

CODA- ASPO

THE CENTRE FOR OIL DEPLETION
ANALYSIS
&
THE ASSOCIATION FOR THE
STUDY OF PEAK OIL

NEWSLETTER No 5 –
MAY 2001

General

Various contacts have been made with the European Union both to alert them to Europe's dire energy situation and to the need to study the issue with much greater attention than has been dedicated so far. Dr Bentley in an important contribution sums up their position as "Getting the message but slowly". That itself can be described as progress and ample justification for the ASPO group to continue its efforts, which are evidently beginning to bear fruit

CODA

The first meeting of the Trustees of CODA was held on 2nd May in London. An office at 12 Great Portland Street House, 305 Great Portland Street, London W1 has been rented and Dr Roger Bentley will be working there full time from June 11th. Telephone and e-mail links will be established as soon as possible.

The Trustees agreed the general programme of work and approved the corresponding budget

In addition to further research on oil depletion itself, the programme provides for

1. A new journal to be called *The Journal of Resource Depletion* is to be produced in conjunction with the Multi-Science Publishing Co, which has agreed in principle to act as printer and publisher. It will represent the mouthpiece of our endeavours and provide a valuable means of communication as well as securing recognition. It is intended to cover general resource depletion in addition to oil itself and will also address the consequences in political, social and economic terms. Dr Bentley will act as Editor and will be actively encouraging members to submit papers for an early launch.
2. It is planned to produce a booklet, setting out the essentials of oil depletion, possibly as a special issue
3. It is planned to conference later in the year to cover the issue of Oil Depletion in order to raise public and political awareness, securing necessary media coverage

Letter to EU Commissioner

The letter to the EU Commissioner reported in the last Newsletter eventually elicited a response, proposing that contact should be made with Mr Cleutinx, the responsible official. That was duly made but he was unaware of the correspondence and had not received the study attached to the letter. He politely expressed interest and said he would investigate further internally. It does not appear that oil depletion is yet a subject of grave concern to the Commission (see also comments by Dr Bentley below). It emphasises the importance of our organisation's efforts to rectify this failing.

IEA shifts ground again

The International Energy Agency has yet again shifted ground. It will be recalled that in its 1998 World Energy Outlook, it did succeed in delivering a coded message explaining the gravity of the oil supply situation, albeit in bland diplomatic terms. Then in the Edition of

2000 it reverted to its earlier position of there not being a cloud on the horizon. A new policy statement has now been issued which does express “concern” about future oil supply and emphasises the need for new study of the matter.

This may reflect the changing position of the United States government. It previously seemed oblivious to resource constraints, possibly being influenced by thoroughly flawed study of the US Geological Survey that claims the world to have a huge potential for new discovery and “reserve growth” with a miraculous reversal of the recorded trend of the past forty years.

A.M.S. Bahktiari in a telling article in the Oil & Gas Journal of April 30th 2001 demonstrates the absurdity of the IEA forecasts by comparing the 1998 and 2000 Editions of the World Energy Outlook as follows

	1998 Forecast	2000 Forecast
<u>Total supply in 2020</u>	<u>112 Gb</u>	<u>115 Gb</u>
Non-OPEC	27	46
OPEC	60	62
Processing gains	2.5	2.6
Identified Unconventional	2.4	4.2
Unidentified Unconventional	19	0

It is absolutely inconceivable that any serious analysis taking into account the resource base could in the span of only two years almost double the estimate of non-OPEC supply in 2020, when most of the news between the two reports has been negative. No new major province has been discovered: the Caspian continues to disappoint; and the North Sea is seen to peak.

In 1998, the mythical balancing item of *Unidentified Unconventional* category was expected to deliver 17% of the supply by 2020, implying the discovery of huge new, albeit unspecified, resources, but two years later this expectation had vanished without explanation.

It is a shocking commentary on a world organisation with prime responsibility for advising the OECD governments and the European Union on oil supply. If nothing else, it demonstrates in very clear terms the importance of the ASPO-CODA mission to unmask this situation, and come forth with well reasoned, logical and consistent estimates upon which sound and rationale government planning may be made.

