



# Reducing the Footprint:

International Approaches Toward  
Sustainable Water Management

William P. Dee, PE, BCEE

President & CEO

Malcolm Pirnie, Inc.



2007 Summer Conference & 27<sup>th</sup> Annual Meeting  
July 19, 2007



Gray, Green and Everything in Between: NACWA Summer Conference - July 2007



*“Sorry, Harold, but I’m reducing our carbon footprint.”*

# Sustainability is Good Business... and it's Good Stewardship



Triple Bottom Line

# It's Not Just for Al Gore Anymore!

*Smart Water : Las Vegas makes sure there is enough water for residents and visitors.*

Public Works - June , 2007

*Efficient water use and proactive planning keep Las Vegas from drying out, now and in the future*



It's Not Just for Al Gore Anymore!

## *Water treatment goes green*

Public Works - June , 2007

*...“green  
building” now  
applies to  
modern marvels  
of construction  
in all areas of  
public  
infrastructure.*

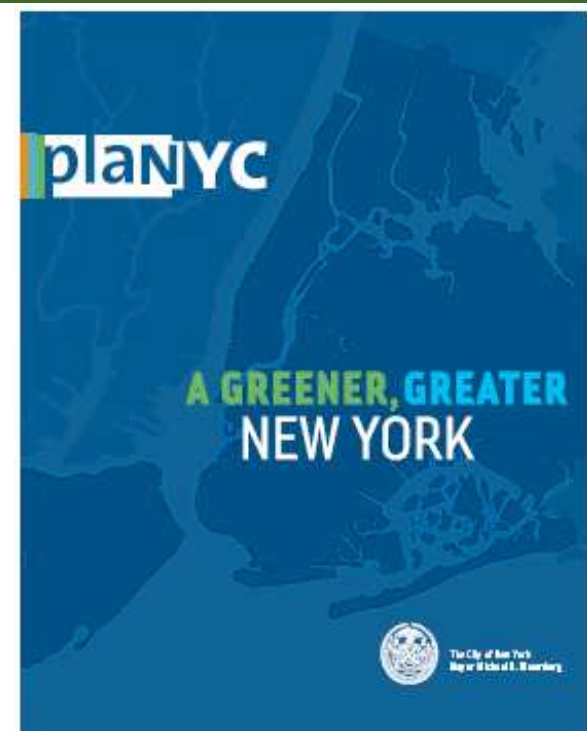


It's Not Just for Al Gore Anymore!

## *New York Sets Path for Sustainable Future*

American City & County - April, 2007

*In September 2006, Mayor Michael Bloomberg created the Office of Long-Term Planning and Sustainability to plan for the city's growth and development and make its government "greener."*



It's Not Just for Al Gore Anymore!

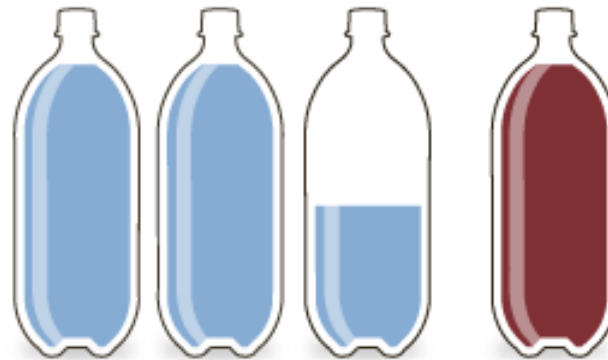
## *Coke Aims to Improve Water Recycling*

The Wall Street Journal - June 6, 2007

*Coca-Cola Co. claims it will boost its water recycling and environmental programs to become water neutral.*

### Quenching the Thirst

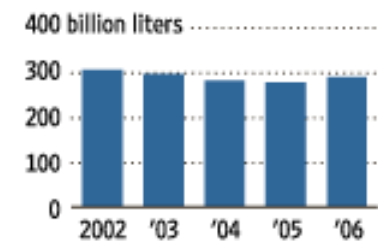
In 2006, Coca-Cola used an average of 5.08 liters of water...



