Catalogue of Research Reports on Infrastructure Sectors

February 2020
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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## EXECUTIVE SUMMARY

## SECTION I: MARKET INSIGHTS, DEVELOPMENTS, FUTURE OUTLOOK AND OPPORTUNITIES

### 1. SMALL-SCALE LNG MARKET OVERVIEW
- Growth Drivers; SSLNG Value Chain; Existing Facilities; Notable Trends; Demand from Key Gas Consumers Segments (CGD, off-grid power; and industrial consumers); Mode of Supply (Truck, Rail, Ship); Major Players/Industry Structure and Stakeholders; Recent Developments; Investment Outlook; Issues and Challenges

### 2. REGULATORY LANDSCAPE FOR SSLNG
- Current Regulatory Regime; Key Regulatory Authorities (PESO, PNGRB, OISD, etc.); Technical and Safety Standards; Issues and Challenges; Regulatory Outlook

### 3. FUTURE POTENTIAL AND MARKET OPPORTUNITIES
- Key Upcoming Facilities; Demand Outlook; Investment Outlook; Regulatory Outlook; Market Opportunities

### 4. COST ECONOMICS & VIABILITY
- Commercial Viability and Business Models; Capex Requirements; Opex Requirements; Cost Competitiveness vis-a-vis Other Fuels; Cost Competitiveness vis-à-vis Pipeline Transportation

### 5. POTENTIAL DEMAND FROM KEY GAS CONSUMERS
- Growth in Gas Demand in the Past Five Years; Sourcing Options; Demand-Supply Gap; Potential Demand for SSLNG; Upcoming Plans and Projects; Issues and Challenges

### 6. GLOBAL EXPERIENCE & CASE STUDIES
- Global SSLNG Market Size & Growth; Trends and Advancements; Select Case Studies (Infrastructure & Capacity, Key Consumers, Mode of Supply, Pricing, etc.); Key Lessons and Takeaways

## SECTION II: LNG MARKET TRENDS, SUPPLY OUTLOOK & INFRASTRUCTURE

### 7. LNG MARKET TRENDS AND OUTLOOK
- Gas Demand Supply Scenario; LNG Import Trends; Sourcing Options; Long-term Contracts; Supply Outlook; Projected LNG Demand

### 8. PRICING TRENDS AND FORECASTS
- Global LNG Pricing Trends; Spot LNG Price Analysis; Long-term Contract Pricing; LNG Price Forecasts

### 9. EXISTING LNG TERMINALS
- Existing Capacity; Utilisation Levels; Pipeline Connectivity; Key Players; Future Expansion Plans

### 10. PLANNED LNG TERMINALS AND CAPACITIES
- Under Construction LNG Terminals, FSRUs and Storage Tanks (Mundra LNG Terminal, Jai gahar LNG Terminal, Chhara LNG Terminal, Dhamra LNG Terminal, Jafnadad LNG Terminal); Proposed/Announced LNG Terminals, FSRUs and Storage Tanks (Kakinada LNG Terminal, Krishnapatnam LNG Terminal, Karaikal LNG Terminal, Kukahali LNG Terminal, Haldia Dock Complex LNG Terminal)

Each terminal's profile will cover project scope, capacity, investment, pipeline connectivity, developer, current status, expected completion timelines, etc.

## SECTION III: STORAGE, TRANSPORTATION & DISTRIBUTION OF SSLNG

### 11. LNG TRUCK LOADING FACILITY
- Existing Infrastructure/Noteworthy Projects; Capex and Opex Requirements; New Trends and Advancements; Key Upcoming Projects; Investment Requirements; Key Issues and Challenges

### 12. STORAGE CAPACITY AND FACILITIES
- Type of Storage Tanks
- Existing Facilities/Capacity
- Trends and Advancements
- Upcoming Capacity
- Investment Requirements
- Issues and Challenges

### 13. LNG SATELLITE STATIONS
- Existing Infrastructure/Noteworthy Projects
- Capex and Opex Requirements
- New Trends and Advancements
- Key Upcoming Projects
- Investment Requirements
- Key Issues and Challenges

### 14. L-CNG STATIONS
- Existing Infrastructure/Noteworthy Projects
- Capex and Opex Requirements
- New Trends and Advancements
- Key Upcoming Projects
- Investment Requirements
- Key Issues and Challenges

The report will be available in a PDF format.
Solar Power in Africa 2020 (December 2019)

Price: Rs 120,000 (USD 2,832)

Project Pipeline, Investment Requirements and Market Opportunities

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SECTION A: SOLAR PROJECTS MARKET OVERVIEW

1. SOLAR PROJECT MARKET ANALYSIS
   - Biggest Solar Projects of 2019 (completed and awarded)
   - Project Analysis (completed projects)
     ● By Country and Region
     ● By Segment (utility-scale, rooftop, microgrids, etc.)
     ● By Year (2015-19)
     ● By Technology
     - Top Players in the Market

2. SOLAR PROJECT COST TRENDS
   - Country-wise Solar Tariffs
     ● Utility-scale
     ● Rooftop
   - Yearly Trends (2015-19)
   - Cost-comparison by Technology

3. EMERGING POLICY AND REGULATORY REGIME
   - Country-wise Policy Analysis
   - Project Allocation Mechanisms
   - Country-wise Regulatory Analysis
   - Financial Incentives

