VEHICLE CONVERSION TO DUAL GASOLINE/CNG

FROM 150 TO 100,000 IN 5 YEARS IN PERU

Background

One of the main challenges when a natural gas (NG) reservoir is discovered in a country where there is no demand for the product is deciding between a project with a Natural Gas processing plant, and transporting the gas to another main NG pipeline to export the product; or developing an integrated project including an energy matrix change.

Peru decided on the second option. The project was ambitious, consisting of building a cryogenic plant in the jungle of Cusco and transporting the gas to Lima through a pipeline over the Andes, climbing as high as 4,000 meters above sea level and covering over 500 km from start to finish. Additionally, the distribution project in Lima was put out to a tender to select an experienced company who could not only physically build the system, but also build a market starting with 10 initial contracts signed with the Government to ensure a minimum volume to start operations.

One of the major issues in the market to be developed was to achieve the transformation of the motor vehicle pool, especially taxis, to a dual gasoline/CNG system, not only to save money but to reduce gas emissions, since most taxis in Lima ran on diesel.

Aims

To create a CNG motor vehicle pool focused on taxis.

Methods

Operations at Camisea began in August 2004. The first clients were the 10 industries indicated above, from which the market slowly grew based on the real savings made by possible by the use of NG.

After five year of increased conversion of vehicles from gasoline to a dual Gasoline/LPG system, the question was how to explain the advantages and differences between this trend and the conversion to dual Gasoline/NG.

In order to plan effective actions to develop the motor vehicle CNG market, it was necessary to answer the following questions:

What companies will convert the cars to a dual Gasoline/NG system?

What would the prices be for converting a car or buying a new CNG vehicle?

How could a taxi driver afford to pay for conversion to this dual system?

How would cars fill their tanks with NG?

How can a dual system automobile be bought while maintaining the manufacturer's warranty?

The answers showed us that we were starting from square one, and the only alternative was to work on different fronts, not only simultaneously, but in an integrated manner, seeking out:

1. Investors willing to go into dual system CNG conversion repair shops

2. Investors interested in going into the CNG service station business

3. Car dealerships interested in going into the CNG or dual system car business

4. Financing programs for taxi drivers to convert or buy CNG cars

5. Reduction of the risk involved in credits for conversion, in order to obtain real warranties and a low default rate on payments

To achieve these goals, a multi-task team worked on the design of a "Gas-Up Control System" that not only combined all market needs, but also helped to create the CNG market and enabled it to grow formally.

The contributors to the project were:

1.- Consejo Supervisor del Sistema de Gas Natural (Supervising Council of Natural Gas System).- Government Institution created to integrate all facts to be part of the project. This Council is integrated by Hydrocarbons Director from the Energy Secretary responsible of supervise CNG Service stations, Traffic Director from the Communications Secretary responsible of supervise conversion repair shops, and Production Director from Industry Secretary responsible to supervise all the equipments involve.

2.- Corporación Financiera de Desarrollo COFIDE (www.cofide.com.pe) .- The Supervising Council named COFIDE as responsible to implement and operate the project.

3.- Gas Natural de Lima y Callao.- This is the NG distributor in Lima. They sponsored the project and proposed the system based on the Colombian experience.

4.- Pluspetrol Peru Corporation.- As Natural Gas Producers, acted as sponsor of the project interested in develop a controlled growth of CNG market, and to avoid informality existing in all other hydrocarbon products markets.

Gas-Up Control System

To integrate all the variables involved in creating a CNG market, a centralized database system was developed, connected by a microchip installed in the tank of each converted car. This database gives us real information on the credit granted for the conversion, and calculates a repayment amount with each time a CNG automobile gasses up at a service station.

This microchip transmits the following information:

- Vehicle data.

- Data on the dual system equipment installed.

- Repair shop that performed the conversion. Each repair shop must be certified by the NG Supervisory Authority.

- Annual checkup of all conversion equipment.

- Five-year checkup of the CNG tank.

