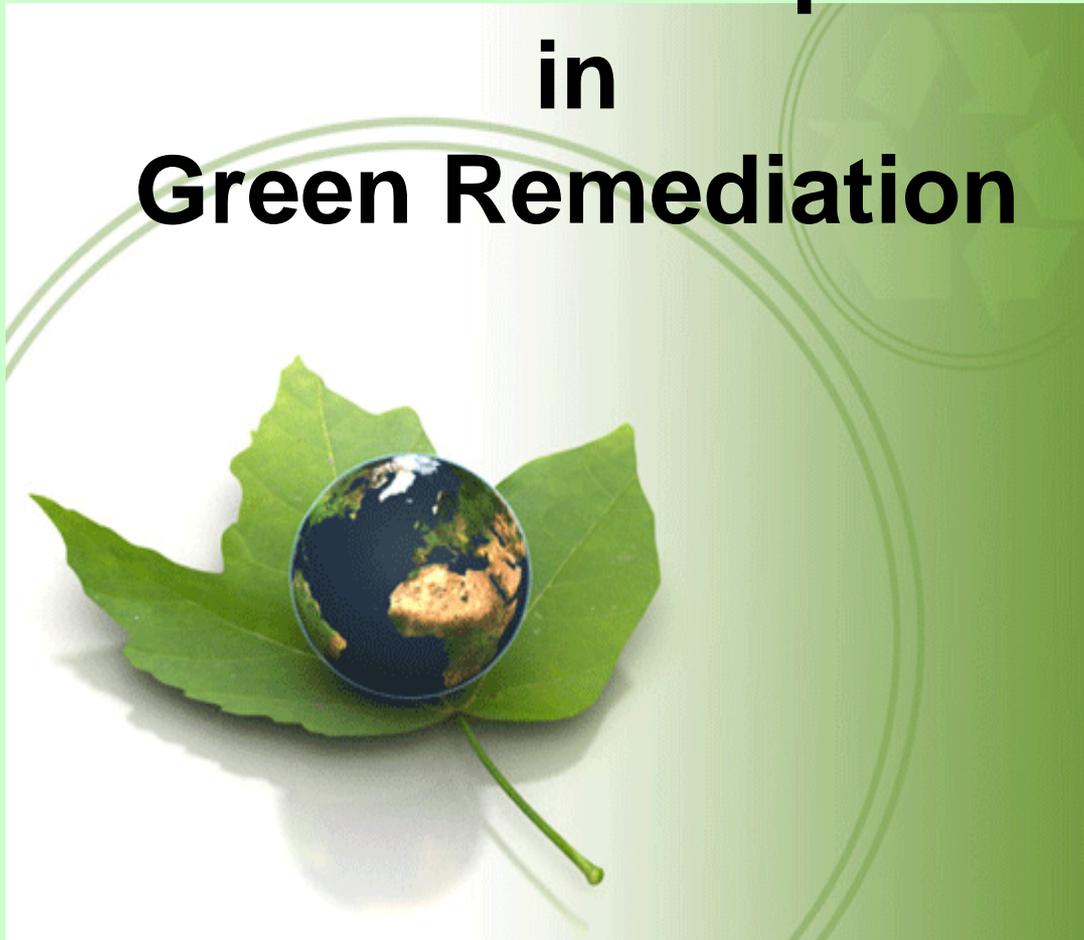




International Perspectives in Green Remediation



Making *Clean* “Green”

February 4, 2009 • Sacramento, California

Symposium Program Overview

Morning

- 1. Global Sustainability and Green Remediation
- 2. SuRF Survey Summary—Perceptions/Needs for incorporation of “Sustainability” within the Clean-up Industry
- Break
- 3. International Trends—UK, Europe and Canada
- 4. Guidance, Analytical Tools, and Incentives

Symposium Program Overview

Afternoon

- 4. Integrating GHG Emission Reduction within the within the California Environmental Quality Act (CEQA)
- 5. Case Studies & Applications of Analytical Methods and Tools-1
- Break
- 6. Case Studies & Applications of Analytical Methods and Tools-2
- 7. SuRF White Paper—Barriers to Implementation & Panel Discussion with Q&A



