## BOOK REVIEWS

***Energy Security for the EU in the 21st Century: Markets, Geopolitics and Corridors***, Edited by JOSÉ MARÍA MARÍN-QUEMADA, JAVÍER GARCÍA-VERDUGO, AND GONZALO ESCRÍBANO (London and New York: Routledge 2012) Hardbound, 336 pages, ISBN 978-0-415-67676-2

Nine Spanish academic economists contributed to this anthology on European energy security; they are mostly at the Universidad Nacional de Educación a Distancia (UNED) so their listings give affiliations only for the two from the Universidad Autónomia de Madrid (UAM); similarly all but one are professors, and only the exception is noted. Given my longstanding objections both to the efforts to politicize oil trade and to policy responses to fears of supply disruption, this book clearly has goals opposed to my views. Obviously, I dispute the portions of the book proposing measures, particularly of political cooperation, to alleviate insecurity. However, the effort does include much interesting work characterizing the world-energy situation and the associated problems. Moreover, it adds without adequately separating the very real problem of ensuring that countries, those with which Europeans contract, perform their contractual obligations.

Chapter 1 by co-editor García-Verdugo and Laura Rodríguez engages in one of my favorite energy exercises–manipulating the data in the convenient Excel workbook containing the *BP Statistics of World Energy*. Useful summary data are presented on consumption, production, reserves, and trade in energy. [Given that BP's trade data cover only oil and natural gas, the authors use the excess of production over consumption as an initial proxy for trade in oil, gas, and coal and then show trade figures for oil and natural gas. However, coal-trade data are readily available from both the International Energy Agency and the U.S. Energy Information Administration.]

However, the more innovative data efforts are developing a pair of indices on energy relations. The first in Chapter 4 by co-editor Marín-Quemada, Carlos Velasco, and Beatriz Muñoz– a graduate student at UNED, tries to measure the "energy affinity" between the European Union (EU) and other countries. This proves largely a measure of supply positions and proximity. Thus, the Russian Federation and Norway have the highest indexes (each over 88) and the United States and Japan, the lowest (-88 for the United States).

Chapters 7 and 8 then respectively discuss the underlying principles and then implement an index of riskiness. On the first, García-Verdugo collaborates with Enrique San-Martín. These two then coauthor with Muñoz to present and discuss the implementation. Norway uniquely among the 158 countries is also the least risky with the U.S. next. Afghanistan unsurprisingly is the most risky.

The bottom 58 are largely inconsequential both as countries and energy producers; the glaring exception is Iraq at 148. The leading oil-exporting countries are spread throughout the top 100 with the Russian Federation at 36 and Iran at 87.

San-Martín and García-Verdugo collaborate on Chapter 9 using the indices to identify the "corridors" of most concern to Spain. The next attempt at quantification is Chapter 11 by co-editor Escribano, Ramón Mahía (UAM), and Rafael de Arce (UAM). The chapter first quantifies the difference and the change from 1996 to 2006 among EU countries in reliance on different fuels. Then the extent to which intra-European imports dominate supply is examined. Then statistics are given on the extent in which ten measures of energy-market characteristics are normally distributed among the EU countries. The penultimate table divides the countries by the intensity of performance in each of the ten characteristics. For each characteristic the countries are divided among the very low, the low, the high, and the very high.

Chapter 13 provides the final quantification. Here Marín-Quemada and Muñoz first formally calculate the low correlation between affinity and risk ($r^2 = 0.0404$). Then the leading countries are ranked into three levels of affinity and of riskiness and tabulation is made of which countries fall into the nine possible combinations of risk and affinity rankings. Further data on these countries and recapitulation of the original rankings follow.

Thus, eight of the anthology's 15 chapters are largely efforts to quantify energy-market condition. Chapter 3 by García-Verdugo and Muñoz is a mixture of some simple measures (for a small number of countries) of energy security and discussion of several others that might be considered. The indicators viewed are percent import dependence, energy/GDP ratios, and the ratio of final energy to total energy. The degree of connectivity and the stability of suppliers are suggested as other measures, and then various ways to develop composite measures are sketched. Chapter 5 by García-Verdugo and chapter 6 by San-Martín involve only largely unobjectionable reviews of assorted energy-prospect scenarios from Shell, a private research operation, and the International Energy Agency. The only problem is a short section in García-Verdugo that incoherently delineates "realistic" and "neoliberal" outlooks on international affairs. He appears to associate trade wars with realism and negotiated free trade with neoliberalism although he muddies the discussion by claiming neoliberals want "cooperative competition" but realists want "radical cooperation."

