
Assessing Environmental Policy Tools

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Abstract: The problem of environmental degradation and crisis is a hot issue in contemporary policy area. Environmental problem, furthermore, is one typical case of market failure. Hence, market does not have any motivation to address environmental problem without governmental intervention. It is desirable to address this issue by making public-private partnership, however, in that the whole society including a state, company, and individual addresses this problem altogether to the extent that it cannot be solved solely either by the logic of market or governmental intervention. Likewise, almost industrialized countries make efforts to mitigate environmental problems with various policy tools moving beyond traditional policy.

I especially focus on three policy programs such as regulation (AB-1493, California), tax incentive (the GBTC, New York), and quasi-market approach (the Clean Air Act of 1990), by which the United States strive to protect environment, and then compare the policies, based on criteria for evaluation. The criteria consist of effectiveness, efficiency, legitimacy, and equity. I then add supplement criteria of generality, contextuality, and complementarities. The upshot of this paper is that effective and efficient administrative management can be achieved through crafting policy tools carefully considering specific conditions and situations for policy area, with emphasizing negotiation, persuasion, and public-private partnership rather than traditional command and control or 'governance without government.

Key words: environmental policy, regulation, incentive, quasi-market-based approach

I . Introduction

Addressing environmental degradation and crisis is a hot issue in contemporary policy area both at domestic and international level. At the international level, for example, the Kyoto Protocol that commenced negotiation amongst 160 countries in December 1997 came to take effect on February 16, 2005 according to Russia's joining the treaty. Regardless of ratification of international environmental treaties, however, almost industrialized countries domestically address environmental problems. One typical example is the United States. Although the U.S. withdrew ratification of the Kyoto treaty, many states and municipalities of the U.S. actually address this issue as well as other environmental issues more effectively than countries that ratify the treaty. In this respect, it needs to analyze how the U.S. federal government, states, and local government actually grapple with environmental problems. In addition, environmental issue is said to be a typical case of market failure. Were it not for governmental intervention, market does not have any motivation to address environmental problem. It is required that the whole society including a state, company, and individual addresses this problem altogether to the extent that it cannot be solved solely either by the logic of market or governmental intervention. Therefore, this issue area requires more importantly public-private partnership.

I focus on how both federal and local governments in the United States strive to protect environment with what policy tools, and then compare the policies implemented by both federal and state level in the United States, based on criteria for evaluation. The criteria consist of effectiveness, efficiency, legitimacy, and equity. I then add supplement criteria of generality, contextuality, and complementarities.

II. Environmental policy tools: Regulation, Incentive, and Quasi-Market approach

The trends of environmental policy of the United States, for Peterson (2004), have evolved to the direction that focuses more on “conflict resolution between energy policy and climate policy,” pursues co-benefits in the decision making process, and brings an effect of “consensus building on actions involving regional markets”(Peterson 2004: 112-114) from adhering to traditional command and control approach.

There may be various policy tools for addressing environment problem; at the state level, for example, enacting law to regulate greenhouse gases such as regulation on emission standards for motor vehicles (California), energy efficient building code policies, and regulations requiring power plants to reduce emissions of CO₂ (Pennsylvania) is an example of regulatory approaches on the other hand, incentive based programs include “Green building tax credit program” of the New York state, environmental taxes provided for competitiveness, funding for renewable power generation and energy efficiency, rebates for customer owned solar and wind systems, purchasing CO₂ credits, renewable power, and some portion of energy from nonpolluting sources. At the federal level, “the Clean Air Act” is a representative new policy tool of ‘emission trading,’ based on the idea of quasi-market based approach. There is also direct government such as a project for developing mass-transportation in order to encourage people to take mass transportation and thereby reduce CO₂ emissions from motor vehicles. In this paper, however, I examine policy tools that represent three policy programs; regulation (AB-1493, California), tax incentive (the GBTC, New York), and quasi-market approach (the Clean Air Act of 1990) because; these tools are typical policy

tools of, respectively, traditional, moderate, and market oriented approach; they may allow policy-designer or -maker to assess both strengths and weaknesses of each approach; finally, these approaches reflect evolution of public policies from 'government' to 'governance.' The three tools also share commonly ultimate goals of raising energy efficiency and whereby mitigating environmental degradation. Furthermore, the AB-1493, particularly, shows how contemporary regulation policies are designed in order for flexible implementation.

