dobré odpoledne!

October 19th

JOSE AREVALO
TOPICS

OVERVIEW CHILEAN MARKET
Market Participants, Transmission System, Market design, Global Organization

2016 ELECTRICITY LAW AMENDMENTS
Diagnosis and purposes, Transmission Main Amendments, ISO Main Amendments

CHILE’S POWER GRID
Northern and Central South Grid, Energy Prices, Tx investments level & Gen projects under construction

OPPORTUNITIES AND CHALLENGES
Grids’ Interconnection, RNCE integration, Regional Interconnections
Market Participants

Generating Companies
GENCO’s

Transmission Companies
TRANSKO’s

Distribution Companies
DISCO’s

Large Consumers

Small Consumers
Power System Market (Energy & Power).

**ISO SPOT Market**
- SPOT: Only GenCo’s - Buy or sell energy (MgC) and Capacity (PNP)

**Bilateral Finance Contracts Market**
- Direct Agreement
  - Genco’s – Large Customers
  - Genco’s – Disco’s (Tenders)

**Large Consumers**

**DISCO’S**
- Regulated Contract (Tariff)
  - Disco – Small customer
Transmission System

- Generation
- Transmission
- Distribution
- Demand

Consumers Agreed contracts (> 5 MW) & regulated prices

ISO

RNCE (Renewable Non Conventional Energy)

Tx Zonal

DisCo

PMG

PMGD
MARKET DESIGN

STRUCTURE

Investment and operation: Private Agents
Markets: Generation, transmission, distribution, each with own regulations.
Network and Gen and Tx market operations: ISO

GENERATION MARKET

Competitive – Marginal Cost Tariff (peak load pricing)
Consumers pay Energy Price and Capacity Price
Capacity payment allows to recover generation investment costs.

TRANSMISSION AND DISTRIBUTION MARKET

Regulated (except some Tx facilities) in tariff and expansión
Tariff based in cost efficiency (investment and operation)
ELECTRICITY INDUSTRY ORGANIZATION

Energy Ministry

CNE
National Energy Commission

SEC
Superintendence

Electric Regulations

Supervisor and prosecutor

Independent System and Market Operator

ISO

Experts Panel

Discrepancy Resolution
Electricity Law & Regulations

Generation

Transmission

Distribution/Large Customers
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Previous Amendments

2004: Ley Corta I. Introduces regulations for transmission system in tariff and expansion.
2005: Ley Corta II Introduces Tenders for regulated consumers supply.
2008: RNCES Law. 2010-14: 5% y 2015-24: 0.5% anual, till 10%
2015: Law. Introduces changes in Tenders for regulated consumers supply.

2016: Law. Introduces changes in transmission regulations and ISO
General Law Electricity Services – 2016
PURPOSES OF AMENDMENTS

**Diagnosis**

- Congestion in Transmission
- Lack in Environmental and social requirements projects
- Increasingly higher energy prices level

**Objectivs**

- Transmission system support energy market driving to a more competitive one
- Improvements in planning process of energy projects
- Higher transparency in Transmission payments from consumers
General Law Electricity Services – 2016
TRANSMISSION MAIN AMENDMENTS

- New definitions and rules for transmission facilities: Trunk, Zone, Gen clusters, dedicated, International
- Regulation to support generation clusters development and International Interconnections
- Strategic Environmental Assessment of new Tx Lines corridor or path options study
- Energy and transmission system long term planning (30) and (20) years
- Stamp tariff to consumers for transmission costs
Main role in transmission system expansion planning

New role: Manages Tenders processes and supervise regulated transmission expansion projects executions (Upgrades and new projects) (Except dedicated)

Manages international interconnections

New role: Monitor Gx and Tx market competitiveness and payments chain
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**CHILEAN MAIN POWER SYSTEMS**

**NORTHERN GRID "SISTEMA INTERCONECTADO DEL NORTE GRANDE – SING"**
- Customers Regulated Price/Non Reg. Price: 11% / 89%
- Hidro/GNL/Coal/Oil/ Eolic/Solar: 0,4% / 35,2% / 51,0% / 8,8% / 2,2% / 2,5%
- Length: 700 km
- Population: 6%

**CENTRAL SOUTH GRID "SISTEMA INTERCONECTADO CENTRAL – SIC"**
- Customers Regulated Price/Non Reg Price: 70% / 30%
- Hidro/GNL/Coal/Oil/ Eolic/Solar: 40,7% / 11,7% / 18,9% / 20,8% / 5,1% / 2,8%
- Length: 1,800 km
- Population: 92%
ENERGY PRICES EVOLUTION

PRECIO MEDIO DE MERCADO

Average market Price bilateral contracts)

COSTOS MARGINALES

Spot Price in Pool market

Fuente: CNE
TRUNK TRANSMISSION PROJECTS INVESTMENTS (MMUS$)
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OPPORTUNITIES AND CHALLENGES
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INTERCONNECTION SIC-SING’S PROJECT

INTERCONNECTION 220 Kv
July 2018

INTERCONNECTION 500 Kv
December 2020

NEW ISO – “COORDINADOR”
January 2017
RNCE INTEGRATION - SYSTEM IMPROVEMENTS

**GENERATION FLEXIBILITY**
- **GEN UNITS**
  - Flexible conventional Units
  - Help RNCE variability (Ancillary Services)
- **SYSTEM INTERCONNECTION**
  - Dynamic power transfer reduces operating impacts
- **AGC**
  - AGC Implementation will help RNCE variability control

**TRANSMISSION SYSTEM**
- **INTERCONNECTION AND CAPACITY**
  - Increase RNCE integration and a bigger market to sell energy to the pool or consumers
- **LOCALIZATION**
  - RNCE in places closer to demand (demand SS/EE)
REGIONAL INTERCONNECTIONS
Interconnection 345 kV
Transmission line, 408 Km, allows export/import energy to Argentina

Decreto N° 7/2015: Authorized to export energy to Argentina
REGIONAL INTERCONNECTION - PERÚ

Frame: Andean Electric Interconnection System Study

OPTION 1 & 2
1) TACNA – ARICA AC line 220 kV Back to Back station. Cap 100 MW 55 kM dist.
2) TACNA – ARICA DC line 220 kV 2 HVDC Stations

OPTION 3
MONTALVO – NCE DC line 500 kV 2 HVDC Stations. CAP 1000 MW 607 kM dist

INTERCONNECTION IS TECHNICALLY FEASIBLE!
SUMMARY CHALLENGES AND OPPORTUNITIES

Law Amendments strengthen power system capacity – drives to a competitive energy market

Law Amendments leads to direct and clear transmission tariff - helps to lower energy prices to consumers

Law Amendments helps to facilitate the process of implement power transmission lines new projects.

RNCE a Gen projects benefit of SIC & SING interconnection - Access to a bigger market

RNCE a Gen projects also benefit from regional interconnection high potential
Law Amendments strengthen power system capacity – drives to a competitive energy market.

Law Amendments leads to direct and clear transmission tariff - helps to lower energy prices to consumers.

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RNCE a Gen projects benefit of SIC & SING interconnection - Access to a bigger market.

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děkuju mnohokrát!

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