

Contents

<i>Chapter</i>	<i>Page</i>
SUMMARY	1
1. INTRODUCTION	7
An Idea to Fill a Need.	7
The Source of Ocean Thermal Energy	7
The Attractions of Ocean Thermal Energy	7
The Supply of Ocean Energy	8
The Status of Ocean Energy Extraction	10
The Purpose of This Report	11
2. TECHNICAL AND ECONOMIC STATUS	15
Technical Problems	16
Heat Exchangers.	16
Cold Water Pipe.	19
Working Fluid...	20
Ocean Platforms	20
Underwater Transmission Lines	21
Open-Cycle System	22
Construction and Deployment of an OTEC Plant.	23
Reliability of an OTEC Plant	23
Summary of Technical Problems	24
Economic Considerations	24
Electric Power Generation	24
Power for Production of Ammonia.	29
Power for Production of Aluminum	33
Summary of Economic Considerations	34
3. STATUS OF GOVERNMENT FUNDING	39
History of Government funding.	39
Effect of Government Funding on Status Of OTEC	40
Future Funding Possibilities	42
Summary of Government Funding	44

LIST OF TABLES

<i>Table No.</i>	<i>Page</i>
1. Countries Bordering Potential OTEC Sites,	9
2. Power Potential of OTEC Plants at Some Potential Sites.	10
3. Estimated Capital Costs of an OTEC Electric Generating Plant.	25
4. Plant Output and Cost per Unit as a Function of Temperature Difference ..	25
5. Busbar Cost of Electricity	26
6. Effect of Some Variables on Cost of Busbar OTEC Electricity.	26
7. OTEC Funding for Fiscal Years 1972 -77	39

LIST OF FIGURES

<i>Figure No.</i>	<i>Page</i>
1. Potential Marginal Costs of Baseload Electricity in the Year 2000 for Coal or Oil-Fired Powerplants	28
2. Possible Range of Uncertainty in Future Cost of Busbar Electricity . . .	29
3. Number of 1,650 Ton per Day OTEC/Ammonia Plants Necessary To Capture Significant Portion of World Plant Capacity.	32
4. OTEC Program Schedule	41