



THE ECONOMIC REGULATORY FRAMEWORK OF ELECTRICITY TRANSMISSION

Dr. Marcelino Madrigal Martínez*
Comisionado
Comisión Reguladora de Energía

April 15th, 2016
CIDE



**Las opiniones vertidas son a título personal y pueden no representar la posición de la Comisión Reguladora de Energía y su Órgano de Gobierno*



SOME INTRODUCTORY CONSIDERATIONS ON TRANSMISSION REGULATION AND THE FACTORS THAT INFORM CHOICES



What regulation needs to achieve from the perspective of a network user

1. There has to be a network available everywhere
2. I need to be able to connect when I what I want
3. At low and stable prices and high quality standards



What regulation needs to achieve from the perspective of an monopoly transmission (or other services) provider

1. There will be a network if I get the resourced I need to build it
2. Access will be granted if you don't bother and in due time
3. Prices are never enough to guarantee reliability of the network



What regulation needs to achieve from the regulator perspective

1. Networks need to be developed efficiently
2. Access needs be granted transparently and non-discriminatorily
3. Prices to recoup efficient costs at required service standards



How to Align the Incentives ? There is no perfect answer

- What is the right balance between market and regulatory mechanisms ?
- Power networks make energy markets imperfect
- Regulation can also be imperfect
- Goals and specific conditions need be analyzed to define the blend that regulatory instruments should use
- The greatest failures in market design come from copying models used under very different conditions (institutional, market structure, physical)



How to Align the Incentives ? There is no perfect answer

- What is the right balance between market and regulatory mechanisms ?
- Power networks make energy markets imperfect
- Regulation can also be imperfect
- Goals and specific conditions need be analyzed to define the blend that regulatory instruments should use
- The greatest failures in market design com from copying models used under very different conditions



Some Particular Features of System

- System with growing demand, not highly interconnected, with some potential lag in investments
- Investment needs from growing demand, but also from need to expand the network to where renewables are located
- As of today, one transmission operator, limited information, unbundling process underway
- In general: a network that needs to grow efficiently (or “eliminate” the transmission barrier efficiently for markets to function)



The Choice of Instruments and Goals

- Transmission cost (excl. System operations) is mostly investment cost (>90%), O&M is the rest
- Efficiency is dynamic. Do we want to improve efficiency by 5% in capital cost over the next 4 years, or do we want to save 10% in O&M over the next 10. Which is better ?
- The choice of instrument will drive what is achieved and when
- The form of regulation is only half of the equation, how costs are allocated is equally important



Some features of the reform

- A big incumbent transmission company in the process of separation
- The reform provides for multiple actors (“transcos”) in the transmission business (finance, construction, and operation of the assets), via special purpose public-private-partnership contracts or associations
- The ministry of energy approves the transmission issued by CENACE and with review from CRE
- The ministry decides which investments of the plan will be implemented by the incumbent utility and which ones by the new actors (contracts or associations)
- There is also the possibility of fully merchant transmission



THE ADOPTED REGULATORY FRAMEWORK FOR THE TRANSMISSION SECTOR: ECONOMIC REGULATION AND PRICING



The adopted regulatory framework

- Planning to guide investment needs
- Competition for the market, tenders for new projects executed by associations or contracts
- There is still the possibility of merchant transmission
- There is monopoly on system operations and to a great extent on planning, no need for a monopoly in transmission ownership



Objectives of the adopted approach

- Facilitate transition to the new market structure: unbundling, making it easier to first reveal costs
- First tariff period of 3 years
- Provide clear, simple, and stable signals to transmission users
- Focus on efficiency improvements where gains are potentially larger: e.g. investment cost for network growth needs
- Explore incentives to improve operational efficiency where there is room for improvement with verifiable data and effective methods



Economic Regulation of the Incumbent Transmission Company: Existing CFE-Grid

- Regulated income: Cost of Service Regulation with Incentives

$$R = C + OM - X$$

- C Capital cost and depreciation
- OM Efficient operational expenses
- X Efficiency improvements factor



Approved Revenue and Transmission Prices

- Applicable for the period of 2016-2018.
- Includes all transmission assets with voltages equal or greater than 69 kV.
- Revenue Split 70% to consumers and 30% generator in a per KWh.
- Postage stamp like tariffs differentiated by voltage level
- X Factor defines and efficiency trajectory of 1% annual reduction in OMA with respect to historical cost
- Adjustments: with efficiency gains, fraction with a exchange rate, inflation
- Revenue to include new investments as auctions developed (next slide)

