

## Improving exploration efficiency through integration of crowdsourcing, collaborative thought generation and knowledge sharing – the Mid North Sea High case (1) *Kees Jongepier and Kjell-Ove Häger, Draupner Energy AB*

Draupner Energy is an oil and gas exploration and development company founded in October 2015 and is headquartered in the Stockholm region in Sweden, with a subsidiary in London, United Kingdom.

Crowdsourcing, collaborative thought generation and knowledge sharing are integral parts of our business model and we plan to provide a constant flow of exploration and development work and invite creative and curious industry professionals, academics, and passionate amateurs to join our global Community where they get access to our data and tools, and can come forward with ideas and solutions in exchange for cash prizes and bonuses.

The purpose is to improve knowledge transfer across different industries and industry segments in order to gain from the insights and experiences of a very broad Community and create the basis for improved understanding of the prospective potential of a given area. Draupner Energy is hoping to tap into this unreleased potential of global knowledge, unrestrained by corporate hierarchies and priorities. We believe this will ensure that maximum value is extracted from the data and will gain critical insights that may be missed within the restricted environment of a traditional oil and gas explorer. Draupner Energy plans to conduct a steady stream of crowdsource projects to build a balanced portfolio of assets and to enhance the value of these assets. A simplified work flow diagram of our business model is shown below to the right.

Crowdsourcing is widely applied globally, for instance in the gold mining industry and with excellent results. In 2000, Goldcorp Inc. pioneered the adaptation of crowdsourcing and use of new digital technologies. Goldcorp made all its geological and exploration data available and organised a global competition resulting in the identification of 110 potential new gold sites, half of which were new to the company, and 80 percent of them yielded substantial quantities of gold. Goldcorp estimated that the challenge saved 3 years of exploration time and the company's revenues soared. Goldcorp and other mining companies have continued to apply crowdsourcing as an important means for value creation.



## MID NORTH SEA HIGH PROJECT

Draupner Energy AB Box 28 17802 Drottningholm Sweden Draupner Energy invites individuals or groups to come forward with ideas and concepts regarding oil and gas

apply in the UK 29th Seaward Licensing Round. An award of a Production License releases a bonus payment and the Draupner Energy has adapted the learnings from this and other crowdsourcing projects and has completed its first project called the "Mid North Sea High Project", which aimed at obtaining new play, lead or prospect ideas to be potentially utilised for a license application in the UK 29<sup>th</sup> Offshore Licensing Round.

The project was launched in late May 2016 at The Geological Society Conference "Palaeozoic Plays of Northwest Europe" in London which was co-sponsored by Draupner Energy. The project was also marketed through social media, blogs (e.g. Oilpro, LinkedIn, Facebook) and in the June edition of the PESGB Magazine and has also appeared on the Norwegian websites Geo365 and GeoNova and in the Norwegian magazine GEO.

Not surprisingly our website was more frequently visited and more Community members signed up when news appeared,







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Ideation Our Community analyses the data and generates the big ideas

**The Project** 

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**Review** Our team reviews the generated ideas and carefully selects the best ideas and matures these together with our Community

info@draupnerenergy.com www.draupnerenergy.com prospectivity in the Mid North Sea High area. Draupner Energy will select initial proposals and provide geotechnical support to develop them into full products which Draupner Energy will have

prospectivity in the Mid Northpossibility of a maximum totalSea High area. Draupner Energyreward of USD 30,000 for eachwill select initial proposals andsuccessful proposal. The projectprovide geotechnical support toruns from June until earlydevelop them into full productsSeptember 2016. Full details ofwhich Draupner Energy will havethe opportunity are available atthe option to acquire and use towww.draupnerenergy.com.

showing the importance of social media and popular websites to reach out to a wide audience. Our website has mainly been visited by people located in the UK, Norway, Sweden, USA and Germany but people from as many as 57 countries have



had a look. Our currently active Community members are located in the UK, Norway, Germany, USA, Canada and

Australia. Draupner Energy made use of the extensive Mid North Sea High (MNSH) data package provided by OGA (© Crown Copyright. Contains public sector information licensed under the Open Government Licence v. 3.0), as well as publically available information. Data, interpretation tools and computing power were made available using a cloud server accessible via a thin client solution. Hence, Community members were able to interpret the data for free only requiring a home computer and an internet connection. Draupner Energy implemented a 3-tier reward system for initial products, full products and after potential license awards.



