

ISGAN Smart Grid Project Webinar Series: Response by Flexibility on Electricity (Reflexe) Project

—Transcript of a webinar offered by the Clean Energy Solutions Center on 3 November 2013—
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Webinar Panelists

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Axel Strang French Ministry of Ecology, Sustainable Development and Energy

This Transcript

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Sean Esterly

Hello everyone. I'm Sean Esterly, with the National Renewable Energy Laboratory, and welcome to today's webinar hosted by the Clean Energy Solutions Center. We're very fortunate to have Axel Strang, Yves Bertone and Laurent Schmitt joining us today. This great group of panelists will be discussing the Response by Flexibility on Electricity smart grid project, also known as Reflexe.

One important note I'd mention before we begin our presentation is that the Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the Solutions Center's resource library as one of many best practices resources reviewed and selected by technical experts.

Now, I just want to go over some of the webinar features. For audio, you have two features. You may either listen through your computer or over your telephone. If you choose to listen through your computer, please select the "mic and speakers" option in the audio pane; doing that will eliminate the possibility of feedback and echo. And, if you select the telephone option, a box on the right side will display the telephone number and audio PIN that you can use to dial in. So panelists, we just ask that you please mute your audio device while you are not presenting. And if anyone has any technical difficulties with the webinar, you may contact the GoToWebinars Help Desk at 888-259-3826.

Now, I encourage the audience to ask questions throughout the webinar. If you have a question that you'd like to submit, please use the "question" pane, and that can be found in the GoToWebinar panel. If you're having any difficulties viewing the materials through the webinar portal, you can find PDF copies of the presentation at cleanenergysolutions.org/training, or you can follow along. Also, an audio recording of the presentations will be posted at that page within the next few weeks. And I'll send out that link once the presentation's get going to it.

So we have a great agenda prepared for you today that is focused on the Reflexe smart grid project led by the VEOLIA Environment. And before our speakers begin their presentations I'll just provide a short informative overview of the Clean Energy Solutions Center initiative. Then following the presentations, we'll have a question-and-answer session and then some closing remarks and a brief survey.

This slide provides a bit of a background in terms of how the Solutions Center came to be. Solutions Center is an initiative of the Clean Energy Ministerial and is supported through a partnership with UN-Energy. It was launched in April of 2011 and is primarily led by Australia, the United States and other CEM partners. So now comes with this unique partnership includes support of developing countries through enhancement of resources on policies relating to energy access, there's no-cost expert policy assistance, and also peer to peer learning and training tools such as this webinar.

There are four primary goals for the Solutions Center: serves as a clearinghouse of clean energy policy resources; also serves to share policy best practices, data and analysis tools specific to clean energy policies and programs. And the Solutions Center delivers dynamic services that enable expert assistance, learning and peer to peer sharing of experiences. And then lastly the center fosters dialogue on emerging policy issues and innovation around the globe. So our primary audience is energy policy makers and analysts from governments and technical organizations in all countries, but then we do also strive to engage with the private sector, NGOs and civil society.

One of the marquee features of the Solutions Center is its expert policy assistance. So this is known as Ask an Expert and it's a great service offered through the Solutions Center at zero cost. So we've established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to any country.

So for example in the area of smart grids, we are very pleased to have Bruno Lapillonne, Vice-President and co-founder of Enerdata, serving as their expert. If you have a need for policy assistance on smart grid or any other clean energy sector, we encourage you to use this useful service.

And again, this assistance is provided free of charge. So if you request assistance, you simply submit your request through the Ask an Expert feature at cleanenergysolutions.org. We also invite you to spread the word about the service to those in your networks and organizations.

This slide provides a brief overview of ISGAN, or the International Smart Grid Action Network. And ISGAN creates a mechanism for multilateral government-to-government collaboration to advance the development and deployment of smarter electric grid technologies, practices and systems. It also aims to improve the understanding of smart grid technologies,

practices and systems and to promote the adoption of related enabling government policies.

And now I'd like to provide some brief introductions for our panelists today. First up will be Axel Strang. Axel is a policy advisor on smart grids, energy storage and hydrogen with the French Ministry of Ecology, Sustainable Development and Energy. And then following Axel, we will hear from Yves Bertone, the Deputy Director and Coordinator of Consortium Projects with VEOLIA Environment. Yves will be providing an overview of the Reflexe smart grid project. And then finally we will hear from Laurent Schmitt for the question-and-answer session. Laurent is the Vice-President for Strategy and Innovation at Alstom. And with those brief introductions, please join me in welcoming Axel to the webinar.

