AFPM
American
Fuel & Petrochemical
Manufacturers

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EPA Docket Center
Environmental Protection Agency
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Washington, DC 20460

RE: Docket ID No. EPA–HQ–OA-2018-0107, Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process (83 *Fed. Reg.* 27524 (June 13, 2018))

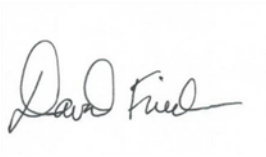
The American Fuel & Petrochemical Manufacturers (AFPM) submits comments on the advance notice of proposed rulemaking (ANPRM) related to increasing consistency and transparency in considering costs and benefits in the rulemaking process.

AFPM is a national trade association whose members comprise virtually all U.S. refining and petrochemical manufacturing capacity. AFPM's member companies produce the gasoline, diesel, and jet fuel that drive the modern economy, as well as the chemical building blocks that are used to make millions of products that make modern life possible.

Our member companies are subject to a broad range of regulatory programs, including air, water, and solid waste regulations overseen by the Environmental Protection Agency (EPA). We are generally supportive of EPA adopting a standard methodology for: (1) carrying out cost/benefit assessments for new or updated regulations; and (2) using the information to determine whether a new or updated regulation is justified. A regulatory approach is preferable to the current paradigm that relies on guidance documents and Executive Orders. However, it is paramount to our membership that promulgated rules governing these assessments be reasonable, flexible, consistent, and grounded in the relevant underlying environmental statutes (*e.g.*, Clean Air Act, Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, etc.). EPA should use the best available data to calculate costs and benefits, and should not calculate benefits for reducing criteria pollutants in areas already in attainment with the National Ambient Air Quality Standards (NAAQS). Additionally, the evaluation of regulatory costs and benefits should be based on the pollutant(s) for which EPA is setting standards.

Thank you for your consideration of these comments. Please feel free to contact me at 202-844-5508 or dfriedman@afpm.org if you have questions or need more information.

Sincerely,



David Friedman
Vice President, Regulatory Affairs
American Fuel & Petrochemical Manufacturers

Executive Summary

According to EPA's Air Pollution Control Cost Manual,[1] cost plays an important role in setting many types of regulations. Depending on the type of regulation and the statutory requirements related to consideration of cost, regulators may attempt to: 1) balance costs and impacts; 2) use cost to choose among alternatives that have similar levels of stringency; or 3) evaluate the regulatory approach that will have the lowest cost while still achieving their goals. It is imperative that the process of estimating all components of regulatory impacts (both costs and benefits) be transparent and consistent, while using up-to-date information.

Industry has provided comments on the regulatory impact analyses (RIAs) for countless proposed regulations, as well as on EPA's proposed revisions to the Air Pollution Control Cost Manual. Our comments on this ANPRM are generally applicable to the issues associated with assessing the costs and benefits for all EPA regulations that impact our members' air emissions, water discharges, and disposal of solid and hazardous waste. We are, however, focusing our comments at this time primarily on the EPA rules that address air emissions because the cost/benefit analyses (CBA) associated with these rules in our view historically have been especially inconsistent, biased, and opaque. In addition, air quality has improved dramatically since the 1990 Clean Air Act Amendments, in large part because EPA has promulgated air standards for almost every category of major stationary sources that have resulted in significant emissions reductions. It is important that future regulatory activities (either new standards or revisions to existing standards) be conducted with careful consideration of the costs and the benefits of those activities beyond the substantial improvements that have already been accomplished.

Obviously, both cost and benefit analyses are important in determining final regulatory requirements. A regulation that imposes cost to the regulated community with little or no societal benefits would not be logical and could harm the regulated community, as well as society if increased costs were passed on to consumers without any associated benefits. However, the incremental costs and benefits attributed to any regulatory action should be the direct result of, and narrowly focused on, reductions in pollutants specified in the underlying statute. For example, a regulation that is meant to reduce emissions of hazardous air pollutants (*e.g.,* mercury) should not be justified on the basis of estimated reductions in criteria pollutants that are regulated under other programs (*e.g.,* $PM_{2.5}$), especially in areas where air quality is already below the NAAQS (which are set with an ample margin of safety). Reductions in different types of pollutants in different geographical areas will not have equivalent air quality or societal benefits, but over the past decade, EPA has repeatedly used reductions in $PM_{2.5}$ to represent the monetized benefits of regulations that set standards for pollutants other than $PM_{2.5}$ (*e.g.*, for the Mercury and Air Toxics Standard, ambient ozone standards reconsideration, and Cross-State Air Pollution Rule). Consequently, EPA has claimed benefits for reducing the same emissions more than once ($PM_{2.5}$ emissions reductions have accounted for the majority of the benefits in over a dozen air regulatory actions in the past 15 years) and has counted benefits from reducing emissions in attainment areas the same as the benefits from reducing emissions in nonattainment areas. It is appropriate for a

[1] EPA/452/B-02-001, https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#cost%20manual.