4. CAPACITY OUTLOOK AND PROJECTIONS (2020-24)
   - Future Growth Drivers
   - Mega Projects Under Construction
   - Upcoming and Planned Tenders
   - New Players in the Market
   - Future Solar Project Market Analysis (MW)
     ● By Country and Region
     ● By Segment (utility-scale, rooftop, microgrids, etc.)
     ● By Year
     ● By Technology

5. PROJECT PIPELINE AND MARKET OPPORTUNITIES
   - Overall Project Pipeline
     ● By Country
     ● By Type (utility-scale, Rooftop, etc.)
     ● By Technology (PV, CSP)
     ● By Stage of Implementation (recently awarded/approved/announced)
   - Top 50 Upcoming Projects
   - Market Opportunities
     ● Developers
     ● Contractors
     ● Financers/Long-term Investors
     ● Technology and Equipment Providers
     ● Other Stakeholders
   - Future Outlook

6. INVESTMENT RISKS AND REQUIREMENTS (2020-24)
   - Past Investment Trends
   - Key Investment Risks
   - Future Investment Requirements

SECTION B: COUNTRY PROFILES

This section will have chapters pertaining to the solar power project pipeline, investment requirements and capacity outlook for 25-30 African countries like Algeria, Angola, Botswana, Cameroon, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Guinea, Kenya, Libya, Madagascar, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe. Each country profile chapter will provide information on:

- Solar Power Potential
- Growth of Solar Power Capacity
- Key Growth Drivers
- Evolving Policy and Regulatory Scenario
- Project Allocation Mechanisms (FiT, competitive bidding, government schemes, etc.)
- Key Projects Awarded Recently
- Upcoming Tenders and Projects
- Cost and Tariff Trends
- Key Developers and Plans
- Contractor Landscape
- Risks and Challenges
- Future Capacity Targets and Demand Outlook
- Investment Requirements

The report is available in a PDF format.
1. EXECUTIVE SUMMARY ......................................................

SECTION I: MARKET TRENDS AND DEVELOPMENTS

2. SECTOR SIZE AND GROWTH ...........................................
   - Growth in Transmission Line Length; Growth in Transmission
     Transformer Capacity; Trends in Substation Additions; Growth in
     Interregional Transfer Capacity; Growth in Transmission against
     Generation Capacity; Growth in Total Transfer Capacity; Trends in
     Network Reliability; Ancillary Services Operations; Trends in Sector
     Investments; Key Issues and Challenges

3. RECENT DEVELOPMENTS .................................................
   - Key Commissioned Projects; TBCB Projects Secured in the Past
     Year; Changing Dynamics of the Private Transmission Sector; M&A
     Deals in the Operator; EPC and Supplier Space; Key Loans and
     Financing Deals; Update on Smart Grid Projects; Technology
     Advancements; Grid Integration with neighbouring Countries;
     Telecom Opportunities for Transmission Operators; Status of India’s
     First Offshore Wind and Grid Integration Project; Others (Powergrid’s
     Maharajhatra status, international projects won, etc)

4. POLICY AND REGULATORY INITIATIVES ............................
   - Reconstitution of National Committee on Transmission; Early
     Regulatory Approval to Transmission Schemes; National Open
     Access Registry; CERC Tariff Regulations for 2019-24; EV Charging
     Infrastructure-related Policy Updates; CERC Order on AGC
     Implementation; CERC’s DSM (Fifth Amendment) Regulations;
     CERC’s Power System Development Fund Regulations; CERC’s
     Sharing of Inter-State Transmission Charges and Losses;
     Regulations; CERC’s (Sharing of Revenue Derived from Utilisation of
     Transmission Assets for other Business) Regulations; SAMAST
     Implementation; Others (FRAS, Proposed framework for Real-Time
     Market for Electricity, etc)

5. NETWORK GROWTH AND INVESTMENTS (till 2024-25) .........
   - Growth Drivers; Projected Line Length; Projected Transformer
     Capacity; Projected Substation Additions; Expansion in Interregional
     Transfer Capacity; Investment Projections; TBCB Opportunities;
     Issues and Concerns; Future Outlook

6. PROJECT PIPELINE (till 2024-25) ......................................
   - Overall Pipeline; Interstate Projects; Line Length (by voltage and
     utility); Transformer Capacity (by voltage and utility); Intra-State
     Projects; Line Length (by voltage and utility); Transformer Capacity
     (by voltage and utility)

7. FORECASTED EQUIPMENT DEMAND (till 2024-25) .............
   - New and Emerging Technology Trends; Projected Requirements;
     Conductors; Towers; Transformers; Switchgear; Reactive Power
     Equipment

8. PRIVATE SECTOR EXPERIENCE: PROJECT DEVELOPMENT & FINANCING
   - Private Participation Experience so far; TBCB Update; Status of
     Projects awarded through TBCB (interstate and intrastate); Analysis of
     Recent Bids; Projects Under Bidding; New Projects identified for
     Bidding; Projects Developed under JVs; New and Emerging Players;
     Financing Models for Project Development and Operation; Issues
     and Concerns

9. ANALYSIS OF TRANSMISSION TARIFFS ............................
   - PoC Methodology and Charges; Interstate Transmission Tariffs;
     Intra-state Transmission Tariffs (Long-term & STOA); SLDC Charges