American policy

Now, the Bush administration confesses to a serious energy crisis, with his Secretary of Energy admitting that it will have colossal economic impact, even changing the “American way of life”. The government proposed to ameliorate it with the following provisions:

- open new federal lands to oil and gas exploration, including the Arctic Wildlife Reserve
- ease regulations on pipelines and refineries
- facilitate new power line construction
- streamline regulations on new power stations
- provide federate aid to nuclear power stations
- expand coal-fired power generation,
- apply new energy efficiency standards on electrical appliances
- provide tax incentives for smaller vehicles

They sound sensible, but the drilling in sensitive areas will no doubt face opposition from environmentalists. It is worth remembering in this connection that the Prudhoe Bay Field in Alaska is a “king”, head and shoulders larger than any other field in the areas due to a unique set of geological circumstances. It is accordingly doubtful that the Wildlife Reserve will be

found to contain anything comparable despite its promising address. A few key boreholes drilled by the government as “research” would resolve the issue without risking the ire of the environmental lobby by opening it to indiscriminate exploration by competing companies. The government has also junked Kyoto, no doubt to facilitate expansion by the coal companies, in an action, which has attracted worldwide condemnation.

Meanwhile the influential Center for Strategic and International Studies in Washington has issued a report about energy supply, recommending that the US should act as the world’s policeman using military means to ensure that the “sea-lanes remain open”. This has been seen as a veiled threat of military intervention to secure oil imports.

At the same time, we were able to furnish data for an important presentation that was made to this same institute recently. It was well received by a high level audience including key foreign affairs personal and a Shell Director, who seemingly accepted the thrust of the argument for an imminent peak in world oil supply. It is understood that this presentation contributed to the government’s unpopular decision to step up coal production and nuclear energy, notwithstanding the environmental hazards, mentioned above. It is gratifying to find that we have a voice in Washington corridors of power.

Reading University

(i). Reading's past contacts with Brussels: “Getting the message, but slowly”
(including recent meetings with DG-TREN's H. Maters & C. Cleutinx).

For some time, Reading University has been attempting to draw the European Commission's attention to the problem of oil depletion. The initial contact was in May 1997, when Reading invited Dr. Kevin Leydon, then Head of Unit, Analyses and Forecasts of DG XVII to attend, a workshop on Oil Depletion at Reading. This he was unable to do. Reading again contacted Dr. Leydon in March 1999, sending him a copy of their paper: '*Oil: The Next 5 to 10 years*', and had a number of discussions with him by 'phone. The main purpose was to ask if there might be funding from Europe for a study on global oil depletion.

Subsequently, in June 1999, Dr. Bentley met Dr. Knut Keubler, a 'Detached National Expert' within DG XVII at a meeting of the Royal Institute of International Affairs (RIIA, also known as 'Chatham House'). Dr. Keubler asked for a copy of Reading's paper: '*Perspectives on the Future of Oil*', and subsequently requested a second copy that went to M. J. Michaux, also of DG XVII. However, no further interest was shown.

This was probably because, at that time, the views of the Commission were firmly that "Past concerns regarding available oil reserves have been eased by the pace of technological development". For example, when Dr. Campbell wrote to Sra. Loyola de Palacio at the Commission in May 2000, to set out the problem, and to offer help in a technical study, this was turned down. The Commission said they were getting adequate advice from existing consultants, and commended to Campbell the book *The New Geopolitics of Energy* by John Mitchell of the RIIA. (Mitchell co-authored the 1979 BP report '*Oil crisis ... again*', that predicted that non-communist-world oil would peak in 1985. This destroyed Mitchell's confidence in oil forecasts, and in *The New Geopolitics of Energy* he simply predicts future 'Rest-of-the-world ' oil production by linear extrapolation.)

Around the Autumn of 1999, Reading contacted Mr. P. Jarvilehto and D. Rossetti, Scientific Officers, 'Energie, Generic actions', on guidance for where funding might be available within the EU's Research Directorate (then DG-XII) for an oil depletion study. No response was forthcoming.

