An Introduction to Environmental Management Accounting (EMA)

Presented at the *conference title*
conference location & date

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Environmental Issues faced by Companies

Energy Supply

Water Shortages

Climate Change

Toxic Pollution

Resource Extraction Impacts

Waste Disposal Capacity

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These Issues translate into…

Risks/Costs

- Higher resource prices
- Business interruption due to resource constraints
- Waste management costs
- Pollution taxes
- Legal liability
- Reduced market access
- Reduced access to financing and insurance
- Reputation/brand issues

Opportunities

- Reduced operating costs via eco-efficiency and waste prevention
- Higher profits or reduced product prices
- Enhanced market access for green products
- Cleaner technology investment opportunities
- Access to socially responsible investors

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A company can't manage its environment-related risks/opportunities without accurate information on its

- use of materials & energy
- generation of pollution/waste

and

- related cost$

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Environmental Management Accounting (EMA)

EMA is the identification, collection, analysis, and use of two types of information for internal decision-making:

- *Physical information* on the use, flows, and fates of energy, water, and materials (including wastes)
- *Monetary information* on environment-related costs, earnings, and savings

United Nations Sustainable Development
EMA Expert Working Group

IFAC

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Why was EMA Developed?

EMA was conceived in recognition of some of the limitations of conventional practices for informing environmental management decisions

- insufficient tracking of energy, materials, and wastes
- "hiding" of costs in overhead accounts and elsewhere in the accounting records
- lack of data on future and less tangible costs in the accounting records at all
- Insufficient communications between the accounting and other departments/staff, e.g., production, environmental, research…

Accounting Challenges: Input Materials

- Materials purchase/inventory information may not entered in enough detail
- Water/energy use may not be tracked in enough detail
- In manufacturing, product recipes may not reflect actual use of materials (or the actual rate of waste generation)
- Others?

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Accounting Challenges: Output Materials

- Some output "materials", e.g., waste and pollution, not tracked as well as input materials, at least not by the accounting function/system
- Some waste-related costs "hidden" in the accounting records, e.g., in overhead accounts
- Some waste-related costs not allocated to processes/products responsible
- The true "cost of waste" not estimated correctly
- Some waste-related classified as fixed when they are really variable, or semi-variable
- Others?

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"Hidden" Costs of Lost Raw Materials

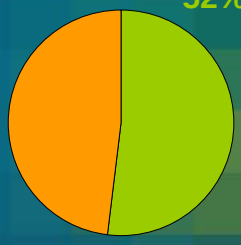
Manufacture of Plastic Rear Panels for Automobiles (As a percentage of input materials)

Manufacturing Loss Allowance per the Accounting Records

2%

Actual Material Loss

52%



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Adapted from: Rooney, Charles. "Economics of Pollution Prevention: How Waste Reduction Pays." *Pollution Prevention Review.* Summer 1993.

Hazardous Waste Ink Cost Southwire company

Company initially estimated the disposal cost of hazardous waste ink as $50/drum

Upon further investigation, it was discovered that the actual cost was $1300/drum

- $819 – lost raw materials (ink, thinner)
- $369 – corporate waste management activities
- $50 – disposal vendor fee
- $47 – internal waste handling activities
- $16 – hazardous waste tax

The "Cost" Iceberg

The true cost of waste can be like an iceberg, with only a small part visible

Adapted from: Bierma, TJ., F.L. Waterstraat, and J. Ostrosky. 1998. "Chapter 13: Shared Savings and Environmental Management Accounting," from *The Green Bottom Line.* Greenleaf Publishing:England.