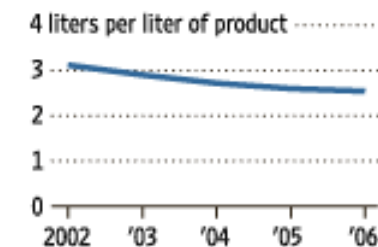
Source: the company

For two liters of product

### Total water use



### Water-use ratio



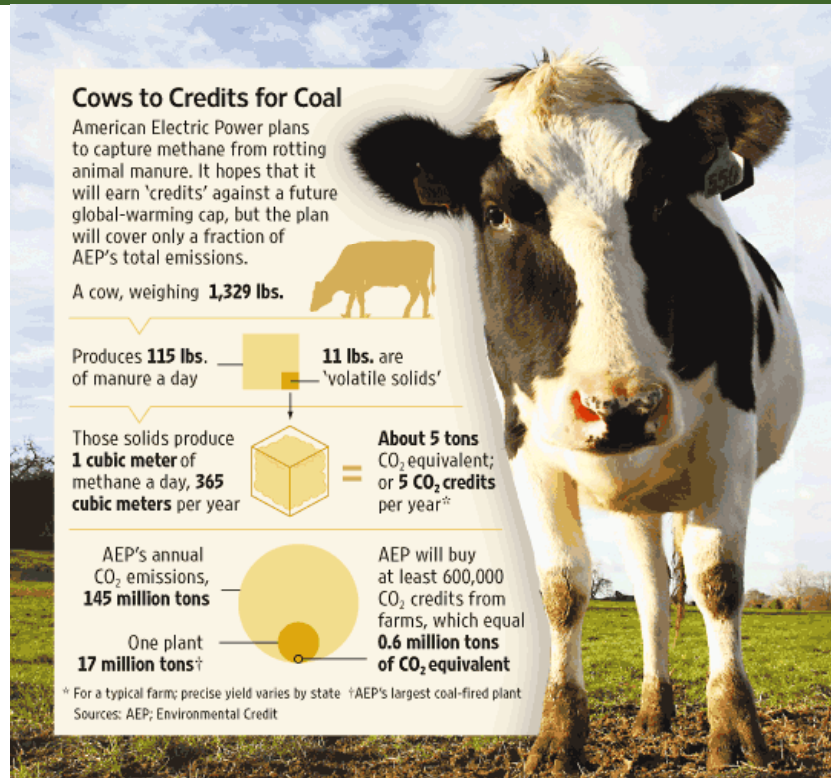


It's Not Just for Al Gore Anymore!

# *Cows, Climate Change and Carbon Credits*

The Wall Street Journal - June 14, 2007

*American Electric Power Co. has agreed to put plastic tarps over lagoons holding livestock waste on farms - using carbon credits to offset power plant operations.*



It's Not Just for Al Gore Anymore!

## *IBM turns up heat on environmental effort*

San Francisco Financial Times - May 10, 2007

*IBM pledges to invest \$1B a year on "green" projects and doubling the energy efficiency of its big computer systems by 2010.*



# Opportunities Abound for Our Industry



- Define Your Carbon Footprint
- Define Your Greenhouse Gas Emission Footprint
- Investigate and Apply Carbon and GHG Reduction Strategies
- Reduce Footprint through Better Energy Management
- Apply Green Practice (LEED) to Facility Designs
- Increase Revenues through Carbon Credit Trading
- Identify Creative Water Reuse Alternatives

# What's Already Happening in the World



## Assets

- Water
- Agricultural land
- Biodiversity
- Marine ecosystems
- Terrestrial landscapes
- Rivers & wetlands

- Focus on 'assets'
  - Values, threats, flow of ecosystem services
- Science-based pragmatic planning
- Targets for action and asset improvement
- Cost-benefit and risk analysis supporting trade-off decisions
- Stronger focus on monitoring, evaluation and reporting
- *Water managed systemically with other natural assets*

# What's Already Happening in the World

- **Australia**  
*Severe drought brings water use and sustainable practices to forefront.*



# Desalination Doesn't Have to Equal High Energy Use...

The Water Corporation -Western Australia

- **Challenge:** Desire to use desalination technology and abundance of seawater without increasing greenhouse gas emissions.



**Resolution:** Offset high-energy use of desal technology with the installation of a wind farm.

**Results:** Combined output of the 48 turbines at maximum wind speeds generate close to 80 megawatts... enough power to run Perth's desalination plant."



*WINNER:  
Desalination Plant of the Year  
The Global Water Awards 2007*

*Kwinana (Perth) Desalination Plant*

# Recycling Water to Meet Growing Demand in Gold Coast...

Gold Coast Council Area, Queensland

- **Challenge:** Improve sustainability and security of water supply in fastest growing urban area of Australia

