Smart Solutions to Climate Change

The failure of the Copenhagen climate conference in December 2009 revealed major flaws in the way the world's policy makers have attempted to prevent dangerous levels of increases in global temperatures. The expert authors in this specially commissioned collection focus on the likely costs and benefits of a very wide range of policy options, including geoengineering; mitigation of CO_2, CH_4, and "black carbon"; expanding forest Carbon Sequestration; R&D of low-carbon energy; and encouraging green technology transfer. For each policy, the authors outline all of the costs, benefits, and likely outcomes, in fully referenced, clearly presented chapters accompanied by shorter, critical alternative Perspective papers. To further stimulate debate, an Expert Panel of economists, including three Nobel laureates, evaluates and ranks the attractiveness of the policies.

This authoritative and thought-provoking book will challenge readers to form their own conclusions about the best ways to respond to global warming.

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Smart Solutions to Climate Change

Comparing Costs and Benefits

Edited by
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Contents

Figures

Tables

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Abbreviations and acronyms

ABC	Atmospheric Brown Clouds
ABI	Association of British Insurers
AC	air capture
AC	average cost
ACEI	Autonomous Carbon Efficiency Improvement
AEEI	Autonomous Energy Efficiency Improvement
AETG	advanced energy technology gap
APP	Asia Pacific Partnership
B/C	benefit-cost
BAU	business-as-usual
BCA	benefit-cost analysis
BCR	benefit-cost ratio
CBA	cost-benefit analysis
CCN	cloud condensation nucleae
CCS	carbon capture and storage
CCSP	Climate Change Science Program
CDM	clean development mechanism
CE	climate engineering
CES	constant elasticity of substitution
CFC	chlorofluorocarbon
CGE	computable general equilibrium
CIO	carbon intensity of output
CIR^3D	carbon intensity-reducing return to R&D investment
CIS	Commonwealth of Independent States
CNG	compressed natural gas
COP	Conference of Parties
CRP	Conservation Reserve Program (USA)
CV	current value
DALY	disability adjusted life year
DICE	Dynamic Integrated model of Climate and the Economy
EDF	Environmental Defense Fund
EI	energy intensity of output
EJ	exajoules
EMF	Energy Modeling Forum
ENSO	El Niño-southern oscillation
EPA	Environmental Protection Agency (USA)
EPO	European Patent Office
EST	environmentally sound technologies
ETS	emission trading scheme
ETS	Emission Trading System
FDI	foreign direct investment
FEEM	Fondazione Eni Enrico Mattei
FSU	former Soviet Union
FUND	Climate Framework for Uncertainty, Negotiation, and Distribution
G4M	Global Forest Model
GAINS	Greenhouse Gas and Air Pollution Interactions and Synergies
GCC	global climate change
GCM	general circulation model
GCP	Global Carbon Project
GDP	gross domestic product
GE	geoengineering
Gg	giga-gram
GHG	greenhouse gas
GLOBIOM	Global Biomass Optimization Model
GtC	gigatons of carbon
GTP	Global Temperature Potential
GWe	giga-watt electric
GWP	global warming potential
GWP	gross world product
HDDV	heavy-duty diesel vehicles
HFC	hydrofluorocarbon
IA	impact assessment
IA	integrated assessment
IAM	integrated assessment model
ICES	Intertemporal Computable Equilibrium System
IEA	international environmental agreement

IEA WEO	International Energy Agency World Energy Outlook
IFR	integral fast reactor
IGCC–CCS	integrated coal gasification combined cycle power plant
IIASA	International Institute for Applied Systems Analysis
IPCC	Intergovernmental Panel on Climate Change
IRR	internal interest rate
ISM	Indian summer monsoon
ITC	induced technological change
LBD	learning-by-doing
LBR	learning-by-researching
LDC	least developed country
LFG	landfill gas
LLF	long-lived fluorinated gases
LNG	liquefied natural gas
LPG	liquefied petroleum gas
MAC	marginal abatement cost
MC	marginal costs
MEF	Major Economies Forum
MER	market exchange rates
MFI	micro-finance institution
MMV	measurement, monitoring, and verification
MT	million ton
MTC	metric ton of carbon
NAPA	National Adaptation Programmes of Action
NAS	National Academy of Sciences
NC	No Controls
NCAR	The National Center for Atmospheric Research
NGO	non-governmental organization
NIS	newly independent states
NPV	net present value
NRTEE	National Roundtable on the Environment and the Economy (Canada)
O&M	operation and maintenance
OC	Optimal Controls
OC	organic carbon
ODA	overseas development aid
OECD	Organization for Economic Cooperation and Development
OHI	other high-income countries
OLS	ordinary least squares
PDF	probability density function
PFC	perfluorocarbons
PM	particulate matter
PPP	purchasing power parity
ppb	parts per billion
ppm	parts per million
ppmv	parts per million by volume
PV	present value
QALY	quality of life
R&D	research and development
RCIO	rate of decline in the carbon intensity of output
REDD	Reducing Emissions from Deforestation and Forest Degradation (avoided deforestation)
RICE	Regional Dynamic Integrated model of Climate and the Economy
SCC	social costs of carbon
SF_6	sulfur hexafluoride
SLF	short-lived fluorinated gases
SPM	Summary for Policy Makers (IPCC)
SRES	Special Report on Emission Scenarios
SRM	solar radiation management
SSA	sub-Saharan Africa
SYR	Synthesis Report (IPCC)
TFP	total factor productivity
Tg	teragram
THC	Thermohaline Circulation
TOA	top of the atmosphere
TT	technology transfer
TW	terawatt
UNFCCC	United Nations Framework Convention on Climate Change
UV	ultraviolet
VOC	volatile organic compounds
VOI	value of information
VSL	value of a statistical life
WHO	World Health Organization
WM	Waxman–Markey (bill)
WTAC	willingness to accept compensation
WTP	willingness-to-pay
YLD	years lost due to disability
YLL	years of life lost