The Globalization of EMA…

- 1992: US Environmental Protection Agency was first national government agency to establish a formal EMA program
- 1999: Expert Working Group on EMA convened by the United Nations Division for Sustainable Development (UNDSD)
- 2004: EMA activities in over 30 countries
- 2005: International Guidance Document on EMA published by IFAC
- 2008 - 2011: ISO Standard on Materials Flow Cost Accounting under development (ISO 14051)

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EMA Around the World…

THE AMERICAS
Argentina
Brazil
Canada
Colombia
Guatemala
Nicaragua
Peru
USA

EUROPE
Austria Czech Rep. Finland Germany
Italy Netherlands Portugal Spain
Slovak Rep. Sweden UK

AFRICA
Egypt
South Africa
Tanzania
Zimbabwe

ASIA-PACIFIC
Australia
Japan
Philippines
Rep. of Korea
Singapore
Taiwan
Thailand
Vietnam

These lists are not comprehensive…

Raytheon and Haas TCM (1)

- Raytheon formed a cross-functional team of staff from purchasing, environmental, inventory, quality, finance, and engineering
- Team mapped out the physical flow of a priority set of chemicals, gases, and wastes in a pilot facility, covering all materials management steps
- A cost analysis revealed materials management costs of US $1 for every dollar of materials purchased
- Initial benefits resulting from the pilot study included scrap cost reductions of ~ $688,000/year, reduced inventory time (from 3-4 months to 1 week), and reduced purchase order cycle time (from 3-7 days to 2 days)

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Raytheon and Haas TCM (2)

- In 1995, the physical mapping and monetary information was used to negotiate the goals and costs of a Chemical Management Services contract with Haas TCM (then Radian Int'l), to manage materials at over 70 Raytheon facilities, and to handle all environment-related data management and reporting
- Contract gave Haas incentives to achieve reductions in materials use and purchase prices, as well as improvements in process efficiency

1) CSP Website, http://www. CSP.org
2) T. Votta, R. Broe, J. Kauffman, and A. White, "Using Environmental Accounting to Green Supplier Contracts," *Pollution Prevention Review* (Spring 1998)

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Sulzer Hydro

a subsidiary of Sulzer Technology Corporation

- Mid-sized facility (430 employees) in Kriens, Switzerland
- Primary products – hydroelectric machinery & engineering
- Assessed materials flows through processes (including wastes)
- Assessed a number of different types of environment-related costs
- Identified opportunities to reduce waste-related costs by 10% and electrical energy costs by 13%

Schroeder, G. and Winter, M.
Greener Management International 17, Spring 1997

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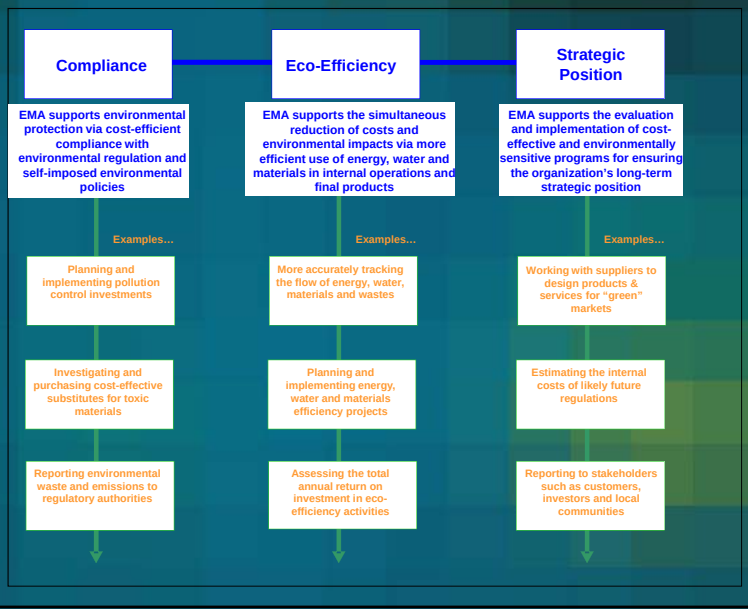
Potential Benefits of EMA…



For more information…

1) For a copy of IFAC's International Guidance Document on EMA, go to IFAC's website:

http://www.ifac.org/Members/DownLoads/IFAC_Guidance_doc_on_EMA_FINAL.pdf

2) For information on the ongoing development of ISO 14051 – a new environmental management standard on Materials Flow Cost Accounting - send email to Prof. Katsuhiko Kokubu at kokubu@kobe-u.ac.jp

2) For other information on EMA methodologies, case studies, software, and training, contact Dr. Deborah E. Savage at dsavage@emaric.org

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