SECTION II: UTILITY PERFORMANCE AND INITIATIVES

10. GROWTH IN NETWORK AND CAPACITY ............................
    - Transmission Line Length; Transformer Capacity; Number of
      Substations

11. OPERATIONAL PERFORMANCE ....................................
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      Substations; Transmission Losses; System Availability

12. FINANCIAL PERFORMANCE ...........................................
    - Trend in Utility-wise Revenues; Trend in Utility-wise Expenditure; Net
      Profits; O&M Costs; Capital Expenditure Trends

13. GRID MODERNISATION INITIATIVES AND PROGRAMMES ...........
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      Infrastructure; Robotics and Aerial Technologies; Others

SECTION III: GRID EXPANSION AND REGIONAL INTEGRATION

14. RENEWABLE ENERGY INTEGRATION AND MANAGEMENT ........
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      Transmission Infrastructure Supporting RE; Green Energy Corridors
      I and II; Transmission Scheme for RE Zones by 2022; REMCs;
      Battery Energy Storage Systems; Issues in Renewables Integration;
      Outlook

15. CROSS-BORDER INTERCONNECTIONS ..............................
    - Overview; Current Transmission Links with Neighbouring Countries;
      Recent Developments; Interconnections under Implementation;
      Planned Transmission Links; Issues and Concerns; The Way
      Forward

16. IR PLANS FOR TRANSMISSION ......................................
    - IR’s mission electrification; Overview of 41k initiative; Planned
      Additions in Transmission Network; Issues and Challenges;
      The Way Forward

SECTION IV: TRANSMISSION UTILITY PROFILES

17. PROFILES OF CTU .....................................................
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      Corporation; Bhakra Beas Management Board

18. PROFILES OF STU .....................................................
    - GETCO; MSETCL; RRVPN; UPPTCL; KPTCL; TANTRANSCO;
      MPPTCL; APTANTRANSCO; TSTransco; HVPNCL; WBSETCL; OPTCL;
      BSPTCL; CSTPTCL; PSTCL; KESBL; AEGCL; JUSNL; JKPD; PTCUL;
      MePTCL; TSECL; DTL; HPPTCL

19. PROFILES OF PRIVATE UTILITIES .................................
    - Sterlite Power Transmission Limited; Adani Transmission Limited;
      Essel Infra projects; Kalpataru Power Transmission; L&T
      Infrastructure Projects; Essar Power Transmission; CLP India;
      Sekura Energy; Others

The report will be available in a PDF format
Power Distribution in India 2020 (February 2020) (Draft ToC)

SECTION I: TRENDS, DEVELOPMENTS, OUTLOOK AND PROJECTIONS

1. SECTOR SIZE AND GROWTH
   - Growth Drivers; Trends in Power Demand and Supply; Growth in Distribution Line Network; Growth in Distribution Transformer Capacity; Substation Additions; Energy Sales Trends; Consumer Growth; AT&C Loss Targets and Achievements; Metering Scenario; System Reliability Indices; Key Issues & Concerns; The Way Forward

2. RECENT POLICY AND REGULATORY DEVELOPMENTS
   - MoP Order on LC Mechanism; APTEL Directive on Delay in Tariff Revisions; Draft Electricity (Amendment) Act, 2018; National Power Discos; Aggregate Power Procurement under Pilot Scheme 2; Aggregate Medium-term Power Procurement Scheme: SCED Pilot Implementation; CERC (Terms and Conditions of Tariff) Regulations, 2019; CERC (Power System Development Fund) Regulations, 2019; Charging Infrastructure for Electric Vehicles - Revised guidelines; RPOS; Others

3. OTHER RECENT DEVELOPMENTS
   - Key Developments under Government Schemes (IPDS, DDUGJY, NSGM); Updates under Smart Metering National Programme; PPA-related Updates; Tariff Hikes; Developments Impacting Discos; Tariff Discos Rankings; Distribution Franchises; Digital Mapping of Feeder Infrastructure for EVs

   - Consumer Base; Energy Sales; Line Length; Transformer Capacity; AT&C Loss; ACS-ARR Gap; Power Purchase Costs; Net Profits; Metering Coverage; System Reliability

5. INTER-DISCO COMPARISON PRIVATE (2014-15 to 2018-19)
   - Consumer Base; Energy Sales; Line Length; Transformer Capacity; AT&C Losses; ACS-ARR Gap; Power Purchase Costs; Net Profits; Metering Coverage; System Reliability

6. FUTURE OUTLOOK FOR NETWORK GROWTH (till 2024-25)
   - Projected Line Length Additions; Projected Substation Additions; Projected Distribution Transformer Capacity Additions; Projected Metering Requirements; Stakeholder Opportunities for Charging Infrastructure for EVs

7. FUTURE OUTLOOK FOR COSTS, TARIFFS AND FINANCES
   - Projected Power Purchase Costs; Tariff Outlook; Outlook on Discos Finances and Losses; Outlook for UDAY

8. UPCOMING POLICIES AND THEIR EXPECTED IMPACT
   - UDAY 2.0; Five-year Vision Plan; Electricity (Amendment) Act; Separation of Content and Cagbage; New Tariff Policy; Private Participation in Distribution; DBT for Subsidies; Others (Distribution Perspective Plan)

