

# Energy and the Environment

## Increasing growth opportunities

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**AIR**  
**PRODUCTS** 

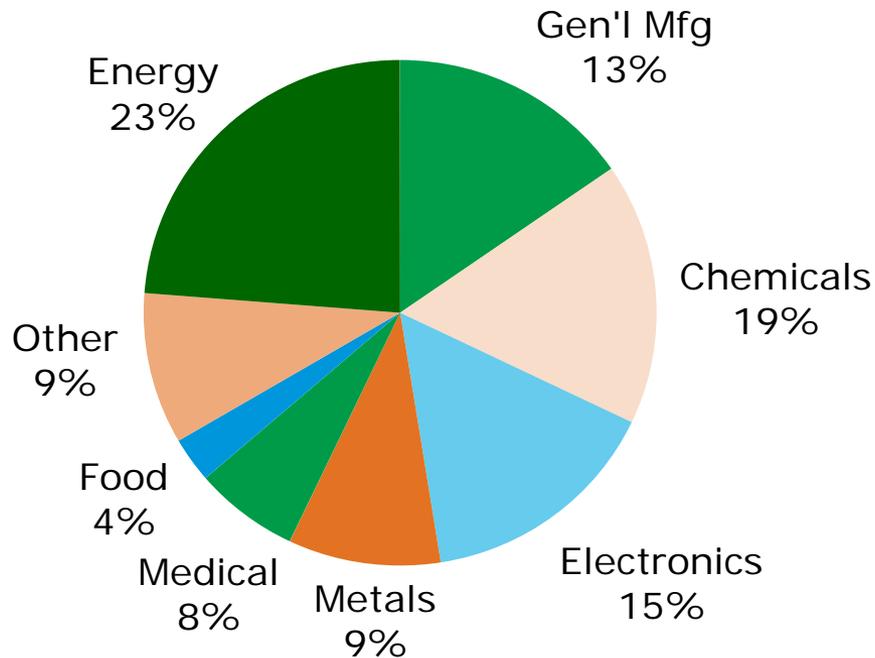
# Forward Looking Statement

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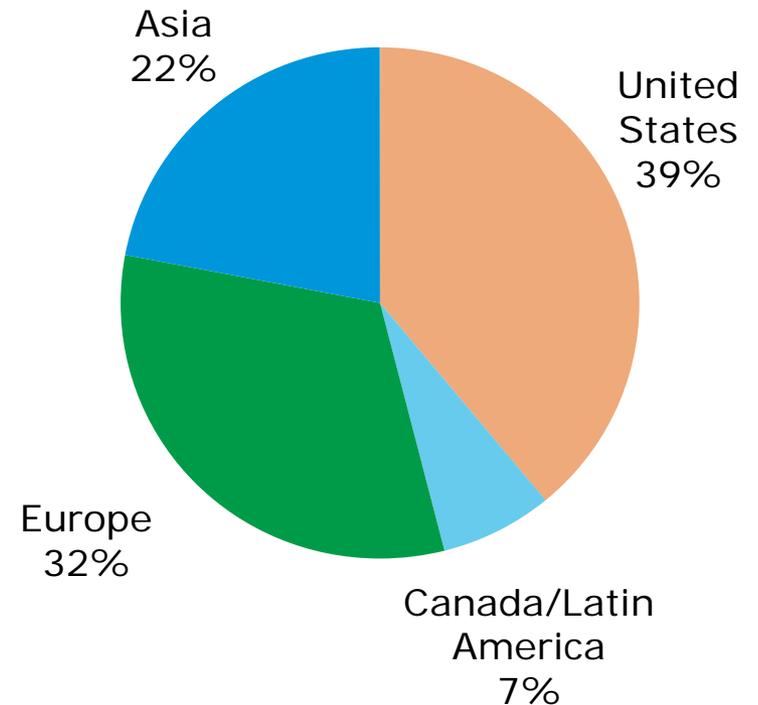
# Diverse Markets and Geographies

- Well positioned for continued long-term value creation

## End Markets



## Geographic Sales



# Providing Solutions for Clean Energy *Industry Leadership*

Resource conservation  
and energy efficiency

Power generation  
development

Technology to make use  
of non-conventional fuel  
sources

Natural gas (remote and  
non-conventional)  
solutions

Hydrogen solutions  
for refiners to enable  
cleaner burning  
conventional fuels

***Providing Energy &  
Environmental Solutions  
for  
Today's Needs . . .  
Preparing  
Solutions for Tomorrow's***

Technology and  
infrastructure enabling  
the development  
of a future hydrogen  
economy

Clean Energy Solutions

Suite of differentiated  
CO<sub>2</sub> capture  
technologies including  
oxyfuel and pre-  
combustion capture

