

# Smart Grid

*A Journey For Discoms*

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- Indian Electricity Act 1910 – Only private players were allowed
- The Electricity (Supply) Act 1948 – Birth of SEBs
- The Electricity Regulatory Commission's (ERC) Act 1998 – Birth of CERC / State Electricity Regulatory Commission
- Finally, to consolidate The Electricity Act (EA) 2003 was notified and enacted.
  - EA is consolidation of all the above three therefore replacing all the prevailing Acts
  - Trifurcation of State Electricity Board viz. Generation, Transmission and Distribution
  - Multi Year Tariff Framework and Rationalization of Tariff

EESL, being funded by various State Discoms, was the first to produce and deploy Smart Meter in UP under Build , Own, Operate and Transfer (BOOT) model in 2015

# What is Amended in Electricity Act 2003

While there are many changes have been suggested, below are related to Smart Grid.

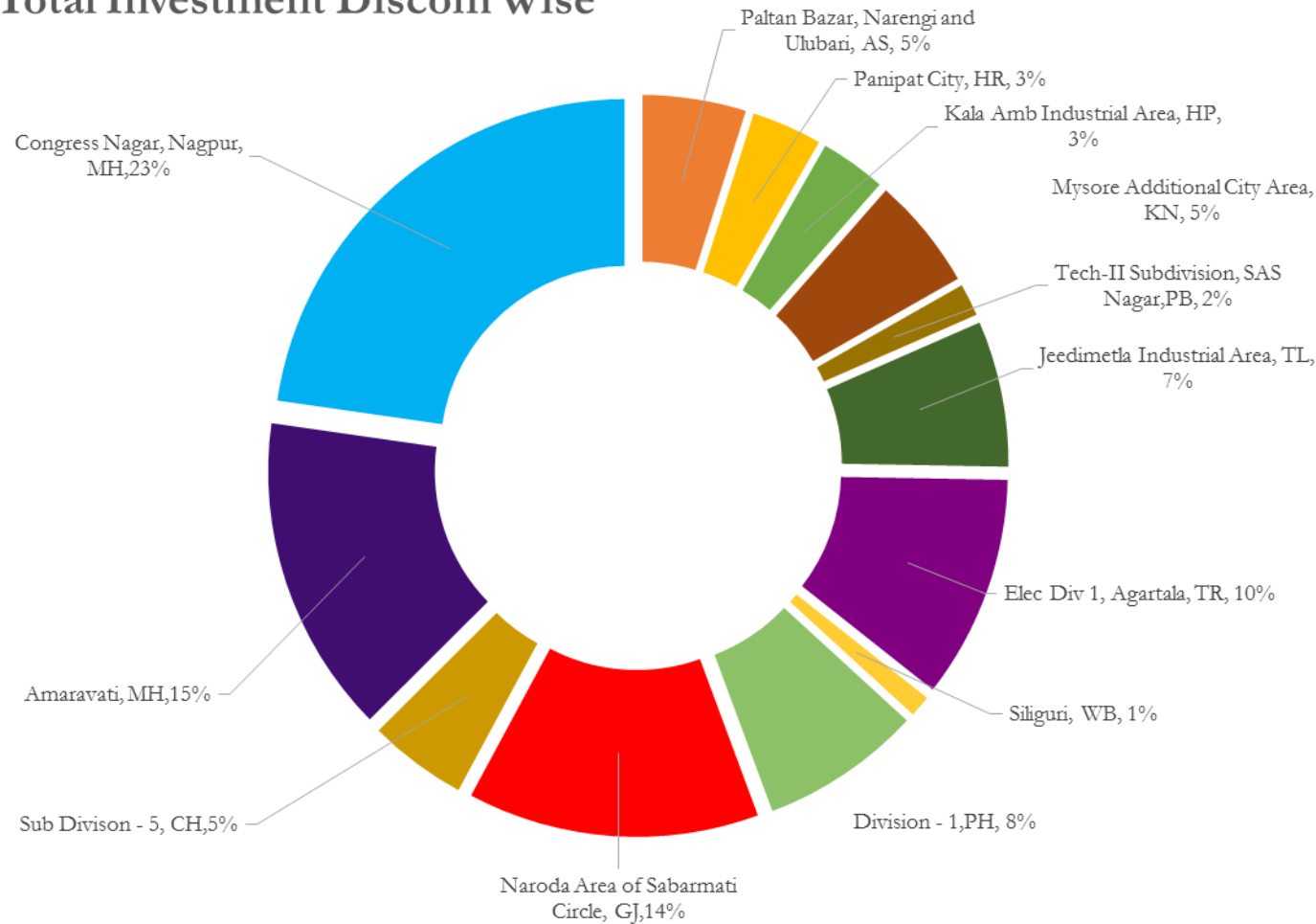
- **Smart meters to be provided for measurement of consumption and metering of electricity for proper Energy Accounting from Generation to consumer end**
- Ancillary Services: Services necessary to support Power System or Grid Operation for maintaining
- Power Quality, Reliability and Security
- **Commission to promote Smart Grid, Net Metering, Ancillary Services. And for this a cell shall be instigated.**
- 24/7 Power supply

