

ISSUE BRIEF

# The Controversy over US Coal and Natural Gas Exports

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## **Resources for the Future**

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# The Controversy over US Coal and Natural Gas Exports

Joel Darmstadter<sup>1</sup>

## Introduction

In international trade, a gap between theory and practice has always existed. Theory stresses, as an underlying ideal, the economic benefits of trade based on comparative advantage. In practice, and for a variety of reasons—institutional constraints, political factors, ambiguity of legal doctrine, bilateral or multilateral treaty obligations—the ideal intermittently bows to reality, whether in the form of explicit protectionism or other barriers.

One such case—the focus of this write-up—concerns a pair of exceedingly disputatious energy trade–policy issues. My discussion centers on US coal and natural gas. Each fuel, for partially overlapping reasons, is embroiled in controversy surrounding plans to serve foreign markets with a significant volume of exports. An interconnected and paradoxical twist underlies this dual contentious issue. On the one hand, it is the sustained surge in domestic natural gas production (predominantly shale gas) that has not only led to a significant erosion of coal’s dominance in the US electric power market, but has also strengthened the coal industry’s effort to use foreign sales to compensate for some of that

## Key Points

- Coal and liquefied natural gas (LNG) exports will almost surely confer net economic benefits to the United States.
- Withholding US coal exports is a self-inflicted wound; other producers can fill the gap to meet world demand.
- LNG exports signify a range of possible domestic natural gas price increases, but most estimates point to price levels still well below those experienced a decade ago.
- Aggravated domestic environmental impacts from export-caused increases in coal and natural gas output must be viewed in context. Compared to environmental oversight over much larger output serving domestic needs, this incremental burden seems manageable.
- A casual, politically driven retreat from its traditional free-trade commitment is scarcely in the interest of the United States.

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domestic loss to gas. On the other hand, the dramatic increase in US natural gas supply has been large enough to induce producers to serve *both* the home market and foreign demand.

In the case of both coal and natural gas, foreign market conditions would appear to represent ideal opportunities for US exports. Whereas coal's role in the US economy has receded markedly and is projected to continue shrinking, its use in Asia—notably China and India—is expected to maintain its robust demand growth for at least the next 25 years. Competitively priced, efficiently mined, and backstopped by large reserves, American coal's prospective stake in that market is generally viewed as solid, notwithstanding the environmental burden that unconstrained combustion practices may inflict.

A different set of circumstances explains overseas prospects for US liquefied natural gas (LNG). In developed economies (e.g., Korea and Japan) the fuel's comparatively benign environmental characteristics are a conspicuous plus. At the same time, the persistence of a highly geographically fragmented supply network signifies, in many places, that delivered foreign prices are a large multiple of the price in the United States—in short, a situation creating a powerful incentive for American producers to exploit these market potentials.

I now consider the cases of coal and natural gas in greater detail.

## The Coal Export Issue

### AN INDUSTRY UNDER THREAT

Even to hold its own, much less contemplate a rebound, coal's future in the United States seems moribund. It is, after all, an industry that, between 1990 and 2010, saw its workforce fall from around 130,000 to 86,000. Although advances in productivity contributed to this change, a flat level of production (at a bit over a billion tons yearly) throughout this two-decade period, an uneven and sluggish trend in exports (which are only now slowly rising), and—especially painful—a dramatic loss to natural gas in new electric power plants all add up to a somber prospect of stagnation. Projections by both the US Department of Energy's (DOE's) Energy Information Administration (EIA) and the International Energy Agency offer little hope for a rebound: US coal production by 2025 is expected to barely exceed that recorded in 2000. With a sustained preference for natural gas, coal's use in electric generation—53 percent in 2000 and 48 percent in 2010—would fall to around 37 percent, as its principal customers would be existing coal-fueled plants rather than new ones coming online.<sup>2</sup>

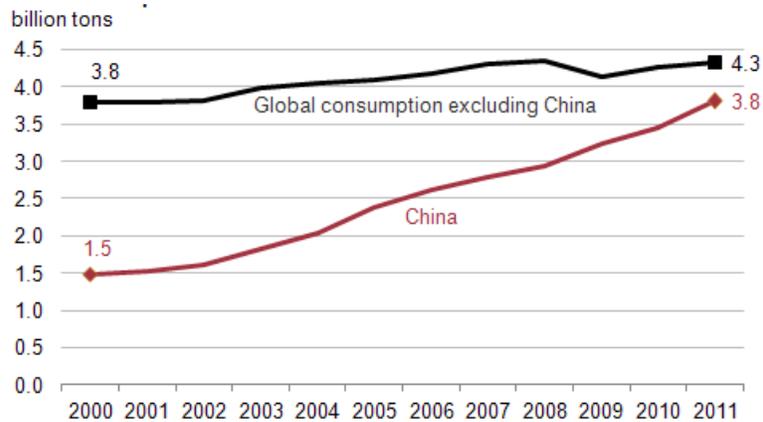
Elsewhere in the world, demand for coal (both metallurgical and steam), itself showing appreciably slower growth than during the last decade, would nonetheless continue expanding—

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<sup>2</sup> The principle sources for the domestic and international coal data shown are EIA 2011, 2012a; and IEA 2012.