Technology enabling  
gasification

Technology to enable  
fuel diversity

# Industrial Gas Growth Opportunities

## *Delivering Solutions for a Changing World*

### Energy



- Hydrogen for refining
- Oxygen for gasification
- LNG heat exchangers
- Gases for photovoltaics
- Efficient Cogeneration

### Environment



- Oxyfuel
  - Efficiency for Glass, Steel, etc.
  - Fossil Fuels to low carbon power
- CO<sub>2</sub> capture
- Hydrogen fuels

### Emerging Markets



- Electronics across Asia
- Equity Affiliate Positions
- Biofuels and Biomass
- Expanding Merchant positions

# Energy and Efficiency

## *Driving oxygen applications*

- Efficiency
  - Steel
  - Refining
  - Cement, glass, aluminum
- Energy
  - Gasification for power, chemicals, hydrogen, etc.
  - Feedstock independence
  - Biogasification and biofuels
- Environment
  - Oxyfuel combustion
  - CO<sub>2</sub> capture



200,000-300,000 tons-per-day new oxygen capacity by 2018  
100+ new plants

# ITM Revolutionizing O<sub>2</sub> Supply

- Lower unit cost for oxygen
- Energy integration with power and steam generation
- Ideal for gasification / energy applications including oxycombustion
- Proprietary ceramic membrane technology



ITM Prototype operating  
in North America

## Commercialization Update

- Building 100 TPD test facility with DOE support
- Target on-stream 2011
- Received DOE award supporting acceleration of scale up

# Air Products Projects Capturing CO<sub>2</sub> from Fossil Fuel-Based Processes

- Oxyfuel technology for pulverized coal boilers
  - Installing proprietary CO<sub>2</sub> capture, purification and compression system at Vattenfall's pilot, Germany
  - Target on-stream 2011
- Hydrogen production from natural gas with CO<sub>2</sub> capture
  - DOE Phase II Industrial CCS Award, Port Arthur, TX
  - Target on-stream 2012
- Oxyfuel CO<sub>2</sub> Purification in China
  - Shanxi International Energy Group study and reference plant design for 350MW demo project
  - Part of joint U.S.-China Fossil Energy Protocol – Annex II: Clean Fuels



