



Catalogue of Research Reports on Infrastructure Sectors

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ABOUT US

India Infrastructure Research is a division of India Infrastructure Publishing Private Limited, a company dedicated to providing information on the infrastructure sectors through magazines, conferences, newsletters and research reports.

India Infrastructure Research publishes research reports in the areas of power, oil & gas, ports & shipping, roads & bridges, telecommunications, aviation and water.

Our reports are acknowledged as high-quality, user-friendly, up-to-date, accurate and comprehensive sources of information. They range from sector overviews (**Power in India**, for example) to more intensive studies of segments and subsegments (such as **Power Transmission in India** and **Power Distribution in India**).

Our clients include most organisations involved in the infrastructure sectors – multinationals, top Indian corporates, commercial and investment banks, consulting companies, public sector companies, government agencies, multilateral agencies and legal firms.

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NEWSLETTERS

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Market Analysis, Key Trends and Outlook

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[For each of the countries we will cover gas reserves, production, R/P ratio, present export profile including five-year export trends to India, existing and upcoming LNG terminals, existing long-term contracts, etc.]



The report will be available in a PDF format.

1. EXECUTIVE SUMMARY

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The franchises covered include:

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- Nagpur (Spanco Nagpur Discom Limited)
- Agra (Torrent Power Limited)
- Muzaffarpur (Essel Vidyut Vitaran (Muzaffarpur) Limited)
- Bhagalpur (SPML Infra Limited)
- Gaya (India Power Corporation Limited)
- Kendrapara Division I & II, Jagatsinghpur, Dhenkanal, Talcher and Angul (Enzen Global Solutions Private Limited)
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(November 2017)

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Demand Outlook and Projections (till 2021-22)

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Industries (India) Limited <p><i>(Each profile covers existing and planned manufacturing capacity, product portfolio, recent orders, financial performance, etc.)</i></p> <div style="display: flex; align-items: center;">  <p>The report is available in a PDF format.</p> </div>
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Changing Landscape, Growing Role of Digitisation and New Opportunities

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1. EXECUTIVE SUMMARY

Solar plants are built to last 20-25 years. After the engineering procurement and construction period is completed, developers need to ensure that the operations and maintenance (O&M) activities are seamless for sustained energy generation over the project lifetime. The report will highlight the emerging opportunities in this space and the growing role of new technologies like automation and artificial intelligence.

2. MARKET OVERVIEW

In the initial years of solar power development in India, O&M was often coupled with EPC and performed by the same vendors, but of late, solar O&M has emerged as a separate market with its own landscape, trends and dynamics. This chapter will cover the following areas:

- ❖ Current size of the solar O&M market
- ❖ Market size by segment
 - Utility-scale, Rooftop, Canal-top & floating solar
- ❖ Key growth trends and drivers
- ❖ O&M Evolution - Reactive to Predictive Analysis
 - Applications in solar O&M, Cost and time savings
- ❖ Emerging Role of Energy Storage
- ❖ Key issues and concerns

3. COST TRENDS

The cost of O&M services has been declining over the past few years and the downward trend is expected to continue. The cost composition itself is changing due to greater automation and use of advanced tools. This chapter will cover the following areas:

- ❖ Solar O&M cost trajectory (2012-18)
- ❖ Cost breakup analysis
 - Vehicles and logistics, Equipment and tools, Overheads, Personnel/ Manpower, Digital, Others
- ❖ Cost projections (2019-24)
 - Business model evolution, Key cost considerations, Impact of scale, Impact of energy storage, Future cost estimates

4. EMERGING O&M BUSINESS MODELS

Globally, there has been a rise of third party solar O&M service providers. As more sophisticated and structured approach emerges in the solar O&M market, third party providers are able to deliver more value to solar investors and owners. This chapter will cover the following areas:

- ❖ Capex-based
- ❖ Profit-sharing
- ❖ Fixed cost
- ❖ O&M extensions
- ❖ Others

5. TERMS OF O&M CONTRACTS

It is important for both developers and O&M service providers to clarify and list out their expectations and accordingly draw up a long-term contract. An effective contract will result in higher plant efficiencies. This chapter will cover the following areas:

- ❖ Time periods
- ❖ Product warranties
- ❖ Performance guarantees/SLAs
- ❖ Penalties
- ❖ Ownership
- ❖ Legal terms

6. GRID MANAGEMENT BY O&M PLAYERS

As the government becomes stricter in its implementation of forecasting, scheduling and deviation settlement mechanism regulations, grid management will become a key component of O&M players. Integration of energy storage on to existing plants will lead to a greater O&M play. This chapter will cover the following areas:

- ❖ Forecasting and scheduling
- ❖ Deviation settlement management
- ❖ Integration of energy storage into existing plants
- ❖ Cost implications
- ❖ Experience so far

7. O&M COMPANY PROFILES

A large number of O&M focused players are coming up, some as hive-offs from existing EPC companies and others as independent specialists. This chapter will have 5-8 profiles of key O&M players in India covering the following:

- ❖ Project portfolio
- ❖ Service offerings
- ❖ Technology tie-ups
- ❖ On-ground experience
- ❖ In-pipeline capacity
- ❖ Etc.

