

WHY COST-BENEFIT ANALYSIS IS FLAWED

Cost-benefit analysis is a failed approach to regulatory analysis, producing reliably unreliable results. To be clear, cost-benefit analysis is not in need of mere tweaking. It is inherently flawed. Over a quarter century of use by administrations of both parties, it has failed to accurately or adequately capture the benefits of proposed regulations, and it has even ignored some benefits altogether because they defied monetization. At the same time, it has frequently overstated the costs to industry of compliance. As a result, cost-benefit analysis is a truly distorted approach to regulatory decision-making that is tilted heavily against new regulations.

One reason that some past administrations have continued to use cost-benefit even though it is unsupported by statute is that it perfectly suited their ideological purposes, slanting regulatory analysis in opposition to protective regulations, so as to benefit industry. The current administration, concerned as it is about protecting health, safety, and the environment should not fall back on cost-benefit analysis, or be cowed into using it, simply because it has been in use a long time.

It was introduced despite the lack of a statutory basis, it has continued in use despite its manifest failings, and the only argument for its continuation is that it has grown familiar to Washington insiders. It is “the way we’ve always done things.” But it has failed the public. It has been an impediment to the enforcement of the law. It has foiled congressional intent. It has become a tool for opponents of meaningful environmental, health and safety protections. Its time has passed.

CONGRESS REJECTED COST-BENEFIT ANALYSIS FOR GOOD REASON; IT PRODUCES IRRATIONAL AND UNRELIABLE RESULTS

Congress has good reason to be skeptical of cost-benefit analysis. Put simply, when applied to environmental health and safety regulation, cost-benefit analysis rests on the untenable assumption that complex ecological and human health processes can be quantified and expressed in dollar terms. In practice, scientific understandings are rarely fine-grained enough to predict impacts in quantifiable terms. Even when they are, data are inevitably vastly incomplete. And even for those quantifiable data that do exist, the process of converting such data into dollar terms raises intractable practical and theoretical difficulties that make most monetized estimates of impacts endlessly contestable. As a result, cost-benefit analysis fails miserably at its appointed task. Rather than providing a common sense tool for insuring reasonable regulation, cost-benefit analysis produces Alice-in-Wonderland results that most of the time are so incomplete and unreliable, they provide endless opportunity for interest groups to manipulate and contest the results.¹

The EPA’s cost-benefit analysis of its rule regulating cooling water intake structures at existing power plants provides an illustrative example. Power plants withdraw millions of gallons of water a day for cooling purposes. In the process, billions of aquatic organisms are killed, either by being

trapped against the components of the cooling water intake structure or by being sucked up into the cooling water system itself. In order to quantify the environmental benefits of a rule that would require power plants to take steps to reduce these adverse impacts, the EPA had to attempt to first quantify and then monetize the number of organisms harmed by this process that would be saved by the rule.

As is typical of such attempts to estimate the environmental benefits of regulation, the data the EPA had to work with were vastly incomplete. First, from the outset, the EPA left out whole categories of aquatic organisms for which it simply had no data. These included a number of species that the EPA acknowledged might play crucial roles in the food chain and other aspects of the aquatic ecosystem—phytoplankton and zooplankton; endangered sea turtles; and even certain commercially valuable species, such as shrimp, lobsters, crabs, and mussels. But even of the fish species it did include in its analysis, the EPA counted only the less than two percent that would be caught by commercial or recreational fisherman if they escape the cooling water intake structures. The EPA candidly admitted that its estimate “does not account for the benefits from the remaining 98.2% of the . . . aquatic organisms estimated to be protected nationally under today’s rule.”²