2.1. Regulation: AB-1493 (California state regulations to reduce greenhouse gas emissions from new motor vehicles)

The AB-1493 is based on acknowledge of substantial and potential effect of climate change and economic impact of the regulation. Climate change caused mainly by GHG emission directly affects public life of California because; it reduces spring snowmelt so that it may create both water shortage and potential flood; rising sea levels would affect some regions and cities of California regional climate change will adversely affect agriculture. There may be also indirect negative impacts on public life See more impacts on the public life². These reasons provide the regulation with high support of public.

2.1.1. Basic Idea

Regulation is a traditional tool that impels individuals, firms, or lower levels of government to change their behavior by enforcement so as to improve social good and welfare. "Social regu-

2. See more impacts on the public life living in California of climate change, in *AB 1493 Draft Staff Report: Maximum Feasible and Cost-Effective Reduction of Greenhouse Gas Emissions from Motor Vehicles*, California Air Resources Board, June 14, 2004, http://www.arb.ca.gov/cc/factsheets/cc_isor.pdf .

lations are aimed at preventing harm to the public. Social regulation is aimed at restricting behaviors that directly threaten public health, safety, unhealthy living conditions, and social exclusion” (May 2002: 157). For May, there are some elements of social regulation; first, “rules that govern expected behaviors or outcomes,” second, “standards that serve as benchmarks for compliance,” third, “sanctions for noncompliance with the rules,” and “administrative apparatus that enforces the rules and administers sanctions” (Ibid: 158). AB-1493 is a regulation that has the above attributes, but it also has different aspects from traditional one. For California Air Resources Boards, it has various programs in order to complement weakness of regulation. For instance, the ARB encourages the regulated automobile manufacturers to comply with the regulation through supporting them by technical assistance.

2.1.2. Policy Goals

AB-1493 was designed to address the global warming through reducing the Greenhouse gases (GHG) emissions from motor vehicles. “The standards adopted by the Board phase in during the 2009 through 2016 model years. When fully phased in, the near term (2009-2012) standards will result in about a 22 percent reduction as compared to the 2002 fleet, and the mid-term (2013-2016) standards will result in about a 30 percent reduction” (California Air Resources Board 2004a: 2). This regulation also aims to bring out economic benefit to the state and spillover effect over other states in the United States. “The long-standing technology-forcing role of the regulation” is another goal of this act (Ibid: 4).

2.1.3. Resources

The California state established the California Climate Action Registry for practicing protection of climate change, with advisory

function of the California Air Resources Board. The California Air Resources Board (ARB) is responsible for adopting, designing, and assessing the regulation, and making partnership for the regulation. The ARB makes partnership with the California Energy Commission, the California Climate Action Registry, and automobile manufacturers.

Regarding to normative resources of the regulation, the AB-1493 to control GHG emission is strongly supported by Californian. "The July2004 Special Survey on Californians and the Environment, conducted by the Public Policy Institute of California, found that eight in ten Californians support the state law that requires automakers to further reduce the emission of greenhouse gases from new cars in California by 2009" (California Air Resources Board 2004a; 1). Both sizes of California's economy and consumption of automobile may be another source that makes the regulation viable. For example, California State motor vehicle registration consists of thirteen percentages of total motor vehicles registered in the United States.³ Therefore, its requirement on motor vehicle emission standards must affect the technology and business strategy of automobile manufacturers.

2.1.4. Scenario for success

The AB-1493 is a regulation that enforces the regulated to meet the standard required. However, this program differs from traditional command and control approach of regulation. For example, the AB-1493 will come into effect in 2006 and apply to

