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# Motivations for self-regulation: The clean air action plan

Genevieve Giuliano<sup>a,\*</sup>, Alison Linder<sup>b,1</sup><sup>a</sup> SolPrice School of Public Policy, University of Southern California, Los Angeles, CA 90089-0626, United States<sup>b</sup> University of Southern California and Southern California Association of Governments, 818W 7th Street Suite 1200, Los Angeles, CA 90017-3435, United States

## HIGHLIGHTS

- We conduct a case study of self-regulation for emissions reduction at seaports in Southern California.
- We examine motivations for implementing the Clean Air Action Plan.
- We find that social and political pressures were the main motivators, with regulatory threats a contributing factor.
- The Clean Air Action Plan is a powerful example of the potential of voluntary strategies.

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## ABSTRACT

In the fall of 2006 the Ports of Long Beach and Los Angeles announced the Clean Air Action Plan (CAAP). Its intent was to greatly accelerate emissions reductions from port activities. The CAAP was unprecedented in several ways: it was a voluntary agreement between two competing ports; it was achieved with the cooperation of local, state and federal agencies; it promised large particulate emissions reductions along with continued port growth, and it had a price tag of \$2.1 billion. What explains the Ports' decision to implement the CAAP? We conduct a case study to explore alternative explanations for the CAAP. Using data from interviews, media, and the history of events leading up to the CAAP, we find that the CAAP was a strategic response to social and political pressures that had built up over the previous decade. Its intent was to respond to local concerns and reduce opposition to port growth. The CAAP represents an example of the potential of voluntary efforts to solve environmental problems.

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## 1. Introduction

In the fall of 2006 the Ports of Los Angeles and Long Beach (POLA/POLB) announced the establishment of the Clean Air Action Plan (CAAP). The CAAP was unprecedented in several ways: it was a voluntary agreement between two competing ports; it was achieved with the cooperation of local, state and federal agencies; it promised large particulate emissions reductions along with continued port growth, and it had an expected price tag of \$2.1 billion. An environmental mitigation plan of this magnitude merits study. What explains such historically unprecedented action?

We consider the CAAP an example of self-regulation, and we use the literature on environmentally responsible behavior of firms to explain the ports' actions. The CAAP is important as an indicator of how port-related environmental problems may be

addressed. It also may provide insights on how collaborative, voluntary programs may address other environmental problems that extend beyond traditional jurisdictional boundaries and hence are difficult to address via conventional government regulation. This paper presents results from a larger study of the motivations, development process, and outcomes of the CAAP (Giuliano and Linder, 2011). Here we explore the motivations of the ports in developing and implementing the CAAP via a qualitative case study. The remainder of this paper is organized as follows. Section 2 provides background on the Southern California context and describes the CAAP. Section 3 summarizes the theoretical literature on environmentally responsible behavior of firms. Section 4 describes our methods and data. Our results are presented in Section 5, and the paper closes with observations and conclusions in Section 6.

## 2. Background

Until the recession of 2008, US foreign trade was on a steep growth trajectory. US total foreign merchandise trade increased

\* Corresponding author. Tel.: +1 213 740 3956; fax: +1 213 740 0001.

E-mail addresses: [giuliano@usc.edu](mailto:giuliano@usc.edu) (G. Giuliano),[alisonlinder@yahoo.com](mailto:alisonlinder@yahoo.com) (A. Linder).<sup>1</sup> Tel.: +1 213 236 1800.

from \$1.6 trillion to 3.4 trillion (in current dollars) between 1998 and 2008 (Federal Highway Administration, 2009). US total foreign trade as a share of gross domestic product (GDP) increased from 26% in 2000 to 30.1% in 2008, with goods making up nearly 80% (Bureau of Economic Analysis, 2011). International merchandise trade is relatively concentrated: the top 10 gateways account for about 44% of all trade (Federal Highway Administration, 2009). Container trade is even more concentrated; the top five container port complexes account for nearly 70% of all container trade, and POLA/POLB alone account for 35%.<sup>2</sup>

### 2.1. Impacts on the Los Angeles region

Growth in trade has generated substantial benefits and costs for local residents. On the positive side, it is estimated that the logistics sector accounts for about 585,000 jobs (1 in every 12 jobs in the region), and provides significant tax revenue to local governments (Chang, 2005). However, these economic benefits come with large costs: congestion, air pollution, noise, and other impacts on local quality of life. Erie (2004) has observed that international trade creates policy dilemmas because the benefits are dispersed (in this case lower prices for goods and services throughout the US) and the costs are concentrated. Benefits and costs may also be unevenly distributed within metropolitan areas. Neighborhoods suffering the greatest negative impacts may not be receiving the benefits of port-related jobs. The dilemma is particularly strong for local public officials, who are dependent upon trade for tax revenue and economic development, but at the same time must respond to legitimate and growing citizen concerns.

