

## **Exploration Offshore West Greenland: An Emerging Frontier Rift Basin with Significant Hydrocarbon Potential**

Mark Cooper\*

EnCana Corporation, Calgary, Alberta, Canada  
mark.cooper@encana.com

and

Robert Gardner, Neil Ethier and J. Chameroy  
EnCana Corporation, Calgary, Alberta, Canada

### **Abstract**

Results from the Qulleq-1 well drilled in 2000 combined with newly acquired seismic data have prompted renewed exploration activity in the frontier rift basins of offshore West Greenland.

Exploration activities offshore West Greenland began in the early seventies with five exploration wells which primarily tested the Tertiary section. Significant hydrocarbon shows were detected only in the Kangamiut-1 well and a hiatus in exploration of about 20 years resulted. Statoil drilled the Qulleq-1 exploration well which although D&A penetrated a Santonian sandstone reservoir overlain by a thick Campanian shale seal. After the results of the Qulleq well the key geological risk in the basin remained a source rock, which is mitigated by the recent discovery of widespread onshore seeps on the Nuussuaq Peninsula and Disko Island. These seeps have been typed to a variety of Mesozoic source rocks and in combination with slicks in offshore basin areas provide evidence of a working petroleum system. The interpretation of new seismic data suggests that a number of deep sedimentary basins exist which could place the postulated Mesozoic source rocks into the oil window. The seismic data also demonstrates that a large number of large structural traps also exist in these basins with the potential for recoverable resources in excess of 1000 mmbbl.

New regional exploration models have been developed for rift basin development, evaluate reservoir and seal regional facies distribution and identify viable source kitchens. Prospective areas have been high-graded by Common Risk Segment Mapping that incorporates all pertinent engineering and geological exploration risks.