

Issue 61

May 2005

**Spring 2005 has encouraged us to look at the nuclear energy option. We are not alone in this reappraisal of an alternative which has for many years been discarded by public opinion as worth no practical consideration. Whether or not the public, however defined, has changed its mind about nuclear is uncertain, but energy planners and analysts have, for various reasons, reopened their files and environmentalists find the need to make a balance between CO<sub>2</sub> emissions and nuclear waste concerns.**

IAEA seems the logical place to start, and we are indebted to David Waller and Alan McDonald for introducing the subject. They remind us of the rationale for the renewal of interest: nuclear is a safe alternative (in spite of its Chernobyl reputation), there is increasing pressure on traditional energy sources, diversification is important to large consumers and the environment is at the top of most agendas. Nuclear today provides 16 per cent of the world's electricity and there are nearly 450 nuclear power plants in operation – it is not a dead industry as many imagine. They are, nevertheless, cautious about the future; they show confidence that the share of nuclear is unlikely to diminish and will, indeed, increase, but it will be a controlled and specific expansion.

Judith Greenwald concentrates on the challenge of CO<sub>2</sub> emission reduction in making a similarly cautious claim for nuclear as part of the solution for the USA. There the

future of nuclear is more acutely under threat in that, while 20 per cent of US electricity supply comes from nuclear, 40 per cent of that capacity will be retired by 2015. The industry is faced by universal problems linked to waste disposal and proliferation, the economics of nuclear plants and political influences, but the demand for CO<sub>2</sub> reduction is playing an increasing part in the formation of public perception. What is needed is international coordination and cooperation in finding guidelines for nuclear development. For the USA, while nuclear still remains an important component of the energy mix, its future, however logical or desirable in terms of a low-carbon environment, is subject to much political, social and economic interplay.

Paul Mobbs introduces a different constraint into the debate. Many of us will have accepted, perhaps without much thought, the general proposition that uranium is found

## CONTENTS

### **Nuclear Energy**

David Waller and Alan McDonald  
Judith Greenwald  
Paul Mobbs – page 3

### **Indian Gas Supply: Elixir for Growth or Priced out of Reach**

Chris Hansen – page 10

### **Oil Production Expectations outside the Middle East**

Andrew Hayman  
Ivan Sandrea – page 13

### **Personal Commentary**

Walid Khadduri – page 19

### **Asinus Muses – page 20**



OXFORD  
INSTITUTE  
FOR  
ENERGY  
STUDIES

in so many places that nuclear power will never find itself short of fuel. Mobbs points out that in practice this is not the case; that the concentration of uranium is critical, as is the type; and that the amount of uranium required depends on the type of reactor. He also states that, if nuclear is to provide a larger proportion of the world's total energy supply, nuclear energy must increase by a factor of 4–8 times in order to make a significant difference to the use of fossil fuels. In these circumstances the lifespan of the known available uranium resources would be dangerously reduced for the continuing operation of the nuclear plant implied. This may seem a peculiarly esoteric argument in the current debate, when it seems to require superhuman effort to agree to the building of even one plant, but it is surely preferable to be sure of the resource before it might be needed.

From nuclear we move to look at mainly non-OPEC oil production in two regions outside the Middle East – West Africa, which has been seen by some as a particularly hopeful area for new oil supply, and South America. Clearly the international system needs a boost from outside the Middle East in the medium and longer term and, in spite of intermittent optimism attached to Russia, other regional expectations would be welcome.

Andrew Hayman analyses the West African scene, but finds that in the period up to 2010 there is unlikely to be any major excitement. Nigeria may increase production by 1 mb/d and Angola by 0.5 mb/d; Equatorial Guinea may reach 0.35 mb/d, but the rest have limited potential. The region is unlikely to produce more than 6.5 mb/d by 2010 (including OPEC Nigeria), but that will be a valuable addition to world supply.

Ivan Sandrea has done the same for South America, excluding OPEC Venezuela. Here the picture is dominated by Brazil and seems unlikely to add much to a regional production hovering around 4 mb/d in the period to 2010. What is lost in the rest of the region will hopefully be replaced by additional Brazilian production. Sandrea shows, however, the extent to which Brazil is the key player, and the technical and managerial prob-

lems that it must overcome. The longer-term predictions are not very favourable for the region.

Our other main article concerns Gas in India. Chris Hansen analyses the role LNG may play provided that the central government and regional policies give it room to manoeuvre without imposing political or economic constraints. He looks at the possibilities of imported pipeline gas from Myanmar or Iran and domestic gas from new discoveries. He also deals with the complicated pricing sensitivities around gas, and concludes that the major determinant may be the regulatory and taxation regime.

Personal Commentary is by Walid Khadduri, who looks at what OPEC policy has been in practice as opposed to what some critics have claimed for it. OPEC has consistently produced the oil required by the international system in spite of sanctions imposed on oil-producing countries by consuming countries. Investment for more capacity, however, remains an outstanding question for OPEC countries to grapple with.

## Contributors to this issue

JUDITH M. GREENWALD is Director of Innovative Solutions at the Pew Center on Global Climate Change

CHRIS HANSEN is a Research Officer at the Oxford Institute for Energy Studies

ANDREW HAYMAN is Director for Africa, CIS and Europe for IHS Energy

WALID KHADDURI is Business Editor of *Al-Hayat* and former editor of *Middle East Economic Survey*

ALAN McDONALD is an energy analyst at the International Atomic Energy Agency

PAUL MOBBS is an independent researcher

IVAN SANDREA is Principal Oil Supply Analyst, OPEC

DAVID B. WALLER is Deputy Director General of the International Atomic Energy Agency