

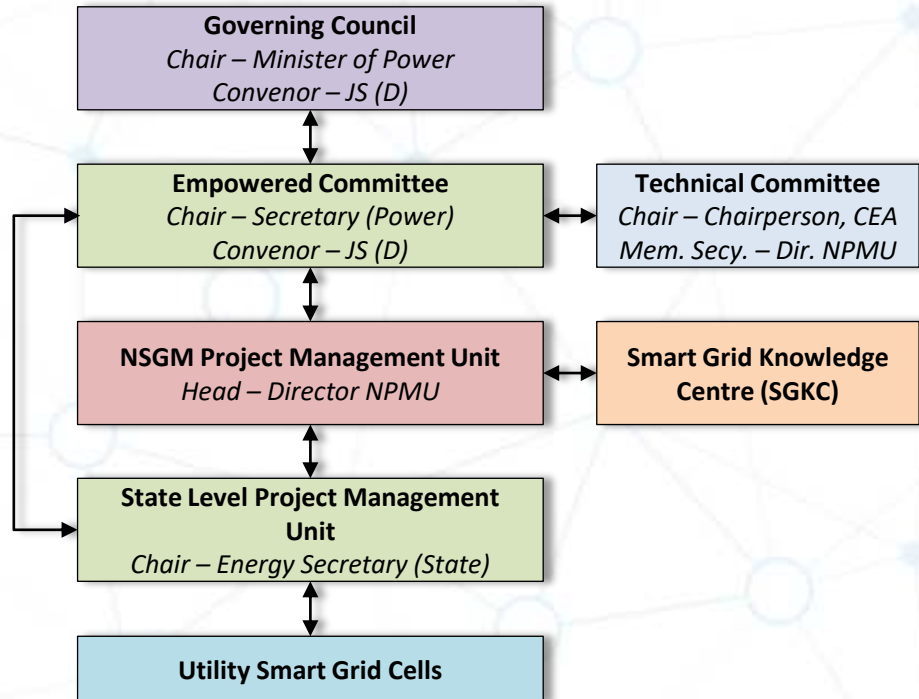
5G and Cloud Interoperability for Smart Grids

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National Smart Grid Mission

NSGM established in March 2015 with following institutional framework:

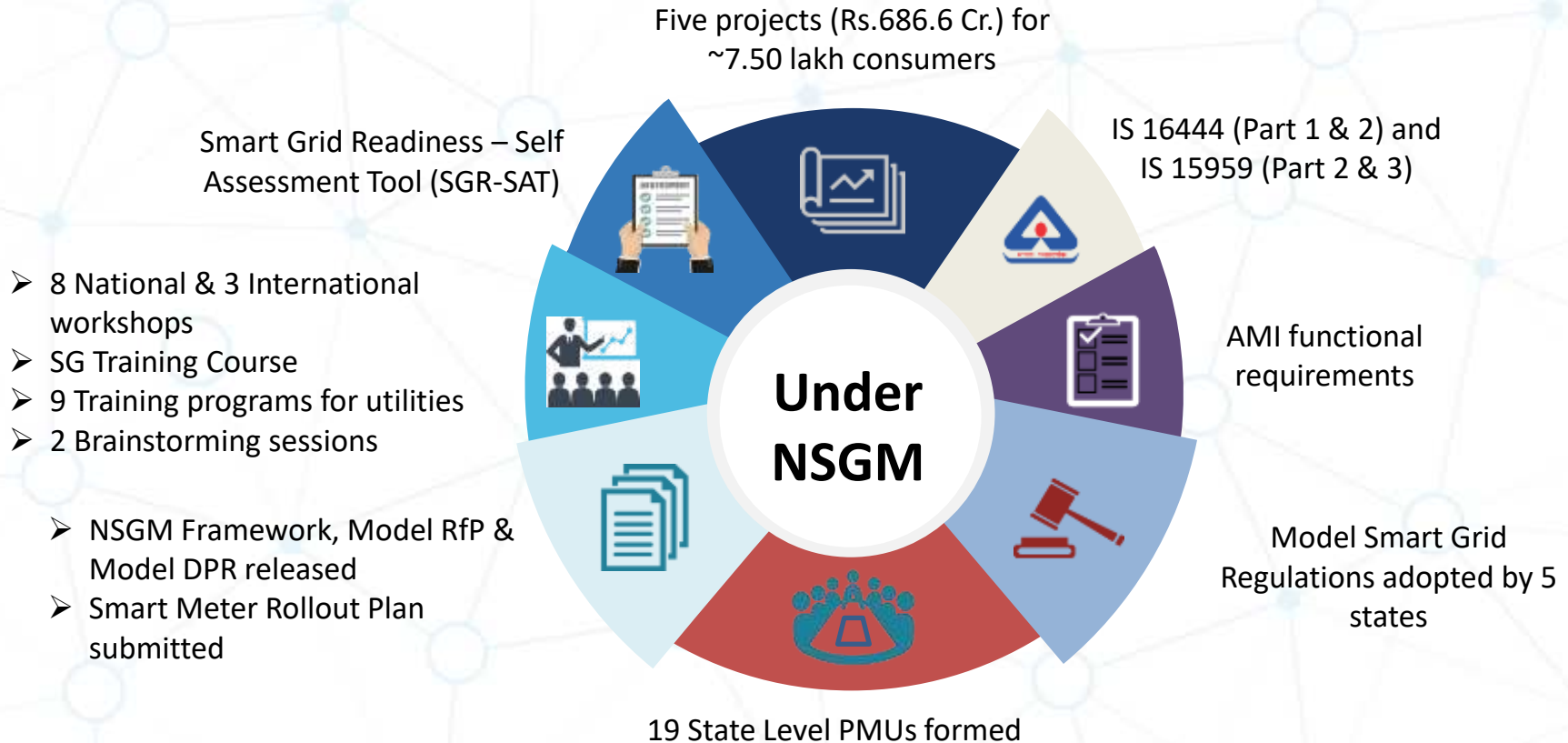


Bilingual website
www.nsgm.gov.in/en
www.nsgm.gov.in/hi

NSGM Objectives

- Bringing in development of Smart Grids:
 - Enable access and availability of quality power to all
 - AMI roll out, prosumer enablement, Demand Response (DR)/Demand Side Management (DSM)
 - Policies and tariffs – Dynamic tariff implementation, DR programs, tariff mechanisms for solar PVs
 - Renewable integration – Green power and energy efficiency
 - Electric vehicles (EV) and energy storage – EV charging stations & energy storage systems
 - Loss reduction
- Capacity building – utilities and regulators
- Technical cooperation, research and collaboration with national and international development partners like ISGAN, USAID, DFID, NEDO, KfW, World Bank, ADB etc.
- Facilitate consumer awareness etc.

NSGM Achievements



Current Scenario

- Foremost, data/control center is established
 - Ideally, one CC for one state
 - City wise/district wise CCs are being deployed depending on project size
 - Assuming 1 CC for 10 lakhs, India may need ~ 220 CCs for 22 Cr. consumers
- Procedure followed: procurement of equipment, then survey & design of communication system and then optimum placement of devices
- Deployment of projects took more than anticipated timeline. Most project deployments took 3-4 years and even more
- Commissioning of all devices not done in same year (calendar year)
- Communication between devices lag, inaccurate data etc.

Need of the Hour (1)

- Smart Grids rely on robust and efficient communication technologies
- Information flow should be secure, uninterrupted and effectively managed
- Currently available technologies like PLC, RF and GPRS have been tested in India and elsewhere
- Communication technology selection is mostly based on vendor's choice and produced mixed results
- Really needed technology which can deliver:
 - No loss data availability
 - Maximum coverage with minimum cost
 - Reliability and security

Need of the Hour (2)

- Not only Smart Grids, other power system application need robust communication
- Low latency communication for critical applications like SCADA, Meter tampers, WAMS etc.
- Cellular technology is being focussed due to variety of offers like private, point-to-point connectivity, security etc.
- M2M communication and maximum possible connections of field devices are required for enabling the grid Smart
- 5G is emerging holy grail and likely disruptor from communication industry, we are only learning how far/wide and deep will be its impact so that Utilities aren't caught off guard!

Need of the Hour (3)

- Another segment is control center communication to consumer end point and vice versa
- Legacy physical data centres migration to cloud data centres
 - 24x7 availability of data
 - Secure and reliable retrieving of data
 - Anywhere/anytime connectivity
 - Low-to-nil latency command executions
 - Real time system view from anywhere etc.
- Cloud infra and investment model (per service/day etc.)

Points to Ponder

- Strengthening of existing infrastructure
- Assessment of existing vis-à-vis newer communication technologies
- Backward compatibility of equipment (in case of fall-back)
- Investment options (per service/day) for using cloud infra
- Cloud infra terms & conditions and moving from one to another
- Data availability and reliability in case of outage etc.
- Leveraging 5G and other technologies with cloud for Smart Grids

Thank you