

Implications of Environmental Regulations for Shipping and Ports

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Introduction

Historically, regulations affecting oceangoing ships have focused on the safety of the ship and its cargo and the safety and welfare of the crew. Regulations to protect the environment are much more recent but increasingly prominent in maritime affairs. This paper examines the impact of environmental regulations on the shipping industry, at sea and in port. That the oceangoing shipping-port complex threatens the environment and human health is clear, and steps to mitigate these problems come from many directions. The danger is that the regulatory regime will be fragmented, complex and possibly undermine coherence and stability in the shipping industry.

I

Maritime shipping is now seen as a major source of environmental problems including atmospheric pollution. Oil leakage was the first widely recognized maritime environmental problem. Efforts to conclude an international agreement to control ocean oil pollution began in the 1920s, but only when the Torrey Canyon oil spill of 1967 showed the immense environmental damage that could result from an accident involving a single large oil tanker did protecting the marine environment become a major global concern. On a growing list of maritime environmental issues including, for example, the disposal of garbage at sea and the transport of invasive species in ballast water, atmospheric pollution quickly rose to the top.

Oceangoing cargo ships pollute the atmosphere because they burn “bunker”, the residual oil left at the end of the refining process which

contains high levels of contaminants.¹ The pollutants bunker fuel generates – mainly particulates (PM), sulfur oxides (SOx) and nitrogen oxides (NOx) – endangers human health. Because these vessels are often registered in countries with lower environmental or safety standards (“flags of convenience”) and pass through international waters, regulation has traditionally been lax.² Attention has been directed increasingly at ships’ greenhouse gas (GHG) emissions, mainly CO₂. International shipping is responsible for 2.5-3.5% of global CO₂ emissions – more than 20% of all transportation generated GHG emissions.

Pollution is not just about ships and bunker. The entire port operation, including ships, trucks, trains, and cargo-handling equipment, is now seen as a major source of pollution and GHG emissions. The combination of growing port activity, the densely populated regions where most ports are located, and the prevailing onshore wind patterns that accumulate rather than disperse port air pollution creates a “perfect storm” of threats to public health.³

Progress toward reducing this pollution has been slow, but efforts to grapple with the challenge of reducing air pollution from ports are gaining momentum. Public voices have become increasingly aggressive. The web site of the Harbor Vision Task Force’s (in San Pedro county, the home of the ports of Los Angeles and Long Beach) declares “Welcome to the ‘Diesel Death Zone’ – Air pollution related caused by the goods movement industry kills about 2400 people in Southern California every year—and the number is growing.” These views are not limited, of course, to California. The European Commission transport department states that “...50% of Europe’s air pollution will come from shipping by 2020 if nothing happens.

¹ Bunker can contain as much as 27,000 parts of sulfur per million — almost 2,000 times as much as would be allowed in trucks operating on U.S. roads. See James E. McCarthy, Air Pollution and Greenhouse Gas Emissions from Ships, Congressional Research Service, Report RL34548, (Dec 23, 2009) <http://www.cnire.org/nle/crsreports/10Jan/RL34548.pdf>

² See James Kanter, “Making Ships Green, in Port and at Sea” *New York Times* (April 26, 2008)

³ Cannon, “U.S. Container Ports and Air Pollution: A Perfect Storm”

Studies show that life expectancy in northern Europe could rise by 1.5 months in that time if we take real measures, which can be done more economically than land-based initiatives, but we need to act fast.”⁴

II

It is not difficult to think of ways to make cargo ships and ports cleaner. The “five Rs” apply. Refuel – that is, use a less polluting fuel than bunker; Replace – with more efficient diesel engines; Repower – change the propulsion system (to wind power, for example); Retrofit – with scrubbers of some sort; Repair/Rebuild – change ship manufacture or design. Some of these could be done fairly inexpensively; some would require much greater and more expensive changes.

