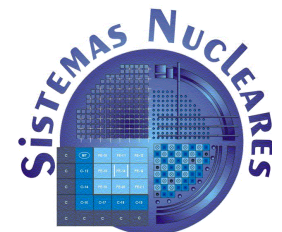


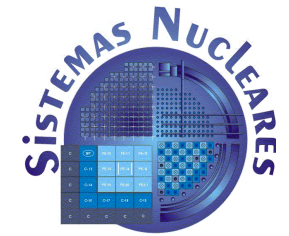


Mexican Nuclear Research Institute

Human Resources in the Area of Nuclear Energy in Mexico

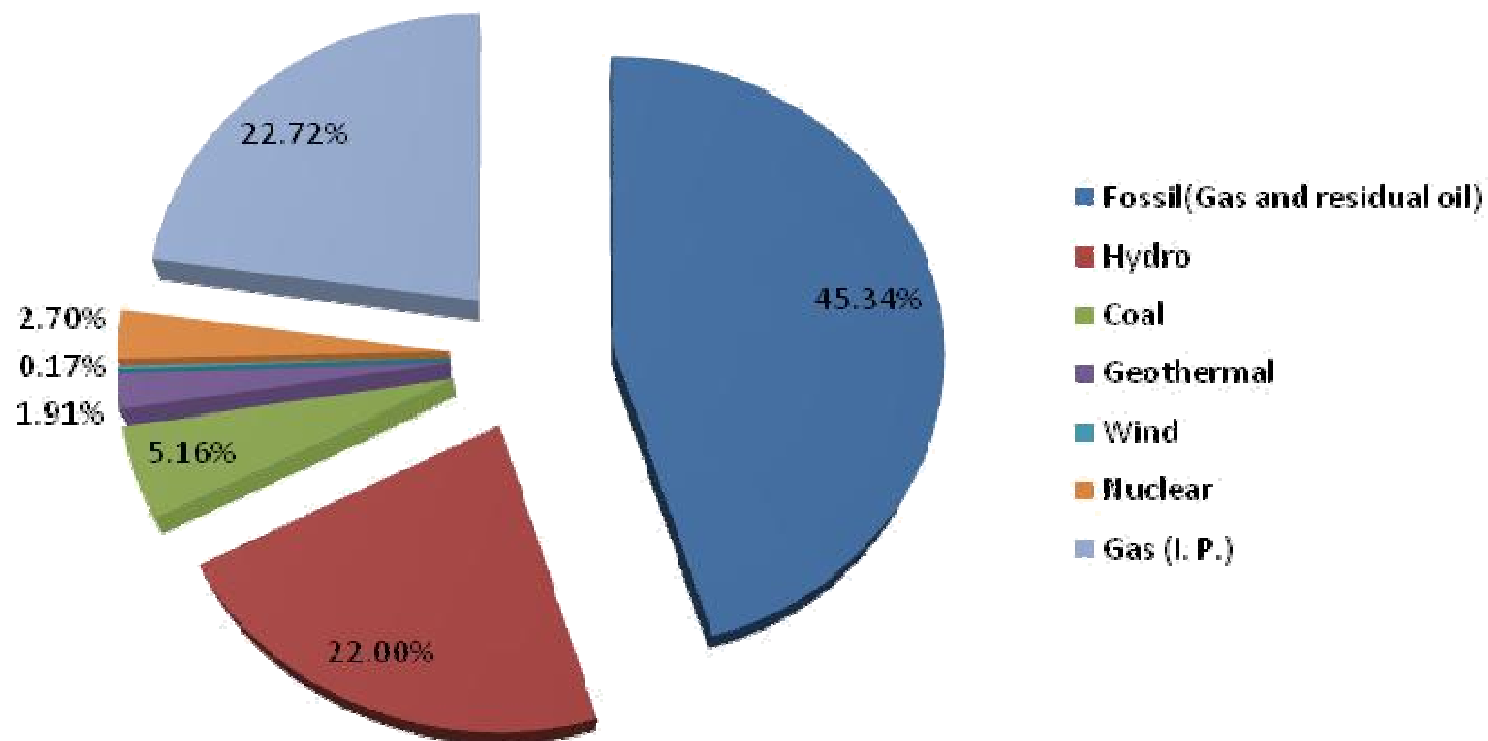
Luis C. Longoria, Javier C. Palacios,
Gustavo Alonso, Edmundo del Valle

