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## Brayton Point power plant: Weigh costs to benefit

The case of the Brayton Point power plant — adjacent to Mount Hope Bay on the Massachusetts-Rhode Island border — illustrates the great potential for use, misuse and abuse of economic analysis in the environmental realm.



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Producing a whopping 1,600 megawatts, the plant is critical to New England's power supply, meeting up to one-fifth of Massachusetts' total electricity demand. To cool the equipment that generates this huge amount of power, Brayton Point withdraws brackish water from the bay, circulates it through pipes and then returns virtually all the water to the bay at somewhat elevated temperatures that have been set by federal and state environmental agencies.

Concern has been expressed that small fish, larvae and eggs are impinged upon the plant's water-intake screens, or drawn through the screens and entrained in the plant. Such impingement and entrainment linked with water withdrawals by power plants are covered by Section 316(b) of the federal Clean Water Act, and this is where the Environmental Protection Agency enters the picture. It is also where an economic perspective enters. The law requires the EPA to take costs into account as it decides what conditions to place on the plant's permit, now up for renewal.

At the request of the plant's owner, I assessed the costs of six technologies identified by the EPA. One provides the largest environmental gains for its cost: an innovative system of new cooling towers, pumps, pipes and screens that would reduce water withdrawals by 327 million gallons per day, significantly reduce heat discharge and cost the company \$57 million up front. By contrast, conventional "closed-cycle" alternatives, favored by some environmental-advocacy groups, would cost dramatically more per unit of environmental gain. In one case, closed-cycle technology would have virtually identi-

cal environmental impacts yet cost more than three times as much.

When a power plant reduces its impact on the environment, there are both desirable and undesirable consequences — greater environmental protection and increased costs of electricity generation. This is why the law calls for a comparison of benefits and costs.

Applying the methods recommended by EPA's "Guidelines for Preparing Economic Analyses" produces striking results: None of the alternative technologies makes society better off and each provides environmental benefits that are much less than costs. Nonetheless, the EPA's focus has been on whether costs are "wholly disproportionate" to benefits, and its approach has been to ask whether the ratio of costs to benefits is greater than 10-1.

Of course, any ratio of costs to benefits greater than 1-1 means that society is losing. But this is the comparison that EPA has been making for years. For the six technologies studied for Brayton Point, the ratio of costs to benefits ranges from 171-1, for the plant's proposed system, to 549-1, for conventional closed-cycle cooling.

In addition to considering the benefits of using less water, we could also consider the benefits of cooling the water discharged to the bay. Reputable biologists have concluded that the impact of the heated water on the fishery is insignificant. But to be conservative, let's assume that the benefits of cooled water would be as great as the benefits of reduced water use. Some might argue that there would also be intangible benefits, namely that people will simply "feel better" knowing that these reductions have occurred. Using EPA's rule of thumb that such intangible benefits be estimated as equivalent to half of direct benefits, the ratio of costs to benefits would range from 57-1 for the proposed system, up to 169-1 for conventional closed-cycle cooling. By any reasonable interpretation, such costs are wholly disproportionate to the benefits.

A legitimate economic analysis of the costs and benefits lets the chips fall where they

may. This is why EPA's recent analysis of the Brayton Point alternatives is so disturbing. It begins by using reasonable analytical methods and finds benefits of proposed actions considerably less than costs, validating the conclusions described above. Apparently not satisfied with that result, the EPA switches gears, examines the cost of habitat restoration, calls that cost a "benefit," and adds it to the benefits column, thereby committing a fundamental error by confusing benefits and costs.

This sort of "avoided-cost method of benefit estimation" has long been recognized as fatally flawed. Applying it will mean that any proposed project (whether the project is good or bad for the environment) will appear to be desirable. By taking the next more costly approach of achieving an objective and calling that the project's benefits, one will always find that "benefits" — so measured — exceed costs. This completely flawed reasoning will come back to haunt the EPA when others use it to push for actions the agency opposes.

It's easy to come up with environmental safeguards that hurt the economy more than necessary. That's not much of a trick, and it's certainly not a success. But for EPA to identify smarter approaches that protect the environment and protect the economy — now, that's a success.

Brayton Point's owner is proposing to spend \$57 million up front on an innovative system to reduce water withdrawals by 327 million gallons per day (and heat discharges by 14 trillion BTUs per year), while continuing to provide one-fifth of the electricity used in Massachusetts. The EPA should embrace this proposal and declare victory.

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