

WORLD ENERGY NEEDS, CLIMATE CHANGE and GOVERNANCE

COLIN I. BRADFORD, Jr. *

The Brookings Institution and the Centre for International Governance Innovation

Summary: This paper proposes the establishment of a *Global Energy Council* consisting of super-ministers for energy policy coordination and of private sector leaders of the eight industrial countries currently in the G8 and six emerging market economies, for example, China, India, Brazil, South Africa, Mexico (BRICSAM) and Egypt. The GEC could be formed at the OECD to serve as a visible focal point for global energy issues and a mechanism for cooperation, coordination and harmonization of energy policies among these leading governments and key private sector actors. These 14 countries are the main players in global energy production, energy use and carbon emissions. Thirteen of the 14 countries are already associated strongly with or are already members of the OECD. OPEC would be represented in the GEC in the same way that the World Bank and the IMF are represented in the G20 finance ministers meetings.

**The major reason for establishing the Global Energy Council is that massive investments in new technologies and new production facilities and infrastructure in this century to cope with the energy needs are required by the combination of significant population and economic growth anticipated in non-Western countries and continued economic growth in industrial countries. Without a focal point for energy and a forum for coordination among the major public and private sector players in global energy, the *externalities* resulting from major investments, technological innovations and policy decisions can have global repercussions and adverse consequences for business, society and the planet. The energy agenda is inextricably linked to the need to reduce carbon-emissions. Twelve of the 14 countries are in the top 15 countries in the world in terms of carbon emissions.

**Energy investment, technology and pricing issues themselves interact with trade, tax, growth, environment and development policies. Energy issues are multisectoral. As a result, super-ministers for coordination among sectors need to be appointed in the 14 countries to orchestrate internal actions and represent multifaceted elements of the energy puzzle internationally. Establishing the Global Energy Council at the OECD takes advantage of existing capacity in the OECD to analyze complex cross-sectoral issues, of the existing OECD practice of facilitating national government and private sector decisions, and of the presence of two major international energy agencies, the IEA and the NEA. Whereas incremental costs of the GEC would have to be borne by the 14 countries, no new organization and no major new expenditure would be required. Another major advantage of this proposal is that it gives *primacy to energy as the entry point into global climate change* rather than approaching energy as an environmental issue. Energy provides a convergent business-technology-government approach to climate, rather than a political-moral-environmental approach, which is more practical.

**The highest priority issue for the Global Energy Council is to draw on business, finance, technology and government leaders *to identify the three or four major sources of energy for the future* that have the potential to significantly *scale-up* their share of total energy needs so as to reduce global reliance on conventional coal and oil. Natural gas and LNG, biomass and other renewable biofuels, nuclear energy, and clean coal technologies seem to be among the most promising possibilities. Facilitating public-private sector consultations can avoid market failures in achieving this major transition.

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In one of its year-end lead editorials, the Financial Times headlined “Time for global action on climate change”, asserting that “2007 must be a year of political action”. The FT concluded that “public opinion is now ready for serious action. This year the politicians must finally respond”. [FT December 29, 2006.]

The Primacy of Energy

Another angle of approach is the urgency with which the energy challenges themselves are pressing in not only on politicians in major industrial and developing countries but also on private companies and private sector leaders. The New York Times has been running a series of articles on energy challenges facing the world featuring private sector concerns and responses. [See:nytimes.com/energychallenges.] International energy companies are taking full page ads in major newspapers trumpeting their efforts to anticipate energy needs in the future and to be responsible stewards of the environment in the process.

Sea changes are afoot on multiple fronts to cope with future global energy needs and supplies. World energy needs are mushrooming, especially as the two emerging economic giants, China and India, accelerate their rate of economic growth with a commensurate increase in their future energy requirements. For China, total demand for gas is expected to double from 176 billion cubic meters or 12 per cent of China’s total energy demand in 2003 to 343 bcm and 18 per cent of the total by 2020. Liquid natural gas imports into China are predicted to grow from 113 bcm to 196 bcm in the same period, testifying to the increasing importance of this capital intensive source of energy. [FT Special Report: “Gas Industry”, December 5, 2006] Public opinion and policy is shifting toward greater acceptance of nuclear energy as an option. Indonesia will use nuclear energy for the first time as a source of electricity in 2007 with assistance from the International Atomic Energy Agency (IEA). China, India and Russia are building 16 of the 29 new nuclear power reactors currently under production. [Washington Post, January 6, 2007, IEA source.] Biomass and renewable biofuels, now barely a sliver of the global energy picture, could provide between 15 and 30 per cent of total energy depending on whether the world adopts a carbon tax or not. [NY Times, “Cost of an Overheated Planet”, December 12, 2006, based on an M.I.T. study, <http://web.mit.edu/ceepr/www/>.]