CBA to identify and include discussion of the ancillary or co-benefits of a proposed regulation, but it is not appropriate for these types of secondary benefits to be used as justification for a regulation. Furthermore, reductions in criteria pollutant impacts should not be counted as a benefit when the reductions occur in attainment areas. The co-benefits or reductions of pollutants regulated under an existing statute like the NAAQS should not be given equal weight when justifying regulations that impose standards on other pollutants. When EPA highlights the co-benefits of a regulatory change in its public statements or documents, particularly co-benefits that are improperly quantified, the true impacts of a rule are distorted and public's opinion of a regulation's stringency, or even its necessity, are prejudicially affected.

I. AFPM's Concerns with Inconsistency and Lack of Transparency in Cost/Benefit Assessments

Benefits can be measured or qualified using many different methods, but there is often a greater amount of uncertainty associated with the estimate of the benefits as compared to the estimate of the monetary costs, which can generally be developed based on standard engineering practices. Due to the varied protocols and methods to estimate benefits, the results of an analysis can vary greatly and may be manipulated to further a political agenda, leading to inconsistency between analyses and disputes regarding the appropriate methods to use in estimating the benefits. This issue is also problematic because the benefits assessments in RIAs are rarely, if ever, subjected to independent third-party peer review. OMB Circular A-4[2] advises that the opinions of those that will be affected by the regulation should be sought out and that the consultation should not be limited to the final stages of the analysis. Industry is often only given the opportunity to review EPA's analysis of the impacts of a regulation only after the publication of a proposal in the Federal Register, not while EPA is developing it.

We share the view of Dr. Michael Honeycutt, who observed that "In recent years, EPA has approached policy decisions with an overabundance of caution, leading to excessively conservative regulations not fully supported by the best available science." Dr. Honeycutt described EPA's approach of systematically overestimating the benefits of regulation as "misleading to the public" that "can result in inadequate attention or resources to address real health effect risks or problems."[3] In addition, overestimating the benefits of a regulation can result in a misallocation of society's resources.

In addition to the methods used to assess the benefits and costs, efforts need to focus on the baseline scenario. The baseline scenario should represent existing conditions and how conditions would change over time if a regulation were not implemented. This analysis should include other draft regulatory actions affecting the same pollutant that are past public comment, and regulatory actions that are final but not yet implemented. Comparing proposed regulations with a reasonable baseline scenario ensures that the incremental costs and benefits identified are specific to the proposed regulation and do not overlap with other regulations. We have found that developing a well-thought-out baseline scenario is often more difficult than developing the scenario with the regulations in place because typically at any

[2] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.
[3] Testimony of Dr. Michael Honeycutt, Texas Commission on Environmental Quality, before the U.S. House of Representatives Subcommittee on Energy and Environment, July 6, 2012.

point in time EPA is actively working to promulgate or revise multiple regulations that have potentially overlapping health benefits (for example, the multiple rules that impact the power sector, such as the Clean Power Plan, NAAQS, Mercury and Air Toxics Standards [MATS], and Cross-State Air Pollution Rule [CSAPR]). As described previously, this issue has been exacerbated by EPA's tendency in the past to rely heavily on the co-benefits of regulatory action in CBAs. Although recently EPA appears to have moved away from this practice, we encourage EPA to establish and follow guidelines that require that a transparent, consistent, and well-thought-out baseline scenario is used in CBAs, and to codify this approach in its regulations.

A regulation's benefits are often derived from third-party research studies. "Benefits transfer" is the procedure of estimating the value of one good or service (the "policy site") by transferring an existing valuation estimate from a similar location (the "study site"). Transfer errors can arise and may result in estimates that differ from the actual values. The acceptable level of transfer error for decision-making is context-specific, but if a highly precise value estimate is required, it is recommended to commission a primary valuation study. When using benefits transfer, marginal values are likely to vary with site characteristics, socio-economic characteristics, and environmental context. Therefore, care needs to be taken to adjust transferred values when there are important differences between the study and policy sites.