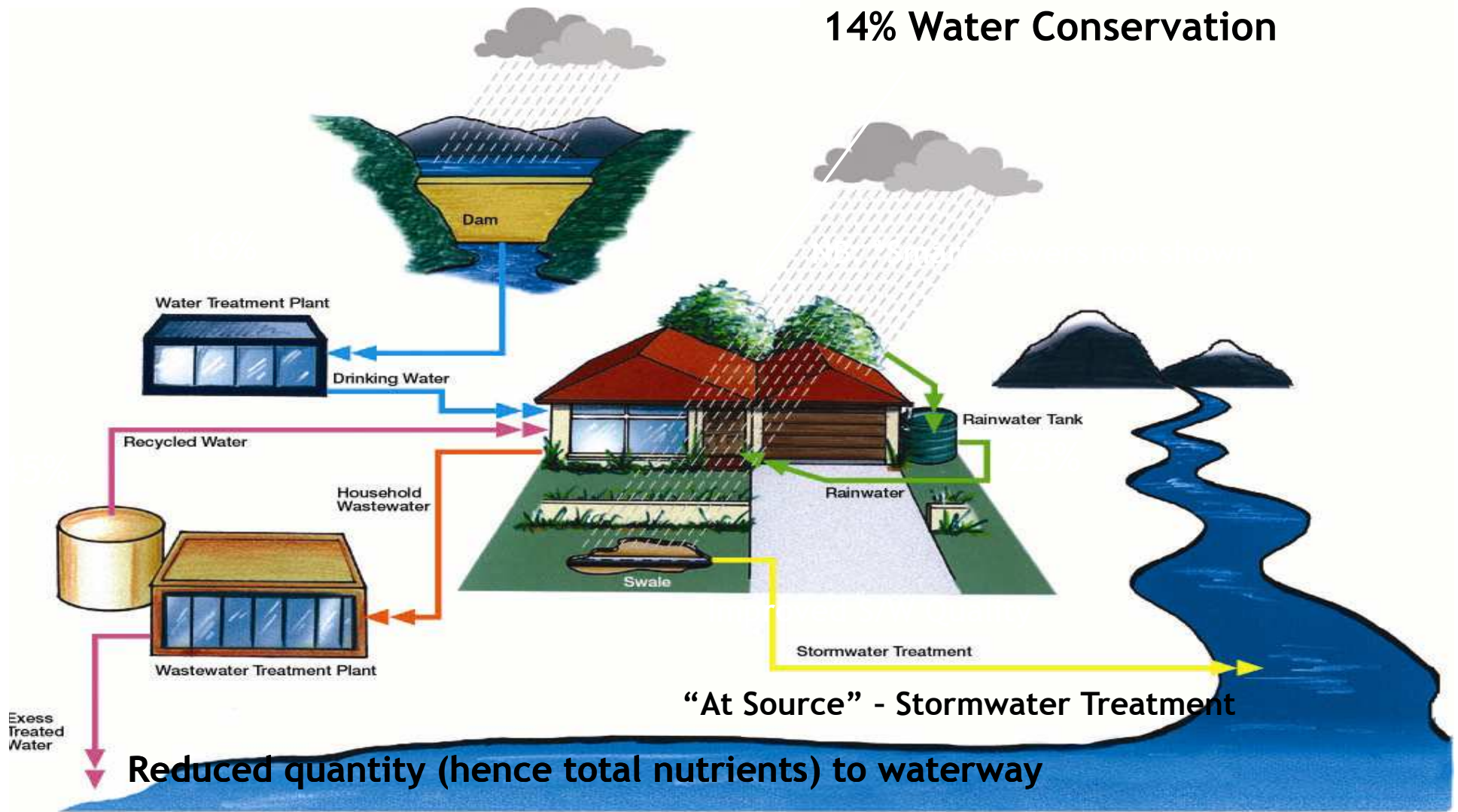
**Resolution:** Triple bottom line approach to developing an integrated water plan that considered all water sources beyond current sources of raw surface water.

**Results:** Complement surface water supply with recycled water (to toilet and outside) and rainwater (to bathroom and laundry), with water conservation methods. Also creating desalination facility.



# GoldCoast Waterfuture

14% Water Conservation

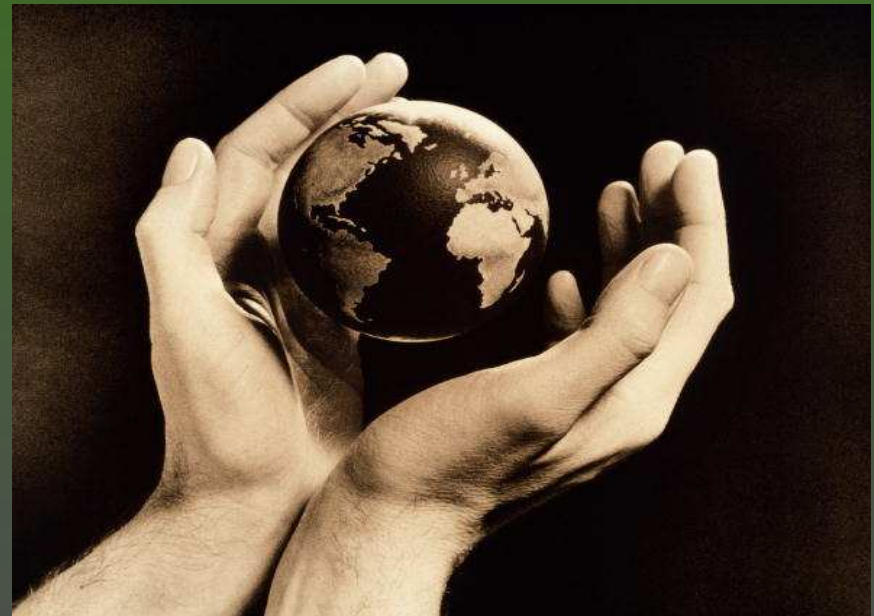




# What's Already Happening in the World

- **Europe**

*The EU warns that few parts of Europe are likely to escape the worst of climate change. The Mediterranean region will lack water while the Alps will see glaciers melt, causing rivers to change course.*



# Wastewater Feeds a River in Spain

Baix Llobregat - Spain

- **Challenge:** Dry region with increasing population - Llobregat River could not maintain ecological flow.

**Resolution:** Add a tertiary treatment plant to existing wastewater facility near mouth of river and transport effluent upstream to augment river.

**Results:** Provided capacity for agriculture and golf irrigation and recharge of wetlands.



***WINNER:**  
Water Reuse Project of the Year  
The Global Water Awards 2007*

# A Sustainable Approach to Policy Making in Hamburg

Hamburg, Germany

- **Challenge:** Flood risks increasing due to global climate change, rising ground water tables due to reduction in ground water extraction, limited capacity in existing sewer system.

**Resolution:** Form an alliance of key stakeholders - Water Expert Council - and prepare a water management strategy.

**Results:** Linkages with regional initiatives including SWITCH, FLOWS, and UWC. Creation of strategies and goals combining water management with urban design.



