

National Commission for Energy Conservation

# “Standards in Mexico, Basic Information”



Hawaii  
May 2005

# Index

- Electrical regulatory framework in Mexico
- Hydrogen in Mexico
- Standards in Mexico

# Electrical regulatory framework in Mexico

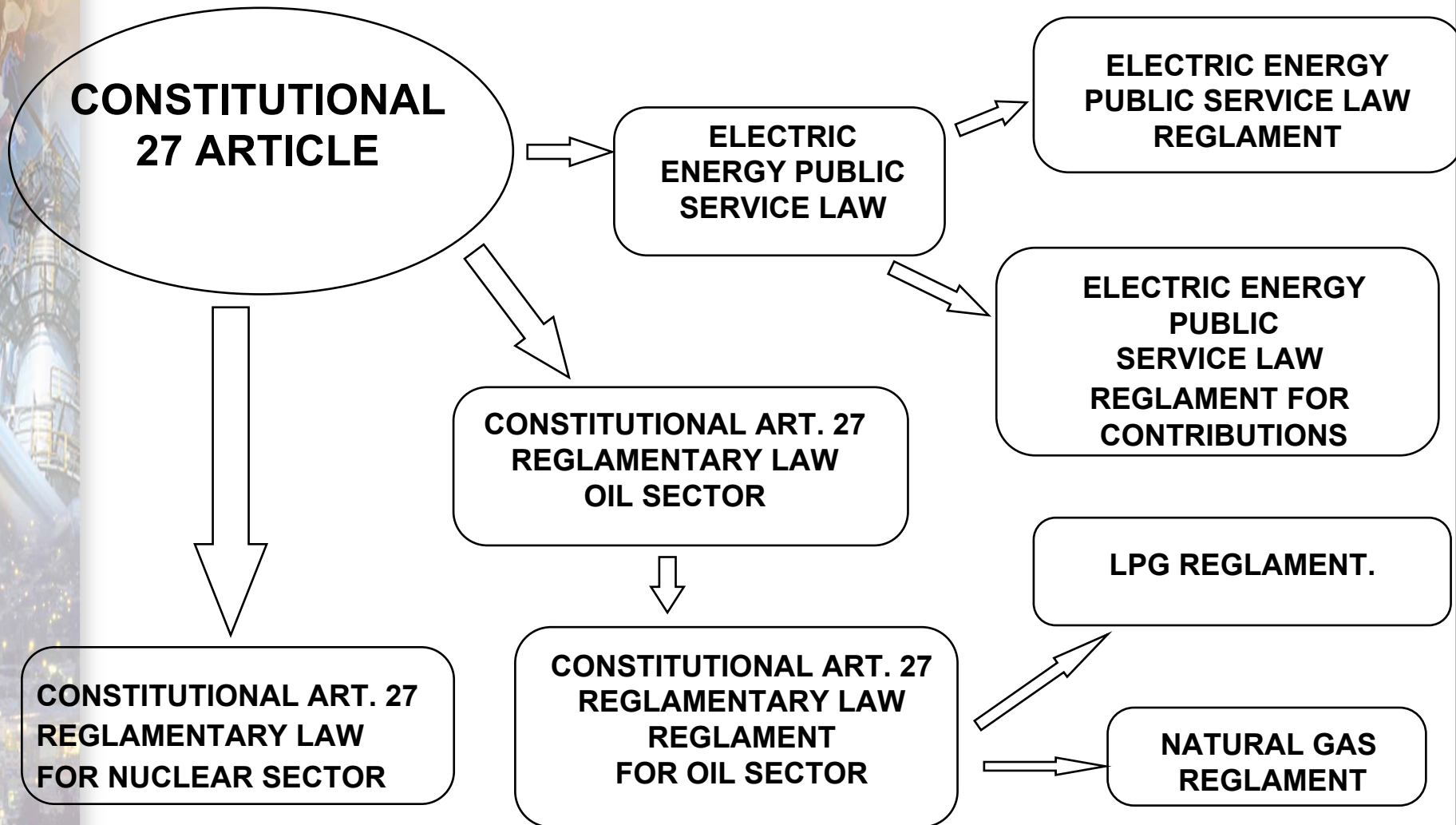


# Electrical energy in Mexico

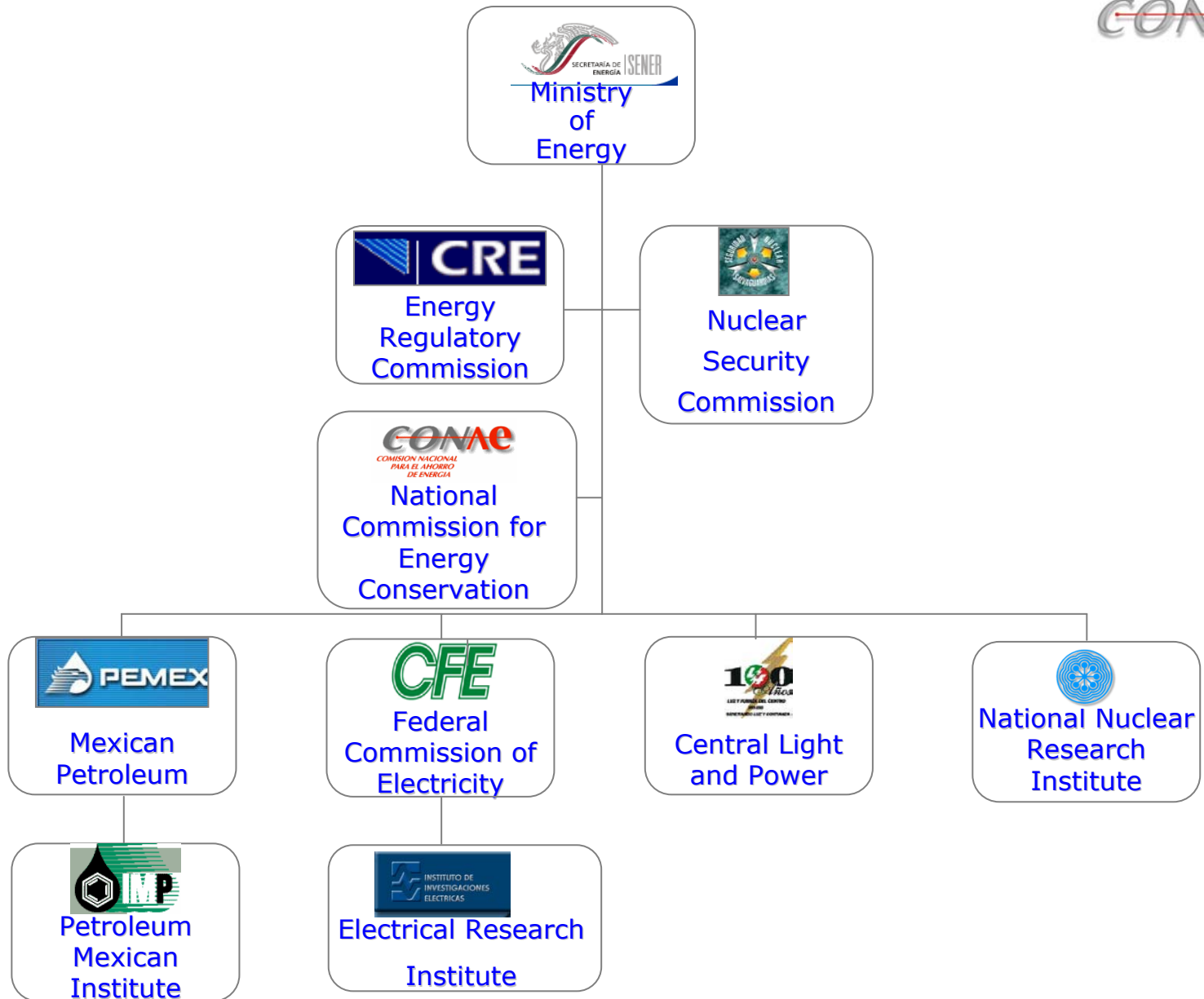


- In Mexico, generation, transmission, distribution and commercialization of electrical energy are activities exclusive for the nation, represented by Electricity Federal Commission and Central Light and Power.
- In 1992, regulatory changes had been made to allow private investments in electrical generation.