Additionally, summing up the value of different services from the same good to arrive at the total economic value of a regulation or policy change should be exercised with caution to avoid double counting. As long as the values are entirely independent, adding up the values is possible. However, the services can be mutually exclusive, interacting, or integral.[4] The interconnectivity and interdependencies of services may increase the likelihood of double-counting services. Also, the interaction of services and values can be dependent on their relative geographical position and scale. The spatial scales at which services are supplied and demanded contribute to the complexity of transferring values between sites. Study sites and policy sites need to be carefully matched. In the case of value function transfer and meta-analytic function transfer, parameters need to be included in the functions to control for important site characteristics.

Providing a well-documented, transparent, and peer-reviewed benefit analysis would improve the regulatory process because both industry and the public would be better able to evaluate impacts of regulation (or non-regulation). The current procedure for analyzing impacts of regulatory actions allows for significant variation and uncertainty. Transparency is essential for ensuring that the analyses use appropriate (*e.g.*, technically appropriate and up-to-date) compliance costs and that impacts to both industry and the public are represented accurately. Transparency and consistency in the analysis of regulatory impacts are essential for industry and the public to understand risk and plan to minimize it.

One example of where EPA's lack of transparency in a CBA has been misleading to the public is in the development of the Mercury and Air Toxics Standard (i.e., 40 CFR 63, Subpart UUUUU), also known as

[4] Turner, R.K, Georgiu, S., Clark, R., Brouwer, R., Burke, J., "Economic Valuation of water resources in agriculture. From the sectoral to a functional perspective of natural resource management." Food and Agriculture Organization of the United Nations. Rome, Italy (2004).

the electricity generating unit (EGU) MACT rule. At the time of proposal, EPA's published Fact Sheet about these rules stated that, among other health-related benefits, implementing them would avoid 17,000 premature deaths, 12,200 hospital and emergency room visits, 850,000 days when people miss work, and 120,000 cases of aggravated asthma.[5] However, in reality each of the health-related benefits EPA cited were predicted to occur as a result of the co-benefit of reducing $PM_{2.5}$ emissions, not from reductions in emissions of the air toxic compounds that were the stated purpose of the rule. EPA did disclose in the fact sheet that they "did not estimate benefits associated with reducing exposure to air toxics," in the RIA for these rules, and that the stated health-related benefits were predicted to occur from PM2.5 emissions reductions. It was misleading and disingenuous for EPA to imply in its public statements that air toxic emissions from power plants were significantly harming the public.

As discussed further below, EPA's reliance on over-quantified $PM_{2.5}$ co-benefits in CBAs is misleading and may prevent EPA from adequately quantifying any health benefits associated with controlling other pollutants.

II. Potential Approaches for Improving Consistency and Transparency

A. Suggestions for improved consistency

There are inherent uncertainties in a proposed regulation's CBA, such as the likelihood and frequency of various future events and the uncertainty surrounding costs and benefits. Over the long term, both investment uncertainty and risk will naturally increase. Estimates of current values should be based on actual data from multiple reliable sources, and estimates of future values should be based on clearly specified models and assumptions. All assumptions should be clearly stated and, where possible, all models should be independently reproducible.

Additionally, the Agency should minimize the practice of "compounding models" when preparing regulatory analysis. In working with complex industrial operations, the Agency will often use "generic models" of operations to make determinations of potential technical requirements, work-practices, and/or emission reduction impacts. Simplifying assumptions and significant cost conservatism (i.e., low cost of capital) is built into these technical analyses and the results, while potentially representing a mathematical industry average, do not represent any single facility in a realistic sense. The results from these analyses then feed the economic models, where further assumptions and cost conservatism are added that further magnify and compound this departure from reality. To the maximum extent possible, EPA should employ real-world technical data for use in making a CBA and rely less on abstract technical models.