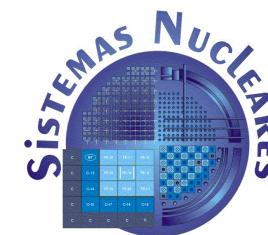




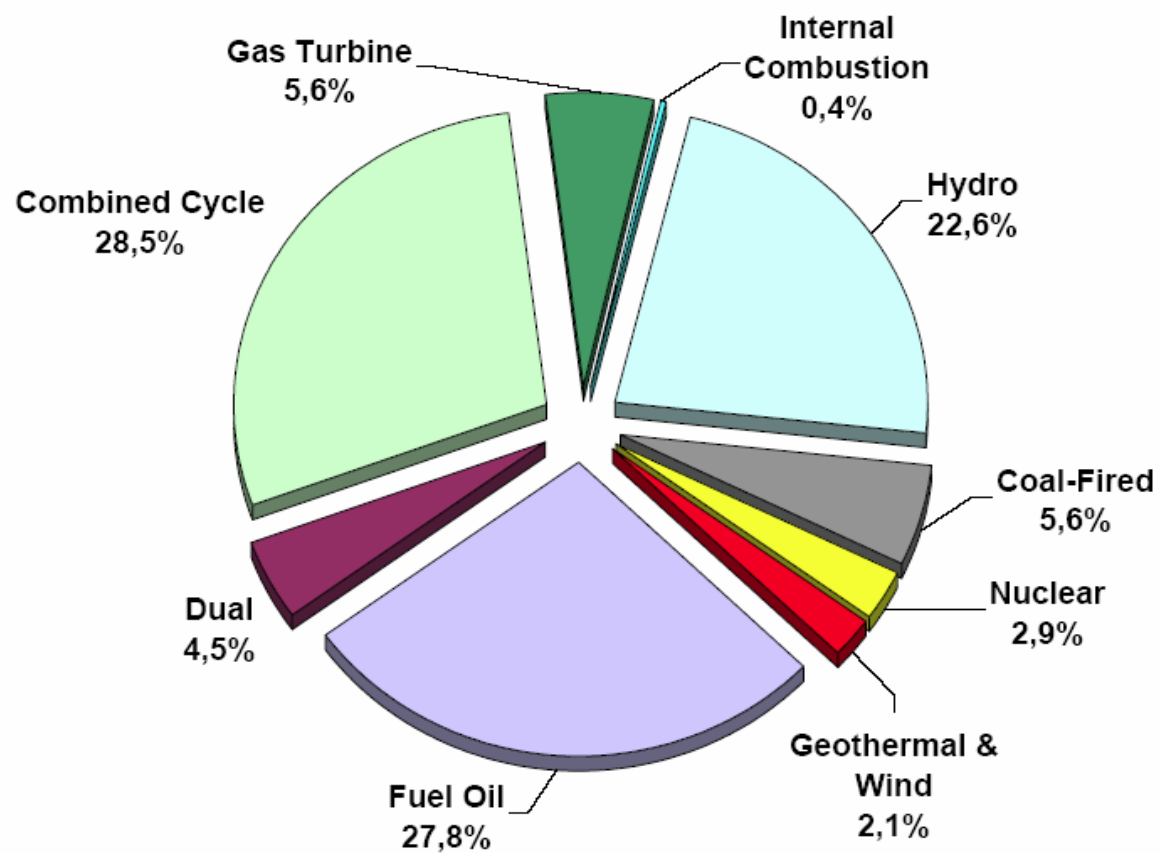
Electricity in Mexico

Source Share.