With regard to ports, approaches to mitigation “encompass a range of possibilities from currently available, low-cost approaches, to more significant investments for cleaner air. Examples of the former include restrictions on truck idling and the use of low-sulfur diesel fuel; the latter includes shore-side power for docked ships, and alternative fuels.”⁵

Much effort is currently focused on cleaner fuel. The first steps were taken at the international level.⁶ The International Maritime Organization (IMO) coordinates international pollution standards for ocean-going ships with member nations. In 1997, the IMO’s 1973 agreement on Maritime Pollution (MARPOL) was extended to set modest controls on air pollution from ships (Annex VI). These standards were revised in 2008 to require more (though still limited) reductions in pollutants. In addition, a new framework for creating Environment Control Areas (ECAs) to provide more rigorous

⁴ “Green Ships: Politicians Ready if Industry Not”
<http://www.adverify.com/story.aspx?sid=211221>

⁵ Diane Bailey and Gina Solomon, “Pollution prevention at ports: clearing the air”,
Environmental Impact Assessment Review (24, 2004) p. 749
(<http://202.114.89.60/resource/pdf/1875.pdf>)

⁶ See James E. McCarthy, Air Pollution and Greenhouse Gas Emissions from Ships

reductions in pollution was put in place. Within an ECA, fuel would have to be over 60% cleaner than the 2010 global average and 96% cleaner in 2015, reducing pollution faster than under the baseline global standards. A US-Canada proposal to create an ECA off the coasts of both countries was approved by the IMO in July 2009 with formal adoption scheduled for 2010 and implementation likely in 2012. When fully implemented, the ECA requirements for engines and fuel would reduce NOx emissions by 80% from current levels, PM by 85% and SOx by 95%.⁷

Meanwhile, the US EPA, port cities, and states – while awaiting international agreement and congressional action – were taking action as well.

EPA's regulations announced on December 22, 2009 require significant reductions in NOx emissions and, with certain exceptions, in the use of low sulfur fuel from vessels using large marine diesel engines for US-flag vessels. The EPA says that these regulations will implement MARPOL Annex VI, which was signed into law in the United States on July 21, 2008 and which will apply to both U.S. and foreign-flag vessels. Once the Canada-US Emission Control Area goes into effect, both U.S. and foreign-flag vessels will have to meet these new standards up to 200 nautical miles off U.S. coasts.

On July 1, 2009 the California Air Resources Board effectively established a "mini-ECA". It introduced new regulations requiring ocean-going vessels operating within 24 nautical miles of California's coastline to use low sulfur fuel. Permitted levels of sulfur will decrease beginning January 1, 2012 and phased out once the stricter ECA limits come into force in 2015. This means that for three years, shippers will have to use a lower sulfur content fuel in California's coastal waters than elsewhere on the US or Canadian west coast.⁸

⁷ Janea Scott and Hilary Sinnamon, Protecting American Health from Global Shipping Pollution; Establishing an emission control area in U.S. waters, Environmental Defense Fund (2009) p. 2 www.edf.org/documents/9466_ECA_report_March2009.pdf

⁸ Emission Control Areas (ECAs) What you need to know; A SustainableShipping.com Briefing Paper (Aug 2009) http://origin.pmcndn.net/p/ss/library/docs/subscriber/ECAs_2009.pdf

None of these efforts deal with GHG emissions. Because most of this occurs in international waters, the focus has been again on international agreement. Rather than include oceangoing ship GHG emission on the Kyoto agenda, it was decided that IMO should take responsibility. But little progress has been made to date.⁹

