

## Chapter 38

# Use of Policy Instruments to Promote Sustainable Energy Practices and Implications for the Environment: Experiences from Singapore

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### ABSTRACT

*The use of policy instruments in the environmental framework to promote sustainable energy practices in Singapore, a country in the South East Asian region, is explored in this chapter. Four areas are specifically identified for coverage: waste production, water consumption, transportation and atmospheric emission, owing to their highly entrenched nexus with the environment. The presence of these policy instruments has been a major factor why sustainable energy practices are well ensconced in Singapore and the rate of increase of the carbon footprint on the environment has been lessened significantly. It is suggested that there are useful lessons to be drawn from the Singapore experience for other countries. Several recommendations are provided in this context.*

### INTRODUCTION

The Earth hosts a complex ecosystem, with the myriad inhabitants such as plants, animals and human beings co-existing not only in a high level of interdependency among themselves to an ex-

tent not commonly recognized but also with the environment such as the atmosphere, oceans and land masses. This interdependence means that the actions of the dominant species, that is, human beings, have the greatest potential to upset the equilibrium in the ecosystem than other species. Indeed, this is what has happened and is continuing to happen – the degradation of the assets in

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the ecosystem is more due to the actions of the human species (Tan & Subramaniam, 2001a), though natural causes such as earthquakes, tsunamis and typhoons do also contribute a small share. The actions of one country also impact on the others since all are intertwined in a complex web of dependencies.

A key factor contributing to the deterioration of the environment is the reliance on unsustainable energy practices. Carbon-based fuel has been the key driver of growth in the industrial economy, and a weaning away from it does not seem to be on the agenda of most countries in the immediate or near future. In such a scenario, there seems to be more scope to engage in sustainable energy practices within the ambit of the carbon-intensive economy as a way to lessen the ongoing assault on the environment than on initiatives to move totally into alternative energy sources.

Sustainable energy practices are a key to promoting a more environmentally friendly lifestyle and reducing the assault on ecosystem assets. With many countries embracing the science and technology driven model to promote socio-economic development (Tan & Subramaniam, 1998), the emerging capitalistic practices are leading to resource depletion, draining of carbon-intensive fuel stocks and general deterioration of the environment.

In recent years, concerns on environmental issues have been given prominent coverage in the media as well as in international fora. More people are now beginning to realize that unsustainable energy practices are taking a toll on the environment and that we are poised to bequeath to the next generation a less inhabitable planet – polluted ecosystems, depletion of life forms in the oceans and forests, and burgeoning population. Politicians have also become sensitized to the debate, though not necessarily to the same extent as the aficionados of the environment. An argument framed in the context of moving totally towards sustainable energy practices is neither pragmatic

nor desirable, given the current political and economic realities of the world. A phased transition in the long term is more feasible.

A discussion on sustainable energy practices can be particularly illuminative if the discourse is framed in the context of a systems approach. A systems thinking has the advantage of seeing how the actions of one component influence the others in the whole (Weinberg, 2001; Slyttner, 2006). Problem solving thus becomes more effective since solutions are sought on a holistic basis rather than in isolation from other considerations. Stakeholders in the system can then see how their actions are influencing the other variables in the equation involving the environment.

Whilst the efforts to explore alternative energy sources should continue, it is to be noted that quite a lot can be done with the use of policy instruments. These instruments can be powerful tools for policy makers to ensure that indiscriminate consumption of precious resources and production of wastes are curbed, and that sustainable energy practices are promoted. There are two principal types of instruments which are in common use: “command and control instruments” that are used to specify adherence to certain norms such as upper limits on emissions from a source; and “market-based” or “economic incentive” instruments such as pollution taxes that use fiscal measures to exact compliance (Keohane, Revesz & Stavins, 1998). “Command and control instruments” have legal sanctity, and enforcement is geared towards regulating the actions of individuals and/or firms (Seik, 1996). Because these instruments are targeted at specific sectors, there is a high degree of certainty in their outcomes (Timilsina & Dulal, 2009) – for example, they have played a key role in reducing air pollution in several countries (Ringquist, 1993). They have also been reported to provide a fillip to the economic competitiveness of nations as well as contribute towards environmental sustainability (Seik, 1996; Hricko 2004; Bartle and Vass, 2007). However, “market-based” or “economic incentive”

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