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DROGAS VIGO S.L - ESIG PRODUCT STEWARDSHIP AWARD 2007 WINNER



This strategy included the use of cryogenic technology to reduce VOC emissions, improved storage facilities to prevent environmental leakages, customer site appraisals and the hosting of seminars on the explosion and fire risk from static electricity.

John Greenhough, Head of ESIG's Product Stewardship Group, said: "I am delighted that Drogas Vigo has won the 6th ESIG Product Stewardship Award. Over the last six years, they have put tremendous efforts into the implementation of their product stewardship strategy. It is an outstanding example of best practice in the sustainable distribution of solvents."

For further information on the ESIG Product Stewardship Award, visit www.esig.org.

Drogas Vigo General Manager, Enrique Casal Garcia (left), receives the award certificate from John Greenhough, Head of ESIG's Product Stewardship Group



From left to right: Alberto Pereira, Drogas Vigo's Sales Manager; Enrique Casal Lareo, Drogas Vigo's Business and Site Manager; Enrique Casal Garcia, Drogas Vigo's Founder and General Manager; Dorothee Arns, ESIG Secretary General; John Greenhough, Head of ESIG's Product Stewardship Group; and José Antonio Ruiz, ESIG Chairman.

ESIG Chair José Antonio Ruiz was delighted to announce that the winner of the 6th ESIG Product Stewardship Award was Drogas Vigo S.L of Spain. The award was presented to Drogas Vigo during Cefic's Responsible Care Conference in Paris.

The ESIG Product Stewardship Award recognises those companies which achieve significant and cost-effective health, safety and environmental improvements in the handling, storage, use or transportation of solvents. The award is designed to promote best practice and to help foster an ethos of continuous improvement in the responsible use of solvents.

An independent jury, consisting of senior representatives from the European Commission, European Parliament, media and trade associations, was impressed by the vision, innovation and execution of Drogas Vigo's product stewardship strategy.

THE LINK BETWEEN AIR QUALITY & GLOBAL WARMING

Global warming is the effect of the earth receiving more radiation from the sun than it can re-radiate from its surface. Some radiation given off by the Earth is trapped by gases in the air and there is a warming effect - the greenhouse effect. The gases absorbing and re-emitting radiation from the Earth are named greenhouse gases:

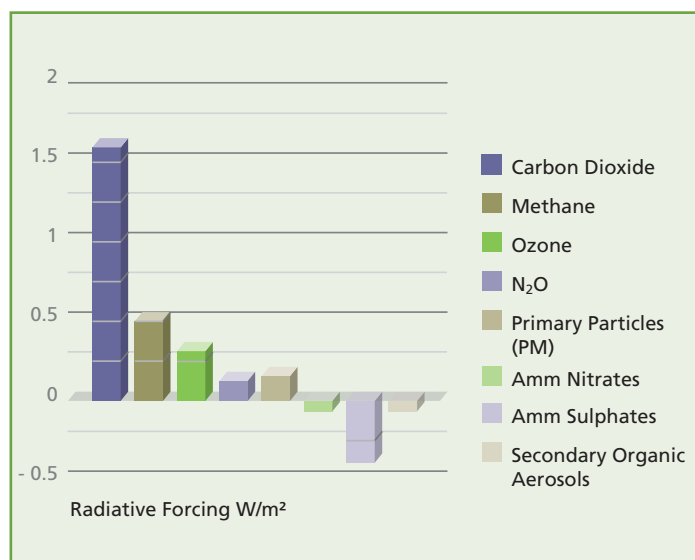
- Carbon dioxide is formed from combustion processes;
- Methane has natural gas leakage, agriculture and landfill as main sources;
- Tropospheric ozone is formed by photochemical reaction of nitrogen oxides and VOCs and has already been the subject of legislation world-wide;
- Nitrous oxide is due to biomass burning, nitrogen fertilisers and sewage.

Each of these greenhouse gases has a different lifetime in the atmosphere. Carbon dioxide, nitrous oxide and methane have typical lifetimes of 100, 120, and 12 years respectively. Ozone has a much smaller lifetime (one month) in the atmosphere and, consequently, has attracted less attention as a greenhouse gas.

Governments are concerned about the long-term effects of global warming. Indeed, climate models predict that a doubling of carbon dioxide concentrations will lead to an average surface warming of 3 degrees Centigrade.

Whereas governments have concentrated on the improvement of air quality, the concern is how to reduce global warming. Here we explore links between air quality and global warming and identify win-win strategies.

TABLE 1: Best Estimates of Radiative Forcing of Greenhouse Gases and Particles



RADIATIVE FORCING

The temperature of the Earth's surface is determined by the balance of the radiation absorbed and emitted by the atmosphere. Radiative forcing is defined as the change in the net radiation balance for the year 2005 relative to 1750.

