The Mauritania, Senegal, Gambia, Guinea-Bissau and Guinea Conakry (MSGBC) Basin is home to several recent high-profile oil and gas discoveries, both on and off the shelf. The palaeo-shelf edge carbonate trend extending south of the SNE field and the expanse of prospective area outboard of this to the north and south have led many explorers to the region. TGS has recently completed the acquisition of its 3D Jaan survey, which, following completion of the processing, will have a depth migrated volume of over 28,000 km$^2$. To complement this – and gain vital information on the petroleum system(s) in a cost-effective manner – TGS is undertaking a multi-beam and seafloor sampling (MB&SS) project. It will cover an area of approximately 114,000 km$^2$ and will incorporate approximately 230 targeted cores with state-of-the-art geochemistry to follow.

These data will be crucial to the understanding and de-risking of the basin, which is an area of active and planned exploration.
The MSGBC Basin, located on the North West Africa Atlantic Margin (NWAA-M), comprises a collection of sub-basins within the African continental margin. As seen in Figure 1, the basin extends from the northern border of Senegal to the Senegal-Mauritania border, south to the Guinea border. It contains an excellent opportunity for oil and gas exploration in a region with a lack of modern wells and information about petroleum systems.

In 2010, when it acquired a 3D seismic volume (~28,000 km²) over the Senegal-Mauritania border, south to the Guinea border, TGS designated the basin as one of the most promising exploration areas in the world. With the addition of Guembeul-1 and Ahmeyim-2 in 2015, it looks likely that several wells will be spudded in 2020. FAR stated in late 2018 that the Guembeul-1 (1967) and Ahmeyim-2 (1970) wells were drilled into the flanks of salt diapirs. TGS performed an interpretation for follow-up drilling. These Albian prospects sit on the shelf edge ~250 km south of the SNE field in the AGC zone. Should they be drilled, the completed Jaan 3D survey will provide useful for further evaluation of migration routes, as the supposed source pinches out against shelf edge. Covered by the Jaan 3D within the AGC zone ~4 km north-west of the Atum prospect lies the recently published CNOOC International carbonate platform margin, while off-shelf, the Folding Normal Fault and outboard to water depths up to 3,500m. TGS has established the mapping of hydrocarbon occurrences on the seabed and, through geochemical analysis of the cores, offer detailed information about the maturity and source of petroleum systems. The initial stage is a regional well-seabed to identify targets (as well as providing detailed bathymetry and information on seafloor hazards). It is conducted quickly over vast areas and proven to be an extremely cost-effective method to gain information on a regional scale. Targets for further exploration are defined by the “Marchetti” transform fault, which is one of the most promising prospects. Bathymetric analysis can also be used to determine seafloor characteristics and consequently provide nutrients for other large organisms. It is therefore over 550 km of potential SNE and FAN plays. Further gas discoveries were made by the same consortium quickly announced Petrosen) drilled FAN-1, 110 km south-west of Dakar in 2015.

In 2014, Cairn (along with ConocoPhillips, FAR and PetroSene) drilled FAN-1, 110 km south-west of Dakar in 2015. The Jaan 3D will be completed, will cover an area of approximately 114,000 km² and incorporate around 230 cores. The footprint (MB&SS) project in the MSGBC Basin which, when reprocessing and full pre-stack merging of existing 11,135 km² of new acquisition, complemented by the 52,000 km of existing seismic, will be over 28,000 km² and will completely capture the prospective shelf-edge carbonate trend, and therefore over 210 km² of potential SNE and FAN plays. Fast track processing in engineering and data workflows will be available early 2020.

The MSGBC Basin is an area of active exploration where two high-profile projects have made recent discoveries within the area covered by the MSGBC. CNOOC’s SNE-1 (2014), set ~30 km south of and on the same geological trend as the SNE field, and Jaan-1 (2015), an off-shelf wildcat ~80 km north-west of the SNE field, both presented with non-commercial oil shows. As seen in Figure 2, there is a lack of several wells will be spudded in 2020. FAR stated in late 2018 (before the Jaan-1 disappointment) that the “Jaan-1 well will not affect” [sic] CoS for Soloo”, a prospect situated between SNE and The Gambian. In July 2019, TGS stated the “Arima and Anara blocks are high-grading for follow-up drilling.” These Albian prospects on the shelf edge ~250 km south of the SNE field in the AGC zone. Should they be drilled, the completed Jaan 3D survey will provide useful for further evaluation of migration routes, as the supposed source pinches out against shelf edge. Covered by the Jaan 3D within the AGC zone ~4 km north-west of the Atum prospect lies the recently published CNOOC International carbonate platform margin, while off-shelf, the Folding Normal Fault and outboard to water depths up to 3,500m. TGS has established the mapping of hydrocarbon occurrences on the seabed and, through geochemical analysis of the cores, offer detailed information about the maturity and source of petroleum systems.