# What's Already Happening Here at Home

- U.S.  
*Individual cities, regions, and utilities are seeking "Green" options for traditional facilities.*



# Building Sustainable Practices in Every Stage of Wastewater Management

Sanitation District of Los Angeles County - California

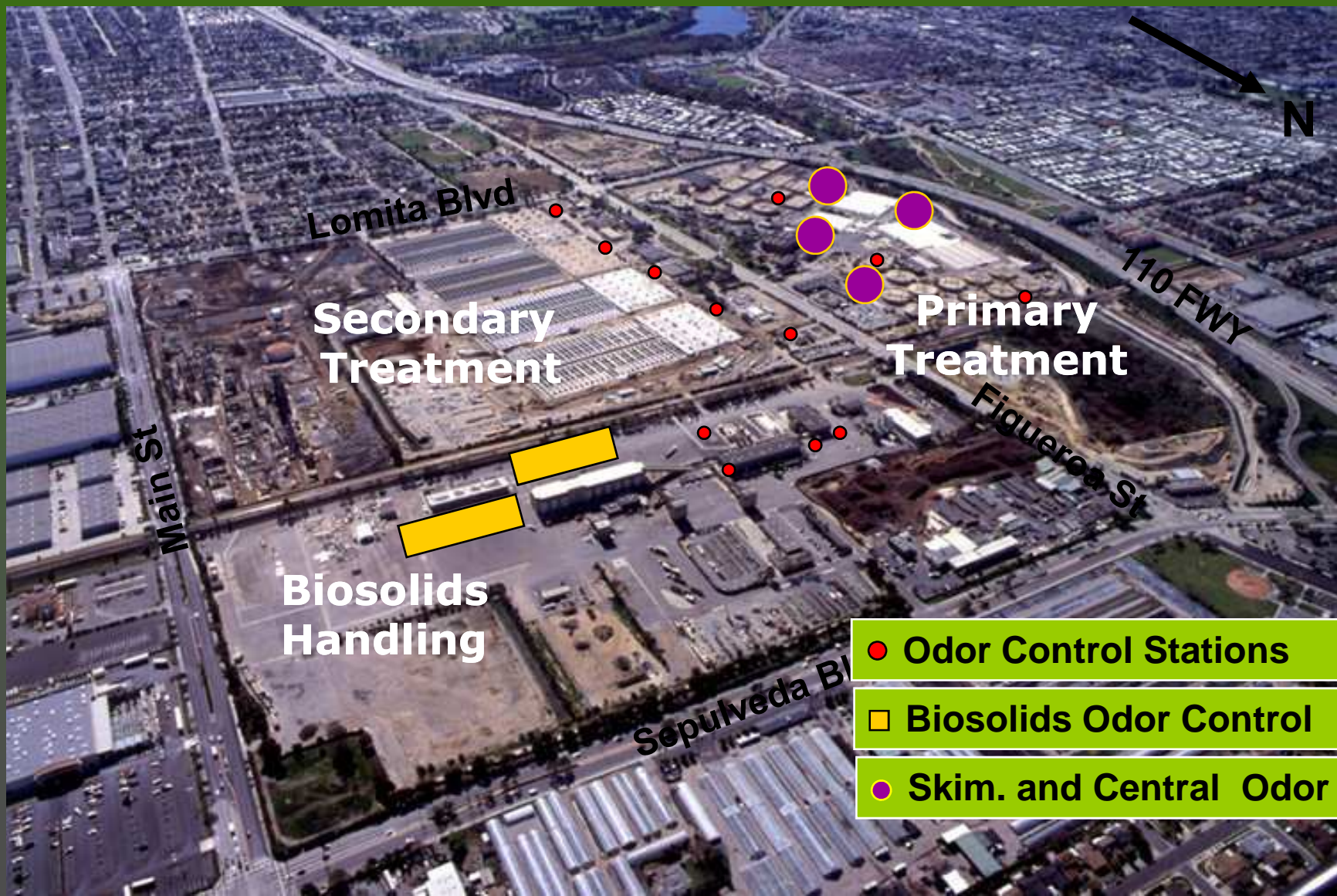
- **Challenge:** Meet the regulatory and legislative mandates in California for sustaining and preserving natural resources while serving stakeholders.

**Resolution:** Apply technology to reduce emissions (odor and carbon), seek opportunities for beneficial use of biosolids.

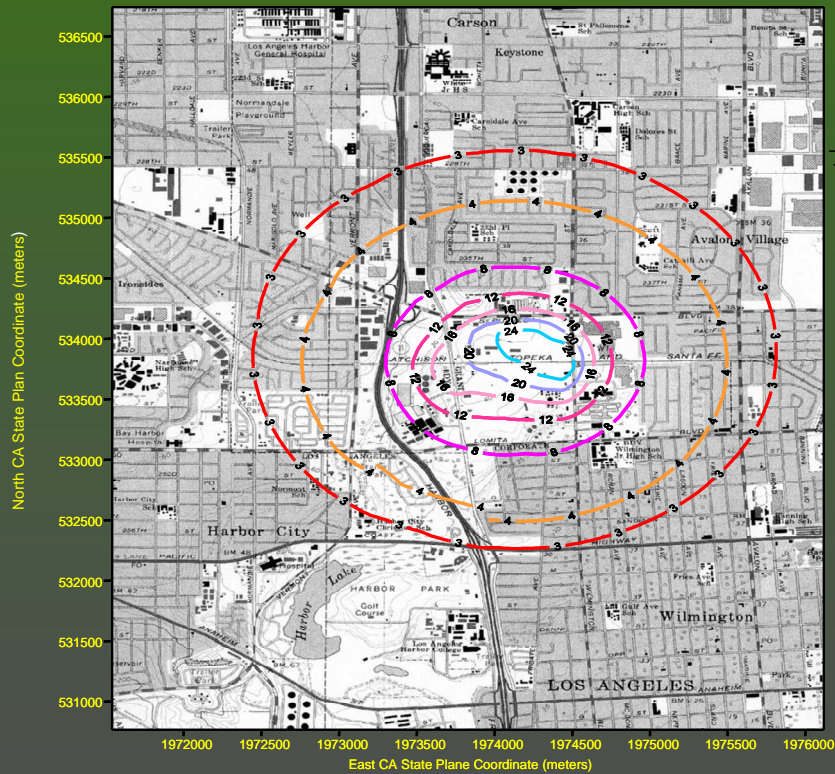
**Results:** Reduced emission pattern achieved. Planning biosolids to land application.