Calculations of radiative forcing have been made for the major greenhouse gases and, recently, particles (PM). Table 1 lists the best estimates of radiative forcing. Those with positive radiative forcing contribute to global warming and include primary particles. Those with negative radiative forcing reduce global warming and include secondary particles. It is clear that carbon dioxide must be tackled seriously to give a long-term reduction in global warming. Methane reduction is more difficult to tackle because so much is occurring naturally, whereas ozone has already been tackled by the Clean Air for Europe (CAFÉ) process.

PRIMARY PARTICLES

The European Union is about to complete its CAFÉ process, where emphasis has moved to the control of particles (PM), mainly primary particles from diesel engines. The diesel engine has gained in popularity and is now identified as lean and green - with lower CO₂ emissions per kilometer than its gasoline equivalent. However, some countries such as France and Austria are reporting a surge in new diesel cars and the pressure has moved towards tighter controls on diesel emissions, both PM and NO_x.

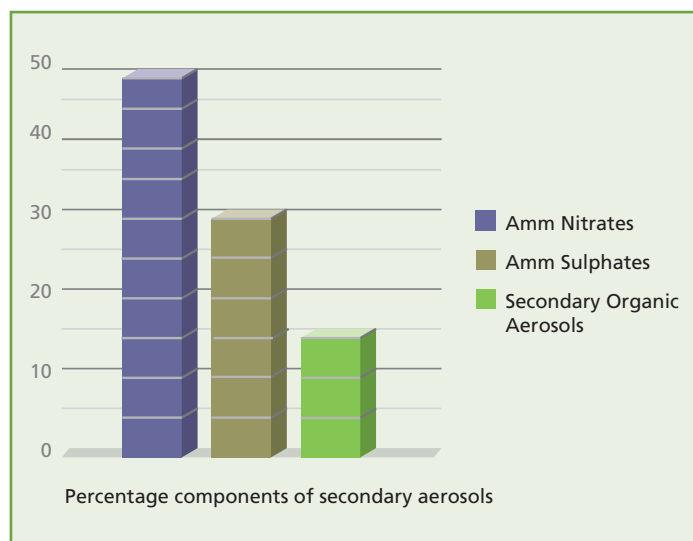
Primary particles have a positive radiative forcing (table 1) and so contribute to global warming. These must be reduced. Given that in summer months, primary PM represents approximately one half of all urban PM_{2.5}, reducing primary PM is a first priority in improving air quality and tackling global warming.

SECONDARY PARTICLES

Secondary particles contribute one half of PM_{2.5} in summer months, with two main types of secondary particles occurring in the atmosphere. These are inorganic aerosols such as ammonium sulphates and ammonium nitrates, and secondary organic aerosols largely formed by the photochemical oxidation of terpenes from natural biogenic sources. The lifetime of these secondary particles is about one week.

The reality of assessing the concentrations of secondary particles lies with air quality models. In summer months, ammonium nitrates account for almost 50% of all secondary PM in Europe, ammonium sulphates some 30% and secondary organic aerosols about 15%. These are illustrated in Table 2-Percentage Components of Secondary Aerosols.

TABLE 2: Percentage Components of Secondary Aerosols



Some 85% of all secondary organic aerosols are formed from natural hydrocarbons such as terpenes, and only 15% from man-made sources. Referring to Table 1, it is clear that the radiative forcing of all secondary aerosols is negative, which helps to reduce global warming. Ammonium nitrates have a radiative forcing of -0.1 W/m^2 , and ammonium sulphates -0.4 W/m^2 , showing that inorganic aerosols contribute to a reduction in global warming. Both ammonium sulphates and nitrates are already in decline and this decline will lead to a temporary increase in global warming. Secondary organic aerosols have increased since 1750, and so

their radiative forcing is slightly negative close to the levels of ammonium nitrates. As such they make a moderate reduction in global warming. Secondary particles contribute to a moderate reduction in global warming and so need not be further addressed by European States.

THE WAY FORWARD

European governments have made substantial efforts to improve air quality, with ozone about to be reduced further in the next decade. Their efforts have now turned to reducing primary particles which constitute one half of all PM_{2.5} in summer months. The reduction of ozone and primary particles will help to reduce global warming as both of these pollutants have a positive radiative forcing.

However, secondary aerosols have negative radiative forcings and so are beneficial in reducing global warming. It is envisaged that secondary ammonium nitrates and sulphates will reduce further in the next decade. Whilst this will improve air pollution, it will lead to a temporary increase in global warming. Secondary organic aerosols are beneficial to the reduction of global warming, and given that their main source is natural sources, their concentrations are unlikely to change.

The EU has played its full part in improving air quality and now needs to address the problem of reducing carbon dioxide in order to control global warming.

SOLVENTS: ESSENTIAL TO BIODIESEL PRODUCTION

Today, biodiesel is the most commonly used biofuel in Europe, but little is known so far about the key contribution solvents make to its production.

