ENERGY TECHNOLOGY INNOVATION

Energy technology innovation – improving how we produce and use energy – is critical for a transition toward sustainability. This book presents a rich set of twenty historical case studies of energy technology innovation embedded within a unifying conceptual framework. It provides insights into why some innovation efforts have been more successful than others, and it draws important policy conclusions. The case studies cover a wide range of energy technologies, ranging from energy supply to energy end use; from successes to failures; and from industrialized, emerging, and developing economies. The case studies are presented by an international group of eminent scholars under the auspices of the Global Energy Assessment (GEA), whose main volume was published in 2012 by Cambridge University Press. *Energy Technology Innovation* presents new data, new concepts, and novel analytical and policy perspectives. It will prove invaluable for researchers, policy makers, economists, industrial innovators, and entrepreneurs in the field of energy technology.

Arnulf Grubler is a world-leading scholar on the history of energy systems and on technological change and innovation policy. He is acting program leader of the Transitions to New Technologies Program at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, and professor in the field of energy and technology at the School of Forestry and Environmental Studies at Yale University. He has served as lead and contributing author and review editor for the Intergovernmental Panel on Climate Change (IPCC) since 1996. He has authored or edited several books, including *Technology and Global Change* (1998, Cambridge University Press) and *Technological Change and the Environment* (with N. Nakicenovic and W. D. Nordhaus, 2002). He is also a convening lead author of three chapters in the *Global Energy Assessment* (2012, Cambridge University Press).

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Energy Technology Innovation

Learning from Historical Successes and Failures

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Acronyms

ACEA	Association des Constructeurs Européens d'Automobiles
ARPA-E	U.S. Advanced Research Projects Agency – Energy
a-Si	amorphous silicon
BEV	battery electric vehicle
BOS	balance of system
BRIMCS	Brazil, Russia, India, Mexico, China, South Africa
CAFC	corporate average fuel consumption
CAFE	corporate average fuel economy
CCS	carbon capture and storage
CEA	French state nuclear R&D organization
CONACYT	Mexican National Council on Science and Technology
COP	coefficient of performance
CRTF	Central Receiver Test Facility
CTC	Copersucar Technology Center
DM	dual mode
DOE	U.S. Department of Energy
EAA	Energy Alternatives Africa
EC	European Commission
ÉDF	Électricité de France
EMBRAPA	Brazilian Agricultural Research Corporation
EPA	Environmental Protection Agency
EPR	European Pressurized Water Reactor
ESDA	Energy for Sustainable Development, Africa
ESTIF	European Solar Thermal Industry Federation
EV	electric vehicle
EVA	ethylene vinyl acetate
FAW	First Auto Works
FCAI	Australian Federal Chamber of Automotive Industries
FFVs	flex-fuel vehicles
FSU	former Soviet Union
GSHPs	ground source heat pumps
HEVs	hybrid electric vehicles
IAA	Institute for Sugar and Alcohol

IAC	Campinas Institute of Agronomy
ICT	information and communication technology
IEA	International Energy Agency
IEC	International Electrotechnical Commission
IGCC	integrated gasification combined cycle
JAMA	Japanese Automobile Manufacturers Association
KAMA	Korean Automobile Manufacturers Association
KBS	Kenya Bureau of Standards
KEREA	Kenya Renewable Energy Association
LNG	liquefied natural gas
M&A	mergers and acquisitions
METI	Japanese Ministry of Economy, Trade and Industry
MOST	Chinese Ministry of Science and Technology
mpg	miles per gallon
NAPS	Neste Advanced Power Systems
NHTSA	National Highway Traffic Safety Administration
NiMH	nickel metal hydride
NUTEK	Swedish Agency for Economic and Regional Growth
O&M	operation and maintenance
PE	private equity
PNGV	Partnership for a New Generation of Vehicles
ProAlcool	Brazil's First Ethanol Program
PURPA	Public Utility Regulatory Policy Act
PV	solar photovoltaic
PWR	Pressurized Water Reactor
R&D	research and development
RD&D	research, development, and demonstration
SANERI	South African National Energy Research Institute
SEFI	Sustainable Energy Finance Initiative
SEGS	Solar Energy Generating Station
SFC	Synthetic Fuels Corporation
SOEs	state-owned enterprises
SRES	Special Report on Emissions Scenarios
SRREN	Special Report on Renewable Energy Sources and Climate Change Mitigation
STE	solar thermal electricity
SWH	solar water heaters
T&D	transport and distribution
VC	venture capital

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