

EPA's **SF₆ Emission Reduction Partnership for the Magnesium Industry** in cooperation with the **International Magnesium Association (IMA)** has developed a work plan for achieving the industry's Climate VISION commitment. The magnesium industry, with continued support from EPA, has committed to eliminate SF₆ emissions by 2010 as guided by the three-part work plan below.

Element 1: Emission measurement and reporting protocols

Participants will use SF₆ emission measurement and reporting protocols developed by EPA and its partners in the **SF₆ Emission Reduction Partnership for the Magnesium Industry** to evaluate progress towards achieving its Climate VISION goal. The Partnership's protocols were established in 1999 and are consistent with guidance provided by The Intergovernmental Panel on Climate Change's (IPCC) Good Practice Guidance for National Greenhouse Gas (GHG) Inventories (see www.ipcc-nggip.iges.or.jp/public/gp/gpgaum.htm Chapter 3.4). As new information becomes available, the protocols will be revised and emission factors updated.

The partnership's protocol is based upon mass balance and requires weighing SF₆ gas cylinders as they are brought into and out of service. This method provides a simple and accurate measurement of annual cover gas usage and assumes that a negligible amount of the gas reacts with the molten metal surface. Therefore, a company's annual emissions are equal to its annual usage. However, recent EPA-sponsored studies at magnesium die casting facilities indicate that between five and fifteen percent of the SF₆ delivered to the molten metal is destroyed in the process and, therefore, not emitted to the atmosphere. International industry and government experts met in July 2004 to begin updating the IPCC's GHG inventory guidance. The results from EPA's studies were considered and may be incorporated in the IPCC's updated guidance to be published in 2006. These issues will be further considered at the IPCC's next Lead Authors' meeting in July 2005.

Element 2: Identify/implement near-term, cost-effective opportunities

U.S. magnesium producers and casting companies are working closely with EPA to identify and adopt cost-effective, near-term climate protection practices. The industry will continue investigating and implementing cost-saving emission reductions strategies such as:

- Identifying and repairing SF₆ cover gas distribution system leaks,
- Monitoring and optimizing cover gas concentration above the molten metal to avoid unnecessary emissions and prevent the generation of potentially dangerous byproducts, and
- Improving machine operator training and awareness.

In addition to the adoption of new technologies, program efforts will include information sharing amongst partner companies on strategies to reduce emissions and transition to

zero emission technologies, and projects to facilitate data collection and to improve data quality.

Many near-term emission reduction strategies as well as 2010 solutions were presented and discussed in December 2004 at EPA's **3rd International Conference on SF₆ and the Environment** [LINK to www.epa.gov/electricpower-sf6/agenda_dec04.html] in Scottsdale, Arizona. Ultimately, the industry expects to eliminate the use of SF₆ altogether and adopt a more environmentally friendly cover gas technology without compromising health and safety thereby eliminating emissions by 2010.

Element 3: R&D and commercialization of advanced technology

In its effort to eliminate SF₆ emissions, the International Magnesium Association and EPA led a 3-year evaluation of protective cover gas technologies that replace SF₆ with alternative protective materials such as SO₂, HFC-134a or a 3M fluorinated ketone named Novec™ 612. These promising alternatives are expected to have a cost of ownership similar to or less than traditional SF₆-based systems. The IMA study's preliminary results were presented at the 61st Annual World Magnesium Conference at New Orleans, Louisiana in May 2004. In addition, one EPA partner company reports installing an alternative cover gas throughout its facility in 2004, demonstrating the technical feasibility of these cover gases alternatives.

EPA, the SF₆ Partnership companies, industry suppliers, and the IMA will work together to further assess the technical barriers and environmental benefits of these promising technologies in 2005. EPA will continue to participate with and receive updates on the IMA's progress towards achieving its Climate VISION goal as a participant of the IMA's SF₆ Substitutes Committee. The IMA's SF₆ Substitutes Committee will next meet during the World Magnesium Conference in May 2005. The industry plans to fully implement more environmentally friendly, alternative cover gas systems by December 31, 2010.