

New Power

REPORT



ELECTRIC VEHICLES

What are the implications of mass 'batteries on wheels'?

DATA

Key to solving energy problems



Photo: Nemo Link Ltd

THE GRID EDGE

Where the action is



WINTER IS COMING

What's the outlook?



NEMO LINK

Starting up a new link to Europe in the face of a 'no-deal' Brexit

LOLE

How secure is too secure?



INTERNET OF THINGS

Alex Goody says the industry must be prepared

The New Power Interview



MIKE ELMER AND JOHN GREASLEY, NEMO LINK

Nemo Link, a 1000MW interconnector between the GB and Belgian markets, is due to go into operation in the next few months. Janet Wood talked to National Grid Interconnector's Mike Elmer and John Greasley about starting up the link in the face of Brexit

As project director, Mike Elmer is about to oversee the commissioning of Nemo, a new interconnector that will link the GB and Belgian power markets.

Discussions about the interconnector began over a decade ago, when power markets and the political situation looked very different. The link will come online in a market where Belgian supplies (thanks to a nuclear outage) are much tighter than those in GB, and trades with Europe face the potential disruption of Brexit. We discuss those issues, but first I want to know about the commissioning progress.

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November, then we are really into commissioning, which is a two-month process. That means testing the system: communication, the trips, the security of the communications networks, the fault networks – it's very extensive.”

Elmer says the project is on schedule (despite a couple of issues, see box). “We have the converter buildings – they are essentially finished in the UK and Belgium. We have laid or the cable and we are just making the final joints. We will be doing a high-voltage test in

Meanwhile, he says: “My colleagues in National Grid electricity transmission are just now finishing off... upgrades to parts of the networks in the south-east to facilitate exporting that power. And on the Belgian side there have been substantial infrastructure system upgrades. The Belgian works are all in, and the National Grid works are due for completion at the end of November.”

There is no trading over the link during commissioning: “Nemo will have to buy small amounts of power from mid-November onwards at low levels and for periods of a few hours. That has to be done in close liaison with the System Operators at both ends at periods when the systems are not under stress.”

The target for final start-up is the first quarter of next year and “we are looking to get it as early as possible in the first quarter because it's good to have the link and be able to flow power”. The link has to operate for 60 continuous days before its “cap and floor” remuneration mechanism kicks in.

The market is waiting for more detailed information about the startup, but Elmer can only say: “At this stage we haven't tested the cable, so it is too early to make any commitments to consumers. We are a bit conservative until we are more certain about the operability of equipment. As we go into late November and early December, we are going to have to start making some statements, as part of the Remit process, to say we expect to be able to release a certain amount at this period of time.” >

There have been cable problems in other links, but Elmer says: “We have a big quality assurance in place. That is not only for us – we can’t get the insurance cover if we don’t deal with the cable in the right way.”

WHAT’S ON OFFER?

The 1,000MW link has some new technology to manage. The converters have HVDC converter electronics – existing technology from Siemens, but this is the first time it has been operated at 400kV. And it is the first time this type of cable – XPLE, a polymer that has lower transmission losses – has been used offshore at 400kV.

Elmer says the market has driven those developments and “we are always looking for the more efficient build, for more reliability”. “It’s not always about the lowest price: it’s about something that

for the next 25 years has the least need for maintenance.”

The HVDC converters will allow for faster switching than earlier interconnectors. Elmer explains: “The equipment has the capability of going from full power one way to full power the other in about 24

seconds. We can’t do that, because we have to think

about ramp rates and how much power you put on to the network. The typical turnaround would be about 20 minutes.

“The switching capability and speed is incredible compared with converters that were built even five or six years ago.”

I suggest that as markets tend to move towards shorter and higher peak prices, that may become important. Elmer agrees: “We see volatility and the important thing for the interconnected business is to be able to respond to that. The market will drive the behaviour of the interconnectors and our job is to provide that capability in as reliable a way as we can. If customers wanted to be providing very rapid response we would unashamedly market the benefits of Nemo.”

The interconnector can offer other services as well as simple power flows.

“The sort of products being planned are things like black start. The technology that comes with the Siemens equipment has inherent black start capability anyway, so it’s not something that needs additional functionality. We are talking to the System Operators [in GB and Belgium] about it, because it’s a valuable service and it’s a good insurance policy... The conversations are ongoing but separate because the dynamics of the networks are very different.

“Then other things like frequency response are important for the System Operators. Our job really is to provide these services and you tell us what you want and we worked closely with the System Operators to see what they can give them.”

BELGIAN POWER SHORTAGES

As regards power flows, Belgium’s power market looks very different this year than it did when the interconnector was first proposed, with major out- >

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THE BIGGEST CONSTRUCTION RISK: CARILLION FALLOUT

In order to transmit power to and from Nemo Link, a line upgrade was needed in Kent. That was a Carillion project. That company’s slide into administration could have affected the project, but Mike Elmer says it caused relatively little upset.