The timeframe for the CBA is also of concern as the longer the period of analysis, the more uncertainty is associated with both the baseline and regulatory action under consideration. Because forecasts of the distant future are less reliable than forecasts of the near future, it is preferential that the CBA use a timeframe that demonstrates relative certainty. OMB Circular A-4 states that the timeframe for assessing the cost of a regulatory action should consider the timing of when the health benefits

[5] https://www.epa.gov/sites/production/files/2016-05/documents/proposalfactsheet.pdf.

associated with that action would be expected to occur, noting that "…it may take years or even decades for a rule to induce its full beneficial effects in the target population."[6] Nonetheless, it is inappropriate for a CBA to utilize a time period longer than the useful life of a rule's target emissions source or emissions control systems. According to the Internal Revenue Service, the class life for industrial process equipment (including steam generation equipment, petroleum refining equipment and the like) is between 15 and 22 years.[7] In this regard, CBAs should use time periods that are commensurate with the timeframe that banks would be willing to consider lending money at a reasonable rate of return.

Moreover, it is essential that the appropriate discount rate be used for assessing present values, and that the same rate is used to discount both benefits and costs. Almost any regulation can be justified by using a sufficiently low discount rate, or by choosing a sufficiently long time period.

With respect to the cost of industry compliance, if capital investment is required to reduce emissions or make a process change, the interest rate used in the cost analysis should not be the current prime rate, as suggested by the November 2017 revision to the EPA Air Pollution Control Cost Manual. Per the 1990 Office of Air Quality Planning and Standards' (OAQPS) Control Cost Manual, the interest rate used in control cost calculations is a pretax marginal rate of return on private investment, or a real private rate of return. In addition, the Sixth Edition of the Cost Manual (January 2002) states, "Common interest rates used by industry and accepted by the EPA for source petitions include the business' current borrowing rate, the current prime rate, and other acceptable industrial rates of return."[8] The minimum acceptable rate of return (MARR) or "hurdle rate" is the minimum rate of return that a company is willing to accept before undertaking a project. Selection of an appropriate MARR depends on many factors, but 12% percent or higher is a customary rate-of-return on capital expenditures expected by most manufacturers considering that the S&P 500 typically yields returns between 8% and 11%.[9] [10] Use of a lower rate such as the current prime rate or even the social discount rate of three or seven percent may not be appropriate because it may not consider the risk and uncertainty associated with such investments, which in absence of this uncertainty consideration undervalues the time value of industrial capital monies. The cost of investing capital to comply with an environmental regulation, rather than investing it in financially beneficial projects for the company with a real rate of return and additional economic benefit (*e.g*., additional jobs, local tax revenue, etc.), must be considered. Capital investments for regulatory compliance usually have a negative rate of return and serve to postpone investments in projects that have a positive rate of return.

OMB Circular A-4 recommends that the present values of the cost and benefits of regulations be estimated using both 3 and 7 percent discount rates. However, discount rates this low may not always be appropriate for all regulations, particularly for regulations that disproportionately affect certain industrial sectors. The petroleum industry must deliver a consistently higher rate of return than other

[6] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.
[7] Internal Revenue Service Publication 946, Table B-1 (2017).
[8] https://www3.epa.gov/ttn/ecas/docs/c_allchs.pdf, Chapter 2, Section 2.4.2.
[9] Park, C.S., Contemporary Engineering Economics, (fourth edition), Section 15.3 (2007).
[10] https://en.wikipedia.org/wiki/Minimum_acceptable_rate_of_return.

sectors of the economy because of the greater risk to investors as a result of the more cyclical nature of the industry. Accordingly, 3 or 7 percent discount rates may not be appropriate for our industry because the annual average rate of return on capital investments reported by refiners is in the range of 15 to 35 percent.[11]

Recognizing the importance that the selection of the discount rate has on the cost benefit of a prospective regulation, we concur with OMB Circular A-4, which notes that "…since the rates of return on capital are higher in some sectors of the economy than others, the government needs to be sensitive to possible impacts of regulatory policy on capital allocation."[12]

A quantitative uncertainty analysis can be incorporated within a CBA into a single modeling framework by assigning statistical distributions to the uncertain input parameters. The CBA would then use a continuum of inputs to evaluate the baseline scenario and the proposed regulation, with the results providing the probability for any given outcome, rather than a discrete result. The CBA would report the probability that a proposed regulation produces net benefits.

The uncertainty associated with the data and methods, the assumptions made, and how the uncertainty and assumptions affect the results are all important components of the CBA results and should be reported. This will provide decision-makers with information on the uncertainty associated with the CBA estimates and identify areas where additional research could reduce that uncertainty.