Once it had arrived at this grossly incomplete quantification of the number of fish benefited by the rule, the EPA faced the difficult task of trying to attach a dollar figure to the saved fish. With respect to the tiny percentage of those fish that would be commercially caught, the EPA simply used the market price. With respect to the even smaller number of recreationally caught fish, it used a controversial model that inferred anglers’ willingness-to-pay for recreational fishing based on their travel costs for visiting particular fishing sites and then used a mathematical model to estimate how that willingness-to-pay would likely increase in response to increased catch levels. Even putting aside the difficulties with this model, the EPA acknowledged that monetizing only the commercial and recreational value of these fish accounted for only a small slice of their overall ecological value. Initially, in the cost-benefit analysis accompanying its proposed rule, the EPA used several methods to attempt to monetize at least some of these ecological values. These methods proved controversial, however, and after receiving considerable criticism in the comments to the proposed rule, the EPA finally threw up its hands and simply attached no dollar value to these ecological values at all. Thus, by the time it issued the final rule, the EPA’s benefits estimate—grossly incomplete by its own admission to begin with—had shrunk by nearly tenfold, from \$735 million in the proposed rule to just \$83 million in the final rule.³

In reporting the costs and benefits of the final rule, the EPA flatly acknowledged that its benefits estimate was grossly incomplete, making a meaningful comparison with costs impossible: “EPA notes that these analyses are based on a comparison of a partial measure of benefits with a complete measure of costs; therefore, the results must be interpreted with caution.”⁴

The real tragedy is that biased and misleading cost-benefit analyses such as that for the EPA’s cooling water intake rule have a real substantive impact, leading to weaker rules than is actually called for under the statute. In the case of this rule, it appears that the Office of Information and Regulatory Affairs (OIRA)—the obscure White House office that superintends agency performance of cost-benefit analysis—pressured the EPA into weakening its proposed rule on the basis of this highly flawed, incomplete, and irrational cost-benefit analysis. Although records of the communications between the EPA and OIRA during the review process are not public, the rule emerged from the OIRA review process without the more stringent requirement that certain plants use the far more environmentally friendly closed cycle cooling process. The only reason the EPA cited for the change was the results of its cost-benefit analysis: The dollar benefits of the rule did not outweigh the dollar costs.⁵

This is just one example of the weakened rules that routinely result when cost-benefit analysis is applied to environmental, health, and safety regulation. We could have cited many others. One study looked at 25 cost-benefit analyses of agency rules reviewed by OIRA in a one-year period and found that in 19 of the 25 cases, the agencies were unable to monetize *any* of the rules' benefits. In the remaining cases, significant benefits were omitted.⁶

The National Highway Traffic Safety Administration's cost-benefit analysis for its new rule setting fuel efficiency standards for light trucks in 2006 omitted the climate change impacts of the rule entirely.⁷ And the EPA's cost-benefit analysis for its Mobile Source Air Toxics Rule literally left out all of the benefits at which the rule was aimed—*i.e.*, those associated with reductions in air toxics.⁸

Nor have we even touched on the litany of theoretical conundrums that plague efforts to apply cost-benefit analysis to environmental, health, and safety regulation. For example, proponents of cost-benefit analysis support the use of a "senior death discount," which literally values the lives of the elderly beneficiaries of regulations as compared to younger beneficiaries. They justify this disparate treatment on the basis of the fact that the elderly have fewer years left to live, and therefore their remaining life is worth "less." The obvious moral repugnance of this practice is somehow lost on supporters of cost-benefit analysis. In addition, cost-benefit analysis attempts to assign value to things based on people's willingness-to-pay, but this is a notoriously problematic measure of value. A person's willingness to pay, for example, is tied in part to her wealth. This leads to ethically questionable practices like valuing the lives of people in the U.S. 30 times higher than the lives of people in India.⁹

The practice of discounting the benefits of regulation that will accrue in the future also creates unending controversy. After decades of debate, there has been no agreement on what discount rate is appropriate for valuing future benefits, particularly those that accrue to future generations. Some argue that no discount rate at all should be used. OIRA suggests a rate of seven percent. Yet final benefits estimates can vary enormously—by orders of magnitude—depending on the discount rate used.

