NEEDS FOR UNDERGROUND STORAGE OF NATURAL GAS IN SPAIN.
PROSPECTS, POTENTIALS AND DEVELOPMENTS: THE SERRABLO FIELD.

EMILIO SOTOMAYOR

1. OVERVIEW OF THE SPANISH GAS SECTOR. THE NATIONAL GAS GRID.

Spain, 38 million inhabitants in 500,000 Km², started using LNG in 1969 in the area of Barcelona, under a contract with EXXON in Libya.

In 1972, the National Gas Company (ENAGAS) was created to analyse and establish the possibilities of a national plan for gas supply and consumption. A new contract was signed with Algeria in 1975, and the first transmission line was laid.

Economic and political changes did not allow a steady and fast introduction of natural and the Algerian contract had to be renegotiated and modified. The new agreement, signed in February 1985, followed by the "Gas Protocole", in July 1985, indicated the starting point of a new and stronger gasification plan, which is now reaching the end of its first stage.

From the first transmission pipeline Barcelona-Valencia-Basque country, commissioned in 1980, the transmission network has been extended to the main industrialized areas, covering at the end of 1987, 2,420 Km. of transmission lines with an additional distribution network of 8,100 Km, including town-gas distribution.

Fig. 1 = THE SPANISH GAS SYSTEM IN 1988

The extension of this national gas network is continuing to all the industrialized areas of the country, meaning that at the end of 1988 the results will be the following:
- Near 3,000 Km of transmission lines.
- About 9,000 Km of distribution network in medium and low pressure.
- 3 LNG terminals, two of them actually being built in Cartagena and Huelva, ready to operate in May 88 (Huelva), and December 88 (Cartagena).
- 2 Producing gas fields.
- 1 Underground storage being converted from one of the producing gas fields.
- One transmission company (ENAGAS).
- 23 Distribution companies operating with natural gas.
- 6 Distribution companies still on manufactured gas.

New projects have already been authorized, notably the Sevilla-Madrid gas line and the link with the European gas network through the Pyrenees mountains, allowing gas imports from north European countries. (A new contract to buy gas from the Troll field has been signed with Norway on the 8th April this year).

Some new projects are still under consideration and will probably be undertaken in the near future, extending the gas grid to other areas not yet gasified.

Since 1980, when the main trunkline was put in operation, natural gas consumption has grown from 16,900 x10^6te (70,800 TJ) representing 2.2% of the primary energy to 28,500 10^6te (119,000 TJ) in 1987, (3.8% of the primary energy) and is expected to improve to 55,000 x10^6te. (230,000 TJ) in 1992, around 7% of primary energy.

Gas imports in 1987 have been 31,686 10^6te. (133,000 TJ) 15,297 10^6te. coming from Algeria (48%), 9,439 10^6te. from Libya (30%) and 6,950 10^6te. from the domestic gas fields, Gaviota, offshore of the Basque country, and Serrablo in the Pyrenees mountains.

Some small gas fields discovered along the Guadalquivir valley, in the South-West, will be put in operation with the Huelva-Sevilla gasline.

2. SALES DISTRIBUTION. NEEDS FOR UNDERGROUND STORAGE

National gas consumption in Spain, is still in the first stage of introduction in the industrialized areas and industrial sales account for 84% of the total sales.

Sales to the residential and commercial sector have to improve from now, more than industrial sales but they will always keep lower than in North European countries and the United States where heating represents a high percentage of the total sales.

These sales to residential-commercial sector have accounted for 16% of the total sales in 1987 and are expected to increase to 20-22% by the end of the century, still far from the 49-50% in the old European Community.

This lower weight of the sales to the residential sector deeply reduces the fluctuation of gas demand, which on a monthly basis varies from 1 to 2.5 including the month of August or from 1 to 1.5 excluding this month.

To modulate this demand, the Spanish gas system, in its actual configuration, have the following resources:

- The storage capacity of the LNG tanks in Barcelona, 240,000m^3 of LNG, plus the LNG tank of the Huelva terminal (60,000 m^3), once linked both Central and South-West system from 1.992.
- The flexibility of production of the domestic gas fields actually producing, Serrablo and Gaviota:
  0 to 1,5 10^6 m^3(n) per day from Serrablo
  1 to 5 10^6 m^3(n) per day from Gaviota