3. According to Statistical Abstract of the United States: 2003, published by U.S. Census Bureau, the number of motor vehicles registered in California is 28,780,000. It composes of thirteen percent of, 230,428,000, total motor vehicles registered in the U.S. See more information in U.S. Census Bureau, Statistical Abstract of the United States: 2003, <http://www.census.gov/prod/www/statistical-abstract-04.html>

new vehicles with 2009 model. It allows automobile company to develop appropriate technologies that can meet this standard with cost-effectiveness. Several technologies that would be developed both by this regulation and company's adjustment of this regulation provides significant reductions in GHG at reasonable costs. Although the costs for developing new energy efficient vehicles may increase the price of the motor vehicles so that consumer may pay more money for buying the vehicles, "these technology improvements will also reduce the operating cost of the vehicles"(California Air Resources Board 2004a: 3). As a result, the regulation is to reduce GHG emission and thereby contribute to mitigating climate change while creating economic benefit both to citizens and to the state. Furthermore, to the extent that GHG emission and climate change cannot be solved by isolated endeavor of a state, it is expected that the regulation is to spill over other states and countries as new technologies develop. Consequently, this "longstanding technology-forcing role of California" (Ibid: 4) results in substantial reduction of GHG emission in both national and global level.

2.1.5. Evaluation

Effectiveness

The effectiveness of social regulations depends on three factors; 1) "the reasonableness of what is required," 2) "the ability and willingness of regulated entities to comply," and 3) "the adequacy of resources for enforcement and for inducing compliance through facilitative actions"(May 2002: 177).

Table 1 shows the specific requirement of this regulation. While it takes effect in January 2006, its standards will be applied from 2009 so that it allows both consumers and especially automobile manufactures to have time for preparing it. Its requirement of standard increases quite gradually. In relation to technology for meeting the standards, ARB staff reports that

technology for meeting the standard has already been developed and it is used even now if the cost for vehicles that are applied the new technology is not considered (California Air Resources Board 2004b). In addition, AB-1493 requires “the regulations to provide flexibility, to the maximum extent feasible, in the means by which a person may comply with those regulations” (Pavley 2002: 3). Finally the regulation is designed and opened, with considering its economic impact. According to researches conducted by California Climate Change Center of UC at Berkeley, while this regulation may increase the price of new vehicles, technologies employed are expected to reduce operating costs and thereby offset the expected increase of price (Roland-Holst, 2006a: 2-20). For automobile manufacturers’ side, however, compliance of this regulation should require costs. As a result, the Alliance of Automobile Manufacturers (AAM) suited the AB-1493 in 2004. In order to cope with the resist and to implement the regulation synergistically, the ARB seeks for providing technological supports and evaluations for automobile manufacturers. These steps and measures are to make the regulation effective and manageable.

Table 1. The specific standards required by AB-1493

Tier	Year	CO ₂ -equivalent emission standard (g/mi)	
		PC/LDT1 (Passenger cars and small trucks/SUVs)	LDT2 (Large trucks/SUVs)
Near-term	2009	323	439
	2010	301	420
	2011	267	390
	2012	233	361
Mid-term	2013	227	355
	2014	222	350
	2015	213	341
	2016	205	332

Source: *AB 1493 Draft Staff Report*: Maximum Feasible and Cost-Effective Reduction of Greenhouse from Motor Vehicles, California Air Resources Board, June 14, 2004, http://www.arb.ca.gov/cc/factsheets/cc_isor.pdf.

Efficiency

Efficiency of regulation can be assessed by “the overall efficiency of regulatory efforts measured by calculations of the net benefits of regulation” and “the cost for governmental agencies and for regulated entities” (May 2002: 178). California Air Resources Board estimates the regulation will reduce GHG emission by an 18% in 2020 and a 27% reduction in 2030. To draw on a policy research employing the Berkeley Energy and Resources (BEAR) model (Roland-Holst 2006b), it is expected that effect of GHG reduction will be 31% in 2020 (Roland-Holst 2006a: 2-21). The net effect of the regulation on the economy is an increase of “jobs by 3,000 in 2010, by 53,000 in 2020, and by 77,000 in 2030” (California Air Resources Board 2004a: 3) through savings from reduced vehicles operating costs (California Air Resources Board 2004b). In the same vein, Roland-Holst calculates that it will create about 22,000 additional jobs by 2020 (Roland-Holst 2006a: 2-21). For the regulated entities side, especially automobile manufacturers, analyses show that the costs for complying with the regulation will be passed on to consumers. And once the technology is developed, there would be not additional costs for the technological innovation (California Air Resources Board 2004b: 163-165). As a result, it would also benefit for the regulated entities in the long term while it is associated with short run costs.