In the end, the intractable practical and theoretical difficulties that plague any attempt to apply cost-benefit analysis to environmental, health, and safety regulation inevitably produce irrational and unreliable results. This indeterminacy only undercuts the justifications for its use—namely, that by providing a rational and "neutral" standard for decision-making, cost-benefit analysis increases transparency and reduces the undue influence of interest groups. In fact, its indeterminacy invites manipulation that leads to litigation and, accordingly, to increased transaction costs for the promulgation of new regulations. The end result is that the agencies have less time and fewer resources to develop new regulations to protect people and the environment or to improve old regulations.

RATHER THAN AIDING REGULATORY DECISION-MAKING, THE USE OF COST-BENEFIT ANALYSIS HAS IN FACT HARMED THE REGULATORY SYSTEM BY DILUTING OR DELAYING MUCH-NEEDED REGULATION

As detailed above, the vast majority of federal health, safety, and environmental statutes Congress prohibited agencies from basing their regulatory decisions on cost-benefit analysis. And it did so for good reason. Cost-benefit analysis in this context produces irrational results. Accordingly, the cost-benefit analysis mandated by Executive Order 12,866 in most instances creates pointless bureaucratic make-work that serves only to needlessly delay and dilute regulatory initiatives. Indeed, that was the original goal of the cost-benefit mandate.

The widespread use of formal cost-benefit analysis by federal agencies began in 1981, when President Reagan signed Executive Order 12,291, requiring formal cost-benefit analysis to be prepared for all major federal regulations. The executive order was seen at the time as a highly partisan effort to slow regulatory activity, and it “proved extremely controversial.”¹⁰ Indeed, it explicitly stated that its purpose was “to reduce the burdens of existing and future regulations.” Executive Order 12,291 gave authority to oversee agency compliance with the new cost-benefit analysis mandate to the newly created OIRA.

It was widely assumed that OIRA’s review of regulations under the executive order’s cost-benefit analysis mandate would have the effect of delaying and weakening rather than spurring regulation, and that, indeed, has been the effect, even during subsequent administrations. For example, as mentioned above, the U.S. Government Accountability Office studied 25 rules that had been significantly affected by OIRA between June 2001 and July 2002 and found that the regulatory protections in 24 of the 25 rules were weakened consistent with OIRA’s recommendations.¹¹ This evidence suggests that the original—politically motivated—regulatory relief objective for White House review continues to play a significant role in the review process.

Even where the use of cost-benefit analysis is not able to produce reductions in regulatory stringency, the mere process of subjecting individual regulation to comprehensive centralized regulatory review has the effect of delaying regulations. Because of OIRA’s small staff (at last count, around 30-35 professional staff) and its large workload (OIRA reviewed around 600 regulations in fiscal year 2006-2007), the review process can last several months, and in some cases, well over a year.

One example of how cost-benefit analysis has been used to hobble much-needed regulation involves the EPA’s 2002 proposed regulation to restrict emissions of nitrogen oxide from large ships.¹² Nitrogen oxide is a precursor to particulate matter pollution, which results in tens of thousands of deaths in the United States every year. It also contributes to ground level ozone, which triggers countless asthma attacks and other lung-function incidents a year—many requiring emergency room visits. In its proposed rule, the EPA offered OIRA two different levels of stringency for controlling nitrogen oxide emissions from large ships. The first imposed a standard essentially identical to what was already required under international law. The second level of stringency mandated a 30-percent cut from the international requirement.

When OIRA ran the rule through its cost-benefit process, it estimated that the economic benefits of deaths and emergency room visits avoided from the more stringent rule at zero dollars. Zero dollars for lives saved, and not a penny for emergency visits avoided. Apparently the EPA reached this conclusion because it lacked adequate data to quantify accurately the number of premature deaths and health emergencies that would be averted

by the more stringent standard. OIRA and the EPA had no reason to doubt there were such savings, and there was no shortage of data to prove it. But in the absence of a firm estimate, OIRA arbitrarily assigned a zero value.

