

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

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Webinar Panelists

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Axel Strang Policy Adviser on Smart Grids Energy Storage and Hydrogen, French Ministry of Ecology for Sustainable Development and Energy

This Transcript

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Vickie Healey

Hello everyone, I'm Vickie Healey with the National Renewable Energy Laboratory and I would like to welcome you to today's Webinar hosted by the Clean Energy Solutions Center in partnership with the International Smart Group Action Network also known as ISGAN. We are very fortunate today to have Yves Bertone and Axel Strang joining us to discuss the response by flexibility on Electricity Smart Group Project, which is otherwise known as Reflexe. One quick note of disclaimer before we begin, our webinar we'd like to redo that the Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this Webinar today is featured in the Solutions Center resource library as one of many best practices resources that are reviewed and selected by our technical experts.

Before we get started, I'd just like to go over a few housekeeping items if you will. So for audio you have two options, you can either listen through your computer or you can dial in over your telephone. If you choose to listen through your computer, please select the mic and speakers option that is located in the audio pane on the right side of your screen. If you do select or choose to use your telephone option, a box on the right side also in that audio pane will display the telephone number and an audio pin that you should use when you're dialing in and I would ask a gentle reminder of our panelist to be sure to mute your audio devices while you're not presenting so this will avoid any background noise. One last thing, if you have technical difficulties with the Webinar, attendees you may contact the Go to Webinar's Help Desk, which is a toll free number at 888-259-3826, and we'll be happy to assist you.

A few other housekeeping items, if you'd like to ask a question of our panelists, we ask that you use the questions pane where you may type in your question and if you're having difficulty reviewing or viewing any of the materials through this Webinar portal, you can find PDF copies of the

presentations at our website at cleanenergysolutions.org/training and you can pull up those PDF copies and follow along as our speakers present. Also, I would like to let you all know that an audio recording and copies of the presentations will be posted to the Solutions Center training page within a few days.

Real quickly, I will go over the agenda. We have a great agenda prepared for you. Let us focus on the Reflex Smart Group project that is led by VEOLIA Environnement. Before our speakers present—begin their presentations, I'm going to provide a very short but informative overview of the Clean Energy Solutions Center Initiative and in following the speakers' presentations, we'll have a question and answer session and that will be followed by closing remarks and a short survey.

So this next slide, I'm going to tell you a little bit about the Solutions Center, how it came to be and some of the services and resources that we provide. First, the Solutions Center is an initiative of the Clean Energy Ministerial and it's supported through a partnership with UN energy. The Clean Energy Solutions Center is launched on April of 2011 and we're primarily led and supported by Australia and the United States governments as well as other Clean Energy Ministerial partners. Outcomes of these unique partnerships include support of developing countries through enhancement of resources on policies relating to energy access. We also offer no cost expert policy assistance and peer-to-peer learning and training tools such as this webinar you're attending today.

So just going over the primary goals of the Solution Center; first, we service a clearinghouse of clean energy policy resources. We also serve to share best practice policies or policy best practices, data analysis tools reports very specific to clean energy policies and programs; and the Solutions Center delivers dynamic services that enables expert assistance, learning and peer to peer sharing of experiences. Lastly, the Center fosters dialogues on emerging policy issues and innovations occurring around the globe. Our primary audience is energy policy makers and analysts from government and technical organizations in our countries. We also really strive to engage with the private sector, NGOs and civil society. Now, I'd just want to speak a little bit about our "Ask an Expert" service this is a mark key feature of the Solutions Center where we do provide expert policy assistance on clean energy policies. "Ask an Expert", I feel it's a very valuable service. It is offered through the Solutions Center and what we've done is, we've established a broad team of over 30 experts from around the globe, some of whom you see on this particular slide. In this, experts are available to provide remote policy advice and analysis and this is provided to all countries at no cost to the requestor. For example, I just want to highlight that in the area of Smart Grids, we are very pleased to have Bruno Lapeon, who is the Vice President and Co-Founder of Interdata, serving as an expert on Smart Grids. So if you happen to need policy assistance on Smart Grids or any other clean energy sector, we encourage you to use this really useful service. Then again, just to remind

you that this assistance is provided free of charge. To request this assistance is very simple, you can submit your request by registering through our “Ask an Expert” feature, which is located at cleanenergysolutions.org. We also invite you to spread the word about this service to other senior networks and organizations that may be interested in utilizing this service.

Next slide please. Just a little bit about ISGAN, it's a platform for bringing high-level government attention and action to accelerate the development and deployment of Smart Electricity Grids around the world. It sponsors activities that build a global understanding of Smart Grids that address gaps in knowledge and tools and accelerates Smart Grid deployment. ISGAN builds on the momentum of and the knowledge created by the substantial global investments that are made in Smart Grids. ISGAN was launched also as a Clean Energy Ministerial initiative just like the Clean Energy Solutions Center and it was launched in 2010. It is organized as a task-shared IEA implementing agreement, which was established in 2011, and ISGAN fulfills a key recommendation in the Smart Grids Technology Action Plan released by major economies from forum global partnership that occurred in 2009. Lastly, ISGAN leverages cooperation with other initiatives such as the Clean Energy Solutions Center and implementing agreements.