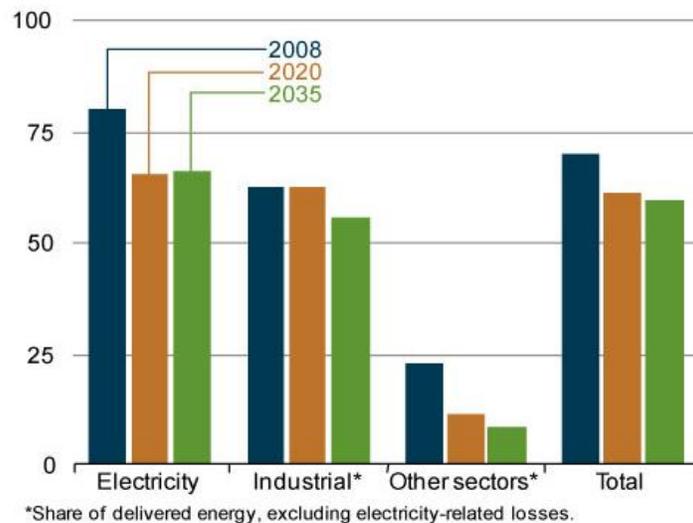
with India, and particularly, China at the forefront of that expansion (see Figure 1). Clearly, the prospect of US exports helping to meet that demand would be one of the few lifelines left for the American industry to survive on, and then only modestly. (To be sure, fundamental breakthroughs in carbon capture and containment could alter that picture; but that and other as yet remote technological changes are not considered here.)

**Figure 1a. China’s Coal Consumption compared to Global Consumption**



Source: EIA 2012d.

**Figure 1b. Coal Share of China’s Energy Consumption by Sector, 2008, 2020, and 2035 (percent)**



Source: EIA 2013.

Recent US coal exports stood at about 110 million tons a year—about 10 percent of total production. Some 90 percent of these exports exit at six major ports, all on the East or Gulf coasts, the most important of which are Baltimore, Norfolk, and New Orleans. Only a small

quantity is shipped from Seattle. To facilitate even moderate export growth—EIA’s baseline projection for 2025 is 115 million tons—it is widely accepted that new transportation capacity, both inland and coastal, is imperative. That’s because, to serve the key Asian Pacific market using Rocky Mountain surface deposits (such as in Montana and the Powder River Basin of Wyoming), both more dedicated long-haul rail capacity and expanded terminal facilities—logistically favoring Washington and Oregon—would be needed.

## THE CONTENDING ISSUES

Notwithstanding expressions of such expansion needs by the coal industry, the last couple of years have seen both protests and legal efforts to forestall that prospect. Though primarily nongovernmental, the opposition has also prompted some expressions of concern by officials at various levels of government. Unlike the situation with LNG (see below), these efforts have little to do with market impacts (US or global), or with statutes explicitly germane to the coal industry. They have everything to do with the programmatic thrust or interpretation of the National Environmental Policy Act (NEPA) or project-specific provisions of such federal statutes as the Clean Air Act. In either case, the filing of environmental impact statements (EIS), where statutorily required, constitutes a core vehicle for the opposition movement.

It’s worth mentioning as well that, on occasion, opposition arguments have included the point that US coal exports encourage rising worldwide carbon dioxide (CO<sub>2</sub>) emissions. The US Environmental Protection Agency (EPA) appears to harbor such concerns, as noted below. However, it is almost certain that US exports merely displace Colombian, Australian, Indonesian, or other coal supplies that would fill the breach created by US export restrictions. In any case, I see no merit in debating in this paper how US trade policy should be framed in the light of foreign greenhouse gas policy, much as such policy questions deserve to be part of a broader analysis and focus on global warming imperatives. (Such a wide geographic focus would also need to address the effect of US natural gas exports, which would shift at least some foreign energy use *away from coal*.)

If, on purely economic grounds, the case favoring the benefits to both industry and nation is, as I see it, largely unambiguous, what is one to make of the dissenting—largely, though not exclusively, environmental—position? I summarize both of the principal ways in which the magnitude and logistics of expanded exports might impinge on environmental imperatives and standards and, beyond that, the legal or regulatory basis for bringing to light—and thereby avoiding—such threats.

On the environmental front, several sources of concern are apparent: the impact of expanded mining; issues associated with long-haul rail transport from coal fields to port areas, giving rise to such concerns as coal dust and diesel emissions and the increased congestion in urban areas of

the Northwest that a significant increase in rail traffic would engender; the disruptive consequences to the communities closest to the to-be-constructed port facilities; and, not least, the extent to which, singly or in combination, these might add more than trivially to US greenhouse gas emissions. In one way or another, each of these aspects is bound to involve regulatory hurdles by federal, state, and perhaps local authorities. It is within the framework of such regulatory oversight that opposition to the coal expansion plans is being waged.

