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978-1-107-04313-8 — How Much Is Clean Air Worth?
Ari Rabl , Joseph V. Spadaro , Mike Holland
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How Much is Clean Air Worth?

How Much is Clean Air Worth? offers a comprehensive overview of the core methodologies and tools used to quantify the impacts and damage costs of pollution. The book begins by reviewing the tools used for environmental assessments and shows that a rational approach requires an impact pathway analysis (IPA) for each of the possible impacts of a pollutant, i.e. an analysis of the chain emission → dispersion → exposure-response functions → monetary valuation. The IPA methodology is explained in full and illustrated with worked examples, difficulties are discussed and uncertainties analyzed. In addition to detailed computer models, a very simple model (the "uniform world model") is presented, enabling readers to make estimates for cases where limited input data are available. Published results for electricity, waste treatment and transport are reviewed, with a thorough discussion of policy implications. This book will appeal to a broad mix of academics, graduate students and practitioners in government and industry working on cost–benefit analysis, environmental impact analysis and environmental policy.

Ari Rabl obtained his PhD in physics at Berkeley and worked for many years as research scientist for energy technologies at Argonne, NREL and Princeton University. He moved to the Ecole des Mines de Paris as Senior Scientist at the Centre Energétique et Procédés until his retirement in 2007, and now continues to work as a consultant. For the last 20 years, his work has focused on environmental impacts and costs of pollution. He is one of the principal participants of the ExternE Project series (External Costs of Energy) of the European Commission DG Research, for which he has co-ordinated several research projects.

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Calculating the Benefits of Pollution Control

Ari Rabl
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Foreword

In the Western world, it has been a long journey to achieve the current ecological and social transition. The US National Environmental Policy Act of 1969 and the European Community Environmental Action Programme of 1973 opened the way to establishing cost–benefit analysis and, later, the polluter-pays principle. The 1981 US Presidential Executive Order 12191 required Impact Assessment studies to be carried out for all major policies presented by the Federal Government, while the 1986 Single European Act stipulated that, when developing environmental policies, the European Community will take account of available scientific and technical data, and of benefits and costs of actions and lack of action.

Within this context, at the end of the eighties, the EU and USA (European Commission's DG XII – Science and Research and US Department of Energy) launched a fruitful collaboration on a joint study on fuel cycle cost that gave birth to the so-called ExternE – Externalities of Energy – project series, funded since then and with different names by the European Commission through its successive Research Framework Programmes.

Among the pioneer actors of this interdisciplinary research work, one can mention David Pearce, Ari Rabl, Anil Markandya, Olav Hohmeyer, Robert Shelton, Russell Lee, Alan Krupnick, Nick Eyre and Richard Ottinger. More recently, key researchers in the field of external costs quantification, tackling the issues of energy, environment and transport have been Mike Holland, Jacquie Berry, Rainer Friedrich, Andrea Ricci, Joseph V. Spadaro, Stale Navrud, Stefan Hirschberg and Milan Scasny.

The concept of external costs entered the European political jargon with the 1993 Jacques Delors White Paper on growth, competitiveness and employment, which stated that "energy can no longer be seen as an unlimited resource, particularly if the external costs associated with climate change, acidification and health are not taken into account (. . .). The way the Community uses its labour and environmental resources highlights some fundamental weaknesses in the incentive structure of the

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