Wartsila Operations & Opportunities in India

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MD, Wartsila India
9Nov, 2011
Mumbai
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1. India macro economics & linkage to Wartsila business
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3. Wartsila opportunities
India Macro Economics & Linkage to Wartsila Business
80% of India is yet to be built

Integration & Execution

Technology
Growth
Deficit
Globalization
Rising Political will
Reforms / UID
Billion+ People
With 35% saving rate

Rising Aspirations
Urbanization
Sustainability
The Game Changers in Current Decade

The 1st Game Changer – Savings Rate

- Consistent Saving Rate of 33 - 35% of GDP witnesses quantum changes in physical infrastructure
- With inclusion of Foreign Investment … 38% of GDP
- Changes in this decade will be transformational

The 2nd Game Changer – Productivity Gains

- Incremental capital output ratio (ICOR) in India is 4.1 – with average investment rate of 38%, GDP Growth of 9% is feasible
- With ICOR improving to 3.5 – growth rate would increase to 10%
- Private Sector has increased their investment from 38% to 60% in the last 8 years & PPP model getting popular
- Government taking efficiency enhancing measures, eg. UID, e-governance, etc.
The 3\textsuperscript{rd} Game Changer – \textbf{Increased Spending by Government}

- GST to bring in additional income in the Government kitty
- Economic activity to boost spending of additional USD 800bn

The 4\textsuperscript{th} Game Changer – \textbf{Evolution of Consumer Demographics}

Current estimates . . . Urbanization moving from 29\% to 39\%

Today:
- “Have Alls” of 5m households earn USD50,000p.a.
- “Have Lots” of 22m households earn USD 18,000p.a.

10 years hence:
- “Have Alls” of 12m households earn USD80,000p.a.
- “Have Lots” of 44m households earn USD 36,000p.a.
- Strength of Consumption wave and risks on balance will remain on the upside
India: A Large Economy

India is the fourth largest economy in terms of Purchasing Power Parity.

Source: CII/World Bank
India’s GDP has increased rapidly over the past 15 years from $250 billion to over US$ 1.3 trillion currently.

Source: CII/National Accounts
Strong Growth in the Last Few Years

GDP Growth (%)

- 7.5% (2004-05)
- 9.5% (2005-06)
- 9.7% (2006-07)
- 9.2% (2007-08)
- 6.8% (2008-09)
- 8.0% (2009-10)
- 8.5% (2010-11)
GDP Composition is Undergoing Change

GDP Composition: 1990-91 versus 2010-11

Source: CII/National Accounts

10 November 2011

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Domestic Savings Fuelling Investments

Recent decline in savings to GDP ratio has been due to lower savings by the public sector on account of the fiscal stimulus.

India’s dependence on foreign savings for financing domestic investments is limited.

Source: CII/National Accounts
Growing middle class

Number of Households (In million)

<table>
<thead>
<tr>
<th>Year</th>
<th>The Poor</th>
<th>Middle Class</th>
<th>The Rich</th>
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<tr>
<td></td>
<td>&lt; 200,000</td>
<td>200,000 – 1,000,000</td>
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<td>1995</td>
<td>160.1</td>
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<tr>
<td>2025</td>
<td>143.0</td>
<td>128.0</td>
<td>9.5</td>
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</table>

Favourable Demographics

India’s Biggest Advantage: One of the youngest populations in the world
Percentage of population aged 65 and older

Wage index is based on labour cost data (collected by UBS) for 14 widespread professions in major agglomerations. Index values are weighted by the share of each occupation in overall employment. India has a significant advantage in terms of labour cost.

<table>
<thead>
<tr>
<th>Country</th>
<th>Index, Hourly wage Cost(South Korea=100)</th>
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<tbody>
<tr>
<td>South Korea</td>
<td>100</td>
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<tr>
<td>Singapore</td>
<td>80.4</td>
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<td>Thailand</td>
<td>20.2</td>
</tr>
<tr>
<td>India</td>
<td>18.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>14</td>
</tr>
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</table>

* Ranks in ()

Source: www.global-production.org
The Domestic Market is Growing

- Higher disposable income, easy availability of credit and high exposure to media and brands has increased the average propensity to consume.

