

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	INTRODUCTION	
	Executive Summary	S-1
1.1	Preface	1-1
1.2	Findings and Conclusions	1-19
1.3	Energy Policy Objectives and Recommendations	1-33
2	ISSUE REPORTS	
2.1	Promoting Energy Industry Competition	2-1
2.2	Energy and Economic Development	2-15
2.3	Energy and the Environment	2-38
2.4	Energy and Transportation	2-60
2.5	Preserving Energy-Related Public Benefits Programs	2-98
3	ENERGY RESOURCE ASSESSMENTS	
3.1	Forecast Summary	3-1
3.2	Energy Efficiency	3-10
3.3	Renewable Energy	3-40
3.4	Electricity	3-80
3.5	Natural Gas	3-153
3.6	Petroleum	3-182
3.7	Coal	3-208
4	COMPLIANCE WITH THE STATE ENVIRONMENTAL QUALITY REVIEW ACT	4-1

(Appendices available upon request)

TABLES

<u>Table Number</u>	<u>Title</u>	<u>Page</u>
SECTION 1.1		
1	New York Energy Prices	1-9
SECTION 1.3		
A-1	Participants in Interest Group Meetings During Energy Plan Development .	1-45
A-2	Commentors to Draft State Energy Plan	1-46
SECTION 2.3		
1	Ozone Level Exceedance in New York	2-41
SECTION 2.4		
1	Energy Benefits of ITS Projects.	2-82
2	Possible Transportation Actions to Reduce Emissions	2-91
3	Potential Ozone Precursor Emission Reductions	2-92
4	Potential Energy Reductions	2-93
5	New York TEA-21 New Start Projects with Funding Authorizations	2-94
SECTION 2.5		
1	New York State’s Public Benefits Program Goals	2-100
2	Public and Private Utility Sponsored Public Benefits Programs in NYS ..	2-104
3	Summary of New York Energy \$mart Program Results	2-108
4	WAP Savings Summary	2-112
SECTION 3.1		
1	Annual Average U.S. EIA Growth Rates of Economic Variables	3-2
2	New York State Forecasts	3-4
3	Energy Demand in New York State	3-5
4	Energy Prices in New York State	3-8
SECTION 3.2		
1	Energy Efficiency Spending in New York State	3-13
2	Utility DSM/SBC Spending with Actual and Projected Achievements	3-15
3	Select Utility Energy Efficiency Activities	3-16
4	NYSERDA-Administered SBC Energy Efficiency Spending with Projected and Actual Achievements	3-17
5	Major New York Energy \$mart SM Commercial and Industrial Energy Efficiency Programs	3-18
6	Major New York Energy \$mart SM Residential and Low-Income Energy Efficiency Programs	3-19
7	LIPA Clean Energy Initiative Actual and Projected Spending and Achievements for Energy Efficiency Programs	3-20
8	Major LIPA Clean Energy Initiative Energy Efficiency Programs	3-21
9	NYPA Energy Efficiency Programs Actual and Projected Investment and Results	3-22
10	Major NYPA Energy Efficiency Programs	3-23

<u>Table Number</u>	<u>Title</u>	<u>Page</u>
11	Expected Annual Energy Savings & Air Emission Reductions from Energy Code Amendments	3-26
12	List of Key Barriers to Energy Efficiency	3-34
13	Statewide Cumulative Electric and Summer Peak Demand Reductions	3-35
14	Cumulative Air Quality and Economic Benefits from Statewide Electricity Savings	3-36
15	Preliminary Technical Potential Results by Sector	3-37

SECTION 3.3

1	Primary Energy Use in 1999 in New York State and in the U.S.	3-43
2	Contribution of Renewable Energy Sources to New York State Electricity Supply	3-44
3	2001-2006 New York System Benefits Charge Funding for Renewable Energy	3-49
4	Technical Potential for Windpower in 2022	3-60
5	Technical Potential for Hydropower in 2022	3-63
6	Biomass Energy Resources	3-64
7	Biopower Technologies	3-65
8	Technical Potential for Biopower in 2022	3-66
9	Technical Potential LFG-to-Electricity in 2022	3-69
10	Technical Potential for PV in 2022	3-71
11	Technical Potential for Low-Temperature Solar in 2022	3-72
12	Technical Potential for Fuel Cells in 2022	3-74
A	Summary of Selected State-Level Initiatives	3-78
B	Hydroelectric Relicensing Schedule in New York State	3-79