Next slide please. Now, I would like to introduce our first panelist Axel Strang who is policy adviser on Smart Grids Energy Storage and Hydrogen at the French Ministry of Ecology for Sustainable Development and Energy. Following Axel, we'll have Yves Bertone, speak on Smart Grids and Electromobiltiy, he is the Deputy Director and Coordinator of Consortium Projects at the Reflexe and Yeloforever VEOLIA Environnement. With that I would like to turn over the Webinar to Axel; Axel welcome.

Axel Strang

Thank you Vickie, for this kind introduction. I want to—before introducing Yves and starting the presentation. I want to bring you some context on the webinar itself and also the Reflexe project in the French context. So this series—this webinar is part of a series of webinar from the ISGAN Annex 1 and the focus of Annex 1 is to—street fold, one is to assess the national motivation drivers and technologies that countries put forth in terms of Smart Grids. The second task, the second—the big idea between Annex 1 is to develop an international projects—Smart Demonstration Project in Venturi and three is—the third is the information exchange and project collaboration. This webinar is really about exchange in information and trying to exchange with the stakeholders and also to show, to put forward the projects that are listed in the ISGAN Project Inventory and within the French framework—the French context reflects one of sixteen projects we have financed through the Investment for the Future Fund and these are on Smart Grids and these sixteen projects account for a total budget of 300 Million Euros with a public funding of 80 Million Euros and we're very pleased to have a presentation today from

this project because it is sure to shed light on the current advancements and return from experience they had so far and so we'll ask Vickie or Heather whether Yves is here before introducing him, So Yves is working at the VEOLIA Environnement and he has had a long career on Electronental Engineering and he had parts of his career in Schneider electric. He joined VEOLIA in 2009 for the energy Management Methods and Tools Department and he's the coordinator of two projects. One is Reflexe and the other one is Yeloforever on the infrastructure for electrical vehicle. So, Heather, Vickie, do we have Yves online?

Heather Sorry for the delay Axel, we do not yet have Yves.

Vickie Healey Inaudible [0:10:31.9]

Heather I'm sorry for the technical difficulties. We are checking if he is having trouble logging in.

Axel Strang Okay.

Heather Were there question—we have this version last night. We have a webinar last—earlier today. Were there questions that came from the audience that came out that you thought you'd like to talk a little bit about while we check try to sort out getting Yves on the line.

Axel Strang Sure, so you will see on the presentation that this project is really about demand response mechanisms for industrial and business consumers in a very practical area in France in Nice, were there's a lot of network congestions so it's a practical area in France where grid constraints that really could give value to demand response and VEOLIA and DALKIA being emerging management companies, they're looking at these projects to add new value to energy management that also bring value to flexibility in the energy management package and one of the big questions at the discussion yesterday or earlier today depending on which country you are in was about how to—how much flexibility were the consumers willing to hand out in terms of—because we're talking about industrial processes or even business processes and sometimes flexibility means. Well some of the business processes will be delayed or you'll have to store the energy somehow. So, there are some investments and there's also an impact on the day to day basis and so maybe we can share the—have a small discussion on the—how do you get your consumers to accept demand response on flexibility and there was a lot of questions about the acceptance regarding around the vocabulary itself, because in France, being in the US and the English wording it's demand response so that's okay in French the term is “Efasmo” which is leave it closer to erasing so that's a bit scary so we have to—the project coordinators had to work a little bit around the vocabulary towards the consumers. So that was a very interesting topic.

Another topic we had also was regarding the Market Model, Market Design, who should be the one investing? That's a little bit unclear because there's a lot of discussions in European level on this on demand response. Also there was a lot of interest in exchanging information between projects, so it was very interesting and we're very happy to hear that project coordinators like this enjoy the setting of the webinar to look at the webinars of the other projects to understand better how things are going in other countries, in other context. So let's see how—where Yves is.

Heather Axel, we're still having trouble having Yves log in. Our apologies to the webinar audience for the technical difficulty here. Thank you Axel, if there's anything else that you'd like to discuss from the webinar earlier today, or I was also going to offer, we have Yves's slides, I don't know if there is anything in particular that you would like me to pull up. If there is anything that you wanted to talk about or if we should keep going with questions that you have had.

Axel Strang Maybe we can start going through his slides so I can shed or pinpoint some interesting things that were in our discussion this morning.

Heather Super! Yes I'd so that.

Axel Strang I know the project rather well because we financed it. So I'll try to get some incites but not as much incites Yves and whenever he can join in we'll—I'll let him talk here.

Heather Super! They are up and ready for you. Thank you Axel.

Axel Strang Great! So the Reflexe Project is a consortium project between—led by VEOLIA, VEOLIA—DALKIA and with four other partners which are ALSTOM, SAGEMCOM, SUPELEC and CEA—INES.

Next slide please.

