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Conference Paper

Securing access to energy

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Security: Creating a Safer World

Securing Access to Energy

Summary

Ensuring secure, affordable supplies of energy is a matter of growing global importance. The challenges ahead include: the depletion of oil and other fossil fuels; the reliance of most countries on foreign energy sources; global distributional conflicts arising from the rapidly growing demand for exhaustible fossil fuels; and geopolitical conflicts arising from the political instability of exporter countries, from exporters using their market power for political purposes, or from terrorism funded by petrodollars.



What are the most effective strategies of increasing energy security? Diversifying energy supplies? Enhancing market transparency and integration? To what extent should these strategies be coordinated internationally? What kind of technological innovations need to be promoted for mitigating energy security risks? What regulation and territorial integration of distribution networks is required to mitigate energy security risks and avoid conflicts between energy producing and consuming countries? How can distributional conflicts between energy consuming countries be avoided?

Proposed Solutions

Expert Opinion

The global nature of these challenges and the growing interdependence between producing, consuming and transiting countries require strengthened partnership between all stakeholders to enhance global energy security. To guarantee energy security in the long-run coordinated action in several key areas is required. These include:

- increasing transparency, predictability and stability of global energy markets;
- improving the investment climate in the energy sector;
- enhancing energy efficiency and energy saving;
- diversifying energy mix;
- reducing energy poverty;
- ensuring physical security of critical energy infrastructure.

Competitive and open markets are essential to the efficient functioning of the global energy system. Efforts to advance transparency, to deepen and spread the rule of law, to establish



and strengthen predictable, efficient fiscal and regulatory regimes and to encourage sound energy supply and demand policies all play significant roles in maintaining global energy security. Open markets are also necessary to attract the necessary investments into a sustainable global energy value chain.

Efforts to improve energy efficiency and energy saving contribute greatly to lowering the energy intensity of economic development thus strengthening global energy security. Increased energy efficiency and conservation reduce stress on infrastructure and contribute to a healthier environment through decreased emission of greenhouse gases and pollutants. Special attention should be given to the transport sector which is responsible for the lion's share in world oil consumption.

Diversification of the energy mix reduces global energy security risks. The necessary action includes the development of low-carbon and alternative energy, the wider use of renewables and the development and introduction of innovative technologies throughout the entire energy sector. The necessary action also includes the reconsideration of the possible contribution of nuclear energy to the world energy mix, possibly complemented by multi-lateral approaches to the nuclear fuel cycle.

Poverty and economic inequality are both powerful causes and consequences of energy insecurity. Improving access to reliable, modern, and sustainable energy services to the populations of energy-poor developing countries is therefore of vital importance for fighting poverty and inequality in general and avoiding resource conflicts.

Last but not least, the security of the world's energy infrastructure is a connected and mutually dependent issue of highest priority. Given the global nature of energy infrastructure, no country can insulate itself from danger elsewhere. Hence, in order to ensure the security of the global energy network it is necessary to get a better understanding of its vulnerabilities and ways to prevent disruptions by terrorist attacks.

Strategy Perspectives

Securing Access to Energy: Response

Lester R. Brown

Founder and President, Earth Policy Institute

The most effective strategies for increasing energy efficiency, and reducing carbon emissions, is simply to restructure taxes by lowering taxes on income and raising those on carbon. For example, initiating a carbon tax and raising it by \$20 per year between now and 2020 would give us a tax of \$240 per ton. In some situations targeted incentives to raise energy efficiency will be needed. This combined with incentives to develop solar, wind, geothermal, wave, tidal, and biomass energy would further accelerate investment in the field. While technological advances to develop new energy sources will be helpful, particularly, for example, with wave power, many technologies such as wind turbines and solar cells are already quite advanced.

One of the exciting new possibilities associated with the development of renewable energy resources is the development of large grids. For example, the super grid proposed for Europe that would integrate the wind resources of northern and western Europe, the solar resources of north Africa and southern Europe, the geothermal energy of southern Europe, and the wave and tidal power of western Europe, could facilitate the development of a carbon-free electricity system. Similarly in the United States, a strong national grid that would link the wind-rich regions of the Great Plains, the Rocky Mountains, and the east, west and



gulf coasts, the rich solar resources of the southern United States, and the geothermal resources in the country's west, with major consumption centers would also help create a carbon-free electricity system.

GES Summary: Access to Energy Panel

Mathew J. Burrows

Counselor, National Intelligence Council

1. Promote diversification, offsetting growing reliance on the Middle East.
 - Possibilities in US, Canada and Mexico exist for meeting demand for energy in North America
2. Foster greater commitment to the market.
 - Encourage greater partnership between Western firms and NOC counterparts could help further NOC efforts to insist with their governments on more economic criteria being used in deliberations on investment opportunities.
3. Help OPEC/producer economies to diversify. Some analysis has suggested that OPEC economies may actually have less aggregate economic growth and success as a result of high-price energy environment than in a more moderate price environment. This means that finding ways to increase production so as to moderate prices would not only be in the best interests of importers; but also in the long term interests of producers.
 - Helping to diversify resource-rich economies might be a way to grow the middle classes in producer countries which would have the added benefit of bringing about economic and political change.
4. Bringing key consumers into the currently OECD-populated IEA. An institution housing all key consumers might signify a modest shift of bargaining leverage from exporters to importers.
5. Encourage creation of global LNG market.
6. Greater initiatives and investment on alternative energies.
7. Energy security also is closely intertwined with global political stability and economic development. Unmanageable national fuel bills will economically torpedo a number of poor developing nations.

