An operator was looking for a more energy-efficient alternative for oil production in the Khanty-Mansi region of Russia. Well economics made power consumption levels a high priority for this operator. Previously, the company had relied heavily on conventional electrical submersible pumping (ESP) equipment from Russian competitors.

The operator approached Baker Hughes, a GE company (BHGE), and negotiated a well test program to allow BHGE to showcase the new FLEXPump™ series pump technology for ESP systems. The operator wanted decreased energy consumption by the ESP system with increased run life. Tests were conducted in five wells with comparable equipment to measure performance.

BHGE assembled a team of engineers to select the best ESP systems for the operator’s field. The centerpiece of the optimized ESP systems were sets of triple tapered 400FLEXPump10 pumps and 400FLEXPump3.2 pumps. The pumps were designed to operate efficiently and effectively in a variety of low-flow conditions. GM™ Performance Series gas separators were also used to separate gas from the liquid before it entered the pump. Well conditions were well suited to the FLEXPump series pump’s capabilities, with flow ranges as low as 50 barrels of oil per day (BOPD).

Less than one year into the well test, BHGE and the operator reviewed the results. Each ESP system with FLEXPump technology used fewer kilowatt-hours per ton of produced fluid than the competition. On average, this equated to a more than 20% savings in energy requirements.

Moreover, the pumps impressed the customer with their reliable performance. Although the installations were still quite new, the operator was convinced by the initial survivability rates that the BHGE FLEXPump series pump line offered reliable operations at decreased power consumption rates when compared with the competition.

As a result of performance during the well test, the customer ordered an additional 200 ESP systems featuring FLEXPump technology.
400 series FLEXPump performance curve comparison

In fluid 1.00 sg

60 Hz, 3,500 rpm

Mean required power (kWh)
per ton of produced fluid

BHGE ESP systems with FLEXPump series pumps

Conventional ESP systems from competitors