

Scottish Wind Farm Work For FUGRO BKS

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Specialist spatial data solutions provider Fugro-BKS Ltd, a key component of Fugro Renewable Services, recently completed an airborne light detection and ranging (LiDAR) survey of five onshore wind farm sites near Caithness in Scotland for RES and Baillie Windfarm Ltd. They have also completed a more conventional topographic survey of another site near Aberdeen, this time for the JNP Group working on behalf of RES.

Our recent airborne LiDAR assignment at Caithness presented lots of challenges, says Chris Boreland, Business Development Manager of Northern Ireland-based Fugro-BKS. The weather was particularly poor on four of the sites, and the fifth was adjacent to the Dounreay nuclear power station, necessitating special flight permissions to fly over the site. This survey, undertaken for an archaeological company (AOC Archaeology Ltd), was part of a major archaeological landscape survey in Caithness and is one of the most detailed landscape mapping exercises ever undertaken in Scotland. The results will be made available to the public through a dedicated website. In this instance the LiDAR survey recorded in detail the Baillie Hill landscape prior to the wind farm construction.

The survey was used to record the setting of one of the most important clusters of Neolithic funerary monuments in Caithness, at Cnoc Freiceadain, offering a unique view of the sites in their landscape context, he adds. Processing the data brought to light a large number of unrecorded features, greatly increasing the number of known hut circles in the area and redefining the extent of medieval and later settlement and agriculture. The data set therefore constitutes an invaluable research tool and an unparalleled means of preserving the landscape of twenty first century Caithness for future reference.

We have seen a marked increase in the use of airborne LiDAR surveys for wind farm developments, says Chris Boreland. A major benefit of LiDAR mapping is the rapid collection of a high accuracy 3D terrain model of the survey area. In the case of Fugro-BKS's FLI-MAP system, a further benefit is the ability to measure ground height information underneath dense vegetation. The FLI-MAP system effectively sees through this vegetation, even if very dense, and can define the ground surface, rocks, mounds and tracks that are otherwise obscured and impossible to map by other means. It does this by distinguishing the first reflected light returns, which define the tops of trees, bushes, grass etc. from the final return which represents the ground surface.

Project developers and consultants are increasing their use of geospatial information, such as the terrain data derived from LiDAR, in a variety of ways. Prior to construction it can be used for wind speed analysis, vegetation cover, roughness, and clearance, view shed analysis, slope stability analysis, access road design, and for environmental and archaeological assessments. This information is an invaluable aid for turbine location selection and volumetric calculations for crane pad construction, as well as providing corridor mapping for network grid connection and substation location selection.

[Fugro Offshore Wind](#) has extensive, in-the-field experience, providing detailed analyses of the seabed and accurate assessments of year-round operational conditions for offshore wind farm sites.

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