Axel, you may still be on mute. Axel, are you still on with us? It seems we have lost Axel. We can go ahead on to Yves's presentation and if we have a chance later, we might come back and allow Axel to do his overview.

Yves Bertone

Yes. Everybody see the screen? So Yves Bertone—so I'm in VEOLIA Research and Innovation that will perform with three entities, VEOLIA Water, VEOLIA Waste and VEOLIA Energy subsidiary which is Dalkia. I'm going to present you what's our reflection about the response in France specifically which have been the project which have been target. However, most of the remark I've seen are quite true on many countries.

So the first thing is—I have made a point of view as a user. I'm not an electrician, I'm a client of the electric market, and therefore, we have to understand and to explain with our way what is the need of the electrical market. So what we identified is that one, we take the national consumptions. So here is an example of France but I've seen many countries similar figures.

We can see—when I take the hourly annual consumptions and looking at what are the high value of the power, here you have [inaudible 0:09:32.2] which is surprising you because usually people are using normal scale. However, we want to concentrate on the low—I mean, event, low-frequency event which is below 400 hours a year, and we have clarified—we separate in three families.

Usually, electrician, people are talking about energy, capacity and emergency. I'm adapting that worth, which are electrical worth, to the client worth which is I need to use something usually, every day I can do something, rare, 200 times time a day—a year, sorry, and exceptional, some year, three-four time, some years, and so in average two times. In that scale, we can see that we have on this country eight gigawatts need, and this eight gigawatts represent 10% of the total power needed in the country.

I'm not going to do and analyze—electrical network is not my job. However, what I'm interested is to find out how can I answer, how can I bring value with the part of site and building that VEOLIA is looking after.

Second point is what is the flexibility of demand response. Sometimes, we see misunderstanding about the use of that. I mean, I don't know if it's in other countries but it's true in France. We mix what is production and flexibility. Sometimes, people are using the emergency diesel group as to say is flexibility. Yes and no. Maybe an exceptional, maybe in support or other things, however, it should not be the main flexibility.

Flexibility is using the resource of the building, of the endorsement site. We do have on this site storage energy, natural storage energy because we have the building energy, we have stock in the industry, we have the capacity—some batteries, some thermal storage, so all that storage are the flexibility we have on the consumer side.

Therefore, the definition that we are presenting about that is first is a time shift consumption need. On energy, on power, that means just that it is the time that we are going to use. It is half an hour, one hour, do you report it on one hour or two at some times, okay. All that is demand response. We can report the need. When we say the report, it means there is no significant reduction of the consumption. If there is reduction of consumptions, therefore it is not flexibility. It is energy reduction and therefore you should do it every day. You should do it whatever the demand of the market.

We have another point as well which is about the CO2 valorisation of the demand response. We have made a study. However, now the thing is how today ISGAN is going to appropriate this subject in each country and national to say, "Okay. The flexibility, once you can have the definition, you can—" I will say give it a CO2 reduction associated. As I'm saying that it is just shift on the side of the consumption side, it is not impacting CO2 locally. What is impacting the CO2 is of course reducing the loss, reducing the—avoiding—starting a new production and so on. What we have identified on the analysis is to say, "Okay. We have nine types of benefits which have to be identified. And after, to see exactly what are the associated demand response that we can answer to that."

Now, I'm going to present the project, Reflexe. So what we have target on the project? We target to make a demonstration project, which have been approved on the French government and its administration. We do have to implement the Aggregation center, which is the role that we are going—in which we are going to connect consumer site, some decentralized production that we consider associated to the industry and tertiary sectors. We do not integrate large power plant or large solar PV. It is just saying that it's still in the area of [inaudible 0:16:11.8] and industrial and tertiary

sectors. We have some storage system and we have integrated the market operator.

On technical side, of course, this means that we have to take the site, understanding how it can be flexible. To evaluate the flexibility we the three criteria I mentioned in the first slide, exceptional, rare, frequent, integrate that in the system, and propose it as an aggregation to the market. On the financial side, of course, we have to take the cost of the deployment of that, and the capacity of the market to cover this cost. On the overall side, I mentioned about the CO₂ and the ACV analysis that we have made. We have as well on the consumer side about the social acceptance of the work made.

On project timing, we have made three years of assessment and analysis. We have started to implement the demonstration. Today, we have to start the platform of aggregation and now we are connecting the site and we are going this summer to test the complete chain. At the end of 2014, we will do the result and assessment of this project.