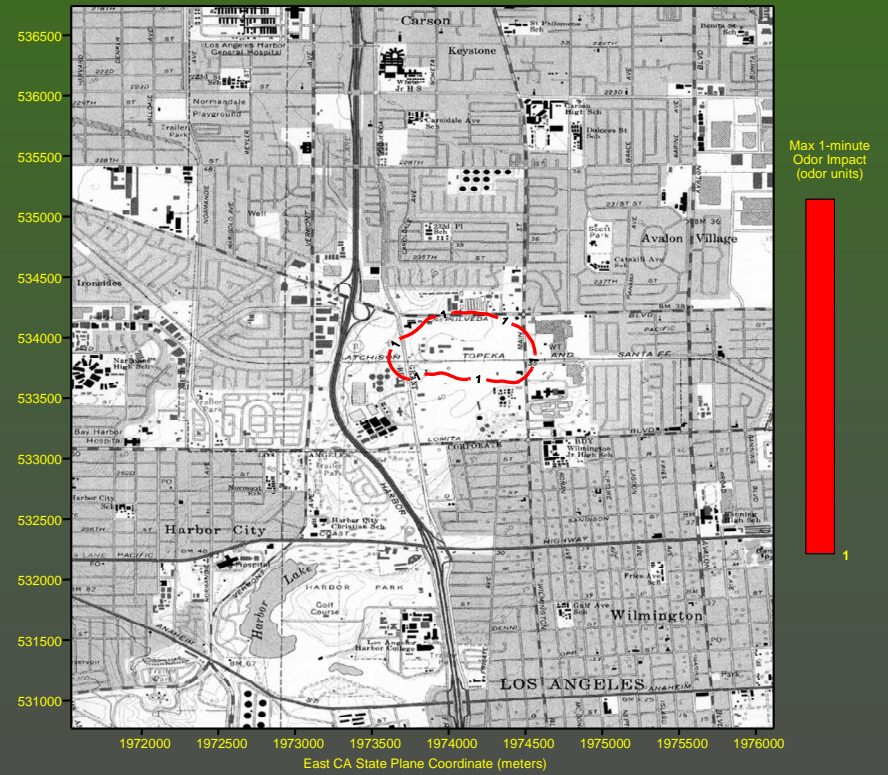
# Joint Water Pollution Control Plant



# Dispersion Models Show Results

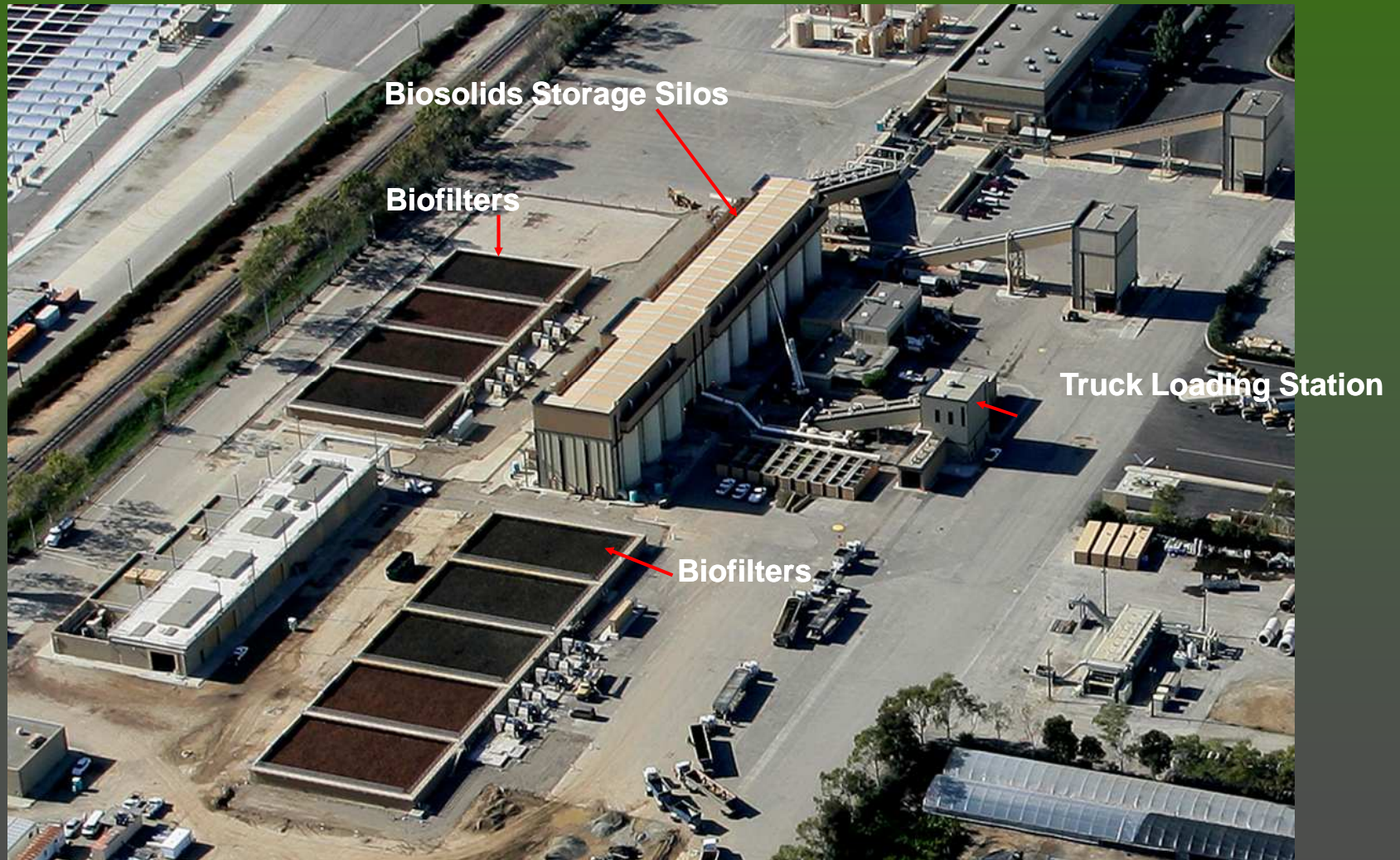


BEFORE



AFTER

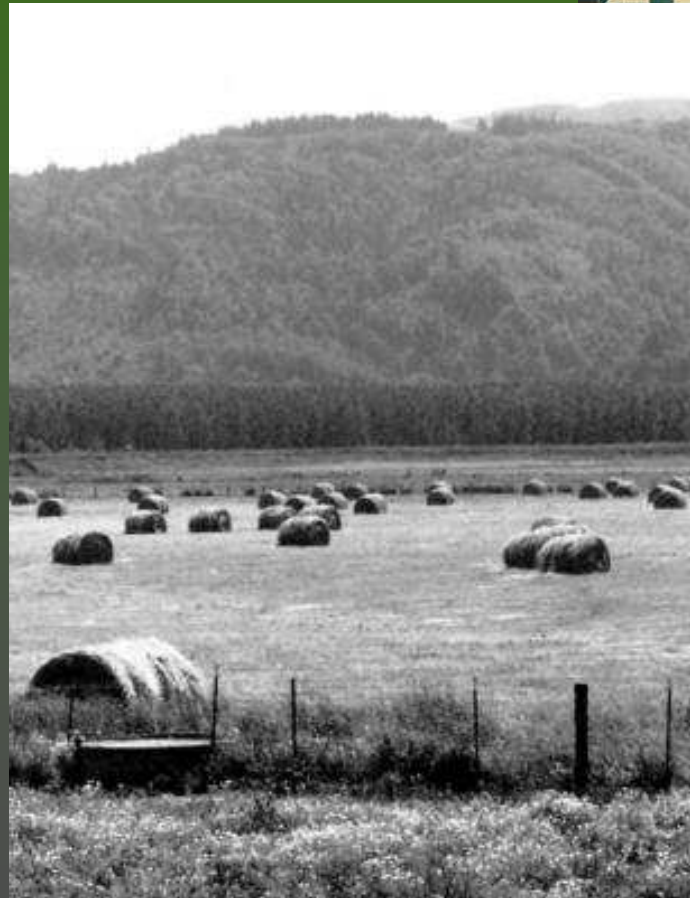
# From Biosolids Storage to...





# From Biosolids Storage to...Farmland...

*Farm Could Grow Switchgrass*



# From Biosolids Storage to...Farmland ...to Biofuel



Gray, Green and Everything in Between: NACWA Summer Conference - July 2007

# Taking Advantage of the Sun

City of Glendale - Arizona

- **Challenge:** Design a new administration and operations/maintenance building at wastewater reclamation treatment facility.

**Resolution:** Apply Green Building (LEED) principles to plan and design of facilities.

**Results:** Long-term energy and maintenance costs savings. Vacuum solar heating tubes in the welcoming entry canopy provides visitors with a clear message of environmental sustainability.



# Proactive Storm Water Management Reduces Wear on Collection Systems

Seattle Public Utilities

- **Challenge:** In a wet climate, manage stormwater proactively to reduce flooding potential.

**Resolution:** Create natural drainage systems through Street Edge Alternatives (SEA) program. Also promote rain water harvesting for homes and commercial real estate.

**Results:** Neighborhoods reduce flooding and add scenic quality. Commercial properties use rain water for toilet flushing. Residents use rain water for gardens and yard work.



