INFRASTRUCTURE
in India

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AIRPORTS

Overview

- Air travel penetration is 2% of USA
- Airport standards well below global benchmarks
- Passenger traffic growth
  - 2013 6%, 2012 -1.8%, 2010 19%
- 53% of passenger traffic handled by Delhi, Mumbai, Chennai and Hyderabad
- Planned investment upto 2017 – USD 12 bn
- Planned private sector contribution – 9.3 bn
- PPP projects since 2004
- AAI controls/manages public sector airports

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AIRPORTS

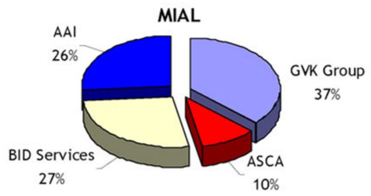
Private Airports (PPP)

- Delhi International Airport (DIAL): Brownfield, USD 1,2 bn.
- Mumbai International Airport (MIAL): Brownfield, USD 1,3 bn.
- Bangalore International Airport (BIAL): Greenfield, USD 440 mn.
- Hyderabad International Airport (HIAL): Greenfield, USD 400 mn.
- Durgapur (BAPL) : Greenfield USD 98 mn
- Cochin International Airport (1999)
- Nagpur International Airport (MIPL)

AIRPORTS

Mumbai International Airport (MAIL)

- PPP (Public Private Partnership) Brownfield-Project
- Concession period 30 years
- Total investment USD 1,3 bn



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Proposed Projects

- 200 low-cost airports to connect Tier II/III towns
- Dholera Airport Project in Ahmedabad
- Greenfield Airports
  - Navi Mumbai (Mah.) USD 2.4 bn
  - Mopa (Goa) USD 500 mn
  - Kannaur (Kerala) USD 300 mn
  - Shirdi (Mah.) USD 50 mn
  - Kushinagar (U.P.) USD 59 mn
  - Taj International (U.P.)
- Managing and developing of Chennai, Kolkata, Ahmedabad and Jaipur airports

AIRPORTS

Opportunities

Equipments and technologies
- Air Traffic Control (ATC)
- Simulators
- Airport safety & security
- Fueling, lighting systems

Services
- Consultancy for air-transport services
- IT Applications
- City-side development

ROAD HIGHWAYS

- 3,3 million km road network
  - only 2% of the roads are highways
- Poor quality of roads leads to inefficiencies
- roads carry 80% of the passengers and 65% of goods
- Planned investment upto 2017 – USD 150 bn
- Planned private sector contribution – 32%
- National Highway Development Project (NHDP)
- Large highway projects as Public Private Partnership (PPP) till 2012
- Major hurdles – land acquisitions, clearances and funding
- Increasing mechanisation

ROAD HIGHWAYS

Road Development

- National Highway Development Project
  - Total 50,600 km - 14,000 km to be awarded
  - subdued project awards since 2013
- SARDP-NE
  (Special Accelerated Road Development Programme- North East)
  - Total 10,140 km - 3,924 km has been awarded
- Rural Connectivity
  PMGSY - Pradhan Mantri Gram Sadak Yojana
- State Highway Projects

ROAD HIGHWAYS

Upcoming Large State Projects

- Agra Lucknow Expressway - 302 km, USD 2.5 bn
- Bandra-Versova Sea Link, Mumbai - 10.1 km, USD 660 mn
- Biju Expressway, Odisha - 656 km, USD 530 mn
- Bawana-Yamunanagar Expressway - 200 km, USD 167 mn
- Coastal Road Nariman Pt.-Kandivli, Mumbai (PPP) - USD 1,410 mn
- North-South Road Corridor, West Bengal - 230 km, USD 730 mn
- Ahmedabad-Dholera-Bhavnagar Project - 116 km, USD 450 mn

ROAD HIGHWAYS

Opportunities

Material
- Construction chemicals, additives
- Solutions for water-proofing

Machines and equipments
- Modern Construction Machinery
- Toll systems
- Security and control systems (GPS Systems)

Services
- Project-planning and management
- Tunneling
- IT Solutions for the construction industry

