

PETROLEUM GEOLOGISCHE KRING

KONINKLIJK NEDERLANDS GEOLOGISCH EN MIJNBOUWKUNDIG GENOOTSCHAP



PGK

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SEPTEMBER 1998 NEWSLETTER

FORTHCOMING PGK EVENTS

- September 11-14** PGK Field Seminar on the Jurassic outcrops in Yorkshire
September 16 W.E. Schollnberger (AMOCO USA), 'Projections of the World's Hydrocarbon Resources and Reserve Depletion in the 21st Century'
October 28 'Novel technology to develop oil & gas', prof. C.P.J.W. van Kruijsdijk (TU Delft)

PGK SEPTEMBER MEETING

The PGK **SEPTEMBER** meeting will be held on **WEDNESDAY, SEPTEMBER 16**, at 17:45 pm and will be preceded by aperitifs from 17:00 pm onwards. The lecture will be held at the KIVI building, Prinsessegracht 23, The Hague.

Mr W.E. SCHOLLNBERGER of AMOCO USA will speak about: 'Projections of the World's Hydrocarbon Resources and Reserve Depletion in the 21st Century'. The speakers have provided the following abstract:

The world economy is highly dependent on the availability of large amounts of hydrocarbons: oil and natural gas represent currently about 60% of all energy traded. Transportation as we know it on land, on water and in the air would be unthinkable without hydrocarbons. Oil and natural gas are also valued raw materials for a thriving petrochemical industry which converts them into a dazzling array of products for our daily life. How long the known petroleum reserves and the yet to be discovered resources will last is a question of great importance to humankind.

Our estimates as per January 1, 1997 are:

- hydrocarbons produced so far 1,150 G barrels Oil Equivalent (790 G barrels oil and 2000 Tcf natural gas);
- proven reserves: 2,020 G barrels OE (1100 G barrels oil and 5100 Tcf natural gas);
- field growth is conservatively expected to contribute additional reserves of 510 G barrels OE (400 G barrels oil and 600 Tcf are natural gas);
- undiscovered resources of hydrocarbons: 2,110 G barrels OE (1010 barrels oil and 6100 Tcf natural gas);
- the worldwide Ultimate Recovery of hydrocarbons (Produced + Proven Reserves + Field Growth + Undiscovered Resources) are projected to be 5,790 G barrels OE (3,300 G barrels oil and 13800 Tcf natural gas).

We do not believe that a distinction between "conventional" and "non-conventional" (≈difficult to produce) hydrocarbons is very relevant. Customers don't really mind whether the products they are using stem from deepwater wells or from tar sands, as long as the price and the quality are right.

Future reserves, field growth, undiscovered resources and ultimate recovery will differ from the 1997 estimates as a consequence of technology advances and of changes in economic, social and political conditions. Just increasing the recovery from hydrocarbons in place above the current averages of about 35% for oil and 50% for gas, will contribute substantial additional reserves. Horizontal drilling, multilateral well completion and air injection provide important options to increase future recovery.

We created three scenarios to illustrate how reserve depletion and estimates of the world's ultimate hydrocarbon recovery might have changed as of January 1, 2101: a high hydrocarbon demand scenario, "Another Century of Oil and Gas"; a low demand scenario, "The End of the Internal Combustion Engine"; and a scenario with intermediate demand for hydrocarbons and increasing importance of other energy resources, "Energy Mix". Under all three scenarios we assume rising energy demand despite ongoing de-materialization of daily life (digital communication replacing brick and mortar, things getting smaller and lighter, world populations topping out at 11 billion in 2060).

As the demand for hydrocarbons grows, we assume, the more economically attractive the search for and the production of oil and gas will be. Consequently, on January 1, 2101 cumulative production of hydrocarbons is projected to stand at 7,455 G barrels OE and ultimate recovery at 11,975 G barrels OE, under the scenario "Another Century of Oil and Gas"; under the scenario "The End of the Internal Combustion Engine", we project cumulative hydrocarbon production at 3,725 G barrels OE and ultimate recovery at 5,140 G barrels OE; and under the scenario, "Energy Mix", we project a cumulative production of 5,665 G barrel OE and an ultimate recovery estimate of 8,675 G barrels OE. We emphasize BOE's, because expected advances in gas to liquids technologies will allow natural gas products to increasingly substitute for oil products.

Under all three scenarios, reserves and undiscovered resources are sufficient to allow hydrocarbon production well into the 22nd century. Until then hydrocarbon production is not constrained by the physical availability of hydrocarbons, but rather by the price of competing energy sources and by the political will of humankind to use hydrocarbons. The three scenarios represent a thesis, an antithesis and a synthesis and we feel that actual hydrocarbon production during the 21st century will be close to the "Energy Mix" scenario.

Predictions are difficult to make - especially about the future. However, for planning purposes we need to look into the future. We feel, a probabilistic approach including teams of geoscientists, engineers, economists, social scientists and political leaders will provide the best predictions.

OTHER EVENTS OF INTEREST TO PGK MEMBERS

September 21-23 International Symposium on the Epicontinental Triassic. To register: + 49 345 5526113, fax + 49 345 5527066, email: trias@geologie.uni-halle.de

Oct. 31 – Nov. 3 Improving the Accuracy & Effectiveness of reservoir Models, Brighton UK. Contact Mrs E. Schut, +31/306956997 or es@eage.nl

November 8-11 Rio '98, AAPG International Conference & Exhibition. Register at +1 9185602679 or convene@aapg.org

December 1-3 PESGB PETEX'98 Conference & Exhibition. Register at +44 1714957808 or pesgb@pesgb.demon.co.uk

MEMBERS NEWS

We have received applications for membership from **Mrs I. Veldhuis** (Occidental NL), **Mr K. de Leeuw** (Panterra Geoconsultants) and **Mr A. van der Molen** (student VU Amsterdam). If no objections are received by the end of the next meeting they will automatically be elected member of the society.

LOST MEMBERS

The newsletters of the following members have been returned to the secretary's office as a result of movement to unknown destination or retirement: Mr. I.E. Uyouko, Mr. D.L. Loftus, Mr. P. Fearn, Mr. B.C. Teuben, Mr. M.D. Thomas, Mr. A.M. Haak, Mr. R.E. Stoeller, Mr. F. Marcellis, Mr. F.J. Krouwel and Mrs.

S. Kist. If you are informed of one or more of the addresses stated before, please contact the secretary (telephone and e-mail are in the letterhead of this newsletter). This is the last call before they will be scratched off the PGK membership list.

SPONSORSHIP

The PGK is very grateful to its sponsors who have been helping to finance the cost of renting the KIVI lecture room, tickets and accommodation for overseas lecturers, monthly drinks for members and contributing to the cost of the field seminars. The following companies are warmly thanked for contributing to our activities in 1998:

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