EPA's persistent inclusion of "co-benefits" when assessing the impacts of a particular environmental statute or regulation creates confusion and inconsistency. In this context, the term refers to monetizing and including all of the alleged ancillary advantages associated with a prospective regulation along with its primary improvements when assessing its benefits. For example, the co-benefits of improved energy efficiency, fuel switching, innovation in energy-generation technology, and job growth were often included when assessing the benefits of greenhouse gas reduction regulations. EPA has relied on $PM_{2.5}$-related health co-benefits when promulgating several new regulations for non-PM pollutants, including the MATS rule, CSAPR, the Boiler MACT rule, and the revised SO_2 NAAQS.[13] The current practice of recognizing and including monetized co-benefits in a CBA artificially inflates the benefits of a regulation or standard above and beyond the specific health, welfare, or environmental improvements that such regulations or standards seek to achieve. Co-benefits can be evaluated, but in our view should not be used to justify regulations, particularly when those co-benefits may already have been realized as a result of another statute or would occur due to external driving forces other than the regulation under consideration (such as changes in availability and/or cost of a particular fuel or material).

B. Suggestions for improved transparency

The costs to comply with a proposed regulation are borne by both industry and consumers. When expensive regulations justified by over-estimated benefits are promulgated, the same society that is

[11] https://www.regulations.gov/document?D=EPA-HQ-OAR-2007-0011-0154.
[12] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf at 33.
[13] Smith, A.E., "An Evaluation of the PM2.5 Health Benefits Estimates in Regulatory Impact Analyses for Recent Air Regulations," NERA Economic Consulting, (2011).

expected to benefit from these regulations also pays the price. Transparency and consistency in the CBA of proposed regulations is imperative for informing the public and justifying the costs they bear.

Since the monetary benefits to industry are negligible at best, a full accounting of the costs to industry should be included in the CBA in the same vein as the benefits that accrue to society. As we have indicated in recent comments on the Air Pollution Control Cost Manual,[14] EPA should use the most up-to-date information to calculate costs, not information obtained in the 1980s and 1990s.

1. Benefit assessment issues

Numerous independent evaluations of the issues associated with the use of CBAs in the process of setting environmental standards have highlighted that establishing objective measures of benefits is the most difficult aspect of the process. Ackerman and Heinzerling have described in detail some of the methods that have been employed in the past to estimate or infer the economic value of non-market or intangible impacts (*e.g.*, "stated preference valuation," "contingent valuation," "wage premium assessment," etc.) as well as the shortfalls associated with attempts to monetize human life and health, as well as with other benefits of environmental regulations. Ackerman and Heinzerling note that regardless of how the benefits of a regulation or standard are established, it is an artificial process that is fraught with uncertainty and fundamentally different than the other side of the cost-benefit equation.[15] Although subject to its own set of issues, assessing a regulation's costs is straightforward compared to assessing its benefits because objective cost information can be obtained from the marketplace.

Methods to monetize the benefits of regulations that are based on the cost of illness or lost economic output use the premise that there is ultimately a measurable economic benefit to otherwise intangible impacts. For instance, higher medical costs and lost wages associated with illness can theoretically follow from higher hazardous air pollutant emissions. One issue with approaches that seek to quantify objective information from epidemiological studies on these impacts is that little, if any, consideration is given to the underlying physical relationships or preexisting or otherwise unrelated conditions.

In many instances, the benefit assessments associated with environmental regulations have been flawed because they have not taken into account the fact that environmental benefits are associated with reductions in both immediate and future risks. For example, an exposed individual may not be subject to immediate risk from ambient levels of fine particles, but could be at greater risk in the future due to increased vulnerability associated with age, diet, or social habits. Accordingly, the benefits associated with reductions in immediate risk and those associated with future risks need to be evaluated separately.

Benefit assessments that presume, directly or indirectly, that reduced mortality risks can save the lives of exposed individuals more than once are also flawed. The cumulative mortality of a particular risk,

[14] https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0341-0052 and https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0341-0042.