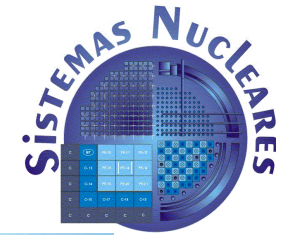
Public Service 46,534 MW*



Comision Federal de Electricidad



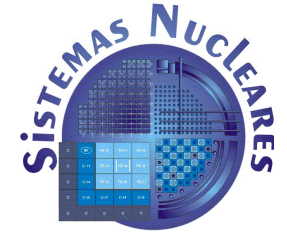
Nuclear Power In Mexico



- Two identical units BWR/5 reactors (1931 MWt Nominal Power)
- Built under an Administration Contract (multiple construction delays)
- Commercial operation
 - Unit 1, July 29, 1990,
 - Unit 2, April 10, 1995
- September 1999, Stretch Power Uprate in both units (105% nominal Power 2027 MWt)
- For the last 10 years provided ~10% of the Total Electricity Generation in Mexico
- They represent only 2.7% of the installed capacity in 2008
- Currently, an Extended Power Uprate is under revision by the Mexican Regulatory Body (120% nominal Power 2317 MWt)



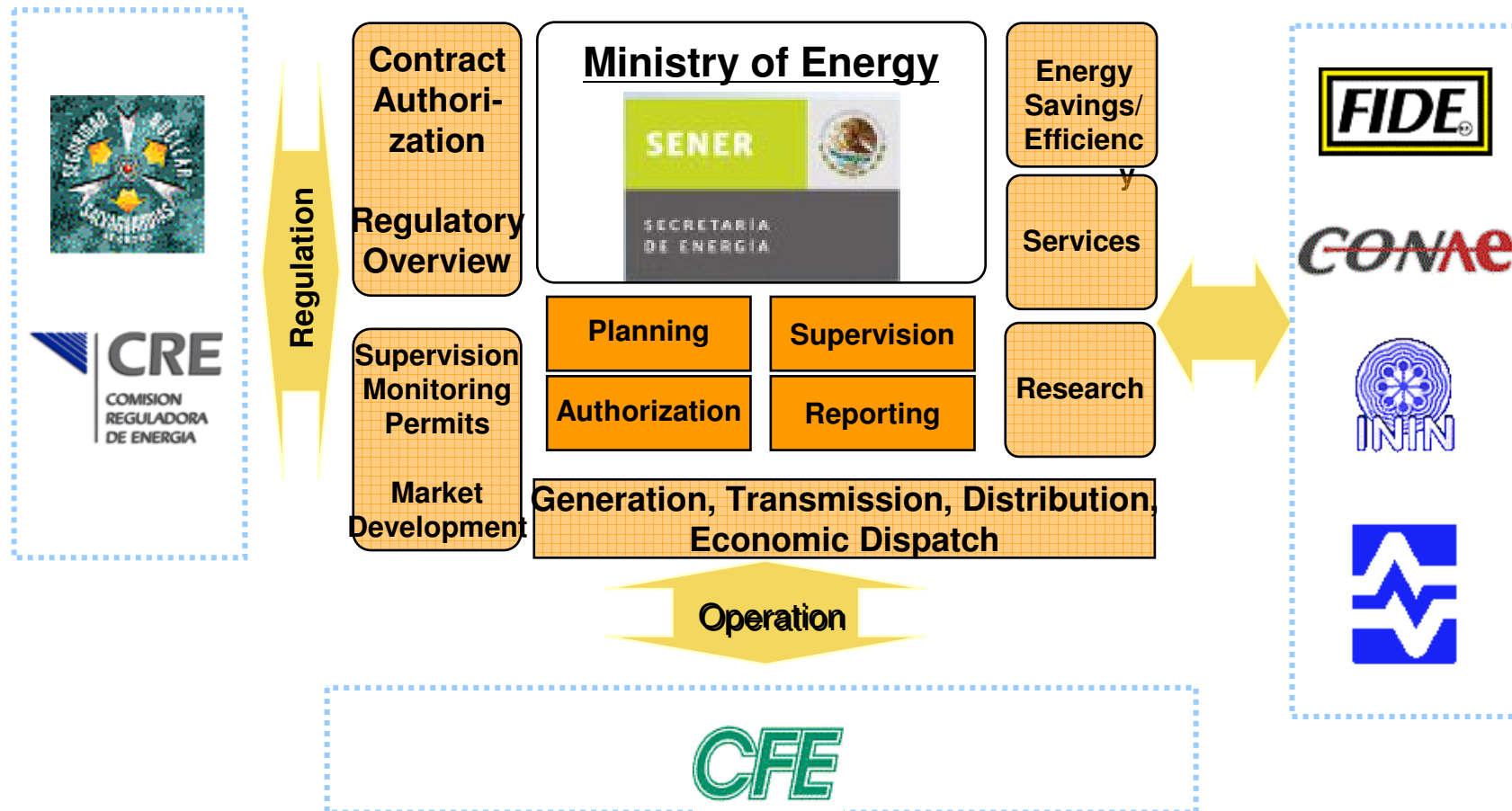
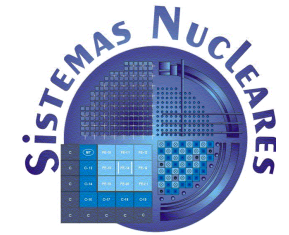
Plans for New Nuclear Power



