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August 3, 2020

To: Administrator Wheeler

From: Jonathan Berry, Partner, Boyden Gray & Associates

Re: *Increasing Consistency and Transparency in Considering Benefits and Costs in the Clean Air Act Rulemaking Process*, Dkt. EPA-HQ-OAR-2020-00044

I write to urge EPA to consider employment effects in benefit-cost analysis (BCA). Job gains and losses can serve as an indicator of potential overall efficiency gains and losses, especially those associated with increasing-returns phenomena in industry. Jobs gains and losses may thus capture effects that are missed by the general-equilibrium analyses EPA usually performs. Adequately considering employment effects is necessary for EPA to achieve its stated goal of taking into account “*all* benefits and costs” from a given regulation.¹

EPA has argued that it need not consider employment effects because (1) employment effects are transitional and (2) any net effect on social welfare due to employment changes is already captured in required general-equilibrium analyses. These theoretical assumptions are unwarranted, however, in the context of many of EPA’s regulatory actions under the Clean Air Act (CAA).

I. EPA should consider employment effects in benefit-cost analysis.

A. Job losses due to Clean Air Act regulation are likely to generate persistent unemployment.

EPA’s guidelines for preparing economic analyses state that “counting the number of jobs lost (or gained) as a result of a regulation generally has no meaning in the context of a BCA,” since “these are typically categorized as transitional job losses [or gains].”² EPA’s assumption that any unemployment resulting from regulation will merely be transitional is inappropriate in the context of the manufacturing jobs affected by CAA regulation. The industries that EPA regulates most heavily under the CAA are, in fact, often characterized by the lack of “mediating mechanisms” that “ensure that affected workers generally do not have lowered employment prospects years after the initial dislocation.”³ For instance, empirical

¹ *Increasing Consistency and Transparency in Considering Benefits and Costs in the Clean Air Act Rulemaking Process*, 85 Fed. Reg. 35,612, 35,613 (June 11, 2020) (“[T]he Agency proposes to provide analysis to the public that will present *all* of the benefits and costs in a consistent manner for all significant CAA rulemakings.”) (emphasis added).

² ENVTL. PROTECTION AGENCY, GUIDELINES FOR PREPARING ECONOMIC ANALYSES 8-6 (2014) (hereinafter EPA GUIDELINES).

³ Kerwin Kofi Charles et al., *The Transformation of Manufacturing and the Decline in U.S. Employment* 48–50 (Nat’l Bureau of Econ. Research, Working Paper No. 24468, 2018), <http://www.nber.org/papers/w24468>.

research suggests that adverse employment effects from the decline in manufacturing jobs since 2000 have lasted far longer than similar effects in other sectors, and that these effects have significantly contributed to the persistent aggregate decline in the workforce over the United States as a whole.⁴ And related research suggests that environmental regulation under the CAA has been a major factor in the decline in those manufacturing jobs.⁵ This evidence suggests that many job losses due to CAA regulations have been persistent, not transitory.

B. Spillover effects due to changes in employment are not adequately captured by EPA's current equilibrium analyses.

EPA also claims that estimating job losses and gains is unnecessary because “[t]he social cost of a regulation already includes the value of lost output associated with the reallocation of resources (including labor) away from production of output and towards pollution abatement.”⁶ EPA’s conclusion follows from the assumptions underlying the general-equilibrium analysis sometimes used by EPA.⁷ “General-equilibrium analysis is built around the assumption” of a perfectly functioning marketplace with constant returns to scale across all industries, such “that for some discrete period of time, an economy can be characterized by a set of equilibrium conditions in which supply equals demand in all markets.”⁸ However, “on an empirical level, . . . in any economic activity which involves the processing or transformation of basic materials—in other words, in industry—increasing[, not

⁴ *Id.* (“The fact that the adverse employment effects from the decline in manufacturing have lasted as long as they have is both striking and puzzling . . . It is clear that some of the mediating mechanisms have not worked, or else were not large enough, for post-2000 manufacturing change. . . . [F]rom our local labor market results we know that many workers of a given level of skill living in a particular market who lost their jobs in manufacturing did not get jobs requiring the same skill in another industry in their same locality. Had this traditional mechanism of adjustment worked strongly, then we would not have estimated negative within-location, within-skill employment effects from manufacturing decline.”).

⁵ Michael Greenstone, *The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures* 3 (Nat’l Bureau of Econ. Research, Working Paper No. 8484, 2001), <http://www.nber.org/papers/w8484.pdf> (finding that “in the first 15 years after the [CAA amendments] became law (i.e., 1972-1987), nonattainment counties (relative to attainment ones) lost approximately 590,000 jobs, \$37 billion in capital stock, and \$75 billion [in 1987 dollars] of output in pollution-intensive industries.”).