# Energy Sector Basic Regulatory Framework



# Electrical sector in Mexico



# Hydrogen in Mexico



# Production

- Hydrogen is produced in Mexico mainly in:
  - Pemex. Is the organism in charge of use, handling and commercialization of all hydrocarbons derivatives.
  - Private sector. produces hydrogen for use as raw material to elaborate others products, goods or services.



# Pemex



- In Mexico the production of the resources of hydrocarbons is exclusive of the nation and this represented by PEMEX, in where the function of the petrochemical industry, is to transform the natural gas and some derivatives of petroleum into raw materials, which represent the base of diverse productive chains. PEMEX, is divided in:
  - Pemex exploration and Production
  - Pemex Refining
  - Pemex petrochemical and
  - Pemex Corporative

# Pemex



- **The basic petrochemical products are:** ethane, methane, pentane, propane, butanes, gasoline and raw material for black of smoke and others (it includes hexane and heptanes).
- **The no basic ones are:** ethylene ammonia, benzene, dichloroethane, ethylene oxide, methanol, paraxilene, propylene, toluene, xylems and others.
- **The main petrochemical chains** are those of the natural gas, the light olefins (ethylene, propylene and butadiene) and the one of the aromatic ones.
- From the **natural gas** the synthesis gas takes place, which allows the large-scale production of **hydrogen**, and later the production of ammoniac and methanol.
- From **ethylene** the different polyethylene classes take place, chloride of vinyl, chlorinated derivatives, oxidize of ethylene and styrene monomer. These derivatives are used for the production of plastics, coverings, molds, etc.

- **From propylene compounds** like isopropyl alcohol take place, polypropylene and acrylonitrile. They are used in the synthetic industry of plastics, paintings and fibers.
- **By baking of butanes**, or like by-product of the process of ethylene manufacture, the 1,3-butadiene is obtained that is a fundamental raw material in the industry of elastomers, for the manufacture of tires, seals, etc.
- **A fundamental chain** in the petrochemical industry is the one of the aromatic ones (benzene, toluene and xylenes). The benzene is the base of production of cyclohexane (used in the industry of nylon) and of the cumene (used in the industrial production of acetone and phenol). Xylenes, on the other hand, are the beginning of diverse petrochemical chains, mainly those of synthetic fibers.

# Pemex/production of hydrogen



- The petrochemical industry in Pemex bought to its subsidiaries in 2002, 12 millions of cubic feet of hydrogen, equivalent to 67 millions of pesos.

# Hydrogen in private industries

- The hydrogen is produced by:
  - Catalytic reformation
  - Electrolytic
  - As sub product from several chemical processes

# Hydrogen in private Industries

- In Mexico, there are 36 plants for hydrogen production (installed capacity 16,797 Ton/year).



# Uses for hydrogen in México (private industries)

- In petrochemical industry, to produce polyethylene and polypropylene.
- Hydrogenation of eatable oils.
- Flat glass production for flotation.
- Production of Hydrogen Peroxide.
- Production of stainless and galvanized steel.
- Argon purification.
- Semiconductors production.
- Turbo generators cooling in thermoelectric plants for electric generation.

# hydrogen regulatory in Mexico



- There is not specific hydrogen regulatory in Mexico, and users should to meet the referenced standards (ISO, ASME, ANSI, OSHA and NFPA) for the use, handling, distribution and storage in an efficient and safety way.



