

# El Paso Inc.

Hi-tech startup cuts refining costs for heavy crude

By Robby Gray

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An El Paso-based company has developed technology that could allow North American oil trapped in a tar-like substance to be refined at prices that compete favorably with Middle Eastern oil.

David Rendina, president of Refinery Science Corporation, 4800 N. Stanton Street, said the search for large engineering companies to help bring their product to the market began last Friday at the Rice Alliance Energy Technology Venture Forum in Houston.

Rendina estimates the technology could be on the market in a few years.

“It changes the dynamics of the energy business because the Western Hemisphere has lots of extra heavy crude oil – as much as there is light oil in the Eastern Hemisphere,” Rendina said. “The U.S. could be an oil exporter again.”

The U.S. Department of Energy estimates that there is over two trillion barrels worth of heavy crude oil trapped in tar sand in North America.

The technology solves two major problems that have plagued the process to turn heavy crude that is infused with bitumen, the substance used to pave roads, into light oil Rendina said.

It reduces the cost of refining heavy crude oil by about 50 percent and can be configured to reduce carbon dioxide emissions.

“There is nothing wrong with fossil fuels as long as they can be produced and used cleanly. This technology will make production of heavy crude oils clean instead of dirty,” Rendina said.

The system – called WildCatterHCU (Heavy Crude Upgrader) – injects hot steam into the thick tar-like oil to reduce its viscosity so that the oil can be extracted and then moved.

The heavy crude, mixed with a catalyst, is then refined into light crude in a process that involves dropping the heavy crude onto a heat transfer liquid, “it works like water drops on a skillet,” Rendina said.

The impurities – coke, heavy metals and the catalyst – remain in the drop, leaving clean, upgraded hydrocarbon vapor that is then condensed. The catalyst is recycled and used again.

A 15-barrel-per-day pilot plant was commissioned in March 2007 and built on a 1.4-acre site on Doniphan Drive. Rendina said they brought in barrels of heavy crude and successfully made it into light crude.

In the future, the WildCatterHCU may be installed in refineries, Rendina said, but their current plan is for the system to be installed in the field and powered with the bitumen there.

Rendina and Russell Chianelli, director of Materials Research and Technology Institute at the University of Texas at El Paso, incorporated the company in July 2004. It came after many years of work and discussion to change the way oil production is concentrated in the hands of a few companies.

Rendina said this meant they had to mitigate the cost of exploration and find an inexpensive, clean method to produce crude oil from North American heavy crude oil.

Since then, Rendina said, the company has raised more than \$5.5 million in capital from private investors.

“We are very grateful that part of our invested capital came from the Camino Real Angels and other high net worth investors from El Paso and Las Cruces,” Rendina said in an e-mail. “UTEP has provided encouragement and has been a source of talent.”

Chianelli said that UTEP’s Materials Research and Technology Institute was able to assist Refinery Science with their expertise in “asphaltenes” – the molecular substances that give heavy crude its difficult tar-like consistency.

“Our own research program heavily centered on basic and applied understanding of heavy tars and bitumens and how to convert them,” Chianelli said. “I always say that you don’t have to go to Houston for energy technology.”

Refinery Science has five active directors, four full-time employees and a team of over a dozen technology marketers focused on developing potential corporate venture capital investment.

Rendina said that the use of the WildCatterHCU to economically refine heavy crude is not dependent on the price of oil, “when we got started we wanted to develop technology that could not be put out of business by a reduction in oil prices,” he said.

Instead, the value created by the technology is found in the difference of price between light and heavy crude, “as long as there is a difference of three dollars a barrel we make money,” Rendina said.