

EXPLAINER

Why Market-Based Solutions Are a Smart Way to Protect the Environment



In the People's Republic of China, an eco-compensation scheme helped boost farmers' income while protecting the environment.

Photo credit: ADB.

Economic incentives push producers and consumers to use resources more efficiently and reduce environmental costs as well as spur innovative practices.

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Introduction

Environmental quality in Asia has significantly declined over the past 60 years because of rapid urbanization, a changing population structure, and high demand for resources, goods, and services. Although there has been increasing policy intervention in Asia, implementation has often been ineffective and lacked a scientific basis.

Identifying and implementing policies that are effective at improving environmental quality while sustaining development gains can be challenging. The region's dynamic setting and changing economic conditions require flexible policies—such as market-based instruments—that enable firms and individuals to make decisions that can benefit the environment and society.

Market-based instruments for environmental management are policy interventions that provide incentives for producers and consumers to change behavior, more efficiently use resources, and reduce their negative environmental impacts. These economic instruments can be more cost-effective and flexible than traditional regulations on environmental protection. They are also dynamic and create incentives to innovate and achieve the least cost for reducing pollution.

This explainer is based on an Asian Development Bank study, *Greening Markets: Market-Based Approaches for Environmental Management in Asia*. It provides an overview and assesses the suitability of using different market-based instruments to address air quality, water, and waste management in the region. It also provides recommendations on how a market-based approach can be used for more efficient and effective environmental management.

What are the advantages of a market-based approach over direct regulation?

Previous experience suggests that relying heavily on direct regulation is not optimal in some sectors as firms cannot make use of technological and management opportunities to reduce pollution at a lower cost. Compared to measures that directly control emissions, technologies, or production decisions, interventions that count on markets and prices are likely to steer decisions toward more efficient outcomes.

Table 1: A Simplified Taxonomy of Policy Instruments

Type	Policy Instrument
Command and control	Bans, technology standards, performance standards, and penalties for noncompliance
Market-based instruments	Pollution taxes, fees, or charges Water pricing Subsidies or subsidy reduction Tradable permits Hybrid policies, such as deposit-refund schemes Payments for ecosystem services

Source: T. Sterner and J. Coria. 2012. Policy Instruments for Environmental and Natural Resource Management. New York: RFF Press.

Market-based instruments have several appealing characteristics. They promote flexibility in finding solutions to improve resource use and environmental quality as well as create incentives to minimize the costs of achieving environmental goals. They also cultivate innovation, creating dynamic pressures that make implementing improvements for environmental sustainability cheaper over time. If properly designed and implemented, these approaches allow any amount of pollution reduction at the lowest cost to society and have the potential to facilitate even greater reductions in emissions compared to standards set by command-and-control regulations.

Market-based instruments, such as environmental taxes and tradable permit markets, create

opportunities to raise government revenues. They can also improve decision-making by disclosing information about markets and raising people's awareness of the environmental impacts of their actions.

Below is a list of common market-based instruments for environmental management.

Pollution taxes, fees, and charges. Placing a per-unit monetary charge on emissions or waste can reduce the quantity generated and make polluters shoulder the cost of such activities. This serves as an incentive to reduce emissions and discharges from production and unsustainable consumption. Examples include emissions taxes, wastewater discharge fees, and solid waste disposal fees.

Water pricing. Applying monetary charges on the use of water services or resources creates incentives to avoid excessive consumption. Water tariffs are commonly used to manage use and demand, address equity concerns, and recover costs for the water utility when the long-run marginal cost exceeds the average total cost.

Tradable permits. A central authority allocates tradable permits to firms, which allow them to emit specific quantities of a pollutant within a given period. A firm must have permits to cover all its emissions, and the total number of permits across all emitters is the "cap." Firms that have more emissions than permits can purchase additional permits from other firms that have lower emission levels. This creates a market for pollution permits called "cap-and-trade" that allows for flexibility on how and where pollution is reduced and ensures that emissions can be reduced at the lowest possible cost.