I amplify this development with a couple of specific examples:

- Two years ago, the firm SSA Marine applied for federal and state permits—triggering, in turn, a formal environmental review—to construct a \$500 million export facility (maximum capacity: 54million tons) at the Gateway Pacific Terminal near Ferndale, Washington, with plans to launch operations by 2015 (Seattle Times 2011).
- More recently, a proposal by a subsidiary of Arch Coal for a coal port instigated a joint environmental review by Washington State’s Department of Ecology, Cowlitz County, and the US Army Corps of Engineers. The Corps, which has jurisdiction over regional waterways, including the Columbia River, has been advised by EPA to also consider the full range of environmental impacts, from coal mining in Montana and Wyoming to increased coal demand in Asia. In EPA’s words, what it seeks from the Corps is the preparation of “an adequate NEPA review, as governed by the Agency’s responsibilities under provisions of NEPA and the Clean Air Act.” (EPA 2012).

The impacts explicitly, if illustratively, singled out by EPA for consideration by the Corps are neither general nor few in number. They include such factors as local haze, endangered aquatic species, tribal cultural resources, and incursion into scenic areas. Significantly, EPA also ponders “the cumulative impacts to human health and environment from increases in greenhouse gas emissions ... from Asia to the United States.” To adequately analyze such farther-reaching impacts and still allow permitting decisions to be rendered in a timely fashion could prove to be a formidable challenge. After all, even a near doubling of annual US coal exports (to, say, 200 million tons) has to be judged in the context of foreign consumption of approximately 1.7 billion tons. Whether, with such magnitudes, it is reasonable to expect the US Army Corps of Engineers to make a credible determination of CO<sub>2</sub> impacts seems open to question.

Opposition to, or questions raised about, these export plans go beyond comments by regulatory agencies and legally framed filings by a number of environmental nongovernmental organizations. Dissenting views have also been expressed by several members of Congress, including, not long ago, by Senator Ron Wyden (D-Oregon) and Representative Edward Markey (D-Massachusetts). In a May 2012 letter to President Obama, the two legislators expressed their concern that

“unrestricted” exports of US energy resources (they list coal, petroleum products, natural gas, and chemical feedstocks) would undermine the benefits of these resources to the domestic economy. Claiming presidential authority (under the Energy Policy and Conservation Act of 1975), they urge Mr. Obama to “address this problem” and ensure that exports “proceed only to the extent that they are in both the short and long-term national interest ....” However that contention may play out, it seems a bit selective to cite the “long-term national interest” when that objective may be constructively addressed as well—or perhaps more effectively—by measures more likely to reduce worldwide use of, and emissions from, coal combustion (Wyden and Markey 2012).

## The LNG Export Issue

### SOME BACKGROUND BASICS

Alan Krupnick and I have sketched out the background to LNG export plans in an earlier RFF posting (Krupnick and Darmstadter 2012). Just to note the essence of the matter, the three-way phenomenon of rapidly expanding proved natural gas reserves, a surge in output capacity, and a sharp fall in price makes the eagerness of producers to go beyond domestic sales and tap the potential of export markets self-evident. The viability of transforming LNG *import* terminals—now largely obsolete—into export terminals rounds out the logic of pursuing international market opportunities. At the end 2012, producers had identified seven terminal facilities (three of which have received federal approval). Total yearly export capacity for these seven projects adds up to approximately 4.5 trillion cubic feet (tcf). At a more tentative planning stage, another seven terminals are in the category of “potential sites identified by project sponsor.” Their export capacity amounts to a volume of around 3.5 tcf (FERC 2012).

Capacity projections are likely to exceed expectations of actual shipments. Also, the pace of investment buildup is, at this point, quite uncertain. If, nevertheless, we assume that these first seven projects will be operational by, say, 2025, they could, maximally, top out at around 17 percent of EIA’s baseline output level of 26 tcf (see Table 1). But insofar as that baseline output projection fails to account (by design) for supply responses driven by expanding foreign market opportunities, it seems reasonable to view the 17 percent figure as unrealistically high. An additional element of uncertainty revolves around competitive pressures from foreign natural gas suppliers. These issues—characteristic of a startup commodity trade regime—are clearly recognized and allowed for by those hypothesizing future scenarios, including those whose work I cite below. Still, the numbers just cited should help provide a useful quantitative context for the more detailed discussion that follows.

