Sustainability at Alcoa

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Global Primary Products
Environmental Manager

ALCOA

Session Agenda

- Alcoa at a Glance
- Alcoa’s Sustainability Journey
- Translating Strategy into Actions
- Integration into SMART Manufacturing
- Questions

Alcoa at a Glance

- Founded in 1888
- 200+ locations
- 31 countries
- $25.0 billion revenue in 2011
- 61,000 employees
- 10 times safer workplace than US average
- Award-winning sustainability leadership
- 120 years of patents, including the original aluminum process
- Only aluminum company covering every stage of aluminum production

Global Primary Products

Bauxite: 51 mmt | **Alumina:** 18 mmt | **Aluminum:** 4.2 mmt | **Energy:** 3.4 GW

Mining

#1 in Bauxite

Lowest cost producer of bauxite in the world with latest mine in Amazon jungle.

Smelting

Global Leader in smelting

Most efficient producer of smelter and chemical grade aluminum at 22 smelters worldwide

Refining

#1 in Alumina

World's leading producer of alumina, with global refinery capacity of 18 million metric tons per year, nearly a third of the international market.

Energy

2/3 of energy assets are renewable based energy

Dedicated to securing energy assets for our facilities by controlling more than 3 GW of generating capacity

Evolution of Sustainability at Alcoa

1952 - Alcoa Foundation created

1998 - First EHS metrics system deployed

2002 - First sustainability report issued

1952

1990

2000

1993 - First Environmental performance report issued

2000 - First long-term strategic sustainability goals published.
- Environmental
- Social
- Financial

2010 - First Chief Sustainability Officer selected
Sustainability Goals updated
Sustainability scorecards developed

The Power of Data and Sustainability

- Data has played a critical role in our Sustainability Journey
- Data enables us to:
  - Engage stakeholders on the economic, environmental, and social aspects of our business
  - Understand and quantify opportunities
  - Engage personnel in decision making
  - Assess and support regulatory activity
  - Demonstrate our commitment
  - Ensure transparent, credible and accurate data are communicated
- Make the best investments for our stakeholders

First Set of Long-Term Goals Produced Results!

Goal

- From a base year of 1990 a 25% reduction in direct greenhouse gas emissions by 2010