[15] Ackerman, F. and L. Heinzerling, "Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection," University of Pennsylvania Law Review (2002).

which is defined as the proportion of individuals alive at the start of a period that die over that period as a result of exposure to a particular risk, cannot be greater than unity. It is true that reduced health risk through reduced exposure is an enduring benefit, since an exposed individual reaps the benefit of reduced exposure throughout their life. But the health benefits that accrue to an exposed individual through reduced exposure cease upon their death. In this regard, an exposed individual's life cannot be saved more than once by reduced exposure, and in particular regulations seeking to control different pollutants cannot save the same life more than once. For example, EPA has in the past relied on the health co-benefit of reduced PM2.5 emissions in multiple regulations being promulgated in the same time period (e.g., PM2.5 NAAQS, ozone NAAQS, CSAPR, the MATS rule, and the Boiler MACT rule). This practice has in effect resulted in the same statistical lives being counted repeatedly.

Moreover, in practical terms the individuals saved are usually the same because they are of advanced age, frail, infirm, and thus at greater risk than the general population. Thus the lives predicted to be saved by a lower PM2.5 NAAQS will very likely be the same individuals whose lives are predicted to be saved by lower ozone NAAQS.

2. Periodic "lookbacks" to assess accuracy of cost & benefit projections

EPA notes in the ANPRM that there is a lack of a regular process for performing retrospective reviews to gain insight about the actual costs and benefits of regulatory actions. A periodic lookback could serve as a type of benchmarking exercise that would allow EPA to determine if costs and benefits are being over- or underestimated. However, because there are so many factors that influence an industry's costs and that impact public health and environmental conditions, it may be possible to evaluate only certain aspects of the CBA. For example, data on cost of controls or process changes and changes in emissions or emissions intensity can be gathered in cases where discrete projects were performed to reduce emissions. However, in most instances, it will be more difficult to determine whether any changes in ambient conditions and public health are directly attributable to a specific environmental regulation, especially on a short-term basis, because there are so many factors that affect ambient air quality and public health (not just emissions from stationary sources). As a consequence, in our view EPA has in the past selectively relied on studies that support a proposed relationship between public health (morbidity and mortality) and air pollution while excluding other studies that show no statistically significant association between them. Requiring periodic post-implementation reviews would enable objective assessments of the real costs and real benefits of regulatory activities to be conducted. However, these reviews should occur outside the burdensome Section 114 Information Collection Requests to industry.

III. Comments on the Issuance of Regulations to Govern Cost/Benefit Approaches in Future Rulemakings

A. Rulemaking considerations

AFPM is generally in favor of rulemaking over policy or guidance to effect change because regulatory actions tend to be more permanent and resilient than policies or guidance documents. We are in favor of regulatory approaches that provide a clear understanding and certainty of the methodology that will be used. However, a regulation that provides the framework for a CBA approach must not be so rigid

that it does not allow for flexible approaches that might be necessary to adequately characterize certain atypical situations.

B. Economic considerations

1. Clarity around cost of capital and opportunity cost

Because there is always a scarcity of capital, the use of capital for control measures must compete with other projects for a particular entity. Because the CBA deals with private costs, it needs to address that a private entity could use the same money needed to fund control measures for a profitable investment. The lost return on investment represents a cost to the entity that must be taken into account when a regulation results in the need for a capital investment that produces no profit. Thus, the cost of control measures should include not only the cost of the equipment and its operations, but also the cost associated with not being able to use the invested capital for a profitable project. The opportunity to undertake the profitable project is lost and that opportunity cost must be accounted for in the cost of the regulation.

Industrial companies normally do not borrow all of the money needed to finance capital investments; some equity financing is usually required. The return on that equity must be included in the overall cost since an industrial company has other uses for that capital that offer a higher return than a pollution control project. In effect, the industrial company is denied the other opportunities if the pollution control project is mandated and the capital cannot be used in other ways to increase profitability.

An industrial company typically uses a capital recovery factor of 25 to 28 percent, which is consistent with a 15 percent discount rate and a project life of six to seven years. A discount rate of 15 percent is quite different from the seven percent used by EPA or the prime lending rate. The impact of using a low figure for the discount rate is to underestimate the true cost of the project. When the seven percent discount rate is used for a period of 20 years, the capital recovery factor is 9.6 percent. When the 15 percent discount rate is used for a period of 20 years, the capital recovery factor is 16 percent. Consequently, the use of a low discount rate does not appropriately consider the uncertainty in capital investments and therefore could grossly underestimate the true cost of a capital intensive project.

