

Table of contents

Acronyms and abbreviations	11
Executive summary.....	13
Résumé	19
Part I. Policy issues for eco-innovation: An overview.....	27
Introduction.....	29
<i>Chapter 1</i> Towards eco-innovation: The role of policy.....	31
The value of a strategic approach: Eco-innovation roadmaps	32
Combining technical and non-technical innovation: From clean technologies to eco-innovation.....	40
Joining up an array of policies: Co-ordination needs.....	51
The role of public-private partnerships	60
New models for technology transfer	64
Notes	70
Annex 1.A1 Methodology for assessing eco-innovation roadmaps under the European Union's Environmental Technology Action Plan.....	71
References.....	73
Part II Case studies on selected eco-innovations	75
<i>Chapter 2</i> Combined heat and power: Policies in Germany and Canada	77
Introduction.....	78
The technological and competitive environment	79
Market, utility and demand characteristics for CHP	82
Main challenges faced by CHP technologies.....	85
Domestic public policies for CHP.....	91
Conclusion	100
References.....	101

<i>Chapter 3</i> Micro combined heat and power generation: Policies in Germany	103
Micro-CHP fuel cell technologies, markets and industry	104
The deployment of micro-CHP fuel cells in Germany.....	117
The main drivers affecting micro-CHP fuel cell deployment	136
Notes	143
Annex 3.A1 List of interviews	145
Annex 3.A2 The added value of micro-CHP fuel cells.....	147
Annex 3.A3 Leading countries in FC-based micro-CHP	149
Notes	155
References.....	156
<i>Chapter 4</i> Carbon capture and storage: Policies in Germany and Canada	159
Introduction.....	160
The technological and competitive environment	160
Market, utility and demand characteristics for CCS eco-innovation	165
Main challenges faced by CCS eco-innovation	168
Domestic public policies for CCS.....	173
Conclusion: The role of initial conditions in policy orientations and timing.....	184
References.....	186
<i>Chapter 5</i> Electric cars: Policies in Canada, France and Germany	187
Introduction.....	188
Technological and competitive environment for electric vehicles.....	190
Market, utility and demand characteristics for electric cars.....	193
Main challenges faced by electric cars.....	196
National public policies for electric cars.....	203
Conclusion	208
References.....	210
<i>Chapter 6</i> Biopackaging: What role for public policy?	211
Introduction.....	212
Benefits of biopackaging eco-innovation.....	212
Biopackaging market prospects limited to niche segments according to the industry	213
The pending issue of the management of biopackaging waste and recycling.....	214
Conclusion	216
References.....	217

<i>Chapter 7</i> Solar tiles in Portugal: Linking research and industry	219
Introduction.....	220
The Solar Tiles Consortium	220
Basics of the technology	221
Eco-innovation in Portugal	229
Public strategy and modes of intervention	229
Prospects for the future	236
Lessons learned	237
Notes	239
References.....	240
Part III Case studies on selected public-private partnerships for eco-innovation	241
<i>Chapter 8</i> The UK Carbon Trust: A public-private partnership for eco-innovation.	243
Rationale and objectives	244
Organisation and governance relations	246
Budget and financial arrangements	254
Main types of activity	256
External co-ordination and coherence.....	274
Main findings and lessons learned	276
Note.....	282
Annex 8.A1 List of interviews	283
References.....	285
<i>Chapter 9</i> Sustainable Development Technology Canada:	
The public-private partnership potential	287
Introduction.....	288
An instrument framed for the specific features of eco-innovation?	288
A coherent and articulated investment strategy for eco-innovation	294
Public-private partnerships <i>versus</i> alternative instruments	
to stimulate and support eco-innovation	297
How does SDTC cope with the usual criticisms addressed to PPPs?	299
References.....	300