Subsequently, Dr. Rayner Mayer of Reading University made contact with Dr. Johannes Maters, Head of Unit, Security of Supply in the Directorate-General for Transport & Energy (DG-TREN), and in January 2000 Reading sent Dr. Maters a copy of their paper: *'Perspectives on the Future of Oil'*.

In June of 2000, Drs Bentley and Mayer gave a presentation on oil depletion to Dr. Maters in Brussels, and spent the afternoon going over the topic in more detail with Ms. Nina Commeau-Yannoussis, who works for Dr. Maters. A proposal was made to Maters for a one-year research project, costing 95 k euros, entitled: 'Assessing Resource Risks to Europe's Oil Supply', that would involve Reading, and seek co-operation from the BGR, NPD and IFP.

Dr. Maters did not support this proposal, but did ask Reading to look at the current draft of their 'Technical Background' document for the Green Paper on Security of Supply, that was then in preparation. (This Green Paper was subsequently adopted by the Commission on 29th November 2000, and has recently been published as a glossy booklet: *Towards a European strategy for the security of energy supply*; comments on which will be accepted until 30 November this year.)

Mater's 'Technical Background' document correctly had curves for the decline in production of EU oil, but showed no knowledge of the corresponding peaks in non-OPEC or OPEC oil; and presented most of its oil data in terms of R/P ratios. The EU's view of increasing dependence of the EU on external oil led the document to propose renewal of nuclear power as a key solution.

Drs. Bentley and Mayer commented on the document in detail, and sent back a long list of suggestions and corrections. These included pointing out the problems with R/P ratios; the likely difficulties within OPEC of raising production in the near term; the range on OPEC's peak dates; and a number of other points including a suggestion that a low-energy, high-renewables strategy merited investigation, vs. automatically switching heavily into nuclear (which public opinion would probably prohibit in any case). A great many of these suggestions were incorporated into the body of the 'Background' document, though they were not reflected in its Executive Summary.

Subsequently, Reading heard that others contacted by DG-TREN did not agree with Reading's views, and so it came as only a small surprise, though still a disappointment, to them to find the final Green paper, as published, essentially ignored much of the information provided. It has for example, p38:

"Reserves [of non-OPEC oil] will continue to be plentiful. ... It is thought that a crude oil price of about USD 20 should make it possible to guarantee the investment in production in non-OPEC regions, which will be needed because of rising demand over the next 20 years."

However, within its Summary of the Technical Background it does have, p82:

"... uncertainty surrounds future investment levels and physical availability of Middle East reserves."

Though the Green Paper misses some of the key points, on balance Dr. Maters and his team are to be congratulated on delivering a paper, on a very contentious issue, that raises significant concerns, and which delineates some of the rather stark choices ahead for the EU. Key perhaps is its recognition (increasingly recognised also across the Commission) that control of energy *demand* will have to be a strong new policy within Europe.

Recently, on 16th May, Roger Bentley visited Dr. Maters, where Reading's response to DG-TREN's '13 points' in the Green Paper (see ASPO Newsletter No. 4) were discussed. Maters and his aides did *not* agree that any oil shortfall might occur soon, and said this was just "Reading's opinion". (One aide to Dr. Maters, Ricardo Soares De Oliveira, explicitly said that the US energy crisis proclaimed by President Bush is just a fabrication to allow Bush to repay election support.)

However, a more useful meeting occurred on the following day, with Mr. Christian Cleutinx who is Unit Head in DG-TREN for coal and oil. Reading first had a meeting with Cleutinx in December last year, and he certainly has now begun to understand the situation; recognising, for example, that the Caspian will help, but is no huge bonanza; and that Russian oil is in decline. M. Cleutinx agreed, in principle, to participate in Reading's 'oil research club' (see below).