Major amendment proposed are multiple Supply Licensees for supply business along with the mandatory provisions of one Govt. Supply company.

# Smart Grid Projects in India – Current State

- As per 12<sup>th</sup> (2012-17) Economic Plan related to Smart Grid, 14 pilot projects were undertaken of total **INR 611 Crs** comprising 13 DISCOMS.

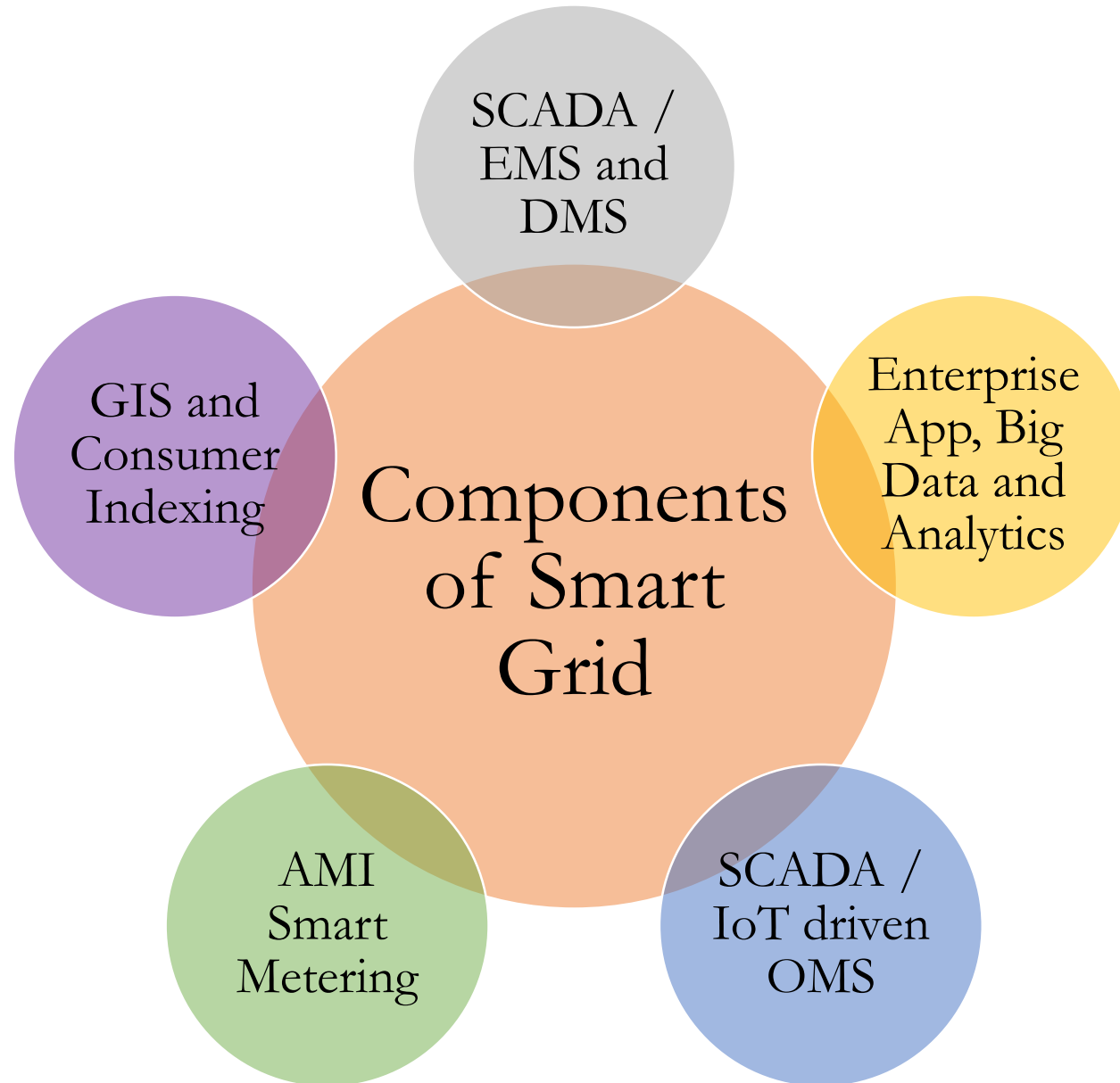
## % of Total Investment Discom Wise



- ✓ Covered approx. 5 lakhs consumers
- ✓ Major Technologies
  - AMI – I/R
  - Peak Load Management (PLM)
  - Outage Management System (OMS)
  - Demand Service Management (DSM)
  - Demand Response (DR)

Source:  
National Smart Grid Mission (NSGM)  
India Smart Grid Forum (ISGF)