Chapter 2 by Escribano and García-Verdugo mainly presents superficially the standard but hotly debated proposition that disruption of energy supplies causes serious macroeconomic disruptions. Chapter 10 by Marín-Quemada, Velasco, and Muñoz is a factual, uncritical review of EU security policies. Marín-Quemada and Muñoz's collaboration on Chapter 12 covering guidelines on security is more problematic. Having accepted the desirability and feasibility of a unified EU effort to influence supply security, the chapter tries to suggest tactics. In chapter 14, Escribano delineates key energy corridors and makes suggestions about ways to prevent their disruption. The book concludes with a chapter by

Marín-Quemada and Escribano on the role of renewables in seeking security. The discussion starts by suggesting such renewables are more secure, reviews utilization trends, traces the possibilities of cross-country trade, and then treats something called the Mediterranean Solar Plan.

In short, the book provides both a good sense of European thinking on energy security and some interesting efforts to measure problems. It is hardly anyone's primer on anything but will be valuable to all presently seriously involved in energy-security issues.

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***Reinventing Fire: Bold Business Solutions for the New Energy Era*** by AMORY B. LOVINS and ROCKY MOUNTAIN INSTITUTE (White River Junction: Chelsea Green Publishing, 2011), ISBN 978-1-60358-371-8 hardback

The six chapters in this volume describe a U.S. energy future in 2050 without the use of oil, coal, and nuclear energy, but with greater reliance on natural gas and renewable for power generation and other uses. The central message is repeated in the Amory Lovins *Foreign Affairs* article of March/April 2012, entitled "A Farewell to Fossil Fuels: Answering the Energy Challenge." All told, according to the authors, this future will deliver over $5 trillion in net energy savings in an economy nearly 160 percent larger than today's. *Where* these numbers come from is hard to pin down. On the surface, this future is extremely difficult to believe. Upon further digging and contemplation, it appears a fantasy.

The book is a product of the Rocky Mountain Institute's project team on Reinventing Fire, relying on the efforts not only of the organization's founder and principal, Amory B. Lovins, but on a number of researchers and modelers within RMI and external to it. The resulting chapters, in order, are entitled Defossilizing Fuels; Transportation: Fitter Vehicles, Smarter Use; Buildings: Designs for Better Living; Industry: Remaking How We Make Things; Electricity: Repowering Prosperity; and Many Choices, One Future.

In the first chapter on fossil fuels, the authors seem to have a nearly visceral desire to reduce use of these fuels, regardless of the costs of doing so. But they ignore and fail to face up to the fact that the energy density of fossil fuels and the ease of their handling make them cheap and flexible to use. They cite climate change/global warming without any hint of scientific skepticism or criticism, wealth transfers overseas resulting from imported oil, oil-security issues and projections, including wars, and the general mercantilist view that it is better for U.S. citizens to produce their energy at home rather than overseas, thereby denying the principle of comparative advantage. In this new world, the risks to national security, the economy, the environment, and public health diminish as

coal and oil and nuclear power are phased out. Yet ignored is the fact that due to new technology, U.S. oil and gas output are rising, thus reducing any national-security risks, as the U.S. lowers its dependence on these imports, and environmental standards, for better or worse, are constantly being tightened by EPA without regard to costs and benefits.

In the transportation chapter, the authors estimate that in terms of oil not needed, the country saves $3.8 trillion in 2010 net present value terms. They lay out a future of superefficient autos, trucks, and planes, which use ¾ less fuel and no oil, and have life-cycle costs lower than the vehicles of today. How do the authors get there? By designing and building vehicles differently, using strong (key to vehicle safety) but light advanced composite materials and downsizing the power trains of these vehicles so that they can be run either on electricity or non-fossil fuels. The present problem and that of the future, however, is that regardless of the technological ability to build and operate vehicles of this type, American consumers do not seem to be interested in buying them, as evidenced in the difficulty of inducing Americans to do so. This in fact is the story to date of the Chevy Volt—a plug-in hybrid—and the Nissan Leaf—an all-electric car. Even with incentives operating in the market (such as a $7,500 rebate for a Volt purchase), most consumers question the high price/worth of these vehicles, the costs of operation and limitations to range, their reliability and durability, and their anticipated resale value. The authors envision future recharging stations using renewable electricity, but this is a long way in the future, if ever. In view of both near-term and longer-term considerations, U.S. consumers have demonstrated their preference for cheap, safe and secure conventional autos and are overwhelmingly unwilling to make the leap from internal combustion engines to Volts and Leafs. The authors as much as assert, without convincing this reader, that the U.S. transportation network can work, grow, and improve, all without any oil whatsoever, offering at the same time reductions in national-security risks and positive environmental benefits. In all of this, the authors put in a plug for better public transportation alternatives to autos, including high-speed rail, but consumer reaction to the latter has been notably cool, and public projects of this type are being either abandoned or scaled back.