Under OIRA's warped approach, rules that produce no benefits are treated exactly the same as rules for which the benefits defy quantification. That meant the tighter standard for nitrogen-oxide literally had nothing going for it, and was therefore rejected. The EPA ended up adopting a rule based on the far less stringent standard, and the air that Americans breathe today has that much more nitrogen-oxide in it as a result.¹³

CONGRESS DIRECTED HEALTH, SAFETY, AND ENVIRONMENTAL AGENCIES TO USE A MULTI-FACTORIAL ANALYSIS THAT EXTENDS FAR BEYOND THE CRABBED AND MYOPIC CONSIDERATIONS INVOLVED IN TRADITIONAL COST-BENEFIT ANALYSIS.

Only two of the 31 statutory mandates that apply to health, safety, and environmental agencies specifically call for a balancing of costs against benefits as part of the judgments agencies must make in formulating regulations. Instead, as illustrated in the attached table, in 29 out of 31 of these provisions, Congress directed agencies to use one of several, well-established alternatives to cost-benefits analysis including the formulation of technology-based or effects-based standards, phased bans, or the balancing of multiple factors.

A. Technology-Based Standards

The most common of the standard setting methods employed by Congress is technology-based standards, sometimes also referred to as feasibility standards. Technology-based standards are called for extensively throughout the Clean Air Act and the Clean Water Act, among many others. These standards set pollution limits at the lowest level technologically and economically feasible, assuming that such pollution reductions will deliver sufficient health and environmental benefits to be worth the costs. This requires the agency to evaluate the likely costs of a proposed standard in order to determine whether it is economically feasible (*i.e.*, "available"). But it does not require agencies to delve into the far more problematic task of attempting to quantify and monetize the environmental benefits of regulation in order to compare them to costs.

Congress' rejection of cost-benefit analysis was grounded in experience with the kind of regulatory paralysis that can result when decision-making standards impose unrealistic information burdens on agencies. Congress' adoption of technology-based standards in the Clean Water Act, for example, was in response to just such a failure. Previous versions of the Act had required standard-setting and enforcement to be based on an evaluation of the benefits of regulation—*i.e.*, on assessments of the quality of the receiving waters. This approach proved to be entirely unworkable—in the words of the Senate Committee on Public Works—"inadequate in every vital aspect."¹⁴ Evaluating the benefits of water pollution reduction required tedious and costly site-specific measurements, as well as assessments of complicated and inadequately understood ecological chains of causation. Technology-based standard-setting, on the other hand, allows the EPA to set uniform national standards for each industry based on the maximum technologically achievable level of pollution reduction.¹⁵ This only requires the agency to evaluate technologies and costs, without delving into the problematic realm of precisely quantifying environmental benefits.

B. Effects-Based Standards

In a number of statutes, Congress has directed agencies to use effects-based standards that consider only the human health or environmental effects of a regulation without regard to economic costs. The most prominent examples of these are the National Ambient Air Quality Standards under the Clean Air Act and the stringent standards for the protection of imperiled species under the Endangered Species Act. In the case of the Clean Air Act, these effects-based standards reflect Congress' concern with the paramount importance of protecting human life as well as its desire to challenge industry to develop the next generation of more effective pollution control technologies rather than accepting the limits of existing technologies. The cost-blind nature of the NAAQS is tempered by the fact that they are implemented through technology-based standards that do allow for the consideration of costs.