Exports of natural gas are not like exports of widgets or—as a less fanciful example—American automobiles, whose export success would resonate positively with most segments of American society. Natural gas presents a fourfold combination of relatively unique circumstances. First, and

at the broadest level, at least some Americans exposed over the years to the drumbeat of “energy independence” as an overriding national objective, may find themselves confounded by the prospect of sharing the fruits of that long-sought development with the rest of the world. Second, with the lowest CO<sub>2</sub> emissions among fossil fuels, natural gas use is consistent with the increasingly heightened emphasis on environmental integrity. Third, running counter to the priority of natural gas *producers* bent on exploiting the profitability of exports to high-price foreign markets, the priority of energy *users* is to keep the lid on domestic gas prices—whether on the part of households scanning their monthly utility bills or gas-intensive manufacturers focused on keeping input prices under control. And fourth, natural gas issues have elevated to national prominence the role of policymakers and regulatory bodies before whom the stakeholders just cited have a venue for pursuing and validating their respective interests.

**Table 1. EIA “Reference Case” Natural Gas Projections**

	2010	2020	2025	2035
US natural gas production (tcf)	20.6	25.1	26.3	27.9
LNG net exports (tcf)	-0.4	0.7	0.7	0.7
US price (2010\$/mcf)	4.16	4.19	5.12	6.64

Source: EIA 2012b.

Note: Natural gas physical volumes are conventionally expressed in trillion cubic feet (tcf). Prices are conventionally expressed in dollars per thousand cubic feet (mcf; the “m” stems from its value of 1000 in Roman numerals).

That fourth point deserves to be spelled out with some specificity. Regulatory oversight of LNG exports resides in two federal bodies: the Federal Energy Regulatory Commission (FERC) and DOE. FERC’s jurisdiction is largely confined to LNG terminal facilities and operations. These encompass oversight of gas pipeline connections, the dry gas-to-liquids conversion facility, and shipping installation. DOE’s jurisdiction, which is much more likely than FERC’s to be at the center of the export debate, gives it authority to issue or deny permits to firms seeking export approval. In effect, however, the default assumption is that exports to countries with which the United States has free-trade agreements (FTAs) are almost axiomatically treated as “in the national interest,” the criterion DOE is statutorily obliged to consider. Thus, one of the most recent (October 2012) FTAs entered into by the United States is with South Korea, the world’s second-largest LNG importer. Even shipments to non-FTA trading partners—though not assured of the expedited approval process accorded FTA countries—are viewed as consistent with the “public interest” under provisions of the Natural Gas Act. Nothing within this policy framework technically bars DOE from asserting a prior US interest in rejecting export permit applications—due, say, to a

national fuel or economic emergency—but experience suggests that such a step would be exceptional.

If, arguably then, regulatory and legal criteria heavily favor unrestricted LNG exports, especially in shipments to FTA countries, the remaining questions and controversy surrounding the contemplated LNG export plans are of a twofold character: the economic rationale and effects on the one hand, and environmental impacts on the other. The economic issue is dominated by the estimated impact of specified export volumes on prices facing US domestic and industrial consumers. Environmental concerns—with hydraulic fracturing (“fracking”) extraction techniques already under fire—center on the effects of still greater gas production to accommodate export requirements. I discuss these two aspects in turn.

### **A Review of Economic Issues and Findings**

With respect, first, to economic aspects, the question of price effects is at the heart of the export controversy—so much so that it’s easy to see why, in the short span of a year or so, a number of major analytical studies, all with reasonable degrees of rigor, have sought to illuminate that dilemma.

To put those studies in perspective, it’s useful, first, to show how, in its 2012 *Annual Energy Outlook* “Reference Case” projections, EIA sees unfolding natural gas milestones, absent major changes in LNG export trends (see Table 1). In summary, LNG exports would represent a minimal 2.5 percent of domestic production a quarter century in the future. Domestic (inflation-adjusted) natural gas prices would rise by well under 1 percent yearly.

Against this essentially business-as-usual trend, a proliferating series of studies has appeared, seeking to examine how a major expansion of US LNG exports would affect domestic gas prices and the surrounding economy. I touch on four such recent efforts.<sup>3</sup>

The US natural gas industry continues to evolve rapidly and in ways not foreseen as little as a decade ago. It therefore makes sense to concentrate on analyses and findings bracketed by the beginning and end of 2012. EIA’s Jan. 2012 study spanned a range of plausible long-term scenarios, with particular emphasis on export volumes and domestic price impacts. An approximate midpoint estimate in projections for the year 2025 points to an export volume of around 1.5 tcf—or 6 percent of estimated production for that year—and a domestic gas price of around \$5.90 per thousand cubic feet (mcf); in other words, some 15 percent above the Reference Case price of \$5.12/mcf shown in Table 1.

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<sup>3</sup> See EIA 2012c; Montgomery et al. 2012; Ebinger, Massey, and Avasarala 2012; and Medlock 2012.

In a December 2012 report commissioned by DOE, the consulting firm NERA took as its point of departure the January 2012 EIA study (summarized above) but greatly expanded that effort in a number of important respects. It calculated the macroeconomic consequences of an extremely wide range of scenarios, with respect to not only alternative export volumes, but also a host of other variables, such as domestic and foreign natural gas demand and supply patterns. The NERA effort thereby went well beyond the (acknowledged) limitations of the EIA study's simplified structure.