9. PROJECTED EQUIPMENT REQUIREMENTS (till 2024-25)
   - Projected Investments in Distribution Network; Growth Drivers; Projected Demand for Equipment

SECTION II: UPDATE ON POLICY PROGRAMMES

10. UJ WAL DISCOM ASSURANCE YO JANA (UDAY)
    - Discos Loss Performance in Last Four Years; AT&C Loss Performance in the Last Four Years; Collection and Billing Efficiency Achievements; ACS-ARR Gap Performance in Last Four Years; Power Purchase Costs; Trend in Tariff Hikes; Smart Meter Deployments; Other UDAY Parameters (feeder metering, U JALA, etc.); Issues and Concerns; The Way Forward

11. INTEGRATED POWER DEVELOPMENT SCHEME (IPDS)
    - Sanctioned and Disbursements; Physical Progress So Far; Digital Transformation under IPDS; Update under RAPDRP & SCADA Projects; Progress of IT enablement under Phase-II; Underground Cabling under IPDS; Smart Meter Installations; New Initiatives and Next Steps

12. DDUGJY
    - Scheme Coverage; Sanctions and Disbursements; Physical Progress So Far; State-wise Progress of Sanctioned Projects

13. NATIONAL SMART GRID MISSION
    - MoP-sanctioned Pilot Projects Experiences; NSGM Targets; Projects Approved under NSGM; Other Initiatives by Discos; Issues and the Way Forward


14. OPERATIONAL PERFORMANCE
    - Billing & Collection Efficiency; AT&C Losses; Outages; SAIFI & SAIDI Indices; DT Failure Rates; Issues & Concerns; The Way Forward

15. FINANCIAL PERFORMANCE
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SECTION IV: COST AND EXPENDITURE ANALYSIS (2014-15 TO 2018-19)

16. EXPENDITURE ANALYSIS
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17. O&M COSTS
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18. CAPITAL EXPENDITURE
    - Trends in Year-wise Capex Trends; Transformer Capacity; Capex Components; Planned Capex and Proposed Break-up; Capex Break-up of Major Discos

19. POWER PURCHASE COSTS
    - Year-wise Trends in Power Purchase Costs (aggregate and per unit); Trends in Utility-wise Power Purchase Costs (aggregate and per unit); Impact of Recent Developments on Power Purchase Costs; Source-wise Power Purchase Costs Trends; Long-term Power Procurement Trends; Short-term Power Trading Trends

20. TARIFF TRENDS
    - State and Utility-wise Trends in Tariffs; Recent Developments Impacting Tariffs; Category-wise Tariff Trends (Agricultural, Domestic, Industrial HT & LT, Commercial); Tariff Revisions; Trends in Cross-subsidy Surcharges

SECTION V: EMERGING TRENDS AND FOCUS AREAS

21. DISTRIBUTION FRANCHISEES
    - Operational/Awarded DFs; Terminated Franchises; Recently Awarded Franchises; Recent Bids; Performance Analysis of Existing Franchisees; Upcoming Opportunities; Issues and Concerns; Outlook; Stakeholder-wise Opportunities

22. SMART METERING INITIATIVES
    - Current Scenario and Progress So Far; Policy Drivers; Central and State Government Initiatives; EELC’s Smart Metering Plans; Recent and Upcoming Smart Metering Tenders; Stakeholder-wise Opportunities; Issues and Concerns; Future Outlook

23. TRENDS IN DISCOM POWER PROCUREMENT
    - Trends in Long-term PPAs in Case I and II; Experience Under Aggregated Power Procurement Scheme; Exchange-based Power; Issues and Concerns; Future Outlook

SECTION VII: DISCOM PROFILES

24. PROFILES OF DISCOMS BY STATE
    - Andhra Pradesh; Assam; Bihar; Chhattisgarh; Delhi; Gujarat; etc.

Each profile would cover the following:
- Area of Operations; Line Length (voltage-wise break up); Number of Transformers; Consumer Growth and Tariff Hikes; Projects Approved under NSGM; Other Initiatives by Discos; Issues and Concerns

25. APPENDIX

The report will be available in a PDF format
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1. EV MARKET SIZE AND OPPORTUNITY
   - Segment-wise Growth in EV Adoption: Two-Wheelers; Three-Wheelers; Commercial Vehicles/Cabs; Private Cars; Buses
   - Market Dynamics: Drivers; Restraints; Opportunities
   - Future Addressable Market

2. CHARGING INFRASTRUCTURE LANDSCAPE
   - Current Status
   - Demand Creation: EESL-led Demand Aggregation; PSU and City Administrators’ led; Private Sector Led; City-led under FAME; Tariff Categories, Standards, Business Models, etc.; Public Private Partnerships/Alliances
   - Supply Side Ecosystem: Manufacturing Capacity; Import Levels; Government Incentives; R&D Investments
   - Key Issues and Challenges

3. KEY EV POLICY INITIATIVES
   - Progress under NEMMP
   - Key Learnings from FAME I
   - Targets and Plans under FAME II
   - State-level Electric Mobility Policies

4. POLICY FRAMEWORK AND ROADMAP FOR EV CHARGING INFRASTRUCTURE
   - Institutional Framework
   - MoP’s Guidelines for EV Charging as a Service
   - Key Features of State Policies: Karnataka; Maharashtra; Delhi; Telangana; Andhra Pradesh; Gujarat; Uttar Pradesh; Etc.
   - City-Level Facilitation: Smart Cities; AMRUT; Light House
   - Policy Outlook