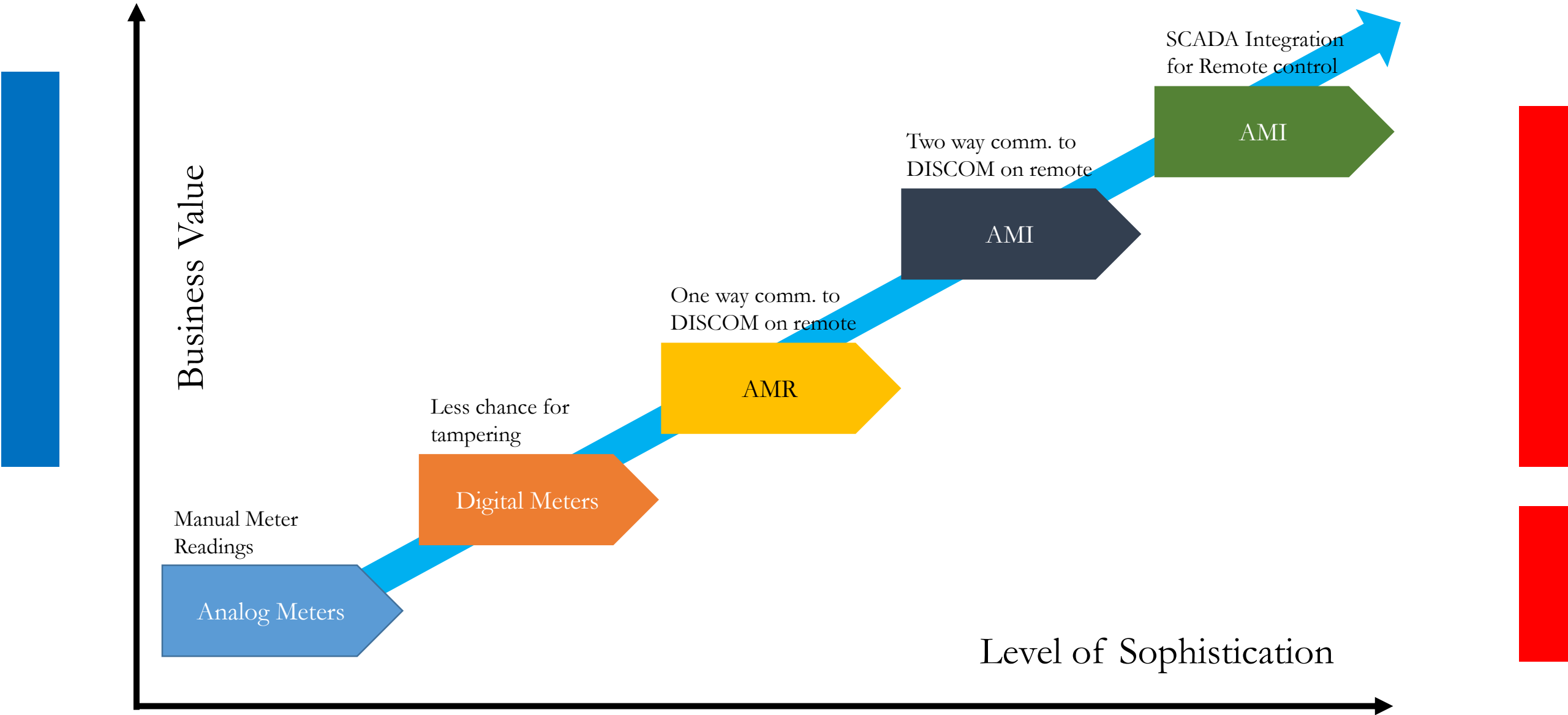
# Key Components of Smart Grid