SECTION 3.4

1	Retail Access Penetration in New York State	3-81
2	Wholesale Price Changes in New York State	3-91
3	Article X Project Status	3-95
4	Existing Transmission Line Voltages and Circuit Miles	3-101
5	Major Interface Limits	3-101
6	Interpool Transfer Capabilities	3-103
7	Fuel Mix Based on Capacity of NYS Installed Units	3-105
8	Fuel Mix Based on Energy Produced for the New York Electricity System	3-105
9	Operating Nuclear Power Plants in New York State	3-109
10	Projected Reserve Margins with No Additional Resources	3-120
11	Fuel Mix Changes Based on Capacity of Installed Units	3-121
12	Generation Changes by Fuel Type	3-121
13	Relative Projected Wholesale Energy Price Index Changes	3-122
14	Projected Emission Changes/Emission Index Changes (Construction)	3-123
15	Projected Reserve Margins	3-126
16	Installed Capacity	3-126
17	Projected Peak Loads	3-127
18	Percent of Load Covered by Local Generation	3-127
19	Fuel Mix Changes Based on Capacity of Installed Units	3-129
20	Generation Changes by Fuel Type	3-129
21	Relative Projected Wholesale Price Index Changes	3-130
22	Projected Emission Changes/Index Changes (Reference Resource)	3-131

<u>Table Number</u>	<u>Title</u>	<u>Page</u>
23	Renewable Energy Scenario Cumulative Capacity	3-133
24	Comparison of Generation Mix Based on Energy Produced between Renewable Energy and Reference Resource Scenarios	3-135
25	Premium Cost for Renewable Energy	3-137
26	Comparison of NO _x and SO _x Emissions	3-140
27	Comparison of Generation Mix Changes Based on Installed Capacity between the Nuclear License Retirement and Reference Resource Scenarios	3-143
28	Comparison of Generation Mix Based on Energy Produced between the Nuclear License Retirement and Reference Resource Scenarios	3-143
 SECTION 3.5		
1	Changes in Annual Maximum Gas and Corresponding Oil Consumption for Electricity Generation	3-175
2	Percentage of Annual Electric Generation Requirements that Could be Met by Gas - Downstate Area	3-176
 SECTION 3.6		
1	Article X Projects Petroleum Profile.	3-203
2	New York State Petroleum Demand and Price Forecast	3-205
 SECTION 3.7		
1	2000 United States Coal Production, Use, and Prices	3-208
2	2000 United States Coal Production by Coal-Producing State	3-209
3	United States Coal Production, 2000.	3-210
4	Estimate of Recoverable Reserves of Coal in United States	3-211
5	United States Coal Mining Statistics.	3-212
6	Coal-Fired Generating Units in New York State	3-214
7	Average Delivered Cost of Coal to New York State Electric Utility Plants	3-215
8	2000 Average Delivered Cost of Coal to New York State Electric Utility Plants	3-215
9	Origin of Domestic Coal Delivered to New York State by Method of Transportation, 1999	3-215
10	Emission Rates for Electric Generation Plants.	3-218
11	New York State Coal Demand and Price Forecast	3-221

