

ATTENTION OF THE READERS.....

The Report of Working Group on Power is based on achievements as on 31.12.2006 and likely 10th Plan achievements for the period 1.1.2007 to 31.3.2007. Estimates have been drawn up for 11th & 12th Plans accordingly. Actual 10th Plan achievements as on 1.4.2007 may result in corresponding changes in 11th Plan figures.

The Report of Working Group for 11th Plan is based on inputs provided by various organizations. Planning being a dynamic process and a continuous exercise, the results/outputs might change with externalities.

CONTENTS

CHAPTER	DESCRIPTION	PAGE NO.
	PREFACE	
	INTRODUCTION	
	EXECUTIVE SUMMARY	1 - 69
Chapter 1	DEMAND FOR POWER AND GENERATION PLANNING	1 - 93
	1.1 10 th Plan Review	
	1.2 Target Capacity Addition during Tenth Plan	
	1.3 Actual Capacity Addition and Power Supply Position during 10th Plan (Till date)	
	1.4 Actual/ Likely Capacity Addition during Tenth Plan	
	1.5 Likely Installed Capacity at the end of 10th Plan i.e. as on 31.03.2007	
	1.6 Demand for Power	
	1.7 Approach to Selection of Projects for 11th Plan	
	1.8 Generation Planning Norms	
	1.9 Generation Expansion Planning	
	1.10 Twelfth Plan Perspective (2012-2017)	
	1.11 Medium Term Plan: 11th Plan (2007-12)	
	1.12 Long Term Plan: 12th Plan (2012-17)	
	1.13 New Initiatives	
	1.14 Captive Power Plants	
	1.15 Maximising Generation from Existing Plants and AGS&P	
	1.16 Energy Efficiency Improvement through Energy Audit	
	1.17 Accelerated Generation & Supply Programme (AGS&P) Scheme	
	1.18 Non Conventional Energy Sources	
	1.19 Issues to be Addressed and Strategy to be adopted for 11 th Plan	
	1.20 Recommendation of the Group	
	Appendix-1.1: Summary of Capacity Addition Target of 41,110 MW during 10th Plan (Region Wise, Sector Wise and Status Wise)	
	Appendix-1.2 List of Projects Commissioned during 10 th Plan upto 31.12.2006	
	Appendix-1.3 List of Units dropped from 10 th Plan (41110 MW)	
	Appendix-1.4 List of the Thermal Projects slipping from 10 th Plan (41,110 MW) and included in 11 th Plan (As per 30,641 MW)	

CHAPTER	DESCRIPTION	PAGE NO.
	Appendix-1.5 List of the Hydro Projects slipping from 10 th Plan (41,110 MW) and included in 11 th Plan (As per 30,641 MW)	
	Appendix-1.6 Details of Best Effort Projects	
	Appendix-1.7 List of Projects Likely to slip to 11 th Plan	
	Appendix-1.8 Capacity Addition programme for 11 th Plan	
	Appendix-1.9 Year wise coal requirement for 11 th Plan	
	Appendix-1.10 Shelf of 12 th Plan projects	
	Appendix 1.11 Comparative Performance of Partnership in Excellence (PIE) Stations with NTPC as PIE Partner	
	Appendix 1.12 State Wise List of Hydro RM&U Projects Completed in the 10 th Plan	
	Appendix 1.13 State Wise List of ongoing Hydro RM&U Projects Programmed For Completion In the 10 th Plan	
	Appendix 1.14 State Wise List of ongoing Hydro RM&U Projects Programmed for Completion in the 11 th Plan	
	Appendix 1.15 State Wise List of Hydro RM&U Projects Programmed for Completion in the 11 th Plan but works of which are yet to be taken up for Implementation	
Chapter 2	TRANSMISSION PLANNING AND NATIONAL GRID	1 - 66
	2.1 Review of Transmission System during 10 th Plan	
	2.2 National Grid	
	2.3 Eleventh Plan Programme	
	2.4 Technology Development	
	2.5 Transmission Requirements for Open Access and Trading	
	2.6 Power Exchange with Neighbouring Countries	
	2.7 Reliability Issues and Grid Operation	
	2.8 Fund Requirement during 11 th Plan for Transmission System Development and Related Schemes	
	Appendix-2.1: HVDC Transmission Bipole, Back-to-back and Monopole lines and terminal station – Existing at the end of 9th Plan and programme for 10th Plan 2002-07	
	Appendix-2.2: Transmission lines and sub-station at 765kV – Existing at the end of 9th Plan and programme for 10th Plan 2002-07	

