

## President's Message

**H**ow do you like the new look? As you will no doubt have noticed, the Newsletter has an updated, more internet-friendly new design – one that we hope you will find attractive. Georg Erdmann, IAEE's Vice President for Publications, has led the efforts that have resulted in these and other behind-the-scene changes in our quarterly bulletin to members. Not only will the new design allow you to consult and download individual articles more easily, we are also developing tools that will allow you to search the contents of past issues (beginning with the Winter 2007 publication). In addition, we are moving ahead with plans to structure each issue around specific themes: short articles will be solicited from members with expertise in each of the identified areas, with a view of providing these experts with a platform to inform and communicate with the entire membership. In this issue (and the next one), for example, many of the contributed articles deal with the geopolitics of energy and energy policy matters in general. Special thanks to Georg and to Headquarters staff for developing this new look for our "old friend". Please feel free to get in touch with your comments, suggestions, reactions to our updated Newsletter – you can do so electronically at [iaee@iaee.org](mailto:iaee@iaee.org). Thanks in advance for letting us know what you think.

As I try to keep abreast of the evolution of the world energy scene, two sets of issues keep drawing my attention – both of which were explored in our recent, successful international conference in Wellington, New Zealand: climate policy and energy poverty. As international energy prices remain high (by the standards of the last 30 years or so), it is increasingly difficult to qualify as "temporary" the difficulties in terms of affordable access to commercial energy sources that are created for the world's poor. As a result, pressures will continue to grow for policy initiatives, at both international and national levels, to alleviate this situation. The tools of energy economics, and by extension the expertise of IAEE members, should be very helpful here to help inform policy actions. For example, it would seem appropriate to highlight that demand- and supply-side considerations have a role to play in this context, and that past experience has offered some support for the notion that market intervention in the form of direct price controls has unintended effects that are far from uniformly positive.

The Stern report and early contributions to the fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC), among others, have contributed to a heightened sense of urgency around climate policy. As you know, the linkages with energy are clear and immediate: activities relating to the production and consumption of key forms of energy result in significant volumes of greenhouse gas emissions. While it is clear that useful approaches to this set of issues must draw from a wide range of disciplines and expertise, it is equally clear that insights from energy economics would prove valuable in helping policy-makers (and others) think about climate policy. The stakes here are very high, and even if environmental objectives were to be considered pre-determined, the costs of achieving such objectives would vary across policy approaches and instruments. From that perspective, one useful contribution of energy economics could well be to help focus attention on the potential benefits associated with post-Kyoto international agreements and national (and sub-national) policy designs that favor lower-cost approaches to achieving given climate policy objectives.

Of course, those are my own personal views, and are in no way meant to be associated with the IAEE as a whole, or other individual members. With that in mind, here's an equally personal forecast: these issues will be with us for many years to come – as will the scope for IAEE members to contribute usefully to an enhanced ability to think about and to deal with them. We will also no doubt continue to debate these and related issues, both formally and informally, at IAEE-sponsored conferences. I hope to see you there!

*Andre Plourde*



## CONTENTS

- 1 President's Message
- 4 The Multifaceted Institutional Landscape and Processes of International Renewable Energy Policy
- 10 Oil, Power and Trade
- 14 Summaries from Selected Plenary Sessions at the New Zealand International Conference
- 21 Oil and the Future of Nigeria: Perspectives on Challenges and Strategic Actions for Sustainable Economic Growth and Development
- 27 Geopolitical Constraints of the Italian Security of Energy Supply
- 29 Stabilization of Greenhouse Gas Emissions: Do We Live in the Age of Miracles?
- 39 Calendar

## Editor's Note

**F**aster deployment of renewable energy is considered a significant element for climate change mitigation, energy security, and economic development. A complex global policy landscape has evolved with manifold initiatives promoting policies and implementing action. Paul Suding and Philippe Lempp of the renewable energy policy network REN21 give an overview.

**Vito Stagliano** writes that oil has become dangerously politicized. It would be prudent to devise a trading structure less susceptible to government intervention, one built on a foundation cleared of OPEC and parastatal legacies. An WTO-negotiated free trade agreement would de-politicized commerce in oil and foster better international relations.

**Wumi Iledare** writes that Nigeria has no reason to allow its economy to be decimated simply because it is endowed with petroleum resources. Four key strategic and tactical actions are proffered in this paper to facilitate sustainable economic growth and development in Nigeria using its petroleum wealth.

**Andrea Qualiano** writes that due to the significant dependence from hydrocarbons' imports, the Italian energy sector is trying to tackle the geopolitical constraints that may endanger the security of energy supply by trying to convert this dependence into interdependence and by diversifying supplying-countries.

**Rögnvaldur Hannesson** note that the economics of global warming has risen to the top of the agenda after the Stern Report was published. One neglected aspect is how the energy needs of developing countries can be accommodated while CO<sub>2</sub> emissions are cut. These requirements are unlikely to be satisfied except by further increasing the use of fossil energy. Unless something near miraculous happens with carbon sequestration or substitution for fossil fuels, growth out of poverty is unlikely to be reconciled with stabilizing CO<sub>2</sub> emissions.

## IAEE/ASSA Call for Papers

10<sup>th</sup> Annual Energy Economics Meeting

January 4-6, 2008 \* New Orleans, Louisiana "Laissez Le Bon Temp Roulez"

### ***"Hot Topics in Energy Modeling"***

If you are interested in presenting please send electronically an abstract of 200-400 words and a short bio to the program chair Carol Dahl at the Colorado School of Mines (cdahl@mines.edu) by May 25, 2007. Decisions on papers presented and discussants will be made by July 1. The program including abstracts will be posted at [iaee@iaee.org](mailto:iaee@iaee.org) by September 1, 2007. The session will be published in an online IAEE/ASSA Papers and Proceedings.

Alternatively, if you are interested in being a discussant please send a short bio and a list of research areas you would feel qualified to discuss. Discussants and at least one member of each paper must be a member of IAEE to be included in the session.

### IAEE MISSION STATEMENT

The International Association for Energy Economics is an independent, non-profit, global organisation for business, government, academic and other professionals concerned with energy and related issues in the international community. We advance the understanding and application of economics across all aspects of energy and foster communication amongst energy concerned professionals.

We facilitate:

- Worldwide information flow and exchange of ideas on energy issues
- High quality research
- Development and education of students and energy professionals

We accomplish this through:

- Providing leading edge publications and electronic media
- Organizing international and regional conferences
- Building networks of energy concerned professionals



Italian Association of  
Energy Economists  
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Are pleased to invite you in Florence (Italy) on June 10-13, 2007 to

## 9th IAEE European Energy Conference **Energy Markets and Sustainability in a Larger Europe**

The Conference will debate energy markets evolution in a larger Europe; security of supply and the role of gas; efficiency and renewable energy for a cleaner environment; new technology for a sustainable future.

With four special plenary sessions, forty concurrent sessions and the participation of very distinguished, important speakers coming from institutions, universities and large energy companies, the conference will discuss a whole range of up-to-date energy issues in one of the most beautiful and artistic city in the world.



### VENUE

Situated in the fascinating and wild Tuscany, Florence is one of the most important art cities in the world, the Renaissance birthplace, famous for its museums, art collections and monuments. UNESCO estimates that 60% of the world's most important artworks are in Italy, with over half of them located in Florence.

The Conference venue is Grand Hotel Baglioni located in the very centre of Florence 5 minutes walk from the Central Station and the other hotels reserved for the Conference.

### SCHEDULE

The Conference will begin on Sunday June 10 with a Welcome Cocktail for participants in Hotel Baglioni followed on June 11 by an opening session and two Plenary Sessions. June 12 will have 2 Plenary sessions and many Concurrent sessions and June 13 is dedicated to the Concurrent session and the Closing Session.



### SOCIAL EVENTS

A private guided visit will be offered to all participants and guests on June 11<sup>th</sup> to the Palatin Gallery in the Pitti Palace, the origins of which go back to 1448, followed by the Gala dinner at 20.30. All the participants are also invited to join AIEE's Awards on Tuesday 12<sup>th</sup> in Palazzo Vecchio, the town hall of Florence, a Tuscan Gothic fortress-palace overlooking the Piazza della Signoria. A cocktail will follow in the Michelozzo courtyard.

### ORGANIZATION TERMS AND REGISTRATION

The Conference is jointly organized by **IAEE** and **AIEE** which provides all organization details and collection of payments. For detailed information please visit the Conference website

[www.iaeeu2007.it](http://www.iaeeu2007.it)

or contact the Conference Secretariat at [assaiee@aiee.it](mailto:assaiee@aiee.it), [info@iaeeu2007.it](mailto:info@iaeeu2007.it)

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# The Multifaceted Institutional Landscape and Processes of International Renewable Energy Policy

*Paul H. Suding and Philippe Lempp\**

There seems to be a proliferation of international partnerships and initiatives dealing with sustainable energy development. Even an informed observer is in danger of losing track over abbreviations like AP6, AREED, GBEP, GVEP, IAP, JREC, MEDREP, NEET, PCIA, REEEP, REN21 – to name only some of those which deal with renewable energy.<sup>1</sup>

In this article, we try to systematise the partnerships and initiatives in the context of the international energy policy process in order to make them visible as parts of an emerging arrangement in which the different initiatives take on specific roles. We shed light on the origins of the initiatives and their rationale. Finally, we make a first attempt to assess the opportunities and impacts, but also consider costs and risks of this system compared to other types of arrangements or regimes, such as the Kyoto Protocol.

## Rationale for the Renewable Energy Policy Action

The rationale for renewable energy being on the agenda of international policy processes lies in the discrepancy between its global benefits and its continued under-exploitation in many countries. As a newcomer in the energy sector, renewable energy (RE) needs considerable national policy support to assure market entry at equitable conditions, i.e., to create a level playing field. Furthermore, to fully unfold the external benefits of renewables, policy support is also needed to actively step up deployment through quota or preferential tariffs, to establish standards, and to promote R&D.<sup>2</sup>

International policy processes like UN CSD or G8, and in particular world summits like WSSD held in Johannesburg in 2002, constitute opportunities to influence national policies. They are the arenas to engage countries and other stakeholders to work towards common goals, and may even produce mutual or multilateral commitments which translate into national policies favouring renewable energies.

## A Renewable Energy Policy Jungle?

The international institutional arrangement for RE has become ever more complex during the last five years.<sup>3</sup> What we see today may look like a political thicket with increasingly interwoven relations between the numerous organisations active in the energy, environment, and development sector. These organisations include stakeholders from the public sector (different levels of government, UN organisations and other international organisations), the business sector (individual companies as well as associations and federations at regional/national/international level, dealing with manufacture, energy production and distribution, finance, insurance, etc.), and civil society (local/national/international NGOs of many different kinds)<sup>4</sup>.

For the purpose of this article, we shall describe as “initiatives” the various interactive relationships that have been created among these organisations.<sup>5</sup> Among the initiatives, the observer may distinguish:

- 1 Partnerships
- 2 Networks
- 3 Organised exchange of experience and plans
- 4 Voluntary public commitments
- 5 Conference series
- 6 Review arrangement

We delineate these initiatives from the international federations of business associations and international professional societies, which are numerous in the various fields of renewable energy technologies, as well as from clubs of ‘like-minded’ personalities or politicians. Organisations like the European Renewable Energy Council (EREC), the International Society for Solar Energy (ISES) or the World Renewable Energy Council (WCRE) have international policy perspectives. They are, however, more conventional and homogenous in their composition and constituency.

In addition, there exist renewable energy units and working groups within international energy, environment and development sector organisations, for example in the International Energy Agency (IEA). The German Government is currently consulting with counterparts about the options of creating an International Renewable Energy Agency (IRENA).

\* Paul H. Suding is head of the Secretariat of the Renewable Energy Policy Network for the 21st Century. Philippe Lempp is also with the Secretariat. See footnotes at end of text.



Finally, there are a multitude of bilateral or multilateral agreements or treaties on energy, in which RE are included<sup>6</sup>.

### Look into the Jungle Book!

1. In partnerships, partners pool their skills and other resources to achieve their shared goals. As resources and liabilities must be shared, partnerships involve some formal structure or a shorter-term legal agreement to which their members must subscribe.

In GVEP, PCIA, and REEEP the partners' skills are combined with financial resources to advance projects for renewable energy deployment, energy efficiency and village energy development. MEDREP aims to provide sustainable energy services particularly to rural populations by tailoring financial instruments for RE projects, strengthening policy frameworks, reducing barriers, and building stronger private sector infrastructure.

JREC was concluded in direct response to the Johannesburg WSSD, after it had become clear that global RE targets were not to be attained. The Small Island Development States (SIDS) and European countries<sup>7</sup> founded the so-called 'coalition of like minded

countries' to set more ambitious goals for themselves. This later became the JREC coalition, which many other developing countries joined. Today, membership is close to 100 countries.

In GBEP, different countries and international organisations collaborate to advance specifically the development of bioenergy in a sustainable way.

The "Implementing Agreement" programmes of IEA, some of which are on renewable energy, can also qualify as partnerships. Through the NEET initiative on technology and R&D cooperation, the IEA is linking up with the international business community, policy makers, researchers and other stakeholders in major developing countries (the so-called "Plus-Five" countries).

Renewable energy is also one of the subjects of the AP6 partnership, which brings together Australia, India, Japan, China, South Korea, and the United States to cooperate more closely on technology transfer and development to combat climate change.

2. Networks are interrelated and generally non-hierarchical groups of independent organisations who gather around a specific issue or need, on which they share the same vision, and towards which they work collaboratively. They have a light-weight structure (or no formal structure at all). There are innumerable networks in the world. On a global level, REN21 has been created to link RE policy activities and initiatives worldwide on a high level. It brings together participants from all stakeholder groups to advance effective RE policy and provide international leadership in a flexible way. Its small secretariat is hosted by UNEP and supported by IEA.

