Technology Policy

Towards an Integration of Social and Ecological Concerns

Editors Georg Aichholzer and Gerd Schienstock



Walter de Gruyter · Berlin · New York 1994

.

Pre	face	v
Tec Res Gei	chnology Policy in the Process of Change: Changing Paradigms in search and Technology Policy?	1
1 2 3 4 5 6 7	Introduction Traditional Motives for Public R&T Policy From Material Technology to Technological Practice The Crisis of Growth-oriented R&T Policy The Role of Technology Policy: Support or Regulation? R&T Policy as a Social Experiment Conclusion References	1 2 6 10 12 17 20 22
Fro <i>Ric</i>	om Socio-economic to Socially Oriented Innovation Policy	25
1 2	Introduction Socio-economic Innovation Policy 2.1 Conventional Wisdom 2.2 Institutional Implementation 2.3 Socially Oriented Technology Policy	25 27 27 29 30
3 4	The Dualistic Model of Technology Policy Socially Oriented Innovation Policy 4.1 The Limitations of Socio-economic Innovation Policies 4.2 The Nature of Socially Oriented Innovation Policies 4.3 Neo-Taylorist and Skill-Based Manufacturing Trajectories	31 33 33 34 35
5	Socially Oriented Innovation Policy Institutions 5.1 Technology Transfer and Diffusion Mechanisms 5.2 Management and the Development of Human Capital Incentives 5.3 Workers Representatives and Concrete Codetermination Support 5.4 Nationally Based Skill Formation Restructuring	36 37 38 38 39
6	European Promotion of Human Centred or Anthropocentric Systems 6.1 European Projects and Programmes	40 40

	6.2 The Socio-technical Trajectory Defined	45
	6.3 Key Issues of Human Centred System Promotion	55
	6.3.1 Direct Promotion	56
	6.3.2 Technology Orientation	57
	6.3.3 Social Orientation	58
7	Conclusion	59
	Notes	61
	References	62
Te Ci	cchnology Policy: The Interaction between Governments and Markets	67
1	Introduction	67
2	Some Characteristics of Technological Change and Technology Policy	67
3	How Technology Policy is Formulated and Implemented in Practice	70
	3.1 The Usefulness of Theory as a Basis for Technology Policy	70
	3.2 Imitation – A Common Mode of Technology Policy-making	71
	3.3 Lobbying as a Mechanism behind Technology Policy	74
	3.4 "Diagnostic Analyses" – an Alternative Basis for Technology	
	Policy-making	75
4	Objectives of Technology Policy	77
5	Reasons for State Intervention in the Process of Technological Change	80
6	Instruments of Technology Policy	82
	Notes	85
	References	92
Pı	romote or Regulate: The Dilemma of Innovation Policy	95
E	rnest Braun	
1	Introduction	95
2	Technology Policy and Technological Innovation	96
	2.1 The Scope of Technology Policy	96
	2.2 Definition of Technological Innovation	98
	2.3 The Role of Technological Innovation in the Economy	99
3	The Perceived Need for Innovation Policy	101
•	3.1 Reduction of Risk for Private Enterprise	102
	3.2 Public Requirements for New Technologies	103
	3.3 Directing Private Innovation toward Public Needs	104
4	Ways of Promoting Innovation	108
	4.1 A Taxonomy of Possible Support Measures	108
	4.2 Research and Development	110
	4.3 Direct Support for Innovation	114
	4.4 Procurement	115
5	Need for Regulation	116
	5.1 Adequacy and Compatibility of Products	116
	5.2 Safety and Health	117
	5.3 Environmental Protection	118

•

6	Modes of Regulation	120
7	Summary and Conclusions	121
	References	122
Ne	w Technology Policy Concepts: Some Reflections on Technology and	
Wo	ork Humanization in West Germany	125
Ric	chard Badham and Frieder Naschold	
1	Introduction	125
2	New Technology Policy Concepts	126
3	Traditional Limitations of Work Design Reforms and Programmes	128
4	The Japanese Challenge	129
5	National Conditions of NTPCs	135
6	Background and History of the West German Humanization of Work	
	Programme	138
	6.1 International Background	138
	6.2 Key National Influences	140
_	6.3 Three Phases of the Programme	141
7	New Technology Policy Concepts in the West German Humanization of Work	
	Programme	143
	7.1 Overview	143
	7.2 The Complex Nature and Tensions within NTPCs	148
	7.3 The Impact and Significance of the NTPCs	151
	7.3.1 Management Domination of Investment Strategies	151
	7.3.2 Lack of Programme Integration	152
	7.3.5 Problems of Diffusion	153
Q	Conclusion	154
0		157
	Deferences	157
		157
De	signing Sustainability of Industrial Society	161
Ud	lo E. Simonis	•
1	Introduction	161
2	Ecological Structural and Technological Change of the Economy	162
_	2.1 De-linking Economic Growth from Environmentally Significant Inputs.	162
	2.2 Examples of Successful and Unsuccessful De-linking	163
	2.3 Trends Towards Industrial Restructuring	166
3	Preventive Environmental Policy	167
	3.1 Environmental Expenditures – Environmental Damages	167
	3.2 Basic Conditions of Preventive Environmental Policy	172
	3.3 Environmental Impact Assessment as Part of Preventive Policy	173
4	Ecological Orientation of Economic Policy	175
	4.1 Conflicts between Economy and Ecology	175
	4.2 Ecological Self-Regulation of the Economy	176
	4.3 Ecological Economic Policy	178