# Norm ISO 14687

Características	Tipo I Hidrógeno gas			Tipo II Hidrógeno líquido	Tipo III Hidrógeno a altas presiones (slush)
	Grado A	Grado B	Grado C		
Pureza del hidrógeno	98	99,9	99,995	99,995	99,995
Para-hidrógeno	NE	NE	NE	95	95
En micromoles/mol salvo otra especificación					
	Tipo I			Tipo II	Tipo III
	Grado A	Grado B	Grado C		
Pureza Hidrógeno (Mínimo mol %)	99,90	99,90	99,995	99,995	99,995
Para-Hidrógeno (Mínimo mol %)	NE	NE	NE	95,0	95,0
Impurezas (Contenido máximo)					
Gases Totales				50	50
Agua (cm <sup>3</sup> /m <sup>3</sup> )	NC <sup>a</sup>	NC		<sup>b</sup>	<sup>b</sup>
Hidrocarburos totales	100	NC		<sup>b</sup>	<sup>b</sup>
Oxígeno	<sup>c</sup>	100		<sup>c</sup>	<sup>c</sup>
Argón	<sup>c</sup>			<sup>c</sup>	<sup>c</sup>
Nitrógeno	<sup>c</sup>	400		<sup>b</sup>	<sup>b</sup>
Helio				39	39
CO <sub>2</sub>				<sup>d</sup>	<sup>d</sup>
CO	1			<sup>d</sup>	<sup>d</sup>
Mercurio		0,004			
Azufre	2,0	10			
Partículas permitidas	<sup>e</sup>	<sup>e</sup>		<sup>e</sup>	<sup>e</sup>
Densidad					<sup>f</sup>

NOTA 1 NE: No especificado

NOTA 2 NC: Que no esté condensado

<sup>a</sup> Agua, oxígeno, nitrógeno y argón combinados: Máx. 1900 µmol/mol.

<sup>b</sup> Nitrógeno, agua e hidrocarburos combinados: Máx. 9 µmol/mol.

<sup>c</sup> Oxígeno y argón combinados: Máx. 1 µmol/mol.

<sup>d</sup> CO<sub>2</sub> y CO total: Máx. 1 µmol/mol.

<sup>e</sup> A ser acordado entre cliente y proveedor.

<sup>f</sup> El hidrógeno no deberá contener polvo, arena, suciedad, gomas, aceites u otras sustancias, en cantidades suficientes, que dañen el equipo de la estación de carga o el vehículo (motor) en el que será utilizado.

# Norms in Mexico

- The basics in standards process are:
  - Representativeness
  - Consensus
  - Public Consult
  - Modification and
  - Actualization

# Norms in Mexico



# Normalization process in Mexico



- This process consists in the elaboration, expedition and diffusion of the standards to national level. There are three types:
  - Mexican Official Norm
  - Mexican Norm
  - Reference Norms

# Mexican Official Norm

- It is the technical regulation of obligatory observance sent by the competent dependencies through its respective National Consultative Committees of Normalization, in accordance with the purposes established in article 40 of the Federal Law on Metrology and Normalization (FLMN), establishes rules, specifications, attributes, directives, characteristics or prescriptions applicable to a product, process, installation, system, activity, service or method of production or operation, as well as those relative ones to terminology, packing noticeable or labeled and those that talk about to their fulfillment or application to it.

# Mexican Norm



It is the one that elaborates a national organisms of normalization, or the Secretariat of Economy in absence of them, in accordance with the arranged thing by article 54 of the FLMN, in the terms of the FLMN, that anticipates for common and repeated use rules, specifications, attributes, test methods, directives, characteristics or prescriptions applicable to a product, process, installation, system, activity, service or method of production or operation, as well as those relative to terminology, packing, marked or labeled.

# Reference Norms

- They are those that elaborate the organizations of the public administration in accordance with the arranged thing by article 67 of the FLMN, to apply them to the goods or services that they acquire, they rent or they contract when the Mexican or international norms do not cover the requirements with the same ones or their specifications are obsolete or inapplicable.