However, this assessment cannot choose but have a limitation in terms of evaluability in that it is just estimation rather than substantial outcomes. Furthermore, considering costs of the regulated, economic benefits is unclear. Nevertheless, the program in terms of efficiency should be evaluated differently from

other regulation in that environmental efficiency cannot be judged short-term economic benefit and AB1493 program allows time for preparing to meet the standard.

Legitimacy

How about legitimacy? As May put in, “social regulations cannot be effective if they rest entirely on sanctions for non-compliance or rewards for compliance” (May 2002: 179). AB-1493 is designed with particular attentions both on economic efficiency and on flexibility, feasibility, and partnerships with stakeholders and concerning parties. Particularly the regulation allows the regulated entities to be able to take “alternative method of compliance with the regulation” (Pavley, 2002: 3). But the Air Resources Board limits the alternative methods. Besides, when it comes to normative side of legitimacy of the regulation, the Special Survey on Californians and the Environment, conducted by the Public Policy Institute of California, showed eighty percent of Californians support the regulation (California Air Resources Board 2004a).

In sum, AB-1493 would be viable as a regulation because of its thorough the design considering economic effects and possible non-compliance factors and gearing flexible mechanisms. However, to the extent that this regulation has not taken effect, it is quite difficult to examine actual evaluation. All of this evaluation is based on specifically reckoned analyses but not draws on substantial evidences.

2.2. Incentives: The New York State Green Building Tax Credit

The New York state enacted the Green Building Tax Credit (GBTC) program on May 15, 2000. It grants a 5-8% tax credit on sustainable buildings of over 2,000 square feet. This program

aims to encourage building owners and developers to design, construct and operate energy efficient buildings utilizing recycled materials and incorporating renewable and energy efficient power generation so that it may reduce directly and indirectly GHG emission. It includes other incentives such as a 30% tax credit on fuel cell installations, a 100% tax credit on the marginal costs of integrating photovoltaic in the building design, and a 15 year real property tax exemption for installation of solar and wind energy systems. The first period (2001-2004) finished and the second is to begin for a Credit Component Certificate from 2005-2009(DEC b.).

2.2.1. Basic idea

The Green Building Tax Credit (GBTC) program as a policy tool is a part of belongs to “tax expenditure,” which becomes more important in recent years (Howard 2002: 411). The definition of tax expenditure is “a provision in tax law that usually encourages certain behavior by individuals or corporation by deferring, reducing, or eliminating their tax obligation. By using this tool, the government pursues its objectives by allowing individuals or corporations to keep and spend dollars they would otherwise owe the government”(Ibid.). When it comes to coerciveness of a policy tool, tax expenditure is little coercive. It motivates taxpayers to follow government’s policy goal, but there is no enforcement so that taxpayers do not have to change their behavior. The rationale for employing tax expenditures is that “greater choice leads to more efficient economic outcomes” (Ibid: 427)

2.2.2. Policy Goals

The Green Building Tax Credit is to maximize energy efficiency of buildings so that directly and indirectly reduce the environmental impacts of large commercial and residential buildings.

For the New York State Department of Environment Conservation (DEC), “green buildings use resources-energy, water, materials, and land more efficiently and effectively and they provide healthier environments for working, learning and living” (GEC a.). This program aims to achieve both economic benefits and environment protection.

2.2.3. Resources

The New York State Department of Environmental Conservation (DEC) is responsible for implementation of this program. The New York State Energy Research and Development Authority (NYSERDA) assist the DEC with technical information and also provide technical and financial assistance to those interested in green building. The U.S. Green Building Council provides/designs a technology for green building such as the LEED (Leadership in Energy & Environmental Design) rating system for sustainable design. This program has been updated since it enacted in 2000. The total amount of this program was \$25 million for period one (2001-2004) and the new legislation passed in 2005 allows another \$25 million for period two (2005-2009) (DEC a.)

2.2.4. Scenario for success

A tax credit utilizes taxpayers’economic motivation by providing incentives. By doing so, it entices taxpayers to change their behavior into socially desirable direction. The GBTC program provides tax credits for building owners and tenants who have plan to construct a building or renovate it following the standard of the program. In building owner and developers’side, they are to have strong motivation to meet the standard because it not only enables them to get taxes credits but also to save construction costs and operation and maintenance costs as well. These standards increase energy efficiency, improve indoor air quality, and reduce in New York State, among other benefits. It may give an-

other benefit for owners because it also allows tax credits to tenants so that it may facilitate owner's rental business. It may lead more developers and building owners to be interested in the program and to apply it. It may also create technological development for constructing green buildings and thereby reduce the costs of building construction and bring out spillover effect. More participation and improved technologies may contribute to development of local economy and reduction of environmental pollution.