Even if the world did not have a climate change issue, the challenges of managing global energy supplies to match global production and consumption requirements in this century are daunting.

The financing, technology, and policy issues are each complex and still more so in their interaction and in their global dimensions. Shifts in policy or prospects in one part of the world have an immediate impact on global market prices for oil, gas and coal, as well as serious regional repercussions. The maneuvers of Gazprom, evident in the Ukraine, Belarus and Georgia recently, but also in its investment policies in remote areas, such as in the Sakhalin and Shtokman projects, have ripple effects in capital and energy markets around the world. [FT Special Report: "Gazprom in Europe", December 21, 2006.]

Energy investments are by their very nature long-term, capital-intensive investments that require a full understanding of the global energy supply-demand balance well out into the future. There are "seismic shifts" in regional demands, in sources of supply, and in technology affecting private investment prospects. Government policies affect the private sector directly but governments in many countries depend largely on the private sector to generate the technology, investment and production capacity necessary to satisfy future demand. The global dimensions of the world's energy system involving trade, investment flows, technology development and exploration of new prospects for fuel sources interact with each other and affect public and private sector actors everywhere. *Private sector actors respond to both market and policy signals.* As a result, investors, business and financial leaders are the major actors in energy supply deliberations and have a stake in public policy decisions. Geopolitical maneuvering plays a role in affecting national prospects and international cooperation. These forces and flows create a global energy system of considerable complexity that needs a focal point and a steering mechanism. At the moment, neither exists.

Despite these intersections of interests, sectors, and actors, there is no single site for international discussion and decision by key policy makers and leaders on global energy, much less on the climate change ramifications of energy patterns and prospects. Providing a policy forum for high level political and business leaders to develop common strategic perspectives on the global energy future that are comprehensive in scope and synthetic in outlook is vital to moving the energy-climate change agenda forward in a timely and effective way. A Global Energy Council composed of senior officials from major energy producer and supplier countries along with private sector leaders, associated with and staffed by the OECD secretariat in Paris, could provide the high-level forum needed. Association with the OECD could also provide the efficiency of building on existing intellectual assets and policy practice at the OECD without creating an additional international organization and a bureaucracy to serve it. What is envisioned here is a forum for policy makers and private sector leaders to coordinate, cooperate and harmonize decisions, not "to create international institutions with real authority to enact mitigation or other climate-related policies directly". [Dessler and Parson (2006), p. 114.] Authority in this proposal rests with senior national officials and decision making rests with business leaders and

officials, not with the international civil servants and lead managers of the OECD itself, the proposal being congruent with current practice at the OECD.

The Global Energy Agenda

The principal function and focus of the Global Energy Council should be on global energy issues, only one of which is global climate change. The main *focus* should be on energy supply, prioritizing those key issues for senior policy makers and leaders which will: (i) facilitate the diversification of energy sources in significant ways balancing energy production patterns and increasing security of supplies, (ii) reduce the carbon-intensity of energy production through technological innovation and diffusion, and (iii) price energy output so that its social cost is increasingly factored into its market cost. The main *instruments* for these three issues are, respectively, investment, technology and taxation. For each issue, markets are critical but coordination and cooperation are fundamental. In each case, inclusion of the major emerging market economies is essential, and a dialogue between industrial countries and EMEs is vital to improved international outcomes.

Diversification: The main challenge in diversification is to facilitate immense, long-term new investments in those energy producing sectors that are the most promising sources for major reductions in global dependence on conventional coal and oil. Large investments in energy production capacity and related infrastructure for distribution and delivery need to be undertaken with a complete view of the energy investment picture to avoid overbuilding in one region and underbuilding in another, creating unnecessary trade and transactions costs, reducing the return on investment, slowing the pace of diversification. *Externalities* are critical features of these investments which make information transparency and coordination necessary instruments for avoiding market failures and disruption. Information up-dating and strategic business planning by energy producing sectors and between them is important among the major corporate, financial and investment entities, along with governments to avoid surprises and haphazard development. The OECD bodies and directorates are ideal vehicles for preparing and maintaining the information base and creating agendas for meetings among key actors.