At the same time as all of this was underway, efforts were being made to reduce air pollution and GHG emissions on the land side. California, as in many environmental cases, leads in identifying and implementing emission reduction measures applicable to shipping. In addition to the regulations on the use of lower sulfur fuel described above, the state also requires emission controls on harbor vessels and shore-side equipment, requires ships to use alternative (electric) power to ships while they are docked at marine terminals and has imposed stricter requirements for re-powering harbor craft and short-haul trucks with cleaner engines.¹⁰ These programs dealing with ports are a part of California's much wider effort to improve the state's transportation environmental performance. This includes its Goods Movement Action Plan (January 2005) which required the State Air Resources Board to establish a program for statewide greenhouse gas emissions reporting and to monitor and enforce compliance with this program; the Global Warming Solutions Act (September 2006) which capped California's greenhouse gas emissions at 1990 levels by 2020 and was the first enforceable state-wide program in the US to cap all GHG emissions from major industries that includes penalties for non-compliance; and California's Air Resources Board Emission Reduction Plan (April 2006) and the ARB's regulations in December 2008 to clean up pollution emission by large trucks. Finally, the Green Freight Initiative focuses on improving existing infrastructure in Southern California to accommodate the growth of goods movement in the region with efficient new highway and rail capacity and transportation technology.

III

⁹ James E. McCarthy, Air Pollution and Greenhouse Gas Emissions from Ships

¹⁰ McCarthy, Air Pollution and Greenhouse Gas Emissions from Ships

Efforts to mitigate ship and port produced pollution and emissions come from many directions. What seems to be emerging is a complex stew of regulations which threaten the coherence and stability of any regulatory regime. Shippers and port operators are pressed to take action but in an increasingly complex domestic and international regulatory environment. One cure creates another problem or opens a new opportunity. Externalities abound.

Let's begin with several basic operational issues.

First, it will take time and money to make whatever changes are required to the world's fleet of 55,000 oceangoing cargo ships. It is not possible to pump a different fuel into the same engine without making other adjustments. Maintenance and lubricants must be adjusted and, since it is by no means clear that ships will use low sulfur fuels through entire voyages, arrangements would be made in these cases for duplicate fuel and lubricant systems.¹¹ Moving quickly to a new generation of greener ships is not likely. Many newly built ships were laid up during the recession and, as demand rises, they will require extensive work to work in the new low sulfur environment.

The availability and price of low-sulfur fuel is much discussed. A report prepared for the San Pedro ports is optimistic: "it is reasonable to expect that bunker fuel producers will increase their supply to keep up with demand" and "even though there are indications that several bunkering ports might have a significantly short supply of low-sulfur DMA [marine gas oil, MGO], the ocean carriers should be able to plan and schedule their routes in advance so their vessels can be refueled at certain ports to maintain sufficient quantities of low-sulfur DMA prior to arriving at the San Pedro Bay ports," although the authors do acknowledge that "...current, future, and proposed low-sulfur fuel regulations at all levels of government, domestic and

¹¹ See "Low Sulfur Fuel; Impacts on the Marine Industry," ExxonMobil, Marine Lubricants
http://www.exxonmobil.com/lubes/exxonmobil/marine/files/LSF_Bulletin.pdf

international, may create competition for the low-sulfur DMA...”¹² One wonders if this level of optimism can possibly be justified. The American Petroleum Institute, for example, estimates that it would cost the fuel industry \$126 billion over 13 years to invest in equipment and chemicals to replace polluting bunker fuels with sufficient amounts of cleaner diesel to supply the shipping industry.¹³

Similar optimism is expressed on costs. The US-Canada ECA proposal states, “The costs of the proposed ECA are expected to be small compared to the improvements in air quality and compare favourably to the costs of land-based emission controls. In addition, they are expected to have a modest economic impact”.¹⁴ This is an interesting but problematic equation. The benefits are generalized public goods, but the costs are levied quite specifically on shippers. The generalized benefits do not “pay” for the cost of fuels and refitting older and building new ships. In addition, pressures will surely mount to make the “polluter pay” for at least some of the costs of reducing air pollution at ports – which will be on top of the cost of expanding and modernizing harbors, docks and transportation infrastructure.

