

Preface

Mankind faces several critical challenges associated with increasing economic growth, but also with the perspective of a longer and healthier life. To meet these challenges such as limiting climate change or developing new non-fossil fuel energy resources, research and innovation are the focus of interest and high expectations. However, research is expensive and the financial resources for research and development (R&D) are limited, particularly in emerging and developing countries. The risk of failure along the path from a good idea to market entrance and successful market diffusion is extremely high.

Given the high expectations of R&D for meeting the challenges on the one hand, and the limited resources and high risks on the other hand, the question arises whether the process of research and development can be made more efficient. Is it possible to achieve a given research and innovation target with fewer financial resources? Could some of the failures on the route from research idea to market penetration be avoided? Could research policies on the part of governments and companies use the same level of financial resources to accelerate innovation processes? There is a need to accelerate the introduction and diffusion of the new generation of technologies which are capable of meeting the described challenges and expectations.

This book reports on efforts to develop a methodology to use R&D budgets more effectively by identifying more clearly the status of the new technology, by setting clear research targets based on the technical and cost data of traditional competing technologies, and by identifying the important players in the innovation process at an early stage. The methodology is applied to four energy technologies, but the authors would like to stress that the methodology developed here could be applied to any research and innovation process that develops new technologies. Of course, the authors are aware that this methodology still has potential for improvement with ongoing progress in methods and data availability. The authors are very grateful to the German Federal Ministry of Economics and Technology (BMWi) for their trust and for providing the financial resources to investigate the question of whether the efficiency of innovations can be improved.



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