The first part of the presentation was about Market Needs. Why do we need this kind of projects? So next slide, and the key topic is on flexibility. When we talk about flexibility there are different levels of flexibility. There is the usual flexibility and you can see the lower right of the slides that they account for in the order of \$200. Was I disconnected? I don't see the slides anymore. Oh there we are. So the usual flexibilities is about 200 hours and the market—the market modeling showed that it's about 3.8 gigawatts in France [Inaudible] [0:16:16.2] flexibility assets you can use. There's a bit more rare unusual 20 hours and the exceptional ones are 2 hours. But these different kinds of flexibility have different value and have different value to different stakeholders. So the usual—what we say the usual flexibility is about trying to leverage the—optimize the market prices. The rare are some—a few times in a year and the exceptional is when you are about to lose the grid and depending on whose side are you

on of the grid, you are less willing to the exceptional case and more play on the usual case but of course in the exceptional case, you can leverage that value much more than in the usual case.

So next slide please.

And the –when I was talking about the vocabulary in the French context the term “Efasmo” was a real problem to approach clients. So there was a need to define demand response and beyond demand response the term of flexibility. So the first thing, is about time shifting of the consumption needs and you have a small graph on the right to show—give an example and what that means also is that there’s no significant reduction in the energy consumption but you’re Just transferring from another time but when you have the postponements, it usually—you have an increase in demand just after the time shift and that means—you see it on the right side on the graph that sometimes the demand exceeds the power demanded without the time shifts. And this is the real problem, is it is how you handle the period just after the flexibility engagements. And so the needs –these constraints, it can lead to some good constraints for the operators. There is often I think, a confusion between—for the consumers about production and flexibility in the production side; and flexibility in the demand side. One the key also things in the French context is that in some times of the year especially for peak demand, we met a lot of CO2. But today there’s no value for the CO2 reduction by postponing or delaying that demand. So this is one of the key things to start with.

Next slide please.

So what they have done also is to look at the collective benefits of demand response going beyond just the economic model and so nine types of benefits were looked at. So these benefits are for the whole system, the whole collectivity and the issue of—one of the main topic of this project is to assess how much economic value there is in demand response and how much collective value there is to foster some recommendations for new market designs so we can put into the market some value that the collectivity, this energy system as a whole can harness, can use. So typically, there is a ceiling on energy at the time of flexibility. There is also—when you install the equipment for flexibility and efficiency, it means you can also manage demands. So you can also do other things with those equipment that we install. You also have savings on the investments overall on the system because you reduce their overall protection capacity. You also have some savings on the cause of the network, so we reduce the cost of reinforcing the network depending on the time of the year or the evolution of the demand. You also reduce the risk for the system overall, there are of course environmental benefits and local job creation because you create a new type of [Inaudible] [0:20:58.1] on the grid and you also create some jobs for installing the equipment and monitoring everything.

So next slide please.

So on the project itself; we'll go through rapidly, quickly through the project description.

Next slide.

So this is a research project and the main thing is about aggregation. So the one of the things that the project will implement is an application center it will connect consumer sites, decentralize production sites, especially PV and emergency generators, some storage systems, whether battery or heating and cooling storage and market operators. So those that operate on the power exchange and the—on the markets. One of the technical targets—some of the technical targets the integration of all these different—all these different, how do you say? These components of the system and to assess the potential for flexibility and then, when you assess the potential for flexibility, how much is it's real financial value; and of course, part of that is also the value for the overall environment and the society at large. It's also a big aspect on social acceptance by the end consumer. So end consumer being business and the industry.

Next slide please.

Axel Strang

Yves Bertone.

Axel Strang

Oh you're online?

Yves Bertone

Yeah I'm here, sorry for—had problem to connect, in fact—sorry. Thank you, I see you've started

Axel Strang

I tried to do my best.

Yves Bertone

Very good, so the product [Inaudible] [0:23:04.2] starts three years ago almost two years—yes, three years ago. Three years have been done to analyze and to take—to overlook to the building and the possibility of flexibility and demand response, to [Inaudible] [0:23:32.9] the needs for the application and we start last year the demonstrator-implementation. Today, we meet the term about the demonstration and implementation and the platform of demonstration is—of aggregation is ready, now we just have to connect to site and we will be able in the coming months to do the complete chain of aggregation from site to platform. The end of next year we'll do the assessment and summary of all what we have learned from the project. We should finish project by October next year.

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So we are in consortium, so what we have made is we have worked among the different industry and knowledge of research partner and VEOLIA as coordinator but DALKIA would bring the knowledge of sites of access to the sites with some from VEOLIA [Inaudible] [0:25:01.8]. We have one

site as well from the Metropole of Nice, which is not under by DALKIA. We have as well the knowledge of energy management from DALKIA and from the [Inaudible] [0:25:22.7] market. On the aggregation platform we made ALSTOM bring—has the knowledge on the US Market using initially the [Inaudible] [0:25:38.5] platform and adapting it to the project.

SAGEMCOM are for the product of Smart metering and communication for demand response on [Inaudible] [0:25:54.5] site and they adapted the product to the commercial building and that part of the deal with them.

CEA, which is the energy research center, they work on two fields, the photovoltaic and mainly about understanding what our prediction, we can make of it and how we can therefore adapt the flexibility to the fructition of photovoltaic power generation and another department is working on electrical storage. We have two subjects from that. One is the high voltage—high temperature—sorry—technology, a new technology applied to a stationary energy storage for the building and we integrate that connected to the building and feeding as well, I mean as aggregation and available to use a storage—adjust in fact with the proposal of the flexibility of the complete demonstrators as we long as well point on the electrical storage where we use of electrical vehicle batteries in which CEA is working.