2.2.5. Evaluation

Effectiveness

Effectiveness measures whether a policy achieves its goals rather than costs. "The most effective tool is the one that most reliably allows action on a public problem to achieve its intended purposes" (Salamon 2002: 22). In this respect, the GBTC program can be assessed relatively effective because seven buildings have been already issued the credit and they account for \$25 million allocated to period one program and subsequently it has created a market for new technologies of green building and pro-environmental places as well. Furthermore, this assessment led to the second period of program and other states look for benchmarking of this program. High participation of this program also means more ecological contribution of the program. When it comes to its effectiveness in terms of the policy goal of energy efficiency and thereby mitigating global warming, however, the objectives (seven buildings) are quite a few. Accordingly, it is skeptical if it achieves ultimate policy goal.

Efficiency and Equity

First of all, because of highly automatic attribute of this tool in terms of utilizing an existing bureaucracy, it may be efficient than regulation "not only because they promote choice, but also

because they keep administrative costs low” (Howard 2002: 427). Besides, it may be an equal policy because beneficiary of environmental policy is not confined to particular individuals. To the extent that only the seven building certificates account for \$25 million, however, this program cannot avoid a criticism in terms of both equity and efficiency.

Legitimacy and political feasibility

It is reported that the real estate, environmental NGOs, business and labor communities strongly support this program, as the above mentioned it, because this program provided economic benefits for owners; contributed to environmentally sustainable development; created new markets and jobs, and give workers healthier working place. When it comes to political feasibility, this program is politically feasible because no one eventually lost, rather benefited if the fact of “\$25 million for the seven” set aside. But the fact does not matter because of the attribute of less visibility of tax expenditure.

2.3. Emission trading (quasi-market approach): The Clean Air Act of 1990

A remarkable innovation of policy tool developed in the United States was the introduction of “emission trading” as a policy tool in the 1990 Amendment. The Clean Air Act of 1990 aimed to address air pollution that afflicts human health and warms the climate. The Acid Rain Program under the Clean Air Act of 1990 allowed the SO₂ trading program and enabled other market-based approaches to be developed for addressing air pollution’s impact on environment. Since 1990, U.S. Environmental Protection Agency (EPA) “has established the rules for this program and industry has taken advantage of its flexibility by reducing SO₂ in the most cost-effective ways possible.” (McLean

2002). While it allowed emission by a given amount of sulfur oxide, it also enabled each utility that could keep its emissions below the allowed to sell “its unused allowance” to others so that they got a right to use the bought allowances beyond their own limit (Cordes 2002: 255).

2.3.1. Basic idea

Emission trading program is a kind of quasi-market based approach and a new trend of tools to supplement environmental regulation. The basic idea is that by grafting market mechanism of buying and selling of emissions permits into policy area, that is, taking advantage of market incentives, the state and society may achieve a policy goal more flexibly and cost effectively. This tool not only enables regulators to cut the monitoring costs but also the regulated to contribute to cost-effectively social goods.

Theoretically, emission trading is not for reducing a total amount of pollution emission but for redistributing pollution by using market function. It may contribute to cost-effective protection of environmental degradation.

2.3.2. Policy Goals

The program called for major reductions in electric-generating facilities’ emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x)—the key components of acid rain—while establishing a new approach to environmental protection through the use of market incentives. It aims to reduce nitrogen oxides emissions at the level of approximately two million tons from 1980 emission levels (EPA b.) There are two phases for the SO₂ requirements. “Phase I, which began in 1995, limited emissions from the largest, highest-emitting electric-generating facilities. Phase II, which began in 2000, tightened the annual limits on the large plants, and set restrictions on smaller, cleaner plants and all new plants. As of 2001, the program encompassed nearly 2,300 units at 1,000

plants” (Office of Air and Radiation Clean Air Markets Division 2002).

