

./).

[Home \(/\)](#) / [A-Z Publications \(/content/publications\)](#) / [Annual Review of Environment and Resources \(/content/journals/energy\)](#) / [Volume 18, \(/content/journals/energy/18/1\)](#) / Article

ANNUAL REVIEW OF ENVIRONMENT AND RESOURCES (/content/journals/energy) **Volume 18,**

(/content/journals/energy/18/1).

Energy-Efficiency and the Economics of Pollution Abatement

[Dennis Anderson \(/search?value1=Dennis+Anderson&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#).

Vol. 18:291-318 (Volume publication date November 1993)

© Annual Reviews
There is no abstract available.

Keyword(s): [energy in economic growth and development \(/search?value1=%22energy+in+economic+growth+and+development%22&option1=pub_keyword\)](#), [environment \(/search?value1=%22environment%22&option1=pub_keyword\)](#).



ENERGY-EFFICIENCY AND THE ECONOMICS OF POLLUTION ABATEMENT

Dennis Anderson

The World Bank, Washington, DC

KEY WORDS: environment, energy in economic growth and development

CONTENTS

INTRODUCTION	291
THE "SEARCH" FOR EFFICIENCY	294
Steam Engines	294
Electric Power	295
Lighting	296
Traditional and Commercial Fuels	297
COST-EFFECTIVENESS IN POLLUTION ABATEMENT	300
LEAD-TIMES AND LAGS IN THE POLICY RESPONSE	306
PRICE AND NONPRICE INTERVENTIONS	308
The Supply Side	308
The Demand Side	310
Ground Rules	312
CONCLUSION: THE CASE FOR ECONOMIC EFFICIENCY	313
APPENDIX	315

INTRODUCTION

For reducing pollution from energy production and use, perhaps no single recommendation has received more attention recently than that of improving the efficiency with which energy is produced and used—or "energy-efficiency" (as it is often called). Improvements in efficiency have undoubtedly helped to abate pollution in the past, and will do so in the future. During the past two centuries, the efficiency of energy-producing and energy-using activities, as measured by the amount of energy needed to provide a given output or service, has improved by factors ranging from 50 to more than

Most Read This Month

Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? (/content/journals/10.1146/annurev-environ-012220-011104)

Isak Stoddard, Kevin Anderson, Stuart Capstick, Wim Carton, Joanna Depledge, Keri Facer, Clair Gough, Frederic Hache, Claire Hoolohan, Martin Hultman, Niclas Hällström, Sivan Kartha, Sonja Klinsky, Magdalena Kuchler, Eva Lövbrand, Naghmeh Nasiritousi, Peter Newell, Glen P. Peters, Youba Sokona, Andy Stirling, Matthew Stilwell, Clive L. Spash and Mariama Williams
pp. 653–689 (37)

The Impacts of Ocean Acidification on Marine Ecosystems and Reliant Human Communities (/content/journals/10.1146/annurev-environ-012320-083019)

Scott C. Doney, D. Shallin Busch, Sarah R. Cooley and Kristy J. Kroeker
pp. 83–112 (30)

Anxiety, Worry, and Grief in a Time of Environmental and Climate Crisis: A Narrative Review (/content/journals/10.1146/annurev-environ-012220-022716)

Maria Ojala, Ashlee Cunsolo, Charles A. Ogunbode and Jacqueline Middleton
pp. 35–58 (24)

Biodiversity: Concepts, Patterns, Trends, and Perspectives (/content/journals/10.1146/annurev-environ-120120-054300)

Sandra Díaz and Yadvinder Malhi
pp. 31–63 (33)

The Ocean Carbon Cycle (/content/journals/10.1146/annurev-environ-120920-111307)

Tim DeVries
pp. 317–341 (25)

Most Cited

 (/rss/content/journals/energy/mostcitedarticles?fmt=rss)

ADAPTIVE GOVERNANCE OF SOCIAL-ECOLOGICAL SYSTEMS (/content/journals/10.1146/annurev.energy.30.050504.144511)

Carl Folke (/search?value1=Carl+Folke&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), Thomas Hahn (/search?value1=Thomas+Hahn&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), Per Olsson (/search?value1=Per+Olsson&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), and Jon Norberg (/search?value1=Jon+Norberg&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true). Vol. 30 (2005), pp. 441–473

Dynamics of Land-Use and Land-Cover Change in Tropical Regions (/content/journals/10.1146/annurev.energy.28.050302.105459)

Eric F. Lambin (/search?value1=Eric+F.+Lambin&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), Helmut J. Geist (/search?value1=Helmut+J.+Geist&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), and Erika Lepers (/search?value1=Erika+Lepers&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true). Vol. 28 (2003), pp. 205–241

Climate Change and Food Systems (/content/journals/10.1146/annurev-environ-020411-130608)

Sonja J. Vermeulen (/search?value1=Sonja+J.+Vermeulen&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true), Bruce M.

[Campbell \(/search?value1=Bruce+M.+Campbell&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), and [John S.I. Ingram \(/search?value1=John+S.I.+Ingram&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#).
Vol. 37 (2012), pp. 195–222

Global Water Pollution and Human Health (/content/journals/10.1146/annurev-environ-100809-125342)

[René P. Schwarzenbach \(/search?value1=Ren%C3%A9+P.+Schwarzenbach&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), [Thomas Egli \(/search?value1=Thomas+Egli&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), [Thomas B. Hofstetter \(/search?value1=Thomas+B.+Hofstetter&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), [Urs von Gunten \(/search?value1=Urs+von+Gunten&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), and [Bernhard Wehrli \(/search?value1=Bernhard+Wehrli&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#).
Vol. 35 (2010), pp. 109–136

WETLAND RESOURCES: Status, Trends, Ecosystem Services, and Restorability (/content/journals/10.1146/annurev.energy.30.050504.144248)

[Joy B. Zedler \(/search?value1=Joy+B.+Zedler&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#), and [Suzanne Kercher \(/search?value1=Suzanne+Kercher&option1=author&noRedirect=true&sortField=prism_publicationDate&sortDescending=true\)](#).
Vol. 30 (2005), pp. 39–74

[+ More](#)

About Annual Reviews:	Discover Content:	Libraries and Institutions:	Author Resources:
What We Do (/about/what-we-do)	Journals A-Z (/content/publications)	Subscribe to Open (S2O) (/S2O)	Article Preparation and Submission (/page/authors/general-information)
Press and News (/about/press-center)	Impact Factor Rankings (/about/impact-factors)	Librarian Resource Center (/page/librarians/librarian-resource-page)	Editorial Principles and Policies (/page/authors/editorial-policies)
Careers (/page/about/careers-at-annual-reviews)	Publication Dates (/journal/pubdates)	Institutional Administration Dashboard (https://www.annualreviews.org/admin)	Contact Us (/page/authors/contact-us)
Contact Us (/page/about/contact-us)	Online Events (/page/events)	Institutional Pricing (/page/subscriptions/instchoice)	Copyright and Permissions (/page/about/copyright-and-permissions)
FAQ (/page/about/faq)	Article Collections (/page/collectionarchive)	Against the Grain (https://www.charleston-hub.com/about/about-against-the-grain/)	Article Proposals (/page/authors/author-instructions/unsolicited-authors)
Help (/help/main)	Knowable Magazine (https://knowablemagazine.org/)		
	Against the Grain (https://www.charleston-hub.com/about/about-against-the-grain/)		

X @ (https://www.linkedin.com/company/annual-

(https://www.linkedin.com/company/annual-reviews/)ualreviews)