Environmental subsidies. Governments provide financial support for environment-friendly activities, such as pollution abatement and development and adoption of green technologies. Subsidies can also decrease consumer prices or support trade-exposed sectors by lowering costs for firms or households.

Removal of harmful subsidies. Taking away harmful subsidies, such as for fossil fuels, is considered a standalone policy instrument that seeks to promote environment-friendly actions or technologies.

Payments for ecosystem services. This scheme captures the economic value of ecosystem services (e.g., food and water supply, carbon sequestration) and creates incentives for producers and consumers to pay for environmental conservation.

Information provision, labels, and voluntary agreements. These are mechanisms to disclose information to consumers about the environmental performance, hazards, or risks of firms or products. Information is necessary for market-based instruments to function successfully and can mitigate transaction costs related to developing environmental markets. Examples include public disclosures, such as sustainability reporting, eco-labels, and green rating or certification programs.

Hybrid instruments. Combining different types of market-based instruments can accomplish multiple objectives while sharing or lowering costs, such as shifting the burden of monitoring and administrative costs from regulators to polluters. Examples of hybrid policies include deposit–refund schemes that apply a charge on the purchase of a product and provides a subsidy for its return, which encourages recycling and reducing waste and combining an environmental tax with a rebate.

What are the enabling conditions for scaling up market-based instruments

The success or failure of market-based instruments depends on several factors.

Specific context and details of implementation. Experience indicates that successful application of such measures is affected by (i) the characteristics of the environmental problem, (ii) the characteristics of the policy instrument, and (iii) local context, including technical requirements, and the economic, social, and political environment. As such, the suitability of a policy is likely to vary with the features of the environmental problems and with a country’s characteristics. Specifically, if a similar instrument has been successfully used in a country of similar socioeconomic status and institutional capacity, that instrument should be promoted.

Table 2: Requirements and Strengths of Market-Based Instruments

Market-based instrument	Requirements	Strengths
Pollution taxes, fees, or charges	<ul style="list-style-type: none"> • Accurate monitoring data on pollution levels • State capacity to enforce compliance • Political acceptance of costs and distributional impacts 	<ul style="list-style-type: none"> • Allow cost-recovery for utilities and government • Can encourage internalization of environmental costs leading to adoption of cleaner technologies
Water pricing policies	<ul style="list-style-type: none"> • Mechanisms to monitor water use and payments • Accurate understanding of demand elasticities and distributional impacts to set tariffs 	<ul style="list-style-type: none"> • Increase efficient use of water resources • Can encourage customers to use water wisely
Subsidies	<ul style="list-style-type: none"> • Accurate monitoring data on pollution levels • Information to facilitate efficient targeting 	<ul style="list-style-type: none"> • Political acceptability • Can effectively facilitate rapid transitions if well-targeted
Tradable permits	<ul style="list-style-type: none"> • Data for initial allocations • Accurate monitoring data on pollution levels • Tracking system to record transactions • Consistent legal frameworks • State capacity to enforce compliance 	<ul style="list-style-type: none"> • Can encourage internalization of environmental costs leading to adoption of cleaner technologies • Can control total level of pollution

Hybrid policies	<ul style="list-style-type: none"> • Accurate understanding of demand elasticities to set front-end charges (deposit) and refunds payable when quantities are turned in for recycling • Payment system to facilitate deposit-returns 	<ul style="list-style-type: none"> • Little need for monitoring when voluntary • Low legal, institutional, and political barriers
Payments for ecosystem services	<ul style="list-style-type: none"> • Identification of baseline pollution levels to assess additionality • Monitoring provision of service 	<ul style="list-style-type: none"> • Flexibility of application • Potential for poverty alleviation
Information provision, labels, and voluntary agreements	<ul style="list-style-type: none"> • Reliable and current data on compliance with MBIs made available to the public 	<ul style="list-style-type: none"> • Enhance compliance with MBIs • Low legal, institutional, and political barriers

MBIs = market-based instruments.
Source: Asian Development Bank.