More problematic than these operational issues is the emergence of increasingly complex, overlapping and even competing regulations. A market basket of regulatory agencies are all pitching in, from supranational (IMO but also UNCTAD), national (US EPA and other federal agencies), supranational regional (EU), state (California’s Air Resources Board), sub-national regional (San Pedro Bay County) and local (the ports of Los Angeles and Long Beach). This complex and unpredictable situation is made more problematic in the US by the culture of “adversarial legalism” (a term used to describe the legalistic, adversarial and expensive US regulatory system) and

¹² Final Report Low-Sulfur Marine Fuel Availability Study Prepared for Port of Long Beach and Port of Los Angeles by Tetra Tech and UltraSystems Environmental Incorporated (April 14, 2008) , p. v
(<http://www.polb.com/civica/filebank/blobdload.asp?BlobID=5086>)

¹³ Quoted in Kanter, “Making Ships Green, in Port and at Sea”

¹⁴ Emission Control Areas (ECAs) What you need to know; A SustainableShipping.com Briefing Paper

intensified by the extreme decentralization of the US federal system.¹⁵

The IMO, the US EPA, California, San Pedro county and the ports of Los Angeles and Long Beach all hope that their environmental regulations will mesh together and that these regimes will not conflict and undermine each other. Again, optimistic. We can envisage the possibility of increasing tension in maritime governance between these different foci of regulation. This would force the question of how regulatory coherence can be maintained through the system.

The case of dealing with oil spills is one example of regulatory complexity. The US International Safety Management Code, enforced since 1998, requires ships entering American ports to meet certain standards, including procedures for reporting accidents and requiring qualified crew. In 1990, the US enacted the Oil Pollution Act which required that oil tankers be double-hulled, and that existing single-hull tankers be phased out. California enacted the Oil Spill Prevention and Response Act in 1990, which established the Office of Oil Spill Prevention and Response within the Department of Fish and Game, which is authorized to direct spill response, cleanup, and natural resource damage assessment activities, as well as regulate all private vessels over 300 gross tons that enter California ports. This led the Intermodal Association of North America to complain that “the evolving patchwork of local, State and Federal clean air regulations will only serve to increase costs, decrease efficiencies, and ultimately balkanise operations for all participants. At a time when the economy is struggling to recover, injecting uncertainty into the stability and performance of our global supply chain is just bad business.”¹⁶

¹⁵ See Robert A. Kagan and Lee Axelrad, “Adversarial Legalism: An International Perspective,” in Pietro S. Nivola, ed., Comparative Disadvantages? Social Regulations and the Global Economy (Brookings Institution, 1997) Frank Manheim’s The Conflict Over Environmental Regulation in the United States (Spring 2009) pp. 86-109 is of particular interest here.

¹⁶ See “IANA Declares Support for ATA Lawsuit Against SoCal Port Concession Plans”

Europe does not do better in this regard. For example, here is a description of the process of ensuring safer bulk carrier operation: “...an IMO policy to ensure safer bulk carrier operation is enforced by EU policies accompanied by domestic interpretation through encouraging ship-owners to register their vessels with an EU flag, made nationally attractive through a member state designated tonnage tax which meets supra-national desires for a competitive playing field.”¹⁷

One answer to this emerging complexity would be a more deeply integrated international regime built around key supranational institutions which effectively represent a broad consensus of interests and values. In this scenario, it would be vital that there be an authoritative voice and uniform standards and that national governments and other stakeholders would be prepared to see their capacity for unilateral action diminished in the interest of system-wide coherence.

