

# The Cantarell Complex

- The dying Mexican giant oil field



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# Cantarell – the Mexican Giant

The Cantarell Field or the Cantarell Complex is the world's 12<sup>th</sup> largest oil field and a very important contributor to Mexican oil production. It is the world's second largest field in terms of daily production after Ghawar in Saudi-Arabia. By 2003 the daily production were 2.1 million barrels per day. Overall Cantarell has produced over 12 000 million barrels of oil.

Cantarell was discovered in 1976 by a fisherman and it was later named after him. It is located 80 km offshore in the Bay of Campeche. The Cantarell complex consists of four major fields called Akal, Nohoch, Chac and Kutz. Akal is by far the largest.

The reservoirs are formed from carbonate breccias of Upper Cretaceous age, the remaining rubble from an asteroid impact that created the Chicxulub Crater below the Yucatan Peninsula.

Cantarell is owned by the national Mexican oil company Petróleos Mexicanos (PEMEX). In 1917 when commercial quantities of oil were produced by British and American companies and this attracted the attention of the government, who rapidly claimed all mineral and resource rights for the state as a part of the Mexican constitution.

Development began fast and by 1979 it produced 51 000 barrels per year. As further development took place and new holes were drilled and new rigs installed the daily production gradually grow to around 1 million barrels per day (Mbpd) by 1981.



*Figure 2: Cantarell offshore oil platforms*



*Figure 1: Location of the Cantarell Complex outside the Mexican coast*

Production from Cantarell was around 1 Mbpd from 1982 to 1993 before a decline started. Massive investments in new wells and wider production tubing together with the construction of a massive nitrogen injection plant was undertaken to halt the decline. This resulted in a steady increase with production of over 2 Mbpd for both 2003 and 2004.

The nitrogen injection facility contains the world's largest nitrogen production plant and is used to increase the pressure inside the reservoir so that more oil can be squeezed out.

In year 2004 Cantarell reached its maximum production and have been in decline since then. Luis Ramírez Corzo, head of PEMEX exploration and production division, announced that the actual output from Cantarell was expected to decline steeply at a rate of 14% per year.

In March 2006 it was reported that Cantarell had suffered from a second year of declining production, with a decline rate of 13.1%. Jesús Reyes Heróles, director-general of PEMEX, has predicted a decline of 15% for 2007.

By 2008 it is estimated that the total production from Cantarell will be 1 Mbd as it continues to decline even further. The rapid decline is a typical behavior of giant oil fields and has been observed in many other fields as well.

Cantarell is by far the most important oil field in Mexico and it has been responsible for over 50% of the total Mexican oil production. The loss of a large amount of Cantarells production is a significant blow to the world oil supply.

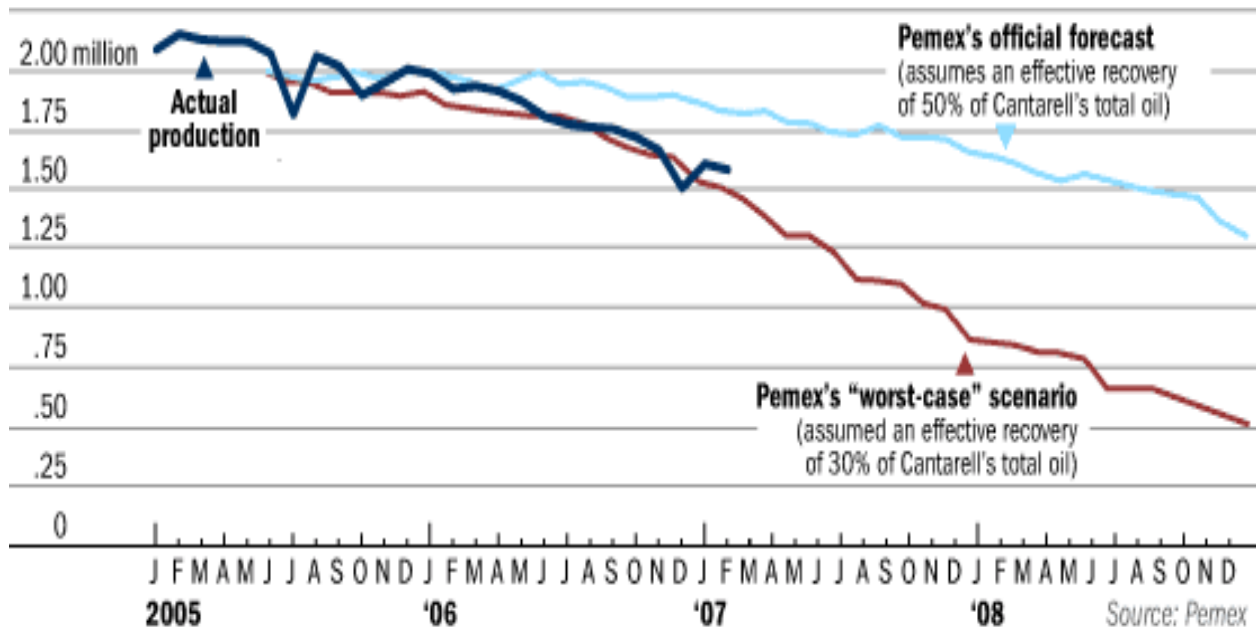
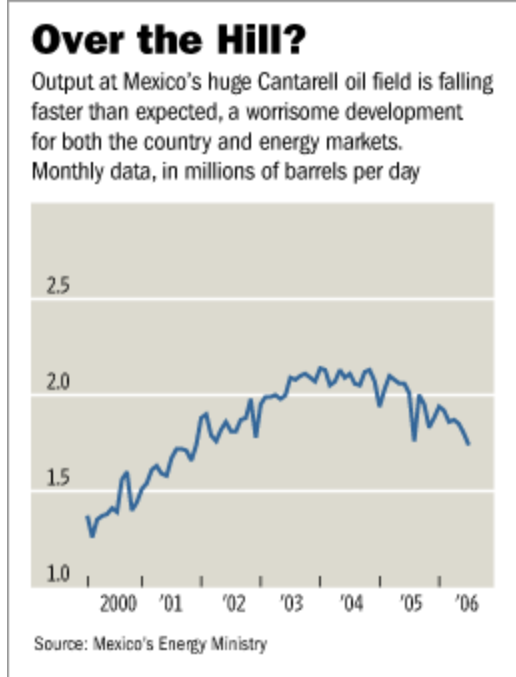


Figure 3: The actual production from Cantarell together with PEMEX forecasts

Mexico is the third largest import source for USA and over 1 million barrels per day are received from Mexican fields each day. Cantarell used to produce over 2 million barrels per day and in comparison to the American fields in the Gulf of Mexico, it is truly a giant. The largest field discovered by USA in the American part of Gulf will produce about 250 000 barrels per day. In 50 years of exploration in the US side of the Gulf of Mexico only one one-billion-barrel oil field has been found, in comparison the Cantarell complex contains between 11-20 billion barrels.

PEMEX best alternative project is now to develop a heavy-oil complex, close to Cantarell in the Campeche bay, which is known as Ku-Maloob-Zaap. Its production is expected to reach 800 000 barrels per day by the end of the decade.



*Figure 4: Oil production facility*

**References:**

Fredrik Robelius – Giant Oil Fields

PEMEX information material

Rigzone project information

([http://www.rigzone.com/data/projects/project\\_detail.asp?project\\_id=22](http://www.rigzone.com/data/projects/project_detail.asp?project_id=22))