Session 2:
“Smart grid innovation in Mexico”

- Francisco de la Rosa Costilla
- Gerencia de Transmisión y Distribución
- Instituto de Investigaciones Eléctricas

FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

iea International Energy Agency

Smart grids are essentially meant to make use of combined sensing, communications, Information Technology and new equipment technologies to improve the operation of a power system

The collective use of expert tools and devices is actually already implemented in our power systems for example at Intelligent Load Dispatch Centers to achieve:

- Advanced Alarm Management System
- Real- time and Historical Trending
- Supervisory Control and Data Acquisition
- Historical Information System and Data Archiving
- Dynamic Security Assessment and Voltage Stability Analysis
- Short-Term Load Forecasting and Market Operations Interfaces
- Network Security Analysis
- Operator Training Simulators

However, Smart Grids are further evolving to accomplish:

- Increased use of real-time data utilizing the latest tools to enhance data integration and user interface
- Increased security of data through a shared data center
- Asset management strategies and programs
- Integration of Automatic Measuring Infrastructure (AMI)
- Improved Distribution Automation
- Implementation of Demand Management and Volt Var Control
- Increased consumer satisfaction through improved reliability
- Wise use of new tools and applications allowing utilities to see real-time energy use, reduced losses and reliability indicators

There have been a number of efforts in CFE to implement some of the smart grid functions like AMI (Advanced Metering Infrastructure).

While these have been undertaken to gain some of the advantages that the AMI technology offers, a comprehensive benefit requires a more ambitious target

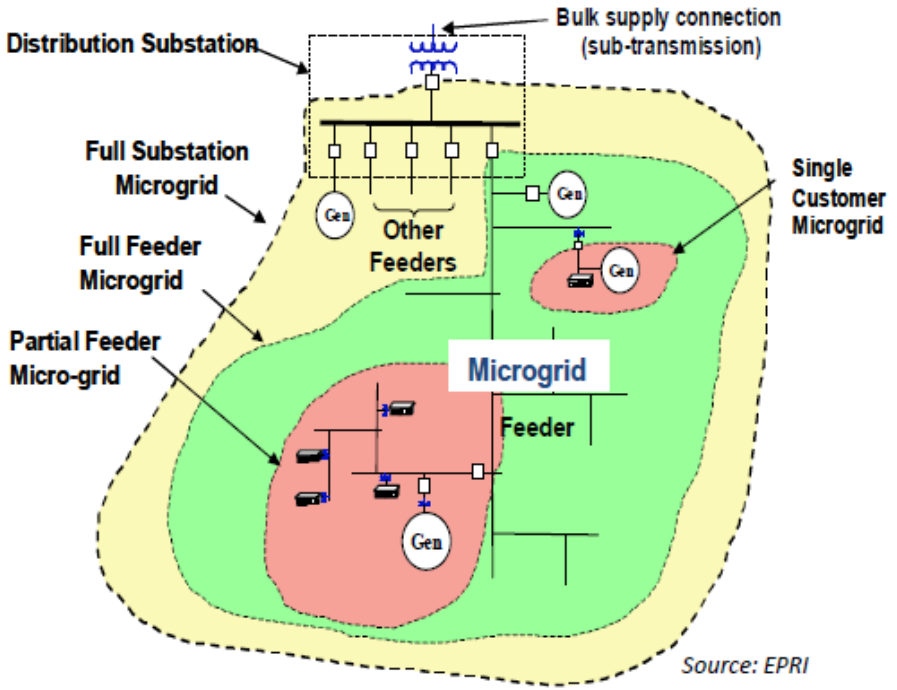
Short, medium and long term actions should be considered focusing first in those which are more important to address, for example loss reduction, AMI and Wind/Solar power integration, with Volt/Var optimization using information from the AMI infrastructure, Fault Detection and Demand Management planned for further stages..

A smart grid deployment road map describing technologies, grid wise locations, specific problems to address in the Mexican system and timelines is what should be deliberated

DOE Definition of a Smart Grid

Our definition:
A group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and island mode.

Residential	Less than 10-kW, single-phase
Small Commercial	From 10-kW to 50-kW, typically three-phase
Commercial	Greater than 50-kW up to 10MW



NATIONAL ELECTRIC DELIVERY TECHNOLOGIES ROADMAP, Jan 2004, United States Department of Energy, Office of Electric Transmission and Distribution

Example for ilustrative purposes

- Define Vision
- Define Targets
- Set Deadlines
- Road map should envision National, Regional and Local Schemes
- Phases should encompass Design&Testing, Technology Development &Market Acceptance, and Manufacturing and Scale up.