The Endangered Species Act, on the other hand, with only a couple of rarely employed exceptions,¹⁶ allows no consideration of costs whatsoever in setting standards for the protection of species facing extinction. This reflects Congress' judgment that endangered species implicate such "immeasurable" and "incalculable" values we should "halt and reverse the trend toward species extinction, whatever the cost."¹⁷ In other words, certain values are simply too important to be balanced against economic costs and therefore stand outside the economic calculus.¹⁸

C. Phased Bans

In a limited number of instances, Congress has ordered a phased ban of a particular risk-creating substance. In some ways, this standard might be seen as special case of an effects-based standard in which Congress has made a determination that no level of the particular risk to be regulated is safe. A phased ban also reflects Congress' judgment that an immediate ban would impose excessive regulatory costs (*e.g.*, because there is no viable alternative to the banned substance) and that a ban should therefore be phased in to minimize the most disruptive aspects of the regulation.

D. Multi-factor Balancing

Even in those instances in which Congress has instructed agencies to compare costs and benefits, it almost never requires them to perform a full-fledged quantified and monetized cost-benefit analysis. Instead, statutes with a multi-factor balancing standard require an agency to consider a variety of factors, and to weigh them in qualitative terms. Thus, these statutes do not require the agency to attempt to quantify these factors or convert them into monetary units. Moreover, they do not indicate what weight an agency is to give to each factor.¹⁹ The EPA, for example, is authorized under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to place conditions on the licensing of pesticides to the extent necessary to avoid unreasonable adverse effects on the environment.²⁰ Congress defined unreasonable adverse effects on the environment as "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits" of the pesticides' use."²¹

(The arguments in this fact sheet were excerpted from comments to the Office of Information and Regulatory Affairs by the Center for Progressive Reform on March 16, 2009)

Only Two Statutory Provisions Protecting Health, Safety, and the Environment Call for Cost-Benefit Analysis

Reliance on Cost-Benefit Analysis?	Statutory Standard	Provisions in Environmental, Health and Safety Statutes	Number of Provisions
Prohibited by statute: 23	Technology-Based	<ul style="list-style-type: none"> • Clean Water Act (existing sources standard) • Clean Water Act (new sources standard) • Clean Air Act (non-attainment areas standard) • Clean Air Act (prevention of significant deterioration standard) • Clean Air Act (national emissions standards for hazardous air pollutants) • Clean Air Act (mobile sources standard) • Clean Air Act (new sources standard) • Occupational Safety and Health Act • Resource Conservation and Recovery Act (land disposal restrictions) • National Traffic and Motor Vehicle Safety Act • Surface Mining Control and Reclamation Act 	11
	Effects-Based	<ul style="list-style-type: none"> • Clean Water Act (ambient water quality standards and anti-degradation policy) • Clean Air Act (national ambient air quality standards) • Food, Drug, and Cosmetic Act (Delaney Clause) • Food, Drug, and Cosmetic Act (pesticide residues standard) • National Forest Management Act (diversity protection provision) • Endangered Species Act (species listing, take, and jeopardy standards) • Wilderness Act • Wild and Scenic Rivers Act • National Wildlife Refuge Administration Act • National Park System Organic Act 	10
	Phased Ban	<ul style="list-style-type: none"> • Clean Air Act (ozone depleting materials standard) • Toxic Substances Control Act (polychlorinated biphenyl standard) 	2
Permitted but not required by statute: 6	Multi-factor Balancing	<ul style="list-style-type: none"> • Comprehensive Environmental Response, Compensation, and Liability Act • Federal Insecticide, Fungicide, and Rodenticide Act • Toxic Substances Control Act • National Forest Management Act (multiple use and sustained yield standard) • Federal Land Policy and Management Act (multiple use and sustained yield standard) 	5
	Technology Based/Cost-Benefit Hybrid	<ul style="list-style-type: none"> • Safe Drinking Water Act²² 	1
Required by statute: 2	Cost-Benefit	<ul style="list-style-type: none"> • Consumer Product Safety Act • Accountable Pipeline Safety and Partnership Act 	2

¹ For a collection of critiques of cost-benefit analysis from a wide variety of accomplished academics, many of whom are CPR scholars, see THOMAS O. MCGARITY, SIDNEY A. SHAPIRO, & DAVID BOLLIER, *SOPHISTICATED SABOTAGE: THE INTELLECTUAL GAMES USED TO SUBVERT RESPONSIBLE REGULATION* (2004).