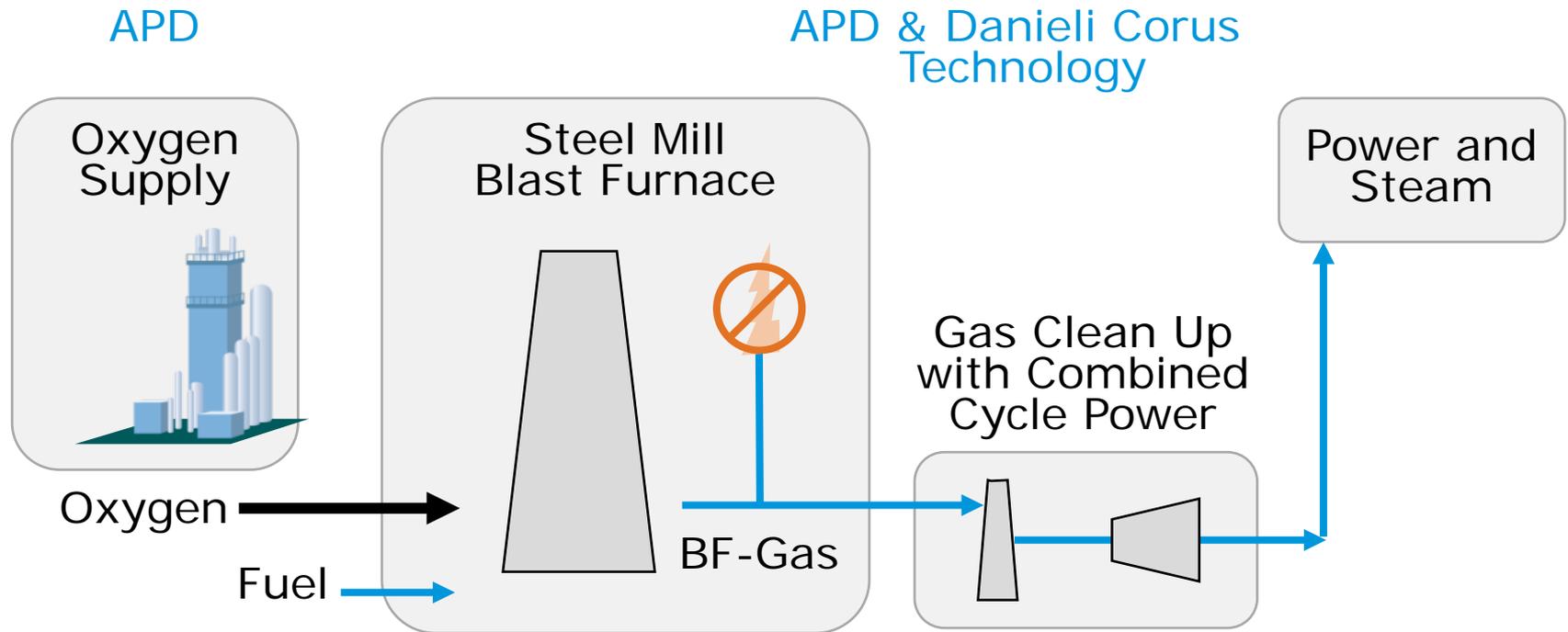
# New Initiatives

## *Tees Valley Renewable Energy Facility*

- Proposed 49MW Energy-from-Waste facility using advanced gasification technology
- Currently in the planning & development stage
- Potential for:
  - Renewable electricity for up to 50,000 UK homes
  - Diversion of 300,000 – 350,000 tonnes of non-recyclable waste from landfills



# BF Plus – Integrated Iron Making / Power Generation



*We offer steel producers the complete package...Lower costs, improved iron making productivity, and a cleaner environment*

# Global Refining

## *Solid Growth for Hydrogen, Power & Steam*

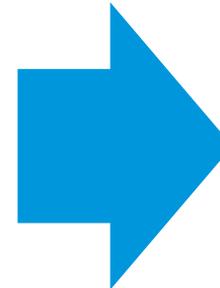
Consumer Growth for Clean Fuels,  
Both Population and Economic



Lower quality  
crude oil



Ultra-low  
Sulfur Fuels



Results in new  
balances for

- Hydrogen
- Steam
- Power
- Fuel

For ultra  
clean fuels



Global Energy  
Markets



Renewable Energy  
Supplies

# New Hydrogen Application: *Transportation Infrastructure*

## Applications Include:

- Material Handling
- H<sub>2</sub> and HCNG Buses
- Trains
- Planes
- Submarines
- Cell-Towers

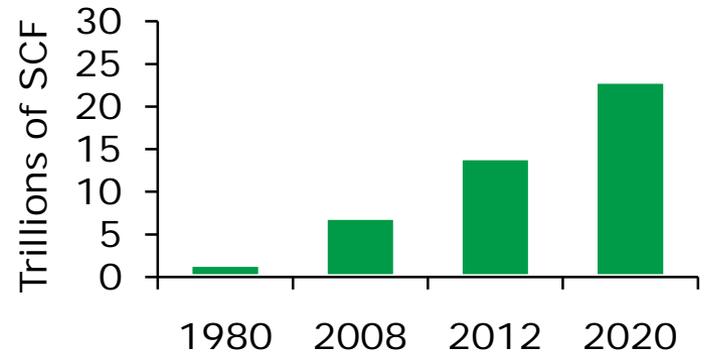


# LNG Heat Exchangers

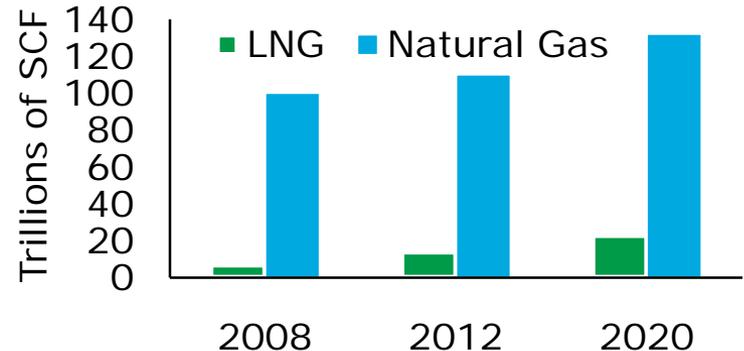
## *Market Leadership*

- APD world leader in natural gas liquefaction technology and equipment
- Sustainable competitive advantage with full complement of technologies
- Significant increase in demand in Asia drives the market
- Anticipate 2-3 LNG orders per year over next 5 years
- LNG global production doubles 2010-2020.

### Natural Gas for LNG



### LNG Production vs. Global Natural Gas Demand



# Sustainability at Air Products

## Business Value



Providing innovative solutions for the world's most pressing challenges

## Environmental Stewardship



Responsibly managing our footprint through improvements and aggressive goals

## Social Responsibility



Improving the quality of life for our employees and plant communities

## Governance



Working with integrity and accountability for our stakeholders

## Water

- Reduce consumption 10% globally by 2015

## Greenhouse Gases

- Reduce by 7% indexed against production by 2015

Thank you...  
tell me more