Approved Revenue (Million Pesos)		
2016	2017	2018
44,687	44,777	45,025

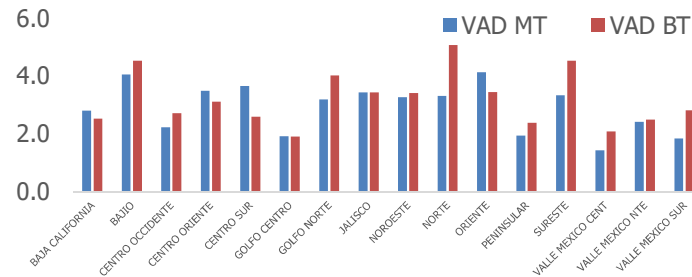
Transmission Tariffs (pesos/KWh, 2016)		
Voltage Level	Generators	Consumers
Voltage \geq 220 kV	0.0499	0.0625
Voltage < 220 kV y \geq 69 kV	0.0904	0.01424



Distribution Tariffs

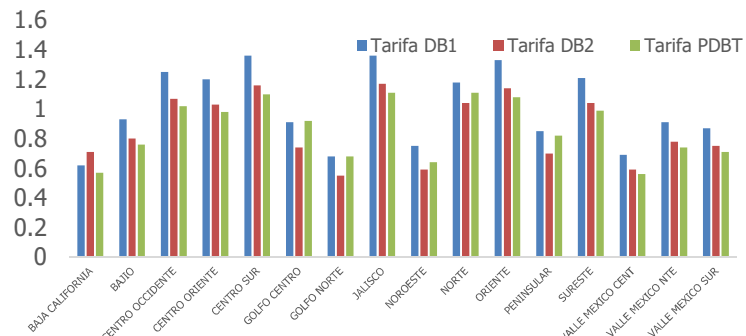
- Tarifas aplicables primer periodo tarifario 2016-2018.
- Tarifas diferenciadas para 16 divisiones de distribución.
- Se determino ingreso eficiente requerido de operación y mantenimiento y capital para cada división.
- Se reconoce un valor máximo de 5% de pérdidas técnicas y 5% no técnicas.
- Se exige una reducción para cada zona que están por arriba de este umbral. Reducciones son de hasta 2.5% para técnicas y hasta 0.8% para no técnicas.
- Se aplica a las tarifas de distribución un coeficiente de 0.95, cuando son generadores conectados a las redes de distribución.
- Cargos se actualizan por inflación y otros factores claramente establecidos.

Ingreso requerido 2016 por división de distribución (miles de millones de pesos)



TOTAL (Miles de millones de pesos)
VAD Media Tensión (MT) y Baja Tensión (BT)
97.45

Tarifas 2016 de baja tensión y pequeño consumo(*) (pesos/kWh)



Doméstico Baja Tensión hasta 150 kWh-mes (DB1)
Doméstico Baja Tensión mayor a 150 kWh-mes (DB2)
Pequeña Demanda Baja Tensión hasta 25 kW-mes (PDBT)



CENACE Regulated Revenue and Fees

- El periodo tarifario es de un año calendario. CENACE presentará cada septiembre su propuesta.
- Incluye inversión para el lanzamiento del mercado y resta ingresos misceláneos del CENACE.
- Ingreso se asigna 30% generadores y 70% cargas.
- Se desarrollarán indicadores de desempeño y calidad en el servicio para el segundo año tarifario.

Ingreso Requerido (Millones Pesos, 2016)

	2016
Ingreso Requerido	2,732

Cuota (pesos)	Periodicidad de cobro	Concepto
\$8,467	Anual , por punto de carga	Operación y mantenimiento del sistema de medición
\$30,000	Único , por punto de carga	Por la obtención del registro a nuevos participantes
\$1,000	Anual , para generadores	Por MW de capacidad

Tarifas de la operación del CENACE (2016)

Centavos de pesos / kWh

Generadores	Cargas
0.24807	0.64824



Auctions for New Transmission Under Contract or Associations

Market mechanisms to determine the lowest required revenue to develop, finance, build, and operation new transmission additions.