Who are we? We are—okay, I present VEOLIA but we are as well with Alstom, Alstom Grid, which are providing the aggregation software; Sagemcom, which is providing communication and smart metering; the CEA, which is research center in France, in-charge of photovoltaic power generation simulation and prediction in account of what the variation of the power production in case of [inaudible 0:18:45.9] and all the impact that it could have on the local production; and on electrical storage, we test on high temperature batteries, Supelec which is university of electricity. All that on support with ADEME, I have mentioned, with the city, and the Commission of Nice Cote d'Azur, and the CapEnergies which is for connectivity in this.

We have now finalized, of course in the first time, the pre-mortem of the project. It's situated in southeast of France which is one of two regions which is sensible to the electrical situation and due to the high voltage connection. On this area, we have targeted what VEOLIA know well, which is large site above 250kVA. On this scale, we have target 20 sites, and we have tried to cover all types of commercial building and industry. We can do all of them of course but we have tried to have enough type in such way that we can extrapolate the result of this project.

Today we have two hotels, we have five offices, one school—one university, public building like airport, like opera, two museum and leisure centers. And on the industry, we have pharmaceutical sites, a waste water station, drinkable water grid, two waste center which is from VEOLIA Waste, and a waste storage sit in which we do production of pure gas. All that make 20 sites, 14 commercial sites with over 300,000m², and 6 industrial sites, all of that.

After we are going to talk about the—we have no definition, what are the—the size of that is not kilowatt, of course. It is the power which is interesting us. We have selected the power in winter, which is more critical in this, and the power subscription of all the sites are making a total of 19 megawatts. We are targeting the capacity of flexibility between 1 and 6 megawatts. I'm going to talk again about those figures after.

What is the structure of the work to be done? It's not just to say, "Okay. I'm a go-getter!" We do have—as operator of the building, we are taking care about what we can do on the building therefore we consider that the commercial and industrial site can be partnered and we propose a demand response service. However, what we do is of course as we are operator of the building we define clearly with the client what we can do and are pushing as well all the critical flexibility that we can do.

I mentioned, for example, the exceptional. Of course, as exceptional it means that we are going to impact in a way that the client will accept it, for example, decreasing the comfort temperature exceptionally because everybody agrees that it's better to have one degree less of comfort but to have electricity. What I mentioned is to say this comfort of course is limited in the time. The temperature come back and therefore there's no reduction in consumption. However, we have reduced the risk of electrical breakdown.

With this operator, we do have a technical operator that is what we—what we do in most of the—our organization for the energy management, we do have original team in-charge of communicating with the site, able to feed the platform, and able to adapt to the demand of the client and in connection with the electrical market [inaudible 0:24:31.4]

On that side of the market, we can provide energy production, energy transport distribution other suppliers. Of course, it's the three, the four actors depending on the market. Spain, we know that we can provide to central production to compensate for the uncertainty for the area. In France, it's more about the national grid, transport grid and in part on supplier side.

On the platform, today a good view of what is a platform. So we have DERMS, which is the platform of Alstom, on which we connect the site through Sagemcom gateway, and as well as battery of CEA and as well the photovoltaic, with the forecast of the photovoltaic, and a central—I mean, the tools that we have developed to be able to forecast on the flexibility on the site and therefore this is able to aggregate and to the technical aggregator and to the trader.

The challenge for the market bid is clearly to convert. As I have mentioned, we have to answer to what are able to provide the site to what needs the electrical market, and therefore we need to centralize and transform what is the potential of the site to what is on the market.

Therefore, we have developed different tools to aggregate that. We did not make test yet because that is the object of this summer.

In summary, today the platform is operational. The industrial site are ready for connection. We already made demand response tests on the site. We are deploying the communication on site. And we will make a complete test probably in February or March, 2014. And in main—I would as of main result, I would say—what I mentioned, we have a lake of definition and regulation on the demand response. The different presentations, sometimes people are mixing are the diesel group, for example, or the production.

Clearly, as a user we have to separate that because clearly I cannot produce flexibility for 10 hours or in some exceptional case. We are limiting in time. We have to postpone our production, okay. And what can be aggregated, how it can be aggregated and provided to the market, of course, that means clearly it's not just a reduction, it is postponement.

We need as well to clearly identify the collective benefit and then back to the business model. However, we cannot say what would be the value of such solution. Last time I present my figures some people would say, "Well, are you going to reduce the production?" No, the production are going to be efficient, are going to be more adapted. A production need to produce more than 400 hours a year, other ways how they will leave. The flexibility we have on site have to be below that. That struck me that we have to share clearly the way of supplying the demand response and the need of the electrical market.