Moreover, there is a difference between project life and equipment life. Plant equipment may last a long time, but the regulatory environment can change rather quickly. As a result, a pollution control requirement can be made more stringent in five to 10 years' time, which would require that additional capital be expended in the future. For an industrial entity, the plant product can change in a relatively short period of time, making the part of the plant that produces this product obsolete. For that reason, industrial entities face higher risks due to the competitive nature of their businesses. As a result, they typically use shorter project life estimates. These considerations must be accounted for in estimating costs for industrial owners. The equipment life is not necessarily the proper life estimate to use in developing the overall cost. Furthermore, systems that operate continuously at the same temperature generally have longer operational lives than systems that undergo frequent startup and shutdown cycles. The equipment life varies depending on conditions. We encourage EPA to gather data on the

control measures to obtain the most technically supportable information about the system equipment life and the factors that influence it.

2. Greenfield facilities vs. retrofit costs

EPA's cost-estimating techniques are typically most applicable to a greenfield facility because they assume there is adequate space to install a particular control or process change and that it is technically feasible for all facilities that are impacted. In reality, existing facilities will experience higher costs to implement changes than a greenfield facility, and acknowledgement of retrofit costs (*e.g.*, through use of a representative retrofit factor) should be included in cost analyses for existing sources. Some factors influencing retrofit costs that should not be ignored include available space, available utilities, safety considerations, longer engineering and installation times, and impacts from lost production during installation.

The capital and operational costs associated with the addition of control systems on existing sources can be difficult to estimate as each existing source is unique and has its own set of site-specific constraints and limitations. As an alternative to using retrofit factors for installations at existing facilities, site-specific cost estimates (which more accurately document the actual cost of installing pollution controls) can be used. Having more definitive guidance or a range of expected retrofit ratios for the various elements of a capital cost estimate would be helpful for industry expectations and planning to minimize risk. The OAQPS Air Pollution Control Cost Manual acknowledges there are costs associated with retrofit applications but does not provide guidance on how to determine an appropriate retrofit cost factor. The use of retrofit factors by industry is often subject to scrutiny by regulators, so specific guidelines would be beneficial.

3. Basic problems with cost estimating

Transparency is essential for ensuring the CBAs use appropriate costs and that impacts to the industries are represented accurately. Instead of escalating historical cost estimates from more than five years ago to current dollar estimates using the price indexing method; it is preferable that updated cost information is obtained for control measures. EPA states in the latest version of the Air Pollution Control Cost Manual that using the price indexing method to escalate base year costs beyond five years does not yield accurate cost estimates.

The caveat to the use of price indexing is entirely consistent with the cautionary information presented in an article written by William Vatavuk, formerly EPA's expert on air pollution control cost information.[16] In this article, the author explains that "over periods of up to five years, the differences between actual prices of equipment and labor and those predicted by a cost index have been found to be small relative to the inherent error in most budget-level estimates." He notes that over longer periods of time, changes in technology, production efficiency, and outside factors like health, safety, and environmental regulations have more of an impact on equipment costs than are captured in price

[16] "Updating the CE Plant Cost Index," Chemical Engineering, January 2002, pp. 62 – 70.

indexes. Moreover, equipment prices and installation labor costs tend to escalate at different rates, a fact that further decreases the accuracy of cost estimates that are escalated beyond five years.

We support the recommendation that abatement cost estimates should not be prepared by escalating base cost information using the price index method beyond an escalation period of five years. In an effort to maintain transparency, the base year used for the equipment costs that are presented in a CBA should be clearly stated.

We note that there is a substantial discrepancy between EPA's recommended limits on the use of price index escalation and the cost estimates used for pollution control equipment. In recent updates to the Control Cost Manual, EPA has presented estimated equipment costs that are over 20 years old and recommends these costs be escalated to current dollars using the price indexing method.

We recognize that gathering, compiling, and maintaining current and accurate cost information on pollution control system costs is a time-consuming and resource-intensive endeavor. The current Agency budget and resource constraints may necessitate a different course of action going forward, and so we encourage the Agency to consider other alternatives to obtain better and more up to date information.

One alternative for EPA to achieve the goal of having more accurate and current equipment cost information is to hire an architectural engineering (A/E) firm to assemble equipment and installation cost information, as an actual equipment buyer would do. EPA has used some Sargent & Lundy cost model information for utility emissions control costing, but this type of information is lacking for smaller industrial applications. Hiring an A/E firm would be a faster and more accurate way for updating equipment cost data for air pollution control systems. Another option is obtaining multiple-source cost information in order to present equipment costs for new installations and the cost of equipment and construction for retrofit installations. Any cost information gathered will necessarily represent a range of potential costs, since there are many site-specific (e.g., configuration) and even geography-specific (e.g., labor availability) factors that influence the cost of buying and installing equipment. In addition, depending on the level of detail in initial cost estimates developed by an engineering firm, uncertainty can be 50 to 100%.

