 21st century?

Jean-Louis CHEREL, member of the CPDP

Thank you Mr LEMOINE. The project manager will take note of your observations. At last over to Mr MAFFEI, the president of the GRAPE. Everyone knows the GRAPE. You now the contract we are operating. We are still on the 12th June. We have not reached midnight yet. But we mustn't move into the 13th.

René MAFFEI, President of the GRAPE

Thank you. I'm going to make full use of the minutes that you are granting me. It's easy to criticise but I consider that given the themes tackled and the length of our debate, we could have had two meetings. That would have saved myself loosing time and to speak past midnight.

Good evening, even good morning. René MAFFEI. I represent the GRAPE. This is 70 associations, 7000 individual members spread acrossBasse-Normandie. I am going to accelerate. First of all, we'll tackle, GRAPE is not against wind power, but it recommends and has done for some time an energy mix, that is to say the distribution of the different sources of energy and that of course in order to avoid polarising financial subsidy, which are often geared to wind power, be it on land or at sea. This morning some people were able to read an article according to which there are 8 million consumers who have difficulty with their energy bills. This means that the first thing to be done or one of the things that is the most important to do is to reduce energy consumption. And this reduction of energy consumption will only be possible if we accelerate isolation of buildings in our region, given the ravages of the Second World War, our buildings consume a lot of energy.

Let me move to our observations with regard to the subject of the debate and our questions. Setting up 75 turbines over 50 km², 175 m high will alter the horizon in our mind and for some will represent a non-negligible visual pollution. In spite of that, distances must be taken into account, the distances between Arromanches, Courseulles and other coastal resorts. In spite of these distances sound pollutions and vibrations will probably be felt, which will pose a problem to those who live on our coast and to tourism activities. And if I believe the panel, the calendar for the works it's about perhaps 5 years of work, which of

course will be spread over those five years, and without wishing to prejudge the future, two years for decommissioning if that happens, which means that there will be affected on tourism during these periods, which will represent about a third of the years of operation, which is about 25 years.

Then there is a question of vibrations – and I've mentioned it earlier - and these will affect areas such as Ouistreham, which will be downwind with regard to the dominant winds. With regard to fishing zones. I was on the meeting at Port-en-Bessin on 12th April and I took good note of the local fishermen who had seen over the years, given their areas where under protection or dredging zones, that they are experiencing reduction of their fishing zone. And as a consequence we share their concerns. Leisure sailing will also be negatively affected.

Then I would like to talk about the average production. It's about 38% of the maximum capacity of the machines. I think that is over estimated with. As above all as we know that wind farm performance, the research concerning wind farm performance is still underway. So we will wait for, that is based on feedback from research that is now 10 years old. According to Mr ANDRÉ, at the meeting in Bayeux on the 20th March, I noted in the reports: renewable energies are not yet sufficiently mature. I'm asking myself the question: what does that mean? Does that mean that there will be technical evolutions in the short time, which could improve yield? Now that's an important question for everybody. With regard to feedback on experienceMr FEER announced at the Port-en-Bessin meeting on the 12th April feedbacks on three Danish wind farms in 91, 2002 and 2003. But these parks do not use the machines that will make the project off the Courseulles shore. We need feedback with regard to the machines, which will be established. Trials at sea will be done on the Heliade machine by next July, that's in a month time. Results will be available at the end of the year. We hope that these results, we will be able to communicate them to you and to all associations involved in environmental protection.

One last point I want to evoke that's the decentralised production of electricity. There again I have under emphasized what Mr PIN said. He says: the decentralised production of electricity is less profitable and poses problems involved in the steering of the network. There again we can ask questions, without being opposed to wind farms, with regard to the difficulties that represents, with regard to smoothing the transmission of electricity across our grid.

Thank you very much for your attention, and sorry, to have spent several enjoyable minutes with you, but at a time, which is perhaps not the most ideal moment of the day. Thank you very much.

Jean-Louis CHEREL, member of the CPDP

Thank you very much Mr President. As you've seen the debate was very loaded. Perhaps there was too much and perhaps two meetings next time.

Claude BRÉVAN, President of the CPDP

You are doubtless correct, Sir. That was due to the wealth of the exchange and the debate, which characterise this meeting. It's been very interesting. Thank you very much indeed all of you for having remained so long. Not everyone is still here, but there is a substantial proportion of the audience who is still here. It's clear that we could come back to some subjects. The two last presentations could give rise to debate. The second last one, the

questions were already tackled in the previous meeting, but one little less with regard to the last presentation. There are still three meetings to be run on the 20th in Ouistreham, where we are going to tackle very technical subjects with regard to the establishment of these wind farms, the nuisances, the pollution they will provoke. And I believe responses will have to be given with regard to the precautions that have to be taken during the work in progress as the subject has been tackled a lot in the last part of the meeting. We will also look at the carbon footprint, which is very important because it's one of the main virtues of wind farms, that is that they do not use fossil fuel. But it is interesting that it would be demonstrated the extent, which this principle is complied with. And we will also talk about decommissioning. And we will talk about the development of the harbour of Ouistreham.

Then there will be two further meetings. One general information meeting in Lion-sur-Mer, which will take place on the 11th July and that will be interesting for those who are not able to come and particularly for some visitors who are not always there outside the summer period. And then on 18th July we will have a final debate. So this debate is approaching its conclusion. It's been extremely interesting. We've heard a very dignified and very stimulating debate in the first part. And even if we've heard many different positions presented, this has been done very respectfully. Everyone has respected everyone else's presentations and ideas. And I would like to thank you all for that even if the interveners of the first part of the meeting have left before the end.

Sorry to have kept you so late. It's very difficult to postpone the agenda or any elements of the agenda to a further meeting. Maybe we should have shortened the first part of the meeting. So thank you all for allowing us to have finished what we intended to talk about. And I hope to see you at the next meeting. Goodbye.