

Publications That Cite EPA’s Benefits-per-Kilowatt-Hour (BPK) Values

Updated December 11, 2024

Publication type	Date published	Location	Summary	URL	Citation
Journal Article	March 2024	United States	Article that evaluates the impact of energy savings recommendations from the U.S. Department of Energy (DOE)-funded Industrial Assessment Center on air quality and human health. Uses BPK in the development of an Excel-based tool to estimate the emissions and health impacts of energy efficiency projects. For an energy efficiency project modeled in California and in New York, compares the health impacts derived from 2023-adjusted BPK values with the health impacts derived from separately running AVERT and COBRA.	https://link.springer.com/article/10.1007/s12053-024-10210-3	Safaei Kouchaksaraei, E., and Kelly, K. E. (2024). Air emission and health impacts of a US industrial energy efficiency program. <i>Energy Efficiency</i> 17(22).
Book Chapter	2023	United States	Book chapter discussing net energy metering and smart utility rate design. Provides a framework for determining the value of solar and references the BPK tool as a resource for evaluating avoided health costs. Describes how BPK suggests that the health benefits of noncombustion generation might exceed the cost of energy technologies.	https://www.sciencedirect.com/science/article/abs/pii/B9780443155918000127	Sioshansi, F., and McCann, R. J. (2023). Chapter 5 - Productive net metering reform: Where do the foundations of regulation, technological change, and good economics meet? In F. Sioshansi (Ed.), <i>The future of decentralized electricity distribution networks</i> (pp. 99–132).
Handbook	March 2022	United States	Handbook that includes BPK in a list of resources for calculating public health impacts from air emissions. Describes how to use BPK and how the values were developed.	https://www.nationalenergyscreeningproject.org/wp-content/uploads/2022/03/NSPM_Methods-Tools-Resources.pdf	National Energy Screening Project (NESP). (2022). <i>Methods, tools and resources: A handbook for quantifying distributed energy resource impacts for benefit-cost analysis</i> .

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Report	2021	Wisconsin, United States	Report written by the University of Wisconsin-Madison for the Public Service Commission of Wisconsin to assess barriers that prevent low-income and urban renters from accessing energy-efficient technologies and to make recommendations for program and policy changes that would improve service delivery to this vulnerable population. References BPK tool as a way to measure monetized public health benefits from reduced emissions.	https://lafollette.wisc.edu/research/addressing-energy-poverty-in-wisconsin-communities/	Downer, L., Leffin, S., McFarlane, M., and Schaefer, N. (2021). <i>Addressing energy poverty in Wisconsin communities</i> . Spring 2021 Workshop in Public Affairs.
Report	September 2021	United States	Report providing an overview of the BPK methodology. Demonstrates how air quality regulators and those working on renewable energy valuations can use BPK values. There is a full table of BPK values included in the appendix (page 18).	https://www.raponline.org/wp-content/uploads/2023/09/rap-seidman-shenot-lazar-health-benefits-by-kilowatt-hour-2021-september.pdf	Seidman, N. L., Shenot, J., and Lazar, J. (2021). <i>Health benefits by the kilowatt-hour: Using EPA data to analyze the cost-effectiveness of efficiency and renewables</i> . Regulatory Assistance Project (RAP).
Report	September 2021	New York, United States	Solar assessment for the Town of East Greenbush referencing BPK. Uses BPK values to estimate the health benefits of a 1 megawatt (MW) solar installation in New York.	https://www.eastgreenbush.org/application/files/1516/3958/4210/Solar Assessment for East Greenbush-rev Nov21.pdf	Town of East Greenbush Conservation Advisory Council. (2021). <i>Town of East Greenbush solar assessment</i> .
Report	May 2021	Illinois, United States	Report guiding the Forest Preserves of Cook County in clean energy planning. Cites BPK as a method for estimating the public health benefits of energy efficiency programs in Illinois and references the Illinois example in the BPK flyer.	https://hdl.handle.net/2142/114313	Prairie Research Institute. (2021). <i>Forest Preserves of Cook County clean energy framework</i> . University of Illinois at Urbana-Champaign.