Nuclear energy is a major potential alternative source of clean energy supply. Clearly, safeguard agreements are crucial to widening use. Further progress needs to be made in developing recycling techniques and safe and secure waste storage technologies. (NEA-IAEA) The World Association of Nuclear Operators (WANO), an international group of 36 member countries formed in 1989 after Chernobyl to enhance nuclear safety and reliability, including all G8 plus six members, most other OECD member countries, plus Iran and Pakistan. WANO could provide a useful source of input into deliberations on how to manage the

nuclear fuel cycle and how to provide assurance to the international community on nuclear safety. [See: wano.org.uk.] An indication of the long term planning horizon necessary for investment new energy technologies is the development of a set of six “fourth generation” nuclear reactors for electricity generation under way among ten countries looking to the year 2100. [See: international forum generation 4 on the internet.]

Carbon Intensity Reduction: Reducing the carbon-intensity of energy production and energy use requires new technologies. The principal focus of energy policy makers in both the private and the public sectors needs to be on technological innovation and investment in energy sources which have the potential to generate significant substitution effects out of conventional coal and oil-based energy production. Crude oil and coal account for 64 percent of world primary energy production. (Energy Information Administration, AER 2005 figure 11.1.) Natural gas, biomass and biofuels, nuclear energy, and clean coal technologies seem to have the greatest potential to significantly increase their share in total global energy output, displacing preponderant reliance on conventional coal and oil thereby markedly reducing carbon emissions. [See Dessler and Parson (2006) pp. 102 ff., the MIT studies at <http://web.mit.edu/ceepr/www/> and NYTimes, December 12, 2006, p C5.] Other sources, renewable and non-renewable, are important sources of clean energy but do not yet appear to have the scale-up potential to make as significant an impact on energy output shares. *Searching for these large-scale substitution impacts should be the major priority for the Global Energy Council.*

Other types of technological innovation increase the *energy efficiency of end uses* in homes, automobiles and industries. These kinds of end-use innovations can stimulate greater economic growth by increasing the energy efficiency and hence productivity of end users while simultaneously reducing carbon-emissions. This is important because of the stimulation effect on economic growth by replacing old capital equipment and because of the linkage of carbon-reducing technologies in important sites in the economy --- homes, cars and industries --- with broader energy conservation efforts on the demand side. Whereas both innovations affecting the supply and the demand side of the global energy picture are important, far more significant sums of investment are needed on the supply side to achieve diversification away from coal and oil than to increase end-use energy efficiency effects. Electricity generation accounts for 25 percent of green house gas emissions, as against transportation which accounts for half that share. (WRI) Relatively more priority to technology innovations and investment on the supply side by energy leaders is needed to make major impacts on reliance on coal and oil over the long run. *Therefore, prioritizing energy supply issues should be the principal focus of the Global Energy Council.*

In addition, greater attention also needs to be given to technological innovation for applications to different geographic and social settings. There is a need for common practices to be developed for making technology sharing arrangements

profitable for providers but accessible to energy suppliers and users, especially in non-industrial countries. New efforts are needed to increase official development assistance to developing countries, especially poorer countries, to reduce the carbon intensity of energy output and to improve end use energy efficiency in a variety of sectors in non-industrial countries. As one observer put it, “failure to put climate change adaptation in poor countries at the heart of the multilateral agenda on climate change will have grave consequences.” (FT 7Feb07) The OECD Development Assistance Committee (DAC), the locus for development cooperation among the industrial countries, is the best site for this, especially if China, India and other emerging donors can be associated with the DAC.

Carbon Pricing: Part of the policy package to improve both energy diversification and efficiency, as well as carbon emissions, is establishing a carbon price that incorporates the social costs to the future into the market today. Carbon taxation would require harmonization of tax policies across borders where differences in national taxation systems would need to be worked out. This is a foundational issue for both energy and climate change. There seems to be an increasing awareness of the degree to which a carbon tax is a promising instrument for the global economy in the 21st century rather than as a threat as it appeared to be in the last century. Clearly, the Stern Review on the Economics of Climate Change helped to increase the feasibility of action on a carbon tax by making palpable the immense difference in cost to the world of acting now on climate change as opposed to delaying action until later in the century.

Post-Kyoto Framework: Finally, what is needed, as the Financial Times editorial cited at the outset highlighted, is for a post-Kyoto framework agreement on global climate change to be ready to put in place when the current Kyoto Treaty arrangement expires in 2012. All energy investments, technologies and policies have impacts on climate change. All deliberations within the Global Energy Council would include climate change as a major criterion for decision, but energy, not climate change should be the primary focus of the GEC. The Global Energy Council, with support from environment ministers and the environment directorate of the OECD (ENV), could also be a key forum for contributing to a post-Kyoto agreement. But negotiating a post-Kyoto framework itself requires other institutional innovations in the realm of global environment governance giving primacy to global climate change which are taken up in another paper.

