

# **Interaction Between a Volcanic and Non-Volcanic System in a Hydrocarbon Province, on the Northeast Atlantic Margin**

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## **ABSTRACT**

Seven exploration wells, drilled into volcanics in an attempt to find hydrocarbons within or below the basaltic units in the Faroe Shetland Basin, have revealed a complex interaction between volcanic and non-volcanic systems, which complicates the understanding of the geological evolution, while at the same time enabling new hydrocarbon plays to be developed. The Faroe-Shetland Basin is situated between the Faroe Islands and the Shetland Islands on the North-East European continental margin. The evolution of the area includes major rifting during the Mesozoic followed by the opening of the North Atlantic and the subsequent separation of Europe and Greenland. The continental break-up caused large scale volcanism from Paleocene to Early Eocene that created the North Atlantic Igneous Province. The Faroese part of the Faroe Shetland Basin is highly influenced by the volcanism and the sub-basins on the Northwestern side are covered by flood basalt associated with the break-up. Large structures that could act as traps for hydrocarbons have been identified on the Faroese Continental Shelf. The primary risk associated with these structures is tied to the influence of the volcanic units which are part of the North Atlantic Igneous Province. The Faroe Island Basalt Group (FIBG) covers both the basaltic lava sequence onshore on the Faroe Islands and the offshore continuation of these lava flows onto the Faroe Plateau, the Faroe-Shetland Channel and onto the Banks South of the Faroe Plateau. The FIBG is currently divided into 7 formations and displays a stacked sequence thickness of ca. 6.5 km of subaerial basaltic lava flows. The dominant flow morphology in the FIBG is the simple and compound type flows. The 7 formations are Beinisdvørð-, Prestfjal-, Hvannahaga-, Malinstindur-, Kvívík-, Sneis- and Enniformation.