Now, as well, as a resource, clearly we have identified that. We can answer to the 10% of the flexibility I mentioned in the first slide. I'm not going to give you the final figures because I still don't have it. We have made analysis on the 20 sites. We are working on the extrapolation of the park on the area, and from this extrapolation, we will be able to tell what is the potential. On the commercial industrial side, it's clear that is should be more than 10%. And if we want to take into account that commercial industry is not the only site consumption on the national needs and as well that of course all the [inaudible][0:30:14] will not be able to provide. All that will be the other studies that we are going to do in next year. I've made an overview of the project and I expect that I've been clear and maybe Laurent is connected now.

Sean Esterly Actually at this point and thank you [inaudible][0:30:50] for that great presentation but at this point we're going to go back and see if Axel's audio is working so that he can get his [overlapping][0:30:59]

Axel Strang Is my audio working? Can you hear me?

Sean Esterly Yes it is. Yup.

Axel Strang

Oh great. Sorry about that. So I was saying well I was speaking to myself a few minutes ago about how fortunate I was to introduce this webinar and so I'm not really introducing it right now but I can bring some line on the context of these series of webinar, of what I—in conjunction between ISGAN Annex One, the clean energy solution center and the global smart configuration. Within ISGAN we have an annex called the global smart grid inventory and the purpose is threefold, one is to assess the drivers and technologies that governments have towards deployment of smart grids, the second one is on building up an international inventory of smart grid demonstration projects and Reflexe is one of those projects within those [inaudible][0:32:01] in this inventory and the third is in the [inaudible][0:32:05] in the information exchange in the project collaboration. And this webinar, if there is a webinar it aligns within these three tasks to promote the exchange between countries within ISGAN but also to the brother community. So to bring a bit more complex on the Reflexe projects it is one of the 16 projects currently financed by [inaudible][0:32:32] which is an energy agency which has a [inaudible][0:32:36] for called investment for the future and which was launched a few cost of projects and for now 16 projects have been run so far, accounting for about 300 million Euros in total budget with the 80 million Euros of public funding. So it's very exciting to see the progress on the Reflexe project and to disseminate the current knowledge and experience they have. So that's it for now on my side and I will turn to the question and answers session.

Sean Esterly

Yes thank you Axel. And so we give—I do want to just remind the audience that if they have any questions they can submit those through the question pane on the go to webinar channel and we did receive a few questions so far so I will go ahead and ask those to either Yves or Axel whoever can best answer those. And the first question is by the aggregation SW the decision making tool including simulation SW open to all, after the project so do those occur afterwards? And does the project produce open source SW.

Yves Bertone

Well the way it is organized is this is a demonstration therefore at the end we have to transform it as operational now after we are in partnership now after as they will propose is platform on the market and VEOLIA will propose his services on the market. So we do not have today a feasibility of how we will work with Alstom or Alstom with us in the future. The target of demonstration is just to see what we can do to learn each other about the way we are working and up to now we are very satisfied about the way we [inaudible][0:35:10] with Alstom and [inaudible][0:35:12].

Now the thing is not what we can do because now most of the things we knew we still don't know what is the added value of the functionality which they have developed about the platform that is more about the technical side and about your question about the business model is still a question on finding where we can operate at just to summarize VEOLIA is well implemented in Europe, in U.S. we do have as well each district we

are operating each district and cooling district however we are not operating today treasury building and the [inaudible][0:36:12] not much and therefore U.S. is not yet adapted market for that.

We need to be operating of proposed to the client that we know how we can bring added value on that. So on our side it will depend on the country and on the opportunity of market on the side of Alstom, Laurent is not here but I could say simply that of course what he learned about it is integrated I mean what is—what he can generate make as a general he integrates his platform and is proposing on the market. Does it answer to your question?

Sean Esterly Yes I believe so and I think Axel had a couple of questions that he was going to come on and present to you next.

Axel Strang Can anybody hear me now? I just want to check. So Yves could you elaborate a little bit on the consumer acceptance especially in the industrial and business consumer side? How flexible are they willing to be per your experience right now?

Yves Bertone Well there's two points. The first thing is about the vocabulary, we already had discussion with that. It's not much in English [inaudible][0:37:46] response is quite adapted. In France we use a [inaudible][0:37:51] which is more looking like a looking the words.

