The ongoing acquisition by PGS of true broadband seismic in the Southern Central Graben of the North Sea can help to develop established plays whilst generating new ideas to revitalise this mature province. Even after several decades of extensive exploration, development and production using conventional seismic, it remains an important hydrocarbon exploration province. Since 2010 PGS has acquired 3D GeoStreamer® data over a large proportion of the Southern Central Graben area. Several of these broadband dual-sensor surveys have been merged to form a large high quality regional dataset CGR2015M, seamlessly covering a significant part (approximately 5,000 km²) of the North Sea Graben Province across the Norwegian, Danish and UK sectors.

During the 2015 season, PGS completed the acquisition of two further GeoStreamer surveys north-west and south of the existing coverage, providing an additional 6,000 km² of coverage over the Tail End Graben in the Danish sector and extending the GeoStreamer coverage towards the East and West Central Grabs to the north. This dataset with enhanced imaging enables an improved regional perspective and understanding whilst revealing the full exploration potential in the greatest detail. The new wave of regional GeoStreamer towed dual-sensor streamer surveys provide the explorations with the tool to reveal more of the hidden potential within this area thanks to the imaging and Quantitative Interpretation possibilities in determining structural definition, lithology and fluids in both existing and potential plays.

Regional west-east seismic section from the Feda Graben in UK waters, through part of the Gertrud Graben in the Danish sector and over the Mandal High and Coffee Soil Fault into the Norwegian Danish Basin. The section highlights the sharp imaging of structures and faults, particularly at depth, allowing for a better regional geological understanding of the complexity in the area.
Is it possible to determine where the future hydrocarbon potential lies or to identify a new play that will ensure continued interest and growth in the Southern Central Graben of the North Sea? The Southern Central Graben is an area of significant prospectivity and contains important play elements on several stratigraphic levels, including deltaic, shallow marine sandstones of the Middle-Late Jurassic in the Upper Corrasomes – Early Paleocene marine channels and shallow marine turbidite sandstones.

With more than 70 wells in the region, many of the large structures have been drilled and have yielded surprising results. A significant number of the wells have been drilled in the Norwegian sector, with results that have led to the discovery of several fields, some of which have been discovered in the Danish and UK sectors. These discoveries have been significant, as they have helped to de-risk the area with regards to the location of possible reservoirs, traps, and seals.

The flanks show several potential extensional features where hydrocarbon accumulations could be identified around the Mandal High and the Utsira High. The flanks include rotated fault blocks, which are critical for defining the location of possible reservoirs, traps, and seals. The northwards dip of the basin within the TEG2013 survey indicates that it extends from the Tail End Graben along the east side of the Coffee Soil Fault, northwards to the Norwegian-Danish Border, as seen in the figure on the left. The figure (left) shows several potential scenarios where hydrocarbon accumulations could be identified around the Mandal High and the Upper Corrasomes – Early Paleocene marine channels and shallow marine turbidite sandstones.

In well 2/9-3, the Late Jurassic Kimmeridge Clay section was found to be a major potential target. The section was found to be a major potential target, providing important insights into the potential for future exploration targets. The combination of seismic and well data has led to the identification of several new potential targets, which could be associated with the permian-Carboniferous unconformity, providing promising prospects for stratigraphic and structural traps for hydrocarbons sourced from Carboniferous and Mesozoic deposits.

**New Potential in the Southern Central Graben**

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