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以下三題請詳讀題目後說明：(1)題目之主要重點及 (2)該題在資源管理之意涵。

(資料來源：Tom Tietenberg and Lynne Lewis(2009), *Environmental & Natural Resource Economics*, 8th edition, Pearson International Edition)

一、(30%)

The U.S. Strategic Petroleum Reserve (SPR) is the world's largest supply of emergency crude oil. The federally owned oil stocks are stored in huge underground salt caverns along the coastline of the Gulf of Mexico.

Decisions to withdraw crude oil from the SPR are made by the President under the authority of the Energy Policy and Conservation Act. In the event of an "energy emergency," SPR oil would be distributed by competitive sale. What constitutes an energy emergency goes well beyond embargoes. The SPR has been used only twice and neither drawdown involved an embargo.

- During Operation Desert Storm in 1991 sales of 17.3 million barrels were used to stabilize the oil market in the face of supply disruptions arising from the war.
- After Hurricane Katrina caused massive damage to the oil production facilities, terminals, pipelines, and refineries along the Gulf regions of Mississippi and Louisiana in 2005, sales of 11 million barrels were used to offset the domestic shortfall.

The Strategic Petroleum Reserve has never reached the original one billion barrel target, but the Energy Policy Act of 2005 directed the Secretary of Energy to bring the reserve to its authorized one billion barrel capacity. Acquiring the oil to build up the reserve is financed by the Royalty-in-Kind program. Under the Royalty-in-Kind program producers who operate leases on the federally owned Outer Continental Shelf are required to provide from 12.5 to 16.7 percent of the oil they produce to the U.S. government. This oil is either added directly to the stockpile or sold to provide the necessary revenue to purchase oil to add to the stockpile.

Sources: U.S. Department of Energy Strategic Petroleum Reserve Web site: <http://www.fe.doe.gov/programs/reserves/index.html> and <http://www.spr.doe.gov/dir/dir.html> (accessed June 20, 2007).

(背面仍有題目,請繼續作答)

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On the surface the answer seems like a no-brainer, since wind power is a renewable energy source that emits no greenhouse gases, unlike all the fossil fuels it would be likely to replace. Yet some highly visible, committed environmentalists including Robert Kennedy Jr. have strongly opposed wind projects. Why has this become such a public contentious issue?

Opposition to wind power within the environmental community arises for a variety of reasons. Some point out that the turbines can be noisy for those who live, camp, or hike nearby. Others note that these very large turbines can be quite destructive to bats and birds, particularly if they are constructed in migratory pathways. And a number of opponents object to the way the view would be altered by a large collection of turbines on otherwise pristine mountaintops or off the coast.

Both the benefits from wind power (reduced impact on the climate) and the costs (effects on aesthetics, birds and noise) are typically externalities. This implies that the developers and consumers of wind power will neither reap all of the environmental benefits from reduced impact on the climate, nor will they typically bear the environmental costs. Making matters even more difficult some of the environmental costs will be concentrated on a relatively few people (those living nearby, for example), while the benefits will be conferred on all global inhabitants, many of whom will bear absolutely no costs whatsoever. The concentrated costs may be an effective motivator to attend the hearings, which are likely to be held near the proposed site, but the diffuse benefits will likely not be.

Since the presence of externalities typically undermines the ability of a market to produce an efficient outcome, it is not surprising that the permitting process for new wind power facilities is highly regulated. Regulatory processes generally encourage public participation by holding hearings. With environmental externalities lying on both sides of the equation and with many of the environmental costs concentrated on a relatively small number of people, it is neither surprising that the hearings have become so contentious, nor that the opposition to wind power is so well represented.

Source: Robert F. Kennedy Jr. "An Ill Wind Off Cape Cod," *New York Times* Op Ed December 16, 2005; Felicity Barringer, "Debate over Wind Power Creates Environmental Rift," *New York Times*, June 6, 2006

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Organic foods typically cost more than conventionally grown foods. As the fastest growing agricultural sector, consumers have shown their willingness to pay a price premium for organically grown food. Recognizing the potential for profits, however, larger agri-businesses and retail stores are jumping on the organic bandwagon.

The words organic, free-range, antibiotic free used to be associated with small farms and local foods. Not anymore says Michael Pollan, author of *The Omnivore's Dilemma*, and a frequent contributor to the *New York Times*. With plans to rollout organic food offerings in 4,000 stores, Wal-mart says the prices will not be much higher than its other food products. How can this be? The price premium that organic products typically carry represents a willingness to pay not only for pesticide-free products for consumption, but also a willingness to pay to keep those same toxins out of the environment. Responsibly grown products cost more, right?

As larger farms start producing organic foods for larger market areas, the distinction between sustainable agriculture and cheaper industrial food gets blurred.

For example, is organic milk from cows that eat organic grain but are never allowed outside better for society? Does this industrial style of large scale production get rid of the externalities of conventional farming or does it replace them with others (such as greenhouse gases from transporting commodities long distances) that are just as harmful? Pollan reminds us that the organic movement used to symbolize sustainability, but questions whether buying organic milk from New Zealand or organic asparagus from Argentina makes sense from a global perspective in an era of energy scarcity and climate change? Have we simply replaced drenching our food in pesticides with drenching it in petroleum?

Source: Michael Pollan. "The Way We Live Now" *New York Times Magazine*, June 4, 2006.