With permitting the emission trading, U.S. government can reduce implementation costs by utilizing market. Businesses are able to comply with a required limitation of emission more cheaply and flexibly.

2.3.3. Resources

The emission trading may operate well by a “well functioning market, adequate information, and the volume of trading” as well as regulatory administrations (Cordes 2002: 259). The U.S. Environmental Protection Agency implements this program. It tracks allowance holdings and records transactions. The Environmental Protection Agency manages the tracking and records by a computerized tracking system (See more details at EPA b.). The Chicago Board of Trade conducts the EPA’s annual auction. Although the EPA holds a series of auctions, most of actual emissions trades have occurred in marketplace. Brokers play a linkage role between buyer and seller for higher volume of allowance transaction. There are some brokers such as, for example, Amerex Energy, BTU Brokers, and Enron Capital & Trade Resources, etc.⁴ EPA also provides standards and information on defined limits on allowance emissions at each source. Finally, there is a sanction for enforcement that noncompliance results in a fine of \$2,000 per each ton of emissions.

2.3.4. Scenario for success

This tool operates through flows of the following steps; that is, regulators first of all set a desired level of overall environmental emissions, then, “issue permits to pollute to individual

4. For additional information, see Clean Air Market-Allowance Trading, EPA, at <http://www.epa.gov/airmarkets/trading/buying.html>

polluters,” and finally let permits to be traded in a market (Cordes 2002: 271). Then, a company that has relatively high costs for reducing pollution is to buy additional rights to pollute from other companies that have reduced their pollution below a given allowed levels.

This mechanism utilizing market force and allowing flexibility encourages polluters to reduce pollutions and develop ecological technologies as well. Furthermore, they are to have economic incentives to comply with the program. It leads to reduce both the costs of enforcement and those of compliance so that may increase compliance and participation. As a result, it may enable the program not only to achieve its goal of reducing greenhouse gas emission but also to bring out sustainable economic development.

2.3.5. Evaluation

Effectiveness

The flexibility of emission trading provides high effectiveness. Actors behave on market force so that they may recognize that exceeding the required cutbacks creates economic advantage. “Tradable permits do not impose the same financial burdens on regulated industries. All parties actually realize a financial gain from the ability to trade rights to pollute with each other” (Cordes 2002: 271). Trading and banking of allowances may create a mutual benefit for company and the environment as well. It may also lead industrial sectors to comply further than the required, which consequently provides both environmental and public health benefits (Ibid). With this high effectiveness, regulators can pursue more ambitious environmental goals for future programs.

Efficiency

Strength of emission trading is that it lowers the costs of

emissions reductions. Lowering costs subsequently leads more participation and compliance, and thereby results in desirable improvement or mitigation of the environmental problems. There is another advantage that “emissions trading offers governments the flexibility to fine-tune the balance between free allocation and auctioning. This could improve the acceptability of the new regulations to incumbent emitters on the one hand, and maximize social welfare through revenue recycling, on the other.” (Philibert 2004: 313). Several assessments confirm introducing permit trading may have reduced the costs of complying with the U.S. Clean Air Act Amendment of 1990 (CAAA) by between 30 and 50 percent (Cordes 2002: 277).

Equity and Legitimacy

There is a problem of this tool in terms of transferring income from high cost companies to low cost companies. If low cost companies are capital intensive and competitive, it can create a disparity among businesses. Furthermore, “permit trading can lead to localized ‘hot spots’ with relatively high level of pollution because of high costs of abatement”(Cordes 2002: 272). A new business also may pay high cost for entrants. A criticism on this tool is that it is a kind of official permission on polluters. Therefore, it is required establishing alternatives clear standards, monitoring, and ensuring market function. In light of this criticism, the EPA needs to achieve accountability through improving accurate monitoring and at the same time releasing information and standards to the public (EPA b).

III. Two evaluation criteria of policy tools

Evaluation I: Effectiveness, Efficiency, Equity, and Legitimacy/ Political feasibility

Effectiveness of policy tools can be evaluated by whether a

tool achieves its policy goals. For Salamon, the most effective tool is to allow the tool to take most reliable action for achieving its goals. When it comes to efficiency of policy tools, costs should be considered. As Salamon puts it, “the most efficient tool may not be the most effective one”(Salamon 2002: 23). While effectiveness is judged by a result, efficiency focuses on costs. Another evaluation factor, equity can be judged by fairness and redistribution. If a tool is complex and there are a lot of actors related, it may be not easy to manage it. “Tool choices can also affect the political feasibility and perceived legitimacy of public action. A program that cannot win political support cannot make headway” (Salamon 2002: 24).

