Environmental Management Accounting as an Innovation Driver

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Unprecedented challenges

Humans have rarely faced the enormous problems we face today with resource shortages, pollution and global climate change

It will affect everyone on earth
Most negatively and few positively...

A word of thanks for global warming from "The tomato farmers of Greenland..."



Lauren Etter

The causes

Ignorance
Greed
Desperation
Stupidity
Poor accounting

EMA can help address many of these causes
Consider just global climate change

Human activity is having a global impact



Red: fires (natural and man-made) Yellow: gas flares Blue: fishing boats and off-shore oil & gas

UCSD

Global warming gases

 CO_2 Methane CFCs
 NO_x SO_x and others



Carbon dioxide

From fossil fuel combustion Deforestation by fire Mine fires 31% increase since 1750 270 billion metric tons added by humans **Charles Keeling at Scripps Institution of** Oceanography in La Jolla played a key role in analysis

Methane

From leaks with fossil fuel extraction and transport Decomposition in wet rice fields Cows Landfills **Termites** 151% increase

CFCs

CFCs (freons) from leaks in air conditioners, refrigerators, freezers
Also once use as solvents and cleaners
All human created
Global warming and ozone layer killer

Nitrous oxides

From fossil fuel and biomass combustion Coal Oil Natural gas Global warming and nitrogen pollution

 Global warming and nitrogen pollution ecosystems damage effects
17% increase

Other concerns

SO_x sulfur oxides Global warming and acid rain Global dust clouds Nuclear isotopes (10,000 year storage) Hormone mimics, drugs, antibiotics, pesticides, heavy metals, persistent pollutants Ecotoxic materials

GWG Impacts

Relative contribution 50% Carbon dioxide **CFCs** 20% Methane 16% 5% $\square N_2O$ Estimates are very rough, understanding remains weak

Warming offset

Global warming has been masked by global dimming Dust and high clouds from jet condensation trails have offset the warming impact from fossil fuels This realization led to increased concern over the true level of warming impact

How much warmer

 Global average air temperature increase
Intergovernmental Panel on Climate Change estimates 3.6+°F by 2100

 Local changes this large or larger have been observed

 Ocean temperature increase
Storminess and storm intensity increase
Changes in growing season, changes in snow pack due to warmer winters
Demand for more air conditioning!

The solution

 Solving this problem will take a major change in thinking and management

- True cost accounting is essential!
- EMA can help with this critical task

Education and awareness

EMA helps raise awareness, improves understanding and highlights areas of ignorance **This will drive** research and innovation

EMA as an innovation driver

 Environmental management accounting helps develop a better understanding of true costs

 Cost information drives innovation much more effectively than regulation
Direct to pocket book costs lead to rapid change

Buildings as an example

Buildings are responsible for 30-40% of the global warming gases in the U.S. Building economics are very distorted by subsidies, perverse incentives and regulations (including utility rules going back to the depression of the 1930s) But true cost accounting can drive rapid change

Buildings as example: opportunity

- The current building inventory could not have been made more inefficient if prizes had been given
- Costs of lost productivity and health from poor indoor air have been estimated at \$160 billion a year for the U.S.
- But, with attention to sun, climate, comfort and health building energy use for space conditioning can be cut 90%

EMA as driver

 Better cost accounting will drive change (with what we already know) and innovation (with many interesting opportunities)

How will the price of electricity change?

How would this affect behavior?

How rapidly could the existing building stock be retrofitted?

The true cost of electricity

	Cents per kwh
Coal fired	
External cost coal	
Net coal cost	
Passive solar net cost	
Wind net cost	

Where do we start

- With whatever organization or company we work with
 Fix just one small thing
- Build support and fix the big things
- Help start an EMA program in your organization
- Lobby for EMA and TCA for energy utilities

When do we start?

□ Now

- This year
- We need to reduce impacts quickly
- This requires improvements in efficiency and eco-accounting
- These can improve comfort and security



Buildings

- Effective design can eliminate the need for heating and cooling
- This off grid house is naturally heated and cooled
- And uses solar and microhydro electricity generated on site

Join the effort Become an active member of EMAN Participate in local sustainability programs Develop EMR skills and support EMR efforts around the world