8. DIGITALISATION AND AUTOMATION AT PLANT LEVEL

Digitalisation and automation will play a key role in providing efficient O&M services, thereby changing the current O&M cost composition, which is currently dominated by manpower expenses. New technologies are being adopted for improving asset lifecycle management, predictive maintenance, remote sensing and control, cloud computing, and use of drones for visual imaging. A number of companies have also already started using robotics for cleaning modules. This chapter will cover the following areas:

- ❖ Emerging role, applications and use case for the following
 - Manpower and material management, Automated monitoring and big data analytics, Robotics, drones and wearables
- ❖ Growing role of artificial intelligence
 - Machine learning applications, AI field assistants and predictive analytics, Existing use cases
- ❖ Key technology providers
- ❖ Industry Perspective (Views of key personnel from the solar O&M industry and technology providers on the growing role of AI, robotics and data analytics)

9. KEY CHALLENGES, BEST PRACTICES AND CASE STUDIES

The lack of attention given to O&M practices is one of the primary challenges that the segment is facing. If the plant is not maintained properly, developers can lose up to 15 per cent of the returns. This chapter will cover the following areas:

- ❖ O&M challenges matrix
- ❖ Best practices (Globally and in India)
- ❖ Case studies (This will cover successes and failures of various technologies, business models and strategies adopted by O&M players)

10. PROJECTED O&M MARKET SIZE (FROM 2019-20 TO 2024-25)

The total addressable market for solar PV O&M is expected to reach 30 GW in 2018-19. It is likely to more than triple by 2022 to exceed 100 GW. In fact, going forward, as the installed base gets larger, O&M revenue may even exceed the development and construction revenue. This chapter will cover the following areas:

- ❖ Impact factors
- ❖ Emerging O&M industry structure
- ❖ Short-term projections
- ❖ Medium-term projections
- ❖ Long-term projections



The report will be available in a PDF format.

(April 2017) No. of slides: 473

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The report is available in a PDF format.

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[Each profile covers the project scope (network length, number of stations, rolling stock, fare system, signalling and telecommunication, traction, etc.), implementing agency, project cost, key consultants, key contractors, key milestones, sources of funding, recent contracts, upcoming tenders, current status, etc.]



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Each profile includes information on company operations, production and sales, financial performance, key projects, expansion plans, outlook, etc.



The report is available in a PDF format.

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Each project includes information on state, length, project cost, current status, developer, contractor, completion date, etc.

FOUR QUARTERLY UPDATES

The quarterly updates include:

- Summary of New Developments
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(Each profile covers existing and planned manufacturing capacity, product portfolio, recent initiatives, financial performance, etc.)



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(Each state profile gives an overview of the housing scenario, role of key agencies and housing boards, state policy on affordable housing, ongoing and upcoming housing schemes, and new initiatives and incentives introduced).

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(Each profile gives an overview of the company's operations and covers its ongoing and upcoming projects).



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- GIFT City; Lavasa; Naya Raipur; Dholera; Aurangabad Industrial Smart City; Vikram Udyogpuri; Integrated Industrial Township Greater Noida Limited; New Delhi; Surat; Varanasi
Each case study provides information on:
- Key Focus Areas (Mobility, Water and Waste, Energy, Governance, Safety and Security, Buildings, Communication, etc.)
- New Innovations and Technologies
- Best Practices and Key Learnings
- Issues and Challenges

22. CASE STUDIES OF EXISTING GLOBAL SMART CITIES

- Amsterdam; Barcelona; Singapore; Stockholm; Manchester; Copenhagen
Each case study provides information on:
- Key Focus Areas (Mobility, Water and Waste, Energy, Governance, Safety and Security, Buildings, Communication, etc.)
- New Innovations and Technologies
- Best Practices and Key Learnings
- Issues and Challenges

23. DATABASE OF KEY PROJECTS

- A comprehensive excel-based database of projects across water supply, sewerage, waste, energy, mobility, roads, flyovers, safety and security, e-governance, healthcare, capacity building and city gas distribution segments.
Each project provides information on:
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- Project Cost
- Type of Project (Area-based or Pan-City)
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Each project profile/case history contains information on project scope, contractor, technology provider, capacity, capex, cost per unit, current status, project timelines, etc.