To the extent to which “climate change is surrounded by many uncertainties on both benefit and cost sides” (Philibert 2004: 319), it is difficult to exactly evaluate each policy tools. In other words, it needs a long-term to assess ultimate effects of policy tools. Nevertheless, each tool can be assessed by effectiveness, efficiency, equity, and legitimacy in order to reckon advantages and disadvantages of each tool in specific policy application.

Table 2. Policy tools grouped by evaluation standards

Policy Tool/ Measure	Effectiveness	Efficiency		Equity	Legitimacy /Political feasibility
		Short	Long		
AB-1493 (Regulation)	High	Low	Moderate	High	High/Moderate
The GBTC (Incentive)	Moderate	Low	Moderate	Low	High
The Clean Air Act (Emission trading)	High	High	High	Low	Moderate/High

AB-1493 is effective in that it is a regulation with attribute of high coerciveness. The Clean Air Act can achieve high effec-

tiveness because of its high flexibility. Its effectiveness also can be judged by its creation of over-compliance. Theoretically, tax expenditure program may be ineffective due to “potential windfall benefits” (Howard 2002: 433) and its anonymous feature for beneficiaries. However, The GBTC program could achieve effectiveness by defining clearly objectives with specific conditions.

Efficiency can be assessed by a tool's economic impact or effect. However, when it comes to environmental policy, it may not be reasonable without consideration of long-term effects. Hence, it needs to assess it by separating short- and long-term effects. In general, regulation places heavy compliance costs on private businesses. It is not exception for AB-1493. Although California Air Resources Board estimates that the net effect on the economy may create more jobs through savings from reduced vehicles operating costs, it is just estimation, not substantial outcome. Furthermore, considering costs of the regulated, economic benefits is unclear. However, the program in terms of efficiency should be evaluated differently from other regulation in that environmental efficiency cannot be judged short-term economic benefit and AB-1493 program allows time for preparing to meet the standard. A quasi market approach can complement the low efficiency of regulation. High efficiency of the Clean Air Act, in this respect, leads more participation and compliance and thereby results in desirable improvement or mitigation of environment because its lower costs and flexibility. Meanwhile, the GBTC program might be efficient than regulation because of low administrative costs. According to a report of the Massachusetts Technology Collaboration, while the average cost of building green is less than \$ 3-5/ft² than conventional building; the Green building is more efficient in terms of energy consumption (Kats, 2003). However, to the extent that only the seven building certificates account for \$25 million, this program cannot avoid a criticism in terms of both equity and efficiency.

In some sense, benefit of environmental policy itself is highly universal. In the long term, most ecological policy may be assessed equal in terms of public health and indifferent impact of climate change on the public life. But if it is assessed by short term or apparent economic benefits, AB-1493 can be assessed the highest tool in terms of equity among others compared here because all social parties are affected and, for the ARB, it would result in reduction in operating costs of vehicles so that it may benefit for low income communities that are much more sensitive about costs. Emission trading may be weak in terms of equity because it may create the localized 'hot spots' and entrant fee. Although long term and ultimate beneficiaries are general public, the GBTC program may raise a skeptical question in terms of equity due to its small size of apparent economic beneficiaries such as \$25 million for the seven building.

To the extent that climate change increasingly threatens sustainable public life and sometimes create substantial socio-economic losses of lives and property, regardless of its efficiency, most environmental policy tools get high legitimacy. When it comes to political feasibility, however, AB-1493 is faced with criticisms from automobile manufacturers. Despite such criticism, it may be feasible because of its high legitimacy and public support. While there is a criticism on the Clean Air Act in terms of providing official permission on polluters, the regulated highly supports this program because of its flexibility and economic benefits. The high support from developers, environmental NGOs, business and labor communities enables the GBTC program to highly feasible politically.

Each tool has its own advantage and disadvantage. It depends on various policy circumstances. Therefore, policy decision maker and designer need to consider them. In this respect, it is useful to examine policy circumstances as an evaluation standard.