ISPRES might also be considered a network. This panel consists of key RE scientists who work to improve renewable energy R&D strategies and policies worldwide. The effort links the science and

### BOX 1: List and Abbreviations of Organisations and Initiatives

#### Organisations

UN CSD - UN Commission on Sustainable Development [www.un.org/esa/sustdev/csd.htm](http://www.un.org/esa/sustdev/csd.htm)

UN DESA - United Nations Department on Economic and Social Affairs - [www.un.org/esa/desa](http://www.un.org/esa/desa)

UNEP - United Nations Environment Programme - [www.unep.org](http://www.unep.org)

IEA - International Energy Agency - [www.iea.org](http://www.iea.org)

#### Partnerships

AP6 - Asia-Pacific Partnership on Clean Development & Climate [www.asiapacificpartnership.org](http://www.asiapacificpartnership.org)

GBEP - Global Bioenergy Partnership - [www.globalbioenergy.org](http://www.globalbioenergy.org)

GVEP - Global Village Energy Project - [www.gvep.org](http://www.gvep.org)

JREC - Johannesburg Renewable Energy Coalition - <http://ec.europa.eu/environment/jrec>

MEDREP - Mediterranean Renewable Energy Programme - [www.medrep.info](http://www.medrep.info)

IEA/NEET - IEA's Implementing Agreements/Networks of Expertise in Energy Technology - [www.iea.org/neet](http://www.iea.org/neet) (see "IEA")

PCIA - Partnership for Clean Indoor Air - [www.pciaonline.org](http://www.pciaonline.org)

REEEP - Renewable Energy and Energy Efficiency Partnership - [www.rceep.org](http://www.rceep.org)

#### Networks

GNESD - Global Network on Energy for Sustainable Development - [www.gnesd.org](http://www.gnesd.org)

ISPRES - International Science Panel on Renewable Energies - <http://www.ispres.org>

REN21 - Renewable Energy Policy Network for the 21st Century - [www.ren21.net](http://www.ren21.net)

#### Organised Information Exchange

CSD Matrix <http://www.un.org/esa/sustdev/csd/matrix.htm>

#### Voluntary Public Commitment Programmes

IAP - International Action Programme of *renewables* 2004 - [www.ren21.net/iap](http://www.ren21.net/iap)

#### Conferences

BIREC - Beijing International Renewable Energy Conference - [www.birec2005.cn](http://www.birec2005.cn)

Renewables 2004 - International Conference for Renewable Energies - [www.renewables2004.de](http://www.renewables2004.de)

WIREC2008 - Washington International Renewable Energy Conference - (*planned*)

WSSD - World Summit on Sustainable Development (UN Millennium Summit)

JPoI - Johannesburg Plan of Implementation - (*see "WSSD"*)

#### Associations, Clubs, others

EREC - European Renewable Energy Council: [www.ercc-renewables.org](http://www.ercc-renewables.org)

IRENA - International Renewable Energy Agency (*discussed*)

ISES - Society for Solar Energy - [www.ises.org](http://www.ises.org)

WCRE - World Council for Renewable Energy - [www.wcre.org](http://www.wcre.org)

G8 - Group of Eight Industrialised Countries

engineering community with the RE policy community.

GNESD is a knowledge network of research centers in different countries all over the world, and partner organisations, the main one of which is UNEP. It provides analyses in the field of energy and sustainable development, by strengthening collaboration between its members in southern and northern countries.

3. An example of an organised information exchange is the so-called matrix, compiled at the UN CSD Secretariat. This is an openly accessible compilation of case studies provided by participating countries and organisations in CSD, on successful measures and projects in RE, among others. It was created for the CSD-14/15 cycle in 2006/07, during which energy is one of four focus areas. The matrix constitutes an action-orientated information base on lessons learnt of past projects in the four focus areas.

Like with past activities, mutual exchange on planned future activities is another useful information instrument. A compilation of plans and programmes of stakeholders with respect to renewables gives all interested parties a clearer vision of what can be expected from the different actors from public, private and third sector. This reduces insecurity and thus risks, and may encourage others actors to replicate success stories. A simple compilation can be further matured into a proper international programme if coordinated in time and content. Some countries are suggesting that UN CSD should organise such a compilation of ex-ante information, building on existing compilations like the International Action Programme (see below).

4. The International Action Programme (IAP) of the Bonn renewables 2004 Conference is more than a simple compilation of future actions, as it has an element of commitment and is, therefore, an example for a programme of voluntary non-binding commitments.

Already in Johannesburg, some voluntary pledges had been made for sustainable energy development, like the commitment by the German Government to create a fund of 1 million Euro for RE and EE.

This voluntary commitment approach was extended and systematised at the occasion of renewables 2004 Conference in what became the IAP. Participants in the conference were invited to hand in commitments for concrete measures or activities ("Actions") which they would carry out after the conference. Some 200 Actions were compiled in the programme. The content of the IAP was analysed to evaluate the impact. This analysis showed that the programme will contribute significantly to CO<sub>2</sub> reduction, investment and employment. Two years later, a follow-up by REN21 demonstrated that 79% of the Actions were implemented<sup>8</sup>.

Such voluntary commitment are open arrangements, but need a convener and host, as well as someone to register the Actions and monitor progress documented through implementing reports. Voluntary commitments recommend themselves as tangible outcomes of conferences.

5. Conferences are initiatives in form of an event, or - if a sequence is established - in form of series. A good example is the "IREC" series of conferences which have taken place since WSSD.

In Johannesburg, Germany took the initiative to invite the countries and all stakeholders to the International Renewable Energy Conference in Bonn in June 2004 ("renewables 2004")<sup>9</sup>. This conference was an overwhelming success in several respects. By its sheer size and participation, it demonstrated the significance of renewable energy, and helped renewable energy to be considered as a major option in the future global development. It filled with confidence the participating stakeholders, as so many – and important – participants demonstrated significant commitment to renewables: along with several European countries the commitments of China and international financial institutions, like the World Bank, were clearly visible.

The success of the Bonn conference led the Chinese government to invite to the Beijing International Renewable Energy Conference (BIREC) in November 2005. BIREC highlighted the significance of renewable energy in another high level setting.

With the announcement of a possible third conference to be held Washington (WIREC 2008), to be supported internationally by the stakeholders convened in REN21, a series is emerging regarding high-level and highly visible RE conferences. If Bonn renewables 2004 placed RE into the mainstream of energy development, WIREC 2008 may be the moment that marks the maturity of renewable energy technologies to become the major option for future energy.

6. Finally, review arrangements may be considered initiatives in their own right, where they are not directly foreseen in the plan of implementation or other conclusions, outcomes, or declarations of international processes. In the case of the JPoI<sup>10</sup>, a review is foreseen. In the case of the IAP, a follow-

up was already carried out. The UN CSD, too, contains a “built-in” review arrangement, as the first year of each cycle is dedicated to review (followed by the policy implementation cycle). However, an effective global RE review is missing, if we do not consider as such an arrangement REN21’s annual Renewables Global Status Report<sup>11</sup>, which provides an authoritative review based on the most relevant information sources, such as the IEA.<sup>12</sup> Some JREC member countries are pressing for an effective RE review arrangement to be linked to the UN CSD cycle, which should take into account and extend the existing efforts.

### **Fertile Ground for Initiatives: a Thorny Negotiation Process on the General Level**

What are the origins of these initiatives and why are they thriving? The Johannesburg 2002 World Summit WSSD which took place ten years after the famous Rio 1992 ‘Earth Summit’<sup>13</sup> may be considered the ‘mother’ of many new partnerships and initiatives. Many participating countries and organisations considered WSSD as the great opportunity to achieve concrete quantified commitments for renewable energy (e.g., in the form of long-term targets) to which governments could be held accountable – similar to the CO<sub>2</sub> reduction targets of the Kyoto Protocol. During the summit it became clear that these ambitious and concrete results were not going to be achieved on a generalised level within the UN community.

The likelihood that the main outcome, i.e., JPoI, was going to formulate rather vague objectives with respect to renewable energy had been anticipated already in the run-up to the summit. This led to the formation of partnerships before and in the course of the negotiations during WSSD as alternatives to the failed attempt to reach a strong general outcome. These partnerships were called “Type-II initiatives”, to distinguish them from the general negotiated outcome.

The emerging architecture with respect to RE is part of a similar development in many other fields where the UN system is not able to deal with issues comprehensively. The creation of dynamic initiatives is a reaction to the inherent difficulties of the UN system and dissatisfaction of some Governments and other stakeholders with the role the UN system is able to play.<sup>14</sup>

Apart from UN summits and commissions, another important generator of initiatives is the G8. A G8 Renewable Energy Task Force was set up in 2000, which produced a report with recommendations in 2001<sup>15</sup>. This task force ceased to exist when it became clear that important G8 members did not back it at that point in time. More recently, existing initiatives like REN21 and REEEP were endorsed by the G8, and new initiatives related to renewable energy were adopted in the Gleneagles Plan of Action of the 2005 summit<sup>16</sup>, some more narrowly related to specific renewable energy issues such as biofuels (GBEP), some more broadly defined on clean energy technology collaboration with the G8plus5 countries, which was to become NEET.

### **The Emerging Architecture of a Core Agreement and Complementary Initiatives**

Looking at the antecedents of initiatives, it is obvious that there is a relationship to negotiated outcomes of UN- and other multilateral conferences. With respect to RE development, the partnerships, conferences and voluntary commitments have been created partly to compensate the lack of concreteness and impulse from the WSSD. CSD makes a virtue of necessity and welcomes input from the partnerships to its negotiations, especially by listing them and offering partnership fairs.

Since Johannesburg, the dichotomy of a comprehensive but general committing outcome (the JPoI) and partial issue-specific initiatives (Type II Partnerships) began to exist. The negotiated outcome can be considered as core and lowest common denominator, while everything else is considered as complement to bring more concrete results that would not be achievable in the plenary assembly. Over time, this dichotomy seems to have evolved into a recognised system, with some countries like the U.S. making extensive use of the partnership approach. The U.S. Government has structured a general concept<sup>17</sup> using the various initiatives, called “featured solutions”, in which experience with solutions are suggested to be scaled up in a “next step”.

In the following graph, the negotiated binding outcome is depicted as centrepiece, with the initiatives surrounding it as complements. It shows how - around a general negotiated outcome – an arrangement of a variety of RE initiatives has emerged (i.e., partnerships, networks, conference series, information exchange and voluntary commitment programs). While the flexible character and dynamism of these diverse initiatives clearly brings advantages, it is recognised that they should not ‘float around’ completely detached from one another or the formal international policy process.

REN21 is placed in the middle of the initiatives, as it has been established to connect the manifold

initiatives and organisations to channel their work vis-à-vis the policy level (“Network of Networks”). It has links with the project and technology oriented partnerships, the G8 process, and of course with the “IREC” conference series (with the Bonn conference marking the starting point also for REN21).

### What Can Initiatives Deliver?

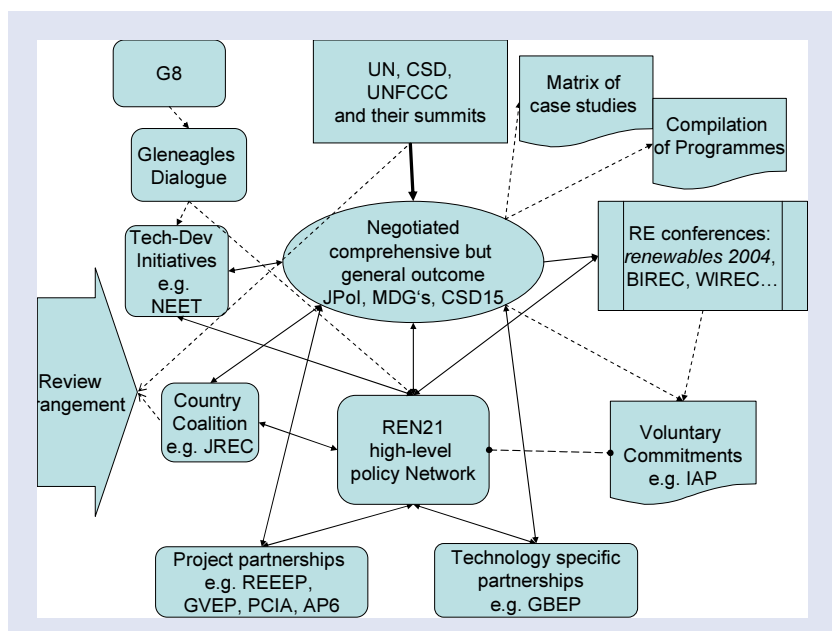
To characterise the general negotiated outcome and the complementing initiatives, the antonyms general – partial/specific, global – regional, binding – non binding, compulsory – voluntary, formal – informal, vague – concrete, and others are useful.

The negotiated outcomes of global processes are formal, general and binding by definition, with a high

degree of legitimacy. They tend to, however, be generic and often vague. If concrete results are strived for, the negotiations become time consuming and may end in failure.

In view of a probable stalemate on ambitious binding goals (e.g., when a worldwide RE target is sought by part of the assembly but rejected by the other), it seems to be an effective way forward to agree on what the common denominator in the general outcome is and leave specific, more ambitious commitments to initiatives. Typically in initiatives, either the all-embracing condition is given up and only willing partners form coalitions, or the formally binding character is given up and partners are invited to join voluntary efforts.

Partial (regional or sector-specific) arrangements may permit ambitious and even binding agreements. The recent agreement by the EU Heads of State and Government



– to reach a 20% renewables target by 2020 – is a strong case in point.

Though legally non-binding, voluntary commitment programmes may ultimately become quite compromising - in particular if accountability is publicly demonstrated, as is the case with the IAP and its follow-up.

When the element of commitment is taken away, what remains is an information tool. That is about as much as the CSD-15 seems to be able to achieve.

### A Raison d'être for Initiatives

The multifaceted landscape of initiatives as a complement of a general, i.e., not specified and negotiated outcome is the result of years of trying, even pulling towards different directions by a multitude of stakeholders. In these circumstances, a framework of general agreements complemented by more ambitious but less formal initiatives is often the best achievable overall outcome-provided all partners in the initiatives work in good faith and with real commitment.

For the maximalist position, which considers global renewable energy deployment targets as necessary, this landscape is not satisfactory at all. However, even a strong proponent of renewable energy must concede, that the initiatives have considerable virtue.

The initiatives keep the dialogue going and offer numerous opportunities for discussion between players. They open opportunities for joint activities – which may include the ‘generally unwilling’ at least in areas where they have ambitions and interest. In any case, they will bring together the willing to go further than the formal process would allow. Also, the initiatives have numerous technical advantages in comparison to a general agreement, such as low transaction cost and others.<sup>18</sup>

Those stakeholders who do not want to see global commitments, can maintain their position without bringing down every attempt of multilateral agreements - and may even find advantages in participating in some of the initiatives.

Critics may claim that the creation of ever more initiatives absorbs energy which should rather be concentrated on the principle objectives. Staging ever more meetings – without reducing the size and



number of the meetings in the main process – may hold up the whole process from advancing, as it keeps the stakeholders busy – maybe trapped – in endless discussions and in myriads of ‘talking shops’.

For progress in the matter, this is a real danger. Initiatives may become cumbersome themselves, occupied with their own administration, and slowly fade before reaching substantial outcomes. If no progress is achieved, or if even the initiatives are joined by some partners in order to slow down advancement or to frustrate partial agreements on urgent and important matters like sustainability of bioenergy, then the purpose of the whole architecture of initiatives is inverted. Initiatives must guard themselves from suffering under the same blocking power of unwilling partners that formal negotiations do. Their institutional architecture must be capable to uphold a flexible membership base that is joined in their ambition to move forward.

This said, it should also be noted that initiatives may actually help bring value back to formal policy processes – ultimately making even strong binding commitments more likely. The architecture should strengthen rather than erode the legitimate UN system.