FIGURES

<u>Figure Number</u>	<u>Title</u>	<u>Page</u>
SECTION 1.1		
1	New York State Primary Energy Use per Unit of Gross State Product	1-6
2	New York State Primary Energy Use and Gross State Product	1-7
3	New York State Primary Energy Use	1-7
4	New York State Energy-Related CO ₂ Emissions	1-8
5	New York State Electric Generation & Sales	1-8
SECTION 2.2		
1	End-Use Energy Prices for Selected Fuels	2-25
2	Changes in Price for Selected Fuels	2-26
3	All-Sector Electricity Price	2-27
4	NYS Average Revenue per Kilowatthour	2-29
5	Residential Natural Gas Price Components for Selected States	2-31
6	Commercial Natural Gas Price Components for Selected States	2-32
7	Home Heating Oil Components for Selected States	2-33
8	Components of Commercial #2 Distillate for Selected States	2-34
9	Components of Gasoline Price for Selected States	2-35
10	Components of Diesel Fuel Price for Selected States	2-36
SECTION 2.4		
1	New York State Existing & Forecasted Daily Vehicle Miles	2-61
2	New York Metro Region Existing & Forecasted Daily Vehicle Miles	2-61
3	ROS Existing & Forecasted Daily Vehicle Miles	2-62
4	Daily Person Trips, 1995 Nationwide Personal Transportation Survey	2-62
5	Journey-to-Work: 2000 Census, NYC and NYS	2-63
6	Journey-to-Work, 2000 Census, NYS and National	2-64
7	Comparison of 1993 and 1997 Commodity Flow Survey	2-66
8	State Energy Consumption Per Capita	2-74
9	Statewide Mass Transportation Operating Assistance (STOA) Funding	2-75
10	STOA Program - Statewide Ridership	2-76
11	STOA Program - Projected Ridership	2-76
12	1997 Shipment Characteristics by Mode from NYS to All Other States	2-79
13	New York E-Z Pass Tag Holder Trend	2-81
14	AFV Acquisition Plan	2-86
SECTION 2.5		
1	Aligning and Balancing the Goals of Energy Customers	2-101
SECTION 3.3		
1	Grid-Connected Electricity Generation from Renewable Sources	3-45
2	Federal R&D Spending in 1999 Dollars	3-47

Figure Number	Title	Page
SECTION 3.4		
1	Peak Demand	3-116
2	Total Electricity Requirements	3-116
3	Average Retail Electricity Prices, 2000-2006	3-117
4	Average Retail Electricity Prices, 2000-2021	3-117
5	Renewable Resource Scenario vs. Reference Resource Scenario (Indexed)	3-136
6	Renewable Resource Scenario vs. Reference Resource Scenario (SO ₂)	3-138
7	Renewable Resource Scenario vs. Reference Resource Scenario (NO _x)	3-138
8	Renewable Resource Scenario vs. Reference Resource Scenario (CO ₂)	3-139
9	Nuclear License Retirement Scenario vs. Reference Resource Scenario (Reserve)	3-142
10	Nuclear License Retirement Scenario vs. Reference Resource Scenario (Index)	3-144
11	Nuclear License Retirement Scenario vs. Reference Resource Scenario (SO ₂)	3-145
12	Nuclear License Retirement Scenario vs. Reference Resource Scenario (NO _x)	3-145
13	Nuclear License Retirement Scenario vs. Reference Resource Scenario (CO ₂)	3-146
SECTION 3.5		
1	U.S. Natural Gas Consumption	3-158
2	NYMEX Average Bid Week Prices	3-160
3	U.S. Gas Production	3-161
4	Gas Rotary Rigs in Operation	3-161
5	LNG Imports	3-163
6	Projected Total NYS Gas Demand	3-173
7	NYS Outlook Case Natural Gas Demand	3-173
8	Projected NYS Core Market Gas Demand	3-174
9	Projected NYS Electric Generation Market Gas	3-178
10	Projected U.S. Natural Gas Wellhead Prices	3-179
11	Projected NYS Residential Gas Prices	3-179
12	Projected NYS Commercial Gas Prices	3-180
13	Projected NYS Industrial Gas Prices	3-180
14	Projected NYS Power Generation Prices	3-181
SECTION 3.6		
1	Crude Oil Reserves	3-183
2	World Crude Oil Production	3-183
3	Major Crude Oil Producers	3-184
4	U.S. Crude Oil Refiner Acquisition Cost	3-185
5	U.S. Petroleum Supply & Demand	3-186
6	U.S. Refinery Statistics	3-187
7	U.S. Rotary Rigs	3-188
8	NYS Distillate Storage	3-190
9	Gasoline & Resid Storage	3-191
10	NYS Crude Oil Production	3-192

<u>Figure Number</u>	<u>Title</u>	<u>Page</u>
11	Petroleum Share of New York Energy Demand	3-194
12	U.S. Distillate Production & Supply	3-195
13	Distillate Inventories	3-196
14	U.S. Distillate Imports	3-197
15	U.S. Gasoline Production & Supply	3-198
16	Gasoline Inventories	3-199
17	U.S. Gasoline Imports	3-199
18	NYS Annual Propane Demand	3-201
19	U.S. Propane Supply	3-201