Evaluation II: Generality, Contextuality, and Complementarities

Another factor that affects a tool's effectiveness is policy circumstances. The effectiveness of tools depends on their circumstances. In other words, "not just the nature of the tool, but also the nature of the circumstances therefore must be considered when making tool choices." Therefore, "one of the major task of the tools approach is to specify the circumstances under which particular tools are likely to be most effective" (Salamon 2002: 22).

There may be various policy tools for one policy area. In this respect, complementarities may contribute to supplementing a weakness of a tool that is implemented in a specific policy circumstances. Although there are a lot of variables that affect circumstances and conditions, I focus on economic capacity and situation as policy circumstances, and administrative levels such as federal or state.

Table 3. Policy tools grouped by standards of policy circumstances

Policy Tool/Measure	Generality	Contextuality	Complementarities
AB-1493 (Regulation)	Moderate	Moderate	Low
The GBTC (Incentive)	Low	High	Moderate
The Clean Air Act (Emission trading)	High	Low	High

Although there are various policy tools, effectiveness and efficiency of policy tools depend on policy circumstances. It is the reason that policy maker should consider generality and contextuality in which policy tools work. While federal government, the EPA in environmental issue, executes general policy, each state especially in climate change also crafts its own policy. The Clean Air Act is a representative policy implemented at the federal level. Emission trading of the Clean Air Act of 1990, in this

respect, is highly general or feasible for the federal policy tool because of its nation wide applicability. Emission trading also can be applied for international level; in fact, the Kyoto Protocol adopts emission trading as a tool, with providing high compliance and flexibility. But if its range of application is confined within narrow region or to only few business areas regulated, its feasibility and usefulness may decrease. This quasi market approach is also highly complementary in that it helps other policy tools be more viable through widening range of choice of the regulated and inducing more compliance. As a result, policy makers may utilize it in order to complement other tools such as regulation.

Each state lies under its own particular socio-economic milieu (contextuality). Therefore, specific socio-economic conditions should be considered. For example, a set of policy tools in terms of its effectiveness and efficiency that California state implements cannot choose but differ from those of New York or other states. Economic conditions and main interest groups also affect political feasibility. In the case of AB-1493, California could enact it because of its purchasing power of automobiles. Motor vehicle registration of California consists of thirteen percentages of total motor vehicles registered in the United States so that it may enable it to be feasible regulation. On the contrary, if Kansas (0.4%) (U.S. Census Bureau) were to enact it, it would be less feasible. But as AB-1493 implements, it may spill over other states so that it may be assessed moderate in terms of 'contextuality.' Although this regulation is less complementary tool, it instead complements its weakness by providing flexibility and leeway in terms of time. The regulatory institution also makes partnership with the California Energy Commission, the California Climate Action Registry, and automobile manufacturers for technological supports and evaluations.

The GBTC program is less general program because of its high costs but if it improves this weakness, it could be more gen-

eral one than now. It is also more effective in a state that has highly urbanized cities. This program, therefore, may be appropriate for more complementary tool than for an independent one.

IV. Conclusion

Policy managers need to understand the goals the programs they run. Therefore, they have to craft contracts, tax incentives, regulations, or other tools to achieve the public purpose, with building consensus for those goals (Kettl 2002: 500). They also have to consider policy circumstances in terms of generality, contextuality, and complementarities.

In relation to regulation, policy designers need to devise more reasonable regulations, rules that require deliberative processes, with emphasizing flexibility and reasonableness. They may apply flexibly regulatory tools that vary in terms of policy alternatives from traditional and coercive administration to the newly gearing tools for governance. Its success depends on “the appropriate fit between the motivations of affected entities and the design and implementation of the tool” (May 2002: 180-81). While emission trading is a relatively new approach as a policy tool for reducing the overall level of any behavior, it can be assessed as a useful tool because of its generality and complementarity as well as its efficiency.

No matter which policy tool consists of what programs such as regulation, market based, and incentive, creative and facilitative administrative management is important for the new governance. Effective and efficient administrative management can be achieved through crafting policy tools carefully considering specific conditions and situations for policy area, with emphasizing negotiation, persuasion, and public-private partnership rather than traditional command and control or ‘governance without government.’

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