



# The GreenHouse project

The objective of the GreenHouse project is to reduce Vallourec's electricity and gas consumption, which will in turn cut greenhouse gas emissions and help reduce global warming. Through this initiative, the Group is preparing for a "low-carbon economy".

The Executive Committee has set a target of achieving a 20% reduction in the Group's energy consumption, i.e. gas and electricity use, by 2020. This corresponds to average energy consumption of approximately 780 kWh per tonne produced in 2020, compared with 980 kWh in 2005. The project was launched at all Vallourec plants in 2009. The V & M Deutschland plant in Mülheim was chosen as the pilot plant and at the end of May 2009, the green light was given to roll out the project to the Group's other sites.

The project methodology, based on an in-depth independent study, is designed to leverage the following three energy-saving projects:

#### **Combining best practice and the best available technology**

An action plan has been introduced to facilitate sharing best practice within the Group. The main features of this plan are as follows:

- An internal organization dedicated to energy saving,
- Creation of Continuous Improvement Teams (CITs) to enhance energy efficiency,
- Inspections and control of the most energy-intensive processes,
- Collection and exchange of best practices throughout the Group,
- Roll out the best available energy-saving technologies,
- An investment plan with due consideration for the priorities adopted and the best available technologies.

Implementing this plan resulted in a series of practical measures in 2009, including:

- Appointment of an "energy manager" at each Vallourec site,
- Creation of project steering committees in France, Germany, Brazil and the United States,
- Global launch of an energy saving process community,
- Establishment of 40 "energy saving" CITs around the world,
- Production of a guide to best practices and the best available technology in the area of thermal processes,
- Training for "energy managers" in France, based on a dedicated training module.

Targets for 2010 include:

- Creation of an additional 70 "energy saving" CITs,
- Production of a "best practices" guide for the Power generation business,
- Creation of an *ad hoc* training module for all "energy managers" throughout the Group,
- Creation of steering committees for thermal processes and refractory technologies.

#### **Energy efficiency diagnostics and furnace heat balances**

In this area, a pilot diagnostic audit was conducted at the VMB steel mill in Brazil as part of the action plan; similar diagnostics are underway at the Saint-Saulve steel mill in France, and 16 heat balance studies were carried out on furnace and heat treatment lines. The activities planned for 2010 include a diagnostic analysis of energy consumption at the most energy-intensive sites and heat balance studies for the Group's main furnaces.

#### **Benchmarking and new technologies**

Vallourec also carried out research and gathered information in the fields of renewable energy, heat recovery and carbon dioxide sequestration. A number of experimental projects in the area of photovoltaic power are planned, and we intend to develop our expertise in related subject areas.

# Energy efficiency

Improving energy efficiency is a key objective for all industrial companies. The action plans introduced at our industrial facilities firmly address this fundamental issue for sustainable development.

## Overview of energy consumption

The main energy sources used by the Group are described in the table below.

Energy source	Origin and type	Carbon Intensity	2008 Consumption	2009 Consumption
Electricity purchased	Renewable sources - Hydroelectric: Brazil, Mexico, USA - Eolic : USA, France, Germany	😊 😊	1,605 GWh	1,111 GWh
	Non-renewable sources - Nuclear Power Plants: France, USA, Germany - Natural Gas Power Plants: USA, Germany, Mexico - Coal Power Plants: China, USA, Germany - Oil Power Plants: USA	😊 😐 😞 😞		
Electricity produced	Renewable sources Thermal plant based on blast furnace gas and wood tar: Brazil	😊	75 GWh	86 GWh
Natural gas	Non-Renewable Source	😐	3,687 GWh	2,652 GWh
Oil Diesel	Non-Renewable Source	😞	195 GWh (18 979 m <sup>3</sup> )	178 GWh (17 307 m <sup>3</sup> )
Gasoline	Non-Renewable Source	😞	6.7 GWh (701 m <sup>3</sup> )	4.7 GWh (492 m <sup>3</sup> )
Charcoal	Renewable Source	😊	3,080 GWh (369,635 tonnes)	2,041 GWh (244,960 tonnes)
Blast furnace gas	Renewable Source	😊	980 GWh	403 GWh

Low Carbon Intensity    😊    50 %  
 Medium Carbon Intensity    😐    17 %  
 High Carbon Intensity    😞    33 %

A few examples of energy savings made possible by the work of the Continuous Improvement Teams (CITs) and by investments in electric-arc furnaces are described below.

## Continuous Improvement Teams are the main driver of the GreenHouse initiative

### Vallourec & Mannesmann Oil and Gas UK

A significant reduction in total energy consumption (more than 10%) was achieved by introducing an energy management programme and setting up a Continuous Improvement Team (CIT).

### V & M France, Déville-lès Rouen pipe mill

A CIT reduced gas consumption by 4%.

### V & M France, Saint-Saulve pipe mill

Consumption during furnace standby periods was reduced by 22%. The consumption figure for October 2009 is in line with the average for the first half, in spite of an 8% fall in tonnage.

## Special work on furnaces

### V & M do Brazil

The success of the renovation work undertaken at the beginning of the year to install a metal curtain across the loading and unloading doors of the furnace, was confirmed in September 2009, with good results in line with targets.

### V & M Deutschland Rath

The combustion temperature in the circular furnace was improved. The hot air temperature was increased by 70°C by cleaning the heat recovery unit, resulting in a 3% saving in gas consumption.