Dr. Bentley also talked with Dr. Vassilios Kougionas, Scientific Officer, Oil technology, CO₂ capture and sequestration, who works for Cleutinx. Dr. Bentley explained the background to the Campbell/Laherrère study, and contrasted this with the fact that the views of many (such as Mitchell) are based on effectively no data at all. (This apparently came as a surprise to Dr. Kougionas!) **In discussing funding for research, Dr. Kougionas suggested the ASPO group pursues the Framework V call for this December; and kindly said we could submit a draft of our proposal to him, to help ensure its wording reflects the Commission's priorities.**

(ii). Reading's proposed 'Oil Research Club'

It seems to Reading that there are three complementary sets of research work that need doing:

(a). Updating the Campbell/Laherrère 1995 study. This would essentially follow the Campbell/Laherrère methodology, but use current data from the HIS Energy/Petroconsultants database. It would give an updated view of the peaking dates by country, or region, of *conventional* oil. The work might require two people working full time for a year, and would need considerable volumes of data from the database; specifically: field production histories, estimated field URR's, API, and water depth if offshore; together with history of discovery vs. wildcats by country or region. The key cost therefore is access to the database, though one might imagine negotiation for use of the database for research purposes, with specific safeguards on how data are released, might be cheaper than outright 'commercial' purchase of the relevant data. It is also recognised that while some of the analysis is mechanical, as for example in plotting up wildcat discoveries to estimate a medium-term ultimate, much of the whole process has to closely involve experienced exploration geologists to make judgements of what the data are saying.

(b). Checking the 1995 Campbell/Laherrère calculations. This has essentially been the work of the University of Reading over the last several years, but there remain quite a lot of areas where more work is warranted. Key subject for study here are:

- Getting reliable production engineers' estimates for scope for increasing recovery factors in existing reservoirs, as a function of price, and timescale. (Incidentally, there has been significant growth in *aggregate* database values in recent years, for which a variety of explanations are possible, and this needs to be examined more closely.)
- Aiming to improve the information of the reserves, investment requirements, and near-term discovery possibilities of the key Middle East countries. This is not an easy task, but there is hope that newer information sources may be opening up to clarify this crucial area.

(c). Research to determine the likely rates that *non-conventional* oil can come on-stream as conventional oil declines. This includes not only considerations of the various resource bases (large in some cases), but also of cost, extraction energy, CO₂ levels and other environmental issues. The non-conventional 'oils' include heavy oils, tar sands, gas-to-liquids, coal to liquids, biofuels, vehicles switching to natural gas, and so on. Rate of switching to higher efficiency use of liquid fuels also needs to be considered.

Research area (a) needs to be addressed by the ASPO membership, or similar, with probably EU funds (Frameworks V, or VI; or possibly DG-TREN themselves, if their interest becomes adequately strong.). **Please contact Dr. Bentley by e-mail (r.w.bentley@reading.ac.uk) if you wish to be part of such a Framework V submission. (Remember that universities can get full marginal costing, institutions 50% of full costing.)**

For research areas (b) and (c), Reading is proposing a 'research club', where individual organisations (commercial and institutional; mainly within the UK in the first instance) will be approached for a one-off payment, possibly of the order of £20,000, in order to have a say in what research is carried out, and to have knowledge of the results.

TotalFinaElf

Mr Bauquis of this major French company has made a presentation on future energy supply.

2000	3.7 Gt	(74 Mb/d)
2020	5.0	(100 Mb/d)
2050	3.5	(70 Mb/d)

also pointing out that estimates of Ultimate recovery have changed little over the past thirty years. He forecasts that oil will provide about 40% of world energy until 2020 when it falls sharply, being replaced by growing nuclear energy. By 2050, coal, nuclear, oil and gas are expected to provide roughly equal proportions, with hydro and renewables contributing only slightly more than today. While the forecast appears to be much too high, it does at least imply peak and decline.

Uppsala University

Professor Aleklett reports that he was one of the speakers at a meeting of the Royal Academy of Science on Energy and the Environment, held on May 18th. The Academy will later come with a statement. He also had a third article in the Svenska Dagbladet on May 20th discussing the natural gas problem facing the United States.