In the third chapter on buildings, the authors call for fuel-savings techniques in a much larger building stock by 2050 combined with integrative design, thus increasing energy efficiency in heating, cooling, and lighting. They estimate that this will save $1.9 trillion in building energy costs by 2050 (on a 2010 NPV basis). These costs savings will also arise from smarter windows, enhanced cooling, improved insulation, and phase-change materials, a technology Lovins has been peddling as a freebie for decades, but it just has not panned out in the market. (e.g., absorbing heat during the day and releasing it at night).

The fourth chapter addresses energy use in the industrial sector. The authors propose reducing primary energy used in industry by 27 percent, with reliance on "cost-effective" energy efficiency and waste heat technologies (such as combined heat and power), as well as on integrative design and newer/better

materials. Energy intensity in the U.S. since the first Arab oil embargo has fallen by 50 percent per unit of GDP produced. More reductions undoubtedly will have a higher incremental cost than those already accomplished. Again the drivers for this future are increased efficiency, such as more closely monitored energy use, improved energy-distribution facilities within industrial facilities, improved and more capable motors, recycling, and reductions in process waste. All told, the authors estimate a 2010 NPV savings of $0.7 trillion. But again, many players in the private sector may do their sums and conclude that the incremental costs are not worth the incremental benefits; if this is the case, the authors want government policies to override private decisions, with new incentives on prices, taxes, waste energy, etc. to induce the private sector to make changes it otherwise would not, or more of the time-tested failed techniques. This theme is particularly articulated on pages 158–160.

The next to last chapter addresses the future of U.S. electricity. It calls for the elimination of coal and nuclear from our current power generation mix, and likewise calls for 80 percent of generation by 2050 (and more in years thereafter) to arise from carbon-free renewables. This is an utter fantasy even over a period as long as nearly 40 years, costs will rise, markets will be disrupted, and it is quite likely that the energy productivity so dearly sought by the authors will never materialize. The authors have little patience with carbon capture and sequestration technologies; their overriding desire is permanently to get rid of coal, regardless of its costs or those of its alternatives. While capital costs of wind and solar power, along with other renewable have declined over the years, these sources are still among the most expensive and have their own sets of environmental drawbacks, such as variability and storage issues. Moreover, it is not only the feedstock for the power to be generated that is so different and probably more costly, it is also the difficulties with the transmission systems' responses to changing demand and supply patterns and congestion issues, that make this future doubtful.

The final chapter looks at the view from 2050 back to the present. It suggests, for example, that houses and buildings are better insulated than they are now and may actually contribute net energy to the electric grid. People drive lighter, safer, more efficient cars, or better yet, take public transportation (same old ideas of the 1970s). The military neither uses nor guards fuel, and its planes and commercial planes fly on algal fuels. But thereafter the chapter raises questions that are answered through the lenses of the authors, without sufficient evidence or analysis to be credible. Firstly, is the vision economically and technologically feasible? Of course, provided the right policies are adopted. Will the vision hurt the economy? No, not once the rules become helpful or at least neutral. What about jobs? The response is not convincing, since there will be major reallocation, and coal miners are unlikely to become workers in clean-energy fields, and regional disruptions loom large. Climate-change issues will benefit, and, according to the authors, U.S. global competitiveness and power will not suffer as Yankee intuition and innovation will rise to the occasion. As to national security,

the elimination of oil enhances energy security, as does an improved and more robust electricity grid. Will this future be attractive to other countries? Of course: here the discussion is largely centered on China, which faces its own set of problems arising from growing demands for energy and greater environmental awareness. Will this future hurt the world's poor? No, it will create prosperity, as pricey oil is no longer in use, and electricity availability is extended to some 1.6 billion people currently without such access. These answers are skewed to support the authors' position without convincing evidence and analysis.