SUPELEC which is a university bringing us knowledge and helping us on different studies buildings and storage and market; all that is made with ADEME which is energy agency and which provide us financial support but as well as the opportunity to share with the other project with the government, the progress of the project and try to solve out the different problem. We are well implemented in city in Nice where we are, where the city, the Metropole and as well the industry agency. We have five buildings from the city, which are integrated in the project. CapEnergies is the competitive pole assembly of a different company and university.

Next slide

All that of course has a demonstrator—what is interesting us is to find a group of buildings, which are targets of the project. The initial project was to situate either in Southeast of France, either on West France. The situation we find out due to situate close to Nice which is an area with the risk of break down due to the only one high voltage feeding from the transports network and transport grid and around Nice before we try to target buildings which are the—known by—mastered by Dalkia and Veolia especially commercial buildings and industrial buildings both 250 kVA. On commercial building, we are looking for two hotels, five offices, one university, and six privilege buildings. One of which is not a small one because it is the Airport of Nice, and on industry six industrial sites. All sites if we take the power subscription during winter that makes a total of 19 megawatts of subscription. And we identified initially between 1 to

6 megawatts capacity of flexibility, which is our target, and today we are on to 2 to 4 megawatts.

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To do aggregation, we need to separate the different actors that we have to manage for doing that. The first thing is locally close to the client, we need to operate buildings and have the technician and manager which knew about the energy management. That's why we present data services of demand response addressed to the industry and the commercial with a local operator. This operator knew well the client. They negotiate and define the different strategies we have identified for the flexibility and this is aggregate through regional technical aggregation. We have the same on the energy management, a small team in charge of aggregation on the regional area. This technical aggregator is able to abate the aggregation platform to put the data about the information of the site adopted as well about the evolution of the client demand and proposing that to the electrical market aggregator, which is going to be on the market site as a photo supplier distribution grid, transport grid or as well as for production supplier.

Next slide.

Next one. Now, if we concentrate about the aggregation platform, the aggregation platform is critical because, therefore, we are going to be able to centralize the different sites, commercial or industry, but as well as the, for example, here are the batteries as well as the photovoltaic and all that data is connected. So when we say they're separately the battery for example this could be in the same site. We are going to evaluate differently, has a possibility of storage of course but of projection on consumptions and we will do the same with—there's a way to produce locally. All that is integrated through the platform of Sagemcom for the communication of system and connected to the Alstom grid dams which is the demand response management system. We feed that as well from Dalkia able to give from the site with the forecasts of PV which are given by CEA and that's the possibility from the trader and the aggregator to adopt and sell the proposal.

Next slide.

Why to aggregate? Because we have to fit in fact the capability of the site which is technical capability grid depending on the flexibility we have contractualized with the site with the demand which is not corresponding to what is the site proposing. And, therefore, we are going to do a decrease of all the offer we have from site to answer to the market. When I say decrease you have to think that on the site as well even if we have negotiated and found a solution of flexibility on the site, this flexibility can take different form. I explained one. It could be we stop the eating for half an hour and that full power, or we can stop half of the power early

and twice the time just to see that the form of the flexibility could vary depending on the technical possibility of the site. When I say half, for example, of the power it will depend on can we control easily the power to make only half of the power and, therefore, to make a longer flexibility, half of the power but longer. It depends of course of what we need on the market and depends on the value when we transform this flexibility is energy capacity are critical.

Next slide.

Next. Now, in the summary of how data progress which is a progress of the project, as I mentioned the aggregational platform is operational. We have tested with simulation, complete chain from simulate on site and to the platform. Now, we are connecting the site already as well as we have made study and we are connecting this site which is on progress at the end of the year. And we should be able to make test of a complete flexibility all the site together by beginning of 2014. That test will be able to review all the characteristic of aggregation because today we have been able to test side by side, but we don't know yet what are the capability of the platform to aggregate and what the added value. We have thought about it. We have made theoretical aggregation. Now, what we need is to test it in full scale.

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Now, today return of experience. First point is the link of definition and regulation about the demand response. I mean it looks like simple but demand response will depend on many matters. It depends on the power. It depends on the duration. It depends on when you do it, you ask it. It will depend on the frequency you will ask it if it is two times a year or 10 times a year, it's not the same. All that is making that each of us are doing their own definition. We need as well on the site to be clear about what are the value, what are the quality benefit of the demand response because sometimes we hear about saying while demand response corresponds to a fuel immanency group. Okay, it's not what it is. Of course, if it is, this benefit is not the same but if we say it is not, it is marginally of it then the benefit could be clearly identified. On the site, what is very important to mention is clearly we identified this as a large resource on commercial and industrial site.

At least, the 10% of flexibility we have mentioned or maybe you didn't mention in the first slide, on the first slide we have mentioned the occurrence of the peak demand of the market. We identified that at least 10%. What we expect is at the end of the experiment next year is that we'll be able to show that what park, I mean, all the buildings of an area, all the buildings of all commercial and industrial sites from an area could represent flexibility for CAL South-East France for example. Then to be able to develop the photovoltaic energy and all its constraint, the target next year is really to see what are the minimum size of this experiment to

answer to the public market. What is interesting to us is clearly that operating it makes a difference between simple flexibility that we could do. I mean, everybody knows about it with industrial product. We'll make a difference between flexibility as operator and flexibility with standard switch on the equipment. This difference should be moved at the end of the project and will give us the interest of developing the flexibility on such site.