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<p>1. OVERVIEW</p> <ul style="list-style-type: none"> - Current State of Municipal Water Supply - Key Sector Trends - Recent Developments - Investment Requirements - Future Outlook and Opportunities - Issues and Challenges - The Way Forward <p>2. WATER SUPPLY AND DEMAND</p> <ul style="list-style-type: none"> - Total Freshwater Resource Availability - Principal Sources of Water Supply - New Water Supply Sources - Water Demand Across Sectors (Domestic, Industrial and Agriculture) - Water Demand Outlook - Demand Supply Balance <p>3. POLICY AND INSTITUTIONAL FRAMEWORK</p> <ul style="list-style-type: none"> - Institutional Structure - Current Norms and Standards - Experience in Compliance to Existing Norms - National Water Policy, 2012 - State Level Policies - Key Issues <p>4. MUNICIPAL SEGMENT SIZE AND GROWTH</p> <ul style="list-style-type: none"> - Current Piped Water Supply Network - Growth Trends - Current Consumption - Consumption Growth (by City-size) - Geographic Analysis - Sewage Generation and Treatment <p>5. PRICING AND TARIFF STRUCTURE</p> <ul style="list-style-type: none"> - Current Tariff Structure - City-wise tariffs - Tariff Trends and Recent Reforms - Proposed Model Tariff Structure - Cost of Water Supply in ULBs - Issues and Challenges <p>6. IMPACT ASSESSMENT OF THE JNNURM</p> <ul style="list-style-type: none"> - Reform Goals and Achievements - Project Funding under the JNNURM - Impact on Water Supply and Wastewater Management - Key Learnings <p>7. NEW GOVERNMENT PROGRAMMES AND INITIATIVES</p> <ul style="list-style-type: none"> - New Government Strategies on Water Supply and Wastewater Management - Focus on Urban Renewal <ul style="list-style-type: none"> • 100 Smart Cities • Rejuvenation of Heritage Cities • Urban Renewal of 500 Habitations - Budgetary Support - Focus on Alternate Water Resources <p>8. FINANCING EXPERIENCE</p> <ul style="list-style-type: none"> - Financing Requirements - Key Funding Sources - Financing Trends - ULB Finances - Risks and Challenges 	<p>9. PPP EXPERIENCE AND POTENTIAL</p> <ul style="list-style-type: none"> - Formats and Models - PPP Enablers - Experience so Far (Completed and Under Implementation Projects) - Case Studies-PPP Projects - Key Learnings - Risks and Challenges <p>10. 24X7 WATER SUPPLY</p> <ul style="list-style-type: none"> - Experience so Far - Case Studies- 24x7 Pilot Projects - Key Learnings - Planned Projects <p>11. METERING WATER SERVICES</p> <ul style="list-style-type: none"> - Current Scenario - Recent Metering Initiatives - Impact of Metering Water Services (Case Studies of Select ULBs) - Market Opportunities - Issues and Challenges <p>12. NON REVENUE WATER (NRW)</p> <ul style="list-style-type: none"> - Focus on NRW Reduction - Current Levels of NRW - Key Factors behind NRW - Recent NRW Reduction Initiatives - Issues and Challenges <p>13. SEGMENT OUTLOOK AND OPPORTUNITIES (2015-2020)</p> <ul style="list-style-type: none"> - Key Growth Drivers - Expected Water Demand in Cities - Investment Requirements and Projections - Project Pipeline (Under Implementation and Planned) - Emerging Opportunities <p>14. PROFILES OF WATER UTILITIES</p> <p><i>(These profiles provide information on existing water network and infrastructure, sewage network and treatment capacities, performance across different service level benchmarks, recent projects, financial performance, etc.)</i></p> <ul style="list-style-type: none"> - Ahmedabad Municipal Corporation - Bangalore Water Supply and Sewerage Board - Chennai Metropolitan Water Supply and Sewerage Board - Delhi Jal Board - Hyderabad Metropolitan Water Supply and Sewerage Board - Jaipur Municipal Corporation - Kolkata Municipal Corporation - Municipal Corporation of Greater Mumbai - Pune Municipal Corporation - Surat Municipal Corporation - Etc. <p>15. KEY PROJECT PROFILES</p> <p><i>(These profiles contain information on implementing agency, project scope, nature of contract, project cost, key players, status, expected date of completion, etc.)</i></p> <ul style="list-style-type: none"> - Under Implementation - Upcoming (bidding/preliminary stage)
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- Ramky Enviro Engineers Limited
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Each profile will cover the overview of the city's sewage generation level, sewage network, treatment capacity, treatment technologies, policy and regulatory initiatives, upcoming capacity, tariffs, fund allocation and other key measures being undertaken towards recycle and reuse.



The report will be available in a PDF format.

Segment Analysis, Outlook and Opportunities

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The report is available in a PDF format.