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Report	April 2021	Northwest United States	Plan outlining Avista's resource strategy and planned procurements for the next 24 years. Cites BPK values as an option for estimating non-energy impact (NEI) benefits.	https://www.myavista.com/-/media/myavista/content-documents/about-us/our-company/irp-documents/avista-2021-draft-electric-irp.pdf	Avista. (2021). <i>Electric Integrated Resource Plan</i> (17th ed).
Report	March 2021	Maine, United States	Report that cites EPA's report <i>Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States</i> to show that transitioning from fossil fuel resources to renewable resources can improve public health.	https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/GEO_State%20of%20Maine%20Renewable%20Energy%20Goals%20Market%20Assessment_Final_March%202021_1_1.pdf	Energy and Environmental Economics, Inc. and Applied Economics Clinic. (2021). <i>State of Maine renewable energy goals market assessment</i> .
Report	March 2021	Minnesota, United States	Report documenting status, emerging trends, and issues in Minnesota's energy supply, consumption, conservation, and costs. Uses BPK to demonstrate the value of health benefits for a solar array installed under Minnesota's Weatherization Assistance Program solar pilot program for low- and moderate-income customers.	https://mn.gov/commerce-stat/pdfs/20210301_quad_report.pdf	Minnesota Department of Commerce, Division of Energy Resources. (2021). <i>Energy policy and conservation quadrennial report, 2020</i> .
Resource List	March 2021	United States	List that includes BPK values in a list of resources that can help support cost effectiveness practices.	https://www.nationalenergyscreeningproject.org/wp-content/uploads/2021/03/Cost-Effectiveness-Testing-Resources-3.25.2021.pdf	National Energy Screening Project. (2021). <i>Cost-effectiveness testing reports and studies on various impacts</i> .

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Report	March 2021	New England, United States	Study that provides estimates of avoided costs associated with energy efficiency measures for program administrators throughout the New England states for purposes of both internal decision-making and regulatory filings. Uses BPK values to calculate non-embedded nitrogen oxide costs.	https://ma-eeac.org/wp-content/uploads/AESC-2021.pdf	Synapse Energy Economics, Resource Insight, Les Deman Consulting, North Side Energy, and Sustainable Energy Advantage. (2021). <i>Avoided energy supply components in New England: 2021 report</i> . Prepared for AESC 2021 Study Group.
Report	February 2021	Illinois, United States	Annual report of the operation and transactions of the Illinois Power Agency (IPA). Uses BPK values to estimate the environmental benefits of the IPA's renewable resource procurements.	https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/illinois-power-agency-fy-2020-annual-report-(2-16-21).pdf	Illinois Power Agency. (2021). <i>Annual report: Fiscal year 2020</i> .
Report	2020	United States	Report that uses BPK to estimate monetary health benefits due to avoided emissions from utility electric efficiency programs implemented. Estimates health benefits for the following regions: Great Lakes/Mid-Atlantic (\$219 million), Upper Midwest (\$97 million), Northeast (\$70 million), Southeast (\$53 million), Pacific Northwest (\$26 million), California (\$25 million), Southwest (\$22 million), Lower Midwest (\$14 million), Texas (\$10 million), and the Rocky Mountains (\$5 million).	https://energyefficiencyimpact.org/	American Council for an Energy-Efficient Economy, Alliance to Save Energy, and the Business Council for Sustainable Energy. (2020). <i>Energy efficiency impact report</i> .