EXHIBIT 2. NATIONAL ELECTRIC DELIVERY TECHNOLOGIES ROADMAP AT-A-GLANCE

Vision

"Grid 2030"…

…energizes a competitive North American marketplace for electricity. It connects everyone to abundant, affordable, clean, efficient, and reliable, electric power anytime, anywhere. It provides the best and most secure electric services available in the world.

Targets

By 2010

- Architecture for "Grid 2030" vision defined and accepted
- Lower cost, more reliable, and field-tested
  - Data visualization
  - Point-of-use deployment of power quality enhancing systems
- Barriers eliminated to acceptance of advanced electric T&D technologies
- Uncertainty about regulations and market operations reduced
- Investments in electric infrastructure and TD&D sufficient to meet the needs

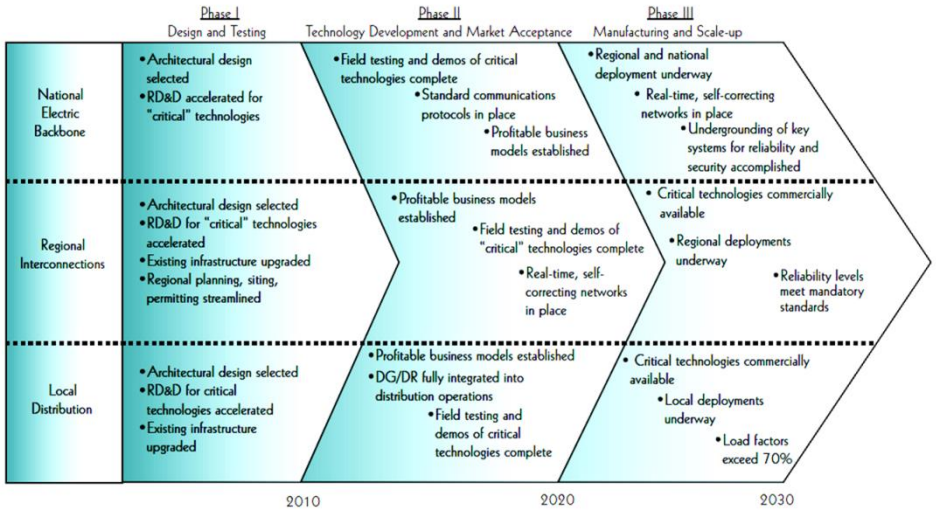
By 2020

- Local and regional deployment of "Grid 2030" architecture
- Expanded installations of advanced electric technologies for grid modernization
- Continued flow of capital into grid modernization projects
- Measurably more efficient market operations and consumer benefits

By 2030

- Intercontinental power transfers accomplished
- Real-time information flow from consumers (and appliances) through system for greater operational efficiency and control
- Near-zero economic losses from power outages and disturbances
- Openly competitive markets in all segments of the electric industry where consumer benefits can be demonstrated

EXHIBIT 3. ROADMAP FOR DESIGNING THE "GRID 2030" ARCHITECTURE



NATIONAL ELECTRIC DELIVERY TECHNOLOGIES ROADMAP, Jan 2004, United States Department of Energy, Office of Electric Transmission and Distribution

Recommendations

Is Mexico on track to realise its objectives for smart grids?	• It will when a coordinated effort from key parties is established
What is the timeframe for to meet objectives?	• It depends on many factors but, for a reference, the USA DOE Roadmap envisioned 15 years (*)
What needs to change and how?	• The adoption and implementation of a Smart Grid Roadmap
What are the key factors supporting deployment of smart grids in Mexico?	• Increasing demand, High losses, integration of Renewable Energy, etc.
Who is responsible for managing role and responsibilities associated with smart grid deployment?	• SENER, CRE,CENACE,CFE
What assistance (if any) is required?	•Building Alliances between Federal, State, Manufacturers, Electric Research, Academic and Other Parties

(*) NATIONAL ELECTRIC DELIVERY TECHNOLOGIES ROADMAP, United States Department of Energy, Office of Electric Transmission and Distribution , Jan 2004

Three key take-away messages to foster smart grid deployment in Mexico

Thank You!