(September 2016)

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Growth Drivers, Opportunities and Outlook

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(August 2015)

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Each country profile covers the following:

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(Each profile gives an overview of the company's operations, key contracts serviced, equipment supplied, recent collaborations, joint ventures, and future plans and strategies).



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Executive Summary

The Indian healthcare sector is currently at an inflection point. While a huge demand-supply gap exists, rising government expenditure backed by a sound policy regime are expected to provide impetus to the sector. Besides, increasing private sector interest and focus on the deployment of innovative technology solutions will further drive growth into the market. The report will highlight the emerging opportunities in this space and the growing role of new technologies like big data, IoT and artificial intelligence.

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**(This section will provide an update on key government programmes such as National Health Mission, National Urban Health Mission, National Rural Health Mission, Pradhan Mantri Swasthya Suraksha Yojana, Rashtriya Swasthya Bima Yojana, National Health Protection Scheme, and Intensified Mission Indradhanush)*

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The next few years will see an IT revolution in the healthcare sector. Technology will contribute substantially to bring about a sea change in service delivery. Deployment of technology like artificial intelligence, big data, cloud computing to improve patient-centric healthcare systems is already on the rise. This chapter will cover the following areas:

- ❖ Technology Penetration in Healthcare Ecosystem
- ❖ IoT for Asset Tracking & Inventory Management Systems
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Each country profile provides information on:

- Economic Scenario and Demography
- Power Demand and Supply Scenario
- Resource-wise Renewable Energy Potential
- Segment-wise Size and Growth (Solar, Wind, Bioenergy, etc.)
- Key Growth Drivers
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- Focus on Off-grid Renewables
- Renewable Energy Demand Outlook
- Renewable Energy Investment Outlook



The report is available in a PDF format.

Weekly Newsletters

India Infrastructure Publishing brings out weekly newsletters that cover the latest developments in infrastructure sectors such as power, oil & gas, infrastructure finance, ports & shipping, roads & bridges, urban water & sanitation, telecom and aviation.

These newsletters are sent every Monday morning via e-mail or fax to provide subscribers with accurate, reliable, up-to-date and comprehensive information on the key developments in these sectors during the previous week.

This service is indispensable for anyone involved with the infrastructure sectors: **developers/operators of infrastructure projects (public or private sector), regulators, policymakers, financiers, bankers, consultants, legal specialists, equity analysts, contractors, equipment manufacturers, service providers, etc.**

The newsletters offered and their primary focus areas are:

Power News

Power News covers the latest developments in the Indian power sector across all key segments – generation, transmission and distribution. The focus areas of this newsletter are government policy, project updates, legal and regulatory developments, contracts and orders, corporate news, financings and reform/restructuring developments.

Oil & Gas News

Oil & Gas News covers the latest developments in the Indian oil and gas sector in the upstream, midstream and downstream segments. The focus areas of this newsletter are developments in policy, exploration and production, downstream, LNG, transportation and finance. It covers news related to investments, contracts and orders, legal and regulatory affairs and corporate developments.

Telecom News

Telecom News covers the latest developments in the Indian telecom sector across all segments – fixed, wireless, broadband, long distance, satellite-based services, etc. The focus areas of this newsletter are government policy, legal and regulatory developments, contracts and orders, corporate news, sales promotion news, and new product/service introductions.

Ports & Shipping News

Ports & Shipping News covers the latest developments in the Indian ports and shipping sector. The focus areas of this newsletter are policy, deals, investments, contracts, plans, financings, projects, tariffs and other regulatory developments. It covers news related to major and minor ports, Indian and foreign shipping lines as well as related segments and sectors like rail connections, containers, etc.

Roads & Bridges News

Roads & Bridges News covers the latest developments in the Indian roads and bridges sector. Its scope includes national, state and key local projects. The focus areas of this newsletter are project updates, government plans and initiatives, contracts and orders, corporate news, financings, concessions and other agreements.

Infrastructure Finance News

Infrastructure Finance News covers the latest developments in the area of infrastructure finance. The focus areas of this newsletter are policy, equity moves, debt/bond issues, mergers and acquisitions, loans and credit, credit ratings, primary and public issues, joint ventures/agreements and financial results. The sectors covered include power, telecom, oil & gas, ports & shipping, roads & bridges, aviation, railways, urban infrastructure, water and housing. The lending institutions covered include financial institutions, nationalised banks, private banks, foreign banks, multilateral institutions and bilateral funding agencies.

Aviation News

Aviation News covers the latest developments in the Indian aviation sector. It covers both the airline and airport segments. The primary focus areas of this newsletter are infrastructure development, policy, investment, contracts and orders, privatisation and modernisation initiatives, promotional offers, financing and key statistics.

Urban Water & Sanitation News

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