Case Studies

How the UK is accelerating net zero energy transition with open data

Nic Granger, chief financial officer and director of corporate at the North Sea Transition Authority, explains how open data is crucial in the acceleration to the net zero transition

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The North Sea Transition Authority (NSTA) licenses, regulates and influences the UK oil and gas industries, offshore hydrogen and carbon storage and has a mission to support the industry's move towards greener energy sources.

According Nic Granger, NSTA's chief financial officer and director of corporate, data is a key enabler in achieving this objective.

"People are using our data to understand the subsurface, the rocks, the geology under UK waters so that they can do things for the benefit of the energy transition," she says.

"So, if you wanted to get a carbon storage license to inject carbon into an old piece of infrastructure you need to understand the geology around that to be able to use it.

"The data that we hold enables people to take that data, analyse it and achieve that understanding," she explains.

NSTA offers two types of data – open data, public data which anyone can use for any purpose by pulling the data using an API onto their own platform.

The regulator also offers separate data sets which are available but not on an open licence. Granger explains "You can use it for your own personal, mainly business purposes. But you can't commercially resell data to someone else."

Data via regulation

While the organisation holds its own data dating back to the 1960s, much of the industry's data has come through regulation created by NSTA in 2015.

According to Granger, regulation was necessary to ensure that external parties were providing the right information.

"Those powers mean that the industry is required to report certain data to us. And then, after limited confidentiality periods, we can make that data publicly available," she explains.

The industry has been broadly supportive about the new rules because they felt it was good to understand how the data could be used and add value, Granger claims.

Last year the NSTA also received powers in the 2023 Energy Act < https://www.legislation.gov.uk/ukpga/2023/52/contents/enacted> to collect carbon storage data from industry, so that when this nascent industry starts to hit the ground running the regulator will be prepared to collect the data.

With the right foundations in place, the next stage for the NSTA was to create a digital platform that would enable industry, government, academia and other parties to access all this data.

National Data Repository

When Granger joined the NSTA in 2017, she led a team that launched the National Data Repository (NDR), the first of its kind in the UK, which provides open data to encourage the use of innovative technologies to enable the search for carbon storage sites as well as supporting offshore windfarm priorities.

The NDR operates on a bespoke, cloud-based platform that now holds around a petabyte of information, reported to NSTA by petroleum licensees and operators of offshore infrastructure.

Nic Granger, NSTA head of corporate

Considered a national asset, some of the publicly available industry data – oil well data for instance – dates to the 1960s. Granger explains the significance of the repository to past and future energy innovators:

"If you wanted to use AI or ML to understand the basins it would be difficult to do this on a small data set. But on a large data set going back to the 1960s you can use the tech or AI on that data.

According to Granger, the repository is also used to help industry understand cost profiles better where it relates to decommissioned infrastructure.

Sweet like chocolate: read more about Mars data integration strategy < https://techinformed.com/sweet-like-chocolate-creating-a-digital-integration-strategy-at-mars/>

The NSTA analytics team used open data from the NDR to create dashboards that enable the industry generate cost profiles and to look at these areas and look at how they can do things better.

The data team has also developed benchmarking tools to ensure that the data the NSTA holds is being used to add more value in the UK and to ensure that learnings are shared across the sector.

"We might bring in CEOs from the top 20 companies working in the sector together for a meeting, for instance, and discuss these benchmarks. We then ask those at the top of the benchmark how they achieved whatever the metric might be, and we ask the others to learn from that," Granger explains.

Learnings from Norway

To ensure best practice and share learnings, Granger adds that the organisation also meets with its Norwegian counterparts across the water, the Norwegian Offshore Directorate, every six months.

"We have the NDR, but the Norwegians have 15 petabytes, so they have much more than us because they started collecting it earlier.

NSTA regularly swaps data learnings with its Norwegian counterparts

"However, we're more advanced in terms of our benchmarking and analysis approach. So, while there's not much overlap in terms of daily business, there's huge overlap in terms of learnings," she says.

