Preface

1 Examples of Success
   1.1 JuMOVe 2: Improved DMFC system .............................................................. 6
   1.2 20 kW SOFC plant: set-up and functional test ............................................. 10
   1.3 Operating of an autothermal reformer with conventional fuels ..................... 14

2 Education and training
   2.1 Fuel cell training and demonstration centre .................................................. 24
   2.2 Staff teaching at universities ........................................................................ 28

3 Scientific and Technical Reports
   3.1 Key topic: polymer electrolyte fuel cells ....................................................... 34
   3.2 Key topic: solid oxide fuel cells ..................................................................... 59
   3.3 Key topic: fuel processing systems .............................................................. 76
   3.4 Cross-cutting topic: process and systems analysis ....................................... 84
   3.5 Cross cutting topic: analysis ......................................................................... 88
   3.6 Cross-cutting topic: quality management ...................................................... 94

4 Selected R&D Projects
   4.1 Market study for DMFC applications in the kW class .................................. 100
   4.2 ZeuS - the SOFC for on-board power supply in cars .................................. 105
   4.3 Mixture formation in autothermal diesel reformers ..................................... 111
   4.4 Process analysis of future CO₂-free membrane power plants ....................... 116

5 Outlook for Future R&D Projects
   5.1 Physicochemical fuel cell laboratory .......................................................... 126
   5.2 Systems with high-temperature polymer electrolyte fuel cells ..................... 129
   5.3 Commercialization of DMFC systems in the kW class ............................... 135

6 Facts and Figures
   6.1 Institute of Energy Research – Fuel Cells (IEF-3) ........................................... 142
   6.2 Overview of department competences ......................................................... 144
   6.3 Publications, technology transfer and resources ........................................... 147
   6.4 Committee work ......................................................................................... 149
   6.5 Contributions to trade fairs and exhibitions ............................................... 151
   6.6 How to get there ......................................................................................... 154
   6.7 List of abbreviations .................................................................................... 157