# Adopting Sustainability Principles in Master Planning

Alexandria Sanitation Authority - Virginia

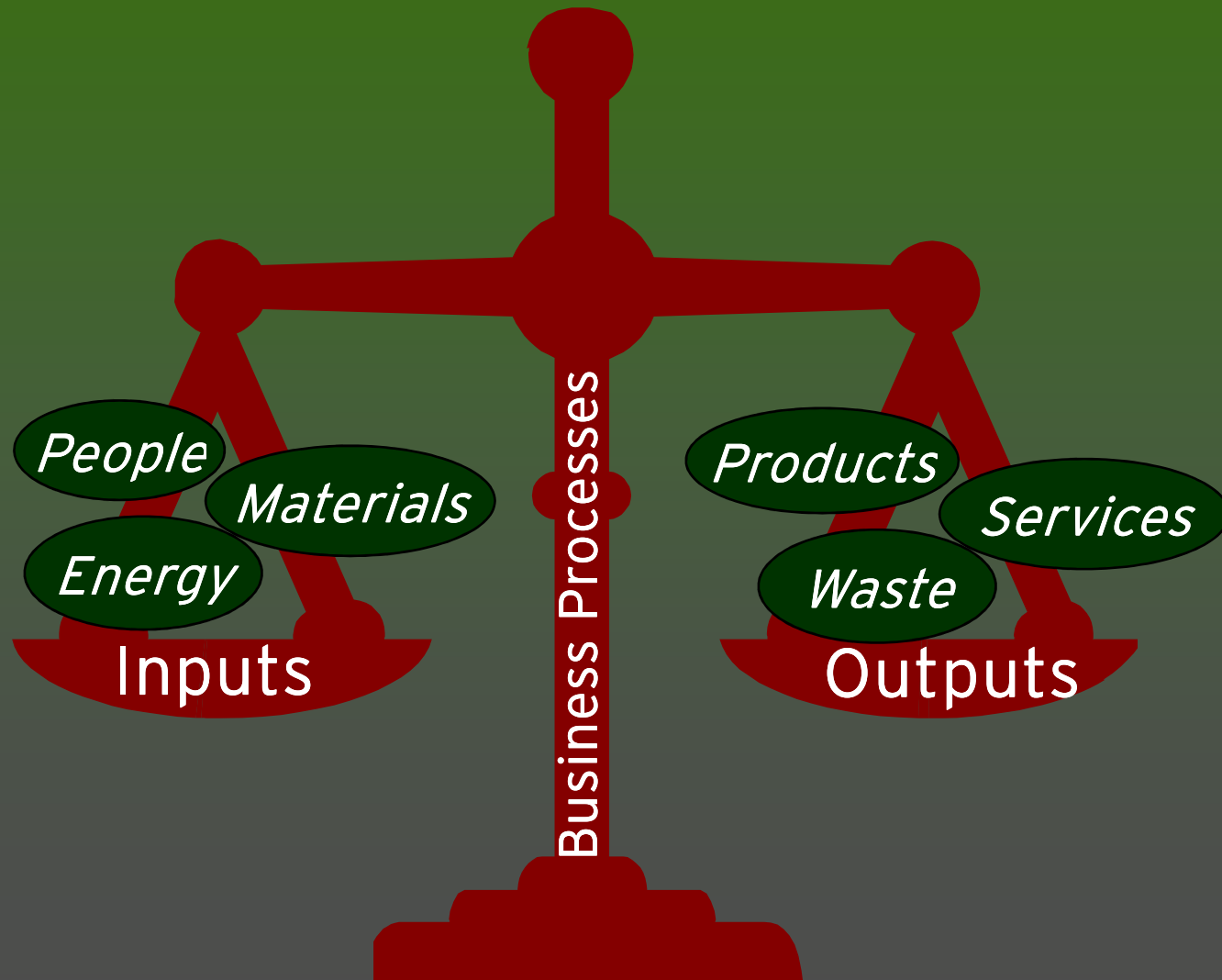
- **Challenge:** Upgrade existing wastewater treatment facilities in environmentally sensitive area (Chesapeake Bay).

