Agder Energi Nett's drone contracts: A milestone for the drone industry

Agder Energi Nett will be exclusively using drones to inspect its power grid in the coming year. Thirty thousand of these masts will be inspected by KVS Technologies.

Drone in action: KVS Technologies has developed its own drone, but also uses Nordic Unmanned drones which they modify with their own intelligence and sensor suite.

'The fact that the drone industry has raised its standards to the point where it's possible for us to enter these agreements is a milestone. They might still fall short in some areas, but we have faith that this will be a success and that we will achieve the results we want,' says Håkon Skavikmo to Dronemagasinet.

Skavikmo is the manager for maintenance and analysis at Agder Energi Nett. In mid-April they announced that they had entered a frame agreement with KVS Technologies AS and Visimind AB (with Sevendof as a supplier). Both companies will conduct aerial inspection and laser scanning of the power grid in the areas assigned to them within the municipality of Agder.

It is noteworthy that only drones will be used in these operations, since helicopters had been used to a large degree before.

'Agder was split into two parts in this tender process. An area in the former Aust Agder comprising a third of the power grid was open only to drone companies, so that we could promote the use of the technology there. The remaining two thirds was open to both helicopter and drone companies, and it turned out that drones won the competition there as well. So all upcoming inspection and laser scanning of forested areas in Agder will be done with drones,' says Skavikmo.

He adds that there were many bidders and that there was stiff competition, but declines to provide any numbers. It is estimated that the total value of the contracts in all of Agder amounts to three million NOK per year.

Important signal to the industry

Agder Energi Nett has previously had a pilot project with KVS Technologies, during which the technology company gathered data from half of Agder Energi Nett's power grid. KVS Technologies has also won the bigger contract in this tender process.

'The part we won was not within the drone category. We won in the category competing against helicopters, and we're taking that as a huge vote of confidence,' says Cato Vevatne, co-founder and CEO of KVS Technologies.

He says it is the first time that one of the five biggest power grid companies in Norway assigns the inspection of its entire grid to a drone company.

‘It’s an important signal to the industry and represents a paradigm shift. Agder Energi Nett isn’t doing this because it’s the cheapest alternative, but because it’s the right direction to take, both in terms of quality and the environment. It means that we have succeeded in breaking into a market with a solution that is considerably better than what has been offered up till now,’ says Vevatne.

Good quality images and data

The contracts are valid for a year, with the option to extend to two years. They entail the aerial inspection and laser scanning of the power grid. Skavikmo provides further details on what the drones will deliver.

‘Firstly the drones will take images of the power masts from both sides and also of the lines across the entire grid, while the forest alongside the lines will be laser scanned. This will make it possible to observe if the power lines have come loose from the insulators or are in the process of coming loose, which would cause a power outage. Secondly, the drones will measure the distance of the lines to the trees, and the condition of the trees on the entire grid, allowing us to decide which measures need to be taken if there are any perceived threats,’ he says.

The environmental and safety benefits associated with using drones for power line inspections are well known. But do they make any difference when it comes to the images and data captured?

‘The images we receive are almost identical to the ones we get from helicopter companies. The same goes for the laser data. We’re confident of this after having completed the pilot project we had with KVS Technologies,’ says Skavikmo.

Are there any downsides to using drones compared to helicopters?