Denmark

In Denmark, a public debate has been initiated by an article from Klaus Illum in the newspaper, *Information*, April 26. It summarises the perspectives on peak oil and the IEA oil production and demand forecasts, as published in Energy Outlook 2000, concluding that there is reason for political concern. On May 16, the Vice-Director of the Geological Survey for Denmark and Greenland (GEUS), Mr. Kai Sorensen, responded in an article saying that there is no reason to worry about the exhaustion of oil resources • missing the point that the debate is not about exhaustion but about the peak of production taking place before the peak of demand. Mr. Sorensen referred to the USGS as the "only institution which seriously seeks to form an opinion about the size of the global oil and gas resource".

In his article Mr. Sorensen refers to Campbell's analyses in a rather dismissive tone. Therefore, Campbell responded in a letter to the editor of *Information*. An abbreviated version of Campbell's response was published on May 22. This week, a summary of Campbell's response appeared on the News list on the home page of the Ministry of Environment & Energy, indicating that the Ministry is aware of the ongoing debate.

Also members of Parliament have become aware of the peak oil issue. On June 6 a seminar on oil revenues and the depletion of the Danish oil and gas fields in the North Sea will be held in the Parliament building. Dr. Roger W. Bentley has kindly agreed to speak at this seminar.

The exchange is reproduced below: **INFORMATION**, 16 May 2001 (translated by Klaus Illum)

If oil runs out

By Kai Sørensen

Vice-director, Denmark's and Greenland's Geological Survey (GEUS)

The assessments of oil reserves vary from the pessimistic, as in Klaus Illum's article *When the Oil Crisis Comes*, April 26th, to the optimistic: *If oil runs out*. The pessimists often base their assessment on figures and arguments from Colin Campbell and King Hubbert's work in the 1950's: "*Predicting when oil production will stop rising is relatively straightforward once one has a good estimate of how much oil there is left to produce*". The prediction that the ultimate oil crisis is just around the corner is based on expectations as to a continuing growth in demand and a decrease in production soon to come. The problem is that this "*good estimate*" is not easily obtained.

Limits to Growth

Many of those who now worry about the energy future had their first AHA-thrill in 1972 when Meadows et al. Published *Limits to Growth*. Considering the then known oil reserves, they predicted that the last oil would be produced already by 1992, assuming a continued (exponential) growth in consumption. The prediction did not come true. And, equally incomprehensible to the man in the street, the proven oil reserves are almost the double of what they were when *Limits to Growth* was published. Klaus Illum's assumption that oil consumption will increase by about 40 percent over the next 20 years should be seen in the light of an increase by 13 percent over the period 1974-94, 8 percent in the period 1979-99.

But is it not true that we are well on the way to the exhaustion of the World's oil reserves? By 1973 there were sufficient reserves for the production to continue unchanged for 48 years, by 1999 there was enough for 62 years! There is no simple explanation to this.

A very elastic concept

According to international consensus, the word reserve means the amount which can be profitably produced using presently known technology and under the present economic conditions. This is a very elastic concept. Most reserve assessment are based on the oil companies' estimates, which are, generally, conservative. Tracing the development in reserves in particular fields, it appears that over time oil fields generally 'grow' in size because of improved extraction techniques, which incorporate into the reserve sphere resources hitherto assumed unprofitable to recover. Furthermore, over time additional resources are found in fields already known. This is the complex background for the growth in oil reserves.

One may say that the reserve assessments which for the last decades can be read in BP's annual energy statistics has the character of a kind of stock-taking. Many of those who are not familiar with this reserve concept, certainly believe, that reserves means something else. Something which is easily evaluated, as assumed by Campbell, for example.

Hence, there is substantially more oil in the underground than what appears from the reserve assessments made at any one time. In the world which occupies itself with the non-living raw materials one operates with yet another concept: the resources. These are the reserves plus the amounts which it is technically feasible to extract and which will probably be found. For oil and gas it goes as for coal: The amount of coal in the underground is some astronomical figure, which is of academic interest only. Therefore, it goes for resource assessments that they normally comprise only the amounts of raw materials which it will be economically feasible to exploit within a foreseeable future (say 30 years).