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Out of a number of initial proposals our staff continued to mature three projects in close cooperation with Community members. Of particular interest were the Lower Carboniferous and Devonian sections in the Dogger Bank area, see figure below (Cameron, 1993).



The Dogger Bank area which is located just north of the Southern North Sea Gas Basin (SNS), was mainly subject to exploration drilling activity about 50 years ago, between 1964 and 1970, when 13 wells were drilled. After a long pause, four more wells were drilled between 1984 to 1993 followed by another long pause with the last well drilled by Esso in 2009 (37/25-1). Unfortunately, all wells were unsuccessful and encountered only traces of hydrocarbons. Most wells targeted Permian and Upper Carboniferous structural plays and we think there is little remaining potential in these plays in this area. Well 37/25-1 targeted the Devonian Kyle Formation which was not encountered, and the well only found minor amounts of dry and wet gas in other formations. However, both this well and wells 37/23-1 and 38/22-1 proved good quality reservoirs in both the Devonian and Lower Carboniferous. Wells 38/16-1 and 38/18-1 found very good mainly gas-prone source rocks in the Carboniferous section. Intra Carboniferous and intra Devonian top seals were also encountered in these wells and are known to work in the SNS and elsewhere on the UKCS. Hence, both presence and quality of reservoirs and source rocks are proven, top seals are likely to exist, leaving problems with charge or lack of closure as the most likely explanations for the lack of success.

The figure to the right shows a sub-regional near base Devonian structural time map. Although this map needs refinement, it indicates that only well 37/12-1 and probably 37/25-1 drilled valid closures at Lower Carboniferous and Devonian levels (TD in 37/12-1 is in the Carboniferous). All other wells are located outside structural closure including the closing contour for the very large A-, B- and C-structures and we think they remain untested especially since insufficient hydrocarbon charge to fill these structures to their spill point is likely, which also could explain the dry 37/12-1 well. The C-structure is probably in the best position to capture hydrocarbons generated and expelled from the surrounding sub-basins (red arrows). Only when the C-structure is filled to spill will the main hydrocarbon flow migrate further to the NW towards the B-structure which is likely to be under-filled. Structure A is in the least favourable position for charge being located at the end point of lateral hydrocarbon migration.





The figure to the left shows a NW-SE geological cross-section sketch through the Cstructure showing a potential structural trap with Lower Carboniferous and/or Devonian strata overlying basement. Kyle pinch out-traps on its flank represent upside potential. Note the resemblance between this cross-section and the picture of the "Durdle Door" (inset). It appears the picture on our Mid North Sea High Project may have inspired some of our Community members! Draupner Energy finds the very large volume potential (most likely for gas) in structures in this area very attractive although we recognise that there is high geological risk, however we believe this can be reduced through more G&G work and data optimisation. Draupner Energy has therefore applied for blocks in this area in the UK 29<sup>th</sup> round. We think that the new angle our Community members introduced, combined with the long experience of our staff made us look at this area with "new eyes" which was exactly what we hoped for using the crowdsourcing model.

Going forward, Draupner Energy plans to continue launching crowdsource projects to build a balanced portfolio of assets and to enhance the value of these assets primarily in the exploration phase, with focus on the UK and Norway. We are in the process of strengthening our organisation and capital base and have started to work on improving our cloud-based internet platforms. We also want to develop our Community to become more dynamic and attractive by encouraging collaboration, sharing of knowledge and information and regularly post information that we think is of interest to our Community.

**Reference:** Cameron, T.D.J., 1993: Carboniferous and Devonian of the Southern North Sea. In: Knox, R.O.W. and W.G. Cordey (eds). Lithostratigraphic nomenclature of the UK North Sea. British Geological Survey, Nottingham.