## Footnotes

1. See list of abbreviations in Box 1
2. For an overview of rationale and policies for renewable energy see <http://www.ren21.net/REPolicies/default.asp>
3. For a general overview see Achim Steiner et al.: International Institutional Arrangements in Support of Renewable Energy, in: Dirk Assmann et al (Ed.): Renewable Energy, A Global Review of Technologies, Policies and Markets, London, Sterling VA, 2006 , pp152
4. For examples, see Box 1
5. See Box 1
6. A compilation of international treaties is prepared by the Energy and Environmental Security Initiative at Colorado School of Law, [http://www.colorado.edu/law/eesi/isea\\_profile.pdf](http://www.colorado.edu/law/eesi/isea_profile.pdf)
7. The determination of the EU countries to work with targets can be observed in the recent decision 20% to 2020.
8. For complete information on the IAP and follow up see and <http://www.ren21.net/iap>
9. <http://www.renewables2004.de>
10. See Box 1
11. See for report downloads <http://www.ren21.net/globalstatusreport>
12. See IEA Renewable Energy Market and Policy Trends in IEA Countries, OECD/IEA 2004; Renewables in Global Energy Supply, An IEA Factsheet, OECD September 2006.
13. For an overview of the international renewable energy policy process see <http://www.ren21.net/PolicyProcess/default.asp>
14. Fukuyama discusses such architecture in general terms in Rethinking Institutions for World Order, see Francis Fukuyama, After the Neocons, America at the Crossroads, Profile Books, London 2006,
15. Find the report under <http://www.g8italia.it/UserFiles/347.pdf>
16. See [http://www.fco.gov.uk/Files/kfile/PostG8\\_Gleneagles\\_CCChangePlanofAction.pdf](http://www.fco.gov.uk/Files/kfile/PostG8_Gleneagles_CCChangePlanofAction.pdf)
17. See <http://www.sdp.gov>
18. REN21 Secretariat: Recommendations for International Commitment Schemes (website): <http://www.ren21.net/iap/lessons-learn/Recommendations.asp>

## Oil, Power and Trade

By Vito Stagliano\*

The geopolitical dimensions of reliance on oil cannot be effectively managed, either by the U.S. or the rest of the world. It would be consequently prudent to devise a trading structure for oil that would be less susceptible to the intervention of governments in the marketplace. Such a structure should be built on a foundation that will have been cleared of present legacies, including, most importantly, of the political intercourse between the House of Saud and occupants of the White House. The world of oil is badly served by the Washington-Riyadh axis, which also enables OPEC<sup>1</sup> and the parastatals<sup>2</sup> that mimic its market-manipulative behavior. A WTO<sup>3</sup>-sponsored free trade round of negotiations to fully commoditize oil would usher in an era of de-politicized commerce for one the world's essential commodities, and foster better international relations among producer and consuming nations.

Anecdotes abound of the perverse U.S.-Saudi ties. The one that follows illustrates how blithely one misunderstands the other and how close to the surface is mutual resentment. In the waning days of the Administration of George H.W. Bush, a desultory effort was organized to expand the U.S. Strategic Petroleum (SPR) reserve by seeking to "lease," from the Saudi Arabian government, 100 million barrels of oil, at below market prices, for storage in SPR caverns. The effort was desultory because the initiative was pursued at sub-ministerial level, when it was clear to everyone involved that a deal could be struck only by direct communications between the President and the King. The President, however, would not ask the King.

The proposal, which would have been profitable to the Saudis only if the "leased" oil were to be released into a disrupted market at the higher price engendered by a major supply disruption, was presented by a U.S. delegation<sup>4</sup> to Saudi Oil Minister Hisham Nazer in July 1991 and billed, *inter alia*, as a means to "further strengthen security and economic relations"<sup>5</sup> between the two countries. Nazer responded within twenty-four hours, dismissing the proposal as incompatible with Saudi policy and interests, a perfectly understandable position. But Nazer went further, seizing the occasion to complain about the financial burden that had been placed on the Saudis by the U.S. to partially offset the cost of the 1991 Gulf War;<sup>6</sup> a war in which the very existence of the Saudi Kingdom could have been at stake.

The "special relationship" between the U.S. and the House of Saud has been described by Taylor as "a self serving fiction that has governed American foreign policy for too long,"<sup>7</sup> even as it remains the frame of reference for U.S. oil policy, oil dependence, and, lately, for the "oil addiction" diagnosed by President George W. Bush in his 2006 State of the Union Address. It is worth noting that the American obsession with Saudi Arabia (oil and terror) has no equal in Europe, whose pathology is governed by Russia and its gas. The geopolitics of energy may well be in the eye, or at least in the perspective of the beholder, shaping perceptions rather than the substance of state-to-state, or, as is more frequently the case, statesman-to-statesman relations. The U.S.-Saudi partnership of convenience, underlying the insecurity of U.S. reliance on oil, especially Arab oil, has provided great political fodder to Democrats as well as Republicans<sup>8</sup>. Alternating perceptions of cooperation and conflict have fueled political posturing by Saudis and Americans, nearly eclipsing the mundane reality that each nation simply looks after its self interest.

U.S. oil policy operates on a sine wave, the upward curve conjunctive with the typically emotive, fluctuating price of gasoline. Oil policy is dormant at the State Department, the National Security Council and even at the Department of Energy, when markets are stable. The Federal policy-making apparatus awakens only when fresh turmoil in the Middle East combines with any accidental disruption of the supply chain, or with a unexpected increase in global oil demand, to unsettle traders in the world's most traded commodity. Conditions for emotional debate (and predictable White House response<sup>9</sup>) were especially favorable in 2006, when oil prices surged to unprecedented levels in less than six months. The resulting price "shock" was almost universally attributed to voracious demand in China and India. Lost in the clamor of an election year were data showing that the United States itself had been (literally) driving oil demand growth since 2002, followed by China. India's growth in demand was entirely marginal to the problem.<sup>10</sup> The prevailing wisdom of 2006 provided a nearly perfect symmetry of national prejudice: craven oil producers (American and Arab) responding to energy-hungry, amoral China at the expense of western consumers.

Governments give oil a bad name. Although oil is traded in a highly complex global market valued at over \$2.5 trillion per year, it is not *freely* traded to the extent that marginal supply is manipulated by the OPEC cartel and by

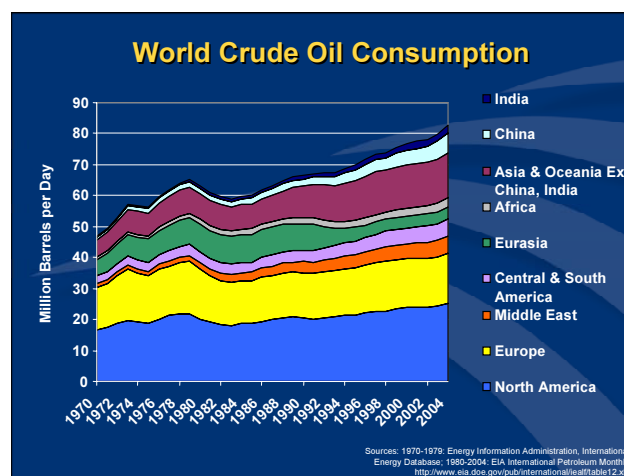
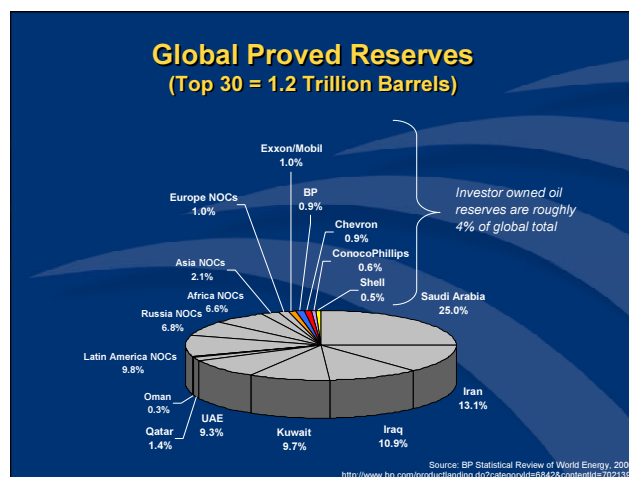
\* Vito Stagliano is a Former Deputy Assistant Secretary of Energy for Policy and author of "A Policy of Discontent: The Making of a National Energy Strategy." See footnotes at end of text.

newly aggressive national oil companies (NOCs). Market-subverting governments, numerous even beyond the members of OPEC, chronically intervene in supply and demand decisions. Over one hundred countries produce oil and over eighty export it. But, seventy-five percent of proved oil reserves, and related production, is under the control of less than two dozen NOCs. The NOCs' participation in the marketplace is seldom entirely transparent; they may act on strictly commercial terms, or they may not; they may deal bilaterally on market or on invisible terms; they may barter, also for arms.<sup>11</sup> The non commercial dimensions of the global trade in oil, including OPEC decisions, are among the contributing factors of the energy security problem.

The debate on the geopolitical dimensions of oil has always presumed that diplomacy and political action can somehow address those consequences of reliance on oil that are not internalized by markets. History would seem to indicate, however, that diplomacy aimed at changing the course of energy policy has a spotty record at best. It is true that diplomacy and Henry Kissinger created the International Energy Agency in the wake of the first energy crisis (of 1973), seeking policy cohesion and Western solidarity against the challenge of THE 1973 presumptuous but effective Arab oil embargo. But it is difficult to imagine how diplomacy might today affect the forces at work in the oil sector. Diplomacy is unlikely to influence the production decisions of the majority of oil suppliers, beginning with the Saudis and including most OPEC members and other NOC producers. European and American diplomacy has failed to dissuade Russia, Venezuela and Bolivia from re-nationalizing their energy sectors, having proved ineffective in safeguarding private investment and Western economic interests. On the political front, the G-8<sup>12</sup> can claim little if any success in preserving even the appearance of international commercial law in the face of Russia's provocative curtailment of gas supplies to Ukraine and oil supplies to Belarus. Diplomacy may well be highly over-rated as an instrument of oil policy.<sup>13</sup>

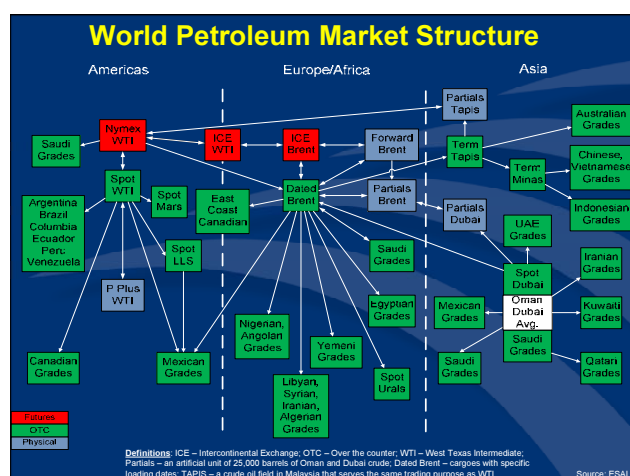
There are many reasons for the inherent limitations of oil diplomacy, the principal one being that Western governments have proved ineffective in instituting domestic oil policies that would provide effective leverage on the geopolitical front. Only marginal success can be claimed by the U.S. and Europe to changing or redirecting consumer and market behavior with regard to the use of oil. U.S. and European oil consumption has increased annually, almost irrevocably for the last two decades, notwithstanding numerous fiscal, regulatory and exhortatory interventions to moderate or reverse the demand trajectory. U.S. and global oil consumption patterns were reversed only once in the last thirty years, between 1980 and 1985<sup>14</sup>, and only as a result of radical measures, responding to the 1979 energy crisis, which in the U.S. included the statutory banning of oil use in non essential sectors of the economy and the imposition of aggressive automotive fuel economy standards.<sup>15</sup> Oil conservation and oil substitution has been much debated on both sides of the Atlantic, but as a practical matter oil continues to dominate the markets for liquid fuels, to the near total exclusion of alternatives, except for ethanol, which in the U.S. has become a legislatively mandated blending agent for gasoline. It is worth noting as a post script to this history that the temporary decline of oil demand in the United States coincided with the final de-control of oil prices in 1981 and the subsequent launch of the NYMEX oil futures market.<sup>16</sup>

Geopolitical policy can, of course, equate to diplomacy by other means. Morse and Richard have estimated that the Saudis earn about \$1.00 per barrel less on oil sales to the U.S. than they do on sales to Europe, translating into a "subsidy" to U.S. consumers of \$620 million per year (in 2002), in return for which, the U.S. deploys military force in the Persian Gulf to protect the House of Saud.<sup>17</sup> Is it possible to conclude that the interests of the United States in the Persian Gulf are essentially bound to Saudi oil? Does the U.S. military have responsibility for the protection of the shipping lanes on which the world's oil travels, or is this a self imposed obligation that masks other purposes?



Do the oil lanes need protection at all, and if so by whom? Should the Saudis, Kuwaitis and Iranians, who are reliant on oil sales for their very fiscal survival, protect their own oil shipping lanes? Should the Europeans and Chinese and Japanese patrol the Strait of Hormuz to protect their supplies? Does the commerce in oil actually require the deployment of armies and navies, and, in the absence of the exercise of military power, would the global oil trade cease to exist?

If it is true, as many claim, that the U.S. government safeguards American interests in the Persian Gulf, however defined – oil dependence, protection of Israel, security umbrella for the Saudis, anti-terrorism, etc. – by force of arms and with Saudi complicity, one may wonder at the results. The U.S. today uses more oil than ever before at prices that are higher in real terms than in most of the last century. OPEC has greater influence on the oil market than it did at the time of the first energy crisis (1973). U.S. private investment in the Middle-East is less now than in history, confined to what may be considered a few token LNG projects. Iraqi oil production, one of the oft-stated reasons for the U.S. invasion, has failed to reach pre-occupation levels. No substantial success can be claimed in holding Iran accountable to the Security Council for its nuclear ambitions, which are fueled by oil revenues. And, although it remains by far the single most important consumer of oil in the world, and the largest importer, the U.S. has less direct control of the oil market than do most of the market's suppliers.



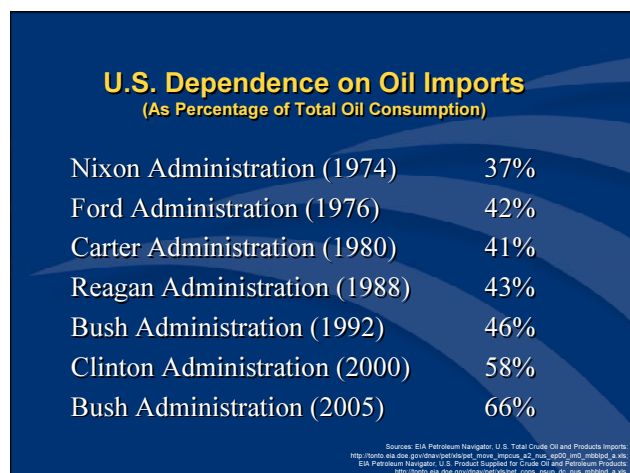
Given this record, it can reasonably be argued that the U.S. might do well to set aside its geopolitical oil strategy and, instead, concentrate its policy resources on trade, in pursuit of a free market for oil. Trade, under generally accepted and independently enforced rules, has been achieved for a vast array of goods and services produced and consumed worldwide. Producer and consumer cartels are rare, if they exist at all, outside the oil sector. With notable exceptions, governments continue to withdraw from most markets, other than through regulation, and private as well as public investments are driven by trade patterns that span the globe. Competitive markets have been good for consumers as well as producers, and standards of living have risen worldwide in conjunction with freedom to trade.