In addition to more accurate industry abatement cost estimates, EPA should include the impacts on small businesses, small governmental jurisdictions, and small not-for-profit organizations on the cost side of the CBA. Secondary and indirect effects on industry should also be considered in the CBA. Current profit margins and economic conditions should also be considered when determining if a cost increase due to an environmental regulation can be borne.

4. EPA's Cost Estimating Tools

With respect to developing cost estimates for the air pollution control equipment or other process changes that would be required to be installed to meet new air quality regulations, EPA has in the past relied on the Control Cost Manual published by EPA's OAQPS. EPA is currently undertaking a comprehensive update to this Manual, and has solicited public comments in the course of this update.

We have, along with other industry trade groups, submitted comments that highlight the numerous limitations and inaccuracies in the Manual. These include:

- The Manual relies on outdated and inaccurate equipment cost data, that in most cases was gathered over 25 years ago;
- The Manual recommends the use of methodology to escalate these outdated cost data to current dollars that is technically unsupportable, and which results in cost estimates that are very inaccurate;
- The Manual uses an overly-simplistic and inaccurate portrayal of the cost of capital and the time value of money; and
- The Manual contains only a cursory mention of the differences between private costs and social costs, and focuses exclusively on private costs.

Unfortunately, the deficiencies we identified have not been corrected.

C. Any Rulemaking Should Include Risk Assessment Provisions

EPA's benefit estimates rely on the results of the Agency's assessment of risk. To improve transparency and consistency in benefit estimation, EPA must also establish clear criteria for the estimation of direct and ancillary health effects in any future rulemaking.

Many of the environmental health regulations promulgated by EPA rely on the development of a dose-response model. A dose-response ("DR") model describes the relationship between exposure to a substance and a potential adverse health effect. It is used to assess risks and estimate benefits. To improve transparency and enhance consistency, the anticipated rulemaking should require the identification and evaluation of all major assumptions and uncertainties in the risk assessment process. This includes an analysis of the uncertainties surrounding the DR model, including study quality and selection, estimations of exposure, the slope and shape (e.g., linear, non-linear, etc.) of the DR curve, and statistical model choice. A DR model's robustness can be determined through a sensitivity analysis that determines whether the model is improperly dependent on an assumption(s).

In presenting the results of any risk or benefit assessment used to support a significant regulatory action, EPA should enhance transparency further by requiring an integrated, quantitative analysis of all major sources of uncertainties. In current rulemakings, EPA often evaluates individual sources of uncertainty without assessing their combined effect. Using a sensitivity analysis to determine the major sources of uncertainty, EPA should require an integrated, quantitative assessment of their combined effect. This would result in a probability distribution of likely outcomes which should be presented to decision-makers and the public in lieu of single estimates that do not convey the full range of uncertainties.

Failure to establish clear criteria for the assessment and presentation of risks and their uncertainties would significantly undermine the effectiveness of the intended rulemaking. It would result in an incomplete assessment and portrayal of the uncertainties in the benefit estimates used to inform rulemaking decisions.

D. Opportunities and Challenges

We acknowledge EPA's major challenge in driving consistency in the decision making process. How should EPA use the results of its cost-benefit analysis? One element that would promote consistency is to establish criteria for determining whether to regulate (or in the case of most air quality regulations, determining whether to regulate beyond a certain level), based on a CBA. In order to establish those criteria, there should be agreement on the definition of reasonable cost. Is the cost only reasonable when the benefits (which are determined taking into account all of the factors discussed above) outweigh the costs? These are difficult questions that will merit discussion as EPA crafts any regulation to guide the proper conduct of CBA and to establish the role of CBA in regulatory decisions.

AFPM supports EPA adopting a standard methodology for: 1) carrying out cost/benefit assessments for new or updated regulations; and 2) using the information to determine whether a new or updated regulation is justified. We prefer a regulatory approach to the current paradigm that relies on guidance documents and Executive Orders that can change with each administration. Our members support promulgated rules governing these assessments to be reasonable, flexible, and consistent, and have appropriate fundamental and legal bases in the underlying environmental statutes.