



## Nuclear power in Spain

# The dawn of a new era

Modern energy supply was completed with two new forms of power: nuclear and natural gas, which arrived in the mid-20th century with companies connected to Gas Natural Fenosa: Unión Eléctrica Madrileña and Gas Natural.

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**T**he first International Conference on the peaceful applications of atomic energy was held in 1955, and was followed almost immediately by the first commercial orders for fission reactors, one with a capacity of 200 MWe using General Electric technology for the Dresden power plant in Illinois (USA) and another with Westinghouse technology for the Yankee power station in the state of Massachusetts, with a capacity of 175 MWe. From then, international roll-out of the new energy took place very quickly, going from an installed power of 1,400 MW in 1960 to 52,000 MW by 1973. Spain was a very different place in the early fifties. The country was hindered by lack of international recognition and its weak export capacity, which meant it could not obtain currency for badly needed imports

1951

The Nuclear Power Committee (JEN) was set up to control the country's nuclear power production.

1957

The appearance of Cenusa and Nuclenor, two organisations handling the fledgling nuclear industry. Goal: to build power stations.



1965

Under the law on nuclear power, Unión Eléctrica Madrileña (UEM) broke away from Cenusa and started work on a nuclear power station project in Almonacid de Zorita (Guadalajara), on the river Tagus. This plant brought the first nuclear power supply to Spain.



of capital goods to modernise industry, plunging the country into autarky, with an omnipresent National Institute of Industry.

**The Nuclear Power Committee (JEN)** was set up in 1951 as a first step towards putting in place a body that would be under institutional control and, if applicable, would lead research and the processes of producing nuclear power in the country. The definitive move towards nuclear power was made by Spanish private electricity companies, which, after post-war shortages, the experience of restrictions and the construction of new hydroelectric power plants, and in response to the burgeoning movement in the United States, reacted speedily and effectively in 1957 to set up two organisations to handle the country's nuclear power

issues: Centrales Nucleares S.A. (Cenusa), grouping together Hidroeléctrica Española, Unión Eléctrica Madrileña (UEM) and Sevillana de Electricidad; plus Centrales Nucleares del Norte S.A. (Nuclenor), a subsidiary of Iberduero and Electra de Viesgo. The following year they announced their intention to build two nuclear power stations in Spain.

**The objective was a difficult one** because of Spain's technological backwardness and political problems, especially since this was ground breaking technology at international level. In 1962, and assisted by US company Atomic International, the JEN began work on building a Spanish prototype reactor, the DON (Deuterium, Organic, Natural) which was supposed to work with natural uranium, moderated with heavy water and an organic coolant. However, the new approach to Spanish

## The José Cabrera Power Station brought nuclear power to Spain. It operated from 1968 to 2006

politics brought in by the Stabilization Plan and the appointment of Gregorio López Bravo as Minister for Industry, opened up the way to acquiring reactors abroad instead of attempting to develop them inside the country.

**A new situation** began with the 1964 nuclear power law, the purpose of which was to promote the development of peaceful applications of nuclear power; the law was also intended to protect life, health and property against the dangers of radioactivity and regulate the application of international agreements in Spain. Under this new framework, Unión Eléctrica Madrileña (UEM) broke away from Cenusa

and quickly developed its own nuclear power station project in Almonacid de Zorita (Guadalajara), on the river Tagus. Meanwhile, the Nuclenor group proposed locating another power plant in Santa María de Garoña (Burgos), on the river Ebro.

**The technology available** at that time had been developed in the United States and used enriched uranium as fuel and water as moderating element, with different refrigeration systems: Westinghouse with pressurized water (PWR or Pressurized Water Reactor) and General Electric with boiling water (BWR or Boiling Water Reactor). In Zorita, Unión Eléctrica chose to use PWR technology, with 160 MW of power. The plant was built between 1965 and 1968. Over time, its name was changed to José Cabrera, who was Chairman of the UEM at the time it was built. This plant introduced nuclear power to Spain, and UEM (now Gas

Natural Fenosa) should be acknowledged for its role in giving the country a new form of energy. It remained in operation until 2006, when it was decommissioned and work began on dismantling the facility. The second power station was Santa María de Garoña (1971), built by Nuclenor with BWR technology and with 466 MW of power. It remained in operation until 2012. ■

*A more detailed account can be found in the chapter written by Ángel Lagares in the book entitled "La Central Nuclear José Cabrera y su entorno" (The José Cabrera Nuclear Power Station and Its Surroundings) published by Unión Eléctrica in 1998.*



1968

Opening of the Almonacid Power Station, later called the José Cabrera Power Station, after the Chairman of Unión Eléctrica Madrileña during that period.

2006

The José Cabrera Power Station, with Westinghouse technology (pressurized water) remained in operation until 2006, when it was decommissioned and dismantling work began.



José Cabrera Power Station.