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Article	2020	North Carolina, United States	Article that cites BPK as a method to estimate the health benefits of better air quality from increasing clean energy in North Carolina. Lists some of the BPK values for the Southeast region to provide a range of 1.58–4.15 cents/kilowatt-hour (kWh) from improvements in outdoor air quality. (Note that the total range for the Southeast is slightly larger than what is included in this paper: 1.57–4.24 cents/kWh across all technology types for 2017.)	https://pubmed.ncbi.nlm.nih.gov/32900898/	Guidry, V. T., Thie, L., and Money, E. B. (2020). Health benefits of North Carolina's transition to clean energy. <i>North Carolina Medical Journal</i> , 81(5), 334–335.
Memorandum	2020	New Jersey, United States	Memorandum that cites BPK as a resource for estimating the public health benefits of weatherization. Includes the following BPK values for the Great Lakes/Mid-Atlantic Region in Table 3: 3.51–7.95 cents/kWh (uniform energy efficiency, 3% discount rate), 3.14–7.09 cents/kWh (uniform energy efficiency, 7% discount rate), 3.57–8.08 cents/kWh (energy efficiency at peak, 3% discount rate), and 3.19–7.21 cents/kWh (energy efficiency at peak, 7% discount rate).	https://www.nj.gov/bpu/pdf/NJ%20Cost%20Est%20Proposal.pdf	New Jersey Board of Public Utilities. (2020). <i>New Jersey cost test proposal</i> .
Report	November 2020	United States	Report that demonstrates how implementing district-scale high-performance strategies can result in energy savings that increase affordability, improve resilience, reduce emissions, and foster economic development. Cites BPK as evidence that renewable energy installations provide health benefits.	https://www.nrel.gov/docs/fy21osti/78495.pdf	Polly, B., Pless, S., Houssainy, S., Torcellini, P., Livingood, W., Zaleski, S., Jungclaus, M., Hootman, T., and Craig, M. (2020). <i>A guide to energy master planning of high-performance districts and communities</i> . National Renewable Energy Laboratory.

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Report	November 2020	United States	Resource for real estate owners and investors looking to develop or accelerate a sustainability program, as well as developers looking for ways to incorporate sustainability into their overall strategy. References BPK values in a list of resources for considering social equity, community, and workforce development.	https://knowledge.uli.org/-/media/files/research-reports/2020/uli-blueprint-for-green-real-estate.pdf?rev=c092aa16cf6340c9a5e8c1a9c915d74f&hash=545CCEA746EC5F1E5E55AA5F6E58C4B	Urban Land Institute. (2021). <i>The ULI blueprint for green real estate</i> .
Working Paper	October 2020	United States	Paper that cites BPK as an option to estimate health impacts of increased emissions from the electric power sector due to electrification.	https://eelegal.org/wp-content/uploads/2020/09/LCOE2-for-posting-9.17.2020.pdf	Tanton, T. (2020). <i>Cost of electrification: A state-by-state analysis and results</i> .
Report	August 2020	Midwest United States	Report that uses BPK to determine the monetized health impact of energy code adoption timing for new single-family homes in nine Midwestern states. Estimates cumulative health benefits for 2009–2019 for the following states: Illinois (\$3,062,096), Indiana (\$28,886,598), Iowa (\$2,848,878), Kentucky (\$13,991,926), Michigan (\$9,495,859), Minnesota (\$17,689,178), Nebraska (\$11,127,039), Ohio (\$16,816,393), and Wisconsin (\$25,953,523).	https://www.mwalliance.org/sites/default/files/meea-research/documenting-the-expanding-benefits-of-strong-energy-codes.pdf?current=/taxonomy/term/11	Burgess, C., and Westfall, N. (2020). <i>Documenting the expanding benefits of strong energy codes: How energy codes impact community health</i> . Midwest Energy Efficiency Alliance.
Report	August 2020	United States	Resource and planning guide for small business owners and staff who want to increase the energy and water efficiency of their properties by creating and implementing a realistic and cost-effective energy improvement program. Highlights BPK report as tool for energy policy development.	https://www.energystar.gov/buildings/tools-and-resources/energy-star-action-workbook-small-business	Energy Star. (2020). <i>Energy Star action workbook for small business</i> .

