Transport of Gas to Market: TAP Project (High-Pressure Gas Transport)

- The exploitation of **stranded natural gas** is becoming increasingly important in relation to the depletion of reserves in Europe and in the United States and to the development of new markets, especially in the Far East. In particular, for Eni the **enormous land-locked reservoirs in Central Asia** are of great strategic value.

- Bringing natural gas from the point of production to the point of consumption economically demands both the use of readily available **LNG (Liquefied Natural Gas) technologies** and new cheap technologies for the **transport by pipeline over long distances**.

- This is the context for the **TAP project** (high-pressure gas transport) for the development of a **more economic transport technology based on the use of high-resistance steels**.

Transport of Gas to Market: TAP Project (High-Pressure Gas Transport)

- The **aim of the project** is to develop LD-HC-HP-HG (Long Distance, High Capacity, High Pressure, High Grade) technology solutions to achieve the following targets:
  - distances of more than 3,000 km;
  - gas transport volumes around 20-30 billion m^3/year;
  - pressures equal to or greater than 15 MPa (double then current levels);
  - use of high grade, ultra-resistant steel (e.g. API 5L X100), in order to ensure pipelines with thickness and diameter in compliance with current industrial standards.

- According to the estimates, the TAP technology will make it possible to **reduce gas consumption at the compression stations** for long-distance transport from 7.5% to around 3% of the transported volume, in the context of sustainable development.

Transport of Gas to Market: TAP Project (High-Pressure Gas Transport)

- Launched in 2003 in cooperation with Snamprogetti/Saipem, Snam Rete Gas and Enitecnologie and finished at the end of 2007, the **project** involves an articulated combination of experimental, engineering and construction activities.

- In 2005 two structures were created to validate the technology: the **Enna-Montalbano demonstration tract**, a 48-inch, 10 km long pipeline in API 5L X80 ultra-resistant steel and connected to Snam Rete Gas network, which was used to test and validate all of the construction aspects for an industrial scale tract.

Construction of Enna-Montalbano demonstration tract in Sicily

Transport of Gas to Market: TAP Project (High-Pressure Gas Transport)

- The other **pilot line** has been realised at the Military Area of **Perdasdefogu** in Sardinia and comprises two tracts, with a diameter of 48 inches in high-resistance API 5L X100 steel. The test, which started in September 2005, involved the use of pressure levels floating between 140 and 150 bar which made it possible, over a testing period of 17 months, to simulate the behavior of an effective industrial infrastructure over an equivalent period of twenty years.

- At the end of the testing program **full scale detonation tests** started. In June 2007 a **test for the propagation of ductile fracture** was performed in order to verify both the toughness properties of API 5L X100 steel and the ability of crack arrestors (specially designed) to stop the fracture. Also hydraulic tests were performed to assess the ability of pipes with defects to resist the internal pressure. The project was completed at the end of 2007.

Tracts of the API 5L X100 pilot pipeline