ten	ts
	•••
	ten

5	Conclusions	179 180
Co As Te	onstructive Technology Assessment: A New Approach for Technology sessment Developed in the Netherlands and its Significance for chnology Policy	181
Jo	ey van Boxsel	
1 2	Introduction	181
,	Technology Assessment	182
3 A	Science and Technology Policy in the Netherlands and their Broader Concerns	104
45	The Idea of "Constructive Technology Assessment"	189
6	CTA: Experiences of NOTA	192
Ū	6.1 CTA Case Studies	192
	6.2 Technology Dynamics	193
	6.3 Constructive TA Projects by NOTA	193
	6.4 Dissemination Activities	195
7	The Future of Constructive Technology Assessment	196
8	The Significance of Constructive TA for Technology Policy	200
	References	202
In: De	tegrating Social and Environmental Costs into High-tech Industrial	205
G	regory A. Daneke	205
		205
1	Introduction	205
2	The Problematic Panacea	200
4	A Mixed Blessing	208
5	The Curious Case of Groundwater Management	209
6	Additional Environmental and Social Costs	211
7	Towards a Sustainable Perspective	213
8	Re-orienting Economic Institutions	216
9	Conclusions	218
	References	219
Sc	cially Oriented Technology Policy in Germany: Experiences of a North	222
KI Ei	rich Latniak and Georg Simonis	223
1	Introduction	223
2	Integration of Differing Goals in Technology Policy?	224
3	Reasons for a Socially Oriented Technology Policy Initiative in 1984 in North Rhine-Westphalia	230
	•	

Contents .

4	Adm Prog	inistrativ ramme N	ve Output: The Initiative Zukunftstechnologien and the Mensch und Technik – Sozialverträgliche Technikgestaltung	234
	4.1	Patchw	vork or Integration?	235
	4.2	Organi	zational Aspects of Implementation	237
	43	Chang	es during Programme Implementation	238
5	Outo	ome and	Impact - Learning Effects on Different Levels	230
6	Con	lusions		240
Ŭ	Note	e	•••••••••••••••••••••••••••••••••••••••	242
	Pefe	rences		244
	Reit	ichees .		245
Na	tiona	l Polici	es Devoted to Technology and the Environment in France:	
To	wards	s an Inte	egrative Approach?	249
La	hsen	Abdelm	alki and Thierry Kirat	
1	Nati	onal Tec	hnology Policy and General Innovation-Supporting Mechanisms	251
	1.1	Theory	and Practice of National Policy in Favour of Science and	
		Techno	blogy	251
	1.2	From S	Scientific Policy to Technology Policy	252
	1.3	Techno	ology, Institutional Change and National Policy	253
2	Fren	ch Envir	ronmental Policy, Past and Present	254
	2.1	Enviro	nment and Environmental Policy: An Introduction	254
		2.1.1	Definition and Scope of the Environmental Issue	254
		2.1.2	Trends and Practice in Environmental Policy	255
	2.2	Feature	es of French Environmental Policy	- 257
		2.2.1	A Belated, Flexible and Centralized Environmental Policy	257
		2.2.2	The Tools of the Environmental Policy	259
		2.2.3	The Institutional Infrastructure of Environmental Policy and its Recent Evolution	261
2	The	Tashnal	Recent Evolution	201
5	on N	ational l	Policy	264
	3.1	Techno	ological Creation and Environment: From Knowledge to	
		Innova	tion	265
	3.2	Trends Enviro	in the Organization and Nature of Technologies in the Field of nmental Protection	265
	3.3	Do En	vironmental Technologies Reveal a Rift in the Industrial System?	268
4	Nati	onal Poli	icies: Between Theoretical Views and Social Realities	270
	4.1	The In	struments of Economic Analysis in Environmental Policy	270
	4.2	Enviro	nmental Protection as Central to Social Attitudes and	
		Techno	blogical Choices	272
5	Con	clusion .		274
	Notes			275
	Refe	rences .		275