An IMO spokesperson states, “Considering the complexity and diversity of the [maritime] industry’s operations across numerous boundaries, unilateral action that would create a variety of national standards is anathema... For maritime interests, uniformity has been the battle cry in a struggle to retain free access to all of the world’s oceans and to prevent the imposition of uneven costs.”¹⁸ Another senior IMO administrator makes the same point: “the... IMO should always and without exception be regarded as the only forum where safety and pollution prevention standards affecting international shipping should be considered and adopted. Regional, let alone unilateral, application to foreign flag ships of national requirements which go beyond IMO standards would be detrimental to international shipping and should, therefore, be avoided.”¹⁹

http://test.intermodal.org/pressroom_files/press_releases/2008/prIANASupportsATA.shtml

¹⁷ Michael Roe and Evangelia Selkou, “Multi-Level Governance, Shipping Policy and Social Responsibility,” Presented at conference on Shipping in the era of Social Responsibility (Sept 2006), p.11

¹⁸ M’Gonigle and Zacher, p. 21

¹⁹ Efthimios E. Mitropoulos, Assistant Secretary-General, IMO, Mare Forum 2000: The Shipping Risk Management Forum, Quality Management versus Risk Finance in

Not everyone is convinced. Just imagine the response of the US Congress to this idea. Indeed, the tide seems to be moving in the opposite direction in the US. In July 2009, for example, Congressman Nadler introduced legislation that would allow state and local governments to set higher air quality standards than mandated by Washington for vehicles going in and out of ports.²⁰ While environmentalists favored the bill, transportation groups were opposed. On group states, “If successful, this effort will not improve air quality or security at our nation’s ports. But it will result in a return to fragmented and patchwork regulations over foreign and interstate commerce, contrary to the U.S. Constitution, acts of Congress, and common sense.”²¹ Europe is balky as well. The European Commission has said that if the IMO fails to make concrete proposals on carbon dioxide, it would consider regulating the matter itself, perhaps by including shipping in the European carbon trading system which would oblige ship owners to buy pollution permits from other sectors.²²

Much of the action on shipping and port pollution and GHG emissions is taking place at the regional level (EU, US-Canada) or, even more, at subnational levels – in particular at the level of individual ports. What the maritime world calls “port-centric governance” is becoming an increasingly important factor in international shipping.

We’ve discussed California’s role in efforts to control air pollution and GHG emissions. The ports of Long Beach and Los Angeles illustrate well the tendency to aggressive port leadership. For

Shipping, Sept 25-26, 2000, Athens Greece
(www.mareforum.com/MITROPOULOS%20Efthimios%20E.,%20IMO.htm)
²⁰ “Nadler Introduces Clean Ports Act to Allow Ports to Enforce Clean Truck Programs”
http://nadler.house.gov/index.php?option=com_content&task=view&id=1525&Itemid=119
²¹ Eric Miller, “Bill Would Let Ports Set Rules On Environmental Standards”
Allbusiness.com (August 9, 2010) <http://www.allbusiness.com/legal/environmental-law-us-environmental/15015653-1.html>
²² James Kanter, “Making Ships Green, in Port and at Sea”

example, the San Pedro Bay Ports Clean Air Action Plan proposes hundreds of millions of dollars in investments by the ports, the local air district, the state, and port-related industry to cut particulate matter pollution from all port-related sources by at least 47% within the next five years. Measures to be implemented under the plan also will reduce smog forming nitrogen oxide emissions by more than 45%, and will also result in reductions of sulfur oxides by at least 52%.²³

The Mayor of Long Beach tells a journalist that he had met with the IMO to encourage them to adopt stricter pollution standards. However, Long Beach “has not signed on to the IMO” because the ports of San Pedro are so far ahead of IMO’s loose regulations that doing so would bring them backwards. “Other ports don’t have the wherewithal, but that doesn’t mean that we should be limited. We’re well beyond where the IMO wants to go. You’re not gonna impose the same standard right now. You should push that a little bit but can’t expect other ports worldwide with fewer resources to meet that. I want to be able to protect our flexibility in dealing with our problem as we see fit.”²⁴ Similarly, the president of the Port of Los Angeles Harbor Commission states, “We’re the landlord of this huge operation.....They’re all tenants. They all want a few more acres, they want a concession. Let me tell you, folks, they’re not going to get it unless they clean up.”²⁵

IV

This all leads to broader questions to ponder. Regulators and environmentalists tend to assume, it appears, that shipping routes are fairly fixed and that exporters, importers and shippers will find ways to deal with new requirements, regulations and costs. This is not likely to be the case.