Axel Strang Erasing.

Yves Bertone Yeah and therefore on the side of the client it's not accepted. I mean of course if is electrician he understands very well however I have first about the—that is what I have mentioned to energy agency [inaudible][0:38:22] and we have to take care and I think it is what is interesting ISGAN is we have to take care that as electrician we are working—the electrician are talking about their word that's clear. Okay but now if we want to associate user client we have to adapt it and that is why I'm as operator as in contact with the end user I clearly take the attention about the word we are using and clearly I'm arguing that we have to adapt the vocabulary and we need to have of the collectivity and of the government to adapt this vocabulary if we want it to present to the end user, that's the first point.

Second point is after how we adapt onsite the flexibility. You have just to think that electricity in average or percent three maximum four percent of the electricity of the bill that's the company are paying so it's not much but it's significant that much so when we do flexibility we have to take care that it should not be too complex for the client. It should be simple, adapted and giving him a good feedback. So first is how we can bring value on this three percent by making something which is going to be at least five percent of this bill and we have the advantage as VEOLIA that we operate site that we make a package of all this energy and therefore we are able to mix that and when we start the project we have—the first

approach we help the client was to visit them and talking about energy in general, flexibility was not understood and they—and as naturally we are talking about energy reductions as we are used to do with our client, and they were expecting that.

So what we have first made quickly on the product is to clarify that while the project is not energy management it is—it is energy management it's not energy reduction it is just to reduce the invoice with the flexibility and of course there are other projects many of them have been major really for the energy reduction. However the confusion today after all the contact we have with client is clear that when we go on the site, when we do energy management that we do for a country we are today including the flexibility in our studies in such a way that is not much complex it gives us the possibility to evaluate and this is part of the energy management.

Third point when I say two points, on the energy, on the client side there are two points is one which is how we handle client and the other thing is how we can bring them about the flexibility. Large part of the flexibility is about the thermal heating and cooling system because this is the main energy we have very flexible as we can use the [inaudible][0:42:44] of the building. So that's clearly identified. However after we have to define how we are going to separate the three type, I say it frequent, rare, exceptional.

Naturally today on the market people understand very well at least form what I've seen from Australia and from U.K. and from France and Germany as well [inaudible][0:43:14] and the usual okay we are trying to shift from day to night or to avoid the peak demand of the day. The usual is very well understood and it is part of the project and it is one element. The two of us are quite less understood. I'm going to—what I've made is first thing is the help I mean—the thing is that we are working in [inaudible][0:43:48] was very useful for that because there is a lot of communication made by the collectivity, made by the department, made by the administration of government totally to say take care today we are on the peak demand, exceptional demand, we need your help. Using this I—it was quite easy for me to present the exceptional case to the client and I based that to try to find a middle where it is rare.

Rare which is 20 times a year which is what in France they name [inaudible][0:44:30] what we can find in other country whatever, this the difficulty after is on this rare and exceptional it is very important that the administration that the collectivity is communicated. And what I've asked in one project, a new project with the university is to try how we could half an indicator to help the company like VEOLIA our competitors to understand what are the communication made by the government or by the collectivity in each area in such a way we see the indicator or with this communication that help us locally to explain our client how we can do flexibility.

Sean Esterly

Okay thank you. I have a follow on question. In your approach to find the clients beyond the demonstration projects do you think it's a case by case approach or can you see a scalable methodology to approach your clients and at this point? And to make them go forward in accepting this type of solution?

Yves Bertone

Well that is one of point of the project as well. Can we—your question is I will reformulate it this project about residential, this project about product, I mean I would say from the [inaudible][0:46:21] okay just put the product and you connect it and you make flexibility. That was one question from VEOLIA and they [inaudible][0:46:32] well. Do you we have added value to this project because I would say if I'm come back on the [inaudible][0:46:46] on the market of course supplier could have an action directly with his client and propose a product connect and mastering directly and make the aggregation directly.

What we could say today after the audit and the first test we have made on our buildings is yes of course all site could be [inaudible][0:47:19] by product. I mean I'm talking about air-conditioning of the heaters from the [inaudible][0:47:31] you could apply the same thing than a residential home. However the constraint you will be have is how you adapt this constraint I mean this equipment to the constraint of the comfort of the people. How it will be accepted and that—will you use I mean another way to explain that is if you find 100 kilowatts, if an operator are using it can we find 200. Today clearly, I didn't have yet the value to say that, it's clear that when we operate it we can bring added value and move from 100 to more.

