Recent drilling results have highlighted the potential for the development of Carboniferous and Jurassic source rocks of England as shale plays. The occurrence of shale gas in the UK has been known of since the nineteenth century, but development of this resource attracted very little interest until recent years. The first exploration well in the United Kingdom that was specifically drilled for shale gas was Prees Hall-1 in northwest England in 2010. This well was hydraulically fractured in the Bowland Shale, but operations were suspended following reports of repeated seismicity caused by the injection of fluid during hydraulic fracture treatment. Sustained natural oil flows have been from the tight, Lower Kimmeridge Limestones in Horse Hill-1 in southern England.

The UK Government has put in place a regulatory framework to encourage the exploration and development of shale resources in the UK covering planning permissions, water use, fracking and benefits to host communities.

The results of an integrated geochemical, geological and petrophysical evaluation of shale plays in Bowland Basin in northern England and in the Wessex Basin in southern England are presented in this paper. The analysed source intervals are the Carboniferous Bowland Shale in northern England and the Jurassic source rocks in southern England including the Upper Jurassic Kimmeridge Clay and Oxford Clay as well as the Lower Jurassic Downcliff Clay, Charmouth Mudstone and Blue Liassic.

An extensive in-house geochemical database was augmented with published data to evaluate the source quality and maturity. The studied source intervals show suitable organic richness and mainly contain a mixture of type II and type III kerogen. Basin modelling results indicate that the Jurassic shale plays in southern England are oil mature while the Carboniferous in northern England reached gas window maturity. Automated Mineralogical Analyses were performed using QEMSCAN®. This data was integrated with petrophysical and log derived elastic properties to identify the presence of suitable brittle intervals for landing horizontal well sections and well completion for production.

Maps were created for hydrocarbon generation risk, reservoir risk and environmental risk for each shale plays under review. These risk maps were combined as common risk segment maps in order to identify the prospective areas.