PFC Reductions from the Aluminum Sector in China through the Asia Pacific Partnership for Clean Development and Climate

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NCGG-5 July 2, 2009

Asia Pacific Partnership for Clean Development and Climate

- Voluntary Government/Industry Partnership
  - Australia, Canada, China, India, Japan, Korea, US
- Addresses energy, air pollution, energy security and climate
  - Accelerate development and deployment of cleaner more efficient technologies
- Eight Task Forces
  - Clean fossil energy, Renewable energy and distributed generation, Power generation and transmission, Steel, Aluminum, Cement, Coal mining and Buildings & appliances

Aluminum Task Force

- Fast growing industrial sector
  - Energy-intensive and direct GHG emissions
  - Especially in developing countries
- APP Countries account for 51% global primary production
  - Significant potential to advance and transform environmental sustainability
- Promote best practices
  - Training and technical support
  - Identify impediments to deployment of best available and affordable technology

Government and Industry Participation

- Both government and industry representatives on the Task Force
- Industry, government and academia participating in various projects
- Effective approach for setting priorities, identification of current best practices and accessing technical expertise

Al Task Force Projects

- PFC Management*
- Anode Effect Termination
- Bauxite Residue Management*
- High Silica Bauxite Processing
- Fluoride Emissions Reduction
- Linkages to Technology Providers
- Aluminum Recycling
- Aluminum Sustainability Measuring and Benchmarking

*APP Flagship – priority sector projects

PFC Management

- Goal: Enable all facilities in Partnership countries to minimize PFC emissions
  - using global benchmarking standards for AED, AEF and AE definition, inventory, etc.
- US and China co-chair project
  - Australia and Canada in-kind and financial contributors
- PFCs highly potent and persistent GHGs

PFC Management Opportunities

- Inadvertent by-product generated during smelting process
  - Cell voltage spikes due to insufficient alumina concentration
  - Emissions a function of Anode Effect frequency (AEF) and duration (AED)
- Reduce emissions through targeted process management and systematic focus on variables that lead to anode effects
  - Alumina feeding system, training staff on best practices, monitoring alumina properties, mechanical maintenance and monitoring cell parameters, upgrades to computer control systems, automated AE termination
- Requires sustained and systematic operational efforts to achieve low AEF
  - Extremely low AEF now documented for all technology types (prebake and Soderberg).

Primary Aluminum in China

- Largest global producer of primary aluminum
- Production capacity nearly double second (Russia) and third (Canada) largest producing countries combined
- Both state-owned (~80%) and privately owned production
- Uses domestically designed and manufactured cell technology, nearly all Prebake
- Estimated 80 smelters

PFC Management Activities in China

- PFC Management Workshop
- Study Tours
- Demonstration Project
- Smelter Measurements
- Continuous Emissions Evaluation
- Anode Effect Termination Computer Control Project

Conclusion

- Unique government/industry sector-based initiative
- Unprecedented access to state-of-art best practices
- Brings together industry and government experts
- Management efforts still early in China but momentum and confidence growing

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