Next slide. I think it's the end. And now I'm ready for question.

- Axel Strang Well, thank you Yves for this seamless transition and the end of the presentation. I'm sure there are lots of questions coming up and we've seen them a few coming up to us. There was one first question from the audience regarding the question of definition of flexibility. So you said you're lacking definition. Do you see the definition of flexibility and demand response in international context or national context, first? And then second question is—is that a prerequisite for market deployment or do you think that you'll find convergence in the definition as people try to define the market design?
- Yves Bertone Well, I think that we go ahead with the definition, yes. And I think that we have started already to make that way. The thing is why I am arguing about the definition of it is I see that people are talking especially for example in Europe. Today, we talked about electrical storage and, therefore, this electrical storage is easy and well identified. Therefore, people go ahead about it. I would say that flexibility is electrical storage. If we clearly don't find that way of thinking, for example, we could simply treat the flexibility and the demand response. And clearly flexibility is electrical storage. We just postpone the way we are consumed so that in some way is the same thing. The difficulty is how today, if we do not identify clearly what is this definition, how we can go to look to the client and makes a valorization of this potential, if nobody defined clearly what is included and that is to you Axel, I'm asking you that, because clearly when I'm going to see on site, people first thing is telling me, "Oh yes, I have emergence group. I can do flexibility." Do you want that?
- Axel Strang No, not really in terms of environmental benefits but for sure if there's an easiest way and it's an emergency situation we could let that fight. It's actually the case right now. So, Vickie, I'll let you ask the next question from the audience.
- Vickie Healey Okay, thank you Axel. So gentlemen, our next question from the audience is what are the key questions on demand response and flexibility that require tension from high level policy makers? For example, if you had 10 minutes with energy ministers, what would you tell them or ask them?
- Yves Bertone Sorry. I didn't understand the question.

- Vickie Healey So as far as demand response is concerned and flexibility and what policy makers should be thinking about or asking about, what are those key questions that the high level policy makers should be thinking about? So for example, if you had 10 minutes to sit down with energy ministers, what would you tell them or ask them with regards to demand response and flexibility?
- Yves Bertone I would say just to portray some answer before is—first, there's real potential of flexibility on consumer site. And the first thing is as administration of the electricity or as the regulation, do you want to use this potential? If you want to use it, therefore, you have to take care not to answer just to the electrical producer to the electrical distribution; you have then as well to see how you're going to take into account this potential of the consumer site.
- Vickie Healey Thank you, Yves. Axel, do you have anything to add to what you've just said?
- Axel Strang No, it's a very interesting point and I'm looking forward to the results of the project to have some more insights and quantitative data on how to go forward in the new market design for flexibility if we need to change anything in the regulation in France to harness that new value that we find in this project. I would use this opportunity to ask a new question from the audience. So Yves, you talked about the 10% of flexibility that you have identified. So with this flexibility be relative to the peak power of the site, the energy demand? And, could you give an example on the type of flexibility that you find in the industrial sites?
- Yves Bertone So there are clearly two main resources. The first is on the commercial building is more about eating and cooling. On the industrial site, it's more about the process and to agree about with the manager of the site, to organize and to see how on these organizations, on the demand of the market, how we could organize is produced. On the progress I have mentioned, there are two things. We have studied the continuous process on which we were very early on waking that and continuous process within those days are potential and some process says no potential in some other. Some processes cannot be discontinuous but some can be discontinuous. They have not been studied in such way because there were no demands up to now but when we ask and we integrate the thing that this can be of variation of cost of the electricity, therefore, this induce—do you hear me?
- Vickie Healey Yes.
- Yves Bertone Sorry, because I had a problem in my computer and so I was wondering. Sorry, I'm just taking care that I'm not disturbed. Okay, sorry. So on continuous process, I would say we have found potential and large potential because we are almost more than 30% of the power of cell site, of photo fumes process we have studied. After this, the discontinuous

process, I mean each time that these people involve that means that it is organized with different tasks. And on that, we are still doing study and see how we can discuss with the people. The main thing here is I would say it is similar to lean manufacturing. The work which is an energy work, I mean I would say it generally, on which I have today more difficulty to quantify the 10%. We don't pay days of potential. Now, to make it clear about the industry generally is very difficult. We have worked on the extrapolation of all projects and clearly the extrapolation of industry is one thing which is difficult to interpret. I would say it in some activity we know; in some others it's very difficult. Therefore, we will have to identify it business by business what other potential. Did this answer?

Axel Strang

Yeah, great. Thank you. Another question I was asked also this morning at the last Webinars so I think it's a very interesting question maybe to elaborate it further on it, it was regarding the location of the aggregator and linked to that its optimal size. So, where do you think the aggregator for this type of consumer should be located, should it be focused on a local level? And, how big should it get regarding its size in terms of megawatts but also location?

