

CONTENTS

	Page
INTRODUCTION	vii
EXECUTIVE SUMMARY	1
CHAPTER 1. OVERVIEW ISSUE PAPERS	11
A. OVERVIEW TASK GROUP	12
B. OVERVIEW TASK GROUP ISSUES LIST	13
C. INTRODUCTION	15
D. OVERVIEW ISSUE PAPERS	19
1. The Nature of the National Energy Policy Goals	19
2. Overall Level of the Federal Budget for Energy R, D&D	21
3. The International Aspects of ERDA's Plans and Programs	23
4. Coordination of Programs Between ERDA and Other Federal Agencies	25
5. Cooperation Between ERDA and State and Local Governments	27
6. Near-Term Energy Problems	29
7. Socioeconomic Research	30
8. Balance Between Supply Versus Demand R, D&D	31
9. ERDA's Basic Research Program	33
10. Commercialization	35
11. Resource Constraints	37
12. Physical and Societal Constraints	38
13. Overemphasis on Electrification	39
14. Methodology and Assumptions Used in Developing the R, D&D Plan	41
15. ERDA Management Policy	43
16. Net Energy Analysis	45
CHAPTER 11. FOSSIL ENERGY TASK GROUP ANALYSIS	47
A. FOSSIL ENERGY TASK GROUP	48
B. FOSSIL ENERGY TASK GROUP ISSUES LIST	49
C. INTRODUCTION	51
D. FOSSIL ENERGY ISSUE PAPERS	53
1. Fossil Energy Objectives	53
2. Primary Oil and Gas Recovery	54
3. Enhanced Oil and Gas Recovery	56
4. Oil Shale Processing	58

5. Synthetic Liquid Fuels From Coal	59
6. High-Btu Gasification of Coal	61
7. Low-Btu Gasification for Industrial Use	63
8. Mining Technology	64
9. Direct Coal Utilization	66
10. Low-Btu Gasification, Combined Cycle Powerplants	* ***** 68
11. Advanced Fossil Fuel Combustion Programs	69
12. Interagency Coordination: Coal Cleanup	72
13. Environmental, Social, and Political Impacts of Mining	74
14. Manpower	76
15. Transportation Systems	78
16. Water Availability	80
 CHAPTER III. NUCLEAR TASK GROUP ANALYSIS	83
A. NUCLEAR TASK GROUP	84
B. NUCLEAR TASK GROUP ISSUES LIST	85
c. INTRODUCTION	87
D. NUCLEAR ISSUE PAPERS	91
1. Standardization	91
2. Performance and Reliability	93
3. Floating Nuclear Powerplants	95
4. Helium-Cooled Reactor—Convertors and Breeders	97
5. Liquid Metal Fast Breeder Reactor	99
6. Light-Water Breeder Reactor	102
7. Molten Salt Breeder Reactor	104
8. Nuclear Environmental Effects	105
9. Plutonium Toxicity	107
10. Waste Disposal	108
11. Safeguards for Nuclear Materials	110
12. Siting	112
13. Uranium Resources	113
14. Uranium Enrichment	115
15. Fuel Recycle	* ****. 117
16. Public Understanding	119
17. Controlled Fusion	121
18. Technologies for Fusion	123
 CHAPTER IV. SOLAR, GEOTHERMAL, AND ADVANCED TECHNOLOGIES TASK GROUP ANALYSIS	125
A SOLAR, GEOTHERMAL, AND ADVANCED SYSTEMS TASK GROUP	126
B. SOLAR, GEOTHERMAL, AND ADVANCED SYSTEMS TASK GROUP ISSUES LIST	127
c. INTRODUCTION	129