Achieved

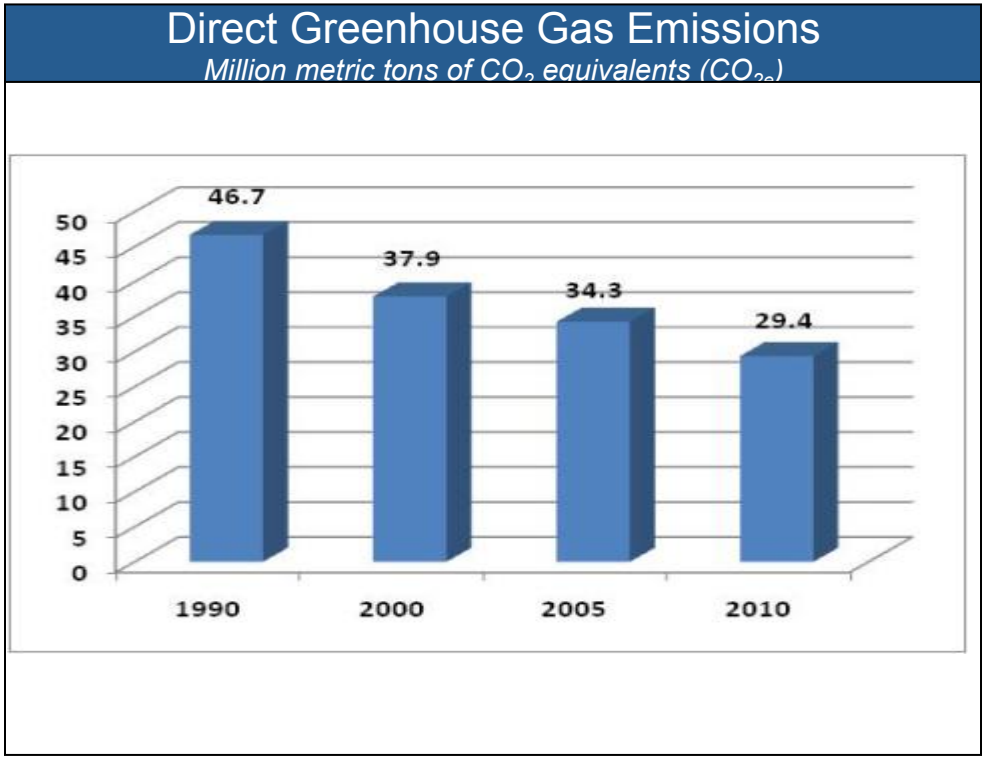
- 37% reduction in direct GHG emissions

Key Levers

- Process control algorithms
- Improved work practices
- Operational stability

Financial Benefit

- Lower KWH per MT
- Lower carbon costs
- Higher production

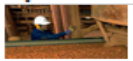


A Decade of Progress

- After a decade of progress, Alcoa reflected upon the original long term goals in late 2009
  - Are we heading in the right direction?
  - What new challenges or opportunities do we see?
    - Population growth driving global concern for water/sanitation, food, energy
    - Major regulatory developments addressing climate (CO2/energy), air and water quality – cost of compliance escalating & technical limitations
    - Sophisticated customers asking demanding questions and eventually demanding materials/products with lowest environmental impacts
    - Growing number of stakeholders/shareholders demanding actions to avoid impacts to earnings, damage to reputation and to promote sustainable practices

- Collaborative discussion occurred within the organization
- Agreement to focus on the critical few

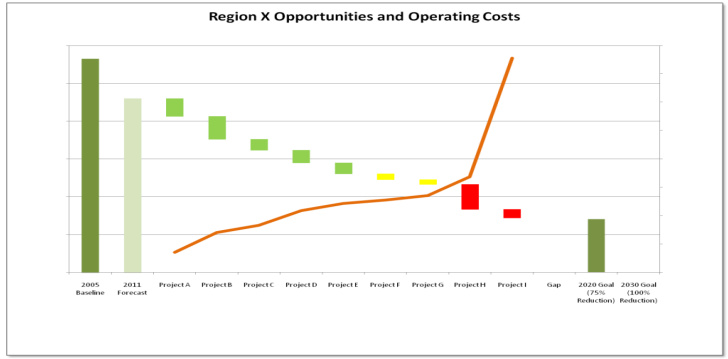
2030 Sustainability Goals (Environmental Focus)

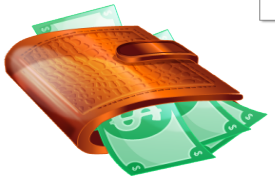
Operations	Targets	Progress Achieved Through Year-End 2010
	From a 2005 baseline, 20% reduction in total (direct and indirect) carbon dioxide equivalent (CO_{2e}) intensity in Global Primary Products (refining and smelting) by 2020; 30% by 2030.	22% → go
	From a 2005 baseline, 10% reduction in the energy intensity of Global Primary Products by 2020; 15% by 2030.	3% → go
	From a 2005 baseline, 20% reduction in the energy intensity of all other businesses by 2020; 30% by 2030.	6% → go
	From a 2005 baseline, 10% reduction in average freshwater-use intensity in each business by 2020; 25% by 2030.	19% → go
	Increase the used beverage can recycling rate in the United States to 75% by 2015 and the global rate to 90% by 2030.	United States: 57% Global: 69% (based on 2009 data) → go
	From a 2005 baseline, recycle or reuse 75% of landfilled waste by 2020 and 100% by 2030.	29% → go
	From a 2005 baseline, 80% reduction in mercury emission intensity by 2020; 90% by 2030.	Negative 16% → go

Resources	Targets	Progress Achieved Through Year-End 2010
	Achieve a five-year average mine land disturbance/mine rehabilitation ratio of 0.75:1.0 by 2020; 1:1 by 2030.	1.15:1 → go
	From a 2005 baseline, 20% reduction in bauxite residue land requirements per million metric tons of alumina produced by 2020; 40% by 2030.	3% → go
	Rehabilitate 30% of total residue storage area by 2020; 40% by 2030.	18% → go
	Recycle or reuse 15% of residue generated by 2020; 30% by 2030.	0% → go
	Develop biodiversity plans for key locations by 2015.	Two pilot plans initiated → go

How Do We Translate Strategy in Action?

- Focus on embedding sustainability into the business strategy
  - Ongoing effort
- Identify opportunities via roadmaps
  - What is possible?
  - What is the value?
  - What gets done by when?
  - What innovation is needed?
- Communicate, communicate, communicate
  - Communicate during quarterly business meetings
  - Communicate progress to Board
  - Engage employees
  - Make relevant at all levels!
- Incentivizing process
  - Energy Efficiency
  - CO_2 reductions
- But there is still opportunity for improvement….





What are the Next Opportunities?