**Resolution:** Start by educating leadership team in sustainable practices in workshop approach.

**Results:** Building sustainability principles into master plan that looks for solutions beyond the plant footprint.



# Striking a Balance is Key for ASA



# ASA Life Cycle

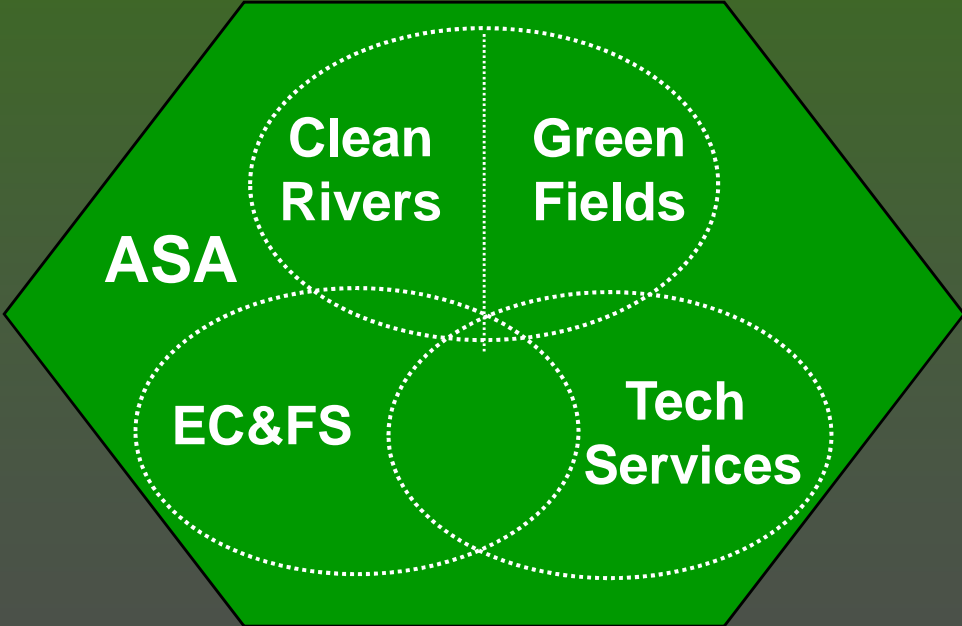
Sun

Air

Water

Land

Suppliers

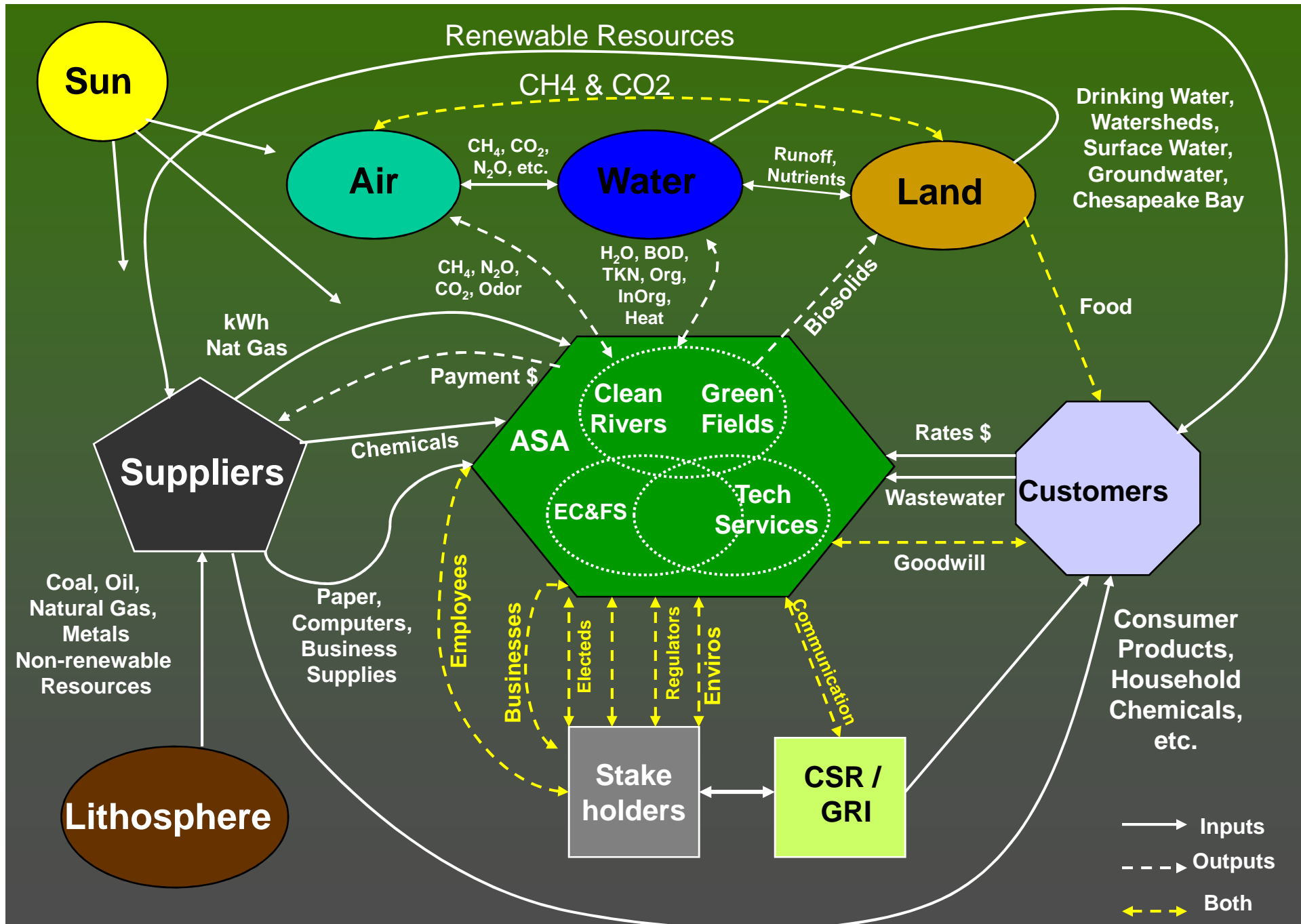


Customers

Lithosphere

Stake holders

EC&FS = Employee, Customer and Fiscal Services



Gray, Green and Everything in Between: NACWA Summer Conference - July 2007



# Seize the Opportunities!



- Define Your Carbon Footprint
- Define Your Greenhouse Gas Emission Footprint
- Investigate and Apply Carbon and GHG Reduction Strategies
- Reduce Footprint through Better Energy Management
- Apply Green Practice (LEED) to Facility Designs
- Increase Revenues through Carbon Credit Trading
- Identify Creative Water Reuse Alternatives



# Reducing the Footprint:

International Approaches Toward  
Sustainable Water Management

William P. Dee, PE, BCEE

President & CEO

Malcolm Pirnie, Inc.



2007 Summer Conference & 27<sup>th</sup> Annual Meeting  
July 19, 2007