Biodiesel is a fuel derived from animal fats or vegetable oils such as rapeseed, sunflower or palm. In Europe, rapeseed oil is the most commonly used oil. The solvent hexane is instrumental in the extraction of the oil from the rapeseed. It enables the extraction of much larger quantities of vegetable oil than by simple mechanical extraction. Whereas today's mechanical extraction can remove only 50-75% of the oil, adding the solvent process enables the capture of up to 99%! We are far from the time when such oils were extracted by wrapping seeds in cloth and exerting pressure on them using devices operated by stones and levers.

Because of their efficiency, processes employing solvents to extract vegetable oils are widely used. Approximately 1 ton of hexane is needed to produce 300-500 tons of biodiesel. Hexane is currently the commonest extraction solvent for oil seeds used throughout the world. Its role is essential to enhance production yields, especially given today's rush to produce more biofuels.

Another solvent, methanol, plays a key role in a further step in the manufacture of biodiesel. During a chemical process known

as esterification, vegetable oil is reacted with methanol in the presence of a catalyst to produce chemical compounds known as fatty acid methyl esters (renamed biodiesel when they are intended for use as fuel). To force the reaction to completion, an excess amount of methanol is used. The advantage is that it can be recycled back into the process after being removed from the mixture by distillation.

WHY OPTIMISE THE PRODUCTION OF BIODIESEL?

In March 2007 the European Union agreed that, by 2020, Member States should achieve 10% of their transport fuel consumption from biofuels. The use of appropriate biofuels may contribute to reducing greenhouse gas emissions from the transport sector.

ESIG's Secretary General, Dorothee Arns, said: "Reducing the environmental impact of the transport sector, which is responsible for 21% of EU greenhouse gas emissions, is a challenge. The importance of solvents in the production of biodiesel cannot be underestimated. Hydrocarbon solvents such as hexane can play their part in helping Member States to comply with the targets proposed by the European Union."

ESIG APPOINTS JOSÉ ANTONIO RUIZ AS NEW CHAIRMAN



José Antonio Ruiz has recently been appointed ESIG Chairman and took up his new position on 1 April 2007. José Antonio replaces Sylvie Lemoine, who had held the post since 2004. José Antonio has a Ph.D in Chemical Engineering and for a number of years lectured at the Complutense University of Madrid, following time spent in a number of companies including Repsol, Elf and TR. He joined ExxonMobil in 1995 and was responsible for sales in Spain. In 1999, José Antonio became Fluids Sales Manager for Spain and Portugal. In early 2007, he moved to Brussels to manage REACH and other environmental regulations in the ExxonMobil Fluids business, in addition to taking up his role as Chairman of ESIG.

Welcoming his appointment as Chairman, José Antonio said: "I am very much looking forward to my new role as Chairman of the European Solvents Industry Group. Solvents are simply essential for so many diverse and varied industrial and consumer product applications. One of the most important roles which ESIG plays is to facilitate and support our customers and downstream users, in particular on the safe management and use of solvents. We continue to develop innovative tools to support our customers in this regard and I'm pleased to announce our latest guide: an interactive DVD entitled "Safe Handling of Solvents", which is detailed later on in this newsletter. I look forward to working more closely with all of our customers in the coming months and years."

TWO NEW TOOLS FOR SOLVENTS USERS



One of ESIG's most important roles is to provide ongoing support and advice for the solvents industry. Now two new useful tools are available that highlight both the benefits of solvents and their safe use.

"The Solvents Family" brochure highlights the diversity of everyday products in which solvents play a vital role, while the "Safe Handling of Solvents" DVD provides practical support in the responsible use of solvents.

In fact, solvents are simply essential for many products to perform effectively and people benefit from them every day. "The Solvents Family" brochure includes a description of 16 key uses of solvents as diverse as the purification of penicillin and even the production of skis! And these are only a few examples of the different applications of solvents – there are literally thousands more! In addition, a "family tree" diagram offers an easy-to-understand guide on the relationships between and usage of different types of solvents. The brochure was produced

in conjunction with the American Chemistry Council and has proved extremely popular – over 6,500 copies have been distributed already to regulators, solvents users and consumers around the world.

The DVD, on the other hand, provides practical advice on how to manage solvents safely to protect the environment and the well-being of people in the workplace. A joint collaboration between ESIG and the Solvents Industry Association (SIA) in the UK, the DVD illustrates a variety of situations in which the use of solvents requires special and careful management. It also emphasises one of ESIG's primary roles: to support the sustainable and responsible use of solvents through dialogue, information-sharing and solutions that address health, safety



and environmental issues. Produced in five different languages, the DVD has been distributed to solvents users all over Europe and initial feedback has been extremely positive.

The brochure and DVD can be downloaded from the ESIG website www.esig.org or ordered free of charge from vme@cefic.be.

SOLUTIONS IS PRODUCED BY THE EUROPEAN SOLVENTS INDUSTRY GROUP.

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