A competitive oil market, one characterized by government intervention that is limited to regulation of trading behavior and transactional transparency, would exert downward pressure on prices, direct investment towards market-driven ends (both in and out of the oil sector), reduce the need for expensive insurance policies such as strategic petroleum reserves<sup>18</sup>, mitigate the requirement to hold commercial stocks at levels above prudent economic inventories, reduce the price volatility engendered by non market decisions, and generally dissipate the inter-governmental tensions that have become the norm in international energy policy.

A free oil market, negotiated under WTO rules, would require the dissolution of OPEC, the last of the archaic “trusts” of the 20<sup>th</sup> century. OPEC operates on premises that are anathema - indeed illegal - to the very policy foundations of WTO, the OECD, the G-8, and, not least, the USTR.<sup>19</sup> A free market for oil

would produce immediate and tangible results on the energy security and the economic front, even among OPEC members whose sclerotic economies could be restructured, from exposure to competition, to join the world that is otherwise driven by private transactions among willing partners.

Oil policy is too important to be left to politicians. Governments can muster neither the discipline nor the economic efficiency of markets, and have proven incapable of making oil policy decisions that are in the best interest of consumers. Governments are the source and not the consequence of the energy security dilemma; their withdrawal from the marketplace would provide the condition precedent to rational use of oil. Free trade in oil would reduce conflict by reducing the financing of terror. It would moderate the boom and bust cycles to which the industry is hostage, produce revenue





streams rather than windfalls for governments that are prone to misuse the income from oil, and provide fiscal and foreign exchange relief to oil-dependent nations in the developing world.

Free-market oil, traded in the highly developed market structure illustrated above, would reduce structural inflation and global trade imbalances, deflect the potential for supply competition between East and West, and likely make infeasible barter arrangements that currently fuel arms exchanges in politically volatile regions of the world. The world, in sum, would be better served by a market for oil that is free of government meddling and consequently also free of its long-standing geopolitical perversions.

### Footnotes

1. The Organization of Petroleum Exporting Countries (OPEC) was established in September 1960, initially at the instigation of Venezuela and partly in response to the imposition of oil import controls by the Eisenhower Administration. The members of OPEC include Saudi Arabia, Venezuela, Nigeria, Libya, Kuwait, Indonesia, Algeria, Iran, Iraq, Qatar, United Arab Emirates, and Angola. Gabon and Ecuador were members but withdrew from OPEC in 1995 and 1993, respectively. Prospective OPEC members include: Norway (the only European nation so-inclined), Bolivia, Mexico, Syria and, possibly, Sudan.
2. State-owned companies that may or may not be independently managed.
3. The World Trade Organization (WTO) has 150 members, including all members of OPEC except for Algeria, Libya, Iran and Iraq.
4. The delegation was led by John Easton, then assistant secretary of energy for policy and international affairs, and included me, then associate undersecretary of energy.
5. Staglino, Vito: "A Policy of Discontent: The Making of a National Energy Strategy," PennWell, 2001.
6. Ibid: Nazer stated that the U.S. had "the most expensive army in the world."
7. In an introduction to Charles Ebinger's "The Critical Link," Henry Kissinger wrote that the energy crisis (of 1973) is not a mere problem of transitional adjustment; it is a grave challenge to the political and economic structure of the free world." And, in his speech of 1977, President Jimmy Carter stated that "our decisions about energy will test the character of the American people, and the ability of the President to govern this nation... This effort will be the moral equivalent of war."
8. As expected, President Bush ordered to federal Trade Commission to investigate price gouging by the oil companies. Numerous presidents from Nixon onward have reacted in a similar fashion to gasoline price increases. However, not once in three decades has the FTC found evidence of oil price collusion.
9. According to EIA data, U.S. imports rose by 2.2 million barrels/day between 2002 and 2005; China's rose by 1.8 million barrels/day and India's by 450,000 barrels/day in the same period.
10. National Commission on Energy Policy: "Collaborative Design and Development of Petroleum Sector Performance Indicators," January 2007.
11. Group of 8: U.S., France, Italy, the U.K., Germany, Japan, Spain, Russia.
12. The possible exception would be Henry Kissinger's negotiations to establish the International Energy Agency in the wake of the 1973 Arab oil embargo.
13. EIA data show world oil consumption in 1980 at ~64 million barrels/day, decreasing to ~58 million barrels per day by 1985. Growth in consumption resumed in 1986 and has remained on an upward trajectory since.
14. Among the Federal statutes that contributed to a restructuring of oil use in the U.S. were the CAFÉ law and the Powerplant and Industrial Fuel Use Act.
15. The final decontrol of the U.S. oil sector was accomplished by Executive Order, issued by President Ronald Reagan in January 1981.
16. Morse & Richard: "The Battle for Energy Dominance," Foreign Affairs, April 2002.
17. EIA and IEA data indicate that OECD government-controlled emergency oil stocks currently equal 1.5 billion barrels; commercial stocks held for strategic purposes are at 2.7 billion barrels.
18. OECD: Organization for Economic cooperation and Development. USTR: U.S. trade Representative.

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We look forward to your participation in these new initiatives.

## Summaries from Selected Plenary Sessions at the New Zealand International Conference

By P. Sharath Chandra Rao\*

### Energy Issues and Policy in Australia and New Zealand

David Smol, Deputy Secretary, NZ Ministry of Economic Development

Mr. Smol spoke about the energy policy of New Zealand and the security of electricity supply. Before 1984 the state was the dominant player in electricity management. Deregulation/Restructuring began post 1984 and since 1999 the shift has been sector specific regulation. He said that the greatest challenges for the security of electricity supply were:

- 1) Timely investment in generation and transmission
- 2) Managing dry-year risk which required a hydro-thermal coordination
- 3) Managing peak demand periods where one has to pay attention to total energy consumption and simultaneously focus on national and local transmission networks
- 4) Managing real time events viz. extreme weather

He emphasized that New Zealand's electricity system was isolated and stingier than other national grids that are tightly meshed with multiple routes to large loads (like USA & Canada). Hence, it had to only look at domestic options or decentralized system/s. He added that the climate change, economic transformation and the future of the energy sector are interlinked.

Thus under the existing business as usual case, energy demand is expected to grow and thermal fuels, especially oil, are likely to dominate the supply mix over the coming 25 years which will result in an increase of carbon emissions particularly in the transportation sector. To avoid this path he recommended developing a New Zealand Energy Strategy which needs to be built on a sustainable energy program that will encompass core energy sectors, integrate with fuel-related parts of national transport strategy, feed into assessment of relative R&D priorities, evolve international relationships and support wider government strategies e.g., economic transformation. In his concluding remarks he said that the NZ Ministry of Economic Development had already begun the process and was currently focusing on:

- 1) Maximizing the contribution of energy efficiency
- 2) Optimizing the contribution of renewable electricity
- 3) The role of LNG (or CNG) as a potential 'backstop' source of supply over the next twenty years.

### Jeanette Fitzsimons, Co-Leader, NZ Green Party

Ms. Fitzsimons echoed the widely held belief that to limit greenhouse gas emissions and move towards a sustainable energy future it is essential to have a price on carbon. She mentioned that the current policy debate in New Zealand had shifted emphasis somewhat from the question of whether there should be such a price, to how such a price might best be set, and how the social impacts of it might be addressed.

Ms. Fitzsimons has been advocating a price on carbon since the early 1990s, and has always believed that it is necessary, but not sufficient. She strongly believes that there are many energy efficient decisions that would achieve a positive return on investment now, but that don't proceed, and hence there are other factors at work. She questioned how many new homes have CFLs as standard lighting? How many domestic and commercial appliances are designed to minimize life-cycle costs (including energy), instead of just least cost manufacture?

She has found that in twenty years not much has changed with regards to the potential of the market to deliver energy efficiency. As a government spokesperson on energy efficiency and conservation, she has lead government programs on solar water heating and energy efficiency. She has been instrumental in addressing several obstacles towards the successful dissemination of the solar water heater program, namely:

- 1) Website for consumers explaining how to decide whether solar is suitable for their homes and what kind of system would suit them best
- 2) A manual and web based information for the building industry showing what solar can do and correcting the myths
- 3) A revised Australia/New Zealand quality standard, more stringent and better adapted to the country's climate zones

\* P. Sharath Chandra Rao is a PhD Candidate at the University of Delaware.

- 4) Franchising training courses across the polytechnique schools and subsidizing training fees for plumbers and non-plumber installers for the first six months

While she has been a strong advocate for efficient, environmental pricing, she feels that climate change cannot be solved by simply putting a price on carbon. She mentioned that there are huge potential costs and carbon savings to be had through renewables and energy efficiency, but they could not be realized by price mechanisms alone – or at least not fast enough to protect us from severe climate change and possibly rapid oil depletion. She concluded her presentation by stating that “One needs to set targets to give certainty to industry to start building capacity” and further, the government has to investigate the underlying barriers. Only by addressing the specific barriers will we (New Zealand government) be able to change behaviors and attitudes, not just prices.

***David Gargett, Transport Demand Analyst, Australian Bureau of Transport and Regional Economics (ABTRE)***

Mr. Gargett discussed the two major energy policy challenges facing Australia and New Zealand: energy security and greenhouse gas emissions. He mentioned that most of the standard economic/econometric models are not really up to the task of considering radical shifts in the transport systems, should they be required. As such it is instructive to consider what the differences might be between business-as-usual transport energy models and some of the transport energy scenarios research now underway at the Bureau i.e., ABTRE.

He recommended long term forecasting using structural models with base case and scenario analysis capabilities. He said that the trend in per capita car travel (kilometers per person) in Australia has in general been following a logistic (saturating) curve against real per capita income – measured by real Gross Domestic Product (GDP) per person.

His study at ABTRE found that: “As incomes per person increase, personal car travel per person also increases, but at a slowing rate over time”. In other words, more car travel is attractive as incomes rise, but there reaches a point where further increases in per capita income elicit no further demand for car travel per capita. However, traffic continues to respond in a one-to-one relationship to population growth.

He concluded his discussion by summarizing the effects of economic development and its associated technical change which are as follows:

- (1) As the economy grows, the road freight task grows even quicker
- (2) The shift to larger vehicles makes possible larger loads and, therefore, less traffic (albeit composed of larger vehicles), but at the same time makes possible lower real freight rates which causes additional demand for freight transport

***Gary Goddard, Executive Director, Energy Division of the South Australian Department of Transport, Energy and Infrastructure***

Mr. Goddard discussed Australia’s National Emissions Trading Scheme (NETS) prepared by the National Emissions Trading Taskforce (NETT) which was formed in January 2001.

The underlying motivation for advancing on such a scheme is the view that the future prosperity of Australia may be better served by taking early action to adapt to a “carbon constrained” world, rather than putting off action and risking a shock to the economy and society. Further, the fundamental obligation of governments is to create a robust and predictable regulatory framework within which new technology and innovation can be developed and applied - to create incentives and rewards for improved environmental outcomes.

The Taskforce has set up a policy that puts Australia on a pathway to reduce its emissions by around 60% compared with 2000 levels by the middle of the century. This is an economy-wide goal, rather than a sector-specific target. To accomplish this goal a cap and trade emissions trading scheme which is similar to the European Union emissions trading scheme has been proposed as it is a widely held belief that they (cap and trade schemes) better guarantee emissions reductions. The scheme is expected to commence as early as 2010.

He briefly discussed the number of objectives of the scheme design. These include: Environmental integrity, Investor certainty, Minimizing impacts on the economy, Flexibility and Equity. Further, the scheme would initially cover the stationary energy sector which represents the largest component of Australia’s emissions. But the design of the scheme has been developed such that additional sectors could be added over time. Also, all six types of greenhouse gases covered by the Kyoto Protocol are proposed to be covered. Although, several of these gases are not emitted by the proposed liable parties

they would be relevant for offset creation.

It is proposed that liable parties would be able to bank permits indefinitely. Unrestricted banking would provide scheme participants with compliance flexibility, encourage early emission reductions and reduce compliance costs, while also enabling a smooth transition path for permit prices.

He mentioned that several new institutional arrangements have been proposed to implement NETS and support its ongoing operation and administration, its registry system, and its reporting, compliance monitoring and enforcement regime. He claimed that NETT acknowledges that bilateral linking with international schemes might be desirable in the longer term but the principal objective of designing the NETS is to establish a strong domestic market. (More information on NETT and NETS can be found at [www.emissionstrading.net.au](http://www.emissionstrading.net.au))

### **Climate Change Policy – Where to Beyond Kyoto I?**

*Suzi Kerr, Motu Economic and Public Policy Research, New Zealand*

Ms. Kerr began her discussion by admitting that involving developing countries post 2012 is one of the greatest challenges for creating an effective global climate mitigation effort. She discussed some of the fatal flaws in the current, Clean Development Mechanism, approach: adverse selection arising from voluntary participation, high transaction costs and the potential for corruption and poor measurement.

She then discussed the key issues in designing an effective, efficient, and internationally acceptable alternative where in she outlined a conceptually simple approach and then explored some of the complexities of making this work in practice. She highlighted some of the key ideas with reference to empirical work and current international proposals relating to avoiding deforestation.

Her study conducted along with Columbia University, United Nations FAO and University of Alberta used a rare panel data set for a tropical forest to analyze the effects of location differences between poor and richer areas on deforestation. They empirically examined the linkage between poverty and deforestation for Costa Rica during the 20th century using an econometric approach and also addressed the irreversibilities in deforestation.

In their experiment after controlling for both observed and unobserved characteristics of locations, they found that poorer areas are cleared more rapidly than richer, suggesting that poverty increases deforestation. Without controlling for locations' characteristics, the impact of poverty on clearing would be underestimated (in this case at zero) because poorer areas have more marginal land, i.e., land that appears to be less profitable for agriculture. For the poorest areas, the impact of poverty is weaker, and they found that in these areas clearing responds less to productivity of land.

*Steve Hatfield-Dodds, Commonwealth Scientific and Industrial Research Organization, Australia*

Mr. Hatfield warned that the current greenhouse gas emission's trajectories involve socially unacceptable climate risks. He mentioned that the ongoing policy discussion had not yet identified approaches that were capable of addressing the scale or complexity of our greenhouse challenges.

He found a number of common misconceptions in the economic analysis of emissions reductions. Some of them are:

- 1) It is not politically feasible to impose high costs now in order to achieve uncertain benefits for future generations
- 2) The social impacts of early action – particularly higher energy prices – are likely to be unacceptable
- 3) The timing of emissions reductions does not matter
- 4) The credibility constraints prevent policy makers from providing effective incentives for near term private investment through signaling future carbon market parameters (impacting on expected returns from research and development, or investment in long lived generation assets)

He suggested that a/any effective action requires the development of international arrangements that are both economically efficient and politically attractive to all key parties, and provide incentives for substantial adoption of low emission technologies by developing countries. He concluded his discussion by outlining a mechanism for extending Kyoto to deal with the emissions associated with trade exposed energy intensive products in consuming rather than producing nations, reducing trade related distortions and providing incentives rather than disincentives for participation.



*Presiding: H.E. Dr. Beat Nobs, Ambassador of Switzerland to New Zealand*

Mr. Nobs briefly mentioned the Stern report and the first part of the Fourth Intergovernmental Panel on Climate Change report, which he said had succeeded in convincing the world that climate change was a fact and thus required drastic measures to be taken especially by the industrialized countries. However, he felt that this realization had not fully translated yet into the political arena.

