

Contents

List of Abbreviations	vi
Section 1: Program Overview	1-1
1.1 Market Overview and Federal Role of the Program	1-4
1.1.1 Current and Potential Markets	1-5
1.1.2 State, Local, and International Political Climate	1-7
1.1.3 Competing Alternative Fuel Technologies	1-9
1.1.4 Market Barriers	1-10
1.1.5 History of Public Efforts in Biomass RDD&D	1-10
1.1.6 Biomass Program Justification	1-12
1.2 Program Vision and Mission	1-12
1.3 Program Design	1-13
1.3.1 Program Structure	1-14
1.3.2 Program Logic	1-14
1.3.3 Relationship to Other Federal Programs	1-15
1.4 Program Goals and Multi-Year Targets	1-18
1.4.1 Program Strategic Goals	1-18
1.4.2 Program Performance Goals	1-19
1.4.3 Program Multi-Year Targets	1-20
Endnotes	1-24
Section 2: Program Technology Research, Development, Demonstration, & Deployment Plan	2-1
2.1 Feedstock Supply Research and Development	2-9
2.1.1 Feedstock Support of Biomass Program Strategic Goals	2-11
2.1.2 Feedstock Support of Biomass Program Performance Goals	2-12
2.1.3 Feedstock Technical Challenges and Barriers	2-13
2.1.4 Feedstock Supply R&D Approach for Overcoming Challenges and Barriers	2-15
2.1.5 Prioritizing Feedstocks Supply R&D Barriers	2-21
2.1.6 Feedstock Platform Milestones and Decision Points	2-25
2.2 Conversion Research and Development	2-28
2.2.1 Biochemical Conversion Research and Development	2-29
2.2.1.1 Biochemical Conversion R&D Support of Program Strategic Goals	2-31
2.2.1.2 Biochemical Conversion R&D Support of Program Performance Goals	2-31
2.2.1.3 Biochemical Conversion Technical Challenges and Barriers	2-32
2.2.1.4 Biochemical Conversion R&D Approach for Overcoming Challenges and Barriers	2-34
2.2.1.5 Prioritizing Biochemical Conversion Barriers	2-38
2.2.1.6 Biochemical Conversion R&D Milestones and Decision Points	2-39
2.2.2 Thermochemical Conversion Research & Development	2-42
2.2.2.1 Thermochemical Conversion R&D Support of Program Strategic Goals	2-45
2.2.2.2 Thermochemical Conversion R&D Support of Program Performance Goals	2-45
2.2.2.3 Thermochemical Conversion R&D Technical Challenges and Barriers	2-46
2.2.2.4 Thermochemical Conversion R&D Approach for Overcoming Challenges and Barriers	2-47
2.2.2.5 Prioritizing Thermochemical Conversion R&D Focus	2-51
2.2.2.6 Thermochemical Conversion R&D Milestones and Decision Points	2-53
2.3 Integrated Biorefineries	2-57
2.3.1 Integrated Biorefineries Support of Program Strategic Goals	2-60

2.3.2	Integrated Biorefineries Support of Program Performance Goals	2-62
2.3.3	Integrated Biorefineries Challenges and Barriers	2-63
2.3.4	Integrated Biorefineries Approach for Overcoming Challenges and Barriers	2-65
2.3.5	Prioritizing Integrated Biorefinery Barriers	2-69
2.3.6	Integrated Biorefinery Milestones and Decision Points	2-69
2.4	Biofuels Distribution Infrastructure and End Use	2-73
2.4.1	Biofuels Distribution Infrastructure and End Use R&D Support of Program Strategic Goals	2-75
2.4.2	Biofuels Distribution Infrastructure and End Use R&D Support of Program Performance Goals	2-75
2.4.3	Biofuels Distribution Infrastructure Challenges and Barriers	2-75
2.4.4	Biofuels Infrastructure Approach for Overcoming Challenges and Barriers	2-78
2.4.5	Prioritizing Infrastructure Barriers and Activities	2-82
2.4.6	Biofuels Distribution Infrastructure and End Use Milestones and Decision Points	2-82
2.5	Biopower	2-85
2.5.1	Biopower Support of Program Strategic Goals	2-88
2.5.2	Biopower Support of Program Performance Goals	2-89
2.5.3	Biopower Challenges and Barriers	2-89
2.5.4	Biopower Approach for Overcoming Challenges and Barriers	2-91
2.5.5	Prioritizing Biopower Focus	2-93
2.6	Sustainability	2-96
2.6.1	Sustainability Support of Biomass Program Strategic Goals	2-99
2.6.2	Sustainability Support of Program Goals	2-99
2.6.3	Sustainability Technical Challenges and Barriers	2-100
2.6.4	Sustainability Approach for Overcoming Challenges and Barriers	2-101
2.6.5	Prioritizing Sustainability Barriers	2-103
2.6.6	Sustainability Milestones and Decision Points	2-104
2.7	Strategic Analysis	2-107
2.7.1	Strategic Analysis Support of Program Strategic Goals	2-107
2.7.2	Strategic Analysis Support of Program Performance Goals	2-108
2.7.3	Strategic Analysis Challenges and Barriers	2-108
2.7.4	Approach for Overcoming Challenges and Barriers	2-108
2.8	Bioenergy Market Expansion	2-115
2.8.1	Bioenergy Market Expansion Support of Program Strategic Goals	2-116
2.8.2	Bioenergy Market Expansion Support of Program Performance Goals	2-116
2.8.3	Bioenergy Market Expansion Challenges and Barriers	2-117
2.8.4	Approach for Overcoming Bioenergy Market Expansion Challenges and Barriers	2-117
	Endnotes	2-121
	Section 3: Program Portfolio Management	3-1
3.1	Program Portfolio Management Process	3-2
3.2	Program Analysis	3-5
	Endnotes	3-11
	Appendix A: Biomass Program Structure	A-1
	Appendix B: Technical Projection Tables	B-1
	Appendix C: Calculation Methodology for Cost Targets	C-1
	Appendix D: Matrix of Revisions	D-1