²³ See the 340 page San Pedro Ports Clean Air Action Plan (www.cleanairactionplan.org/civica/filebank/blobdload.asp?BlobID=2425)

²⁴ Mara Schechter, “Commentary: The Port of Long Beach Hoists the Green Flag An Environmental Turnover in One of the Dirtiest Industries,” Emagazine.com, nd (<http://www.emagazine.com/view/?4374&printview&imagesoff>)

²⁵ Elizabeth Shogren, “California Aims to Slash Port Pollution” (National Public Radio, May 30, 2006) <http://www.npr.org/templates/story/story.php?storyId=5438620>

How do shippers respond? Where cargo is “discretionary” – that is, where freight is destined for places far from the port of entry – shippers might have room for choice. Certainly there has been intense competition among West Coast ports for China trade.²⁶ And when players are 800 pound gorillas, they can do pretty much what they want. Wal-Mart Stores, for example, went from shipping 80% of its freight through Southern California in 2002 to 15% in 2009.²⁷ Sometimes, room for choice is limited. In a recent interview, the captain of a large container ship, the MOL Efficiency²⁸, says he has already tried lower-sulfur fuel in his engines, and it works. “We can use [it], no problem,” he says. “The problem is cost.” But if that’s the price of entry into the Port of Los Angeles, his company, Mitsui OSK Lines, is ready to pay it because this is where they do the most business.²⁹

The impact on routes may be profound. A serious threat would be regulatory regime “shopping” in which ports attract shippers by offering lower environmental standards. This seems fairly unlikely. But another change is perhaps more so. Given rising local opposition to port development and expansion and changing land use patterns, the era of the historical port city (that is, where the city grew around the port) may be coming to an end. Perhaps more remote ports which are not embedded in the middle of a large population center are the next stage. One the key advantages of Prince Rupert Port or the proposed Mexican megaport at Punta Colonet is that they are not subject to the hassles of operating in the middle of a large community.

Cost will be critical. Fuel use and GHG emissions can be reduced by sailing to closer ports (advantage to Prince Rupert Port or Halifax).

²⁶ See Jessica Brice, “Ports make improvements to lure lucrative China trade,” *Bloomberg News* (Aug 21, 2005)

http://www.ilwu10.org/news/documents/ports_make_improvements.pdf

²⁷ Nicholas Casey, “Los Angeles Port’s Rivals Make Gains,” *Wall Street Journal* (April 14, 2009) <http://online.wsj.com/article/SB123966509693815117.html>

²⁸ For a sense of how hard it is to regulate oceangoing ships: MOL is an Indian-based wholly owned subsidiary of a Japanese firm, Mitsui OSK Lines, whose liner division is headquartered in Hong Kong. This vessel is flagged in Panama.

²⁹ Shogren, “California Aims to Slash Port Pollution”

Another way to do the same is to operate at lower speeds (“slow steaming”). The combination of higher fuel costs, greater expense to meet environmental requirements and slow steaming may well alter the global production-container game plan that emerged in the last decades of the 20th century. This conjuncture may, for example, hasten the regionalization of production networks, moving Chinese production to Mexico, for example. Another possibility might be the emergence of vast regional hubs – in Panama or the Caribbean – serviced by enormous container ships shuttling from Asian ports through the Panama Canal, which would trans-ship goods to ports on the east coast of North America by smaller, faster and fuel efficient liners.

From a Porter-esque perspective, one can certainly see that changing environmental requirements could spur innovation in ship and engine design and fuel technology. One author notes that "environmental politics is a blessing for forward-thinking naval architects, designers and technology companies. Shipping faces a decade of legislative changes, some of which are already written while some have yet to be decided on, but all of which will make some of the biggest changes the industry has seen since the invention of the diesel engine 100 years ago. Not everyone is happy with the prospect and some are sceptical of its worth. Nevertheless, changing rules are bringing new technologies into the world's fleet, putting novel ship designs on the table and, most radically, raising suggestions for new fuel types."³⁰ In this sense, new environmental regulations may mark the end of an era of traditional shipping.

