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# Distribution Transformers - Energy Efficiency & Reliability

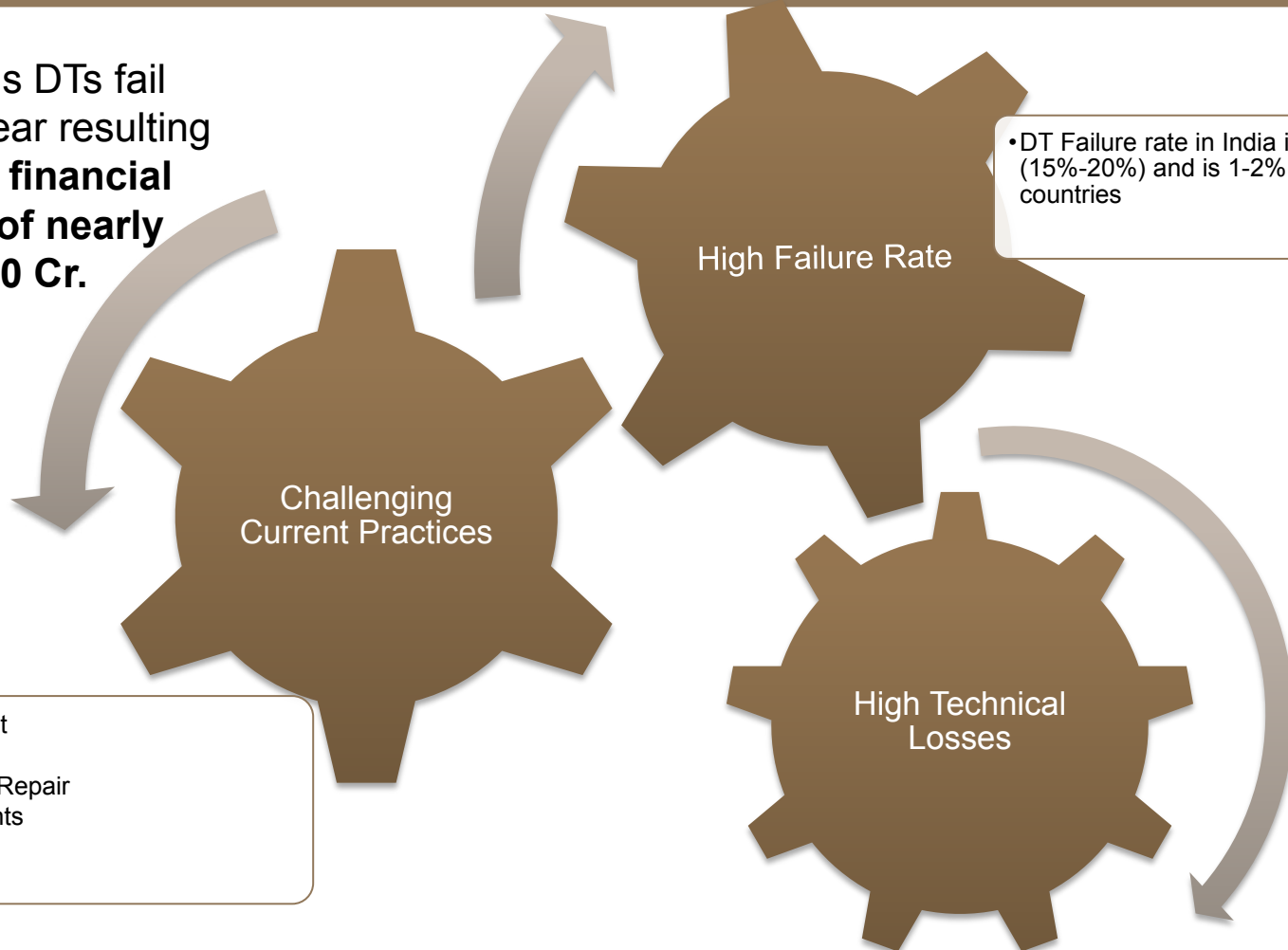
Manas Kundu  
Guwahati, 20<sup>th</sup> July 2017



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- **Third world's largest transformer market (2015-16)**
    - **Distribution – 180,000 MVA**
    - **Power – 90,000 MVA**
  - **Compounded production growth rate - 9.8% (2006 – 2016)**
  - **Distribution transformer production CAGR over 10 years – 7.7%**
  - **Distribution transformer installed stocks growth rate – 6.4% (2005 – 2011)**
  - **Exceeding 7 million distribution transformers, 400 million kVA s powering India**
  - **Total distribution transformer assets valuation > INR 50,000 Crores**

# Issues around DTs

6-8 lakhs DTs fail every year resulting in **huge financial losses of nearly Rs. 5000 Cr.**



•DT Failure rate in India is very high (15%-20%) and is 1-2% in developed countries

- Procurement
- O&M
- Breakdown Repair
- Replacements

- No Load Losses
- Full Load Losses

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- **Distribution Transformer failure rate ~ 13%**
    - **Ranging from 0.5% to 22%**
  - **Approx. 70% repaired , balance replaced**
  - **Approx. additional cost to distribution sector - INR 5,000 Crores**
    - **Repair - INR 3,000 Crores**
    - **Replacement – INR 2,000 Crores**
  - **Approx. additional burden to consumer – 6.5 Paise per unit !!**

# Energy Efficiency – An Opportunity

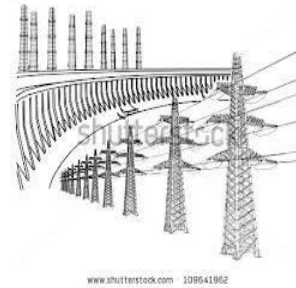
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**95 TWh Annual Electricity Savings through 2030**