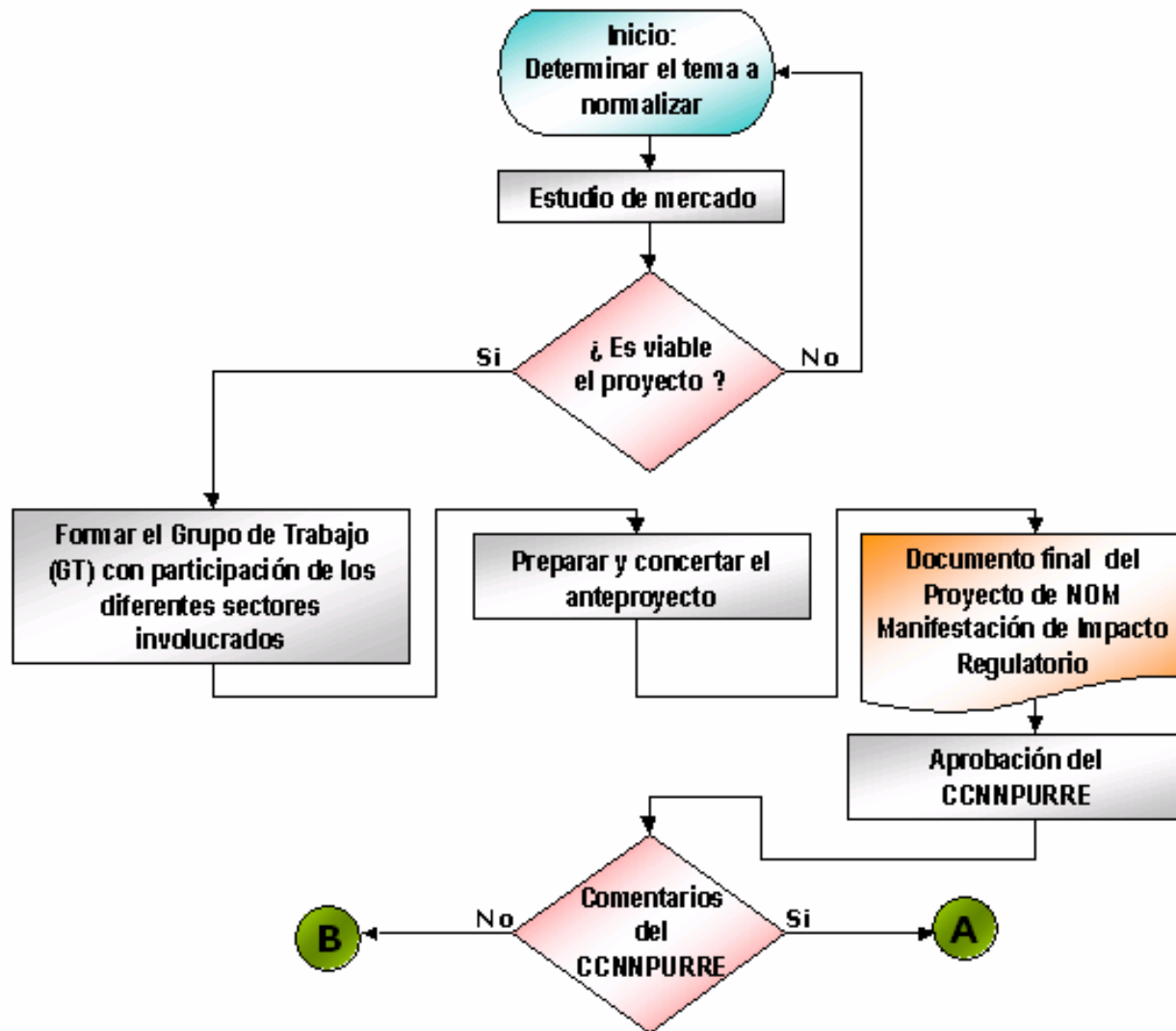
# Other norms used in Mexico

Within the normalization process, for the elaboration of the national norms the international norms are consulted:

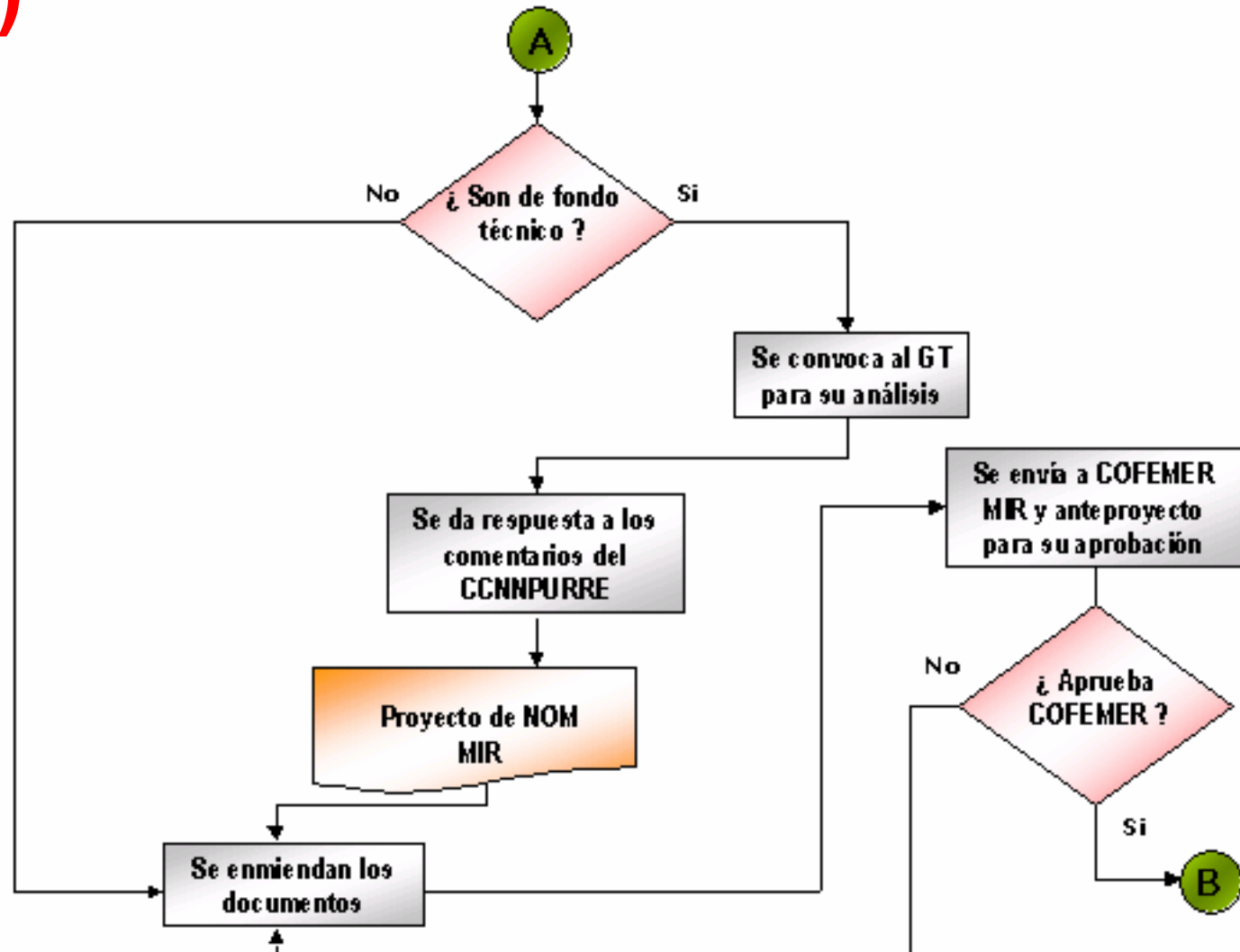
- Norm or international lineament, that emits an international organism of normalization or another international organism related to the matter, recognized by the Mexican government in the terms of the international right.
- Foreign norm, that officially emits an organism or recognized public or private dependency of normalization by a country.