⁶ EPA GUIDELINES, *supra* note 2, at 8-6 to -7.

⁷ *See id.* 8-4 to -6; *see also, e.g.*, Arnold C. Harberger, *On Measuring the Social Opportunity Cost of Labor*, 103 INT’L LAB. REV. 449 (1971) (showing the absence of social benefits from a policy that raises labor demand in one sector of a simple two-sector general-equilibrium model); John R. Harris & Michael P. Todaro, *Migration, Unemployment and Development: A Two-Sector Analysis*, 60 AM. ECON. REV. 126 (1970) (similar result).

⁸ EPA GUIDELINES, *supra* note 2, at 8-4 (“When the imposition of a regulation alters conditions in one market, a general equilibrium model will determine a new set of prices for all markets that will return the economy to equilibrium. These prices in turn determine the outputs and consumption of goods and services in the new equilibrium. In addition, the model will determine a new set of prices and demands for the factors of production (labor, capital, and land), the returns to which compose the income of businesses and households. Changes in aggregate economic activity, such as GDP, household consumption, and other variables, also can be calculated in the model.”).

constant,] returns dominate the picture for . . . reasons that are fundamental to the nature of technological processes.”⁹ And, if at least one industry in the economy experiences increasing returns, an increase in employment “generates external or spillover benefits on all persons in the market nexus . . . due to the exploitation of specialization that is made possible by the market’s extension.”¹⁰ For these reasons, “[t]he benefit for the hired individual from added employment,” which general-equilibrium analysis captures, “is only a part of the overall efficiency benefits,” since each new job exerts positive spillover effects on the whole market due to occupational upgrading and increased specialization.¹¹

Spillover benefits and costs can be difficult to model. However, because of the intimate connection between increasing-returns phenomena and employment,¹² job gains and losses associated with a regulation can serve as an indicator of potential net societal gains or losses due to increasing-returns phenomena in industries. Including employment effects in BCAs provides a way for EPA to capture these spillover effects and thus more accurately evaluate the effect of its proposed regulatory actions.

II. EPA has the capability to consider employment effects in formal BCAs.

EPA already has the tools it needs to consider employment effects of proposed regulations in BCAs. Although agencies are not currently required to consider job losses and gains in formal BCAs, “the vast majority of regulations” already “include some assessment of the regulation’s effect on employment.”¹³ EPA’s own guidelines for economic analyses state that “if desired, the analyst can assess the employment impacts of a regulation as part of” an Economic Impact Analysis (EIA), and EPA provides guidance on what factors to consider

⁹ Nicholas Kaldor, *The Irrelevance of Equilibrium Economics*, 82 *ECON. J.* 1237, 1242 (1972).

¹⁰ James M. Buchanan, *Economic Interdependence and the Work Ethic*, in *THE ECONOMICS AND THE ETHICS OF CONSTITUTIONAL ORDER* 159, 167–68 (1991); see also Martin L. Weitzman, *Increasing Returns and the Foundations of Unemployment Theory: An Explanation*, 7 *J. POST-KEYNESIAN ECON.* 403, 407 (1974) (stating that “[i]n most reasonable models of an economy with non-trivial increasing returns to scale, . . . higher levels of equilibrium employment are associated with higher real wages” due to greater overall efficiency in production). The basic insight can be traced back to Adam Smith: “[F]or Smith the existence of a ‘social economy’ and the existence of increasing returns were closely related phenomena . . . [P]erhaps the most significant [chapter of *The Wealth of Nations*] is devoted to the proposition ‘that the division of labor is limited by the extent of the market’—a theorem which Allyn Young, writing 150 years later, regarded as ‘one of the most illuminating and fruitful generalisations which can be found anywhere in the whole literature of economics.’” Kaldor, *supra* note 9, at 1241.

¹¹ Timothy J. Bartik, *Including Jobs in Benefit-Cost Analysis*, 4 *ANN. REV. RESOURCE ECON.* 55, 62 (2012).

¹² Martin L. Weitzman claims that “there can be no involuntary unemployment with strict constant returns to scale in all aspects of technology. . . . I see increasing returns and imperfect competition as not just another minor detail, but as crucial aspects of the Keynesian story. That story simply cannot be told . . . without something like increasing returns blocking unemployed laborers from working on their own or in small groups.” Weitzman, *supra* note 10, at 406.