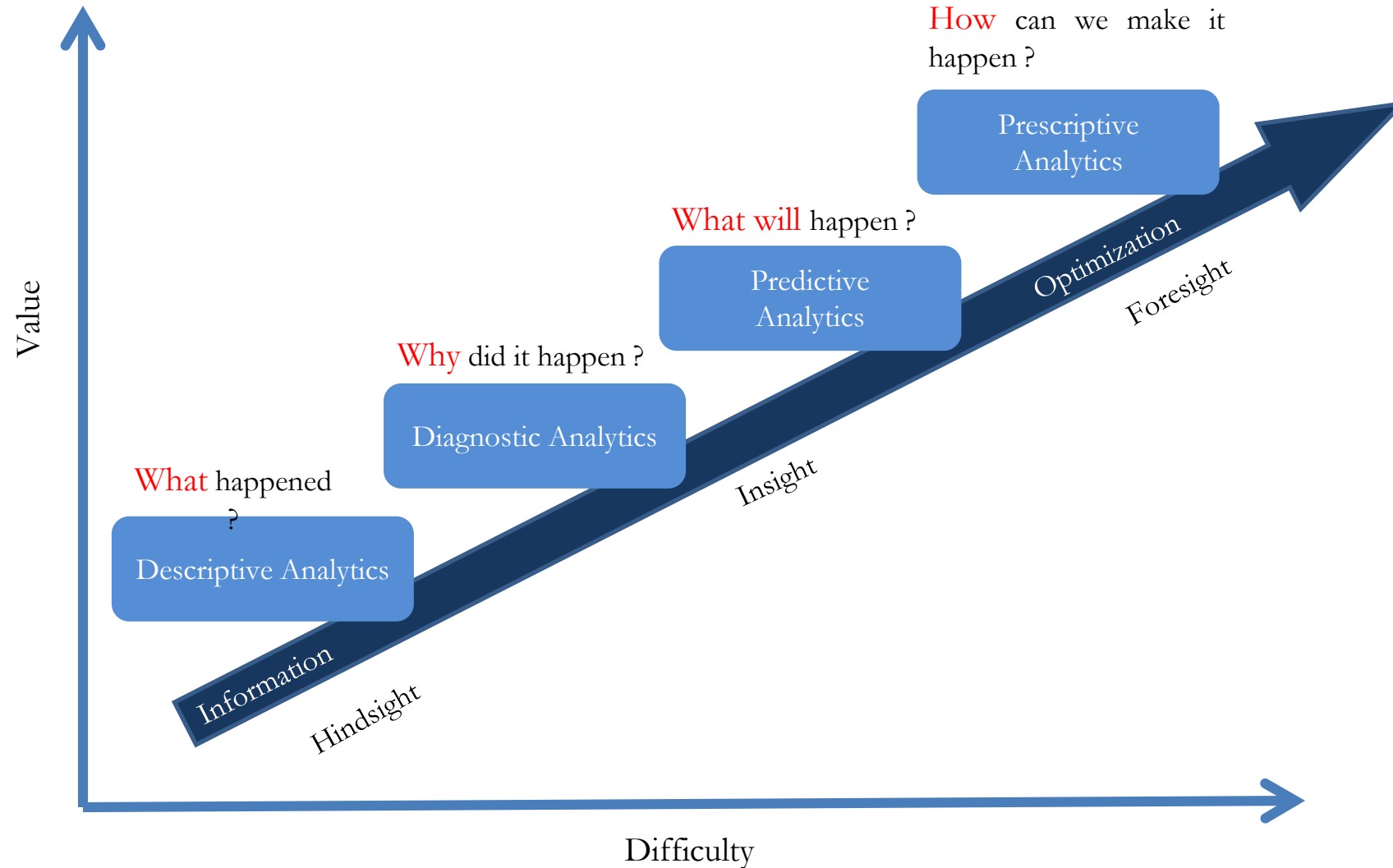
## Key Drivers for Smart Grids for different stakeholders