4. REGULATORY REGIME
   - Charging Station Guidelines
   - Fiscal and Non-fiscal Incentives
   - Licensing Norms
   - Evolving Tax Regime
   - Emerging Standards and Practices

5. EMERGING TARIFF TRENDS, COSTS AND RETURNS
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   - Viability Assessment: With Subsidy; Without Subsidy
   - Competitive Fuel Analysis
   - Return Assessment

6. IMPACT ON THE POWER GRID
   - Demand Side Impact
   - Revenue Side Impact
   - Impact on Voltage Profile
   - Discom’s Approach
   - Future Outlook

7. PROJECTIONS AND OUTLOOK (2020-25)
   - Power Demand Forecast
   - Battery Demand Forecast: By Technology
   - Charging Station Demand Forecast: By Charging Type
   - Direct Charging
   - Fast Charging
   - Ultra Fast Charging
   - Battery Swapping: By Use
   - Captive

8. TECHNOLOGY TRENDS
   - By Type: Ultra Fast Charging; Battery Swapping; Range Extension Systems; Wireless Charging; Renewable Energy Charging
   - By Output: AC/ DC
   - By Power Rating: 1/ 2/ 3
   - By Charging Speed: Slow/ Fast/ Ultra-fast
   - By Connector Type: CCS, GB/T, CHAdeMO

9. BATTERY RECYCLING
   - Cost of Battery Recycling
   - Government Efforts
   - Private sector Initiatives
   - Projected Recycling Market by 2025

SECTION II: VALUE CHAIN, BUSINESS MODELS AND PLAYER PROFILES

10. KEY STAKEHOLDERS: RECENT DEVELOPMENTS AND THEIR PLANS
    - Government and Regulators
    - Battery Suppliers
    - Auto OEMs
    - Power Utilities
    - Charging Infrastructure Developers
    - Oil and Gas Companies
    - Real Estate Firms
    - Financiers
    - Consumers

11. OWNERSHIP STRUCTURES AND ASSOCIATED RISKS / EMERGING BUSINESS MODELS
    (This will have detailed information on city-level pilots and project case studies)
    - ULB Operated
    - PPP-led
    - Managed by Discoms and Power Generators
    - Facilitated by Public Transport Corporations/ Aggregators
    - Set up by Automakers and Battery Manufacturers

12. KEY CHARGING STATION OPERATORS AND DEVELOPERS
    (This will have over 10 profiles including their details pertaining to city-wise operations, fleet count, the number and size of charging stations, key partnerships, investments, operational experience, key challenges, future plans, etc.)
    - Ather
    - BESCOM
    - BSES
    - EESL
    - Fortum
    - Hyderabad Metro Rail Limited
    - Lithium Urban
    - Mahindra Reva Electric
    - NTPC
    - OLA
    - SmartE
    - Tata Power
    - Etc.

The report will be available in a PDF format.
EXECUTIVE SUMMARY

1. POWER SECTOR MARKET OVERVIEW
   - Power Demand and Supply Trends
   - Fuel-wise Power Generation
   - Retail Power Market Structure
     • HT Industrial Segment
     • LT Industrial Segment
     • Commercial Segment
     • Residential Segment
     • Agricultural Segment
   - Key Recent Developments
   - Overall Power Tariff Trends
   - Trends in National Average Power Purchase Cost
   - Issues and Challenges

SECTION I: HT INDUSTRIAL CONSUMERS MARKET

2. MARKET OVERVIEW
   - Historical Trends
     • Sale of Power to HT Consumers
     • Share of HT Consumers in Total Power Sales
   - Outlook and Projections

3. TARIFF TRENDS
   - All-India Average HT Industrial Tariff Revisions
   - State- and Utility-wise Trends in Average Rate of Sale of Power
   - HT Tariffs as a Percentage of Average Cost of Supply
   - Year-on-year Changes in Tariffs
   - Trends in Cross Subsidy Surcharges for HT Industrial Consumers
   - Trends in Short-term Retail Power Trading

SECTION II: LT INDUSTRIAL CONSUMERS MARKET

4. MARKET OVERVIEW
   - Historical Trends
     • Sale of Power to LT Consumers
     • Share of LT Consumers in Total Power Sales
   - Outlook and Projections

5. TARIFF TRENDS
   - All-India Average LT Industrial Tariff Revisions
   - State- and Utility-wise Trends in Average Rate of Sale of Power
   - Year-on-year Changes in Tariffs

SECTION III: COMMERCIAL CONSUMERS MARKET

6. MARKET OVERVIEW
   - Historical Trends
     • Sale of Power to Commercial Consumers
     • Share of Commercial Consumers in Total Power Sales
   - Outlook and Projections

7. TARIFF TRENDS
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   - State- and Utility-wise Trends in Average Rate of Sale of Power
   - Year-on-year Changes in Tariffs

SECTION IV: RESIDENTIAL CONSUMERS MARKET

8. MARKET OVERVIEW
   - Historical Trends
     • Sale of Power to Residential Consumers
     • Share of Residential Consumers in Total Power Sales
   - Outlook and Projections

9. TARIFF TRENDS
   - All-India Average Residential Tariff Revisions
   - State- and Utility-wise Trends in Average Rate of Sale of Power
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The report is available in a PDF format.