¹³ Jonathan S. Masur & Eric A. Posner, *Regulation, Unemployment, and Cost-Benefit Analysis*, 98 *VA. L. REV.* 579, 585 (2012).

when conducting such an analysis.¹⁴ EPA’s current guidance states, however, that these impacts “[in most situations] should not be included in the formal BCA.”¹⁵ Because these employment-effects analyses are not actually incorporated into the agency’s formal BCA, they currently tend “merely [to serve] as a check on the practicability of the regulatory option the agency ha[s] already chosen on other grounds—and a standardless check at that.”¹⁶

EPA thus already routinely estimates employment impacts of regulations; to more accurately capture the full societal impact of its proposed regulations, the agency simply needs to incorporate these estimates into the formal BCAs, recognizing that the particular employment analyses required may vary based on the regulation being considered.

III. EPA can build on available research to establish the metrics necessary to appropriately consider employment effects in BCAs.

Meaningful consideration of employment effects in the regulatory decision making process, therefore, involves at least three steps: (1) clearly relocating evaluation of job gains and losses from EIAs and feasibility analyses only, into formal BCAs; (2) identifying regulations with potentially significant employment impacts; and (3) balancing employment effects against the other costs and benefits of a given regulation.

Within that first step towards including employment effects in formal BCAs, EPA could, potentially in collaboration with other agencies, (1) establish “the value of a statistical job,” (2) estimate “multipliers to translate compliance costs into reduced investment,” and (3) derive “a direct relationship between the sheer volume of regulation and rates of investment and productivity growth.”¹⁷ Multiple researchers have attempted to establish empirically the relationship between increased regulation and job losses,¹⁸ and there is a substantial literature that aims to specifically “examine[] whether environmental regulation has caused job loss.”¹⁹

¹⁴ EPA GUIDELINES, *supra* note 2, at 9-8 to -9.

¹⁵ *Id.* at 9-8.

¹⁶ Masur & Posner, *supra* note 13, at 591.

¹⁷ OREN CASS, THE ONCE AND FUTURE WORKER: A VISION FOR THE RENEWAL OF WORK IN AMERICA 99 (2018). The “value of a statistical job” is a conceptual analogue of the “value of a statistical life” regularly used in the economic analysis of environmental and public-health regulation.

¹⁸ See, e.g., LAWRENCE J. SPIWAK ET AL., PHOENIX CENTER POLICY BULLETIN NO. 28: REGULATORY EXPENDITURES, ECONOMIC GROWTH AND JOBS: AN EMPIRICAL STUDY, PHOENIX CTR. 1 (Apr. 2011) (using “fifty years of data and modern econometric methods to . . . estimate . . . the relationship between . . . regulatory activity and economic growth and job recovery” and finding a sizable negative effect of regulation on jobs), <https://www.phoenix-center.org/PolicyBulletin/PCPB28Final.pdf>. But see, e.g., Tara M. Sinclair & Kathryn Vesey, Regulation, Jobs, and Economic Growth: An Empirical Analysis (Mar. 12, 2012) (unpublished manuscript) (on file with the George Washington University Regulatory Studies Center) (critiquing the results of Spiwak *et al.*).

¹⁹ Masur & Posner, *supra* note 13, at 583 n.12. See, e.g., Randy Becker & Vernon Henderson, *Effects of Air Quality Regulations on Polluting Industries*, 108 J. POL. ECON. 379 (2000) (finding that regulation of plants in polluting

Regulators as well as government scientists and economists can build on this research to establish statistical job values, estimate the correct multipliers, and derive the relationships most appropriate for the CAA regulatory context.

Ultimately, there is no single formula for the best regulatory analysis. “Different regulations may call for different emphases in the analysis, depending on the nature and complexity of the regulatory issues and the sensitivity of the benefit and cost estimates to the key assumptions.”²⁰ Given the significant, but currently uncaptured, contribution of employment effects on the social welfare that results from CAA regulations, EPA should investigate ways to incorporate the net impact of job gains and losses as part of the present rulemaking.

industries reduced construction of new plants by up to 45% in nonattainment areas); Greenstone, *supra* note 5, (finding that between 1972 and 1987, counties that were heavily regulated under the Clean Air Act experienced differentially large job losses); W. Reed Walker, *Environmental Regulation and Labor Reallocation: Evidence from the Clean Air Act*, 101 AM. ECON. REV. (PAPERS & PROC.) 442 (2011) (finding that the 1990 amendments to the Clean Air Act had negative impacts on jobs). *But see, e.g.*, Eli Berman & Linda T.M. Bui, *Environmental Regulation and Labor Demand: Evidence from the South Coast Air Basin*, 79 J. PUB. ECON. 265 (2001) (finding no adverse employment effects of local air quality regulation); Richard D. Morgenstern et al., *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. ENVTL. ECON. & MGMT. 412 (2002) (finding generally no significant employment effects of strict environmental policies).

²⁰ OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, OMB CIRC. A-4, REGULATORY ANALYSIS (Sept. 17, 2003).