CHAPTER	DESCRIPTION	PAGE NO.
	Appendix 2.3 List of major transmission schemes completed and programmed under the development plan of the Regional Grids and National Grid during the 10 th Plan-Northern Region	
	Appendix 2.4 List of major transmission schemes completed and programmed under the development plan of the Regional Grids and National Grid during the 10 th Plan-Western Region	
	Appendix 2.5 List of major transmission schemes completed and programmed under the development plan of the Regional Grids and National Grid during the 10 th Plan-Southern Region	
	Appendix 2.6 List of major transmission schemes completed and programmed under the development plan of the Regional Grids and National Grid during the 10 th Plan-Eastern Region	
	Appendix 2.7 List of major transmission schemes completed and programmed under the development plan of the Regional Grids and National Grid during the 10 th Plan-Inter-Regional	
	Appendix-2.8: Inter-State Transmission Schemes For The 11 th Plan	
	Appendix- 2.9: States' Transmission Schemes for the 11 th Plan Evacuation System for Generation Projects	
	Appendix-2.10 State-Wise Details of Normative Assessment	
Chapter 3	DISTRIBUTION INCLUDING VILLAGE AND HOUSHOLD ELECTRIFICATION	1 - 57
	3.0 Overview	
	3.1 Key Issues in Electricity Distribution Sector	
	3.2 Distribution Reforms	
	3.3 New Legal and Policy Framework	
	3.4 Policy Initiatives	
	3.5 Distribution of Power in Urban Areas	
	3.6 Achievements Under APDRP	
	3.7 Distribution of Power in Rural Areas - Initiatives in 10 th Plan	
	3.8 Development of Revenue Sustainability - Franchisees	
	3.9 Role of Panchayati Raj in Franchisee Development	
	3.10 Power Distribution in Rural Areas Through DDG	
	3.11 Short Term Strategies for DDG Schemes	
	3.12 Medium Term and Long Term Strategies	
	3.13 Cost to Serve/ Delivered Cost	

CHAPTER	DESCRIPTION	PAGE NO.
	3.14 Role of Stakeholders	
	3.15 Role of REC	
	3.16 Institutional and Financial Models	
	3.17 Special Focus Areas for 11 th Plan	
	3.18 New Programmes/Schemes for 11 th Plan	
	3.19 Agriculture Sector - Subsidies and Cross Subsidies	
	3.20 Water Energy Nexus	
	3.21 Open Access in Distribution	
	3.22 Multi-Year Tariff	
	3.23 Public Private Partnership	
	3.24 Impact of Power Sector Reforms – Success Stories	
	3.25 Best Practices	
	3.26 Requirement of Funds	
	3.27 Recommendations	
Chapter 4	DEMAND SIDE MANAGEMENT AND ENERGY EFFICIENCY	1 - 14
	4.0 Introduction	
	4.1 The Energy Conservation Act	
	4.2 Energy Saving –Target and Achievement of 10 th Plan	
	4.3 Energy Conservation Strategy in the 11 th Five-Year Plan	
	4.4 Policy Research for Accelerating Adoption of Energy Efficiency and DSM Programs	
	4.5 Budget Outlay for the 11 th Plan	
	4.6 Recommendations	
Chapter 5	RESEARCH & DEVELOPMENT	1 - 21
	5.0 Introduction	
	5.1 Overview of R&D	
	5.2 Technology Development in Power Sector	
	5.3 Identified Projects for 11 th Plan by Central Utilities	
	5.4 R&D Project Provisions and Test Facilities for CPRI	
	5.5 Major Project Proposals for 11 th Five Year Plan	
	5.6 Short Listed Short Term & Long Term Projects	
	5.7 R&D Funding	
	5.8 Intellectual Property Rights	
	5.9 Human Resource Development and Technical Competence Building	
Chapter 6	DEVELOPMENT OF POWER SECTOR IN NORTH-EASTERN REGION	1 - 11
	6.0 Introduction	