The presentation by Ambassador Nobs focused on the reasons for this gap between science and politics, and the status of the political discussion in the international arena. As the first commitment period of the Kyoto Protocol comes to an end in 2012, he recommended “possible” approaches to successful negotiation of a subsequent international agreement.

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<b>Supply and Access</b> <ul style="list-style-type: none"> <li>Oil – conventional &amp; unconventional resources, geopolitics</li> <li>Refining – capacity, technology</li> <li>Natural gas – access and geopolitics</li> <li>Role of National Oil Companies</li> </ul>	<b>Electricity Infrastructure</b> <ul style="list-style-type: none"> <li>Building transmission – who? how? New technologies?</li> <li>Managing grids: Independent system operators, traditional utilities</li> <li>Smart grid and other IT applications</li> <li>Building new generation including alternative energy sources</li> </ul>
<b>Legal and Regulatory Considerations</b> <ul style="list-style-type: none"> <li>Siting energy facilities</li> <li>Increasing regulatory efficiency</li> <li>Managing legal uncertainties</li> <li>EPAct 2005: an evaluation</li> </ul>	<b>Energy Trading</b> <ul style="list-style-type: none"> <li>Oversight – veracity of price data</li> <li>Volatility – impact, management</li> <li>Oil, gas, coal, electricity price linkages</li> <li>Impact of market structure</li> </ul>
<b>Alternative Energy &amp; Efficiency</b> <ul style="list-style-type: none"> <li>Mass-scale solar power, wind power</li> <li>Coal gasification</li> <li>Biofuels – amount, timing, delivery infrastructure</li> <li>Energy efficiency</li> </ul>	<b>Human Capital</b> <ul style="list-style-type: none"> <li>Trends in skills needed</li> <li>Impact of demographics and societal trends on career choice</li> <li>Role of educational institutions</li> <li>Role of media and reporting on perceptions of the energy sector</li> </ul>
<b>Science and Technology</b> <ul style="list-style-type: none"> <li>Role of IT (upstream oil &amp; gas, demand-side management, smartgrid)</li> <li>Frontier technologies: nanotechnology, biotechnology, material sciences</li> <li>Energy storage and energy efficiency</li> <li>Science of climate change and carbon sequestration</li> </ul>	<b>Other Energy Delivery Infrastructure</b> <ul style="list-style-type: none"> <li>Refining capacity</li> <li>Petrochemicals</li> <li>LNG regasification terminals</li> <li>Pipelines</li> </ul>

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# Oil and the Future of Nigeria: Perspectives on Challenges and Strategic Actions for Sustainable Economic Growth and Development

By Wumi Iledare\*

## Background

The current state of the upstream petroleum industry in Nigeria portrays an optimistic outlook, *ceteris paribus*. According to the *Oil and Gas Journal* (OGJ), Nigeria ranks among the top 10 nations in proven oil and natural gas reserves, worldwide. As of January 1, 2007, the estimated crude oil and natural gas reserves are 36.2 billion barrels and 181.9 trillion cubic feet (TCF). To expand Nigeria's proven oil reserves to 40.0 billion barrels and increase its production capacity to 4 million barrels per day by 2010, the national government is willing to invest about \$9-10 billion annually over the next five years [1].

The upstream oil and gas industry outlook in Nigeria is robust. Nearly 200% of proved reserves produced in Nigeria from 1970-2005 have been replaced by new reserves, indicating that the petroleum business environment in Nigeria compares favorably with the global environment (see Figure 1). The replacement ratio shows the extent to which Nigeria has pushed the reserves crunch date back in time and the willingness to remain a viable player in the global oil and gas industry for years to come.

Further, the currently estimated reserves life index (RLI) in comparison to the defined historical benchmark (Critical RLI) in Nigeria is dynamically in sink with global expectations (Figure 2). In this paper, the critical RLI is defined as the minimum RLI over the last decade. By implication, if the current RLI falls below the critical RLI, unless substantial amount of new reserves are added quickly, production will decline significantly. Thus, Nigeria can sustain its current aggregate average production of 2.2 million barrels per day for 11.4 years under current operating and economic conditions. However, beyond 11.4 years, the production rate will fall below 2.2 million barrel per day unless substantial new reserves are discovered. Similarly, according to Figure 2, non-OPEC oil producers, on average, can only sustain its aggregate average production rate of 41 million barrels per day for about three years before an inevitable decline.

The upstream industry performance indicator with a significant concern for Nigeria is the high rate at which recoverable oil reserves in Nigeria are being extracted (Figure 3). The ratio of the distribution of global production with respect to global reserves distribution in Nigeria is approximately twice the distribution ratio, on average, for members of the Organization of Petroleum Exporting Countries (OPEC). Nigeria seems to be producing its oil in excess of its share of world reserves and if it continues to do so, its ability to wield any significant influence in future OPEC market-sharing deliberations may be reduced drastically.

Regarding the state of Nigeria's economy, petroleum, especially oil, has been its main driver since the end of the civil war in 1970, contributing nearly 80% of government revenues and 90-95% of its foreign exchange earnings, on average, over this period. These facts notwithstanding, the impact of Nigeria's industrial sector (petroleum sector inclusive) to the overall GDP remains abysmal (See Figure 4). This contention is more so if one keeps in perspective the national government (HG) investments in upstream joint venture (JV) operations in Nigeria. It is estimated that HG spent about \$19 billion for JV operations in Nigeria from 2002 -2006 [1].

Figure 1

### Aggregate Reserves Replacement Ratio, 1970-2005

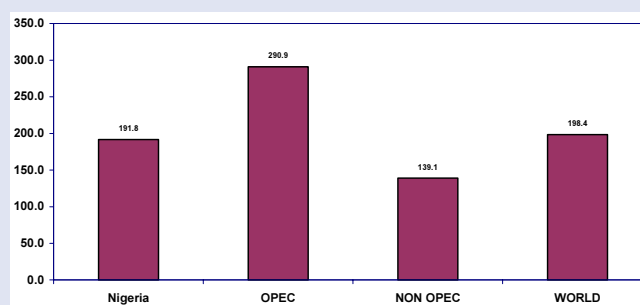
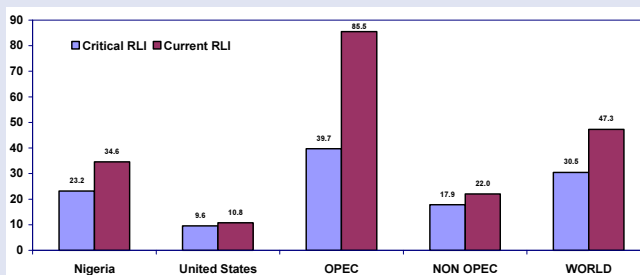


Figure 2

### Production Sustainability Index (PSI in Years)

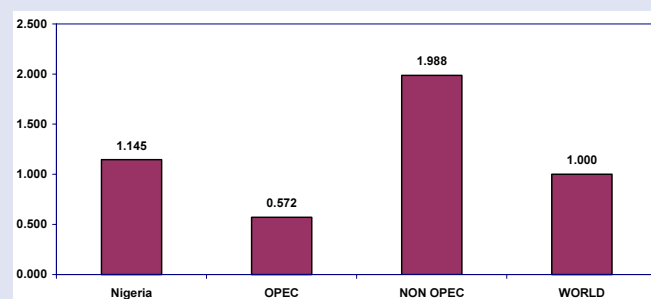


\* Wumi Iledare is a professor of petroleum economics at the Center for Energy Studies in Louisiana State University. This is an overview of the paper he presented at the 2007 Abuja Petroleum Roundtable in Abuja, Nigeria on March 8, 2007. An expanded version of this paper is available on request ([wumi@lsu.edu](mailto:wumi@lsu.edu)).

With these large government investments in the upstream oil and gas sector, the potential to derive maximum wealth and a sustained economic growth from the oil and gas industry should be indubitable. So the questions to ask are what does the future hold for oil and gas in Nigeria and how can Nigeria attain its economic aspirations using oil and gas industry as the prime mover of its economy in the next five years? This paper presents perspectives on challenges facing the oil and gas business in Nigeria and proffers strategic actions to take within the context of the role of oil and gas business in fulfilling the nation's aspirations for sustainable economic growth and development.

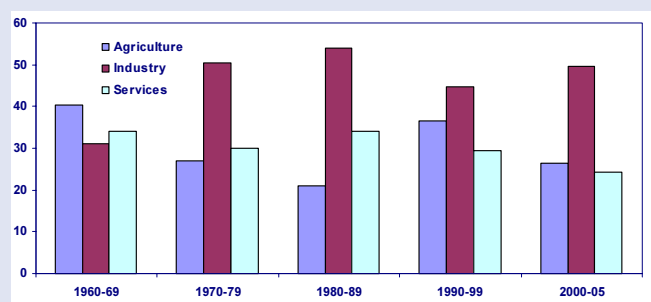
**Figure 3**

**Equitable Depletion Index (EDI)**



**Figure 4**

**Structure of Output: Value Added as % of GDP**



**Challenges Facing the Petroleum Industry in Nigeria**

The challenges facing the oil and gas industry in Nigeria may perhaps be quite difficult to resolve constructively without an amendment to the 1999 Constitution of Nigeria. The key elements of these challenges include resource ownership and the exclusive rights of the national government to grant the permission to explore and develop petroleum resources in Nigeria; effective, progressive petroleum fiscal systems; funding options for joint venture operations and the NOC; authentic indigenous participation in the domestic oil and gas industry; the rules of law and institutional empowerment; and continual membership of Nigeria in OPEC.

*Effective and Stable Fiscal System:* Fundamentally, the constitution of Nigeria is the guiding principle underlying petroleum resource development and the allocation of revenue derived from all mineral extraction. Beyond that constitutional foundation, the fiscal terms governing some operational and revenue or production sharing aspects of petroleum fiscal systems in Nigeria are mostly predetermined through national legislation. On the other hand, the non-fiscal instruments are subject to negotiation and here lies some of the political risk and uncertainties to be quantified.

There is no doubt that the petroleum fiscal agreements (PFA) in Nigeria are good enough to propel Nigeria's

economy to its full potential. A study published in 2004 by scholars at Louisiana State University's Center for Energy Studies, however, suggests that the type of contract offered is not as important as the design of the contract and the terms negotiated [2].

According to Table 1, the present worth of a project under production sharing contract arrangement (PSC) to an IOC is more sensitive to fluctuations in oil prices than it is for a joint venture project (JVA) projects. The sensitivity is, however, asymmetric with respect to decreasing or rising prices for both types of projects. The latter is also true for the present worth of the project for NOC. On the other hand, the present worth of a PSC project for the NOC is less sensitive to price variation than it is for a JVA project. Furthermore, Table 1 shows that hydrocarbon price fluctuations affect NOC profitability share more significantly than IOC share under PSC arrangement. The opposite effects, however, prevail under JVA arrangement. So as the debate to convert JVs to PSCs in Nigeria continues, stakeholders must pursue fiscal systems with less emphasis on regressive fiscal elements such as royalty, bonuses, or sliding scales parameters with no adequate consideration for price and cost dynamics [3].

*Authentic Indigenous Participation Issue:* The use of the word authentic is very deliberate. There are many policies in place since the inception of the industry to accomplish this home-grown participation in the petroleum business. Oil blocks have been awarded to indigenous firms over the years, but only a few of these firms are actually authentic. Local content development policy is also in place. It may, however, be argued that these policies are set up to continue to fail not because of the lack human skills or technical expertise, but because of inadequate financial intermediation.

*Resource Ownership and Control:* The exclusive ownership of petroleum resources by the Federal Government in Nigeria, in my view, creates undue leakages in the economy. Secondly, exclusive own-

ership has promoted inefficiency in petroleum block allocation mechanisms, corruption, and limited transparency. Third, it has rendered ineffectual every strategy to indigenize the local petroleum industry and significantly repressed the development of the local economy in each of the petroleum producing communities. There are lessons to be learned from the U.S. regarding the role of petroleum producing state or province. In Nigeria, unlike the U.S., royalties from petroleum and energy related taxation policies are centralized. No meaningful impact of petroleum taxation policies can be felt in petroleum producing communities in a sustainable way, notwithstanding, the special revenue allocation to petroleum producing local governments and states. Thus, the issue of resource ownership is most likely the critical factor underlying the perpetual clash of interests among stakeholders in the Niger Delta, which has resulted in numerous damages to the nation's economy.

**Institutional and Human Capital Development:** There is a myth in the international community that the oil and gas industry in Nigeria lacks skilled oil and gas professionals, thereby justifying the flooding of petroleum professionals and contractors into the country from abroad. An audit of local and international staff to delineate jobs and skills will help to address this myth. Although there is a lack of solid data at my disposal, I can on the basis of personal observations and interviews venture to declare that Nigeria has competent workers, but they are underutilized.

Regarding institutional issues, the statutory responsibilities of the Department of Petroleum Resources (DPR) in the Ministry of Energy have never been in dispute. Yet, attaining the autonomy and independence needed to effectively perform its function continues to be elusive. While, some will argue that the level of funding to hire, train, and buy equipment for DPR workers has improved in recent years, many people will agree that much more ought to have been done, and sooner. Another institutional concern is the petroleum policy formulation process by the National Assembly through its committees and staff. There seems to be inadequate infrastructure and human capacity to independently evaluate the policy acts governing the oil and gas sector [3].

**Funding Options for the National Oil Company:** Currently, the funding requirements for JVA operations from the government are substantial. The government spent, on average, \$3.7 billion on the JVA upstream investments from 2002-2006 and the estimated projected annual funding requirement for JV operations alone ranges between \$11 and \$13 billion from 2007-2011 [1]. The evidence is strong to suggest that the national government has received adequate revenue over and above its original investment. There is no reason to doubt that this will continue to be so. But is this the optimal way to use scarce resources when basic energy, transportation, sanitation and environmental infrastructures need urgent attention? Iledare suggests that host government participation in oil and gas development may not be an efficient way to spend its oil wealth [4].

**Continual Membership of Nigeria in OPEC:** OPEC is an intergovernmental association created in 1960. Nigeria became a member of OPEC in the early 1970s and since then the shriek for it to withdraw its membership has not ceased to be passionate. Let me venture to say that Nigeria has been good to OPEC and staying in OPEC is also good for Nigeria in terms of production within the context of the exhaustible nature of petroleum resources. This assertion is buttressed home by technical data on oil production capacity, export dependency on oil, currently estimated proven oil reserves, and measures of the economic performance of member nations. These data suggest that Nigeria's production ceiling allocation and its marketed production within OPEC have been quite favorable in comparison to other members [5]. Figure 5 shows the ratios of production share to capacity share (P-K) and Quota share to capacity share (Q-K).