- Focus on improving data quality, availability, and accessibility
  - SMART Manufacturing!
- Current Condition
  - Business cases for sustainability can be enhanced
  - Many data components are lagging
  - Numerous spreadsheets are used to store and analyze data
  - Heavy reliance on people to collect and manage data
  - “You don’t know what you don’t know”
- SMART Vision
  - Ability to quantify and build a business case based on the true opportunity
  - Real time, leading data
  - Common definitions, data historian and analytic tool set
  - Talent is able to analyze and optimize the results
  - Ability to collect information to explore the unknown -> drive innovation

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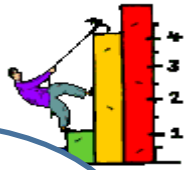
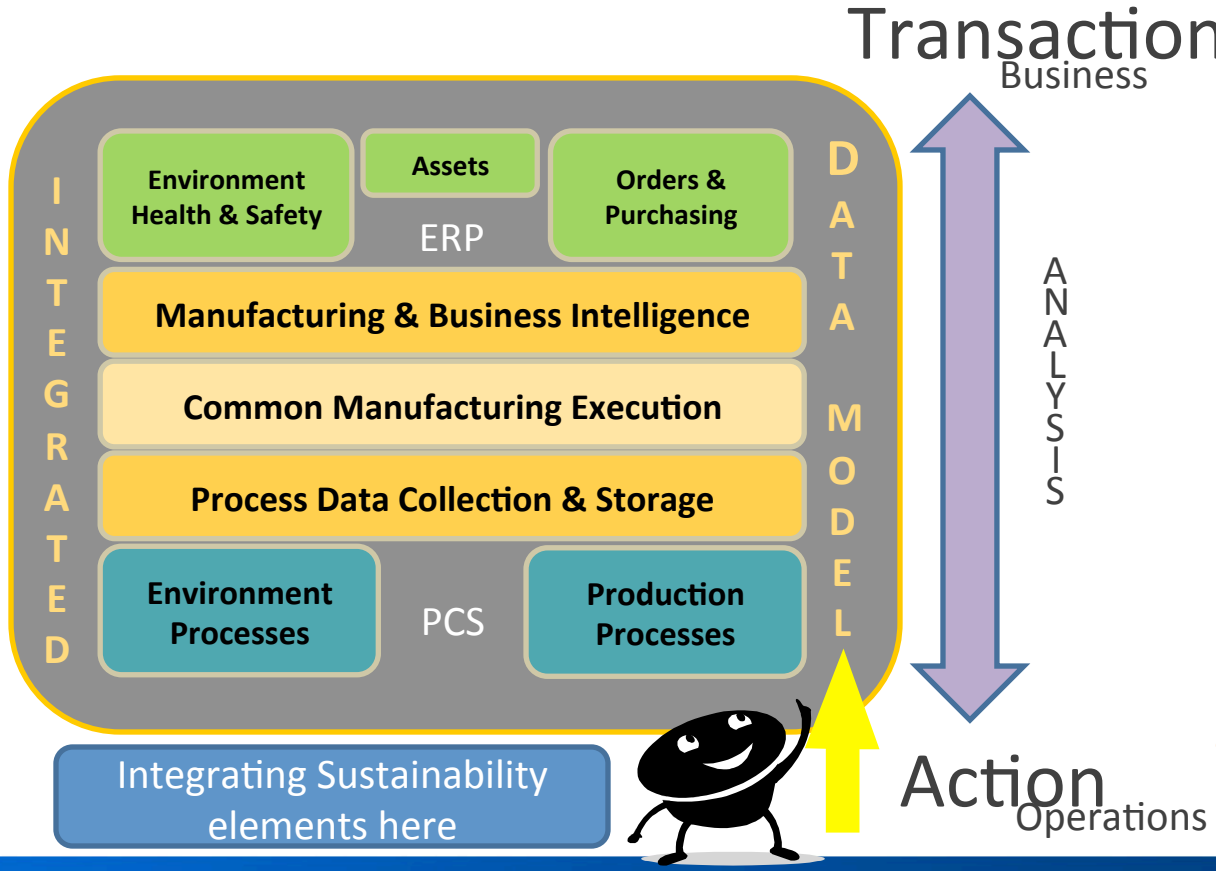
  -
  -



SMART Vision

- Well developed business cases may be underdeveloped
- Real time leading data
- Common definitions, data historian and analytic tool set
- Talent is able to analyze and optimize the results
- Ability to collect information to explore the unknown -> *drive innovation*

How Do We Achieve SMART Manufacturing?