Figures

Figure 1.1. Balance between supply and demand side instruments.....	34
Figure 1.2. Contrast between EU and selected non-EU OECD countries	35
Figure 1.3. Instruments reported in the roadmaps, by technological area	37
Figure 1.4. Principal instruments in ETAP roadmaps by innovation group	38
Figure 1.5. Principal instruments in ETAP roadmaps by regulatory framework conditions.....	39

Figure 1.6. Development of inventions with respect to AFVs.....	44
Figure 1.7. Share of patents held by firms born after 2000.....	58
Figure 1.8. Median number of patents in the portfolio of firms created after 2000.....	59
Figure 3.1. The micro-CHP system components	110
Figure 3.2. Synthesis of the main drivers of micro-CHP deployment	115
Figure 3.3. German supply-side and demand-side instruments	134
Figure 3.4. Functional policy framework to support the unfolding of the fuel cell trajectory.....	140
Figure 7.1. An overview of solar technologies.....	223
Figure 7.2. The innovation system of solar tiles in Portugal	226
Figure 7.3. The development phases of solar tiles.....	230

Tables

Table 2.1. Comparison of the different CHP systems.....	81
Table 2.2. Main markets for CHP systems	84
Table 2.3. Comparison of policy instruments to stimulate CHP investment and diffusion	92
Table 2.4. CHP installed base in Germany in 2008	94
Table 2.5. Guaranteed electricity price bonus for biogas in Germany.....	97
Table 3.1. Characteristics of micro-cogeneration technologies.....	105
Table 3.2. Policy instruments to support micro-CHP	117
Table 4.1. Technologies for carbon capture, transport and storage in the power sector.....	161
Table 4.2. Three alternative CO ₂ capture technologies.....	163
Table 4.3. Estimation of costs for CCS in power plants in Germany (EUR/tCO ₂).....	169
Table 4.4. German view of the different challenges to the CCS chain.....	173
Table 4.5. Alternative policy instruments for stimulating CCS roll-out.....	175
Table 4.6. Public support for CCS demonstration power plants.....	176
Table 4.7. CCS implementation by the three main German electricity providers	180
Table 4.8. CCS large-scale demonstration projects in Canada	183
Table 4.9. Patterns of domestic CCS policy differentiation.....	185
Table 8.1. Income structure of the Carbon Trust, 2008 and 2009	255
Table 8.2. Classification of Carbon Trust measures	264
Table 8.3. Carbon Trust expenditures by type of activity, 2008 and 2009.....	266
Table 9.1. Distribution of SDTC funding by sector.....	292
Table 9.2. Environmental benefits of the projects funded by SDTC, by sector.....	293
Table 9.3. Relative SDTC funding and GDP by province	294
Table 9.4. Leverage of SDTC funding.....	297

Boxes

Box 0.1. Technological trajectory, defined.....	15
Box 1.1. Take-home messages from the study of policies to support biopackaging	42
Box 1.2. Take-home messages from the study of policies to support combined heat and power generation (CHP).....	45
Box 1.3. Measurement of the impact of eco-innovation policies by the UK Carbon Trust	48
Box 1.4. Take-home messages from the study of policies to support electric cars	50
Box 1.5. Take-home messages from the study of policies to support micro-CHP generation	53
Box 1.6. Take-home messages from the study of policies to support solar tiles in Portugal	55
Box 1.7. The performance of knowledge transfer networks in the United Kingdom	57
Box 1.8. Governance structure for micro-CHP in Germany.....	61
Box 1.9. Take-home messages from the study of policies to support carbon capture and storage	66
Box 3.1. Fuel-cell R&D budget of the United States, Japan and the European Commission.....	126
Box 3.2. The NOW co-ordination organisation for the NIP programme.....	128
Box 3.3. Features of the Impulse programme	132
Box 7.1. Feed-in tariffs in Germany	235
Box 8.1. Composition of the Carbon Trust Board of Directors	248
Box 8.2. A snapshot of governance arrangements of other UK public-private partnerships in the field	253