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Greenhouse Gas Emissions Inventory

The results of Abengoa's 2010 **greenhouse gas (GHG) emissions inventory** paint a **complete picture of all emissions stemming from the company's operations**. This analysis, duly structured to embrace the different scopes and sources involved, also includes and breaks down emissions generated from biomass operations. The inventory has been disclosed and published with a view to allowing other companies to incorporate climate change policies into their core activities and concerns.

Greenhouse Gas Emissions. Annual Inventory	
Scope 1	**2010 (t eq. CO_2)**
Fixed combustion	2,069,054
Mobile combustion	74,326
Processes	276,393
Fugitive emissions	12,871
Emissions generated from biomass use	1,795,727
Scope 1 total	**4,228,371**
Scope 2	**2010 (t eq.CO_2)**
Electricity consumption	580,073
Consumption of other energy types	13,013
Scope 2 total	**593,086**
Scope 3	**2010 (t eq. CO_2)**
Supplies from third parties	4,564,984
Commutes from work	27,833
Commutes to work (including biomass emissions)	18,925
Losses from electrical power distribution	51,808
Value chain losses for fuels used in acquired energy	77,049
Scope 3 total	**4,740,599**
Total	**9,562,056**

The **objectives the company set** itself for 2010 have enabled it to curb its CO_2 emissions by over 64,000 t and develop the methodology needed to label the following products:

- Steel structures.
- Solar thermal kWh.
- Photovoltaic kWh.
- Waelz Oxide.
- Ferrosita.
- Waste treatment.
- Recovered aluminum (secondary).
- Bioethanol.
- Exported electricity, generated steam and desalinated water at cogeneration plants.
- Sulfuric acid, oleum and electricity generated at desulfurization plants.
- Desalinated water.
- Traffic control cabinets.
- Ticketing machine.

Rule Governing Preparation and Maintenance of the Inventory

Since its inception, Abengoa has displayed an unflinching commitment to environmental protection. For this reason, company business has always focused on aspects related to sustainability. In 2007, a working group was set up with the backing of the company's Chairman's Office. Comprising the Quality and Environment Department and the coordinators of the different business units, the group devised a rule in order to create and maintain Abengoa's greenhouse gas emissions inventory in accordance with the **company's Joint Management Systems.**

As a product of this work, Compulsory Compliance Rule 5/003 (Norma de Obligado Cumplimiento, or NOC) 05/003, "Quality and Environment Management. Sustainability Management. Greenhouse Gas (GHG) Emissions Inventory" was published in June 2008, the aim being to define the methodology for generating and maintaining the emissions inventory, and to allow for monitoring and communication of GHG emissions throughout all Abengoa companies, including both direct and indirect emissions.

There are only a handful of companies worldwide that employ such an exhaustive methodology for measuring the emissions generated by products and services acquired from third parties (scope 3). At the time Abengoa started up its GHG measurement system, the company incorporated into its rule the methodology required to calculate emissions of this scope, embracing its entire chain of goods and services suppliers[1].

Main Emission Sources

With a view to streamlining and standardizing the process of calculating GHG emissions, the internal rule includes an in-depth methodology on measuring emissions for all three scopes, in accordance with the provisions of the Greenhouse Gas Protocol. The main sources analyzed are as follows:

Scope 1	Scope 2	Scope 3
Fixed combustion	Electricity acquired	Value chain of acquired energy and fuel
Mobile combustion	Thermal energy acquired	Goods and services acquired
Flare stacks	-	Business trips
Metal recovery process	-	Commutes to/from work
Bioethanol production process	-	Losses from electrical energy transportation and distribution
Use of fertilizers	-	
Dumpsite emissions	-	-

1 See chapter titled Abengoa and its Suppliers

Scope 1	Scope 2	Scope 3
Water treatment plants	-	-
Fugitive natural gas emissions	-	-
Refrigeration systems (HFC)	-	-
Electrical switchgear (SF6)	-	-
Aerosols (HFC/PFC)	-	-
Foam blowing (HFC/PFC)	-	-
Lubricants	-	-
Paraffin waxes	-	-
Use of GHG-containing gases	-	-
Biomass combustion or transformation		

Bases for Calculating Emissions

GHG emissions can be determined by applying either a calculation-based or measurement-based methodology. The former is the preferred method for gauging emissions, while the latter is restricted to obtaining stationary emissions.

While on this subject, it is worth explaining the bases on which the **company calculates emissions** pertaining to goods and services acquired (scope 3). All orders impose an obligation on the supplier in question to provide details of the emissions associated with the goods or services requested by the company, and similarly to adhere in writing to the Social Responsibility Code.

With a view to helping all suppliers adapt to these procurement requirements, Abengoa affords them a six-month transition period for those suppliers that are initially unable to provide details of their emissions, although they must undertake in writing to implement this reporting system. Any suppliers that fail to report their emissions within the six-month term, or do not undertake to do so, may not become company suppliers, save for certain exceptions requiring special authorization, in which case the companies in question are required to estimate the emissions generated by their supply activity.

Given that the inventory is still being implemented among suppliers this year, an exception has been made to allow, for the purpose of calculating 2010 emissions, suppliers that have not been able to provide their emissions directly to instead furnish estimates of all emissions associated with their supply activity (scope 3). Abengoa companies have carried out this calculation in accordance with emissions factors and databases compiled from recognized sources and international bodies. As a result, roughly 50% of the scope 3 supply-related emissions under the 2010 GHG inventory have been estimated directly by the company.

The internal rule dictates that each piece of emission data must be accompanied by a quality index, which in turn must be associated with the emissions data for each source and each greenhouse gas, and with each parameter involved in the calculation. This index indicates just how **reliable the data** in question is, and is invariably standardized to ten. The rule sets forth a number of minimum quality requirements for each emission source, depending on the emitting potential of the center and whether the source is principal, secondary or minimal.

Recording and Reporting Information

At present, companies are reporting their emissions in accordance with the corporate system, which contains a GHG emissions section available to the heads of the inventory process. This section enables them to consult the monthly GHG emissions report for each company – according to the scope detail, 1, 2 or 3; the list of suppliers and their degree of adherence to the internal rule (providing details of emissions associated with their supply activity).

Emissions data submitted by suppliers is validated by the Abengoa companies through application of a validation system that is part of the NOC-05/003 internal norm portaiming to the inventory.

Likewise, Abengoa has now finished implementing an **IT application** specifically designed to calculate GHG emissions, which also enables the company to consolidate data and improve the overall functionality of the inventory.

Assignment of Emissions to Products and Services

The internal rule also envisages the future assignment of emissions to products, a process that will have its own specific methodology. For the 2010 inventory, emissions were not tagged to individual products and services, with the exception of those performed when developing the methodology for the aforementioned pilot cases.

Defined Control Processes

The internal rule also imposes the obligation on all Abengoa companies to implement an **internal audit** process to **ensure** that all the requirements included in the guide are correctly implemented. The planning of this audit process must be duly documented on a yearly basis.

In similar fashion, the inventory for each company is assessed as part of the programmed control and follow-up visits managed by Abengoa's Quality and Environment Department.