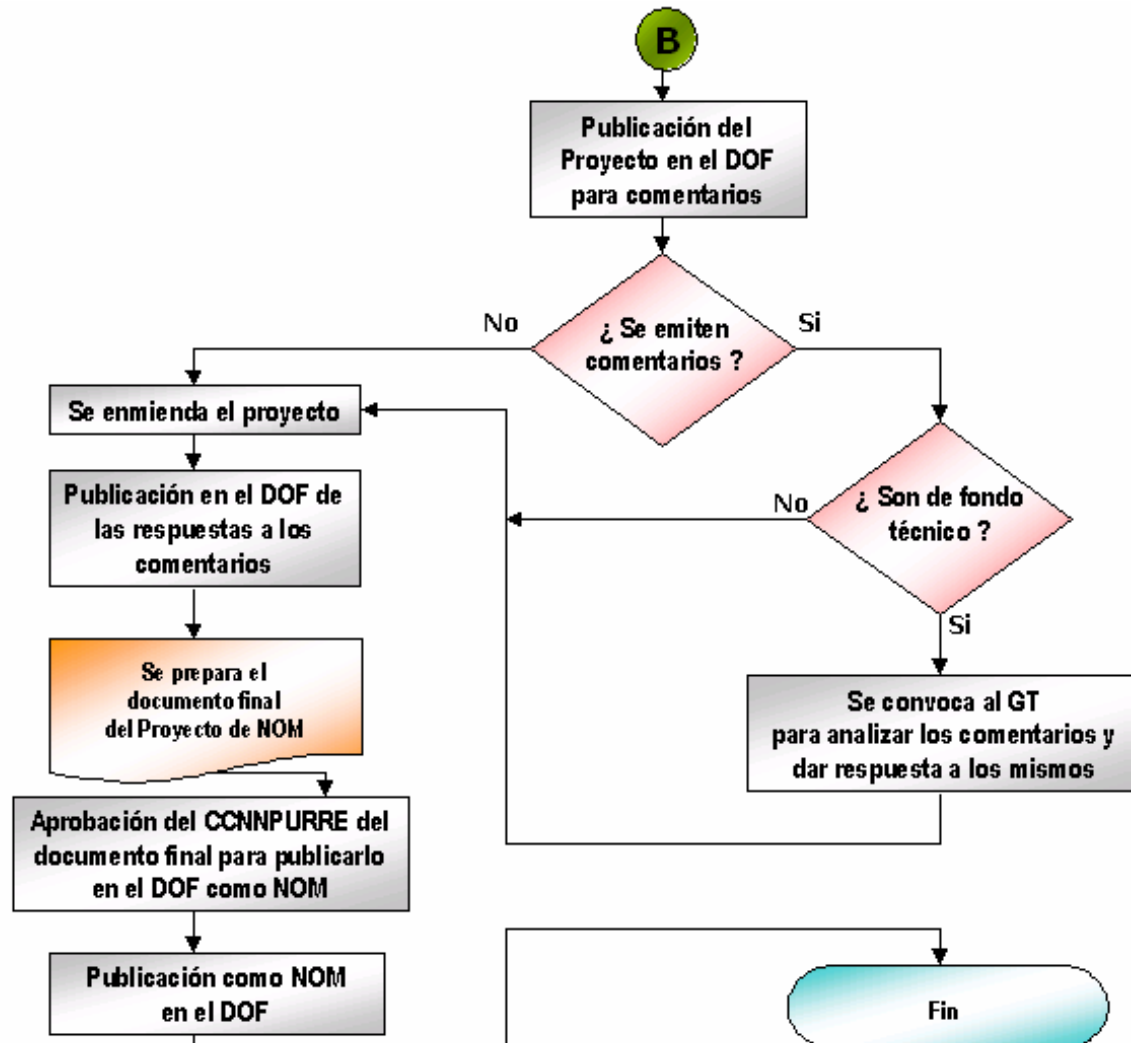
# Process of accomplishment or update of norms in Mexico (1/3)



# Process of accomplishment or update of norms in Mexico (2/3)



# Process of accomplishment or update of norms in Mexico (3/3)



# Considered time of accomplishment process or update of norms in Mexico



# Organisms involved in the accomplishment of norms in Mexico (1/2)



- Secretariat of Energy  
<http://www.energia.gob.mx/>
- National Commission for Energy Conservation  
<http://www.conae.gob.mx/wb/distribuidor.jsp?seccion=22>
- Secretariat of Economy – General Direction of Norms  
<http://www.economia.gob.mx/html/normas.asp>

National Association of Normalization and Certification of the Electrical Sector, (ANCE) A.C.