Dessler and Parsons conclude their excellent book on climate change by saying: “Managing human influences on the Earth’s climate is like piloting a super-tanker through dangerous waters...Unfortunately, no one is steering right now....We can probably avoid the rocks, but we need to start now.” There is no one steering the energy supertanker either. It looks like “we need to start now” by creating a high level forum as a strategic steering mechanism involving the major actors affecting the future of global energy supply. For this we need political leadership.

Global Energy Governance

For there to be an adequate political representation of the energy-climate change nexus at the international level, governments will need to appoint super-ministers with cross-portfolio mandates to be able to deal with the multisectoral, and hence multiministerial dimensions of this challenge at home and coordinate with other governments abroad. A super-minister would be modeled after the U.S. Trade Representative, who has inter-departmental jurisdiction, reports directly to the president, is authorized to negotiate for the United States but is not above a cabinet secretary. This is the major governance innovation that needs to happen at the national level in order for it to be possible to adjudicate these issues at the global level. Global governance innovation depends on national governance innovation occurring first. Having energy-climate change super-ministers meet at the OECD capitalizes on the existing multisectoral directorates at the OECD, obviating the need for a new institution. (See Figure IV.)

There are an array of assets in the directorates of the OECD with the expertise and experience to generate the staff work necessary on the issues of investment, technology and policy to prepare policy dialogue and decision meetings for super-ministers and other senior officials and private sector leaders. But beyond these, there are two major entities at the OECD which directly deal with energy, namely the International Energy Agency (IEA) and Nuclear Energy Agency (NEA) which are of major importance in making the OECD an excellent site for the Global Energy Council.

The IEA was formed in 1973-74 in the wake of the first oil crisis to represent oil-consuming nations. It now has 26 members comprised mostly of members of the OECD. Importantly, the IEA has memoranda of understanding agreements for participation in IEA activities with Russia, China and India. In fact, there are side agreements with each of these three critical countries in their overall relationship with the OECD even though they are not member countries of the OECD. There is an Office of Global Energy Dialogue as part of the IEA which seems well positioned to provide support for a Global Energy Council in incorporating key non-member countries. Founded in 1993, the IEA Global Energy Dialogue was established to reach out to countries beyond the OECD who are increasingly important to the global energy outlook and establish working relationships and an opportunity for policy dialogue with them. The associations of Russia, China and India with the OECD and the IEA are absolutely essential for the viability of having the Global Energy Council supported by the OECD. FT headlines declare "IEA 'must engage Beijing and Delhi'", quoting Nobuo Tanaka executive director-elect of the IEA. [FT, January 6, 2006.] The statistical strength of the IEA in the energy field is legend and would be a vital source of support for a new global governance mechanism for energy. In many ways, the GEC proposal simply takes what the IEA is already doing and ratchets it up to a higher policy level focusing on energy supply issues. The difference in form would be to engage the EMEs as full members in the Global Energy Council, even though all but Mexico

are not members of the OECD, and to limit the number of countries represented in the Council to those which are the largest players as energy producers, energy consumers or carbon emitters.

Similarly, the critical and changing role for nuclear energy is monitored, researched and discussed by the Nuclear Energy Agency (NEA), like the IEA, also a body of the OECD apart from the main OECD secretariat which gives it greater autonomy and flexibility. Located in Paris, in the country with the greatest reliance on nuclear energy for electricity production (over eighty percent of French electricity is produced by nuclear plants under the aegis of EDF, Electricite de France), the NEA is another significant asset as the world searches for alternative sources of energy beyond conventional coal and petroleum. The NEA has 28 member countries, all member countries of the OECD accounting for 85 per cent of the world's installed nuclear capacity. It would seem feasible for the NEA to act as a bridge between the Global Energy Council and the non-OECD nuclear producers as well as a bridge to the International Atomic Energy Agency (IAEA), a UN specialized agency with 143 members located in Vienna.

There is no separate energy directorate at the OECD but there are directorates for all the elements of the energy puzzle. There are OECD directorates for Economic Analysis (ECO), Fiscal and Financial Affairs (DAF), Tax Policy and Administration (CTP), Environment (ENV), Science and Technology (STI), Trade and Agriculture (TAD) and Development Assistance Cooperation (DAC). Each has competent staffs and experience convening high level policy makers to discuss, coordinate and decide critical national and international policy issues. [See: www.oecd.org and Figure IV.] The ability of the OECD secretariat to flesh out these elements of the energy puzzle and engage private sector leaders and public officials in discussion and coordination is simply an addition to their current practice and analytical expertise, not a new undertaking. It is not necessary to create a new staff to prepare for ministerial level meetings because that is what the OECD does on a regular basis. It will be necessary, however, for the 14 countries constituting the GEC to contribute additional funding to the OECD to finance the incremental costs of its operations. There is also a tradition at the OECD of including labor and business in policy discussions both in preparation for ministerial level meetings and through the TUAC and BIAC mechanisms which are the Trade Union Advisory Council and the Business Industry Advisory Council that have some autonomy of function within the OECD. A forum of private sector organizations and individuals from over 90 countries for the generation and sharing of information on current energy issues also exists, but outside the OECD. [See www.worldenergycouncil.org.]