- India has a mobile subscriber base of over 800 million and is currently adding around 8-10 million subscribers every month; about 50% penetration is expected by 2012.

- Automobile production now exceeds 15 million units per annum including passenger vehicles, commercial vehicles, two- and three-wheelers.

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Source: CII

10 November 2011
Inflation has been High

- Inflation continues to show an upward trend and stands at 9.7% for September 2011, slightly lower than August 2011.

- Food inflation though moderated a bit yet a cause of concern. Supply side bottlenecks are responsible for still high level of food inflation.

- RBI has been tightening monetary policy in order to prevent inflationary expectations from hardening.

Source: CII
Tightening Monetary policy

Change in Policy Rates of RBI

<table>
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<th>Effective Dates</th>
<th>Repo rate</th>
<th>Reverse Repo rate</th>
<th>CRR</th>
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<td>4-Mar-09</td>
<td>5.00</td>
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<td>21-Apr-09</td>
<td>4.75</td>
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<td>29-Jan-10</td>
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<td>16-Sep-10</td>
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<td>6.00</td>
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<td>17-Mar-11</td>
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<td>3-May-11</td>
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<td>6.50</td>
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<tr>
<td>16-Sep-11</td>
<td>8.25</td>
<td>7.25</td>
<td>6.00</td>
</tr>
<tr>
<td>25-Oct-11</td>
<td>8.50</td>
<td>7.50</td>
<td>6.00</td>
</tr>
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</table>

- RBI has increased its reserve repo rate and the repo rate several times since March 2010, in order to tame unsustainably high inflation.
- Banks were not affected by the crisis as they are adequately capitalized and do not have any exposure to US mortgage related assets.
- Banks have so far been able to protect their margins by raising interest rates on both deposits and loans. But the broader slowdown in the economy may have an impact on banks’ profitability.
Fiscal Deficit for 2010-11 stood at 5.1%, lower than the Budget 2010 estimate of 5.5%.

Budget 2011 has projected a decline in the deficit to 4.6% of GDP in 2011-12.

Fiscal Deficit to be progressively reduced to 3.5% by 2013-14.

However, subsidies on account of high fuel prices may cause a problem.

Source: CII
Both imports and exports contracted in 2009-10 in the aftermath of the global recession. However, India recorded a robust growth of 37.6% in exports in 2010-11. India’s trade deficit in 2010-11 moderated slightly due to robust growth in exports.

- Export of services has expanded rapidly at a CAGR of 17% in the last five years
- India runs a surplus in its services trade as opposed to a deficit in goods trade

Source: CII
The currency has tended to depreciate recently on account of India’s current account deficit and the impact of global crises on capital inflows into emerging markets.

The rupee has traded in a band of around Rs 44-46 against the USD.

Both FDI as well as portfolio inflows moderated in 2010-11. While FDI has recovered, portfolio inflows remain volatile in the current year.
Wartsila in India
We live by our Mission, Vision, and Values

Mission

- We provide lifecycle power solutions to enhance the business of our customers, while creating better technologies that benefit both the customers and the environment.

Vision

- We will be the most valued business partner of all our customers.

Values

- Energy – Capture opportunities and make things happen
- Excellence – Do things better than anyone else in our industry
- Excitement – Foster openness, respect and trust to create excitement
Wartsila Milestones in India

- FIRST ENGINE SUPPLIED BY WÄRTSILÄ DIESEL IN INDIA 1983
- INCORPORATION OF THE COMPANY 1986
- ASSEMBLY FACTORY SET UP AT KHOPOLI 1989
- ISSUE OF SHARES TO PUBLIC 1989
- 500 MW FROM KHOPOLI 1999
- FIRST IPP SIGNED 1999
- 100 ENGINES UNDER O&M AGREEMENT IN INDIA 2003
- EOU UNIT AT KHOPOLI FOR MANUFACTURING GEAR BOXES 2005
- LARGEST GAS POWER PLANT 100MW SET UP IN TAMIL NADU 2005
- O&M OF STG PLANT 2005
- 3000 MW DELIVERED IN INDIA 2006
- WARTSILA INDIA DELISTED FROM STOCK EXCHANGES 2007
- O&M OF WIND PLANTS 2008
- DRY DOCKING FACILITY AT PARADIP PORT 2008
- WORKSHOPS IN KHOPOLI & VISAKHPATNAM 2009
Wärtsilä in India