This book, while raising and addressing interesting questions for the future of U.S. energy, is really another dream-like policy agenda of its authors. It does not help that these are outcomes that Lovins has claimed for decades would occur immediately. Theirs is the right and only way to proceed. They dislike oil and coal for a host of reasons, but fail to convince the reader that what they suggest is really worth the costs of implementation. Despite the subtitle of the book, Bold Business Solutions for the New Energy Era, the volume exhibits a marked distrust of markets and loudly calls for an expanded role for government without making the case for it. An interesting read, but to be taken with many pounds of salt.

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***Fuel Taxes and the Poor: The Distributional Effects of Gasoline Taxation and Their Implications for Climate Policy***, edited by THOMAS STERNER (Washington: RFF Press 2011), 366 pages, ISBN: 978-1-61726-092-6, Hardback

In 1920, Arthur C. Pigou argued that the existence of negative externalities such as pollution is justification for government action, advocating taxes to discourage externality generating activities. Such taxes would punish polluters and provide incentive to produce in more environmentally friendly ways, increasing social welfare. While the notion of justifying economic intervention on the basis of welfare analysis was criticized by many over the years (e.g. Robbins, Rothbard, Coase), Pigou's thesis still provides the foundation for current supporters of environmental taxes, including most of the contributors to the ambitious and broadly focused *Fuel Taxes and the Poor*. Yet this volume is concerned with more than reducing emissions; it focuses on addressing the argument that fuel taxes are regressive, disproportionately impacting the poor. Researchers analyzing data from 25 different countries on five different continents conclude that it is not the poor, but rather the middle and high income earners who are most affected by fuel taxes, especially in poor countries.

The editor of this book, Thomas Sterner, Professor of Environmental Economics at the University of Gothenburg and university fellow at Resources

for the Future, has written extensively about natural resource management, particularly the economics of energy and climate. Motivated by a deep concern about climate change and economic development, Sterner has deliberatively compiled an impressive collection of academic studies of the distributional consequences of fuel taxes.

This volume will prove indispensable to those interested in climate change policy, but also has value as a primer on analysis of distributional effects of taxation, covering various measures of progressivity and finer details of such measurements such as consideration of the unit of analysis, what measure of consumption or income to use, and how the tax burden is allocated between producers and consumers.

After the introductory chapter, the book includes three chapters on the United States, each taking a different approach to analysis of the issue of the distributional effects of fuel taxes. Those are followed by analyses of countries in Central America, Asia, Africa, and Europe using a range of approaches. Some methodological conformity was imposed to ease comparison across the many countries included in the book, with the final chapter providing a meta-analytic comparison and policy conclusions. This is a technical, research oriented book, not one written for a general audience.

When considering automobile fuel taxation, the conclusion that fuel taxes are not generally regressive outside of the highest income countries is not surprising; in most developing countries, poor people cannot afford cars. However, fuel taxes also raise the cost of public transportation that may be relied upon more heavily by the poor. Further, in middle income countries, where automobile ownership has risen significantly in the past decade or two, fuel taxes may have a proportionately more negative impact on low and middle income families. Both of these considerations, and more, are accounted for by the various researchers in this study.

While the title of the book, and much of the publicity surrounding it, focuses on fuel taxes, several contributors note that fuel subsidies are more prevalent than fuel taxes in many developing countries. The distributional analysis of reduction or elimination of a fuel subsidy is essentially the same as that of raising a fuel tax, but the impact on government budgets and economic growth may be significantly different. Deficits and growth are not the main focus of the book, but they are not to be overlooked, especially in light of governmental budget crises around the world. Focusing on a change that not only reduces pollution, but also reduces budget deficits, and may actually contribute to economic growth may be a more palatable approach than focusing on raising fuel taxes.

This book provides arguments for government involvement in fuel markets and justification for preference of taxes over other forms of regulation on the basis of efficiency. It does not, however, address the question of what the "right" level of taxation is or what the optimal level of pollution is. An increase in fuel taxes or reduction in fuel subsidies is assumed necessary and progressive taxation is deemed positive. Fuel taxation can be a cost effective means of re-

ducing pollution. However, fuel taxation is only efficient if overall welfare is maximized, balancing environmental gains against reductions in consumer and producer surplus in fuel markets and possible reductions in economic growth.

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