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Autore	Marzano, Carlo
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2. Record Nr.	UNINA9910140553603321
Autore	Vogel Werner <1952->
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Development; Contents; Preface; Preliminary Remarks and Summary; The Significance of the Rapid Deployment of Solar Thermal Power Plants for Energy Policy; Acknowledgments; List of Tables; 1: Introduction; 1.1 Historical Background; 1.2 Formulating the Problem; 2: The Salient Facts; 2.1 Solar Tower Power Plants as the Basis for Cost Estimates: Cost Analyses; 2.2 The Combined System of Solar and Backup Power Plants ("Solar Power System"); 2.2.1 Solar Base-Load Plants; 2.3 How Much Does Solar Power Cost?; 2.3.1 Introductory Remarks

2.3.2 Investments and Power Costs2.3.3 Are the Additional Costs Compared to Nuclear Plants Affordable?; 2.3.3.1 Burden on the Economy Due to Higher Power Costs (The Cost DifferenceSolar Energy - Nuclear Energy); 2.3.4 Possibly Lower Cost Differences, Potential for Further Development; 2.3.5 "Hidden" Costs of Conventional Power Plants; 2.3.5.1 Nuclear Power Plants; 2.3.5.2 Coal-Fired Power Plants; 2.3.5.3 Fossil-Fuel Backup Power Plants for the Solar Power System

2.4 Possible Time Scales for the Operational Readiness of Solar Thermal Power Plants and the Comprehensive Replacement of Current Power Plants2.4.1 Special Aspects of Solar Power-Plant Development; 2.4.2 The Simplest Technology - Consequences for Development and Construction on a Large Scale; 2.4.3 The Basic Development Tasks for Heliostats; 2.4.3.1 Stability; 2.4.3.2 Cost Predictions; 2.4.4 The Most Important Single Point: A Cost Study for the Standard Heliostat; 2.4.5 The Interdisciplinary Character of Solar-Plant Development; 2.4.6 Consequences for the Organization of Research

2.4.7 Industrial Initiatives and Start-up Funding3: Solar Technologies - An Overview; 3.1 Dish Plants; 3.2 Tower Power Plants; 3.3 Parabolic Troughs; 3.4 Linear Fresnel Plants; 3.5 Updraft (Chimney) and Downdraft Power Plants; 4: Some Additional Economic Factors; 4.1 Detailed Treatment of the Costs of the Solar Power System - Comparison with Competing Types of Power Plants - Discussion; 4.1.1 Solar Power Systems with Coal-Fired Backup Power Plants (Instead of Natural Gas Plants); 4.1.2 Overview of Costs; 4.1.3 Coal-Fired Base-Load Power Plants with CO₂ Sequestration

4.1.4 Coal-Fired Power Plants without CO₂ Sequestration4.1.5 Nuclear Power Plants; 4.1.6 Weighing Cost Differences; 4.1.7 Separate Considerations of Solar and Backup Power Supplies; 4.1.8 Solar Power at the Plant Site; 4.1.9 Hydrogen Production; 4.2 Comparison with the Study of Sargent and Lundy; 4.2.1 Costs from Various Studies; 4.2.1.1 Investment Costs; 4.2.1.2 Operating and Maintenance Costs; 4.2.2 Response of the NRC to the S&L Study; 4.2.2.1 The Research-Political Context of the S&L Study and the Criticism of the NRC

4.2.2.2 Conclusions Based on the Current Preliminary State of Knowledge

Sommario/riassunto

This important contribution to the issue of renewable energy describes the technical and economical requirements of mass-produced solar thermal power plants, from the different types of power plants to the development needs and a massive development program. The authors - renowned and experienced experts in the field - show that solar thermal power plants, because of their simple technology, are easy to build with high production rates and therefore can play a substantial role in the rapid substitution of fossil fuels. On the basis of solar thermal power (using long distance transmission) and