After a car has been converted to dual Gasoline-CNG system, the Supervisory Authority appoints a Certifier to verify:

- That the Repair Shop is certified.
- That the equipment installed, including the tank, has been registered with the Authority.
- That the installation was made in accordance with Peruvian technical laws on NG.

Once the Authorized Certifier completes the previous steps, the microchip is installed in the CNG pump hole, the car's data is entered in the chip, and it is then registered in the centralized system database.

Likewise, all service stations have installed hardware and software that allow the CNG pump to read the microchip data and communicate with the main computer and the centralized system database simultaneously. When a car comes in to fill up on CNG and the hose is connected to the tank, the information from the microchip installed in the car identifies the vehicle and the computer searches for it in the database of the centralized system. The car will receive authorization to pump CNG only if it is registered the database. To the contrary, authorization will be denied.

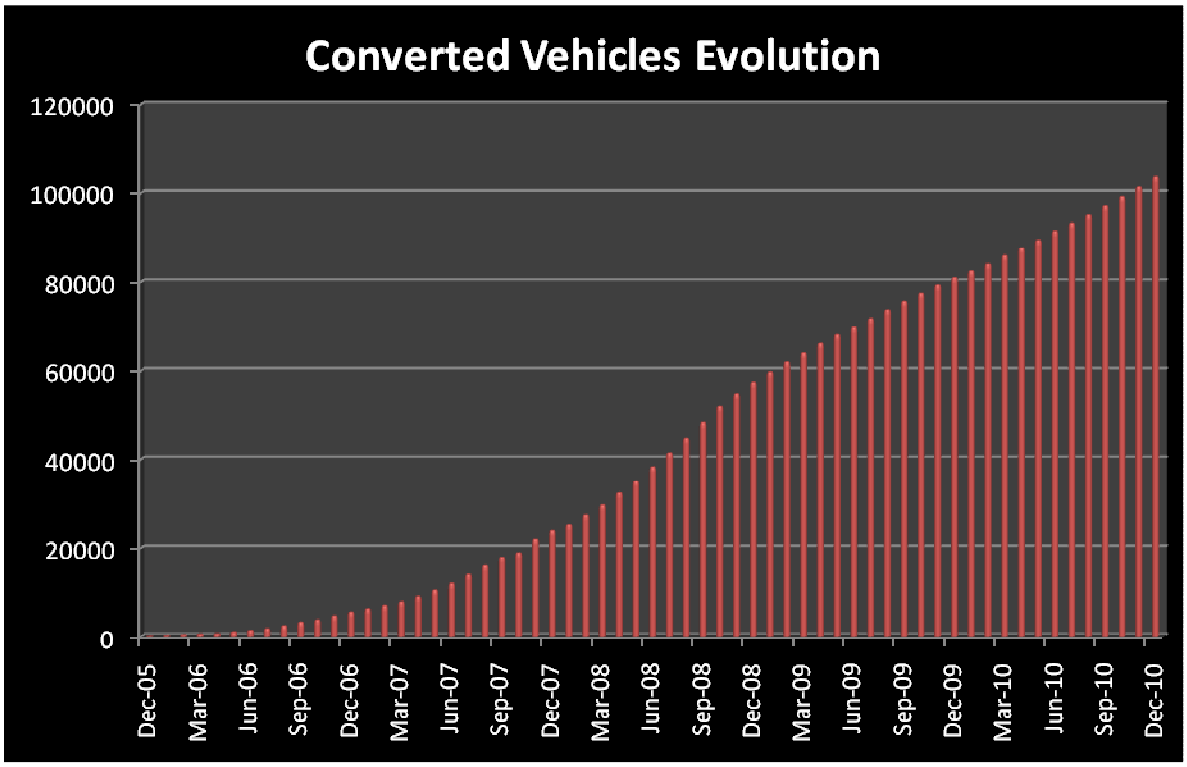
Additionally, the loan paid out to the taxi driver may be input to the centralized system and an additional amount of money may be calculated that the taxi driver must pay with each CNG gas-up to pay installments on the loan. This facility not only enables taxi drivers to finance conversion costs, but it also lets car dealers sell new cars that can be paid off with each CNG gas-up.