Analyses by Consumers: HT/LT Industrial, Commercial, Residential and Agriculture; Analysis by State and Time Period

Electricity Tariff Trends in India (December 2019)
No. of slides: 126   Price: Rs 55,000 (USD 1,298)

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The report is available in a PDF format.

No. of slides: 193
# Captive Power in India 2019

Trends, Economics, Options & Outlook + A comprehensive database of 2,800 Captive Power Plants

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The report is available in a PDF format.
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## Key Trends, Regulatory Landscape and Demand Projections for Open Access-based & Captive Projects

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    - SunSource Energy
    - ReNew Power
    - Tata Power Solar

The report is available in a PDF format.
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1. **MARKET OVERVIEW, KEY TRENDS AND RECENT DEVELOPMENTS**
   - There is a rising popularity among developers, especially renewable energy players, to go for third-party direct sale agreements. States of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana in the southern region of India and Rajasthan, Punjab and Haryana in the northern region of the country are fast catching up with open access transactions. But there are significant challenges in the growth of this segment, especially those pertaining to discoms’ resistance to let go of their high-end consumers.

2. **IMPACT OF AMENDMENTS IN ELECTRICITY ACT, 2003**
   - Amendments Pertaining to Open Access for Renewables
   - Likely Impact on Growth of Open Access-based Power Projects
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3. **EXISTING OPEN ACCESS POLICY AND REGULATORY SCENARIO**
   - The policy and regulatory framework in this space is currently highly dispersed and varied across states, and is not even stable over the years. There is always a risk of open access charges changing year on year, making it a risky proposition to invest in.
   - Overview of Open Access Charges and Losses: For Solar Projects, For Wind Projects
   - Model Regulations for Intra-state Open Access and Group Captive
   - State-wise Orders of Open Access/Group Captive
   - State-wise Implementation Status Overview
   - State-wise Power Demand and Supply Overview
   - RPO Trajectory for Open Access Consumers
   - Key Issues and Challenges

4. **INDUSTRY STRUCTURE AND BUSINESS MODELS**
   - The industry structure in the renewable open access segment has been emerging gradually with more number of players entering into this space. Project developers and investors are currently cautious of investing significantly in this segment, but the trend is now changing.
   - Power sale options: Bilateral, Collective, REC
   - Industry Structure
   - Key Players and Capacities: Solar Segment, Wind Segment
   - Risks and Concerns

5. **TERMS OF THIRD-PARTY POWER SALE CONTRACTS**
   - It is important for both the buyers and sellers to clarify and list out their expectations and accordingly draw up the commercial power sale contract as per the applicable regulatory framework in the respective state.
   - Time Period
   - Extension Provision
   - Tariff and Escalations

6. **ROLE OF ENERGY BANKING, F&S AND DEVIATION SETTLEMENT MECHANISM**
   - Energy banking will play a key role in the success of solar and wind power-based open access projects. Banking is presently allowed by SERCs upon the levy of a banking charge, which differs in magnitude across states.
   - Rules around energy banking are specified in different types of documents in various states. Additionally, various attributes of the energy banking framework also differ across states.
   - State-wise Energy Banking Mechanism for Open Access Projects:
     - Banking Charge, Banking Period, Buy-back Rate, Restrictions on Time of Injection, Withdrawal of the Banked Energy, Other Attributes (seasonality constraints, buy-back rates, accounting for RPO, etc.)
     - State-wise Emerging Energy Banking Framework
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7. **STATE PROFILES**
   - This chapter will include profiles of Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Telangana, Uttar Pradesh, Chhattisgarh, Haryana, Delhi, Punjab, etc.
     - Open Access Charges and Exemptions for Solar and Wind Power:
     - Key Players and Capacities: Overall Solar, Solar Open Access, Overall Wind, Wind Open Access
     - Landed Cost and Return Analysis
     - Process and Approvals for Open Access Projects
     - Key Industrial and Corporate Clusters: Existing, Upcoming

8. **PROJECTED OPEN ACCESS MARKET**
   - Over 2 GW of green power is being sold to big corporates through direct agreements and the trend is northbound as more and more corporates and industries are joining in the race. The business case for renewable energy based open access is getting stronger with the decreasing cost of green power and increasing cost of thermal power.
     - Short-term (2019-23) and Long-term (2024-28) Projections
     - Renewable-based Open Access Capacity Projections
     - Open Access Projected Tariff and Pricing Trends
     - IRR Projections
     - Future Growth Drivers
     - Expected Market Restraints

EXPERT OPINION

The report will feature 5-8 interviews of senior representatives at regulatory commissions, large open access consumers and key open access project developers, and experienced industry consultants.

The report is available in a PDF format.
EXECUTIVE SUMMARY
With the growing demand for power in urban areas and industries, underground cable systems are becoming an increasingly indispensable part of power transmission and distribution systems. With improved technologies and increased reliability, the cost differential between underground cables and overhead power lines is narrowing and utilities are acknowledging the benefits associated with underground cabling. This report will attempt to take a look at the key trends in the deployment of underground cables so far; analyse the plans and proposal of T&D utilities; examine new and evolving technology improvements and solutions being offered by the industry; as well as assess the key issues and challenges.