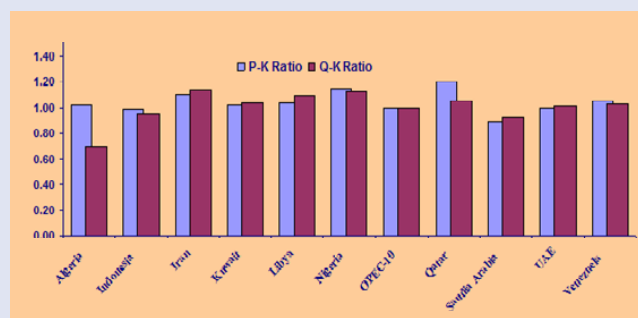
**Table 1**

**Price Effects on the Present Project Worth under Different Petroleum Fiscal Arrangements**

	Sensitivity of Project Worth to Price				Price Responsiveness of Project Worth			
	IOC		NOC		IOC		NOC	
%	PSC	JVA	PSC	JVA	PSC	JVA	PSC	JVA
-40	-43.8	-37.5	-41.0	-41.7	1.095	0.938	1.024	1.042
-30	-28.4	-24.5	-27.0	-27.3	0.948	0.818	0.900	0.911
-20	-16.0	-13.7	-14.9	-15.2	0.799	0.685	0.746	0.762
0	0	0	0	0	-	-	-	-
20	8.2	7.0	7.6	7.7	0.408	0.349	0.382	0.385
30	9.9	8.3	8.9	9.2	0.329	0.278	0.298	0.306
40	10.3	8.6	9.2	9.5	0.256	0.216	0.231	0.237
Source [3]								

**Figure 5**

**Historical Distribution Ratios of Capacity, Production and Quota for OPEC-10 Nations**



## Tactical and Strategic Actions for Sustainable Growth

Nigeria has no reason to continue to allow its economy to be decimated simply because it is endowed with petroleum resources. An interesting question is whether development strategies, which Botswana, Chile, Malaysia, and Indonesia utilized successfully to avoid the phenomenon called “Dutch Disease,” will work in Nigeria [6]? I think the answer is unambiguously yes, but the national psyche to share the national cake for personal consumption of final goods and services produced abroad must be redirected. There are just too many millionaires with no meaningful productive investment in the national economy, yet they wield too much political power that inhibits the implementation of good economic policies in Nigeria. Four key strategic and tactical actions for sustainable economic growth and development using petroleum wealth in the oil and gas sector in Nigeria are hereby recommended.

*Domestication of the oil and gas industry in Nigeria:* Domestication (not nationalization) of the oil and gas industry in Nigeria will promote active local participation in the petroleum business, not only in terms of human resources at the upper management and technical staff level, but material resources in terms of internalizing a significant portion of inputs in upstream operations. There is evidence to suggest that as the proportion of upstream expenditures spent locally increases, the contribution of the upstream sector to the gross domestic product will increase significantly. So, in order to realize the 2010 target of 70% without compromising industry standards, there must be a sustained adequate investment flow into local businesses and policy incentives to grow indigenous participation of local entrepreneurs. Thus, it may be expedient to use a portion of the excess revenue accruing from rising oil prices to provide credit facility to authentic local entrepreneurs to facilitate limiting the impact of barriers to entry in the oil business in Nigeria to home-grown firms.

*Emphasize Exportation of Hydrocarbon Derivatives:* In the statement of purpose submitted to the University of Pittsburgh in 1983, I stated that in order for Nigeria to grow its economy, it must de-emphasize foreign exchange earnings as the focal point of its petroleum policy. Nearly 25 years later, I am obliged to say that nothing has changed. It is ironic, that the focal point for the development of natural gas in Nigeria is still governed by how to earn more foreign currencies from gas development than from oil. Unfortunately, Nigeria’s economic growth has not improved proportionately to the growth in foreign exchange earnings from primary hydrocarbons exports. Thus, a redirected focus to hydrocarbon derivatives exports will add more value and grow the economy faster than hydrocarbon exports. It will also fuel the growth of the economies of nations surrounding Nigeria. A pragmatic tactical action is to challenge the World Bank and IMF to grant loans to regional nations for intra-regional trade and development. Nigeria can also use a portion of its excess foreign reserves to grant aid and loans to nations within the region to foster trade. This is similar, I think, to what high income developed nations have done for many decades to less developed nations in the world.

*Realign, Reevaluate, and Empower Institutional Agencies:* The Department of Petroleum Resources (DPR) in the Ministry of Energy, the Federal Internal Revenue Services, the Department of Immigration and Naturalization Services, the National Petroleum Investment Management Services (NAPIMS) in the Nigerian National Petroleum Corporation (NNPC) group, and the Ministry of Finance, to mention a few, need a realignment and a reevaluation of responsibilities, and empowerment. There are discussions as to the expediency of NAPIMS being housed in the NNPC group rather than in the Ministry of Finance the way the Department of Petroleum Resources is currently housed in the Ministry of Petroleum. It would seem though that if NNPC is to become the benchmark of the oil and gas industry in Nigeria, a reassessment of the joint venture financing options in Nigeria is imperative. In which case, housing NAPIMS in the Ministry of Finance may be more functionally programmatic than housing it in NNPC. The awareness of the functional responsibility of the Department of Petroleum Resources (DPR) is not speculative; neither should the fact that the department is housed in the Ministry of Finance be consequential. Adequate funding of DPR is imperative for it to discharge its responsibilities as efficiently and effectively as Minerals Management Service (MMS) does in the U.S.

*Effective Management of Petroleum Wealth:* A country that wants its future generations to benefit from an exhaustible resource, such as petroleum, must transform this non-renewable resource into a renewable one by investing in productive capital, such as energy and transportation infrastructures and water resources and sanitation and human resource capital [8]. An amendment to the constitution to allow petroleum producing states to collect tax revenue, royalty and other taxes directly for oil extracted from offshore or onshore lands designated state or local jurisdictions will make managing the flow and expectations of petroleum revenue easy in Nigeria. It would allow the designation of only a proportion of this fund for immediate budgetary purposes and a predetermined proportion should be invested ac-



cordingly. Each state shall set up a revenue allocation committee with legislative authority to ensure that equitable distribution of such funds is attained to facilitate contentment and promote stability.

The federal government, on the other hand, shall collect corporate taxes, royalty, and other taxes directly into the federal treasury. And subject to constitutional amendment, revenue accruing from NNPC operations must be treated as revenue and not net income. This tactical action will manage federal budgetary expectations and the flow of revenue into the government coffers. This action also will reduce corruption and make transparency much easier because the only spendable money is the declared return on government investment by NNPC.

## Conclusion

The sustainability of petroleum business environment compares favorably with the global ratio over the same period, an indication that petroleum industry outlook in Nigeria is very robust. This is also supported by the fact that the currently estimated reserves life index (RLI) in comparison to the defined historical benchmark (Critical RLI) in Nigeria is dynamically in sink with global expectations. The only indicator with a significant apprehension is the high rate at which recoverable oil reserves in Nigeria are being extracted. Nigeria seems to be extracting its petroleum in excess of its share of world reserves. Although, the primary focus in this position paper is on fiscal systems design and OPEC membership issues, other industry issues and concerns are also briefly reviewed including, resource ownership, authentic indigenous participation, human and institutional development, and funding options for the joint venture operations. Four key strategic and tactical actions, which can facilitate economic growth and development using petroleum wealth in the oil and gas sector in Nigeria, are discussed in the paper. Nigeria, therefore, has no reason to succumb to the phenomenon called "Dutch Disease," which has traditionally infected most natural resource dominated economies.

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## CONTENTS

- Technological Change for Atmospheric Stabilization: Introductory Overview to the Innovation Modeling Comparison Project by Michael Grubb, Carlo Carraro and John Schellnhuber
- The Transition to Endogenous Technical Change in Climate-Economy Models: A Technical Overview to the Innovation Modeling Comparison Project by Jonathan Kohler, Michael Grubb, David Popp and Ottmar Edenhofer
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- Decarbonizing the Global Economy with Induced Technological Change: Scenarios to 2100 using E3MG by Terry Barker, Haoran Pan, Jonathan Kohler, Rachel Warren and Sarah Winne
- Endogenous Structural Change and Climate Targets Modeling Experiments with IMACLIM-R by Renaud Crassous, Jean-Charles Hourcade, and Olivier Sassi

## Geopolitical Constraints of the Italian Security of Energy Supply

By *Andrea Qualiano\**

The Italian energy sector is characterized by a significant dependence on hydrocarbons that in 2005 accounted for 87% of the overall domestic energy consumption. Basically, Italy relies predominantly on oil and natural gas, both widely used in the power generation sector and in the civil and industrial sectors. Considering the relative scarcity of domestic energy reserves, Italy must import fossil fuels in order to cover its energy needs.

According to O&G Journal, Italian oil proven reserves in 2006 amounted to 622 mbl, the third largest among European Countries. Domestic oil consumption is actually estimated at 1,8 mbl/d, meanwhile production has a limited capacity reaching 155,000 bl/d. In order to balance the gap between demand and supply Italy imports oil for 93% of its total oil demand.

Basically, oil is imported from a variety of geographical areas like North Africa (38,1%), Russia (16%), Persian Gulf (13,3%), Iran (11,1%), Republics of Central Asia (8,9%), North Sea (4,6%) and Central America (0,1%).

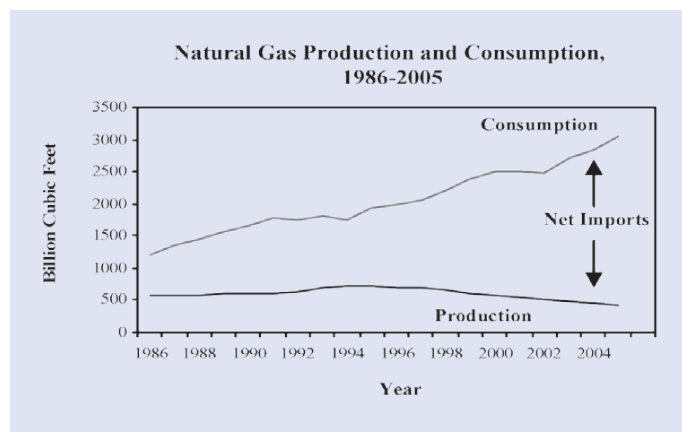
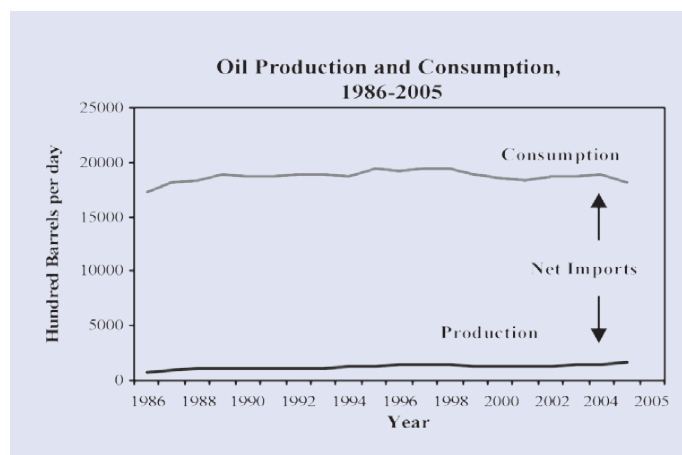
That is the same case for natural gas, where proven gas reserves are estimated for 247 bmc, of which only 170 bmc are effectively exploitable due to technical and geological constraints. In 2006, domestic production was 11 bmc while gas demand reached 84.4 bmc, clearly outbalancing the overall supply towards imports (87%).

### Geopolitical Dimension of Imports

Paradoxically, Italy imports natural gas from the same areas as oil but in this case imports are concentrated mainly in two countries, Algeria (31,6%) and Russia (29,6%), that together account for the 61,2% of the total gas imports. That situation is mostly due to the rigidity of the transport infrastructure, based on a cross-border pipeline system connecting the country with Algeria (TRANSMED), Russia (TAG, Trans Austria Gasleitung), Northern Europe (TENP, Trans Europa Naturgas Pipeline) and Libya (GREENSTREAM). Those pipelines are responsible for 95% of total imports, meanwhile the sole working LNG rigasification plant is actually supplying only 4%.

Subsequently, in an economy substantially dependent on hydrocarbon imports, the geopolitical dimension acquires a primary role in the security of supply. Indeed, a low level of diversification along with a high dependence on imports may endanger the security of supply. In fact, this dependency actually creates a vulnerability that must be managed in order to avoid any sort of supply interruption, especially in the gas sector where the rigidity of the transportation system doesn't allow any short-term, rapid switching between exporting countries.

Particularly, a cross-border pipeline system is far more exposed and vulnerable to geopolitical setbacks in areas wherein many interests are at stakes, as in the Ukrainian case. During winter 2005/2006, an international crisis occurred between Russia and Ukraine over the renegotiation of gas prices imposed by Gazprom. After failure of negotiations, on January 1<sup>st</sup> 2006, Russia closed the two pipelines dedicated exclusively to the Ukrainian gas supply, provoking an unexpected interruption of gas flows in the three other pipelines crossing Ukrainian territories and directed to Europe. Following the shut down, most of the continental European Countries were hit by gas shortages with an average deficit of 29%. In order to cover TAG's shortfalls (reaching 24%), the Italian government responded principally by maximizing



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imports from the other pipelines, calling heavily on gas storage (delivering 70% of their total capacity) and switching fuels from gas to oil in power plants that would allow it.

Nevertheless, recent tensions between Russia and its neighbouring countries have increased concerns about Russia's reliability in supplying gas. The Georgian case is a good example of what European countries fear. On January 2006, for undefined reasons, an explosion blew up the sole pipeline connecting Georgia with Russia, leaving Tbilisi without gas for several days. It is significant that Georgia was one of those former Soviet satellite states, like Ukraine and Moldova, questioning Gazprom about the unanticipated raise of gas prices. For some analysts, this is a sort of Russian punishment for having moved away from its influence and adopted western economic models for opening their markets to foreign investments.

Another relevant geopolitical issue concerns the current closeness between Moscow and Algiers that have recently tightened their relations in the gas sector with the risk of a future "gas cartel" that might strengthen their dealing power against Italy and the rest of Europe. An example of this new cooperation between Russia and Algeria is the acquisition by Gazprom of some of Sonatrach's stakes in the GALSI project, which in 2011 will bring Algerian gas to Italy by an undersea pipeline landing firstly in Sardinia and then in Tuscany. Moreover, by following gas sector liberalization, both Gazprom and Sonatrach will get access

to the Italian downstream, strengthening their role in the Italian energy sector.

Beside these geopolitical constraints, the Italian gas situation is becoming far more complex due to falling domestic gas production, estimated to plunge from the current 11 bcm to 5 bcm in 2010.

Subsequently, the reliance on imports will be dominant. Thus, the import of natural gas by pipeline is no longer sufficient to ensure a stable gas supply and handle the increase in gas demand in the medium and long-run.

To face all these problems, Italy has been forced to shape its energy policy along geopolitical factors in order to reduce import risks and guarantee security of supply. There are two key issues that characterizes this energy tendency.

### From Dependence to Interdependence

The first issue is the transformation from dependence into interdependence. Normally, in case of dependence, the more a country imports a specific good the more it will suffer from unpredicted interruptions, due to its impossibility to produce the good locally in the short run. This situation is completely different with fossil fuels, because of their scarcity and inability to be "re-generated". Furthermore, by considering the prisoner's dilemma in a market structure wherein fossil fuel demand is rigid, the exporting country might be induced to assume a defection choice, since its dealing power is higher than the buyer's.

