

REX

Realtime Energy eXchange

Alliander and CGI partner for a more flexible energy market.

Realtime Energy eXchange (REX) is a software platform developed for Alliander by CGI. It connects end-users with existing energy trading markets, who can now buy and sell energy whenever it suits them best. It is a big step for the energy transition, as it introduces more flexibility and more renewables in the system. We met Nigel Spooner (Vice-President, Global Utilities, CGI), Jos Siemons (Director Consulting Services Energy & Utilities, CGI) and George Trienekens (New Business Manager, REX/Alliander) at the European Utility Week to find out more about this innovative IT solution.

Why was it so important to develop REX? What does it mean for the market?

George: Everyone is working on energy savings, and it's great. But we tend to forget about flexibility, which is very important. Energy markets are very vulnerable to price manipulation and price instability, the fact that jeopardizes the healthy growth of the economy. REX is addressing this problem. It is an affordable and user-friendly solution that allows for the increased stability of energy prices by means of "unlocking" flexibility.

Can you give an example?

George: Imagine that you are a company with a large office building. With REX you could start heating it a few hours earlier, when energy prices are lower because the wind is blowing harder, instead of doing this during the regular working hours, when both demand and prices are high. Renewable energy sources are not flexible because you cannot store such big energy supplies and they have to go directly into the electricity supply chain, but now we can compensate for that.

How does REX work exactly?

George: We took PowerMatcher™¹ as a core. It is a customer friendly, cheap, scalable technology that optimizes and balances demand and supply. PowerMatcher™ operates as an event based system. We took it and added the functionality so it is now usable in the



1. PowerMatcher™ is an interactive automated system for local exchange of electricity, developed by Flexible Alliance Network. CGI is working on a second release which is based on open source and easy to use for end users.

2. APX Power NL is an independent electronic exchange for anonymous electricity trading.

Dutch wholesale market. We improve the flexibility, bundle it and trade it smarter than before on the APX Power NL², one day ahead of the delivery.

Jos: PowerMatcher™ is focused on a local balance between demand and supply, although such balance cannot be created just at any moment, because sometimes you have an energy shortage, and sometimes a surplus. REX allows you to trade that surplus on the energy market and/or to use flexibility in real-time at the imbalanced market. Real-time trading is a must to make it all work of course.

George: Personally, I have seen many similar pilots and research projects in the past. We think it's time to make it work in the real world.

Who can already use REX, and where is it available?

George: For larger clients we can already do it throughout The Netherlands, and that is a country with almost 17 million citizens. In this regard, office buildings with high energy consumption are an example.

For smaller clients it is now possible only through Liander's grid, which covers one third of the country. But in a few years it may be possible to offer it to small clients throughout the whole country too. We are also looking across the borders, because in other countries flexibility is getting more attention than in The Netherlands, as in Belgium. We will start with testing REX on Ameland, and then go on with Triodos Vastgoedfonds, a bank with very sustainable practices which pays a lot of attention to how its buildings operate. REX is the next step for many companies with sustainable ambitions, because it lets their buildings use energy at the moment when it's sustainably produced and prices are low. They get to pay much less for their energy, sometimes close to 20% less.

Who else can benefit from REX?

Jos: We are researching the possibility of electric vehicles (EVs). There are around 45.000 electric cars in The Netherlands at the moment (December, 2014). They all have large batteries in them, especially the Tesla. If you can introduce more flexibility into the way these are charged, it would be very good for the overall balance of the



Nigel Spooner
Vice-President, Global
Utilities at CGI

system. Tesla drivers use a battery with a capacity range up to five hundred kilometers, but this is more than what is needed basically. The rest can be used in a flexible way without losing comfort (as EV drivers can also use super /fast chargers.)

Where would you then install the software, in the case of EVs?

Jos: There should be one element of the software in the car or in the charger. Then there needs to be an interaction with the car driver, who will decide how much flexibility he or she can contribute to the system.

So, the piece of software that everyone has needed has finally arrived.

George: Yes. Everyone is talking about smart grids, but we bring the flexibility. We created a solution that solves one of the challenges of the energy transition, and it does it in a cheap way. That's the key to the future.

Jos: Absolutely. It's good to have a vision, but it is even better to take the steps to reach that horizon, and to learn from it. That is what we did together. It is a very strong collaboration.

Was it difficult to develop REX?

Jos: Yes and no. We had a very short time frame to produce a first version, so it was very challenging. We put our best people on to it. Not just software developers, but software developers who understand the energy business and what needs to be developed. We managed this not as a traditional project, but with an Agile Scrum approach. It is a methodology for developing complex and innovative software projects employed by leading companies worldwide. This allowed us creating a first version of REX in just three months.

George: It really helped that CGI knows how the energy market works, which is not common knowledge. We had to deal with a lot of legal aspects. Now we are happy that we are meeting all the mandatory requirements, because it means that REX is really working and not just another pilot. ●

All over the world people are demanding a better interaction with their energy suppliers. Luckily, technology is catching up.

We can now see our energy consumption in real-time: it is becoming easier and cheaper to install sensor technology, smart meters being just one example.

More people want to generate energy themselves. As a result, the distribution network becomes more bi-directional, which calls for communication to become bi-directional too. We are moving towards a situation where you can not only choose when and how much energy to use, but also set the prices yourself.

For all of these reasons, the technology which CGI and Alliander have been developing is highly relevant, and there is more work to do.

European markets are very dynamic. The UK in particular has become somewhat of a laboratory for the rest of the continent, where we are testing everything that the smart meters might allow us to do. Given all of this, the opportunities for REX are fantastic, and I am looking forward to getting more involved with it.

We can be absolutely certain about the rise of IT in the energy sector, simply because there will be much more data. We used to read our meters every month or even every year, but now we can do it every fifteen minutes. The good news is that we are collecting so much data. The bad news is that we don't yet really know what to do with it. However we do know that it is really only possible with advanced information technology, and CGI is contributing to this.

We are making sure that what we bring to the market is what the market really needs. This may be challenging with the growing data volumes and complexity, because we need to not only develop new solutions, but also constantly modify existing ones. So that's what we are doing, together with Alliander and other clients – we work on what the industry really needs and produce innovative solutions like REX.