Yves Bertone

So you asked me and I will answer. It's slightly different from this morning in the way that I will compete that. There is no point about the size. There is no point about the potential and how we can transform the potential we find in site to the maximum point of view. I mean there's a maximum of each potential. When Dalkia is operated on site, we are able to go far in the details of all the possibility of the site. And, therefore, what is interesting for when we go on site and we're going to be in details like we have made in Reflexe, therefore, we are not just to stop to say it, "Okay. Can we get in touch with the national grid?" I don't mind. What I need is I need to say it what are the possibility of site in power, in frequency, in different time, and now how can I propose that to the electrical market, whatever it is, in such a way that all the flexibility will be sale in some way?

It will be promoted through the market. It could be local. It could be national. I don't know. I have no preference. I would say today I have stretched to you that in some area it will be easier to start locally and well the chance we have in this have been a good opportunity to try to develop the partnership with other projects and to see what other flexibility is possible. It's remained that once we have a national market for the capacity market. It is complementary as well as action. In a different country, we'll have different approach. The thing is we have to find the way that all the flexibility that would be exceptional, rare, or frequent will be promoted through the demand, through the work which will be made. It will be a shame that we do not analyze and then we'll be able to do only the exceptional, only the rare, only the frequent and, therefore, we will lose a part of the value of the work made on site.

Vickie Healey

Great Yves and Axel. Thank you very much for bringing that very important question into the discussion so great question and a great answer. Our next question comes from the audience of course and the question is—are all the technologies and the standards that you need to integrate and manage flexible resources available now? And if not, what are the gaps and what is needed to bridge these gaps?

Yves Bertone

The project Reflexe is centralized on the existing equipment and the only technology we are using is the new communication, the books and so on, and communication which are developed. Locally, we identified clearly with the test of the task of CEA that energy storage is today not much used even for the energy management. And it's a shame because it will be another opportunity for the flexibility to be larger and greater and more flexible. And so that is locally I would say it the [inaudible] [0:58:33] or the electrical storage is a resource. We expect that we'll have opportunity to develop. The financial part is clear that today they analyze so that cost efficiency on the flexibility even on [inaudible] [0:58:58] it should be as well for all the need of the site and those technology are existing I would say today and the only thing is we would expect this to reduce the size of the storage and to reduce the constraint of storage especially for the battery. We have to study the installation of eye temperature battery in the building and we have to let it on the site of the CEA because it was too complex to install it on a building site. It's clear that industry will be easier but still we have a lot of constraint about that. On the other side for the technology of communication on getting larger and more flexible—still that, one of the studies which were in charge of [Inaudible] [01:00:11-12] to find a way to communicate easily with the existing building management system—it's not easy. It's not somebody for the flexibility; we have many studies about that.

We see that even if they manufacture some [Inaudible] [01:00:35] about the standardization, about the product—as we back that for example still that many sites still with the old technology and it is very difficult to adapt an existing business BMS through to flexibility.

We have days stormed out about the flexibility which have been made in U.S. It didn't bring us much on the analyze we have made because we were going further on the details about the prevision—so, maybe it would be as some enrichment of these stand-out communication system.

On the aggregation side while we were expecting a lot about the new technology of data management because the forecasts, the analyze of the data and the capability of the system to adapt quickly the flexibility of with the collection of the data we get from the site is something that I think that is will answer to some after which our thinking that the time response was long from the site.

We have passed the platform and today, I can say that, “Well, the reaction is less than two minutes all the train and the first target was to be able or

below for the market of the reserve market, we tend to be confident—we are confident to reach this flexibility.” Can we evaluate to lower time, to shorter time—I don’t know yet.

Axel Strang

Great, thank you Yves. To go a bit further on the response time—could you elaborate and this is one of the questions from the audience on which types of markets you intend to play on? Do you expect to be on Day Ahead Market, Intra-day Markets and then what is the—how does the consumer benefit from this flexibility—does he get paid directly? How do you give the value back to the consumer?

Yves Bertone

Yes, so there are two questions. First the market and then I’ve told the consumer. On the market, while the study is—initially we were, the initial we were thinking about the existing market in France which is the Adjustment Market and which is a day before.

We quickly, in fact simplify that because this is restricted and affects the flexibility we analyze on the site do not—I mean could have, we could use the fact that we are making enough of the-day-before but the fact it doesn’t bring much value.

And most of the potential is available now—I mean on the midst—there is a few which required up to 10 minutes or half an hour depending if it is automat, there is an automat behind that—that it is very quick. So, after, it will depend on how we can aggregate that and, and sell it. As I’ve mentioned in the previous question, more market there is more opportunity and more we transformed to put control to the value on the market better it is.

On the side of the client, there is two-type of service we can render. The first thing is to say, “Well, we’re going to sell directly to the client and negotiate that case by case.” It was a first reflection. We see it is not corresponding to the model we have in Energy. It’s better to have—you have to think that it is—the value of flexibility is something like a few percent of the electrical invoice which is itself few percent of the total cost for the company. So, we’re talking about the percentage of the percentage—therefore, we have to take care a lot to spend much energy. We have to show what we are doing. We have to transform it as a value and simplify that.

So, the business model we have is more to integrate that in the negotiation with the client—globally for the Energy. And if it’s gain one, two, three percent of the global invoice—it is integrated due to the negotiation of the market. Integrated as well as we see in Energy Management and it is the role of Dalkia the operator to optimize that and make sure that it is going to interest the client.