- ✓ Projects must form part of PRODESEN
- ✓ They must have been instructed by SENER to be developed under this new scheme
- ✓ Must be awarded under a competitive auction process
- ✓ Bidding must include “reserve prices” for which project is not awarded
- ✓ The regulated income is expressed as a constant annuity for the life of the project

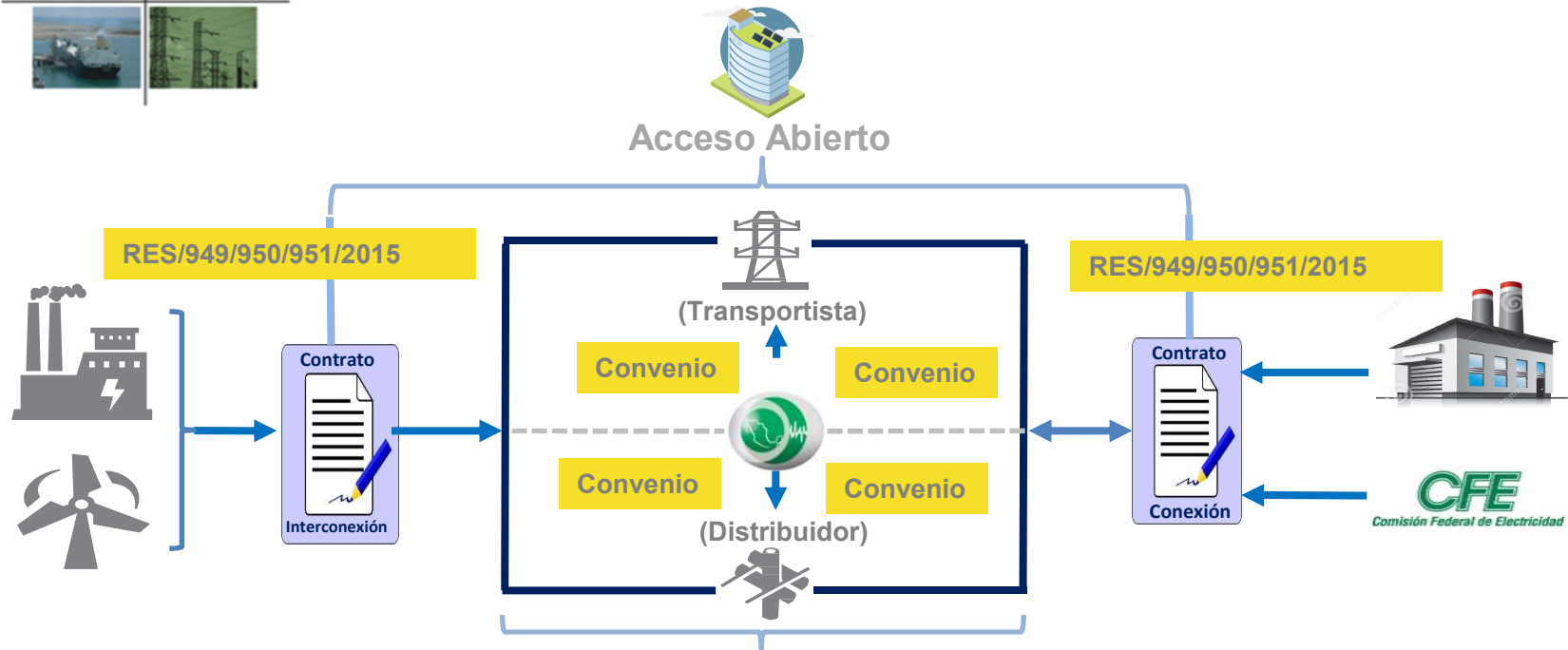
- ✓ **Regulated income determined by auction.** Lower annuity that results from the competitive process (auctions). The annuity is specified by all bidders so that it covers their cost to design, finance, build, and operate their project during its life in optimal conditions according to network code.
- ✓ **Annual payment added to existing network required revenue** existing network and new auctioned projects income form the total network income that is recouped for network tariffs
- ✓ **Annual payment modified only by inflation and other indices**



THE ADOPTED REGULATORY FRAMEWORK FOR ACCESS AND QUALITY REGULATION



New Instruments for Access Regulation: Set I



Interconnection Criteria: Rules for Performing Interconnection Studies and Determining Interconnection Needs

The Grid Code: Reliability, Quality, and Security Criteria for the Grid



Terms and Conditions for Transmission and Distribution Services

Contents:

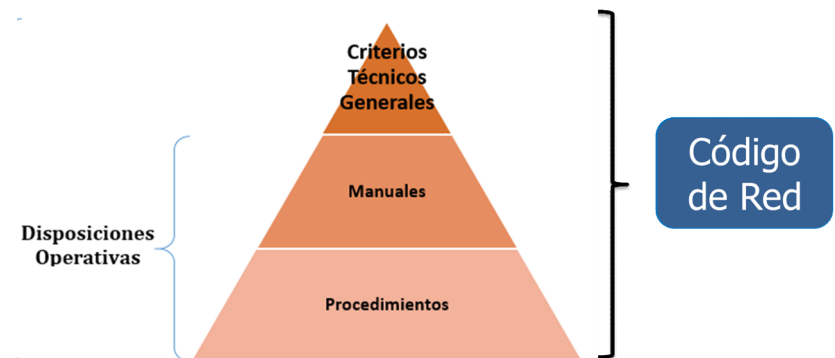
- **Apartado 1.** General provisions
- **Apartado 2.** Public Service Nature of Grids
- **Apartado 3.,** Availability, Continuity, Quality of Services
 - Artículo 18. Performance parameters of the transmission network
 - Artículo 19. Quality and continuity of service indicators
- **Apartado 4.** Terms of service



Reliability, Quality, and Security Criteria of the System: Grid Code

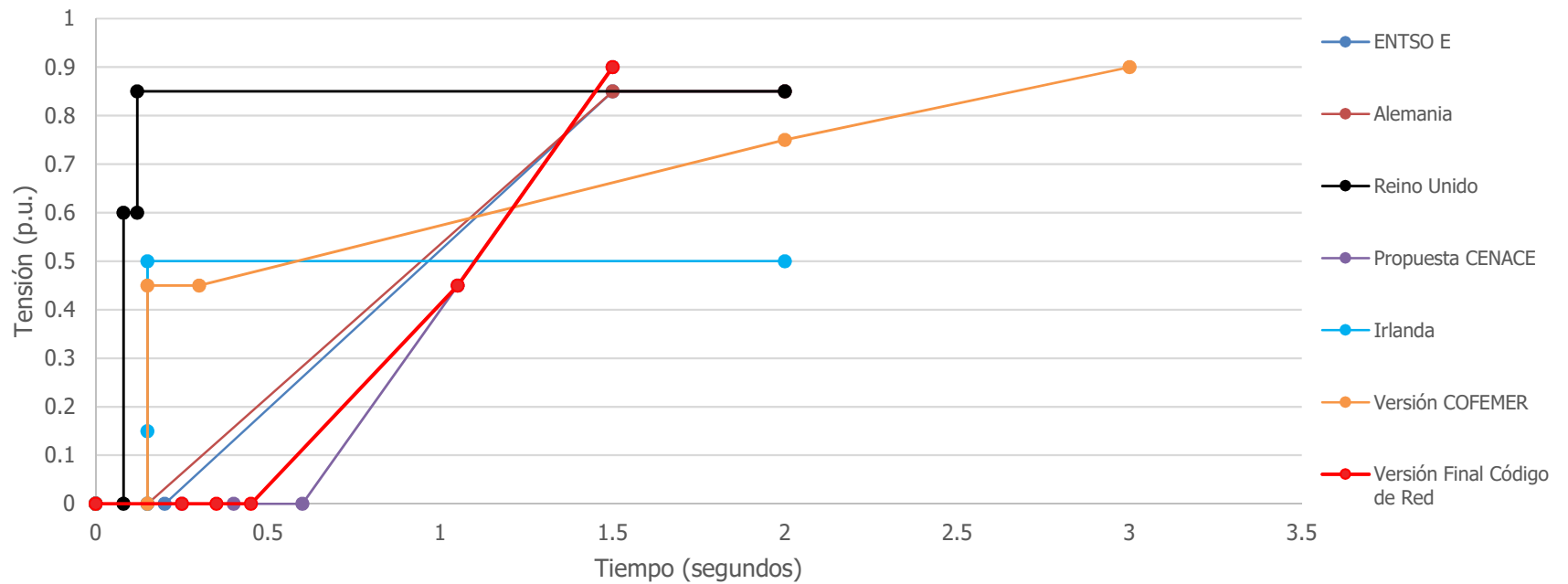
Criterios y requerimientos técnicos mínimos para el desarrollo eficiente de la planeación, control operativo, acceso y uso de la infraestructura del SEN para garantizar la operación confiable, continua y segura del sistema.

- Planeación del sistema.
- Operación del sistema.
- Interconexión de Centrales Generadoras.
- Conexión de Centros de Carga.
- Monitoreo del SEN.
- Interoperabilidad y seguridad informática.
- Sistemas Eléctricamente Aislados.
- Criterios específicos para áreas Interconectadas (Baja California, NERC).





Criterios técnicos generales para la interconexión de Generadores: Requerimiento de soporte de hueco de tensión





iGracias!

www.cre.gob.mx