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## Environmental Awards 2015

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### Summary

EIGA's Working Group 5, Environmental has produced this newsletter to share with EIGA members the learning and best practices highlighted in the Environmental Award nominations. EIGA received fourteen award nominations that covered a range of best practices.

### Introduction

The EIGA Environmental Award recognizes EIGA Members for environmental excellence and nominations can be received for sites, teams, or individuals. The Environmental Award aims to promote best environmental practices and recognise employees these in the Industrial and Medical Gas industry who have been involved in these. The award program also enables EIGA to share these best practices and to promote environmental awareness and improvements within companies and across the industry.

The award is open to all EIGA member companies. All applications for the award are categorised according to a number of areas that demonstrate benefits to the environment and EIGA member company operations.

The environmental categories are:

- i. Projects that focus on pollution prevention e.g. recycling, reuse, reclamation of waste materials.
- ii. Initiatives that focus on product stewardship e.g. designing products so that their environmental impact is minimised.
- iii. Activities that conserve resources e.g. efficiency improvements for process to reduce energy and water use.
- iv. Projects that work with the local community and provide environmental benefit for the local community.
- v. Developing and innovating new solutions to environmental issues that demonstrate the industries environmental leadership.

Each application is assessed against criteria that focus on:

- Initiatives that aim to go beyond regulatory compliance
- Achieving long term effectiveness for the project
- Ensuring that the project provides significant and measureable environmental benefit
- Bringing environmental benefits to the local community where the project is initiated
- Employee involvement and participation in the project
- Providing environmental benefits to the gases industry
- Creating an innovative solution to an environmental issue

## Selection of best practice initiatives submitted by EIGA members

For the 2015 Awards, presented at our 2016 Annual General Meeting, EIGA received applications from a range of projects that merit recognition for improving the environment. In this Newsletter is a selection of the projects that were judged to have met the criteria and should be seen as best practice in the Industrial and Medical Gas industry.

A number of nominations concerned with energy and water efficiency improvements included:

- Filtering inlet water to improve the efficiency of cooling water pumping.
- Adding condensate to cooling water make up to reduce the volume of water used.
- Water from the ASU cooling tower was reused as raw material for production of acetylene .
- Installation of a control system to improve the consumption of reactive power.

Please also refer to EIGA's Environmental Newsletters ENL 25 *Energy efficiency* and ENL *Water use and minimisation*.

Several Members' nominated projects for hydrogen plants including:

Heat recovery of vapour condensates by installation of a revaporization system (flash tank) to revaporize to 7 bar both boiler purge and condensates from vapour traps. This vapour is then used in a heat exchanger to heat the amine solution used in the carbon dioxide absorption unit where residual heat is recovered.

Additional recovery of carbon dioxide product by installation of a carbon dioxide head condenser in the vent line of this recovery unit, allowing to reach a temperature of -35°C, and thus recovering 177kg/h carbon dioxide of the 266 kg/h carbon dioxide that were previously emitted. This means a reduction of 67% of carbon dioxide emissions coming from the plant.

Heat recovery of combustion gases from steam reformer in plants by means of a first heat exchanger using water from the plant to lower the temperature of the gases. Afterwards, this heated water is used to increase plant feed (natural gas, naphta or LPG) to the maximum temperature possible in a second heat exchanger, in order to reduce the vapour consumption of the plant. This reduced energy use and atmospheric emissions.

Avoided performing hydraulic tests on the ten beds of a PSA (mandatory every 12 years) through a surrogate test called ultrasonic graphic. This avoided generating more than 500 m<sup>3</sup> of waste (used catalyst, alumina, activated carbon) and saved almost \$2 million in cost of catalysts.

Replacement of burners in a reformer furnace with more efficient ones lowered NOx emission (from around 120 mg/Nm<sup>3</sup> to around 90 mg/Nm<sup>3</sup>).

## Award Winners



Two projects were declared winners of the award.

The first award winner was **S.E. Carbueros Metálicos S.A.** for their project *New CO<sub>2</sub> Recovery Unit*. This involved the replacement of the front end of an existing carbon dioxide plant, that was burning fuel in a boiler to produce carbon dioxide, with a new design that recovers the carbon dioxide content from a nearby customer's flue gas. In the past this flue gas was vented to the atmosphere.

This project has resulted in a reduction of carbon dioxide emissions of 8000 MT/yr; a reduction of fuel oil consumption reduction of 2700 MT/yr and a 97% reduction of other flue gas emissions;6 such as NOx/SOX.

In addition, 30% of the absorbent used in the cleaning process is reused in the customers glass furnace.

The second award winner was **Air Products France Team** for their project *Carbon dioxide reduction certification “Fret 21, Les chargeurs s’engagent”*: reduction in logistics impacts. A range of improvements in transport logistics were implemented that:

- Decreased the distance driven between customers for liquid bulk deliveries. This reduced by 6.8% the distance driven between customers per MT delivered, equivalent to 47 tons of carbon dioxide emissions saved per year.
- Decreased the distance per cylinder delivered for cylinder gases distribution by 10.4%
- Used extra light trailers to increase the payload by 7.5%, leading to a reduction of 3.8% of the distance driven by those transports, and introduced multi modal distribution using rail.

Overall the initiative reduced distance driven by road for the inter districts by 27.4%, equivalent to 237 tons of carbon dioxide emissions saved per year.



### Special Recognition

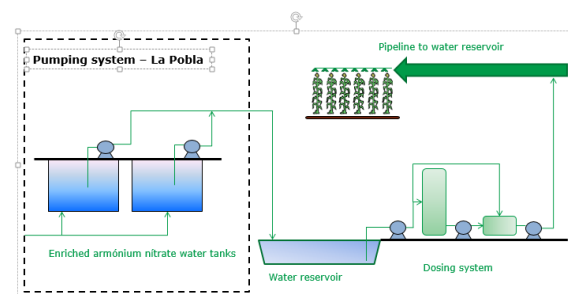
WG-5 Environment and EIGA’s Safety Advisory Council (SAC) also recommended that the Board of Directors give special recognition for the **S.E. Carbueros Metálicos Pobla Site** project *Use of by-product ammonia water for agriculture*, for the benefits it was providing to the local community and positive external impact for the gas industry.



The team at the nitrous oxide production plant developed a scheme to use water enriched with ammonium nitrate as fertilizer for the local farmer’s crops, benefiting the local community and at the same time eliminating a waste stream. Members of the community of irrigators require nitrogen fertilizer for their fields. There is a close proximity between the irrigation community and Nitrous Oxide production plant. The team were able to show that the product could meet the nutritional requirements of the fields, preserving the natural fertility of the soil and prevent their impoverishment and prevent leaching of potentially toxic substances to groundwater.



### Fertirrigation Project : Installation scheme



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Air Products Internal Use Only



## Actions

EIGA member companies should continue to encourage their employees and site teams to initiate environmental improvement projects since they have the potential to benefit the business, the environment and also promote the good environmental stewardship of member companies in the communities where they operate. A list of operational best management practices can also be found in EIGA Doc 88 *Good Environmental Management Practices for the Industrial Gas Industry*.

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