The Co <i>Ma</i>	e Hist njunc <i>sahir</i>	torical Development of Japanese Science and Technology Policy in etion with Socio-economic Policy	279	
1	Intro	duction	279	
2	S&T (194)	Institutional Framework and S&T Policy as Built into Industrial Policy 5-1955)	280	
3	Towa	ard the Integration of Science and Technology Policy under Economic	283	
4	Prior	ity Shift of S&T Policy from Economic Growth to Social Welfare	203	
_	(197)	0-1980)	293	
5	S&T	Policy Built into Globalization (after 1981)	298	
6	Conc	clusions	301	
	Ackr	nowledgments	302	
	Refe	rences	302	
Na	tional	l Systems of Innovation and Technology Policy: The Case of		
De Bei	nmar nt Da	k	303	
1	Intro	duction	303	
2	Rece	ent Developments in Danish Technology Policy in Brief	304	
3	Inter	national Specialization of Small OECD Countries	305	
4	Natio	ons and Globalization	310	
5	'Soci	ially-Oriented' Technology Policy in a Danish Context – Some Examples	312	
5	Note		316	
	Refe	rences	320	
To	wards	s a Social Orientation in Finnish Technology Policy	323	
Τοι	rsti L	oikkanen and Esko-Olavi Seppälä		
1	Intro	duction	323	
2	Polic	cy for R&D	323	
3	Finn	ish (Science and) Technology Policy	329	
	3.1	Prior to the 1980s	330	
	3.2	From the Technology Committee to the Government's Report to		
		Parliament in 1985	330	
	3.3	The Science and Technology Policy Council	332	
4	Towa	ards a Social Orientation?	333	
	4.1	The Social Orientation	333	
	4.2 The Role of Technology Policy for Finnish Economic and Social			
		Development	334	
		4.2.1 Developments before the 1980s	334	
		4.2.2 Towards Social Orientation in the 1980s	336	
		4.2.3 Technology Assessment Efforts	338	
		4.2.4 Intermediate Summary	339	
	4.3	A Case: Integration of Environmental and Technology Policies	340	

-

	4.3.1 Developments Prior to the 1980s	340
	4.3.2 Towards an Integrative Approach	341
	4.3.3 Intermediate Summary	343
	4.4 Assessment of Finnish Development	344
5	Conclusions	345
	References	346
Teo	chnology Policy in Spain: Issues, Concerns and Problems	349
Lu	is Sanz-Menendez and Emilio Muñoz	
1	Introduction	349
2	Antecedents of the Spanish Situation in Science and Technology: 1940-1975.	352
	2.1 From Self-sufficiency to the Stabilization Plan: 1939-1959	352
	2.2 The Period of "Developmentism" in Spain: 1960-1975	354
3	The Position of Science and Technology during the Democratic Transition	357
4	Public Policy Actions in Science and Technology	359
	4.1 The Reform of the Science/Technology System in Spain in the 1980s	359
	4.2 The Instruments of Reform	360
	4.3 Technological Policy and the National R&D Plan	362
_	4.4 Technology Policy and the Ministry of Industry and Energy	363
5	Large Policies, Little Ecological and Social Awareness	364
6	Conclusion. Convergence with Europe: How Far are We?	369
	Notes	371
	Keterences	312
Te	chnology Policy under Conditions of Social Partnership: Development	
and	d Problems of an Integrated Strategy in Austria	375
Ge	org Aichholzer, Renate Martinsen and Josef Melchior	
1	Introduction	375
2	Structural Conditions of Technology Policy in Austria	375
	2.1 The Problem of Small States	375
	2.2 Economic Structure	376
	2.3 The Policy Pattern of Social Partnership	378
	2.4 New Challenges	379
3	Development and Organization of Technology Policy	380
	3.1 Initial Phase	380
	3.2 Integration Phase	382
	3.3 Distribution of Competences	382
	3.4 Decision-making	383
4	Goals, Instruments and Resources of Technology Policy	385
	4.1 Technology Policy Concept	385
	4.2 Instruments	386
	4.3 Expenditures	390
5	State of Affairs and Problems Regarding the Implementation of an Integrated	
	Technology Policy	392
	5.1 Policy Mix and Effects	392

.

.

.

.

.

	5.2 Considering Social and Ecological Aspects	394
6	Summary	396
	Notes	397
	References	400
Bio	graphical Notes	405
Su	oject Index	409
Na	me Index	413

.

۰.

.