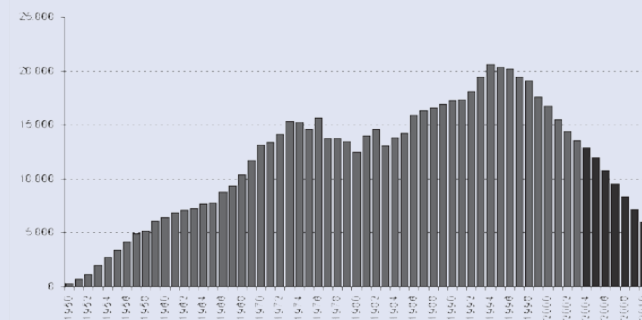
By taking into account all these factors, Italy is trying to reduce this one-way dependence by transforming itself into a mutual exchange of goods and commodities. Consequently, there is a balancing reallocation of powers that shifts the former dependence into a mutual dependence. Subsequently, there is a sort of "embedded liberalism" in which the defection option appears not feasible for both parties, because neither of them would be better off in case of coercion. Practically, Italy is exchanging its technological know-how and hand-made and manufactured products for fossil fuels. This mutual exchange involves not only economic affairs. Italy is also promoting a political and multicultural dialogue for the purpose of tightening its bilateral relations with these exporting countries.

### Diversification of Exporting Countries

However, the sole interdependence cannot assure a stable security of supply. For this reason, Italy is trying to diversify the producing countries in order to increase supply, control prices and finally to avoid the concentration of dependence on a few countries. While diversification has been successfully applied to the oil sector, due to its flexibility, there are still several obstacles hampering the

(continued on page 30)

**Current and Estimated Italian Natural Gas Production, 1950-2010**



Source: Italian Energy Authority (AEEG).



## Stabilization of Greenhouse Gas Emissions: Do We Live in the Age of Miracles?

By Rognvaldur Hannesson\*

Recently, the issue of greenhouse gases and global warming has moved up a long way on the agenda, especially in the two industrialized countries which are not parties to the Kyoto Protocol, the United States and Australia. In both countries this is partly due to extreme weather phenomena; hurricane Katrina and a prolonged period of drought.

One swallow does not make a summer, and neither does one hurricane nor even seven years of drought make a climate change. But even if more and more scientists are becoming convinced that the climate is indeed changing and that it is due to emissions of greenhouse gases it does not follow that such emissions should necessarily be curtailed. This is a question of which would be more burdensome, the cost and inconveniences of reducing greenhouse gas emissions or the lower costs of adjusting to the climate change expected to result from such reduction.

The Stern Report has famously argued that the possibly catastrophic costs of climate change could be avoided by a reductions in greenhouse gases that would cost as little as two percent or so of GDP. Time will show whether this is wishful thinking or based on realistic expectations of technological development. There is, however, one aspect that is given rather short shrift in the Stern Report, and that is the impact on the poor and medium rich countries in the world for energy. The relationship between growth in GDP and growth in the use of energy is well established and not likely to change any time soon; in many countries the growth in GDP has been accompanied by an even stronger growth in the use of energy. This is particularly true for poor and medium rich countries going through the early stages of industrialization. Add to this the fact that the great majority of the world's people live in poor and medium rich countries which have a long way to go to get anywhere near the living standards we take for granted in the rich countries of the world, and it follows that the use of energy in the world will have to grow enormously to make that possible.

Where is that energy going to come from? In the short to intermediate term there is simply no credible alternative to fossil fuels, except nuclear energy. The latter cannot, however, meet all the energy demands made by people who are emerging from poverty. Every year six to seven million people in China are becoming owners of cars for the first time. We are a long way from the carbon dioxide free car in the rich countries of the world, and still further in China and other poor and medium rich countries. Currently solar and wind power accounts for less than one percent of all commercial primary energy in the world. Even if the production of these energy types is to grow by leaps and bounds, as they have in fact done in recent years, they still will not matter much for a long time. And they are not yet suitable for meeting the aspirations of people that are emerging from poverty as driving cars and travelling in aeroplanes.

Unless the aspirations of the poor people of the world get frustrated and economic growth in their countries comes to a standstill, there is every reason to expect that the emission of greenhouse gases will continue at the present level and even intensify for many years to come. A simple piece of arithmetic brings that point home. Take China and the United States as representative of the economically developing versus developed countries in the world. A few years ago China's GDP per capita was about 10 percent of that in the United States. Ignoring population growth, it would take China about 30 years to catch up with the United States if the growth rate of GDP is 10 percent per year in China and 2 percent in the United States. But the Chinese population is about 4.5 times greater than that of the U.S. Hence, after 30 years the total of Chinese and U.S. GDP would be about 7 times bigger than now. Even if advances are made in curtailing carbon dioxide emissions, they would likely grow several times over in that scenario.

China and India together account for about 40 percent of world population. Add to that all the other poor countries of the world and it is clear that the issue of carbon dioxide emissions will largely be decided by the economic development in these countries. One could argue that the rich countries of the world should make room for improvements in living standards in the poor countries by curtailing their carbon dioxide emissions. But the rich are a minority and would have to make major cuts to accommodate the much more numerous poor. If that is going to mean severe cuts in the standard of living it is unlikely that the electorate in the rich countries would support it.

Hence, we are well advised to brace ourselves for climate change and all that goes with it. Climate change, to the extent it is related to greenhouse gas-

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es, is caused by the concentration of greenhouse gases in the atmosphere. Greenhouse gas emissions are a problem to the extent they are not absorbed by the earth through uptake by the oceans and the earth's vegetation. According to the Stern Report the assimilative capacity of the earth is about 20 percent of the present emissions. To avoid climate change altogether we would thus need to reduce emissions by 80 percent of the present level. Given the requirements of economic growth, that is highly unlikely, to put it mildly. Added to this is the fact that agriculture and land use are responsible for more than 30 percent of greenhouse gas emissions, again according to the Stern Report. Some of these emissions are very difficult to do anything about, such as the release of methane from the digestive systems of cows and other ruminants. Perhaps it would help if we all became vegetarians.

But perhaps whatever little we can do will help. If a solution is to be found to reducing greenhouse gas emissions without a major setback in the standard of living and frustrating the aspirations of the poor people of the world it will have to happen through advances in technology. Some of that is already available, but at a prohibitive cost. A higher cost of carbon fuels would make some of those technologies viable and stimulate the search for new ones. A carbon tax would do just that. And if the carbon tax fails to stimulate new technologies it will at least bring in some revenue for the governments that put it in place. That governments need revenues is not in dispute, although we can argue over how much. It is certainly preferable to satisfy that need for revenues by taxes that have beneficial effects, or no effect at all, rather than by taxes on labor or capital which discourage work effort and investment. In addition, the carbon tax would reduce the use of fossil fuels which are increasingly coming from politically unstable and unreliable countries.

### Italian Energy Security

(continued from page 28)

diversification of natural gas exporting countries, mostly because of infrastructural constraints.

For this reason, the Italian government sees the potential of LNG to reduce the geopolitical risks related to pipelines, easily diversify gas suppliers, increase gas supply with a subsequent decrease of prices, and finally facilitate a spot gas market. Then, LNG facilities along with an improvement of gas storage capacity may encourage the creation of a physical gas hub, due to the Italian geographic position, that can strategically supply gas to continental European countries. Unluckily, this scenario is not yet feasible due to the NIMBY syndrome that is opposing LNG facilities. In fact, of 10 regasification plants proposed, only three have been authorized.

Eventually, LNG trade cannot resolve the geopolitical problems affecting the hydrocarbons import system. What essentially should become a top priority in the energy agenda is the reduction of dependence on fossil fuels, both for geopolitical and environmental reasons. Therefore, the Italian government is promoting innovative market-based systems to enhance the efficient use of energy products through innovation and new technologies (White Certificates) and stimulating the development and distribution of renewables (Green Certificate).

The main message of this article is that the problem of energy security is without short-term solutions. Only the coordinated use of an array of measures, national and international, can reduce the risks of energy crises while helping to manage emergency situations that could arise.

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## Lithuanian Association for Energy Economics (LAEE)

The Lithuanian Association for Energy Economics was established in 1992, one year after the re-establishment of Lithuanian Act of Independence had been declared. The idea of creation of such association was generated even earlier, in 1990, when some freedom of “perestroika” period allowed broader contacts of scientists from the Baltic States with colleagues from Western countries. From the very beginning of existence of newly independent countries, security and stability of energy supply was a key issue for the survival of economics, particularly for Lithuania, without any significant local energy resources. Several representatives of IAEE from different countries (Kurt Lekäs from Sweden, Tony Scanlan from UK, Ulf Hansen from Germany) visited Lithuania at that very difficult time and initiated the establishment of local Association for energy economics.

The members of this newly established association came from different institutions, related to energy, but a majority were from the Lithuanian Energy Institute – the main research center in the region. In October 1992 the IAEE together with the newly established local affiliate organized in Kaunas a very important East-European Conference “Improved energy efficiency in former centrally – planned economies”. For all participants and particularly for westerners it was great experience to get acquainted with the realities of energy supply in a newly independent state during that cold late autumn.

The membership of LAEE is very stable and from the beginning has fluctuated around twenty, representing the energy companies, regulatory bodies, research and academic. Since its establishment, the LAEE has worked actively to assist the government in different matters of energy economics and energy policy at a really difficult period of transition from centrally planned to free market conditions, and in the period of preparation for membership in the European Union. In the success of reforms and restructuring of the entire energy sector, with almost full implementation of a majority of the Directives of the European Union, there has been some valuable input from IAEE members.

The Lithuanian membership in the European Union almost coincides with the sharp price rise of all primary energy resources. The obligation to permanently shut down the Ignalina nuclear power plant - the main source of comparatively cheap electricity, by the end of 2009 when the remaining 90% of primary energy is imported from Russia creates a very specific political and economic environment, when energy issues are on top of the political agenda for almost on all parts of society. The members of Lithuanian AEE are trying to be active participants in related events and help the politicians find optimal solutions and keep the situation stable, at a time when a lot of hot issues are facing the energy sector of Lithuania.

In recent years efforts have been made to attract young PhD students who specialize in energy economics and related fields to join the LAEE and IAEE.

LAEE regularly organizes two meetings per year dedicated to the most important issues of the time. The seminars or workshops, which were organized during the period of 2005–2006 illustrates the following:

### 2005

- “The future of nuclear energy in Lithuania” organized in collaboration with the Ministry of Economy, Vilnius, March 24, 2005;
- “Hydrogen energy – hopes and realities”, Kaunas, June, 2005.

### 2006–2007

- “Energy supply options and security of supply in the Baltic States and common energy strategy”, Vilnius, April 10–11, 2006;
- “The analysis of Lithuanian and Baltic States energy strategies” in collaboration with the Ministry of Economy, January 30, 2007;
- “Role of distributed energy resources in the EU and current status in the Baltic States”, Vilnius, 6 March, 2007.

The accumulated experience, small but stable and dedicated membership, the strong support from Lithuanian Energy Institute and good professional relations with major energy companies create favorable conditions to organize the 2009 or 2010 European IAEE conference in Lithuania. We expect to announce that our Affiliate will propose hosting a future European Conference during European IAEE conference in Florence this year.

Jurgis Vilemas  
Chairman of Lithuanian AEE



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Authors will be notified by June 5<sup>th</sup>, 2007, of their paper status. Authors whose abstracts are accepted will have to register and submit their full-length papers before August 5<sup>th</sup>, 2007. Quality papers among accepted ones would be printed as a special issue of an international journal or a special volume. Other related documents are available on the following website: <http://caee2007.cier.edu.tw>

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## The Austrian Association for Energy Economics

The Austrian Association for Energy Economics (AAEE) was founded in the mid 1990s and currently has 37 members consisting of academics from universities, international organisations, utilities, businesses and students. In 2007 Arno Gasteiger is president of the AAEE; Reinhard Haas from Vienna University of Technology is executive director of the Austrian affiliate. Since its establishment AAEE has continuously increased the number of members.

The AAEE aims at creating a broad and independent discussion forum in the field of energy technologies as well as energy and environmental economics. The activities carried out by the AAEE to achieve the abovementioned objective are as follows:

- AAEE, together with the Energy Economics Group at Vienna University of Technology, the Austrian Energy Agency and Technical Museum of Vienna, hosts quarterly “Energy Talks” since 1999, where research results and timely topics in the energy sector are presented and discussed. Each time about 100 participants attend.
- Since 1999, together with the Energy Economics Group, AAEE also hosts biannually an International Energy Economics Congress at Vienna University of Technology where distinguished national and international representatives from science, businesses and politics, mainly from Central Europe, discuss advanced sustainable energy systems. From 14-16 February the 2007 Conference took place under the subject “Future energy systems: Technologies and investments between markets and regulation”. 300 participants were welcomed by the organisers and 115 papers were presented at the conference covering supply security issues, electricity market design, energy policies, technologies and environmental issues. See adjacent pictures for scenes from our recent conference.
- Last but not least, selected AAEE members frequently contribute to the European, North American and International IAEE Conferences.

A major aim of the AAEE is the support of young scientists in the field of energy economics and since 2006 AAEE lists student members.





# Hybrid Modeling of Energy-Environment Policies: Reconciling Bottom-up and Top-down

Guest Editors: Jean-Charles Hourcade, Mark Jaccard, Chris Bataille and Frédéric Gherzi

Over the last two decades, energy-economy modelers of all stripes have begun to realize that energy and climate change policy cannot be approached solely with either a financially denominated macroeconomic 'top-down' approach, be it CGE or otherwise, or a purely technologically denominated 'bottom-up' approach. Large scale shifts in the energy system, like those that effective climate policy may require, will involve similarly large changes in technology and the micro- and macrostructure of the economy, demanding realistic modeling of all these dynamics.

This is the 'hybridization' challenge, to bring technological explicitness and micro- and macroeconomic realism together in one integrated policy analysis package, and it has given rise to several distinct hybrid modeling approaches. Yet, while individual publications over the past decade have described efforts at hybrid modeling, there has not yet been a systematic assessment of their prospects and challenges. To this end, several research teams held a workshop in Paris on April 20, 2005 to compare and share their hybrid modeling strategies and techniques.

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## CONTENTS

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- WITCH: A World Induced Technical Change Hybrid Model by Valentina Bosetti, Carlo Carraro, Marzio Galeotti, Emanuele Massetti and Massimo Tavoni
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# Multi-Greenhouse Gas Mitigation and Climate Policy

Guest Editors: *Francisco C. de la Chesnay and John P. Weyant*

This Special Issue of *The Energy Journal*, entitled Multi-Greenhouse Gas Mitigation and Climate Policy, presents the results of the most recently completed study organized by Stanford University's Energy Modeling Forum (EMF), commonly referred to as EMF-21. Edited by John Weyant, Stanford Univ., and Francisco de la Chesnay, U.S. EPA, the 520-page volume is the largest and most comprehensive international, coordinated study on greenhouse gas (GHG) scenarios to date.