Today there is only one institution which seriously seeks to form its opinion on the size of the global oil-gas resource. That is the American geological survey (USGS), which currently has a *World Energy Project* running. The latest report from this group arrives at the following resources (reserves plus the 30-year resource) for the World as a whole: 410 billion cubic metres of oil. This should be seen in the light of already produced amounts of 110 billion cubic metres and an annual production of 4 billion cubic metres. As one can see, there is a very large resource to added to the reserves.

The oil price moves up and down

In his article, Klaus Illum followed Campbell's foot tracks and reached the conclusion that the World faces a serious oil price crisis. The oil price moves up and down but this is primarily due to political events, not to circumstances which have to do with nature and size of the resource. There are many good reasons to reduce the consumption of oil and natural gas, e.g. environmental, but the day when we shall really experience oil and natural gas a scarce resource lies far away in the future. So far away that scenario may never become a reality.

Long before that day we may produce energy in a way presently unknown and oil will remain in the underground as much coal presently does. If one needs to worry it is not the oil resource quantities one should pitch into. Because then the worry will turn into disappointment.

If Oil Runs Out" -- A Reply from C.J.Campbell

The very title of Mr S*rensen's article *If Oil Runs Out* demonstrates a failure to grasp the essence of this debate. Although oil, being a finite resource formed in the geological past, must one day run out, no serious analyst thinks that it will do so for very many years to come. The point is not when it will eventually run out, but when production will peak. That will clearly be an important turning point with far-reaching consequences, given the world's heavy dependence on cheap oil-based energy. It is not helpful to speak of optimists and pessimists, when what are needed are realists basing their assessments on valid data and the extrapolation of genuine discovery trends.

Mr S*rensen is right to comment on the elastic nature of reserve reporting. The industry has systematically under-reported the size of discoveries for good commercial and regulatory reasons; and several OPEC countries reported huge spurious increases in the late 1980s when they were vying with each other for quota based on reserves. It is precisely why serious analysts reject the published data, as given for example in the BP Statistical Review, referred to by Mr S*rensen, which simply reproduces unreliable information compiled by the Oil and Gas Journal and does not draw on the company's own considerable knowledge. World discovery, based on the industry's own data, has declined since the 1960s, despite all the advances in technology, a worldwide search and a deliberate effort to test the biggest and best remaining prospects. It is easy to understand this pattern of discovery. The larger fields, which hold most of the oil in any province, are found first because they are too large to miss. The peak of discovery has to be followed by a corresponding peak of production: that is realism, not pessimism.

Mr S*rensen falls into the common trap of comparing oil with coal. Oil is a liquid not an ore, being concentrated into a few accumulations by Nature. It is either there in profitable abundance, or it is not there at all. If Mr S*rensen studied the production statistics of the world's major fields, plotting annual against cumulative production, he would observe in most cases a straight-line decline, which conclusively shows that technology has had little impact on the reserves themselves.