No of Employees: 1187

No. of Power Plants: 250

No of O&M Plants: 54 Power Plants, 1430MW

Total MWs: 3500 Power Plants
1500 Ship Power

WÄRTSILÄ IS A WELL RECOGNISED BRAND IN INDIA
Power Plants MW in India

2011(Oct): 3500 MW

- Cement: 20%
- Textiles: 18%
- Nuclear: 1%
- IPPs & Utilities: 25%
- Process & Engineering: 18%
- Fertiliser & Chemicals: 10%
- Steel & Alloys: 8%
MWs under O&M in India

- 1998: 61 MWs
- 1999: 128 MWs
- 2000: 222 MWs
- 2001: 302 MWs
- 2002: 348 MWs
- 2003: 484 MWs
- 2004: 592 MWs
- 2005: 664 MWs
- 2006: 764 MWs
- 2007: 822 MWs
- 2008: 818 MWs
- 2009: 1040 MWs
- 2010: 1016 MWs
- 2011: 1430 MWs

Oct
Delivery Centre India - Khopoli

Manufacturing:
- Auxiliary Manufacturing
- Machine Shop
- Special projects for Navy

Services Workshop
- Reconditioning Activity
- Ship Repair Unit (SRU)

Wartsila Land & Sea Academy
Wartsila Business Opportunities in India
Wärtsilä enhances the business of its customers by providing integrated systems, solutions, and products that are efficient, economically sound, and environmentally sustainable.

Being a truly global organisation with an extensive network, we have the ability to create and supply solutions and large systems, supported by a broad product portfolio.
13 major ports, 182 minor / intermediately ports spread over 7212 km coastline
4 large and 28 small and medium sized shipbuilding yards
Indian Ship Building - Overview

- Indian shipbuilding industry accounts for 1.5% of the global shipbuilding industry.

- Shipbuilding in India is quite fragmented. Though there are more than 32 shipyards of various sizes, commercial shipbuilding is controlled primarily by 8 shipyards.

- The Industry is not known for volume production; Order books of shipyards varies from small interceptor boats to Warships to large vessels like Tankers and Bulkers.

- At present, Indian Shipyards have an order book in the region of € 4.3 billion. Approximately, € 3 billion are export orders, while approx. € 1.3 billion is for domestic shipping companies.
Indian Government Maritime Agenda: 2010 - 2020

Total investment USD 36 billion. Major investment areas include:

- Creating port capacity of 3,200 MT to handle traffic of 2,500 MT per year. Improve port performance on par with best in the world.

- Increase India’s share in global ship building to 5% and 10% in ship repairing

- Human resource development in shipping

- Introduction of new Shipbuilding Subsidy Scheme

- Grant of Infrastructure sector status and Strategic sector status to shipbuilding industry

- Shipping Policy: Increase Indian tonnage through necessary policy interventions

- Declaration of new coastal policy

- Setting up of a Maritime Finance Corporation

- Setting up ship repair units/maintenance hubs in all major ports

- Promote use of inland waterways for cargo movement
Indian Govt: Support to Shipping industry

POLICY INITIATIVES

INSA (Indian National ship owners Association) has approached government to give Owner’s Interest Subvention Facility to replace aging ships.