D. SOLAR, GEOTHERMAL, AND ADVANCED SYSTEMS		
ISSUE PAPERS .....	.....000 . o	133
1. Setting Criteria for Program Priorities .....	.....	133
2. Rationale for Funding of High-Risk Projects .....	.....+	135
3. Resource Availability .....	.....	137
4. Organizationof ERDA's Research Program .....	.....	139
5. ERDA Program Management .....	.....	141
6. Support for Study of Decentralized Solar Electrical Generation .....	.....	143
7. Emphasis on Electric Energy Systems .....	.....	144
8. Emphasis on Solar Heating and Cooling of Buildings .....	....."'"'	146
9. Purposes of the Solar Heating and Cooling Demonstration Program .....	.....	148
10. Role of User Incentives in Solar Heating and Cooling of Buildings .....	.....	150
11. Standards for the Measurement of Solar Heating and Cooling Equipment Performance .....	.....	152
12. Impact of Solar Energy on Utility Peak Demand .....	.....	154
13. Biomass Energy and Food .....	.....	155
14. Legal and Institutional Constraints in Geothermal Energy .....	.....	157
15. Environmental Constraints of Geothermal Energy Development .....	.....	159
16. Nonelectric Uses of Geothermal Energy and Geothermal Goals .....	.....	161
17. Variability of Geothermal Reservoirs .....	.....	163
E. COMMENTARY ON ERDA PLAN		165
CHAPTER V. CONSERVATION TASK GROUP ANALYSIS		169
A. CONSERVATION TASK GROUP		170
B. CONSERVATION TASK GROUP ISSUES LIST		171
C. INTRODUCTION		173
D. CONSERVATION ISSUE PAPERS		175
1. Importance of Conservation .....	.....	175
2. Program Management and Coordination .....	.....	177
3. Interaction With the Private Sector .....	.....	179
4. Use of the Term "Conservation" .....	.....	181
5. Need for Nontechnological Research .....	.....	183
6. Demand Modeling and Conservation Planning .....	.....	185
7. Design Methods and Standards .....	.....	187
8. Development and Demonstration .....	.....	189
9. Constraints in Building Construction .....	.....	191
10. Need for Thermodynamic Analysis .....	.....	193
11. Oil and Gas Substitution .....	.....	195
12. Use of Foreign Technology .....	.....	197
13. Transmission and Distribution Priorities .....	.....	200
14. Active Load Management .....	.....	202

15. Orientation of Automotive Programs	204
16. Cooperation With the Transportation Industry	206
17. Nonhighway Vehicle Transportation Program	208
18. Energy Recovery From Waste	209
CHAPTER VI. ENVIRONMENTAL AND HEALTH TASK	
GROUP ANALYSIS+....	211
A. ENVIRONMENTAL AND HEALTH TASK GROUP	212
B. ENVIRONMENTAL AND HEALTH TASK GROUP ISSUES LIST.o.o.00"	213
C. INTRODUCTION	215
D. ENVIRONMENTAL AND HEALTH ISSUE PAPERS	217
1. Environmental Impacts of High Voltage Transmission Lines	217
2. Ground and Surface Water Contamination From Surface Mining	218
3. Energy Consumption and Inadvertent Climate Modification	220
4. Variance on Environmental Standards During Development	221
5. Energy Modeling and DataBank Requirements	223
6. Site and Technology-Specific Nature of Cause-Effect Relationships in Environmental Health Impacts	225
7. Integration of Environmental, Health, Social, and Institutional Research Into Technology Programs	227
8. Energy Impacts of Air and Water Pollution Control Regulations	229
9. Competing Demands for Water in Western River Basins	231
10. Need for Social Research in Offshore Energy Programs	233
11. Effect of Public Attitudes on Program Implementation	234
12. Program Focus in Fossil Fuel Health Effects Research	236
13. Inadequate Inventory of Skills and Techniques in Health Effects Research	239
14. Atmospheric Sulfates as a Potential Constraint on ERDA's Fossil Fuel Program	241
ATTACHMENT I-OUTSIDE CRITIQUES	243
ATTACHMENT II—ERDA AND THE CONGRESSIONAL ACTS	311