A critical change has taken place in the structure of port stakeholders. Stakeholders in the shipping community long agreed on key values – expanding trade, more efficient operations, profitability and safety for vessels and crews. Rising concern about the impact of ships and shipping on the environment and the changing structure of the shipping industry have made this a more problematic relationship.

³⁰ Craig Eason, “Changing rules on emissions spur innovation in design and fuel types”, *Lloyd's List* (3 December 2010) p 4
www.imo.org/KnowledgeCentre/CurrentAwarenessBulletin/Documents/CAB%20170%20December%202010.pdf

Stakeholders who play a growing role in port systems may not share these values. The traditional messiness of ports was the price paid for jobs and income. Environmental groups may be less committed to these objectives if they feel the environmental sustainability of their communities is compromised. Increasing trade and growing ports is a matter of great contention

In the interview cited earlier, the Long Beach Mayor says, “I can’t in good conscience talk to people about expanding the port unless it gets cleaner.” The Port has said that it hopes to lower emissions by 50% even while cargo doubles, which he calls “a great start.” But he keeps thinking, “What would you tell families around the Port with young children with asthma [and other diseases]? Is it worth it? [We’re] not willing to tolerate growth at any price anymore” the Mayor said, “My first job as mayor of Long Beach is to protect the health and safety of my citizens. In my city, families that live along the trade corridors have two to three times the statewide average of asthma cases. That’s not an accident... we are not going to allow kids in Long Beach to contract asthma so someone in Kansas can get a cheaper television set. Those days are over.”³¹

New financial players have also begun to emerge as stakeholders in the maritime industry. These institutions may have no historical stakes in maritime world but are investors who see ships and ports as financial assets and have little loyalty beyond a port’s asset value at a given moment. This would raise many new questions. What impact, for example, would mergers and e-commerce have on competition in maritime industries?

Today’s mergers and e-commerce technology may concentrate market power in a limited number of carrier groups and could undo the competition resulting from economic deregulation. Will there be a need for re-regulation to preserve competition under the new regime? The industry is still working its way through a period of intense market-driven mergers as carriers search for

³¹ Schechter, “Commentary: The Port of Long Beach Hoists the Green Flag An Environmental Turnover in One of the Dirtiest Industries”

economies of scale and scope that will allow them to compete and survive in the larger national, North American, and global markets. The broad characteristics of the new business models parallel the transformations taking place in the automobile, banking, and telecommunications industries. The new business models are likely to be consolidated (through another round of mergers), international, asset-based, and information driven. How might re-regulation affect productivity?³²

Conclusion

The oceangoing shipping-ports complex is a major source of environmental damage and health risk. Many new regulations are directed at the shipping industry by many regulatory agencies operating at various local, regional, national and supranational levels. Looking forward, we can think of several possible future scenarios for the shipping-port regulatory regime. One, a single international regime, seems most unlikely. A more malign scenario could be imagined as fragmentation and competition of maritime regulatory regimes intensified and drove shippers to seek the bottom of the regulatory market. More likely, would be a third scenario in which the existing system of multi-level governance continues. The very complexity of the system permits adaptation as players and different levels of governments strengthen or weaken, and as institutions such as IMO continue to be viewed as legitimate and useful. We might see the system shifting to a new equilibrium with a larger national government role without changing the fundamental rules or aims of the game. The role of regional organizations (such as EU) and local governments (such as the port of Long Beach) might increase. The danger, of course, is that the patchwork quality of regulation and enforcement could worsen and balkanization of the maritime regulatory system increase.

³² US Department of Transportation, Federal Highway Administration, "Regulation: From Economic Deregulation to Safety Regulation"