• Reservation of coastal shipping for Indian flagged ships only

• Restoration of the Cargo Support Policy for ships registered in India, under which ships registered in India will be given the first right of refusal for cargo movement of companies

• Possible exemption from Service Tax for coastal shipping following a proposal by Ministry of Shipping to Ministry of Finance
We provide superior value to our customers with our flexible, efficient and environmentally advanced energy solutions, which enable a transition to a more sustainable and modern energy infrastructure.
Power Sector . . . the context

- Energy shortage
- No 24x7 obligation
- Growth aspiration is high!
- Only base load & renewable tariff regime
- Subsidies & poor discom’s financial health
- Fuel challenges
- Huge deficit between plan & delivery
- Power sector sliding down
Peak Demand is an Issue

PEAK DEFICIT OF ABOUT 70 GW LIKELY BY 2017

Demand vs. available supply*

<table>
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<tr>
<th></th>
<th>2007</th>
<th>2012</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td>Demand</td>
<td>120</td>
<td>197</td>
<td>315</td>
</tr>
<tr>
<td>Available supply</td>
<td>49</td>
<td>90</td>
<td>142</td>
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<td></td>
<td>101</td>
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<tr>
<td></td>
<td>75</td>
<td>112</td>
<td>197</td>
</tr>
</tbody>
</table>

Peak deficit
Per cent

* Including captive
Source: Planning Commission; McKinsey analysis – Integrated Revenue Model (IRM)
Smart Power Generation

Enables transition to Affordable, Reliable and Sustainable energy infrastructure.
Fast Flexible Gas Plants – operational flexibility

5 minutes to full load!

- Coal Fired power plant
- Combined Cycle power plant (GTCC)
- Industrial GT power plant (GTSC)
- Aeroderivative GT power plant (GTSC)
- Combustion Engine power plant

Note: Start up times from warm stand-by!
Challenge:
Building adequate generating capacity and the right technology with load following capability to match the demand curve.
Gas based fast flexible plants would be cheaper than imported coal plants for intermediate and peaking applications. Coal tariff is calculated at full load. If efficiency loss due to lower load is factored the gap will further widen in favor of fast flexible gas plants.
Impact of Smart Power on Generation Mix Optimization

Provides a solution for major issues confronting the Power Sector:

1. Environment
2. Wind & Solar power integration
3. Coal & Natural Gas availability
4. Land acquisition & water crisis
5. T&D Losses
6. Transmission bottleneck
7. Time to the market for capacity addition
8. Load shedding

Study by IIT Delhi
Detail study on

Optimal Power Generation Mix for India

Centre for Energy Studies
Indian Institute of Technology Delhi
April, 2011

Prof. R. Balasubramanian
NTPC Chair Professor
Economic Value Add: Smart Power Generation

Unrestricted demand (MW) of India - 2016-17 (17th EPS, CEA) (218,209 MW)

÷ Extrapolation factor (2.99)

Unrestricted demand (MW) of 4 states - 2016-17 (17th EPS, CEA) (73,070 MW)

= Savings - 4 states (2016-17)

AP, Karnataka, Maharashtra & Punjab

Energy Savings

242,297 Bn Kcal → Equivalent to Rs. 4,551 Cr of Primary Fuel

CO₂ Emission Savings

101 Mn Tonnes → Equivalent to Rs. 9,682 Cr of Certified Emission Reduction (CER) or ~18% of India’s current per annum CO₂ emission from power sector

Water Savings

413 Mn Cu m → Equivalent to Rs. 624 Cr of Industrial Water

Per Annum (Recurring Savings)

Savings - India (2016-17)

Land Savings

14,212 Acres → Equivalent to Rs. 3,695 Cr of Industrial Land or equivalent to a mid-sized town

Capex Savings

Rs. 31,415 Cr

Transmission Capex Savings

Rs. 15,919 Cr

One time Savings

Rs. 47,334 Cr (over 7Bn Eu)

Rs. 14,857 Cr (over 2Bn Eu)
WHY Smart Power Generation?

1. Environment

- Optimization of power generation mix with Base Load & Peak Load generation plants (30GW gas based distributed power plants)

- CO$_2$ savings of ~100MnT/yr by end of 12$^{th}$ 5 year plan: Almost 10% reduction, valued at ~ Rs 9,700 Cr

- 100MnT CO$_2$ savings/yr =
  - > 82,000MW of Solar
  - or,
  - > 20,000MW of Solar +
  - > 37,000MW of Wind generation capacity, valued at over Rs 500,000Cr capital
WHY Smart Power Generation?