It's clear that if this more is not much then I would probably leave that to electrical [inaudible][0:48:35] to propose his product directly. If I can transform that as 200, therefore I would say probably that the added value as operating the system as proposing the value is more interesting than to do just direct. [inaudible][0:48:59] as competitive they are complimentary. It's clear that in that way we have to get only complex site with 250 kva or the small one whatever we do not operate there is no—I mean if we have somebody which is going on the site it's clear that there's no permanence on site and there's no follow up close the site.

Therefore you need to find when you are with small site, you need to find a solution which is automatic which is not going to be the most efficient clearly yes but which is more efficient whatever because you are taking it to account that you have limited costs to implement on that. On the big site and I mean when I say big site 2,000 meters, 4,000 square meters of buildings quickly we see that we operate automation is not always on site but it's often going on site therefore we can adjust every day the flexibility we can pick from the site. Just to remind that the flexibility we are talking about thermal part it depends on the temperature outside it's clear that when we have low I mean not much it's not too cold outside therefore there's not much heater and therefore—well there is more flexibility and in

some way because comfort the people are not less sensible to the cold, however the power is more limited. On the other side when you are going to be very cold when it will be a period of high demand therefore you have to be very careful because you cannot do the same flexibility the temperature on the building can drop quickly and therefore you have to take care that as the flexibility you are going to propose on site will be adapted to what the client is ready to accept and this is not simple and this needs a communication locally.

Axel Strang Well thank you Yves. I will turn back to Sean who has a few questions from the audience.

Sean Esterly Yeah thank you. The next question we had come in with regards to your statement that's saying that the project should reduce the invoice by applying flexibility. So did the cost for that fall under a monopoly regulation?

Yves Bertone I don't know yet, the business plan is not finalized clearly yes the regulation could bring a part but it could be as well complimentary of what is existing of what we can do. Just to remind that we have I would say we could save three types of cost reduction. The first point is the power connection on the site, which could be optimized which is often made but this could be developed with flexibility.

The second point is to say that from the supplier which is interest with some regulation case about addressing the supplier has to make compared to what he forecasts to buy on the market. And the third point is more the exceptional or more the case of the critical part on the national grid of maybe on some critical production or make that it is a [inaudible][0:53:38] client I would say of using that the point we knew difficulties how we measure the flexibility because if we [inaudible][0:53:53] the way to measure it we have to make it simple, we have to make sure that we have not added some regulation just to save well—if you're not checking everything somebody will trick and will not do flexibility. Yes I know—I see probable as I mentioned in France the rules are so severe today that it's very difficult to start so what we are looking for clear and we are the first to say well we won't cheat, that's clear. However how we can start, so we have to make that regulation helps to start, help to develop the activity, help to propose the flexibility and to control afterwards all the exceptional case, all the people taking care about—taking to account the real flexibility has to be solved afterwards.

Today it's clearly what I see in different countries, I'm not talking about U.S. but in Europe, we haven't start. Another thing as well about the economy clearly as well on the way we communicate is we associate the flexibility to the energy conservation because we see that doing that our term is people—we are making energy management for years so when we go to see a client of course most of the times they will say, yeah already made, it is ready, it's perfect so nothing there to say well there's something

more to do. The way to approach this client and to save the face to everybody is as well to say well we proposed something new, it's integrating of course the energy management that it is new that's it's because flexibility and therefore the energy management that we made will be as well an opportunity to save money for the client and to deploy the solution on the client side.

Axel Strang Alright thank you. And the next question that we received. What are the economic drivers for the size of demand response in France?

Yves Bertone To me or to Axel?

Axel Strang That one was just directly generally so I think whoever could best answer it. That doesn't specify who it was directed towards...

Yves Bertone Axel?

Axel Strang I could start with a few elements in the French National context I'd be—we have a some constraints on the capacity of supply at some periods of the [inaudible][0:57:34] especially in the winter because we have lots of electric heating. We do not have a constraint on the summer as in other countries due to air-conditioning and so some of our constraints are due to some group constraints especially in the [inaudible][0:57:49] area that the Reflexe project is based in. And also some constraints in some periods of the year where if it gets really cold then we have lots of demand and we might have some issues on providing power that time.