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Report	August 2020	United States	Report that incorporates BPK values, estimating energy efficiency's public health benefits, into an analysis of the cost savings potential of building energy conservation measures. Concludes that accounting for the public health benefits increases the cost savings potential of building efficiency programs.	https://eta-publications.lbl.gov/sites/default/files/attaching_public_health_benefits_to_building_efficiency_measures_at_the_national_and_regional_scales.pdf	Langevin, J., Satre-Meloy, A., and Fadali, L. (2020). Attaching public health benefits to building efficiency measures at the national and regional scales. In <i>2020 ACEEE summer study on energy efficiency in buildings</i> . Lawrence Berkley National Laboratory.
Report	June 2020	Wisconsin, United States	Report that uses the BPK values for the Upper Midwest and Great Lakes/Mid-Atlantic to estimate the non-energy benefits of energy efficiency and renewable energy in Wisconsin by creating a weighted average: 3.96–8.94 cents/kWh. Appendix F (page F-5) provides a detailed discussion of BPK methodology.	https://focusonenergy.com/sites/default/files/WI%20Focus%20on%20Energy%20CY%202019%20Volume%20III.pdf	Cadmus. (2020). <i>Focus on energy calendar year 2019 evaluation report: Volume III appendices</i> . Prepared for Public Service Commission of Wisconsin.
Public Comment	June 2020	United States	Letter from NAACP San Diego urging FERC to reject the New England Ratepayers Association's (NERA) April 14, 2020, petition seeking federal jurisdiction over state net metering programs. Cites BPK values.	https://www.biologicaldiversity.org/programs/energy-justice/pdfs/2020-6-15_450-Groups-Letter-to-FERC-re-NERA-petition.pdf	Maxwell, F. (2020). <i>FERC must reject petition endangering net metering and urgently-needed just transition to a clean and resilient energy future (Docket EL20-42 - Petition for Declaratory Order)</i> . NAACP San Diego Branch.
Report	May 2020	United States	Report that cites the BPK values for the Southwest, Great Lakes/Mid-Atlantic, and California to show the potential health benefits of energy efficiency in those regions. There is a full table of BPK values included in Appendix C (page 32).	https://naseo.org/data/sites/1/documents/publications/HES%20for%20LMiv9.pdf	Koewler, M. (2020). <i>The value of adding home energy score to low-income energy efficiency programs</i> . National Association of State Energy Officials.

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Comments	May 2020	United states	Comments that cite EPA's report <i>Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States</i> in a list of EPA Air Actions relying on underlying scientific data that would be restricted from consideration by EPA's "Strengthening Transparency in Regulatory Science (Supplemental notice of proposed rulemaking)" (Table 1).	https://www.nrdc.org/sites/default/files/media-uploads/2020-05-18_censoring_science_supplemental_proposal_-_nrdc_comments_final.pdf	Natural Resources Defense Council. (2020). <i>Comments of Natural Resources Defense Council on "Strengthening transparency in regulatory science (supplemental notice of proposed rulemaking)."</i>
Report	May 2020	United States	Report that lists the BPK values as one option for estimating non-energy impacts of energy efficiency programs and provides a short summary of the BPK methodology and results.	https://escholarship.org/content/qt1924c3g9/qt1924c3g9.pdf?t=qbnieu	Sutter, M., Mitchell-Jackson, J., Schiller, S.R., Schwartz, L., and Hoffman, I. (2020). <i>Applying non-energy impacts from other jurisdictions in cost-benefit analyses of energy efficiency programs: Resources for states for utility customer-funded programs</i> . Lawrence Berkeley National Laboratory.
Utility Filing	April 2020	Maryland, United States	Filing from a group of six electric utilities in Maryland that submitted an application to the Public Service Commission of Maryland for energy storage projects. The energy storage projects will displace power consumption during peak hours, and the application uses the energy efficiency at peak BPK values to estimate the health benefits of shifting from on-peak to off-peak hours.	https://webapp.psc.state.md.us/newIntranet/Casenum/submit_new.cfm?DirPath=//Coldfusion/Casenum/9600-9699/9619/Item_4&CaseN=9619/Item_4 (second link, page 44)	Exelon Utilities. (2020). <i>Application of joint Exelon Utilities for approval of energy storage pilot projects</i> . Case No. 9616.

