Overview Colombia
Power System & Renewable Integration
Institutional structure

Policy

Minminas

Planning

Regulation

Creg

Control and observation

Operational procedures

Cno

Sector coordination & monitoring

Operation & Market

Cacsse

 Xm

Una empresa ISA
XM Roles

XM is in charge of operating the Colombian National Interconnected System through the National Dispatch Center -CND-.

XM is in charge of managing the Energy Market -MEM-.

XM manages the International Energy Transactions with Ecuador and coordinates the interconnection with the Venezuelan Electricity System.
Operation & Market

CND Operation

- Coordination of maintenance
- Offers
- Ecuador offers
- Dispatch
- Redispatch
- Operation
- Review the operation

Energy Planning

- Electrical planning

Registry Agents, Borders, contracts

- Loading and calculating Operational information
- Calculation generation, demand and Loss of energy
- Commercial availability Calculation
- Calculation of ideal dispatch
- Spot Price calculation
- Calculation Deviations, Constraints, Reconciliations, AGC, TIE
- Risk management
- Settlement Contracts

ASIC Market
XM is in charge of the planning, coordination, supervision and control of the generation and transmission resources of the National Interconnected System, complying with the operating regulations issued by the CREG and the technical agreements approved by the CNO.
Expected VRE Capacity

Concepto UPME

- Hoy: 9.9 MW, 19.9 MW
- 2018: 337 MW
- 2019: 127 MW
- 2020: 200 MW
- 2023: 1050 MW
- Total: 1743 MW

Requests for connection according UPME 2017

- 4474 MW
- 4787 MW
Wind farms location

Challenges:
- Potential transient overvoltages
- Voltage and power oscillations
- System Instability
Variability

Demand

Net demand

Hourly data 2014 y 2015
Grid code modification proposal
- Connection requirements
- Forecasting
- Reserves
- Supervision
- Deviations
- Voltage and frequency control

Forecasting prototype
- Forecasting prototype solar, wind y small hydro

DER Proposal & studies
- Distributed energy resources (DER)
  - Supervision
  - Load changes
  - Interaction between transmission and distribution
  - Connection requirements
- Studies
  - Flexibility
  - Connection VRE

Operative changes
- Training
- Regulation
- Procedure
- Technology

2017
2018