Contribution to Securing Access to Energy

Nick Butler

Chairman, Cambridge Centre for Energy Studies (CCES)

There seems to be broad agreement on the objective – an orderly but rapid transition to a lower carbon economy which in the process reduces the degree of dependence on a limited number of unstable and potentially hostile suppliers and on limited, and therefore potentially vulnerable infrastructure systems.

The discussion seems to be focused on Europe and I will keep to that although the approach is relevant to other areas as well.

A number of specific steps, combining public policy and private action, are necessary.

- An agreed carbon price – ideally agreed on a non partisan basis and therefore established as “permanent” for the purposes of business planning. The price should



be a set at an agreed level (say \$ 40 a ton) and then adjusted up or down according to progress towards an agreed sustainable level.

- An agreed pan European wide target for low carbon energy supplies as a proportion of total energy supply. This target should progressively rise.
- Major tax incentives (100 per cent capital allowances, a 10 year tax holiday, capital gains relief etc) to encourage private investment in low carbon supplies, in energy efficiency and in technology to reduce carbon impacts on the consumption side.

Since these steps will take time to have a material impact and since we remain dependent on hydrocarbons in the meantime others steps are necessary

- A major programme of R and D on Carbon Capture technology – promised but not delivered by the EU
- Significant engagement with the three major sources of oil and gas supply
 - with Russia – going beyond abusive rhetoric to identify points of mutual advantage and reciprocity in the energy sector
 - with the Middle East – engagement in the peace process and in nation building in Iraq rather than simply enjoying American discomfort
 - with Africa – to establish good governance and to end the tolerance of corruption.
- Major investment (probably requiring public sector involvement or leadership) in the development of diverse infrastructure for the delivery of supplies into and across Europe.
- A realistic reappraisal of competition policy – leaving behind the focus on unbundling and putting in its place the need to establish companies with the scale and depth of expertise necessary to invest and take risks on the scale required both in Europe and globally – in both the tradition energy sector and in renewables. Competition policy should be rebased to promote restructuring – including the development of larger firms and the consolidation of a sector which is fragmented and sub-optimal.

On Securing Access to Energy

Hillard Huntington

Executive Director, Energy Modeling Forum at Stanford University

Below are a few issues that I worry about.

Countries need to coordinate their monetary policies to control inflation, because energy supply disruptions will have the largest economic impacts when inflation is rampant. This coordination will protect against severe recessions if energy policy is unsuccessful in eliminating future energy disruptions.

Better coordination between energy and more general trade is needed. International agreements need to allow ethanol imports where they are cost effective and discourage countries like the USA from subsidizing domestic ethanol sources. In addition, current international trade agreements consider ethanol as an agricultural product that provides it a different rate than biofuels, considered as an industrial product.

Energy markets need to be made more transparent, particularly in countries where fuel price controls make it cheap to buy energy relative to world price levels. We should encourage international agreements that seek to reduce these subsidies much like any other subsidy that influences international trade.



Energy imports should originate from a range of producing areas with varying degrees of supply risk that are independently related to each other. This import supply diversity will be more cost effective than efforts to reduce total imports.

Governments should pursue publicly funded investments and policies for energy supply and demand research and development in certain situations. These policies are more likely to be successful if they focus on technologies where investors will not appropriate the benefits from general R&D that create large spillover effects on other sectors. They will be least beneficial when they duplicate private-sector investments.

Major refinements in intellectual property law are needed. An excellent example is the clean-coal R&D activities in the USA and other developed countries. Efforts should be expanded to facilitate the shift of these new technologies to India and China, but they cannot be given away. Investors will not pursue these options unless property laws provide them with some assurance that they will appropriate the benefits of their R&D activities.

The best way to reduce our exposure to insecure supplies is to have consumers pay a fee that reflects the expected economic cost imposed by a disruption. The revenues from these fees could be used for R&D expenditures on alternative energy, redistributed evenly to each household, or may not even be collected by the government in the first place. An example of the latter situation includes private car insurance policies that are based partly on miles driven. Another example is a car feebate scheme, where gas-guzzler owners pay a fee to gas-sipper owners.

Guaranteed floor prices for oil will be very hard to implement effectively. Everyone favors this insurance policy when prices are high. If prices collapse, citizens no longer want to pay their insurance premium, particularly when large oil companies are one of the major beneficiaries.

Coordination between climate change and energy security policies may not necessarily mean adopting a policy that meets both goals at the same time. Countries may be able to meet both goals at lower costs by selecting a portfolio of climate-change and energy-security options that collectively meet these goals.