Additionally, the successful deployment of market-based instruments has required years of work and a long-term political commitment by governments. Implementing these policies requires a willingness to experiment and adapt programs to changing conditions. Policy makers in Asia who are considering the use of one or more of these instruments need to appreciate the challenges of implementation, and they will need the support and guidance of those who have successfully implemented them.

Political acceptance, including public understanding of a policy and perception of its fairness.

Political acceptance is stronger when there is a wider public understanding of environmental problems and their impacts. This could be achieved through information campaigns and gradual implementation of the policy. Public perception of a policy's fairness, including its effect on income distribution, is also critical to its political acceptance. Consider a policy that increases the price of fossil fuels. The stakeholders range from those with powerful interests, such as oil producers, to taxi drivers and poor rural households, each of whom will be affected differently. While oil producers may benefit from such a policy, consumers may absorb the direct and indirect costs and benefits of the price increase.

Distribution of a policy's costs and benefits across groups, particularly to poor and vulnerable populations. Studies evaluating the distributional effects of taxes in developing countries have often found that the direct effect tends to be income progressive. The direct burden of environmental policies tends to fall most heavily (as a percentage of income) on higher-income groups. However, the overall distributional impact of a tax also depends on the use of government revenue.

For a market-based instrument to be politically tractable, policy makers must consider their impact on vulnerable groups, such as low-income households. Lower tax rates or exemptions can be implemented to minimize impacts on such groups. Alternatively, revenues from an environmental tax could be used to help those who are most adversely affected. For instance, environmental tax revenues could be used to reduce other taxes or subsidize public goods and services such as mass transit.

Environmental benefits are often pro-poor in developing countries because poor rural households depend heavily on natural resources and poor urban households are greatly affected by pollution. However, while the costs of a market-based approach may be felt immediately, the environmental benefits may only begin to appear gradually over time.

Impact on competitiveness and unemployment, particularly pollution-intensive and trade-exposed firms. Environmental taxes are often thought to increase domestic production costs, which would consequently decrease the competitiveness of exports and make imports more competitive. However, empirical evidence has shown that implementing ambitious environmental policies often has little impact on competitiveness, trade, and employment.

What can impede successful implementation?

While there is no universal formula for successfully implementing market-based instruments to address environmental problems, lessons from previous experiences can help inform further deployment or upscaling.

Policy and regulatory frameworks favoring economic development over environmental protection have affected the performance of market-based instruments. Many developing countries lack policy frameworks and institutional resources that would ensure compliance with environmental goals and requirements. In most cases, environmental taxes have been set too low to incentivize polluters to make major reductions in emissions or have not been used widely for industries due to concerns over competitiveness.

Monitoring and enforcement are critical to the successful implementation of market-based instruments. Prioritizing economic growth has also led to inadequate monitoring and enforcement of environmental requirements. This stems from capacity gaps, resource constraints, overlooking the aggregate environmental performance of small and medium-sized enterprises (SMEs), lack of coordination between sectoral agencies, low engagement with the public on environmental compliance, and leniency toward polluters. Experience in some developing countries suggests that monitoring and enforcement capabilities can be maximized and administrative costs minimized by targeting a limited group of polluters responsible for the largest share of pollution.

Pricing strategies need to be set high enough to incentivize behavioral changes. Many countries in Asia have seen more success in improving air quality through pollution charges than they have in addressing water pollution. This is due to taxes on fuel consumption being set relatively higher than taxes to improve surface water quality.

The political system can affect the choice and performance of measures. Governance and the multi-jurisdictional nature of environmental problems can affect the enforcement of environmental regulations. Corruption and lack of coordination between national and local regulatory bodies can lead to lax enforcement. Strong institutions and coherent procedures for enforcement are needed for market-based instruments to be effective.

The nature of pollution sources and local economic structure plays a critical role in effective implementation.

The formality of economic sectors and the type of polluters can affect the performance of market-based instruments. There is great potential for engaging SMEs—which often operate informally and are collectively responsible for large amounts of industrial pollution and energy consumption—in environmental improvement.

Resources

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