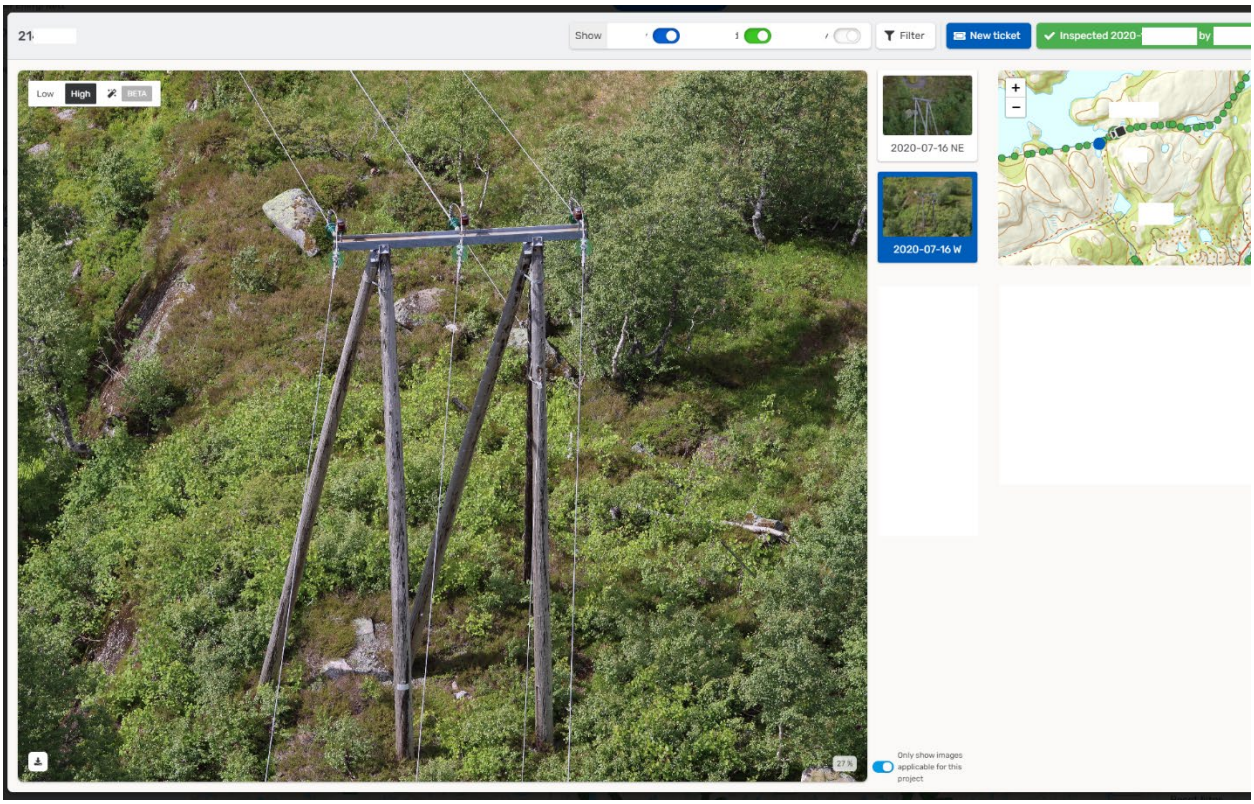
‘A helicopter can cover all of Agder in six weeks in good weather conditions. Drones will probably take a bit more time, and we’ve been less stringent in our demands when it comes to this. We can always start the drone inspections earlier, and run for a bit longer, says Skavikmo. He also acknowledges that there will always be ‘a certain level of risk’ that unforeseen events can occur. ‘What can go wrong is that we’re unable to inspect the entire grid within the given timeframe. Some faults could go unnoticed as a result.’

Autonomous drones

KVS Technologies will be using autonomous drones in the inspections for Agder Energi Nett. Vevatne explains that they will be streamlining the data collection process, making the delivery of the service more efficient, and ensuring that the same quality data is gathered year upon year.

‘Not having a pilot on board or having someone manually control the flight means that we have to ensure that all the know-how is built into the drone beforehand,’ Vevatne says. He emphasizes that it is nonetheless possible to take over control of the drone for safety reasons, if it is necessary to do so. The drones will be preprogrammed to gather data from the masts.

‘Our software automatically creates optimal flight paths that cover the entire grid, which our drones can then fly once they are in the correct starting position in the field. The drone’s onboard camera systems operate of their own accord, following the lines and gathering the images and laser data for the customer. The customer then uses our Grid Analytics software, a cloud-based data visualization and analysis programme, to gain an immediate overview of the condition of their power grid. Documentation is basically handed over to the customer in real time. This is especially valuable in power outages, where our customers are completely dependent on having problems on the grid uncovered as fast as possible.’



KVS Technologies Grid Analytics: This is how the software interface looks for the power grid companies.

Since the pilot project with Agder Energi Nett started in 2019, KVS Technologies has identified and solved a number of issues.

'It's no secret that inspecting thousands of kilometres within a short period of time is a different ballgame to inspecting just a few kilometres or a few thousand high-voltage masts. The masts we're supposed to inspect aren't always standing where the customer says they are, and we've managed to solve this with artificial intelligence which controls the sensors actively in order to compensate for the misinformation. This is how we're able to get the right data. We've had to invest heavily in industrializing our drone system, since a lot of the systems and components that are currently available do not meet industrial quality standards for large scale commercial operations,' says Vevatne.

A more competitive drone industry

KVS Technologies counts some of the largest power grid companies in Norway as its customers, and Vevatne says that in 2021 the company has seen healthy growth in the number of customers and jobs it has.

'We've spent close to 300,000 hours developing a solution that can be scaled. The market in Norway is too small to justify this level of investment, and we're working hard towards internationalization. That has been the plan since day one,' he says.

Agder Energi Nett has made it its mission to adopt sustainable solutions in its work of running and maintaining its power grid. Skavikmo states that this was the first opportunity they've had to use drones on a large scale, where helicopters would have traditionally been used before.

'Helicopters will probably be used for other purposes in the years to come, but we're reducing that usage now. We hope that other drone companies will be able to win similar projects with other power grid companies – it would make the industry more competitive,' he says.

Agder Energi Nett will kick off this project towards the end of April and the inspection work will commence shortly after.

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