<b>Utilities</b>	<b>Customers</b>	<b>Government and Regulators</b>
<ul style="list-style-type: none"><li>- Reduction in AT&amp;C Loss</li><li>- Peak Load Management and Demand Response</li><li>- Self-healing grid- faster restoration of electricity after fault or disturbances</li><li>- Lowering of Power Purchase Cost and ARC</li><li>- Better Grid Visibility</li><li>- Superior Asset Management</li></ul>	<ul style="list-style-type: none"><li>- Improved quality of supply – no more voltage stabilizers</li><li>- 24x7 Power for All</li><li>- “Prosumer” enablement – can produce own electricity and consume or sell</li><li>- Options to save money by shifting loads from peak hours to off-peak periods</li><li>- Increased choice for customers – including green power</li></ul>	<ul style="list-style-type: none"><li>- Satisfied Customers</li><li>- Tariff neutral system upgrade and modernization</li><li>- Financially sound utilities</li><li>- Reduction in emission intensity</li></ul>

# Smart Meter – Maturity Model

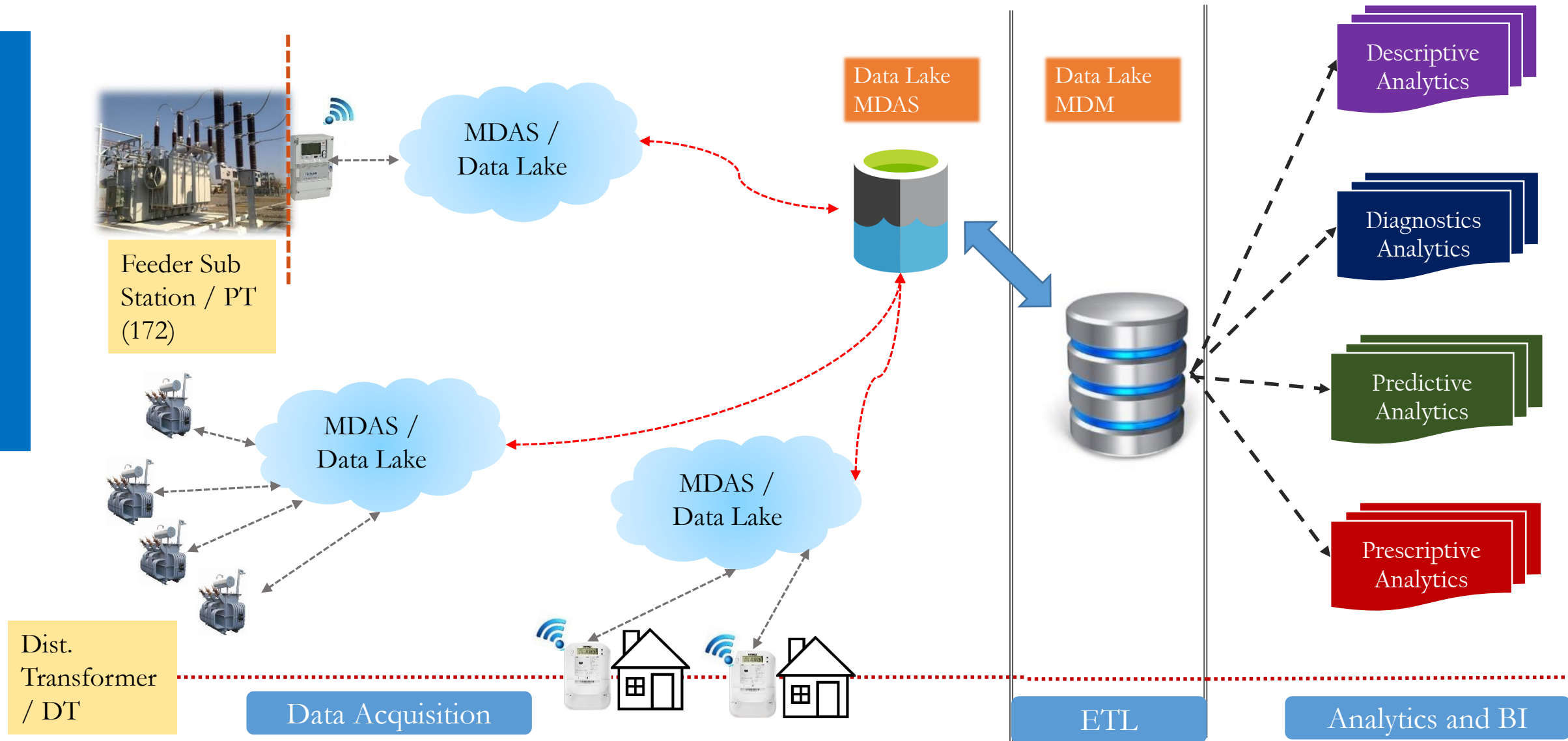


# Using Smart Grid Data for Analytics





# Collecting Smart Grid Data for Business



Smart Grid Market to reach INR  
50,000 Cr by 2022

Total 35 lakhs Smart Meters need to  
be installed by 2019

Govt to invest INR 990 Crs till March  
2020 under NSGM

All 32 States and UTs shall comply  
National Tariff Policy (2016) by 2020

AT &C Loss to below 15% by FY 19  
ACS – ARR to become zero by FY 20

Govt. is planning to set up National Electricity Distribution  
Company (NEDC).

- Smart Meter Installation Status
  - Between 200 kW and 500 kW - Only **1%** have been achieved.
  - Greater than 500 KW – Only **3%** have been achieved.
- In India, around **41%** of Total Distribution Transformer (DT) are ‘un-metered’!!
- Total AT&C Loss – Still above **20%**
- Interoperability Issues – Integration Related

1

Lack of Standardization across MDAS - Interoperability

2

Cheaper mode of Communication  
GPRS, RF Mesh, LPWAN, Others..

3

Retrofitting of IoT / Smart Meters to the existing Assets

Miles to Go....

Thank You