Murphy Group took over the Carillion contracts. Elmer admits: “It was a big worry for us, to be frank. There were negotiations beforehand, but the transition between Carillion and Murphy was brilliantly done in about a week. The Carillion people migrated to Murphy under the TUPE regs, which was great. It had the potential to give me a big disturbance but it didn’t.”

He adds: “There was a point when Carillion formerly notified National Grid [that it was entering administration] which they were required to do.” But under the terms of the joint venture they were also required to present the client – National Grid – with a proposal for a replacement. “It’s quite standard in National Grid contracts that we don’t have to ‘pick up the pieces’. They had been having conversations with Murphy for some time unbeknownst to us so a lot of work was done beforehand without us being aware of it,” says Elmer.

He says: “It worked. Murphy group were looking for an opportunity. They acquired the Carillion energy projects in the UK.” It’s as well the transition was smooth: without that line the power could not be exported from Nemo.

There was one other risk that materialised and could have delayed the project.

“Twice we had damage [to the subsea] cable from trawlers, and that was something that we knew could happen.

“We found ourselves in the situation where trawlers dropped their nets and went across the table and caused damage.” The first instance was a trawler from the Netherlands and “the following year a trawler from the same company in Belgium did the same thing”.

Elmer says: “We had great insurance which facilitated the repairs. We had great support from the Belgian and Dutch authorities and we could take actions through maritime law.

The repairs were the “biggest headache”, he said, but the company had started its cable work early. “So when we had issues with the damage it ate up some of the time we had allowed for risk.”

ages in its nuclear fleet leaving it short of capacity.

Elmer says: “They are building an interconnector with Germany as well. The dynamics of their system are changing anyway, so they have to look at their own system.

But undoubtedly when you get things like the nuclear situation they are in, instantly it focuses the mind. Elia is looking at what they can do to accommodate it.”

I suggest that if power prices in Belgium rise in response to the lower capacity, it may mean lower power flows towards GB – and less use of the link if prices converge. Elmer says: “We will look to hedge into the future if we can, by reserve booking of that capacity, but there are other services we can provide: the day-ahead, month-ahead, quarter-ahead, year-ahead. If you look at any business you want to get the mix between offering services to get predictability of revenues.”

He adds: “On any given day the interconnectors are there to balance the systems in both markets. Whatever the market wants in terms of price, there is also an energy security and reliability dynamic that goes on.

That might mean that power has to flow contrary to what the price might indicate, because of the needs of the network.”

That is the flexibility that interconnectors provide, he says. In the long term, more intercon-

nection means price convergence in any case – albeit with price spikes. Then, “it might swing possibly from being merchant-driven into the fact that we still need power flows for energy reliability and low-carbon forms of generation”.

BREXIT ISSUES

Of course, the link was planned and begun before the vote on exiting the EU. Elmer and I are talking a few days after the government published documents which said that GB would crash out of the EU’s emerging Internal Energy Market (IEM) in the event there was “no deal”. Interconnectors, which

were already seen as a potential Brexit casualty, were in the spotlight.

“From a business point of view, it would be good to still be part of the IEM, just because it has common platforms and systems – everyone knows them and it would be good and efficient,” says Elmer. “When the Brexit vote came through it was unexpected. We have spent time developing some alternative systems should we operate outside the IEM, because we know that people still want the capacity and still need to trade power.”

That’s an issue I also discuss with John Greasley, customer and regulatory manager at National Grid Interconnectors, with regard to the IFA interconnector with France. He says: “We have to consider the potential that we won’t be able to participate in the Internal Energy Market [in the event of a no-deal Brexit] and we won’t be able to participate in day-ahead coupling.

“Brexit planning hasn’t resulted in any situation where the interconnectors aren’t flowing, but there is a lot of work we are doing, with partner companies and regulators both sides of the link, to make sure we have the right access rules in place.

“Primarily the impact is on the systems and processes that we would use to facilitate the trading. There may be European rules, like day-ahead coupling, that we are no longer allowed to participate in or use. We have contingency plans in place, so we will essentially revert back to the processes we had in place before market coupling.” That was about five years ago.

“We’ve got lots of work to do between now and 31 March. The main thing is that we need sets of rules in place to govern the operation of the interconnectors in a no-deal world. We are doing lots of work with regulators at the moment, so for IFA we have a set of rules and over time they have gradually migrated to EU rules as they have been harmonised. We have to grab some of that back and get it agreed between the French and GB regulators.

“Our fallback position, if the day-ahead market coupling fails, is to run explicit day-ahead auctions, which is what we used to do. We have the capability to do that.”

As a newer link, Nemo does not have a set of rules or an auction platform that pre-date market coupling to fall back on. Mike Elmer says that for Nemo: “We have had to develop some ancillary systems and some manual systems in the event of an outcome that is less easy to predict [like operating outside the IEM]. We will still operate – we might have to use some different systems than we originally planned for – but in the time that we have had since the announcement we have mitigated that.”