Given its complexity and wide scope, it's risky, but necessary, to try to collapse the NERA analysis into those findings particularly germane to the theme of this paper. In the NERA analysis, US gas price increases are estimated to vary between \$0.33/mcf (in 2010 dollars) when LNG exports are expected to begin (some five years hence) to a range of between \$0.22/mcf and \$1.11/mcf as exports grow in ensuing years. A rough \$0.65 midpoint in that range would represent around a 13 percent increment to the baseline price of \$5.12/mcf estimated for 2025 and shown in Table 1. LNG export levels comprise a wide range of possibilities in NERA's analysis. For present purposes, I extract from that range an approximate 2025 midrange estimate volume crudely corresponding to the price effect just noted. My very tentative look at the data points to an LNG export volume of some 2.5 tcf, or a magnitude approaching 10 percent of domestic production.

If one were to train a forensic eye on the preceding several paragraphs, it would disclose a somewhat paradoxical state of affairs: EIA's analysis, in comparison with NERA's, suggests a slightly higher price penalty associated with a lower level of assumed LNG exports. But a careful dissection of the underlying explanation for that slightly anomalous outcome would constitute an analytical challenge of its own and one that is well outside the purpose of this paper. I note that the price penalty inflicted on the US economy and society by reasonable assumptions about LNG exports over the next dozen years falls into a zone of 10–15 percent above levels otherwise prevailing.

Given its otherwise comprehensive character, a weakness of the NERA study is its failure to flag whatever externality impacts might be associated with heightened US gas exploitation. Even then, it faces the further challenge of ascribing a dollar value to such damages, although it might be possible to associate the consistency between some of the model's higher-price cases with elevated emissions characteristics. But NERA does acknowledge disparate impacts of various projected trends on different socioeconomic groups and industrial sectors, noting that "impacts will not be positive for all groups in the economy" (Montgomery et al., 8). Therein lies much of the political controversy the report has engendered, particularly with respect to impacts on households and gas-intensive manufacturers, such as Dow Chemical (see comments below). But it did signal unambiguously positive net benefits for the economy as a whole across the entire scenario spectrum—in some cases, net benefits of significant dimensions.

Compared to the earlier EIA report and the two studies recapped below, the NERA report elicited by far the most sharply voiced, if not always coherent, dissent.<sup>4</sup> For example, in a comment submitted to DOE, the Sierra Club observed that reliance on natural gas exports would subject the United States to the “resource curse” that has condemned some other economies to fatal neglect of their value-added manufacturing sectors. It also criticized NERA for its use of outdated statistics, neglecting, as a matter of fairness, to acknowledge that the rapidity of change in the natural gas industry meant persistent change in the baseline to which future trends are to be compared. Somewhat more cogently, the Sierra Club critique noted NERA’s neglect of environmental costs.

The Sierra Club’s dissenting judgment on the NERA report was matched by that of Representative Edward Markey (D-MA), by then already on record as a staunch opponent of LNG exports. In a December 14, 2012, letter to DOE Secretary Steven Chu, Markey characterized the study as “deeply flawed methodologically” and inattentive to negative impacts of LNG exports. Still more recently, a letter from Senator Ron Wyden (D-OR) addressed Secretary Chu with a similar dissenting judgment (Wyden 2013).<sup>5</sup>

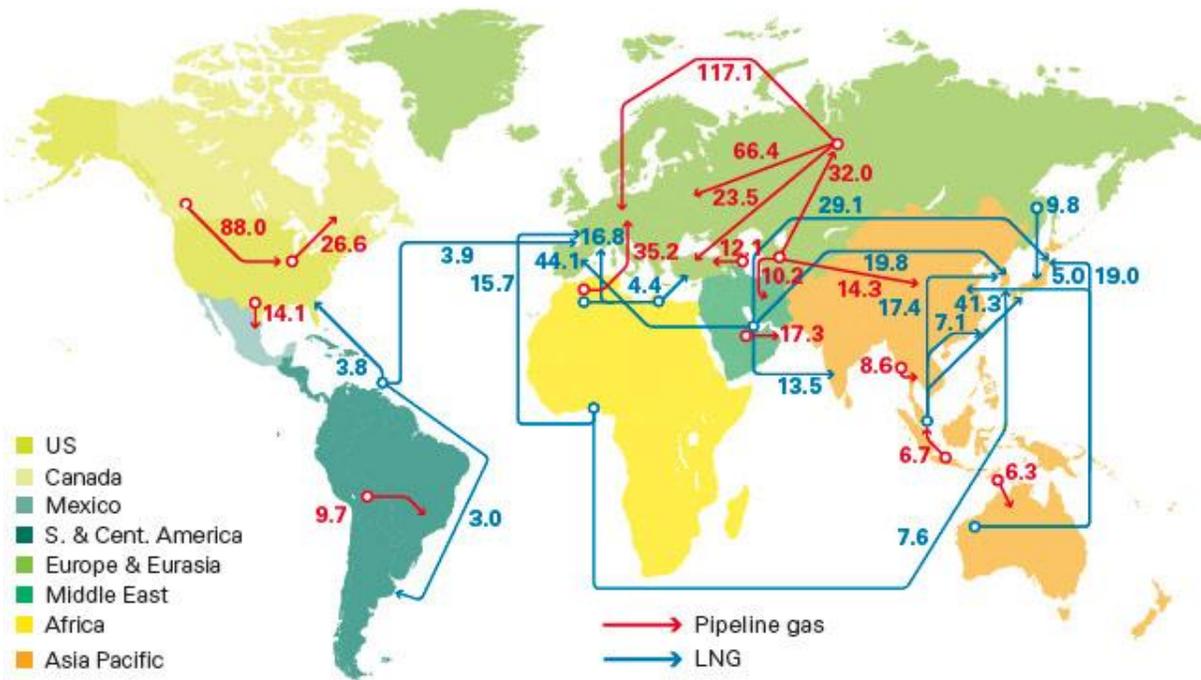
Given the undeniably activist posture of the Sierra Club, and the persistent and widely publicized judgments voiced by Representative Markey, it is important to note that several submissions to DOE by research-oriented groups took a far more nuanced stance in commenting on NERA’s pro-LNG export findings. Thus, staff members of the Peterson Institute for International Economics, in a forcefully argued filing, underscored the trade policy implications of a denial of LNG exports: “If the United States, acting through the DOE, decided to put substantial restrictions on US exports of LNG, that decision would stand in stark contrast to US opposition to export controls by foreign countries on their natural resources.” And the staff of the Bipartisan Policy Center (BPC) endorses NERA’s conclusions, highlighting them as “Consistent with BPC’s Analysis of the Economic Impacts of LNG Exports.”