This Special Issue provides a complete report on a comparative set of analyses of the economic and energy sector impacts of multigas mitigation of anthropogenic GHGs, including carbon dioxide ( $\text{CO}_2$ ) and the more potent non- $\text{CO}_2$  GHGs including methane ( $\text{CH}_4$ ), nitrous oxide ( $\text{N}_2\text{O}$ ) and a set of fluorinated gases (PFCs, HFCs and  $\text{SF}_6$ ). In 2000, energy-related  $\text{CO}_2$  emissions accounted for about three-quarters of global emissions, with the combination of non- $\text{CO}_2$  gases making up the rest on a  $\text{CO}_2$ -equivalent basis.

The objectives of this study were to: (1) conduct a multigas policy assessment to improve the understanding of the affects of including non- $\text{CO}_2$  GHGs and terrestrial sequestration into short and long-term mitigation policies; and (2) advance the state-of-the-art in integrated assessment and climate economic modeling. Nineteen energy-economic modeling teams from Asia, Europe, and the U.S. along with international experts on non- $\text{CO}_2$  GHGs and forestry participated in the study. Many of the modelers who participated in EMF-21 have now formed a new international consortium (supported by the new EMF-22 study) to develop the next round of global economy, energy, and GHG scenarios.

Results from EMF-21 provide reference projections of all GHGs to 2100 and also estimate the economic effects of meeting a stabilization target of 4.5 Wm<sup>-2</sup> (watts per square meter) relative to pre-industrial times, which corresponds to an equilibrium temperature increase of 3.0°C. Although the models project that  $\text{CO}_2$  emissions grow throughout the century, the range of reference case projections is quite large, with projections from some models showing slightly more than a doubling and others showing an approximate five-fold increase over the century. The reference emissions for  $\text{CH}_4$ , the second most important GHG, show about a doubling of emissions over the century. For the climate stabilization case, all models show that climate mitigation under a multigas policy leads to an appreciable reduction in both marginal costs and effects on global GDP.

The two principal insights from the study are: (1) the range of economic sectors from which non- $\text{CO}_2$  GHGs originate is far larger and more diverse than for  $\text{CO}_2$ ; and (2) the mitigation costs for these sectors and their associated gases can be lower than for energy-related  $\text{CO}_2$  alone. Taken together, these two factors result in a more diverse portfolio of potential mitigation options, and thus the potential for reduced costs, for a given climate policy objective.

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## CONTENTS

- Overview of EMF-21: Multigas Mitigation and Climate Policy, John P. Weyant, Francisco C. de la Chesnay, and Geoff J. Blanford
- Global Anthropogenic Methane and Nitrous Oxide Emissions, Elizabeth A. Scheehle and Dina Kruger
- Mitigation of Methane and Nitrous Oxide Emissions from Waste, Energy and Industry, K. Casey Delhot, Francisco C. de la Chesnay, Ann Gardiner, Judith Bates, and Alexei Sankovski
- Estimating Future Emissions and Potential Reductions of HFCs, PFCs, and  $\text{SF}_6$ , Deborah Ottinger Schaefer, Dave Godwin, and Jochen Harnisch
- Methane and Nitrous Oxide Mitigation in Agriculture, Benjamin J. DeAngelo, Francisco C. de la Chesnay, Robert H. Beach, Allan Sommer and Brian C. Murray
- Carbon Sequestration in Global Forests Under Different Carbon Price Regimes, Brent Sohngen and Roger Sedjo
- GHG Mitigation Potential, Costs and Benefits in Global Forests: A Dynamic Partial Equilibrium Approach, Jayant Sathaye, Willy Makundi, Larry Dale, Peter Chan, and Kenneth Andrasko
- Flexible Multi-gas Climate Policies, Jesper Jensen
- The Role of Non- $\text{CO}_2$  Greenhouse Gases in Climate Change Mitigation: Long-term Scenarios for the 21st Century, Shilpa Rao and Keywan Riahi
- Long-Term Multi-Gas Scenarios to Stabilise Radiative Forcing – Exploring Costs and Benefits Within an Integrated Assessment Framework, D.P. van Vuuren, B. Eickhout, P.L. Lucas and M.G.J. den Elzen
- Multi-Gas Emission Reduction for Climate Change Policy: An Application of Fund, Richard S.J. Tol
- Impacts of Multi-gas Strategies for Greenhouse Gas Emission Abatement: Insights from a Partial Equilibrium Model, Patrick Criqui, Peter Russ and Daniel Deybe
- Multigas Mitigation: An Economic Analysis Using GRAPE Model, Atsushi Kurosawa
- Burden Sharing Within a Multi-Gas Strategy, Alain Bernard, Marc Vielle and Laurent Viguiery
- Non- $\text{CO}_2$  Greenhouse Gases in the Second Generation Model, Allen A. Fawcett and Ronald D. Sands
- Benefits of Multi-Gas Mitigation: An Application of the Global Trade and Environment Model (GTEM), Guy Jakeman and Brian S. Fisher
- Multi-gas Mitigation Analysis on Stabilization Scenarios Using Aim Global Model, Junichi Fujino, Rajesh Nair, Mikiko Kainuma, Toshihiko Masui and Yuzuru Matsuoka
- Technology Policy and World Greenhouse Gas Emissions in the AMIGA Modeling System, Donald A. Hanson and John A. "Skip" Laitner
- Multi-Gas Forcing Stabilization with Minicam, Steven J. Smith and T.M.L. Wigley
- The Role of Non- $\text{CO}_2$  Greenhouse Gases and Carbon Sinks in Meeting Climate Objectives, Alan S. Manne and Richard G. Richels
- Efficiency Gains from "What"-Flexibility in Climate Policy An Integrated CGE Assessment, Christoph Bohringer, Andreas Loschel and Thomas F. Rutherford
- Multi-Gas Mitigation Analysis by IPAC, Kejun Jiang, Xiulian Hu, Zhu Songli
- Economic Impact Assessment of Climate Change – A Multi-gas Investigation with WIAGEM-GTAPEL-ICM, Claudia Kemfert, Truong P. Truong, and Thomas Bruckner
- India's Non- $\text{CO}_2$  GHG Emissions: Development Pathways and Mitigation Flexibility, P.R. Shukla, Amit Garg, Manmohan Kapshe, Rajesh Nair
- Costs Savings of a Flexible Multi-Gas Climate Policy, Asbjorn Aaheim, Jan S. Fuglestedt and Odd Godal
- The Role of Non- $\text{CO}_2$  GHGs in Climate Policy: Analysis Using the MIT IGSM, John Reilly, Marcus Sarofim, Sergey Paltsev and Ronald Prinn

## Publications

**Five-Year Outlook for Geopolitical Risk in 21 Oil-Producing Countries.** (2006). Price: n/a. Contact: The PRS Group, Inc., 6320 Fly Road, Suite 102, East Syracuse, NY 13057-9358 USA. Phone: 1-315-431-0511. Fax: 1-315-431-0200. Email: [custserv@prsgroup.com](mailto:custserv@prsgroup.com) URL: [www.ICRGonline.com/products.aspx](http://www.ICRGonline.com/products.aspx)

**Energy for Development: Twenty-First Century Challenges of Reform and Liberalization in Developing Countries,** Rangaswamy Vedavalli. (2007). 500 pages. Price: \$99.95. Contact: Anthem Press, c/o Books International Inc, PO Box 605, Herndon, VA 20172-0605, USA. Phone: 1-703-661-1500. Fax: 1-703-661-1501. Email: [bimail@presswarehouse.com](mailto:bimail@presswarehouse.com)

**Fuel Cells: The Sourcebook.** (2007) Price: \$600/\$900 print/cd. Contact: EscoVale Consultancy Services, One Brightlands Road, Reigate, Surrey RH2 0EP, United Kingdom. Phone: 44-1737-230820 Fax: 44-1737-230820 Email: [fuelcells@escovale.com](mailto:fuelcells@escovale.com) URL: [www.escovale.com](http://www.escovale.com)

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**1-3 May 2007, Electric Power 2007** at Rosemont, IL. Contact: Conference Coordinator, TradeFair Group Events, 11000 Richmond Ste 500, Houston, TX, 77042, USA. Phone: 832-242-1969 URL: [www.electricpowerexpo.com/grid](http://www.electricpowerexpo.com/grid)

**7-11 May 2007, 15th European Biomass Conference & Exhibition. From Research to Market Deployment - Biomass for Energy, Industry and Climate Pro** at ICC Berlin International Congress Center, Berlin, Germany. Contact: Ernestina U. Munoz, Conference Secretariat, ETA-Renewable Energies, Piazza Savonarola 10, Florence, 50131, Italy. Phone: +39 055 500 2280. Fax: +39 055 57 3425 Email: [biomass.conference@etaflorence.it](mailto:biomass.conference@etaflorence.it) URL: [www.conference-biomass.com](http://www.conference-biomass.com)

**7-11 May 2007, Large-scale Gas Projects Course, part 1** at Groningen, The Netherlands. Contact: Evanya Breuer, Manager Customer Relations, Drs., Energy Delta Institute, P.O. Box 11073, Laan Corpus den Hoorn 300, Groningen, Groningen, 9700 CB, The Netherlands. Phone: +31 50 524 83 12. Fax: +31 50 524 83 01 Email: [breuer@energydelta.nl](mailto:breuer@energydelta.nl) URL: [www.energydelta.org](http://www.energydelta.org)

**7-11 May 2007, International Petroleum Fiscal Systems: Analysis & Design** at Dundee, Scotland. Contact: Hugh Gunn, Seminar Co-ordinator, Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee, Dundee, DD1 4HN, Scotland. Phone: 01382 385871. Fax: 01382 385854 Email: [h.j.b.gunn@dundee.ac.uk](mailto:h.j.b.gunn@dundee.ac.uk) URL: [www.cepmplp.org](http://www.cepmplp.org)

**7-11 May 2007, Underground Gas Storage Course** at Groningen, The Netherlands. Contact: Evanya Breuer, Manager Customer Relations, Drs., Energy Delta Institute, P.O. Box 11073, Laan Corpus den Hoorn 300, Groningen, Groningen, 9700 CB, The Netherlands. Phone: +31 50 524 83 12. Fax: +31 50 524 83 01 Email: [breuer@energydelta.nl](mailto:breuer@energydelta.nl) URL: [www.energydelta.org](http://www.energydelta.org)

**7-18 May 2007, 7th Annual New Era in Oil, Gas & Power Value Creation** at Houston, TX. Contact: Event Coordinator, Center for Energy Economics, Bureau of Economic Geology, The University of Texas at Austin, Houston, TX, USA. Fax: 713-654-5405 Email: [energyecon@beg.utexas.edu](mailto:energyecon@beg.utexas.edu) URL: [www.beg.utexas.edu/energyecon](http://www.beg.utexas.edu/energyecon)

**9-10 May 2007, DECX Europe** at Brussels, Belgium. Contact: Elisabeth Brusse, Conference Manager, Cogen Europe/ Synergy, The Netherlands. Phone: +31 346 590901. Fax: +31 346 590601 Email: [elisabeth@synergy-events.com](mailto:elisabeth@synergy-events.com) URL: <http://www.decx-europe.com/>

**9-11 May 2007, Gas Mart 2007** at Chicago, IL. Contact: Conference Coordinator, PowerMarketers.com, PO Box 2303, Falls Church, VA, 22042, USA URL: <http://www.pmaconference.com/GasMart2007.pdf>

**14-18 May 2007, Global LNG – The Complete Supply Chain** at Oxford UK. Contact: Lesley Rigg, Sales Manager, The Oxford Princeton Programme, 1st Floor, 59 St Aldates, Oxford, OX1 1ST, United Kingdom. Phone: +44 (0) 1865 254 524. Fax: +44 (0) 1865 254 599 Email: [lrigg@oxfordprinceton.com](mailto:lrigg@oxfordprinceton.com) URL: <http://www.oxfordprinceton.com/search/coursedetails.asp?ID=318&PLP=LNG1>

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**15-16 May 2007, Biomass 07: Power, Fuels, and Chemicals Workshop** at Grand Forks, ND. Contact: Derek Walters, Communications Manager, University of North Dakota, Energy & Environmental Research Ctr, PO Box 9018, Grand Forks, ND, 58202, USA. Phone: 701-777-5113. Fax: 701-777-5181 Email: [dwalters@undeerc.org](mailto:dwalters@undeerc.org) URL: [www.undeerc.org](http://www.undeerc.org)

**21-25 May 2007, Host Governments & Oil Companies: Their Strategies & Tactics in International Upstream Petroleum Licensing** at Dundee, Scotland. Contact: Hugh Gunn, Seminar Co-ordinator, Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee, Dundee, DD14HN, Scotland. Phone: 01382 385871. Fax: 01382 385854 Email: [h.j.b.gunn@dundee.ac.uk](mailto:h.j.b.gunn@dundee.ac.uk) URL: [www.cepmplp.org](http://www.cepmplp.org)

**21-25 May 2007, Strategic use of IT in the Gas Industry** at Groningen, The Netherlands. Contact: Evanya Breuer, Manager Customer Relations, Drs., Energy Delta Institute, P.O. Box 11073, Laan Corpus den Hoorn 300, Groningen, Groningen, 9700 CB, The Netherlands. Phone: +31 50 524 83 12. Fax: +31 50 524 83 01 Email: [breuer@energydelta.nl](mailto:breuer@energydelta.nl) URL: [www.energydelta.org](http://www.energydelta.org)

**21-25 May 2007, LNG & Gas Contracts & Project Financing** at Port of Spain, Trinidad. Contact: Victoria Jolly, CWC School for Energy Limited. Phone: +44 20 7978 0074. Fax: +44 20 7978 0099 Email: [vjolly@thecwcgroup.com](mailto:vjolly@thecwcgroup.com) URL: [http://www.thecwcgroup.com/train\\_detail\\_home.asp?TID=16](http://www.thecwcgroup.com/train_detail_home.asp?TID=16)

**22-24 May 2007, Floating Production, Storage and Offloading Systems 2007** at The Café Royal, London, UK. Contact: Romain Ollichon, Mr., IQPC Ltd., Anchor House, 15-19 Britten Street, London, SW33QL, United Kingdom. Phone: 00 44 (0) 7368 9300 Email: [romain.ollichon@iqpc.co.uk](mailto:romain.ollichon@iqpc.co.uk) URL: [www.iqpc.com/uk/fpso/ediary](http://www.iqpc.com/uk/fpso/ediary)

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**28-30 May 2007, Commercial Strategies in the Energy Marketing Sector** at Dundee, Scotland. Contact: Hugh Gunn, Seminar Co-ordinator, Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee, Dundee, DD1 4HN, Scotland. Phone: 01382 385871. Fax: 01382 385854 Email: [h.j.b.gunn@dundee.ac.uk](mailto:h.j.b.gunn@dundee.ac.uk) URL: [www.cepmplp.org](http://www.cepmplp.org)

**29-30 May 2007, Local Content Management Asia 2007** at Prince Hotel, Kuala Lumpur, Malaysia. Contact: Philip Parba, Producer, IQPC Worldwide, Singapore. Phone: 65 6722 9388 Email: [enquiry@iqpc.com.sg](mailto:enquiry@iqpc.com.sg) URL: [www.iqpc.com/sg/local\\_content\\_management](http://www.iqpc.com/sg/local_content_management)

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