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Comments	April 2020	Missouri, United States	Comments suggesting that, in addition to considering the public health costs from continuing to burn coal, Ameren should consider in the air quality and public health benefits of investments in replacement resources, including energy efficiency and renewable energy. The comments cite the BPK values as a resource for monetizing the benefits from these investments and explain that BPK is consistently updated to reflect public health impacts caused by energy efficiency and renewable energy.	https://static1.squarespace.com/static/5936d98f6a4963bcd1ed94d3/t/5e8dd9e5c19cc97b1dc2b72e/1586354662259/Sierra+Club+2020+Ameren+IRP+Comments.pdf	Sierra Club. (2020). <i>Sierra Club's initial comments on Ameren Missouri's 2020 integrated resource planning process.</i>
Report	March 2020	United States	Report exploring states' role in better integrating locational value into distributed energy resources siting and development. References BPK values as a resource to estimate the health benefits of investments of renewable energy.	https://www.cesa.org/wp-content/uploads/State-Strategies-for-Valuing-DETs-in-Cost-Effective-Locations.FINAL_.pdf	Hausman, N. (2020). <i>State strategies for valuing distributed energy resources in cost effective locations.</i> Clean Energy States Alliance.
Report	February 2020	Arizona, United States	Report that uses BPK to examine the health benefits from implementing a Renewable Energy Standard and Tariff (REST). Found that REST resources deployed from 2008–2018 yielded \$61 million and \$185 million in cumulative benefits for two Arizona utilities.	https://static1.squarespace.com/static/5f8721831dd8c167b78e87b1/t/5ff10dc0a6a0ae63d6f75af4/1609633224868/AZ%2BREST%2B-%2BFinal%2BReport.pdf	Burgess, E., Roumpani, M., Davidson, M., Latapi, S., and Gorman, J. (2020). <i>Arizona renewable energy and tariff: 2020 progress report.</i> Prepared by Strategen Consulting for Ceres.
Presentation	December 2019	Nebraska, United States	Presentation about energy trends in Nebraska that includes BPK. One slide shows some of the BPK values for four of the regions (Northeast, Southeast, Mid-Atlantic, and Upper Midwest), and the slide states that the BPK values “make EE and RE much more cost-effective.”	https://www.raponline.org/wp-content/uploads/2020/01/rap_colburn_seidman_nebraska_trends_2019_dec_17.pdf (inactive as of December 11, 2024)	Colburn, K. and Seidman, N. (2019). <i>Energy in Nebraska: Trends and opportunities.</i> Regulatory Assistance Project.

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Blog post	November 2019	United States	Post that provides an overview of EPA's report <i>Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States</i> . There is a full table of BPK values included in the blog post.	https://ilsr.org/could-the-health-benefits-of-renewable-energy-cover-your-electric-bill/?utm_source=Energy+Self-Reliant+States&utm_campaign=6a5ad34ae0-Energy+Self+Reliant+States+1+2+15+1+8+2015+COPY+01&utm_medium=email&utm_term=0_86e661ed1e-6a5ad34ae0-82765397	McCoy, M. (2019). <i>Could the health benefits of renewable energy cover your electric bill?</i> Institute for Local Self-Reliance.
Blog post	October 2019	United States	Post that provides an overview of the BPK values and methodology. Includes BPK values for five regions: Northeast, Southeast, Mid-Atlantic, Upper Midwest, and Texas. It also includes for comparison the costs that two specific utilities are paying for new wind and solar resources: Xcel Wind (0–1.8 cents/kWh), and NV Energy Solar (0–2.1 cents/kWh).	https://www.raonline.org/blog/value-added-measuring-the-health-benefits-of-the-layer-cake/	Lazar, J., and Seidman, N. (2019). <i>Value added: Measuring the health benefits of the "layer cake."</i> Regulatory Assistance Project.

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