Greasley adds that Nemo is working with the Joint Allocation Office to provide it with the services it would need in a no-deal world.

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“Nemo does not have a set of rules that pre-date market coupling to fall back on

Are there other issues to be managed around Brexit? Elmer says: “We have thought about potential things – everyone has had to. For example, if it turned out that there is a tariff on the movement of materials between us and the EU. There is spare cable, should we need it in the future, that it is planned to be stored in the north-east of the UK. We considered a scenario that said if we need to access the cable quickly and there was some

arduous process you have to go through to get it to Belgium – will it be better just locating it in Belgium or the Netherlands? All the things we could think about have a solution.

We are autonomous to the degree that we are training up our own people in Belgium and the UK, and we just can’t imagine a situation where if we needed specialist support quickly we can’t get it to the UK. **NP**

UNDER DEBATE: WHAT’S THE ROLE OF INTERCONNECTORS IN THE CAPACITY MARKET?

What is the role of interconnectors and how should they be supported in the Capacity Market (CM)? I talk about those issues with John Greasley, customer and regulatory manager at National Grid Interconnectors.

Some in the UK generation lobby argue that interconnectors have an unwarranted advantage in the CM auction. He says: “Obviously, we don’t agree with that. With regards to the Capacity Market it’s useful to think about the benefit that interconnectors bring to consumers. Our view is that the participation of interconnectors has reduced the clearing price... that’s a cost that eventually flows through to consumers. Our estimate is that 1,000MW of interconnector capacity brings about £80 million of benefit to customers. It’s big money.”

CAP AND FLOOR

One of the generators’ complaints is that interconnectors with a “cap and floor” arrangement for returns have less risk to price in.

Greasley says: “An interconnector would be funded by National Grid and we generate our revenue from people that use that capacity. We generate revenues from selling our capacity, the Capacity Market and selling services to the System Operator. The cap and the floor are designed so that if we are within that range we keep our revenues. If we have a bumper year that excess goes back to consumers. If we have low revenues we get topped up – which just covers our cost of debt.”

However, competitors argue that it’s not the explicit payment that counts, but the fact that the floor reduces risk for the company and that shaves the bidding price. Greasley says: “When we decide whether to take an investment decision we look at our three sources of revenue and we would be highly unlikely to invest if we don’t think we will make the floor [return]. But it does provide insurance in the exceptional circumstances that that might happen.”

On the other hand, Greasley points out that interconnectors carry their own risk: “The majority of our revenues are outside our control. Most of our revenue comes from the arbitrage between the prices at either end [the link receives a percentage of the arbitrage] and we have no control over that.”

He cites that uncertainty as the reason why, although historically investment in interconnectors has been encouraged, for a quarter of a century IFA was the sole link between the GB and European systems. “There was lots of interest, but no-one went the last step to make the investment decision. Cap and floor has come along and it is an ingenious regulatory method that gets the balance right between risk and reward for the stakeholders.”

He adds: “The downside to the insurance policy is that we have to give money back if we go over the cap. The other downside is that we have to be available 80% of the time in order for it to be effective, otherwise the floor does not apply.”

Incidentally, he adds: “The French half of IFA is owned by the TSO and it gets a regulatory return regardless of how much it is operated.”

Generators also complain that power from interconnectors can undercut domestic generation because it is exempt from carbon price floor and transmission costs.

Greasley hits back at that, noting that with the EU ETS the fuel is taxed at source, and so are transmission fees. Applying those in GB would be taxing it twice. He says those are just two of a variety of taxes and charges and “we feel those two examples have been pulled out” as the ones that favour foreign generators and imports instead of GB generation.

SECURITY OF SUPPLY

Greasley is keen to expand on the role of interconnectors in providing security of supply, which he cites alongside the fact that they offer cheaper power (or it would not flow in the direction of GB) as a key benefit for consumers.

In a call for evidence on the Capacity Market, BEIS highlighted the role of interconnectors and the derating factor. That is at 60% and others argue that interconnectors should be derated further, because at times they may make a negative contribution to security of supply. “We don’t believe that is the case,” says Greasley. He says the evidence is on his side. For example, during the “Beast for the East”, although IFA was exporting during the early part of the week, “the UK didn’t need IFA then”. It switched to import in response to rising GB power prices after the first gas deficit warning.

Greasley says interconnectors should be subject to less, not more, derating. “Out of 2,000MW we only get credited for 1,200MW and we will probably be importing 2,000MW at times of stress. The Capacity Market has over-procured by 800MW and that has cost the consumer.”

Asked what level is right, he doesn’t have a figure, but he notes that no technology is at 100%, to account for possible breakdowns. “One option is for sources of power to bid in what they want to bid, and having a different penalty regime,” he says, a regime that applies in some capacity markets elsewhere. It is something that would have to be looked at in more detail, he says. Until then, “our view is that we should be credited for more than we currently are”.