So in terms energy ecology there is a strong driver towards having flexibility at different levels of the consumer side especially as we go forward we deploy more and more renewables, we have to be able to a flexibility on both sides, on the production side and on the consumer side. So we are trying to create a market, design the market to give value to flexibility on the production and on the consumer side to learn the market, our capacity, market mechanism so to provide some longer term economic value to the adequacy and security supply to be added on top of the current market designs. So it might not be strong economic drivers for now per se but we're looking forward to bringing more economic value to flexibility as we see forward that we need to and we use projects that the Reflexe project should give it feedback on what is needed to build this capacity of flexibility for the future. And then Yves can elaborate a little bit more on some of the things that are today in economic drivers.

Yves Bertone To complete what you said Axel, initially in front there were two points what you said is about the pick demand on the winter due to the a lot of electric heater and second point is the deployment which is not yet [inaudible][1:00:13] the forecast of saying that if tomorrow [inaudible][1:00:17] is deployed on the territory how we could bring value to that. On the renewable energies there is forecast and well we have made

study with CA about the forecast which is quite good I would say for day to day of the month.

However forecasts of course there's error on the forecast from time to time and that is coming back about the rare and exceptional. We are—an error of forecast mean that you thought that there will be wind at 9 o'clock and the wind came only at ten therefore you have one hour shift on your—on the grid which are missing, how the flexibility could postpone that and therefore you don't need therefore to start a new portion just because an error of forecast. This is something that today we have not find a way to present which is to separate in fact on both sides production and consumptions, what are outside the base, when I say the base what is not—you cannot control and what you can control. Of course we know well that the peak production can be controlled and on the other side we have as well on the flexibility and the consumption, the flexibility we can control and that is something to find a balance between both of them.

Sean Esterly Thank you Axel and Yves. Next question is also directed I believe towards you Yves in that several parts to it I'll just read the whole thing for you and that is what are the current thoughts about the future or optimal side of an the aggregation center, how many aggregated megawatt [inaudible][1:02:41] and would small aggregation centers make sense.

Yves Bertone Sorry I did not understand well your question. Could you repeat?

Sean Esterly Yeah, it was "What are the current thoughts about the future optimal side of an aggregation center?"

Yves Bertone Okay. Well the question is today the question was about 10 megawatt in France and there was reduction in one megawatt. The question is there are two parts on the question. It says the thought of what we need to start to test and how [inaudible][1:03:30] which are not electrician I insist on saying that initially I mean, Dalkia or is not distribution or seller of electricity.

Most of that market I would say therefore how you have the [inaudible][1:03:52] to propose and I'm not sure it is a question of size, while there's a question of size clear I mean internally one it was say about the ten megawatt it was a question of saying it is high we see that well 20 sites we arrive to four megawatts therefore I mean it's easy for VEOLIA to extend that and to reach the ten megawatts. It's not the question is more after what are the value and how we can start deployment as I mean as long as you don't know about the market it's difficult to start. I would say between the criteria of the size and the market value, the market value is more critical because when you know about the market value then you decide to deploy. Today we do not have, we have a constraint of size and not a good view about the market value, so I would say between in your question yes the one or ten megawatt is accessible. However what is more critical is the market value.

Sean Esterly

Thank you Yves. I have a follow question on the size of the aggregator. So beyond just the size in terms of megawatts do you have a [inaudible][1:05:39] some experiences, some thoughts on if an aggregator should be focused on a local level that you are or should we have more value that we're spread out on a more rather regional or national location, the spread out on the national loads and level.

Yves Bertone

I would say—well these two things is—we are looking I mean in the study we are doing is we are studying three cases about aggregation. Dalkia is already doing aggregation on an island for a size of five sites on which we due to industrial site which the ten megawatt. So we can do that but how we do that is very simple we are not choosing sophisticated tools we are just making a simple [inaudible][1:06:45] which is I would say what I name is supervision or the control common system which is just you push the button and you switch on/off or you call and you get the client to stop his machine.

This is what a competitor is doing in France and what many people doing today. Outside this type of market is one market clear however and it needed to start the cost of the supervision here is similar I mean is integrated in all the system and therefore you can start outside the deployment. However with this function you are not able to adapt what is the true needs of the market and to optimize as I was saying in the presentation about the industrial product and the aggregation as operator, we are coming back about the product and on which we do on/off. This is a market, however, if we want to I mean as operator and using for the energy management we know that whatever we are going further than that and therefore we do have more function when we are going on the client side we know better I mean we know well about what he needs, what his constraint and therefore we are able to supply the platform with many criteria. To give an example, on one simple site we have something like five scenarios, different scenarios about flexibility on one site and about one frequency which is the rare one.