1. T&D INDUSTRY OVERVIEW
The T&D industry has been growing steadily with investments being made in system strengthening and capacity additions. This chapter gives an overview of the T&D industry and will focus on:
- Growth and Size of Existing T&D Networks
- Recent T&D Network Additions
- Projected T&D Network Additions
- Projected Capex (till 2022-23)
- Future Outlook
- Issues and Challenges

2. MARKET SIZE AND GROWTH FOR UNDERGROUND CABLES
Most of India’s T&D network continues to be strung overhead across the country; however, concerns about reliability and quality of supply are making utilities gradually replace their networks with underground lines. This chapter gives an overview on the new and emerging utility requirements in the underground cabling segment and will cover the following:
- Experience so far in T&D Networks
- Emerging Utility Requirements
  - Transmission
  - Distribution
- Major Projects Commissioned
- Transmission
- Distribution
- Major Projects Awarded/Under Construction
- Transmission
- Distribution
- Key Recent Tenders
- Issues and Challenges

3. RECENT TRENDS AND ADVANCES
Well-designed and well-installed underground cable systems are expected to have a service life of 30-40 years. Utility providers, transmission companies and cable manufacturers are hence, looking for new technologies and solutions to respond to new grid challenges. This chapter looks at the new and promising technologies, designs and solutions for underground cable networks.
- Design, Laying and Construction Processes
- Product and Technology Trends
- Market Trends and Developments (JVs/Acquisitions/Partnership Deals)
- Pricing and Cost Trends

4. OPPORTUNITIES UNDER KEY CENTRAL/STATE GOVERNMENT PROGRAMMES
Underground cables are an important part of several central government initiatives for improving T&D networks under IPDS. This chapter provides the details of plans and targets of works proposed to be taken up under various schemes.
- Snapshot of Key Government Programmes (IPDS, Green Energy Corridors, State Government Initiatives, etc.)
- Physical Targets for UG Cabling Works
- Funding Availability for UG Cabling Projects
- Issues and Concerns

5. OPPORTUNITIES UNDER SMART CITIES MISSION
The Smart Cities Mission offers significant opportunities for underground cabling in key cities. Some cities such as Indore, Belagavi, Dharamshala, Lucknow, Kanpur and Tirupati are implementing projects for setting up underground cabling network for utilities such as electric wires, water pipelines, stormwater drains, sewers and telecommunication cables. This chapter provides the details of plans and targets of works proposed to be taken up under various schemes.
- Snapshot of the Mission
- Physical Targets for UG Cabling Works
- Projects Completed so Far in Key Cities
- Projects Under Construction/ Awarded
- Proposed Projects
- Issues and concerns

6. OUTLOOK AND PROJECTIONS (till 2022)
This chapter will give a snapshot of the investments and physical targets proposed for underground cabling networks by transcos and discoms. The information presented in this chapter is based on both primary and secondary information collected from transcos and discoms.
- Growth Drivers for UG Cabling
- Expected Demand for UG Cables
- Plans and Targets of Utilities by Segment
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  - Distribution
- Budgeted Capital Expenditures on UG Cabling
- Future Outlook

7. LEADING PLAYERS
This chapter primarily focuses on the profiles of key vendors and technology providers for underground cabling. Each profile covers the following information:
- Brief Company Overview
- Key Product Offerings
- Existing Manufacturing Capacity
- Financial Performance
- Future Plans

The report is available in a PDF format.
ENERGY

Future of Solar O&M in India (September 2018)
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 be 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 is available in a PDF format.

Price: Rs 60,000 (USD 1,416)

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This section has 30 chapters pertaining to the renewable energy scenario and outlook for 30 African countries. These includes Algeria, Angola, Botswana, Cambodia, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Guinea, Kenya, Libya, Madagascar, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

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.)
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The franchises covered include:
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The report is available in a PDF format.

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12. CASE STUDIES  
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    - Each profile will provide an overview of the airport, key stakeholders involved, ownership structure, traffic trends, financial performance, user charges, current capacity, expansion plans, key initiatives, recent contracts, etc.

18. OTHER UPCOMING/UNDER CONSTRUCTION AIRPORTS
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    - Each profile will provide an overview of the airport, traffic projections, ownership structure, expected capacity, future timelines, recent contracts, expansion, etc.

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    - Monorail Projects: Chennai Monorail Project (First Corridor); Delhi Monorail Project; etc.
    - Others

Each profile will cover the project scope (network length, alignment details, number of stations, rolling stock, fare system, signalling and telecommunications, traction, etc.), ownership details, implementing agency, cost estimates, key consultants, key contractors, key milestones, funding pattern, expected ridership, recent contracts, upcoming tenders, current status, etc.

The report will be available in a PDF format.
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The dataset covers the following:
- M attents of Key Upcoming Projects; Zone-wise Expenditure in 2019-20; Track Electrification; Distribution Works; Electrification; Dedicated Freight Corridor (DFC) Projects; High Speed Rail (HSR) Projects; Suburban Rail Projects; Rapid Regional Transit Systems; Station Redevelopment Projects; Rail Tunnel Projects; Key PPP Projects

Each profile will cover traffic, capacity, capacity utilisation, existing berthing facilities, planned capacity addition and upcoming projects.
Road Development in India 2020  
(January 2020)  
Price: Rs 110,000 (USD 2,596)  
Research report with weekly newsletters and monthly updates  

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    - Each profile will cover traffic, capacity, capacity utilisation, efficiency and financial performance trends for the past five years; existing berthing facilities; planned capacity addition and upcoming projects

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    - Each profile will cover traffic, capacity, capacity utilisation, existing berthing facilities, planned capacity addition and upcoming projects

The report is available in a PDF format.

