## Society and the assessment of technology

Premises, concepts, methodology, experiments, areas of application

by François Hetman

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ъ с

## TABLE OF CONTENTS

-

Cha	pter I. TECHNOLOGY ON TRIAL	19
1.	<ul> <li>Disenchantment with technology and "technological progress"</li> <li>a) Technophiles and technophobes</li> <li>b) Power from knowledge</li> <li>c) Social accounting of technological change</li> </ul>	19 21 22 24
2.	<ul><li>Main features of technological society</li><li>a) Techno-scientific complex</li><li>b) Characteristics of technological society</li></ul>	26 27 28
3.	<ul> <li>Frustration resulting from technological civilisation</li> <li>a) Grievances against science and technology</li> <li>b) Betrayal of scientists and technologists</li> <li>c) Lack of ethical understanding</li> </ul>	33 34 35 37
4.	<ul><li>Failure to respond to social aspirations</li><li>a) General climate for science and technology</li><li>b) Broken dialogue between technology and society</li></ul>	$\begin{array}{c} 40\\ 40\\ 42\end{array}$
5.	<ul> <li>Demand for control of technology</li> <li>a) Food and robins</li> <li>b) Community's interest in technology</li> <li>c) Control without stifling</li> </ul>	$45 \\ 46 \\ 47 \\ 49$
Cha	apter II. CONCEPTS OF TECHNOLOGY ASSESSMENT	53
1.	<ul> <li>Definitions and dimensions</li> <li>a) Appraisal of technological "progress"</li> <li>b) Systematic analysis of socio-technical systems</li> <li>c) Social impact analysis</li> <li>d) Evaluation of alternative technologies</li> <li>e) Study of technological futures</li> </ul>	53 54 55 57 59 61
	f) Control and management of technology	6,5

2.	<ul> <li>Economics of technology assessment</li></ul>	67 68 69 70 74
3.	Conceptual levels and focus pointsa) Technologyb) Economyc) Societyd) Individuale) Environmentf) Value and social aspects of decision-makingg) Choice of a starting pointh) Appropriate level of assessment	76 78 79 81 83 84 86 88
4.	<ul> <li>Modes of analysis</li> <li>a) Specificity of technology assessment</li> <li>b) Epistemic approach</li> <li>c) Problem-solving framework</li> <li>d) Institutional framework</li> <li>e) Teleological framework</li> </ul>	91 92 94 96 99 101
5.	<ul> <li>Scope delineation and quantification</li> <li>a) Prerequisites</li> <li>b) Understanding of inter-relationships</li> <li>c) To quantify or not to quantify?</li> <li>d) Ranking of social values</li> </ul>	105 105 107 109 112
Cha	pter III. EXPERIMENTS AND DEVELOPMENT OF METHODOLOGIES	115
1 <b>.</b> 2.	<ul> <li>General framework of assessment methodology</li></ul>	115 115 118 132 134 136 140 140 145
3.	<ul><li>Basic modes of apprehending the future</li></ul>	200 200 202

4.	Cost	t/benefit analysis in technology assessment studies	207
	a)	Main stages of cost/benefit analysis	208
	b)	Utility and impact	210
	c)	Preventive computation of impacts	214
	d)	Cost/benefit analysis as a learning process	215
	e)	General criteria and techniques of evaluation	217
	-,		
5.	Full	social assessment of technology	224
	a)	Mapping of societal consequences	225
	b)	The Delphi method	226
	c)	Relevance tree	234
	d)	Event evaluation and review	236
	e)	Relevance matrix	237
	f)	Cross-impact techniques	241
			$\frac{241}{247}$
	g)	Multi-discipline systems approach	
	h)	Technology assessment function	248
	i)	Goal-oriented methodologies	252
a.		W ADDAG FOD THE ADDITCATION OF	
Una	pter		0.00
		TECHNOLOGY ASSESSMENT	263
1.	Mon	itoring of negative side-effects of existing technologies	263
	a)	Thresholds of public perception	264
	b)	Interdependencies between technological and societal	
		phenomena	265
	c)	Unexpected impacts on social groups	266
2.	Env	ironmental quality	270
-	a)	Choice of optimisation instruments	271
	b)	Causes of environmental deterioration and	
	,	environmental quality levels	274
	c)	Design of environment	276
	d)	Control-oriented approach	
	e)	Environmental evaluation system	279
		Evaluating environmental impact	281
	f)		285
	g)	Optimum environment and standards	289
'n	Dee	and in a financian	
3.		ycling of resources	293
	a)	Utilisation of residuals	293
	b)	Recovery of non-renewable resources	297
	C)	Resource management approach	299
4.		eening of scientific knowledge and R and D results	303
	a)	Systematic scrutiny of scientific discoveries	304
	b)	Relevance of linkages between science and technology .	306
	c)	Degree of innovative contents	308
	d)	Choice of new technological opportunities	310

5.	Desirable new technologies	317
	a) Technology as a dependent variable	319
	b) Programming by objective in the field of technology	320
	c) Vectors of functional capabilities	324
	d) Profiles of desired new technologies	328
Cha	pter V. PROMISES AND PROBLEMS OF TECHNOLOGY	
	ASSESSMENT	331
1.	Institutional framework	331
	a) Obsolescence of existing policy-making patterns	331
	b) Technology assessment in government	334
	c) The role of legislatures	336
2.	New specialised institutions	339
	a) Examples of new solutions	340
	b) Principles of effective technology assessment	
	institutions	342
	c) "Innovative branch" of government	347
3.	Analysts and decision-makers	350
	a) Continuous evaluation of the states of society	350
	b) Pragmatic approach and social planner's approach	351
	c) Internalised assessment and externalised assessment .	355
	d) Reciprocal learning system	358
4.	Pluralistic assessment	362
	a) Innovators	363
	b) Utilizers	363
	c) Governmental techno-scientific complex	364
	d) Legal order	365
	e) Competitive assessment	367
5.	Toward a humanly and socially relevant technology	371
	a) Changing the scale of values	371
	b) Search for new goals	373
	c) Limits to a "global system"	374
	d) Technology for Man	376
CO	NCLUSION	379
BIE	SLIOGRAPHY	391
AN	NEX	
	Seminar on Technology Assessment	
	OECD, Paris, 26-27-28th January 1972	415

.