23rd ROUND: De-risking the Barents Sea Southeast – using Towed Streamer EM

PGS has covered all areas of interest in the Barents Sea Southeast with densely sampled Towed Streamer EM data, and there is now a unique opportunity to evaluate blocks using seismic in combination with resistivity anomalies.

An illustrative resistivity section determined using unconstrained inversion of Towed Streamer EM data in the Barents Sea. There is an obvious resistivity anomaly at about 2,300 m depth that is structurally conformant, coincides with a known hydrocarbon accumulation, and is highlighted using unconstrained inversion. The red color bar highlights the highest resistivity values only; there are additional variations of resistivity that are not shown by this choice of display. The vertical axis is depth [m]; the horizontal axis is profile distance [m]. The seismic data in the background is full stack broadband dual sensor array.
Towed Streamer EM and GeoStreamer® – The ultimate de-risking technology

Technological improvements now make it possible to use resistivity information in combination with seismic data to evaluate blocks that possess a combination of structural seismic information and anomalously resistive features.

By using a Towed Streamer EM system it is possible to acquire CSEM data in a cost effective manner to determine the subsurface resistivity at both the regional and prospect scale. In addition, the results may be further enhanced when structural constraints are employed in the Barents Sea Southeast, where these constraints could be derived from the Group’s high-resolution seismic data acquired over areas A, B, C and D. Thus, there is the potential to use the resistivity information, together with an interpretation of the seismic data to evaluate blocks e.g. by identifying blocks which possess a combination of structural seismic information and anomalously resistive features.

A quick turnaround is required to ensure that both the seismic data and resistivity models are ready to be used by interpreters, so that the maximum amount of information can be gained in a timely fashion at the block evaluation stage, with the possibility that more value can be extracted from a combination of seismic and Towed Streamer EM data to mature leads into prospects. As the inversion process is entirely data driven PGS ensures the accuracy of the results by delivering 2.5D anisotropic sections from our own dedicated EM Processing and Interpretation group as well as 3D inversion results by delivering 2.5D inversion sections. By performing unconstrained inversions of the Towed Streamer EM data to determine the sub-surface resistivity we retain the maximum possible amount of information from the data before considering any constraints on the solution.

The resistivity determined from unconstrained inversion of the Barents Sea Southeast on a 2D-2D section.

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