CHAPTER	DESCRIPTION	PAGE NO.
	6.1 Status at the beginning of 10 th Plan	
	6.2 Review of Generation Capacity Addition Programme during 10 th Plan	
	6.3 Reasons for Slow Pace of Project Execution	
	6.4 Power Demand & Supply Analysis of the Region	
	6.5 Generating Capacity Addition Programme in North Eastern Region/ Sikkim during 11 th Plan	
	6.6 Development of Transmission System in North Eastern Region	
	6.7 Evacuation of Power from Major Generation Projects in the North-Eastern Region along with Power from Projects coming up in Sikkim and Bhutan during the 11 th Plan and early 12 th Plan Period	
	6.8 Special Attention for Distribution in NE Region	
	6.9 Fund Requirement	
	6.10 Policy Initiatives and Recommendations	
Chapter 7	HUMAN RESOURCE DEVELOPMENT	1 - 25
	7.0 Back Ground	
	7.1 Elements of HRD Planning	
	7.2 Assessment of Manpower	
	7.3 Training	
	7.4 Funding & Capital Outlay	
	Appendix 7.1: Training Load during 11 th Plan for Technical Manpower (Includes Infrastructure) in Thousand-Man-Months (TMM)	
	Appendix 7.2: Training Load during 11 th Plan for Non-Technical Manpower (Includes Infrastructure) in Thousand-Man-Months	
	Appendix 7.3: Training Load (Induction) during 12 th Plan for Technical Manpower (Includes Infrastructure) in Thousand-Man-Months	
	Appendix 7.4: Training Load (Induction) during 12 th Plan for Non-Technical Manpower (Includes Infrastructure) in Thousand-man-months	
Chapter 8	LEGISLATIVE AND POLICY ISSUES	1 - 41
	8.0 Back Ground	
	8.1 Implementation of Provisions of Act and Policies	
	8.2 Status of Implementation and Deviations of Integrated Energy Policy	
	8.3 National Electricity Policy - Deviations and Status of Implementation	
	8.4 Major Issues and Recommendations	

CHAPTER	DESCRIPTION	PAGE NO.
	8.5 Summary of Recommendations	
	Appendix 8.1: Fund Requirement for Training of Electricity Regulators and Staff	
	Appendix 8.2: Comments of Prayas Energy Group	
	Appendix 8.3: Comments of IIT Kanpur	
Chapter 9	KEY INPUTS	1 - 49
	9.1 Introduction	
	9.2 Coal & Lignite	
	9.3 Transportation of Coal: Available Infrastructure	
	9.4 Natural Gas	
	9.5 Key Input Materials	
	9.6 Generation Expansion Plan	
	9.7 Material Requirements for Generating Stations	
	9.8 Material Requirement for Power Transmission System Network	
	9.9 Material Requirement for Distribution System Network	
	9.10 Material Requirement for Power and Distribution Transformers	
	9.11 Other Materials for 11 th & 12 th Plan Projects	
	9.12 Total Requirement of Various Materials for Capacity Addition Planned during 11 th & 12 th Plans	
	9.13 Availability / Supply of Key Materials	
	9.14 Constraints / Policy Support Required	
	9.15 Availability / Capability of Manufacturers	
	9.16 Construction Capability	
	9.17 Availability/Capability of Construction Agencies	
	9.18 Availability of Construction Equipment	
	9.19 Special Measures for Thermal Projects	
	9.20 Recommendations	
	Appendix 9.1: Port wise Projected Traffic and Capacity Estimation (2013-14)	
	Appendix 9.2: List of Construction Equipments to be Augmented for Hydro Projects	
	Appendix 9.3: Construction Equipment Availability vis a vis Augmentation required for adding 14000 MW / per yr.	
Chapter 10	FINANCIAL ISSUES AND POWER SECTOR FINANCING	1 - 46
	10.1 Financial Performance of Power Sector during 10 th Plan	
	10.2 Fund Requirement for 11 th Plan	
	10.3 Renovation and Modernization of Power Plants	
	10.4 Transmission Network	

CHAPTER	DESCRIPTION	PAGE NO.
	10.5 Distribution and Rural Electrification	
	10.6 Human Resource Development	
	10.7 Research and Technology Development	
	10.8 Demand Side Management	
	10.9 11 th Plan Estimated Fund Requirement	
	10.10 Year Wise Fund Requirement	
	10.11 Sources of Funds	
	10.12 Estimated Funds Mobilization	
	10.13 Lenders' Issues	
	10.14 Developers' Concerns	
	10.15 Recommendations & Implementation Strategy	
	10.16 Implementation Mechanisms	
	Appendix 10.1: Detailed Outlay and Achievement for Funding 10 th Plan - State Sector	
	Appendix 10.2: Approved Tenth Plan Outlay Internal and Extra Budgetary Resources Gross Budgetary Support	
	Appendix 10.3: Assumptions for Estimation of Cost of Generation Projects	
	Appendix 10.4: Projects Under Construction	
	Appendix 10.5: Committed Projects	
	Appendix 10.6: Projects to be taken up in 11 th Plan for Likely Benefit in 12 th Plan	
	ACRONYMS	