Therefore in conclusion I would say, “Yes, there is a value.” I mentioned in one of the slides there’s the client, there’s the technical. There is the operator and there is the rationale and then after that there is the market. When I say that I transform to the client—in fact, I have to make sure that the operator, the one which is going to be handling the site is interest to manage this point on the site and it has to be interest on the subject—in such a way that he will not forget the subject and say, “Well, it’s signal re-point and therefore I will take it.

We have to make sure that in the chain we’ve mentioned that this is not marginal and today as we know, if we are talking to somebody which is responsible for energy, from the operational site or plan site—we should each time mention that we should be in some percentage in such a way that we will interest people.

Vickie Healey

Thank you Yves. Axel likely, there is another question from the audience that you wanted to present.

Axel Strang

Yes, I think there is a follow-up question directly link to what you said, so how would you go about—especially for launching this for users—going about, going the beyond the 10% limit, you can find a new flexibility but it needs capital and investments and operating costs.

So, one of the questions that was in the audience was, “How do you evaluate that so that it make sense over all for them? And beyond the 10%, you know, if you try to have—they invest in you a flexibility capacity—what are the additional benefits that you can try to sell to them?”

Yves Bertone

Actually, there will not be—I mean from the business we have study. There is no investment just for the flexibility. This is not—there’s no case we’ve seen. It is rational as I was arguing about the—the side about the argument on the public side on the government to say the world—there is a potential, why not to use it? Then they cannot go to say that, “Well, it’s business to be made and very profitable.”

Clearly, if you have a prediction to be made, it’s more interesting to make it centralized, more efficient than on locale. So on locale, we’re going more to see what is needed. And I was mentioning for example Thermal Storage—we know it by studies that this is a possibility to reduce the investment for the production, reduce the constraints of our bill—on the power size of the connections.

It has well reducing an investment. It is well as giving some flexibility on affecting the smoothing the need. And therefore there’s and there’s increasing the [Inaudible] [01:11:09] efficiency, making it stabilize in so such a way that for example for the fact—heat pump to be more efficient and to use it by night for example if the temperature outside is better than during the day or that’s criteria give sometimes opportunity to as told Thermal Storage.

This thermal storage because it is implemented, because we studied it therefore, yes we could say it or we could increase it by 2% of the volume, 20% maybe and provide additional flexibility. Maybe we can do that. But we will not define Thermal Storage just for the flexibility.

Therefore, what we see on the deployment is that's why we were mentioning that when we go to advise the client what energy so there is about energy efficiency. We will have to study first all what we can provide them with the technology today available, to reduce risk consumption to optimize the efficiency of his systems. And taking as well as associating that with the opportunity for some technology such storage for example, but all the possibilities to transform that and evaluate that on the flexibility market.

I'll mention another one you just say to building which was going to be better insulated on which you will have some warm with the better energy therefore, okay it's better for the comfort but it will be as well better for the flexibility.

Vickie Healey

Greatly, thank you very much. I think we have time for possibly two more questions—and I just want to let the audience know if you've asked a question that we weren't able to respond to due to our time constraints we will follow-up with you after the webinar and try very hard to get answers to you regarding your questions.

I have another question from the audience regarding—Yves, this is for you. Are you intending to analyze the effect of demand response on the distribution grid or is the focus primarily on marketing a flexibility?

Yves Bertone

In fact, what we have made to first to analyze we have identified from the literature, the main demand. We didn't focalize about the locale, the distribution or about the national grid because this for me is more if you analyzed, to be made by the government but the benefit about it.

And when we say that we need the flexibility and I wish I am going to give an example. If you said, locally, there's a transformer which is limited in power and there's a new installation on this line and therefore it was for the distribution, it would be interesting to have flexibility on one of the site in such a way that we can postpone the transformer.

Okay, therefore what will happen is, you will have during the period of ice-trans, [Inaudible] [01:15:36]. In France it's specifically during winter due to the, a lot of heating, electrical heating and therefore you know that its flexibility could be [Inaudible] [01:15:49] during this period. This is the same than what I will, what could be asked more about the rationale and on the line of the south east because this line is constraint with the same point during winter of the constraint.

There is some demand which are similar and what we are more studied is to try to separate seven case if it comes rare and exceptional, each one—no, it's not seven, it's six, right? One for the frequent which is quite easy because it's one or two times a day and it is some pick that you can see already in the curve. For the rare, what we have identified is the two I've mentioned already I mean through the winter or same on summer in some countries.

And assert which is corresponding more about the [Inaudible] [01:17:08-09] which is happening anyway at any time—which is corresponding to a narrow of what I name an error of forecasting for Renewable Energy. That is the three categories for the rare and after this for the exceptional two-case—one which is still the weather case, exceptional cold winter, maybe in some countries the hot summer. The last one is the one which is on the market in Europe which is the reserve of Energy due to [Inaudible] [01:17:58] their selves, by what is essential is our investment and therefore they have to stop.

And the unit to compensate which is a quick stop which is the starting of a new power between that—the flexibility could be a time, I mean could be available quickly and giving time for a cool central for example to start in case to compensate a nuclear power. All these team, we—that's been what we have used—this is the 16 that is what we have used because they seem different.

