Voluntary Aluminum Industrial Partnership

$\text{SF}_6$ and the Environment: Emission Reduction Strategies
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Discussion Points

- VAIP background
- VAIP agreement structure
- Program results
- Benefits of VAIP program for producers
- Future direction
Aluminum Electrolysis Operations

Electrolysis cell

Production line

New and consumed anodes
VAIP Background

- Growing awareness of issue in early ’90s
  - CF₄ and C₂F₆ produced during anode effects
  - 100 year GWPs of 6500 and 9200
  - Very stable in atmosphere

- EPA and Aluminum Association dialogue
  - EPA proposal for voluntary reduction agreement as part of Climate Action Plan
  - Agreement language developed for reduction from 1990 baseline
VAIP Background

- Individual companies sign voluntary reduction agreements
  - Company targets established based on technology and capability
- Program officially launched in early 1995
Elements of the VAIP Partnership

- Common agreements and principles
  - Only technically feasible and cost effective sought
  - Acknowledge that factors that influence rate of PFC generation not fully understood
  - Target 30% - 60% reduction in PFC emissions
Elements of the VAIP Partnership

- Company responsibilities
  - Provide a liaison person
  - Reduction target based on technology and capability
  - Monitoring and reporting
Elements of the VAIP Partnership

- EPA responsibilities
  - Provide a single liaison person
  - Sponsor workshops for information sharing
  - Communicate on progress of the program
Trends in PFC Emissions From US Primary Aluminum Production

Specific PFC Emissions and Trends in US Production

![Graph showing specific PFC emissions and primary aluminium production from 1990 to 1998. The graph displays a downward trend in specific PFC emissions and a relatively constant level of primary aluminium production.]
VAIP Program Benefits

- Accelerated reductions in emissions achieved
- Establishes communication channel for dialog on common issues
  - Setting emissions reduction targets
  - International climate change negotiations competitiveness issues
  - Inventory documentation
- Workshops held for information sharing
VAIP Program Benefits

- **Measurement programs**
  - Better understanding of PFC generation mechanisms
  - Standard reference materials developed
  - Measurement protocols documented

- **Fundamental research program at MIT**
  - Improving understanding of basic mechanisms
  - Interplay with measurements program accelerates knowledge development
Opportunities for the Future

- Further reductions enabled by
  - Incorporation of best practices
    - Improved work practices
    - Better ore control
  - New technology
    - Inert anode materials
    - Process control improvement
Opportunities for the Future

- Reduction in uncertainty in emissions inventory
  - Common reporting templates
  - Use of IPCC Recommended Practices
  - Additional measurements
Summary

VAIP provided an effective forum to bring US aluminum industry and US EPA together to address a common issue and produce superior results through a voluntary effort that could be tailored to each company’s needs.