Energy Vulnerabilities in a Divided Europe

Johannes Teysen

Chief Operating Officer and Vice Chairman of the Board of Management, E.ON AG

The energy question appears to be the most difficult challenge for societies in the coming decades. Physical shortage of fossil fuels and man-made limitations on usage due to climate combating strategies on the one hand and a need for generous usage of affordable and reliable energy to feed economic growth and social welfare on the other hand contradict one another. Europe is especially vulnerable to this issue since it is more dependent on energy imports compared to all other continents and is therefore least well positioned for the strategic competition of the economic strongholds across the world. Europe is also divided with respect to energy policies as well as proper frameworks for the energy and utility industries. Based on this analysis I would like to propose the following solutions:

Full Authorization of EU for Energy Policies

Presently, the EU is only entitled to set frameworks for a competitive and integrated energy market but lacks the authorization on the content issues of energy policies. Therefore, contradicting national energy policies of the member states leads to a suboptimal strategic positioning of our continent with respect to global competition. An integrated market without an integrated energy policy framework leads to a balancing out of good and bad national



policies and thus makes the overall system unnecessarily expensive. Europe and its energy industries would also have stronger purchasing powers and could build better and lasting relationships with energy supplying regions if this issue were addressed and changed appropriately in the debated new EU contracts.

Diversification of Energy Mix and Sourcing Strategies

Since primary energy resources are unevenly distributed around the world and we are most dependent on their import, Europe should strive to sustain a broad energy mix including fossil fuels, nuclear and renewables. All energy choices contain risks and opportunities but the worst chance/risk-profile results from an unnecessary political limitation of such choices. While exploiting its present competitive advantage in the field of renewables, Europe also needs to further develop and sustain its present competitive advantage with respect to other forms of traditional primary energies and the broadness of its current energy mix. The sourcing of oil, natural gas, coal and uranium has become a geo-political topic due to the fact that most of these fuels are found in unstable geo-political regions of the world. Europe therefore also needs to widen its perspective in respect to sourcing issues, wherever possible, without for example trying to export its own political beliefs on the proper market framework for energy or market policies.

Pro-active R&D Strategies and a Strategic Investment Program

The EU and its member states should encourage an ambitious and far reaching R&D program on energy. Such a program should be financed from national and EU budgets or special funds resulting from the auctioning of ETS certificates and be open to all types of energy technologies (supply and demand side) and be unbiased with respect to specific technical solutions. It should involve technology partners from European industries and define clear targets based on long term political goals (energy efficiency, climate protection, affordability). The R&D programs should, however, be set up in a way as not to interfere with the proper functioning of the internal markets (e.g. no special quota or pre-defined feed-in prices for demonstration projects but clear grants subject to a pre-defined research program or project). At present, there is also a lack of political leadership and support for the much needed new energy investments which leads to more and more cancellations of planned investments across Europe. The industry must therefore not only carry the technical or financial risks associated with these kinds of high capital intensive projects but also bear these “political” investment risks.

Consolidation of Purchasing Power Outside Europe but Full Liberalization Inside Europe

While it might be advisable to even consolidate some purchasing power outside the continent (as it has been done in the past or is clearly the case on the suppliers side), Europe should clearly and unconditionally embrace a fully functioning competitive framework for the energy industry in Europe. Markets provide the best and cheapest answers to challenges that we face today, while government planning has failed time and time again (e.g. Californian energy crisis). Obviously with the long lead time of investments and the restricted flexibility on the demand side, a proper market framework needs to be put in place that encourages new investments and market entries of new competitors and assures a transparent and open competition of independent market forces. The role of governments and regulatory authorities should, however still and only be to set a consistent framework and let the markets thereafter work out the solutions. At present, there are too many steering systems that sometimes contradict one another (e.g. the ETS regime and conflicting quota and price regimes all set to reach the same political goal of an efficient and carbon reduced energy system). Any system that is put in place must be at least optimized on the European level to



secure least cost options and a competitive landscape for solution providers. If energy markets show deficiencies, Europe should wherever possible rely on the overseeing powers of the proper cartel authorities and the energy market regulators and not interfere with legislative measures targeting a problem but by lack of integration in the overall system creating even additional new problems. However, in the case of Europe wide steering systems such as the ETS or discussed integrated systems for renewables, Europe needs just only define a market based framework but then also bear the accountability for the transparent and efficient working of such trading based systems by, for example setting up a body to educate the market participants (e.g. a similar body as the central bank, which is missing in the ETS scheme and which caused excessive costs and market disturbances in spring of 2005). Other steering mechanisms should only be used to boost market development where imperfections are likely to occur (e.g. energy demand steering of private households appliances or insulation investments to be shared by landlords and tenants with long payback times).

The here proposed changes need a broader political dialogue across Europe and should involve suppliers, customers and experts from the industries as well as the European and national lawmakers. I believe that such changes could strengthen Europe and support not only its climate combating policies but also help to achieve the economic goals of the Lisbon agenda as well as social questions around the energy issue and put Europe in a good position in a competitive energy world for the third millennium.