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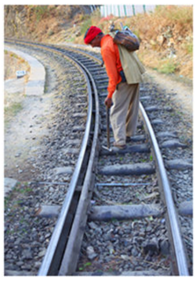
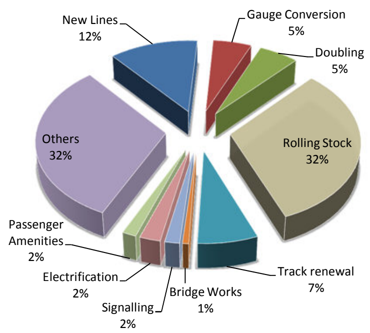
RAILWAYS

- Network spread 109,221 km
  - Track coverage 35km per 1,000 sq.km. (Global 100 km)
  - Average speed – 25km per hour
  - Popular routes running at over 100% capacity
- Freight accounts for over 70% of revenues
- Passenger segment making losses
- Modernisation & Upgradation
- Investment requirement till 2032 – USD 560 bn
- PPP to be the growth route
  - share in 2007-2012 - 4%
- important players
  - Railway Board - Ministry of Railways
  - RDSO
  - COFMOW



RAILWAYS

Total investments USD 8,81 bn.
Segment-wise investments 2013-14



RAILWAYS

Key Areas with 100% FDI allowed

- Projects related to High-speed trains
- Procurement of rolling stock
- Tech solutions for level crossings
- Electrification of railways
- Dedicated freight lines on JV/PPP models
- Construction of new signalling systems
- Suburban corridor projects through PPP

- Revamp of PPP model announced

RAILWAYS

Major large planned projects

- Dedicated Freight Corridor Project
  - USD 16 bn project
  - Western Corridor - 1.483 km
  - Eastern Corridor - 1.839 km
  - projected completion 2019
  - 4 more corridors (Kolkata - Chennai, Delhi - Chennai, Kolkata - Mumbai and Chennai -
- Mumbai-Ahmedabad High speed rail corridor USD 8,8 bn
- Nine corridors to run semi-high speed trains (160-200 kmph)
- Locomotive Factories (PPP) USD 400 mn
  - Electric Locomotive factory at Madhepura (Bihar)
  - Diesel Locomotive Factory at Marhowra
- Rail Coach manufacturing unit at Kolar (Ktk) USD 240 mn

RAILWAYS

International Presence

- Siemens
- Bombardier
- ABB
- Alstom Transport
- Areva
- Alcoa
- Nencki AG
- Nortel
- EMD Locomotives
- Sperry Rail
- Ansaldo
- Faiveley
- Thales
- Unipart Rail
- VAE
- Plasser
- Frauscher
- Getzner
- Kapsch
- Geoconsult
- Schuhfried
- IGM Roboter

RAILWAYS

Opportunities

- High Speed Rail Technology
- Rails, points & crossings
- Optical fibre telecommunication system
- Earthquake-proof technologies
- Non-destructive bridge testing
- Railways safety systems
- Rail traffic control system
- Tunneling
- Lifts & escalators
- Station redevelopment expertise

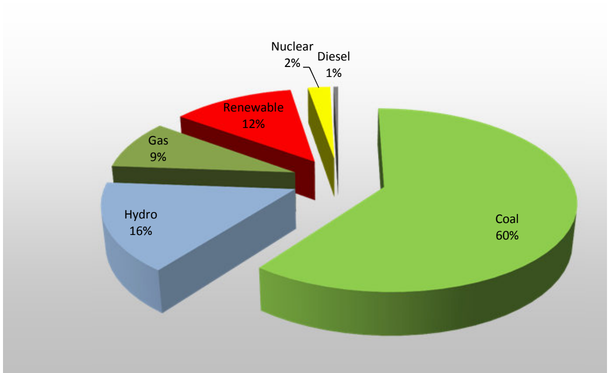
ENERGY & ALTERNATIVE ENERGY

Overview

- India ranks 5th in Electricity production
- Power Supply Shortage 5,1%
- Transmission & Distribution losses 23% (average)
- Per capita consumption less than 917 kWh
- Proposed investment till 2017 – USD 224 bn
- Private sector installed capacity – 36%
- Indian nuclear market estimated at about USD 100 bn
- Solar Mission plans addition of 1.00.000 MW by 2022