Perhaps the most serious impact of increased trade is air pollution. The ports are the largest single source of emissions, in part because of jurisdictional problems. The local air district, South Coast Air Quality Management District (SCAQMD), does not have jurisdiction over ships or trains. Ships use high sulfur content “bunker fuel,” the cheapest form of diesel. They emit some 23 t of sulfur oxides on a daily basis in Southern California and are responsible for almost 60% of the ports’ diesel emissions (Hanson, 2006). Adding to the problem are the unique characteristics of the port drayage segment of the trucking industry which has resulted in an older (and dirtier) heavy duty diesel truck (HDDT) vehicle fleet.

The environmental impacts of port-related trade are spatially concentrated: communities surrounding the ports and along the main rail and truck corridors suffer the highest concentrations of air pollution and the most truck and rail traffic. Residents are disproportionately low income and of minority status, generating a serious environmental justice problem.

### 2.2. Institutional context

There are two key aspects of the institutional environment that help to explain the challenge of port-related air pollution externalities. The first is the historical independence of ports. Though quasi-governmental agencies, ports have considerable independent authority. As special authorities, they have substantial autonomy, as will be explained in Section 3.1. Cities typically desire port growth because of the associated economic benefits of maritime trade such

<sup>2</sup> Data sources: [http://www.marad.dot.gov/documents/U.S.\\_Waterborne\\_Foreign\\_Trade\\_by\\_Custom\\_District.XLS](http://www.marad.dot.gov/documents/U.S._Waterborne_Foreign_Trade_by_Custom_District.XLS), [http://www.bts.gov/publications/national\\_transportation\\_statistics/2008/excel/table\\_01\\_47.xls](http://www.bts.gov/publications/national_transportation_statistics/2008/excel/table_01_47.xls)[http://www.marad.dot.gov/documents/U.S.\\_Waterborne\\_Foreign\\_Trade\\_by\\_Custom\\_District.XLS](http://www.marad.dot.gov/documents/U.S._Waterborne_Foreign_Trade_by_Custom_District.XLS), [http://www.bts.gov/publications/national\\_transportation\\_statistics/2008/excel/table\\_01\\_47.xls](http://www.bts.gov/publications/national_transportation_statistics/2008/excel/table_01_47.xls).

as increased employment and tax revenues<sup>3</sup>. Indeed, many US ports are subsidized via infrastructure investment, reduced service fees and other means as regions compete for port-related growth. Because of these competitive pressures (or the threat of such pressures), the ports have been able to resist and even bypass environmental requirements on several occasions in the past (Erie, 2004).

Second, there is the fragmented regulatory environment in international trade. Ports are part of a complex global supply chain that includes ships, trains, trucks, and on-dock equipment. In the Los Angeles Region, authority over emissions depends upon the source and is shared among federal, state and local agencies. Trucks are regulated by the state, because California was granted a federal waiver to do so. Off-road vehicles and harbor craft are regulated jointly by the state and federal government. Railroad locomotives are subject only to federal regulation.

Ships are subject to standards by national flag of origin. The ships calling at POLA/POLB are foreign flag, and hence not subject to US regulation. An area of uncertainty is the extent to which national and state governments have regulatory authority within coastal waters. As a result of the fragmented regulatory environment, efforts to reduce emissions have taken place through political and legal processes, including legislation and environmental lawsuits.

### 2.3. The CAAP

The purpose of the Clean Air Action Plan was to reduce port-related emissions by nearly half within five years, far beyond what would have been achieved by existing and planned federal, state and local regulation standards. Specifically, the CAAP sought to reduce particulate matter (PM) by 47%, oxides of nitrogen (NO<sub>x</sub>) by 45%, and oxides of sulfur (SO<sub>x</sub>) by 52% from 2005 levels (POLA and POLB, 2006). The CAAP, officially passed in 2006, was a five year plan. Outcomes of the plan were to be evaluated at the end of the five years, and in 2010 an updated CAAP was established.

The CAAP is organized around the primary emissions sources at the ports, including heavy duty vehicles (HDV), ocean going vessels (OGV) cargo handling equipment (CHE), harbor craft, and rail. Additional commitments include an update of port-wide construction standards, a Technology Advancement Program (TAP), and an Infrastructure and Operational Efficiency Improvements Initiative. There are 13 source specific control measures. Table 1 summarizes the control measures by source and gives costs as estimated by POLA and POLB.

The list of control measures and allocation of costs was the result of a long negotiation process led by the ports (Giuliano and Linder, 2011). By far the most ambitious and costly measure is the conversion of the drayage truck fleet, known as the Clean Truck Program (CTP) and accounting for about 90% of the total cost. The CTP calls for replacement of the entire drayage truck fleet, which number about 7000 “frequent trucks” and 9800 “semi-frequent trucks” (POLA and POLB, 2010). Another ambitious measure is the goal of using shore power or equivalent at most terminals within 5–10 years. This requires electrification of berths and retrofitting of OGVs to operate on electric power. The cost estimates in Table 1 do not include the full costs of CAAP. The plan listed costs expected to be incurred by the ports and selected other sources. Private costs are not included. CHE, trucks and harbor craft costs, for example, were expected to be incurred by the equipment owners. Rail and vessel owners and operators would

<sup>3</sup> In some cases cities may prefer other types of coastal development and displace port activity, as in San Francisco and Baltimore. This tends to happen when ports are not profitable and in decline.

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