These different scenarios about what one is able to do I would say first of all one hundred percent of the power during two hours or half of it, of half fifty percent of it that's four hours. Just to give you an idea of different parameter we can handle. All that is not need a specific platform which is able to aggregate that and propose the best integration of that and therefore the platform [inaudible][1:09:41] of that or equivalent are needed and therefore you need for the second step outside—I mentioned initially than [inaudible][1:09:53] the minimum is to start then after you are going to invest as soon we get sufficient site it's clear that we are going to integrate this kind of tools and therefore we can optimize the resource. I cannot tell you today to which size the Alstom platform is or competitors is interesting to us. It will depend on the market, it will depend on the service we are going to provide. Can we integrate the three services I mentioned where exceptional, rare, and frequent in the same platform and serve different clients of the market like the supplier and the grid I don't know.

This is something that we want to study but we stopped to study and then on which we'll make a conclusion next year.

Axel Strang Well thank you Yves it sounds like we need to schedule a new webinar with you a year from now so can you give more of your results relative to how much a value we should try to get from the market or to address it's system what problem or system value. I did have a last question from my side is beyond the customers that you chose for the demonstration projects which type of consumers would [inaudible][1:11:40] business side would you think would be the next target that would be the most valuable for you.

Yves Bertone The main thing on I mean today clearly I mean we are focusing on the client on the target that which is common to the target of [inaudible][1:12:03] which is when you do—we aggregate and when do an offer we do a complete service of—therefore it's not we don't—we are not going to target today specifically on which side it is adapted to the flexibility but more we are going to target because of the low value of the flexibility compared to the energy cost we are going to target where they care as added value to operate and therefore today the target of Dalkia is just revolving commercial building and industrial site, depending of the [inaudible][1:12:56] the area there is different business target. The main thing is you need I mean when we do operate that we need to be in close contact with our plan, we need to be—to have the confidence in the way we are going to handle the energy with client.

Axel Strang Great thank you, Sean do we have any more questions from the audience.

Sean Esterly Nope we've covered all the questions from the audience and if you're all set with your questions with Axel that I would just like to thank both of you for your presentation today and the great discussion on Reflexe and just give you the opportunity before we ask the audience to take a very brief survey, opportunity for any closing remarks that you might have.

Yves Bertone To whom?

Sean Esterly Oh just that if you have any closing remarks to wrap up.

Yves Bertone Well I can mention that this—Axel introduced a different project in the world in France but there's many other project in the world I don't know much about USA but I would say in Europe what is the feeling the [inaudible][1:14:34] the project is specifically in France due to the animation which is made by the government, many competitors I mean other projects are taking into account the constraint that's existing of this market which is great because therefore we have the same language and we can talk with the government on the same base of knowledge. So the interest of having launched all these projects is a good point to VEOLIA and to the market because therefore today each [inaudible][1:15:23] start to have a good idea of what is possible, what are the opportunity, now the

question is now to the need is to transform this opportunity in concrete.
Axel.

Axel Strang

And on my side I would add that we're very pleased to be able to have some of our French projects participate in the world economic. I think there would be other webinars within this ISGAN Clean Energy Solutions Summit [inaudible][1:15:56] framework. I'm not really sure about the schedule of the next webinars but if you're interested in other projects [inaudible][1:16:07] please make sure that you contact me or the organizers which will send you more information a lot of information for now for the French projects or in France but it should be translated at some point this year or next year so I'll keep that in mind and if you keep in touch on that topic and I hope to see some of you at the our next webinars, we're presenting the French projects and then I'll let Sean wrap up for today.

Sean Esterly

Yeah thank you again Axel and Yves and there's additional information on our future webinars it's again smart webinars and another webinar on cleanenergysolutions.org and before we end our webinar today I just like to ask the audience to take a quick minute to answer three survey questions that we have of the survey is the webinar content providing you with useful information and insight. And the next question is the webinars presenters were effective. And the final question is overall the webinar met my expectations.

Great and thank you for answering our survey and on behalf of the Clean Energy Solutions Center I'd just like to once again thank our panelist for the presentations and the discussion and thank our attendees for participating in today's webinar. We very much appreciate your time and hope everyone has a great rest of your day and I also invite our attendees to check the solution center website over the next few weeks. If you'd like to view the slides or listen to any recording of today's presentations as well as any previously held webinars. And additionally you can find information on those upcoming webinars and other training events and we also [inaudible][1:18:44] in those in your networks about solution center resources and services including the no cost policy support. So once again have a great rest of your day and hope to see you again at future Clean Energy Solution Center events. And this concludes our webinar.