Session 1



Global Sustainability & Green Remediation



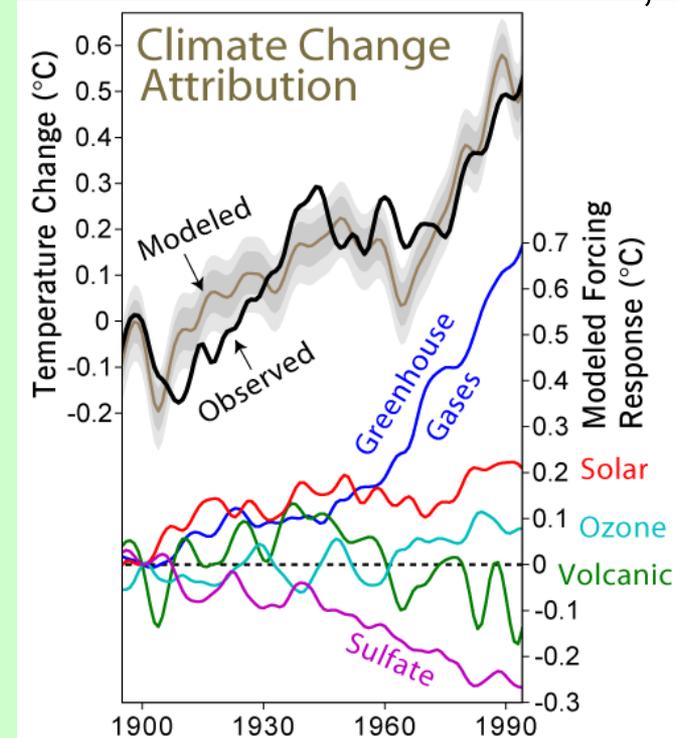
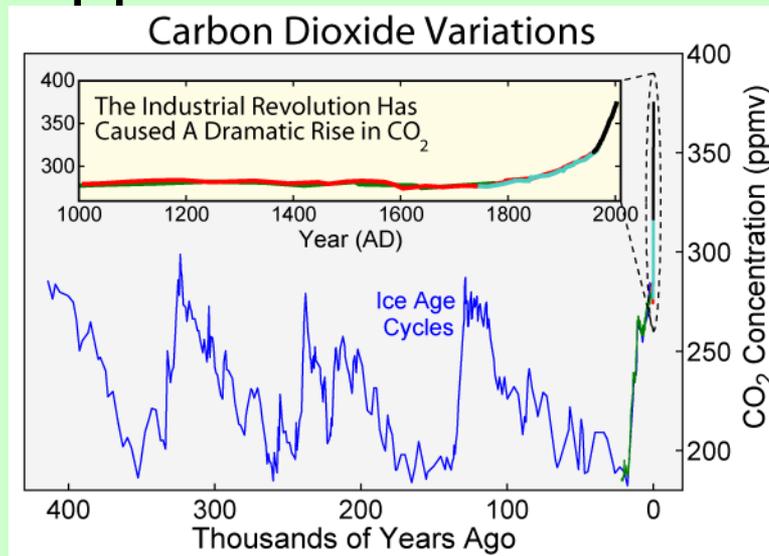
Mikos Fabersunne

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Global Climate Change—The Big Problem...

- Today: 387 ppm CO₂,
- Annual increase: 2 ppm
- Predicted tipping point: 450 ppm
- Runaway point: 2°C additional increase



http://www.globalwarmingart.com/wiki/Image:Climate_Change_Attribution.png

http://www.globalwarmingart.com/wiki/Image:Carbon_Dioxide_400kyr_png

The Consequences

- Arctic ice sheet may disappear in 5 years
- Himalayan ice-sheet may disappear by mid-century → drought for ½ China's population
- 60% of world ecosystem services have been degraded ; 15 of 24 evaluated ecosystems are being damaged
- 1/3 of all species committed to extinction by 2050



Easton Glacier on Mount Baker in the North Cascades of Washington, 2003, by Mauri Pelto

...More Consequences

- Year 2000: 150,000 climate-change-related deaths (malaria, malnutrition, diarrhea, flooding): 90% African and Asian
(World Health Organization)
- 1996-2005: \$667 billion in direct losses = 20 x greater for developing countries *(World Bank Independent Evaluation Group, June 2007)*

And from the Millennium Ecosystem Assessment:

- 1.1 billion people live on < \$1/day & lack access to clean water; 2.6 billion lack access to improved sanitation
- > 850 million undernourished 2000-2002, increase of 37 million from 1997
- per capita food production ↓ sub-Saharan Africa
- 70% live in rural areas dependent upon ecosystem services

**See *Living Beyond Our Means: Natural Assets and Human Well Being*,
Statement of the Board of the MEA,
<http://www.millenniumassessment.org>**