**19 % reduction in Distribution Losses**

**Cumulative financial Savings  
INR 56,000 Crores**

**13.3 million tons annual reduction of carbon dioxide emissions**



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**Equivalent to the Output of a 4400 MW Wind Farm**



**Equivalent to 75 million Ton of coal**



**INR 21,000 Crores Investment in energy efficient DT**

**INR 45,000 Crores Savings in operating costs**

**Equivalent to 3.3 million cars off the road**



# Partnership Approach For Enhanced Reliability

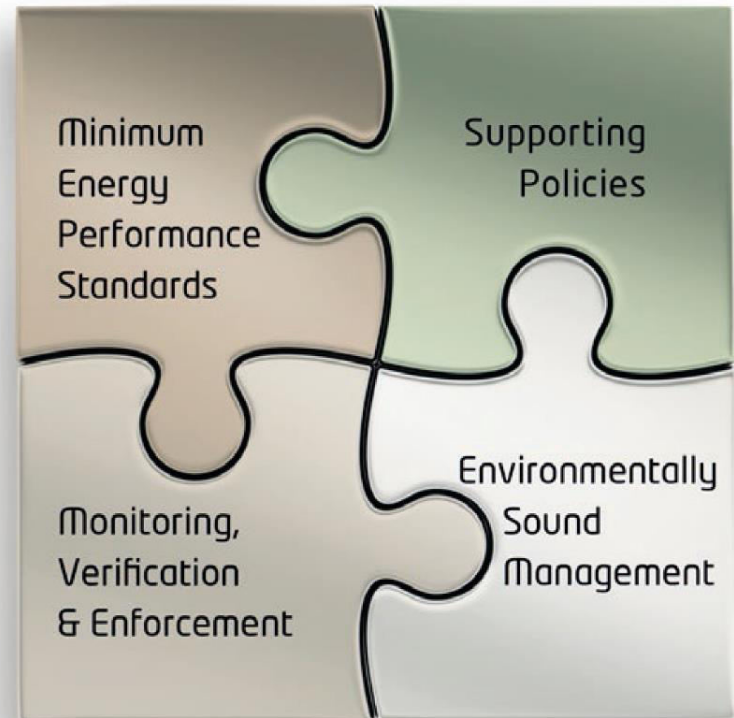
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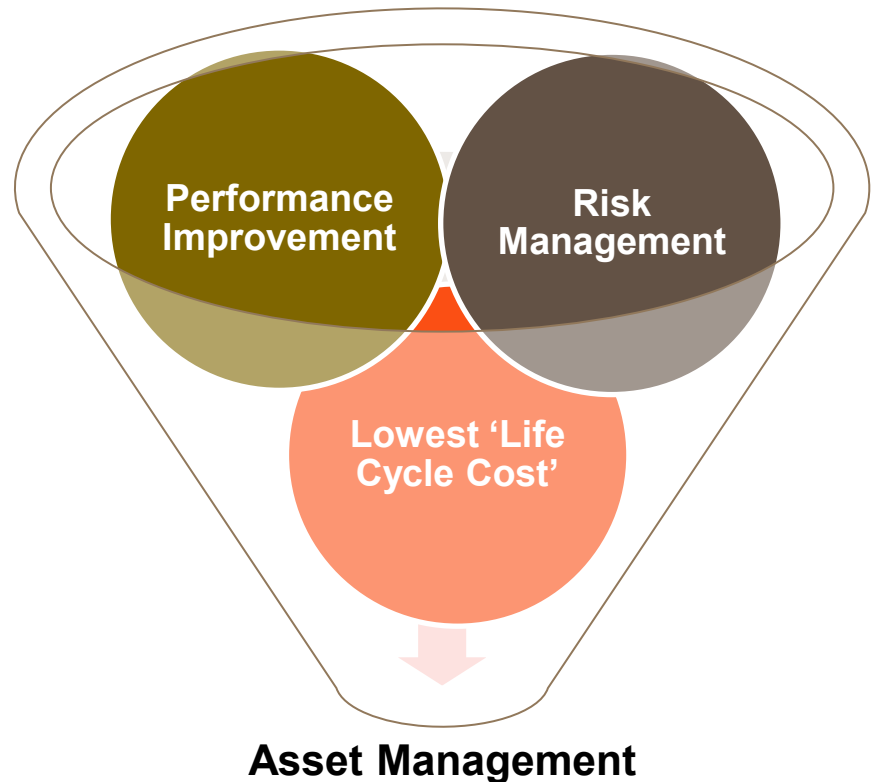
- **Improved procurement process**
  - Vendor qualification
  - Vendor / product certification
- **Improved operation / maintenance system**
  - Deployment of “SMART” monitoring & protection systems
  - Outsourcing of maintenance services
- **Outsourcing of Distribution System Network Services**

# Integrated Approach For Rapid Energy Efficiency Transition

- Improved MEPS
- Incentives from Network regulators'
- Utilities' & manufacturers' partnership for 'MV& E'
- Effective 'Life Cycle Management'  
– Cradle to Grave



- Risk Management
  - Regulatory risk
  - Customer risk
  - Vendor risk
- Performance Improvement
  - SAIFI
  - SAIDI
  - T & D losses
- Lowest 'Life Cycle Cost'
  - Procurement & Installation cost
  - Operation & maintenance cost
  - Recycling of assets





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# Thank you

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