In the wake of the EIA study but before issuance of NERA’s report, an analysis authored by Kenneth Medlock III, and issued by Rice University’s Baker Institute for Public Policy in August 2012, viewed the LNG export issue with particular attention to the world natural gas and LNG market with which US firms would have to compete. His close look at the world market context leads Medlock to a twofold, and somewhat paradoxical, finding: first, that the price impact of US exports will be moderate; but second, that that very outcome is, to a significant extent, the result

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<sup>4</sup> In response to a Federal Register notice, comments received are shown under DOE, Fossil Energy: Initial Comments on 2012 LNG Export Study.  
[http://www.fossil.energy.gov/programs/gasregulation/authorizations/export\\_study/export\\_study\\_initial\\_comments.html](http://www.fossil.energy.gov/programs/gasregulation/authorizations/export_study/export_study_initial_comments.html)  
<sup>5</sup> A bit earlier (Dec. 5, 2012), Sen. Wyden’s office issued a statement reflecting the senator’s view that, while allowing that “[f]orecasts and scenarios are worthwhile...it is critical that exports do not squeeze out or price out the billions of new, natural gas-related investments in the U.S. chemical, industrial, and electric generation sectors.”

of the foreign LNG supply curve being much more elastic than is commonly supposed, thereby limiting the volume of competitive US exports to a level lower than others have assumed. To be sure, he also judges the elasticity of America’s shale gas supply curve to be seriously underestimated. But, in the final analysis, he believes “that international market response will ultimately limit the amount” of US LNG exports. (Medlock, p. 33) (Figure 2 shows the prevailing global natural gas trading network.)

**Figure 2. Trade Flows Worldwide (2011; billion cubic meters)**



Note: Natural gas data is shown in billion cubic meters; 1 billion m<sup>3</sup> = 35 billion ft<sup>3</sup>.  
 Source: BP 2012.

In fairness to the NERA report to DOE, I note that it, too, examines world market natural gas conditions as a factor influencing one or more of its scenario outcomes. But in contrast to Medlock, who expresses his own judgment about *the* likeliest bottom line, NERA deals with an array of “if this, then that” possibilities, leaving it to the reader (or, perhaps more to the point, its client, DOE) to choose a preferred result.

A fourth major 2012 study was by the Brookings Institution’s Charles Ebinger and colleagues. In contrast to the other three studies reviewed, the Brookings effort did not involve the construction of a separate economic model; instead, it presents a critical review—and its own synoptic conclusions—based on a substantial body of other research consulted. Here are some principal findings:

[The] challenges to LNG exportation, including physical and human capacity and demands for natural gas from competing domestic sectors, are not insurmountable .... [In] light of current global supply and demand projections, some amount of US LNG exports is likely to be competitive in global markets .... US LNG exports are likely to have a modest upward impact on domestic prices, and a limited impact on the competitiveness of US industry and job creation .... US LNG [exports are] likely to make a positive, albeit relatively small, to the US gross domestic product ... [and] trade balance .... The study recommends that US policy makers should refrain from introducing legislation or regulations that would either promote or limit additional exports of LNG from the United States (Ebinger, Massey, and Avasarala, vi-vii).