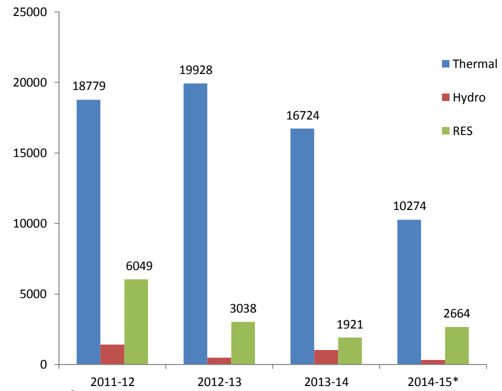
ENERGY & ALTERNATIVE ENERGY

Energy sources - Installed capacity 259 GW



ENERGY & ALTERNATIVE ENERGY

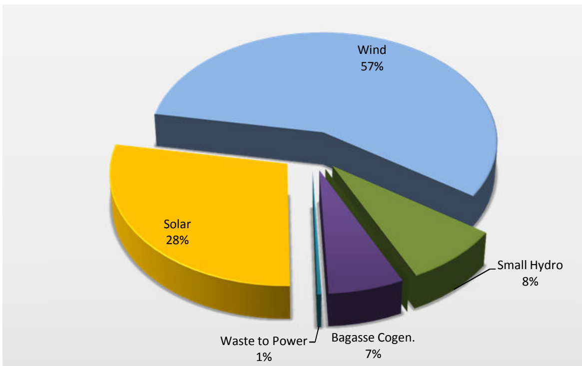
Capacity Additions



ENERGY & ALTERNATIVE ENERGY

Renewable Energy sources

Capacity addition in 2014 – 2,664 MW



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ENERGY & ALTERNATIVE ENERGY

Renewable energy - potential & capacity

Energy sources	Potential	Installed capacity
Bio Mass (Agro residues)	16.881 MW	**4.025 MW**
Wind power	48.561 MW	**22.644 MW**
Small Hydro	15.000 MW	**4.025 MW**
Co-generation Bagasse	5.000 MW	**2.818 MW**
Waste to energy	2.700 MW	**107 MW**
Solar power		**3.383 MW**

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ENERGY & ALTERNATIVE ENERGY

Solar - some planned large projects

- Public Sector
  - Coal India - 1 GW
  - BHEL - 500 MW
  - BHEL consortium UMSPP - 4 GW (Sambhar)
  - NTPC - 3 GW
  - SECI - 1 GW (Mahboobnagar)
- Private Sector
  - SunEdison - 5 GW (Rajasthan)

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ENERGY & ALTERNATIVE ENERGY

Alternative energy - opportunities

- Biomass power generation plants
- Biogas plants
- Photo-voltaic technologies
- Concentrated Solar Power (CSP) systems
- Geo-Solar heat pumps
- Motor-regulators for wind-energy plants
- Geothermal energy technologies
- Energy efficiency technologies

CONSTRUCTION

Overview

- Construction contributes about 7.4% to the GDP
- employs over 40 mn (skilled and unskilled)
- Infrastructure accounts for 54% share in the construction
- Construction component in infra projects
  - Roads 65%
  - Power - Thermal 40%
  - Power - Hydro 65%
  - Railways 78%
- Construction Equipment market growing at 15-20% (YoY)

CONSTRUCTION (RESIDENTIAL, COMMERCIAL)

- Growth till 2008 – 35% p.a.
- Low mechanisation

Residential
- 75% of the market is residential
- shortage of 26 mn. houses (2012)
  - 2/3rd of the demand is for budget housing
- Properties under construction – USD 230 bn
  - Half of it luxury apartments

Commercial
- IT/ ITES and BFSI driving the demand
- Retail: Malls and stores

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CONSTRUCTION (RESIDENTIAL, COMMERCIAL)

Opportunities

Equipment and Materials
- Newer construction technologies (Pre-fabricated; system formwork)
- Modern construction material – additives and special mixtures
- Automatic, Multilevel parking systems
- Security systems and devices
- Quality lighting

Services
- Green-building technologies
- Shop design

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INFRASTRUCTURE

Challenges

- Land acquisition
- Delay in clearances
- Lack of funds
- Rising interest rates
- Sector specific issues (fuel shortages)

- Inadequate planning while taking contracts
- Insufficient skilled manpower

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