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# Kazakhstan Evolution<sup>TM</sup> Locomotive

GE Transportation is specially adapting the very best new locomotive technology for the Kazakhstan market. This new GEVO 12-cylinder diesel engine uses significantly less fuel while producing the same 4,400 horsepower as its 16-cylinder predecessor.



imagination at work

# Kazakhstan Evolution<sup>TM</sup> Locomotive

## Revolutionary technology for the CIS region

Kazakhstan's railway system plays a huge part in its developing economy. Because both China and Russia depend on Kazakhstan's locomotives for transportation and international trade routes, it is imperative that they have a dependable and cost-efficient railway system. However, Kazakhstan's Soviet-era locomotives were extremely energy inefficient, unreliable and highly toxic, producing high levels of carbon dioxide.

Kazakhstan partnered with GE to build a new fleet of locomotives designed specifically to improve the efficiency and quality of their railway system. GE started with its typical Evolution<sup>TM</sup> Series Locomotive, a product of \$200 million and six years of research that was launched in 2002, and added new energy-saving technologies to create the Kazakhstan Evolution Locomotive.

The Kazakhstan Evolution Locomotive is among the first to meet the United States EPA's Tier II emissions standards. Its dual-cab model features an interior walkway that bridges both ends of the locomotive. Traction motors on each of the six axles are powered with an alternating current (AC) – a first for the Commonwealth of Independent States region. GE's engineers also designed a centralized "smart display" to deliver pertinent information through a straightforward, easy-to-understand system to honor Kazakhstan's request for a user-friendly locomotive.

The Kazakhstan Evolution Locomotive's 12-cylinder diesel engine produces the same 4,400 horsepower as its 16-cylinder predecessor. And it accomplishes this feat using less fuel, delivering significant savings over the life of the diesel locomotive. The smaller engine will also create a 3 percent to 5 percent reduction in the amount of fuel used – around 189,000 fewer gallons of fuel in the engine's lifetime. This reduction in fuel consumption is estimated to save more than \$378,000 per train and reduce harmful emissions by more than 40 percent.