Price: Rs 110,000 (USD 2,596)
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Each profile will cover information on throughput, current capacity & capacity utilisation, key facilities, draught levels, dwell time, equipment availability and planned expansion.

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Each profile will cover information on company operations, existing infrastructure, network covered, financial performance, future plans, etc.

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![The report is available in a PDF format.](image-url)
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The report is available in a PDF format.
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The report will be available in a PDF format.
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The report will be available in a PDF format.
Water Market in India 2019

Municipal, Industrial, Desalination & Wastewater Treatment/Reuse

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Each project will provide information on:
- Scope; Project Cost; Current Status; Segment (Municipal or Industrial); Mode of Implementation (PPP or EPC); Contractor/Developer; Equipment Supplier (wherever available); Funding Sources (wherever available); Expected Capacity Addition; Expected Completion Date

The report is available in a PDF format.

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The report is available in a PDF format.
# Affordable Housing in India 2019 (September 2019)

## Progress so Far, Recent Developments, New Projects and Future Outlook

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The report is available in a PDF format.
Municipal Solid Waste in India 2019

Key Takeaways and The Road Ahead

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The report is available in a PDF format.
Executive Summary

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   - 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; issues and challenges and key learnings.

8. Experience with Non-Mission Cities
   - Greater Mumbai; Amravati; Delhi (Non-NDMC area); Cuttack; Myssuru; Others
   - 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; issues and challenges and key learnings.

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The report also provides a comprehensive Excel-based database of ongoing and upcoming projects across the water supply, sewerage, waste, energy, mobility, roads, flyovers, safety and security, e-governance, health-care, capacity building and city gas distribution segments.

Each project provides information on: Scope; Current Status; Mode of Implementation; Implementing agency; Project Cost; Type of Project (Area-based or Pan-City); Contractor/Developer; Expected Date of Completion, etc.

The report is available in a PDF format.
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The report is available in a PDF format.
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**OPINION AND INSIGHTS**

- Niraj Didwania, Head, Corporate Development and Investor Relations, Healthcare Global Enterprises
- Nitin Nag, Regional Director (South), Cloudnine Group of Hospitals
- Dr. Nilkanth Gandhi, Senior Manager, Business Advisory Services, EY
- Dr. Kirit Chadha, Senior Vice President - GRL Operations and Medical Affairs, Metropolis Healthcare
- Dr. Manjiri Bakre, CEO and Founder, OncoStem Diagnostics
- Nitin Siyodla, Founder and CEO, Sohum Innovation Lab
- Arun Agarwal, Founder, Jaaniti Innovations

The report is available in a PDF format.
# Investment and Market Opportunities in African Infrastructure

(October 2018)

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Each of the sectors covers:
- Size and Growth, Emerging Trends and Recent Developments, Proposed Investments, Upcoming Projects, Market Opportunities, Issues and Challenges, Future Outlook

The report is available in a PDF format.

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Irrigation Market in India (August 2019)

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The report is available in a PDF format.
# Investment and Market Opportunities in Southeast Asian Infrastructure

(August 2019)  No. of slides: 704

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Each country profile covers the economic scenario, sector-wise global competitiveness rankings, current state of infrastructure, sector-wise size and growth, snapshot of project pipeline and trends in budgetary allocations.

The report is available in a PDF format.
EXECUTIVE SUMMARY

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3. DEFENCE MANUFACTURING LANDSCAPE
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4. POTENTIAL FOR PRIVATE SECTOR PARTICIPATION
   - Experience So Far; Major Developments; Key Players; SP Policy; Impact of the Strategic Partnership Policy; Key Completed/In Process of Delivery Projects; Focus on JV; and Collaborations; Tax Environment; State-level Incentives; Recently Awarded Contracts; Emerging Areas of Private Participation; Upcoming Opportunities; Issues and Challenges; The Way Forward

5. SECTOR OUTLOOK AND MARKET OPPORTUNITIES
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SECTION II: DEFENCE OFFSETS: PROGRESS AND OPPORTUNITIES

6. DEFENCE OFFSETS MARKET
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7. FUTURE POTENTIAL AND OUTLOOK
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   - Shipbuilding: Existing Fleet Size; Trends in Expenditure; Key Players; Key Opportunities; Market Opportunities; Segment Outlook

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9. PROFILES OF DEFENCE PUBLIC SECTOR UNDERTAKINGS (DPSUS)
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10. PROFILES OF PRIVATE PLAYERS
    - Airbus Group India; Ashok Leyland Defence Systems; Bharat Forge Limited; BAE Systems India; Boeing India; Larsen and Toubro (L&T); Dassault Aviation; Tata Group; Reliance Defence Limited; Punj Lloyd Industries Limited; Mahindra Defence Systems; Adani Defence & Aerospace; Other Players (Domestic and Foreign)

Each profile gives an overview of the company's operations, key contracts, recent collaborations, joint ventures, and future plans and strategies.
Banking Technology in India (September 2018)

Current Status and Emerging Trends

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- Key Issues and Challenges
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