- Since 2003 several viability nuclear power studies have been done in Mexico
- The electricity state company (CFE) has considered it as an alternative option
- The decision is controversial
- According to Mexican Law the generation of nuclear power is exclusively operated by CFE
- An International solicitation is mandatory
- Any new nuclear project is forecast to be from own resources or under a turn key project.

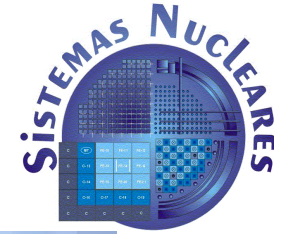


Mexican Electrical Sector





University Higher Degrees

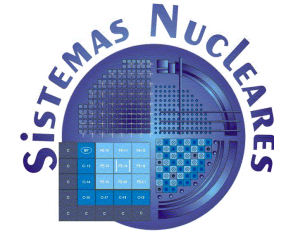


- MSc. In Nuclear Sciences. University of Mexico (1967)
- PhD. Nuclear Engineering. University of Mexico (1967)
- MSc. In Nuclear Sciences. University of Zacatecas
- MSc, PhD in Nuclear Sciences. University of the State of Mexico
- MSc. In Nuclear Engineering. Mexican Polytechnic (1961)





Human Resources

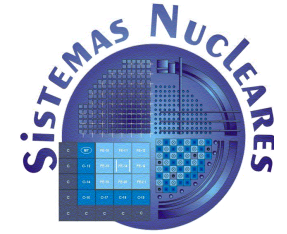


- Specialized workers, retirement
- Lack of specialized University Degrees
- Renew Workforce at the Nuclear Plant
- Continuous Training
- Women in Nuclear Jobs