We find a similar point and after what we have to try is to integrate the flexibility we have on-site. We have some studies which aren't talking about the frequency regulations. We didn't work on it because it seems to us that the medium sites that we are targeting are adapted to it. Central firewall which is the automat could do that mostly and we have submitted a better ratio for them.

Axel Strang

Great, thank you Yves. I have one last question I think it would be soon to start time to wrap up. So, one two-fold question regarding the consumers. So, I made a comment before you arrived on the consumer acceptance of flexibility. So, the first part of my question would be, “How flexible are your consumers willing to be and how was that a challenge for you to explain flexibility? And then second part of the question is, “When you look at the commercial deployment, what kind of outreach do you need to do to capture that new potential of flexibility?”

Yves Bertone

Yes, the acceptance is critical. It is critical for the client. It is critical as well for the team. We knew very well that the temperature often we say to—we would like to have 18 degrees in the building but people would want 21 therefore, we open to have to adapt enough to find a compromise with the client. Even if the client is not the one we pay—because there's it would be a client which cheap paying and then there is a client which is requiring that the system working.

So, when I have worked about the frequency of the flexibility, this was his with the return of experience or in [Inaudible] [01:21:30]—because there were already operating a nest, the fact that exceptionally, people were ready to make an effort to reduce consumption, reduce their power on the network.

Initially, the people who are on the team I mean the product we are working about the flexibility or we are not going to match working with the user because it's not easy. And therefore, we have to separate and split the work saying well, the usual is the one which is not impacting the client. If you do something every day, the client the user shouldn't feel it. If we do the exceptional therefore, we have to base and to take care of that there is a communication that is ready. We make communication with them to make sure that they would accept exceptional case.

And on which for example, I've mentioned this morning we could reduce the temperature temporarily for a short time with a degree which is death defying. They have been study about the acceptance with the client and as long as we communicate, as long as the people understand what is happening they are ready to accept that exceptionally they will have a partial and comfort. I made it to extreme.

This was the easiest then after the more difficult is now how could you explain that you're not going to do a medium site saying that okay I'm not exceptional however I'm rare and I want, I want the help of the people. So, that is what we have studied.

There are two conclusions to that. First is, we need the support of the collectivity to communicate locally about the constraints or locally communicate nationally about the constraints and said okay there is some need on which we need some flexibility and you should accept that for one or two hours, 10 times a year you could have two degree difference, for example.

This is something that we've seen that it is—that the people are almost ready. The only thing is, we need to structure communication which is going to be able to be accepted by the people. And the more we'll do that, in common with the collectivity better and easier it will be for operate. Therefore, what we're doing is the conclusion of that there is two directions.

First, we're working to try to find out a way for the collectivity to make and place an indicators which is we'll be able to all the actors to say it, okay, I have made some action locally by communication, by information, by some different action and good people now know about that subject in such a way that when the company like that will go and see people, it will be corresponding to a message—coming back about the definition of the message at the beginning of the presentation.

So, that is an action which is a communication which is based and common and everybody should agree. Just as a remark for example on that in France some said that the flexibility makes some economy and some said it's not. So, when you see two messages like that, it's not good for anybody that says two message which is contrary opposite.

On the other side based on the action as well we've made for the operator in such a way that they would have tools and to be able to operate on the site, to explain and to be able to test different configuration in such a way that we are going to be able—the grid, the scale will be easier I mean to reach if there's a communication but the operator locally can do as well a part of the job and adapt the building flexibility to that message.

Vickie Healey Yves, thank you for that great answer and we're running a little short on time. So, I'd like to thank both you and Axel for your great presentations and discussion today. It's really been great to hear such informative and balanced presentations on this topic and I would very much like to say thank you to our audience for your great questions.

We've really enjoyed hearing what questions you have and hearing responses from our panelists. So with that, just like to offer Yves and Axel a few seconds to provide any closing remarks, you might have before we move on to our short survey.

Axel Strang Sure, if I may start—I want to thank you for the opportunity to have this webinar. I think there will be so I said this it's a series of webinars from Annex 1 and it might be—I don't know that schedule, but there will be other similar presentations from other demonstration projects around the world. So, stay tuned for other announcements of this time and maybe I'll talk to you soon. I'll hear you soon on the series of webinars because I expect other projects from France also this, I think there's another project webinar project in Austria next month. I bet you will hear about it as soon on—energy solution.

Vickie Healey Thank you. Axel, I think you're cut out at there at the end but thank you. Any do you have any final remarks to make?

Yves Bertone Well, thank you as well for the invitation. I would say that as well—I share, I mean the ideas about Axel, about we are and search project and there are many projects on the subject. There's a lot of initiative and it is great to share that this knowledge because today, I would say we are working on the new way of working and we need whatever actions on different point of view about that. So, thank you so much for the invitation.

Vickie Healey Right, thank you so much for sharing the information about Reflex—and with that, Heather—could you just display the first question of our survey? And we really appreciate your feedback from the audience, as it really helps us to understand what we're doing well and where we might

improve. So, if you take just a few moments to answer the following question—The webinar content provided me with useful information and insight. Thank you and our next question. The webinar’s presenters were effective. Okay and our third and final question is ...

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