² National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,660-61 (July 9, 2004) (to be codified at 40 C.F.R. pts. 9, 122, 123, 124, and 125).

³ Compare EPA, *Economic and Benefits Analysis (EBA) for the Proposed Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-001 (February 2002), at D1-4 with National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,666 (July 9, 2004) (to be codified at 40 C.F.R. pts. 9, 122, 123, 124, and 125).

⁴ National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,666 (July 9, 2004) (to be codified at 40 C.F.R. pts. 9, 122, 123, 124, and 125).

⁵ National Pollutant Discharge Elimination System—Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 67 Fed. Reg. 17,122, 17158 (April 9, 2002) (to be codified at 40 C.F.R. pts. 9, 122, 123, 124, and 125).

⁶ David M. Driesen, *Is Cost-Benefit Analysis Neutral?* 77 U. COLO. L. REV. 335, 376, 397 (2006).

⁷ See U.S. Department of Transportation, National Highway Traffic Safety Administration, Final Regulatory Impact Analysis, Corporate Average Fuel Economy and CAFÉ Reform for MY 2008-2011 Light Trucks VIII-64 to VIII-65 (March 2006), available at

http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/2006_FRIAPublic.pdf.

⁸ Control of Hazardous Air Pollutants From Mobile Sources, 71 Fed. Reg. 15804, 15907-10 (Mar. 29, 2006).

⁹ See David W. Pearce, W.R. Cline, A.N. Achanta, Samuel Fankhauser, R.K. Pachauri, Richard S.J. Tol, & P. Vellinga, *The Social Costs of Climate Change: Greenhouse Damage and the Benefits of Control*, in CLIMATE CHANGE 1995: ECONOMIC AND SOCIAL DIMENSIONS OF CLIMATE CHANGE 179, 197 (J.P. Bruce, H. Lee, & E.F. Haites eds., 1995).

¹⁰ CASS R. SUNSTEIN, *RISK AND REASON* 20 (2002).

¹¹ See David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. COLO. L. REV. 335, 365, 380 (2006).

¹² See Control of Emissions of Air Pollution from New Marine Compression-Ignition Engines At or Above 30 Liters/Cylinder, 67 Fed. Reg. 37,548, 37,597-98 (proposed May 29, 2002) (to be codified at 40 C.F.R. pt. 94).

¹³ See Control of Emissions From New Marine Compression-Ignition Engines At or Above 30 Liters Per Cylinder, 68 Fed. Reg. 9746, 9755 (Feb. 28, 2003) (to be codified at 40 C.F.R. pts. 9, 94).

¹⁴ *A Legislative History of the Water Pollution Control Act Amendments of 1972*, Ser. No. 93-1, at 1423 (1973); S. Rep. No. 92-414, at 7 (1971).

¹⁵ *Weyerhaeuser v. Costle*, 590 F.2d 1011, 1042 (D.C.Cir. 1978).

¹⁶ See 16 U.S.C. § 1539 (2000).

¹⁷ *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 184 (1978).

¹⁸ CASS R. SUNSTEIN, *RISK AND REASON* 213-14 (2002) (suggesting that ESA may be "rooted in a theory of rights, one that rebuts the presumption in favor of cost-benefit balancing"). See also Amy Sinden, *In Defense of Absolutes: Combating the Politics of Power in Environmental Law*, 90 IOWA L. REV. 1405 (2005).

¹⁹ SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, *RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH* 39 (2003).

²⁰ 7 U.S.C. § 136a(d)(1)(C) (2000).

²¹ 7 U.S.C. § 136(bb) (2000).

²² Under the Safe Drinking Water Act Amendments of 1996, EPA is authorized but not required to deviate from the technology-based standards on the basis of cost-benefit analysis.