GIS App

The NSTA often works with other stakeholders. For instance, while the regulator doesn't cover offshore wind farms, it still has a mission to see how it can integrate different energy type across the basin.

"You can't do that without a map, to be able to spatially plan, so the North Sea and in other areas of UK sea, we needed to understand the users of those areas better," says Granger.

The NSTA's data team worked with Crown Estates and Crown Estates Scotland (responsible for the UK's offshore wind strategy and licensing) to come up with a geographic information system app, which integrates these elements into one place.

Says Granger: "What this means is that if you are working in the energy planning space you can look at these maps and see where the potential for carbon storage lies; where the existing oil and gas and existing carbon storage licences are and it enables you to work together without the data being duplicated across platforms – this is all interoperable data .

"Just having this map has started conversations around how our future energy sources could work."

Results and benefits

Granger notes that the work her organisation has done with windfarm stakeholders can be measured by the number of offshore wind bids.

"What we've seen is companies taking that data, re-processing it, and then using it for offshore wind bids. We feel that a big chunk of that success is because companies can access the data. So, it's about taking data, using it to understand the sub-surface rocks and the geology, and applying it in a different way."

NSTA's data is also being used to support carbon storage licencing. Data has been packaged up and made available through NSTA's Open Data Site. This process allows interested parties to understand subsets of information and to consider which licences to apply for.

According to Granger the NSTA saw its data downloads go up 20-fold on the week of issuing the carbon storage licencing round.

"We think that 60% of the UK's carbon abatement can be made through carbon storage. And those licences give us the ability, as a country, to store up to 10% of the carbon. Data isn't the only thing that enables that process. But if people didn't understand the subsurface, they wouldn't be able to apply for the licences," she says.

Other parties that plug into the data including academia, which is using the information for research. "There are about 180 universities or academic organisations accessing our data from every continent. Research is a huge chunk of what we do, especially in the area of carbon storage," Granger adds.

Current projects

The next step for the NSTA, according to Granger, is to create a Digital Energy Platform encompassing the organisation's offerings on a modern tech stack.

The platform will include the NDR as one app, the Open Data site with GIS as another with the third comprising of an Energy Portal – which Granger explains is a transactional system between itself, the industry and other government departments.

NSTA has just issued a set of data principles for industry and stakeholders

Another big piece of work in the pipeline is the creation of a cohesive digital data strategy for the industry, which Granger is chairing a taskforce to work towards.

The first part of this strategy, on data principles that will support the industry in the context of energy transition, was published last week < https://www.nstauthority.co.uk/news-publications/data-principles-will-benefit-industry-and-support-transition/> .

Granger explains: "We prefer to talk about data principles more than data standards. So, we've got some basic guidance to give when legislation calls up industry for its data."

"It's very difficult to argue with high quality complete data sets. In terms of what standard might be met, we've been less stringent on that."

Other aspects of this strategy involve work on a common data toolkit so that data isn't duplicated or trapped in pockets or silos, while a third area involves looking at softer but equally important elements such as data skills and training across the sector as well as cyber security best practice.

One AI on the future

Surprisingly throughout Granger's presentation at State of Open Con 24 < https://techinformed.com/the-oss-community-mulls-its-future/> , and afterwards when we meet for an interview, there was little mention of AI.

Long term, Granger says its use is definitely on the cards, and will support what the data team does, "but we're not there yet" she adds, implying that the data still needs tidying up to make sure that the quality is there.

She adds: "We're looking at using AI as productivity tool right now as copilot in house, but our focus is on making sure that the conditions are there in terms of the data for people to be able to access.

"So, creating the new NDR account-based platform where people can access data in their browsers without having to do huge downloads, this will enable the potential for AI in the future," she adds.

And Granger's parting advice for those working on open data projects is a simple but often overlooked point. Nail what your outcomes are before you start collecting data.

"You can't just collect a load of data, there has to be a clear purpose for it. And then focus on the quality of that data as opposed to the technology, because the technology is the easier part of it."

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