That last observation reflects the authors' judgment that normal market signals—domestic and international—are adequate to the task of shaping decisions by gas producers and consumers broadly in the economic interest of American society. Alas, it has become abundantly clear that such reassurance is sharply questioned by several constituencies and by legislators staking out positions on their behalf, who concentrate not on the economywide impacts of LNG exports, but rather on the inescapable distributional consequences that resultant price increases will bring about: simply put, US natural gas producers will gain at the expense of US gas users.

Let's consider the circumstances confronting two gas-using constituencies: households and industry. Both will face gas price increases, their extent depending on a number of factors, including export volume, demand and supply responses, timing, and international gas market developments. That said, it is somewhat surprising—some would say reassuring to the household sector of society—that the magnitude of projected price increases I review above fall within a pretty narrow range whose median points to a price, a dozen or so years from now, approximately 15 percent above the baseline level of around \$5.12/mcf (expressed in 2010 dollars). To be sure, such an increase, measured against the persistently declining prices (to a level of below \$4/mcf) in the last few years can easily spur alarm over an imminent threat to consumer welfare, especially for households heating their homes with natural gas. But the broader perspective within which the situation should be viewed—the fact that even an elevated amount of exports will leave domestic prices well-contained and nowhere near a price approaching \$9/mcf in 2005—does not justify the alarmist tone taken by some legislators and others fearful of hardships ahead.

But such an alarmist tone is in fact reflected in the anti-export position separately embraced by an important segment of the industrial community. In a society that, however simplistically, is sometimes stereotyped as one composed of conflicting factional economic interests, it is quite unusual to witness, as has emerged in the LNG export situation, an *identity* of interests between households and a major manufacturing sector. The petrochemical industry is highly dependent on natural gas feedstocks in its production of a variety of outputs, such as plastics, fibers, resins,

polymers, and many others serving multiple markets (from agriculture to households) domestically and internationally. The large drop in gas prices in recent years has therefore been a boon to the industry's operations and has impelled it to voice sharp opposition to LNG exports. But, as with households, one will not find a nuanced distinction between genuine threats and minor irritants in terms of the sector's competitiveness. Astonishingly, veiled hints about having to relocate plants overseas—where gas prices are a large multiple of those in the United States (around five-to-one most recently)—have been part of the industry's script. Thus, Dow Chemical, a petrochemical giant, has unqualifiedly urged a cap on LNG exports, citing the importance of low and stable natural gas prices as vital to its own robust future. With little subtlety, the company suggests, more generally, that unrestricted LNG exports would symbolize the country's momentum toward a natural resource-based economy at the expense of a high value-added manufacturing society that has been its successful historical hallmark. It seems ironic, to say the least, that firms that, to their credit, have traditionally embraced free-trade philosophy, would advance such arguments.<sup>6</sup>

The NERA analysts obviously could not take up export-driven cost impacts on particular firms, although their study did estimate the extent to which an elevated gas price might depress output levels for energy-intensive firms as a group. The approximate range of such a decline varies from 0.5 to 0.8 percent below production levels otherwise prevailing. Although such a prospect cannot be casually swept aside, a reasonable characterization of what may be in store might temper the more hyperbolic scenario.

Although a number of other companies and some trade groups have either allied themselves with Dow or temporized on the issue, others have been outspoken proponents of LNG exports. Among that group we find ExxonMobil, the American Petroleum Institute, the US Chamber of Commerce, and the National Association of Manufacturers. (In protest, Dow dropped its membership in the latter.)

In the case of individual firms, like ExxonMobil and Shell, it isn't that such highly integrated and broad-based companies are not also major players in the petrochemical field. They are. But perhaps their coexisting and disproportionately important role as crude oil and natural gas producers shapes their stance on the LNG question.

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<sup>6</sup> Dow has expressed its reservations of LNG exports widely. Even well before release of the NERA report, of which the company turned out to be harshly critical, the company was steadfast in questioning the rationale for LNG exports. As quoted in the *Wall Street Journal* (Oct. 4, 2012), George Biltz, the company's vice president for energy and climate change, observed: "Do you grow the US economy, or do you send the gas over to other economies and help them grow?"

## THE SURROUNDING ENVIRONMENTAL DEBATE

The brewing political firestorm over LNG export plans is paralleled by dissent from prominent environmental interests. The intensity of that opposition is reflected in a kind of “heads-we-win, tails-you-lose” posture adopted by those groups. On the one hand, even prevailing shale gas extraction—never mind its further expansion—has raised health and safety concerns that need to be addressed. Examples include the threat of groundwater or surface water contamination; methane releases associated with drilling and pipeline connections; the possibility of seismic disturbance; and, more generally, the uncertain ability of localities to cope in a timely fashion with rapidly changing pressures on community resources and institutions. For a graphic example of such an adaptation challenge, one need only look at the problems encountered in another rapid resource startup boom—the shale oil bonanza of North Dakota (Brown 2013).