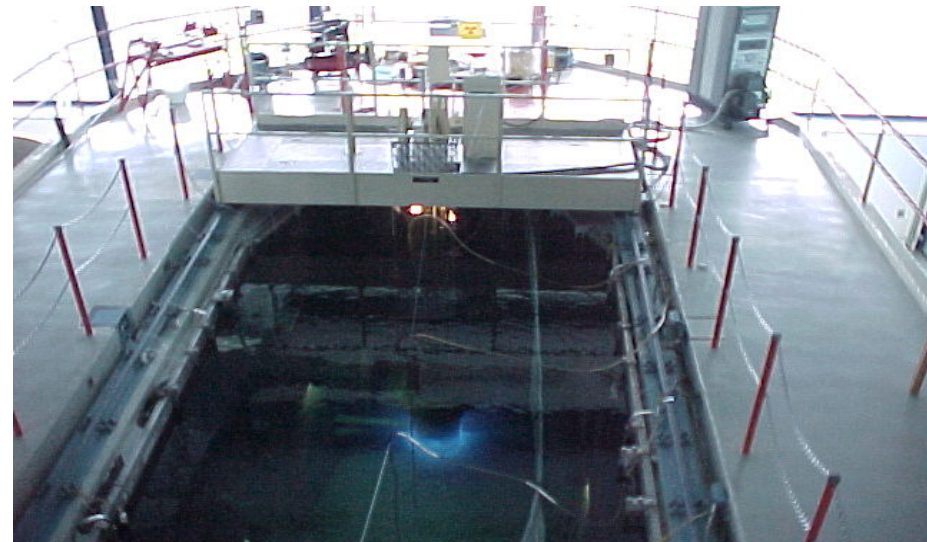




Jobs for Nuclear Engineers

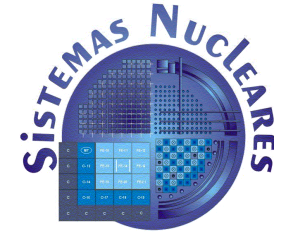


- Mexican Nuclear Research Institute 23%
- Universities (Academy) 22%
- Nuclear Regulatory Commission 13%
- Nuclear Plant 10%
- Electrical Institute 6%
- Companies Overseas 5%
- IAEA 3%





Mexican Nuclear Research Institute

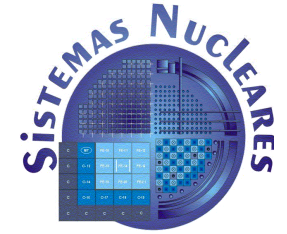


- Mexican Nuclear Research Institute has 735 full time employees.
- The average age for all the personnel is 52 years and in the case of researchers is 55 years
- Difficulty in employing new graduates
- Student Scholarship Program
- Joint academic programs with universities





Laguna Verde Nuclear Plant

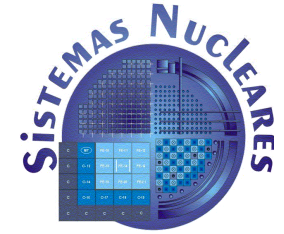


- Retirement of qualified personnel
- Difficulty in employing new personnel
- Loss of skilled workers in key areas
- New technical areas as a result of plant ageing
- Personnel for possible Plant Life Extension
- Technical dependence from external companies





Case of proposed expansion

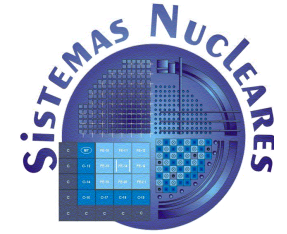


- The skilled workers needed for the construction of a new nuclear plant need to be found since almost all personnel involved in the construction of the Laguna Verde plant have retired.
- Personnel for licensing a new plant have to be recruited.
- Support personnel for the construction of a new plant





Jobs for Nuclear Engineers

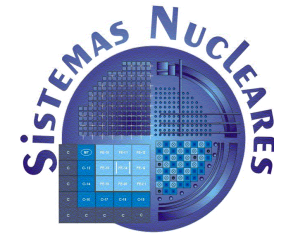


- Internship programs to prepare new graduates to work in the nuclear industry
- Multi skilled workers have to be prepared to work in several nuclear areas
- Selection and training of new personnel
- Scholarships for future engineers
- Join training Nuclear Industry, University, Research Centre





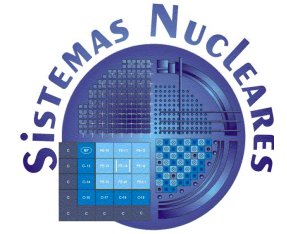
New nuclear Scientists and Engineers



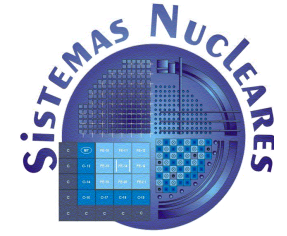
- No single university can sustain a academic program for scientists an engineers.
- There must be a network of universities offering joint academic degrees.
- Economic support for the students must be found from the Scientific Council and the nuclear Industry
- Collaboration between the Nuclear Industry and Universities
- International collaboration (WANO,NEA, WNU)
- Role of IAEA. Each state is responsible to ensure sufficient personnel for each nuclear installation.



Discussion



- Programs for nuclear scientists and engineers have to be in place according to each country's needs
- Selection of new personnel and Training of work force
- New academic programs in nuclear areas
- Joint training programs Industry, Universities and Research Centers
- International Cooperation
- Role of IAEA



END