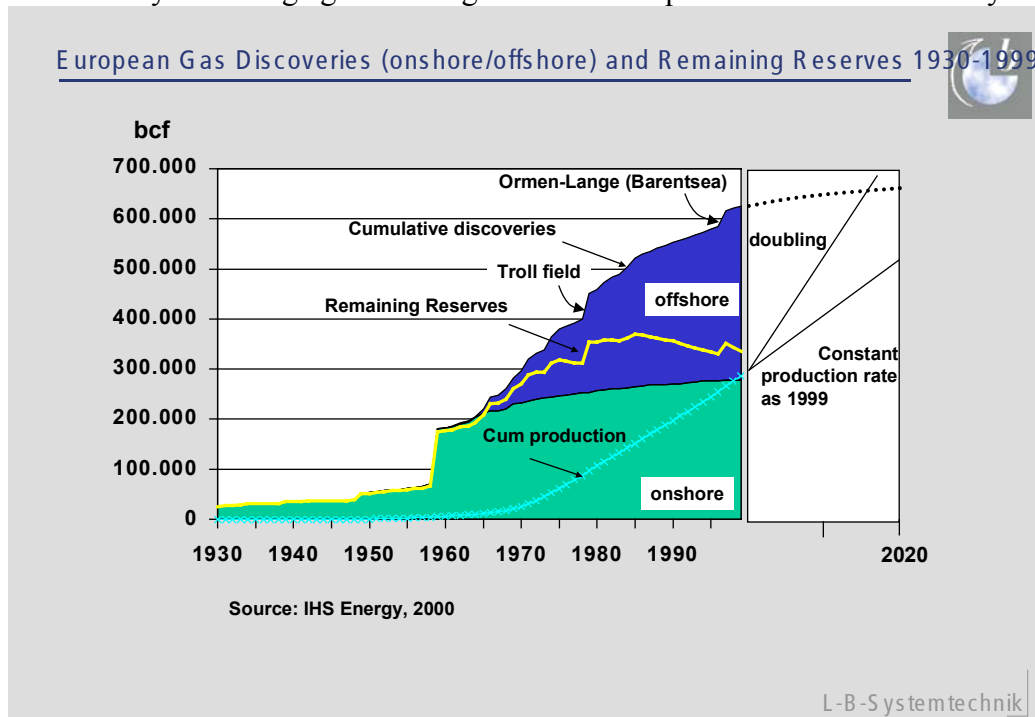
It is understandable that Mr S*rensen should applaud the recent report of his sister organisation, the US Geological Survey. But if he studied the methods used carefully he could hardly fail but conclude that it is little more than pseudo-science. Take for example the case of East Greenland, which is not only treated as part of North America, but is considered to be the World's most prospective area. The USGS made a number of alternative estimates of possible field-size distributions of the world's basins. The results were then given to statisticians who after many iterations concluded, in for example the case of East Greenland, that there was a 95% chance of finding more than zero and a 5% chance of finding more than 111.815 Gb. A Mean value of 49.684 Gb was computed from this wide range. It offends common sense to quote to three decimal places the slim chance that East Greenland might contain almost double the North Sea. Furthermore, the USGS admits in its text that it was exceedingly uncertain about the assessment of reserve growth.

Government institutions that simply accept published reports of this sort fail in their responsibility. What they should do is study the matter themselves, using valid industry data. The results will clearly speak for themselves without appeals to optimism or pessimism. The peak of discovery in the North Sea was in 1973 and peak production is now close. It should surprise no one but Mr Sorenson that the world discovery peak in the 1960s, which is fact not speculation, heralds the corresponding peak of production that cannot be long delayed. About half of what remains lies in just five Middle East countries.

It is significant that the International Energy Agency, which had also been infiltrated by the USGS, now delivers a clear message in its recent policy statement. Denmark has an important role to play, and its Geological Survey could contribute usefully. Thorough studies are needed more than expressions of blind faith.

L-B Systemstechnik

Dr Zittel has produced an excellent study of Europe's gas supply and demand in a world context, from which the following plot is reproduced, showing cumulative discovery, which is markedly flattening against rising demand. Europe's will have little left by 2020.



Clausthal University

Professor Blendinger writes of his continued interest in the subject of depletion, of discussions with other interested parties in Germany, and of his quest for research funding. His website is attracting much world interest.

The university has put on its website a video of a lecture on oil depletion given in December. It is now attracting much interest and attention especially in the USA, being reproduced on several other websites. It can be seen on

www.rz.tu-clausthal.de/realvideo/event/peak-oil.ram

It has also been translated into Portuguese, and may be seen at www.amerlis.pt/oil/lecture

Jean Laherrre

Jean Laherrre is making an important presentation on oil depletion at the IIASA meeting in Vienna. He has again to confront the flat-earth economists who continue to try to bolster their flawed ideas about the near infinite size of the oil and gas resources by appeals to spurious Russian research on the abiogenic origin of oil and gas, which has been discredited, even by the USGS.