Despite proposing to associate the Global Energy Council with the OECD for all the reasons given above, it is proposed to limit the membership to a smaller group of key countries that are the major players in the energy puzzle. As various alternatives for the country composition of expanded summits have been considered in recent years, there is some consensus that a practical solution to

the trade-off between representativeness and efficiency of decision-making at the summit level is to expand the G8 summits to include several emerging market economies (EMEs) such as China, India, Brazil, South Africa, Mexico and Egypt to form an L14, for example.

If we were to identify the top 15 energy producing countries, the top 15 energy using countries and the top 15 countries in carbon emissions, 12 of the L14 countries would be included in the top 15 energy users and carbon emitters. See graph at the end of this paper showing that “the top 20 emitting countries account for 75 percent of global emissions, according to WRI estimates.” (www.wri.org/newsroom/ Oct 16, 2006.) Because France, Germany, Italy and Japan are major importers of energy, they are not in the top 15 energy producing countries, nor is South Africa, but the other nine of the 14 countries are in the top 15 energy producing countries in 2002. [See World Bank, World Development Indicators, 2005, pp. 154-161.] The only country that ranks in the top 15 in all of three indicators that is not in the L14 group of countries is Iran. All of the L14 countries are either members of the OECD and the IEA or associated with it through memoranda of understanding, except South Africa and Egypt. South Africa, however has a “structured relationship” with the OECD and is on an “accession path” to OECD membership. (SAfrica, MFA, Annual Report 2005-06, p. 103) Brazil and Mexico are associated with the IEA through the Global Energy Dialogue. Australia, Indonesia and Korea are ranked in the top fifteen in two of the three indicators, both Australia and Korea being members of the OECD and the IEA.

The bottom line is that the L14 seems to capture the main players in global energy and all but one of the L14 countries are already associated strongly with or are already members of the OECD.

It would be important to include OPEC in the Global Energy Council mechanism. The Organization of Petroleum Exporting Countries (OPEC) is composed of eleven member states, none of whom are members of the OECD. OPEC clearly is a key participant in the energy /environment discussions. As indicated by the following statement by OPEC at the UN Climate Change Conference in Nairobi in November 2006, subscribes to the main principles of climate change agreements. “OPEC therefore reiterates the importance of The United Nations Convention on Climate Change and its Kyoto Protocol and calls for strict adherence to their fundamental principles, and in particular to common but differentiated responsibilities and respective capabilities”. This last phrase reflects the position of the five EMEs in the Gleneagles G8 Summit, insisting on growth as a priority. This is the most contentious issue in achieving agreement between industrial countries and EMEs on a post-Kyoto framework. Therefore, it is proposed here to include OPEC in the deliberations of the Global Energy Council in the same way that the World Bank and IMF are participants in the G20 finance ministers meetings.

It is extremely important to include the big oil exporting countries in these discussions for economic and political reasons. This could perhaps also be a way to engage OPEC countries in a wider dialogue. This precedent is all the more important as gas producing countries consider forming a cartel similar to OPEC. The world potentially faces fragmentation into blocs and regions, weakening global institutions and global approaches to challenges which in the 21st century are increasingly global in nature. Forming a Global Energy Council based on the L14 and associated with the OECD, the IEA and the NEA could be a major step toward global governance reform by creating a truly global forum that includes the major energy countries in forging strategic approaches to a global energy future entailing a massive transformation in sources of energy supply.

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*The author is director of the global governance project of the Wolfensohn Center for Development at the Brookings Institution. An international economist, Dr. Bradford has served in senior economic and policy positions in the OECD and the World Bank and in the U.S. government in the United States Senate, the Treasury Department and the Agency for International Development where he was chief economist from 1994 -1998. He has also taught at Yale University, American University, Georgetown University and the School for Advanced International Studies (SAIS) of Johns Hopkins University. He and Johannes Linn have edited a book Global Governance Reform: Breaking the Stalemate, just published by Brookings Press in February of 2007.

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IV. Elements of the Global Energy Challenge

