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## VSE invests US\$720 million in researching renewable energy-based products

The climate change forecast for the coming decades obliges companies to adopt environmentally sustainable processes and use renewable energy sources on their production lines. To help meet this challenge, Vale Soluções em Energy (VSE) will invest US\$720 million by 2012 to research and develop products and technologies for generating clean, sustainable power.

Created in 2007 through a partnership between Vale and Brazil's national development bank, BNDES, Vale Soluções em Energy has the mission of developing, industrializing and commercializing comprehensive distributed energy (on-site generation) systems using renewable and less polluting raw materials. Such systems are designed to be installed close to locations that need power, to be fueled by inputs available in the region, such as ethanol, natural gas, waste and biomass.

"VSE is fully capable of generating clean, sustainable energy for the World Cup and Olympics, and we can also work with saline aquifers in the Northeast for irrigation or along the course of the country's gas pipelines," says the CEO of VSE, James Pessoa.

In 2009 and 2010, VSE obtained one of the biggest credits ever granted in Brazil by Finep, the Ministry of Science and Technology's research funding entity. The credit is intended to promote some of VSE's technological development projects. Total funding of R\$190.2 million was approved, R\$160 million as loans and R\$30.2 million as grants.

In order to develop clean, sustainable power, VSE has a Product Development Center in São José dos Campos (São Paulo state), covering 100,000 square meters next to the São José dos Campos Technology Park. The center, a platform for innovation, is equipped with sophisticated laboratory infrastructure and hosts a team of engineers, researchers and draftsmen who are conducting research in three VSE programs - multi-fuel motor-generators, turbo-generators and gasifiers.

### Motor-generators

The aim of VSE's motor-generator program is to develop a range of generators of 50KW up to 1,250 KW power, with high-performance, high-efficiency internal combustion engines. Their primary power sources will be renewable and/or environmentally sustainable fuels, such as natural gas and biogas.

Made up of compact units that can be used in a modular way, motor-generators have the advantage that they enable generating plants to be assembled quickly and safely with a wide range of power, and they provide for safe, reliable operations in continuous, emergency and peak regimes. As a result, this equipment can be used to replace existing, more polluting technologies in order to generate electricity in a fixed location and in heavy/hybrid vehicles such as buses, trucks, tractors and harvesters.

VSE's motor-generators use pure ethanol as fuel, and produce 68% less greenhouse gas emissions and 50% less noise than diesel motor-generators, as well as eliminating particulate and sulfur compound emissions.

## Turbo-generators

VSE's turbine technology development program is divided into two projects. One of them involves researching natural gas- and ethanol-powered turbines. At the moment a range of small turbines is being developed, including the first electricity-generating turbine fueled by natural gas to be built in Brazil. The second project, called CombiCycle, involves developing technology to combine thermodynamic natural gas and steam cycles in a single cycle. In addition, this technology will be able to use any fuel to generate electricity with very low gas emissions, as well as generating clean freshwater.

## Gasifiers

The aim of this project is to create a new range of gasifiers to produce synthetic gas (syngas) to use as a fuel. Gasifiers use coal, biomass or garbage as raw materials. The company also plans to develop a pressurized gasifier using oxygen to feed CombiCycle systems.

### More information

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