On the other hand, even if—as some environmental advocacy groups reckon—higher natural gas prices were to staunch such environmental threats because of reduced domestic demand, one can nevertheless foresee trouble. For if exports are sufficiently robust to push up domestic gas prices, then one can expect to find some reversion to coal in startup power plant decisions. And that situation, in turn, leads to higher CO<sub>2</sub> emissions than would otherwise prevail. Of these alternative positions, I believe that the case of increased coal represents by far the less persuasive scenario, perhaps even justifying an assertion that this argument is “frivolous.” But I leave it to the reader to ponder that possibility, noting only that any significant expansion of coal combustion flies in the face of EPA authority to effectively impose strict greenhouse gas emissions standards on any such decisions.

But the consequences of intensified shale gas production and fracking do merit attention, even though, as in this case, fears may be overstated. After all, given the time for the run-up to initial LNG export shipments and, beyond that, the multi-decadal life expectancy assumed in LNG terminal investment strategies, doesn’t it seem unreasonable to suppose that early resolution of the environmental impact dilemma could go hand-in-hand with pursuit of LNG-export plans?

## Conclusions

1. The preponderance of analyses point to significant net overall benefits to the US economy from permitting LNG exports, notwithstanding the prospect that, inescapably, there will be both winners and losers. Even so, it matters how the terms “winners” and “losers” are defined. If a household’s baseline frame of reference is *today’s* natural gas prices, any real price increase can be construed as a loss. But keep in mind that, compared to natural gas prices (and expectations) of a decade ago, even appreciable future price increases are likely to represent a win.

2. The projections reviewed here point to domestic price increases of a magnitude only moderately higher as a result of LNG exports. Moreover, over time, we are likely to see a self-correcting limit to an ever-expanding volume of US LNG exports. Growing overseas gas production will chip away at America's transitional advantage. Some post-Fukushima revival of Japan's nuclear power capacity may slacken that country's gas requirements. In other words, expect the large multiple between (low) US costs and (high) foreign prices to shrink.
3. The economic rationale for coal export plans seems unassailable, given the industry's domestic stagnation and continued demand growth abroad. Even if foreign coal combustion signifies rising greenhouse gas emissions, the United States has, at best, limited ability to control that outcome because the import needs of China, India, and other countries can be satisfied by non-US suppliers. Ultimately, it may take a multicountry global warming strategy for the world's major coal exporters to craft a joint approach to greenhouse management imperatives.
4. I leave it to legal scholars to parse federal statutes invoked to allow a presidential restriction on energy exports (recall Wyden and Markey 2012). The temptation to exploit the elasticity of the concept of "national interest" is understandable. But it may be risky if that policy route serves to provide cover for a disguised energy subsidy to domestic stakeholders that may—at the very least—violate the spirit, if not the letter, of our obligations under World Trade Organization rules. Recall how, a few years ago, Vladimir Putin (then in his first presidential term) disrupted westward-bound pipeline gas exports, apparently with the dual purpose of settling political scores with Ukraine and keeping prices low for Russian consumers. (A disrupted energy sector in several European countries was an additional consequence.) More recently, as recounted in an RFF study, China used its global monopoly position in certain rare-earth commodities to benefit its domestic firms by manipulating exports (Shih et al. 2012). Heavy-handed meddling in foreign trade is surely a direction in which the United States would not wish to head.
5. With respect to both gas and coal, environmental issues remain unsettled and deserve attention as part of the broad export debate. In the case of shale gas extraction, however, the challenge is almost entirely independent of the extent to which exports compound the problem. Exports, after all, will be a relatively modest add-on to the volume of output serving the domestic economy. In the case of coal, both magnitudes and logistical factors—increased Western surface mining, multiple train loads heading to Pacific export terminals, congestion in Oregon and Washington urban areas—constitute developments which, even if not unprecedented, are significant enough to trigger the purview of NEPA,

along with programmatic or project EIS oversight along various links in this lengthy and intricate supply chain.

6. Finally, it's worth flagging one of the sterile and dismissible arguments against LNG exports—namely, that energy independence, once so strenuously achieved, should not be diluted with cockamamie ideas like sharing some of our good fortune in the form of exports. Never mind that the economic payoff from exports, including side benefits such as a reduced trade deficit, are scarcely frivolous national goals. In any case, as Roger Sedjo and I have elsewhere argued with respect to oil,<sup>7</sup> neither does self-reliance, with all its economic benefits, magically immunize us against international energy shocks and security dilemmas; nor can we show that many years of import dependence exposed us to a persistent state of vulnerability. In short, reaping the rewards of LNG sales to the world market is not a perversion of our natural gas patrimony.

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<sup>7</sup> A four-part series by myself and Roger Sedjo on “Energy Independence – What Then?” can be found at [www.common-resources.org](http://www.common-resources.org). They were posted on the respective four dates of the series: Nov. 15, 2012, Nov. 27, Dec. 6, and Dec. 18. A related Common Resources blog by Roger Sedjo (“Can Fracking Achieve Climate Stabilization and Long-Term Energy Independence?”) was posted Jan. 15, 2013.

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