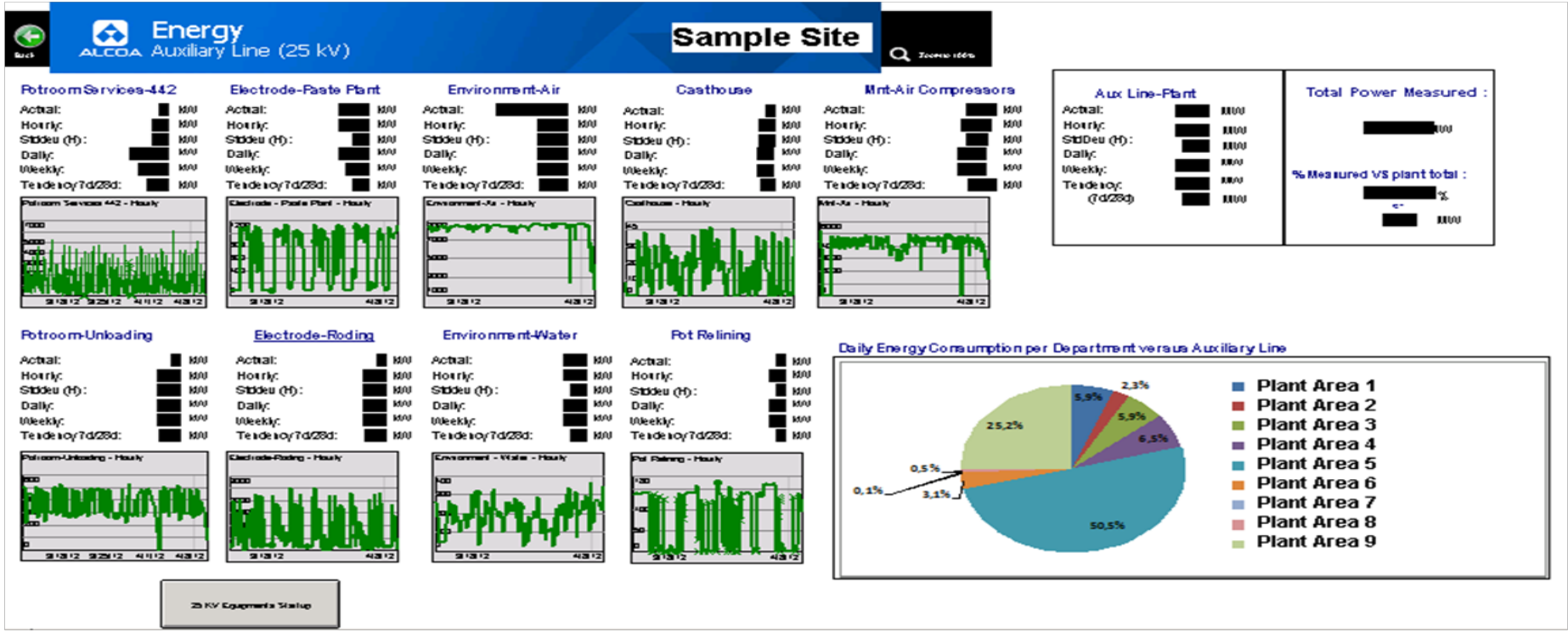


1. Common Applications for Manufacturing Execution (MES)
2. REAL-TIME and HISTORICAL data capabilities
3. Network integration from shop floor to the enterprise
4. Comprehensive analysis toolset

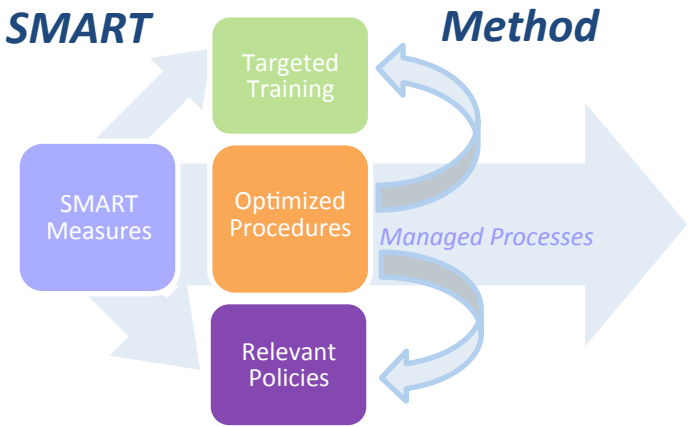
Sustainability and The Data Model

- Opportunity to identify what data elements will be critical to monitor and measure
  - Mega trends
  - NGO/external requests
  - Regulatory headwinds
- A critical lever to developing and refining business cases for deploying projects
- Links with analytic tool set
- Empowers and engages the employee

For example….the Power of Data



Leverage SMART Manufacturing to Continuously Improve



Transparency
Accuracy
Communication
Engagement
Credibility
Visibility

Action

Alcoa's Bottom Line

Improved through measurable improvements on

Entity Level Objectives

Alcoa. Advancing Each Generation.

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