<http://www.ance.org.mx/index1.htm>

- National organism of Normalization and Certification of the Construction and Building , ONNCCE, S.C.  
<http://www.onncce.org.mx/>

# Organisms involved in the accomplishment of norms in Mexico (2/2)



- Electrical Research Institute  
<http://www.iie.org.mx/>
- Pan-American Commission of Technical Norms  
<http://www.copant.org/>
- Advice of Harmonization of Electro technical Norms of the Nations of America  
<http://www.canena.org/>
- National Ecology Institute  
<http://www.ine.gob.mx/>
- Federal Commission of Regulatory Improvement  
<http://www.cofemer.gob.mx/>

# Legal Foundation (1/5)

The main referring documents of legal endorsement in Mexico to normalization, are:

- The Federal Law on Metrology and Normalization (FLMN), that is in force from the 16 of 1992 July and its Regulation from the 15 of January of 1999, establishes that the dependencies of the Federal Public Administration, in their scope of competition, constitute the National Consultative Committees of Normalization (NCCN) to send Mexican Official Norms (NOM), on products, processes, methods, facilities, services or activities, as well as to promote their application and to watch their fulfillment.

<http://www.economia.gob.mx/?P=993>

- Regulation of the Federal Law on Metrology and Normalization  
([http://www.economia.gob.mx/work/normas/Marco\\_legal/Reglamentos/rlfmn.pdf](http://www.economia.gob.mx/work/normas/Marco_legal/Reglamentos/rlfmn.pdf))

## Legal Foundation (2/5)

- The Secretariat of Energy, by conduit of the National Commission for de Energy Conservation, has the faculty to emit Mexican Official Norms of Power Efficiency, which are formulated by the National Consultative Committee of Normalization for the Preservation and Rational Use of Energetic Resources (CCNNPURRE), which it is presided over by the Conae's General Director.



# Legal Foundation (3/5)

- Procedures for the evaluation of the conformity. Procedures of certification and verification of subject products to the fulfillment of the Mexican official norms, competition of the Secretariat of Economy.

[http://www.economia.gob.mx/work/normas/Marco\\_legal/Acuerdos/Acdo\\_normas\\_27mar02.pdf](http://www.economia.gob.mx/work/normas/Marco_legal/Acuerdos/Acdo_normas_27mar02.pdf)

# Legal Foundation (4/5)

- Agreement that identifies the tariff fractions of the tariffs of the Law of the General Tax of Import and the Law of the General Tax of Export, in which classifies the subject merchandise to the fulfillment of the Mexican official norms in the entry point from the merchandise to the country, and in the one of their exit, published in the Official Newspaper of the Federation the 27 of March of the 2002. Federal law on Metrología and Normalization.

[http://www.economia.gob.mx/work/normas/Marco\\_legal/Acuerdos/Acdo\\_normas\\_27mar02.pdf](http://www.economia.gob.mx/work/normas/Marco_legal/Acuerdos/Acdo_normas_27mar02.pdf)

- Agreement on technical obstacles to the commerce

<http://www.economia.gob.mx/?P=211>

# Legal Foundation (5/5)

- Regulation of the Customs Law  
<http://www.shcp.gob.mx/servs/normativ/index.html>
- Regulation of the Law of Foreign trade  
<http://www.cddhcu.gob.mx/bibliot/>
- Regulation of the Federal Law of Economic Competition  
<http://cfc.gob.mx/cfc99e/legislacion/>



CONAE

---

CONAE

[www.conae.gob.mx](http://www.conae.gob.mx)