2. Wind & Solar power integration in the Grid

- Large mix of wind & solar brings instability in the grid
- This needs quick response plants to balance
3. Coal & Natural Gas availability:

- Brings 6,9% efficiency in overall fuel mix of the country = reduces coal availability problem
- Reduce the expensive gas requirement to one fourth by utilizing the same in Peak Load management plants
- Saves Rs 4,500 Cr in primary fuel cost
4. Land Acquisition & Water Crisis

- With smaller foot print, potential to save >24000 acres of land
  - Valued at > Rs 6000 Cr
- Negligible water consumption, saves 410MnCu Mn water (equivalent to the annual need of a city like Mumbai)
  - Valued at > Rs 625Cr
5. T&D Losses

- Local generation for the peak demand at load centers & local consumption
- ~0.25% savings of total energy consumption
- Valued at Rs 675 Cr
WHY Smart Power Generation?

6. Transmission bottleneck

- Local generation for the peak demand at load centers & local consumption
- Releases >20% of the transmission capacity
- Valued at Rs. 15,900Cr
WHY Smart Power Generation?

7. Time to the market for capacity addition
   - Modular structure
   - 12 – 15mths power out from financial close
   - Quicker financial close
8. Load shedding

The survey (2009) - How do consumers cope & the price?
21 cities across India & 1500 respondents

VOLL for the country: 289,000cr or 6% of GDP

The investment
100,000 cr invested

The "coping" costs for consumers

Residential

Commercial

The annual recurring cost
30,000 cr annual cost

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Way forward for Indian Power Sector

Electricity for all consumers meeting agreed reliability standards – 24x7
Economical & Sustainable, with lowest CO₂ footprint

Enabler: Efficient Transmission & Distribution
Enabler: Demand side management and conservation
Enabler: Renewable Energy Portfolio
Flexible Base-load & Peaking Plants = SPG

Dynamic Reserve capacity
Quick response
Base load generation or Bulk Power

Load centre plants, CHP
Excerpts from “Grey to Green India – Peaking Power a Game Changer” Conference
(Well attended by over 50 Policy makers, Regulators, Discoms, Developers, Financiers & Lawyers)

- Peaking power capacity to be treated differently – a must!
  - Bid for long term supply for peaking power
  - Competitive bidding with technology specific to Peaking requirements

- Dichotomy expressed by Discoms . . .
  - Consumer do not want load shedding at peak hours
  - I am in trouble to dispose energy during off peak hour
  - Wind/Solar integration

- Uncertainty on Gas – Viability on LNG & tariff model support

- Need for integration & optimization of generation mix approach for 12\textsuperscript{th} five year plan
### Need for Smart Power Generation to meet Peak Shortages

#### Deficit in Peak Power Portfolio 2012: Top 10

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>STATE</th>
<th>Demand (MW)</th>
<th>Availability (MW)</th>
<th>DEFICIT (MW)</th>
<th>(%)</th>
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<tr>
<td>1</td>
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-27594

Source: CEA (in CAC meeting by POSOCO)
Suggested Approach to 12th Five Year Plan

The Electricity Act, 2003

Section 61: Encouraging efficiency, economical use of resources, good performance and optimum investments -
• Optimise Generation Mix for future capacity addition

National Electricity Policy 2005: Para 2.0:

Demand to be fully met by 2012 -
• 12th Plan to mandate 24x7 Power to all in phased manner by ‘17

Energy and peaking shortages to be overcome -
• Differentiate capacity addition target under specific heads
  - Base load
  - Peak load, and
  - Renewable
and, create enabling mechanism for such capacity to come up
Preventing the unexpected and optimising our customers operations is our shared passion. We serve you whenever, wherever. We provide the broadest portfolio and best services in the industry for both ship power and power plants. We offer expertise, proximity and responsiveness for all customers regardless of their equipment make in the most environmentally sound way.
POWER PLANTS UP TO 500 MW

Thank You