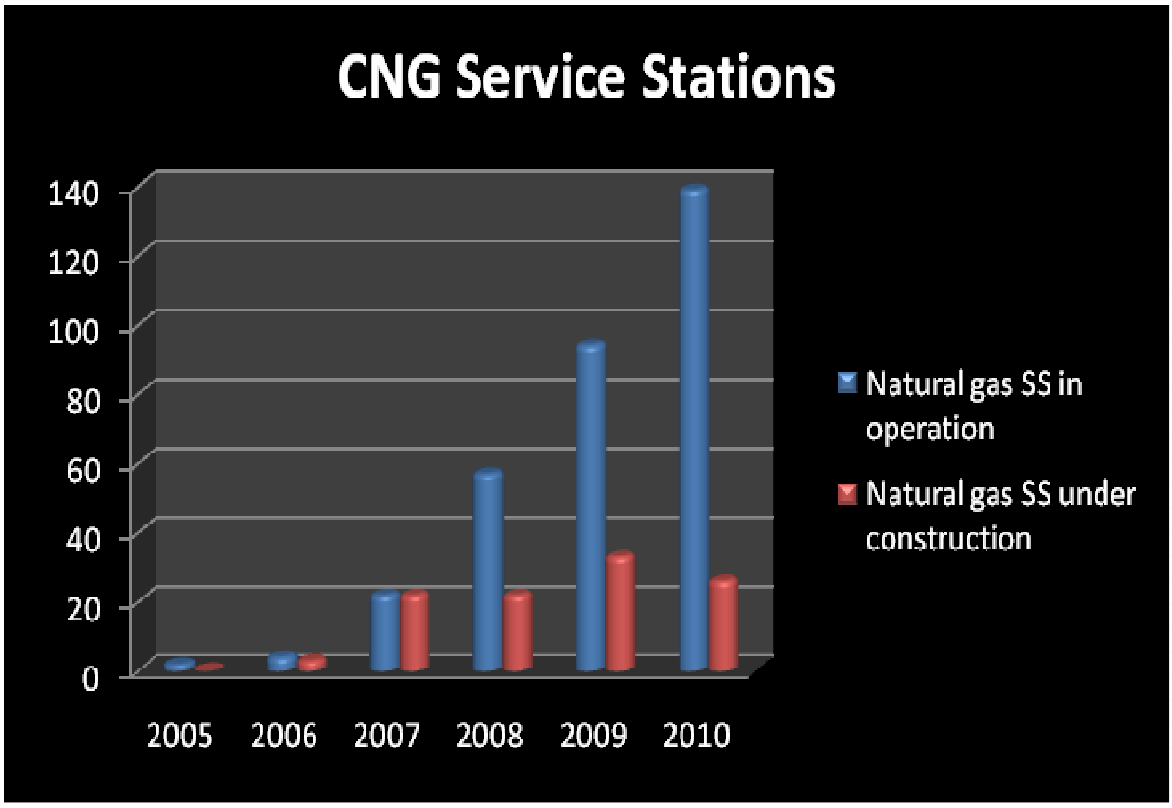
Other benefits of this system include:

- Enables traceability of all components of the CNG conversion equipment
- Prepares statistical information

- Provides commercial information
- Any other information the authority may require

Results





Conclusions

- This system helps maintain control over the CNG market, avoiding informal facilities that may be made in violation of safety standards, since the entire conversion chain and CNG gas-up system is online.
- This system enables an extraordinary rate of growth for the car conversion market.
- Needless to say, countless problems were encountered along the way, basically because the growth rate of each actor in the market was different. However, we have already achieved the stability the market needs to continue growing in an orderly and sustainable manner.