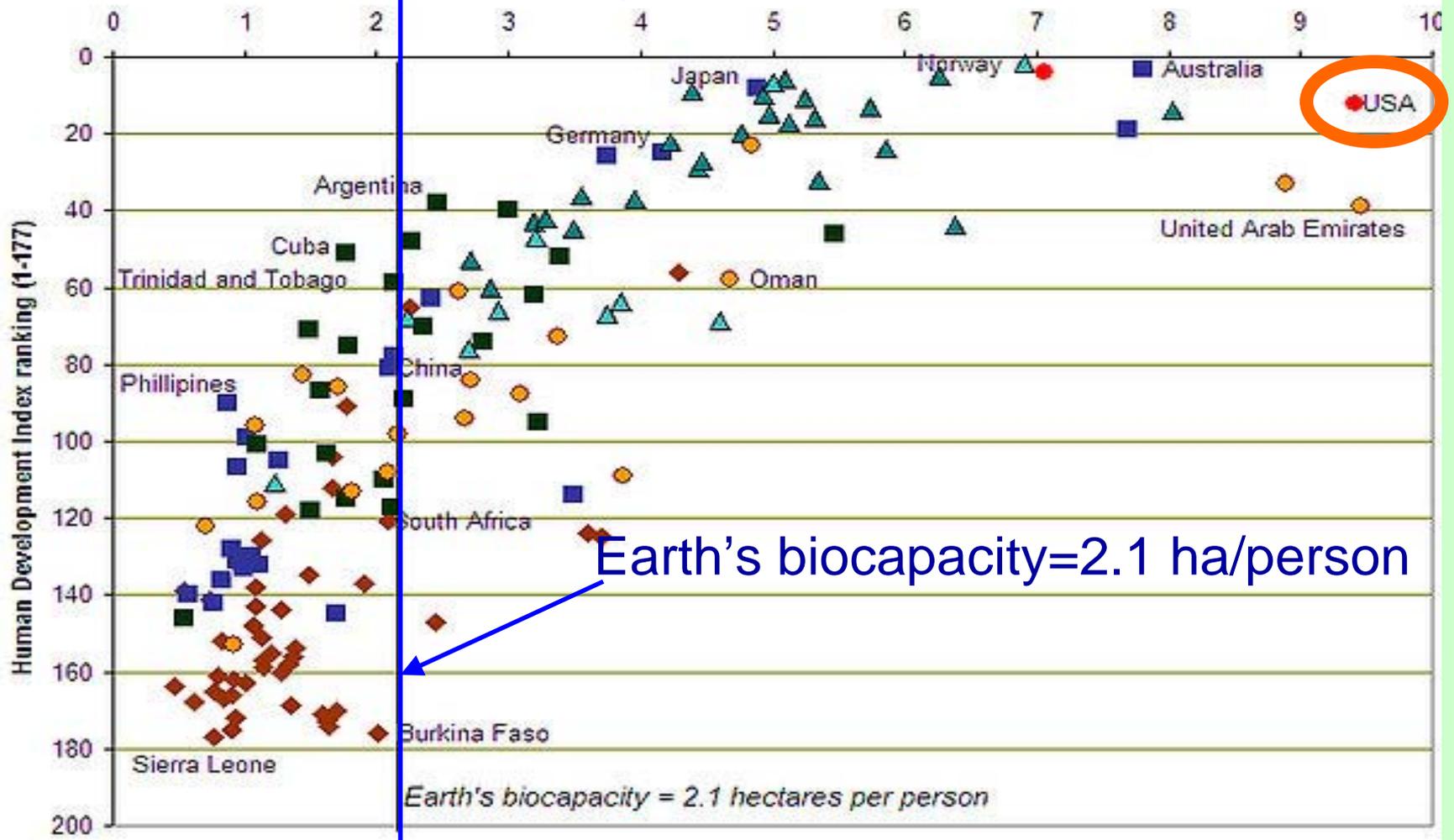
Sustainability...

- from the Brundtland Report, *Our Common Future* (1987)¹:
 - “...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
 - requires just access to resources and equitable distribution of benefits
 - “A world in which poverty and inequity are endemic will always be prone to ecological and other crises.”
- from the field of ecology:
 - the ability of an ecosystem to maintain ecological processes, functions, biodiversity and productivity into the future
 - long-term rate of resource use \leq rate of replenishment

¹ inspired by the 1983 United Nations World Commission on Environment and Development

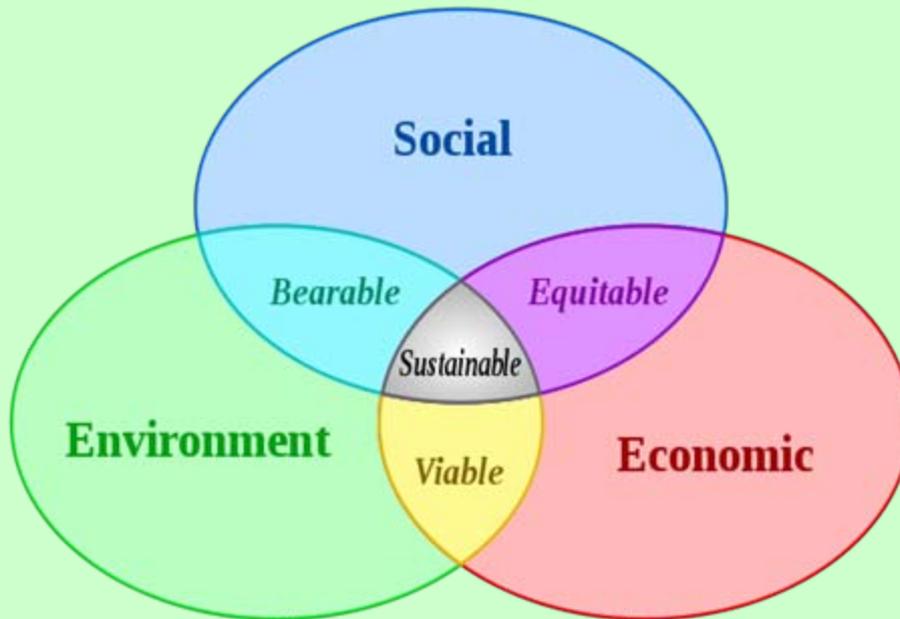
Human Welfare and Ecological Footprints compared

Ecological Footprint: hectares/person



The Conclusion...

- We are not living sustainably, nor equitably, on the planet



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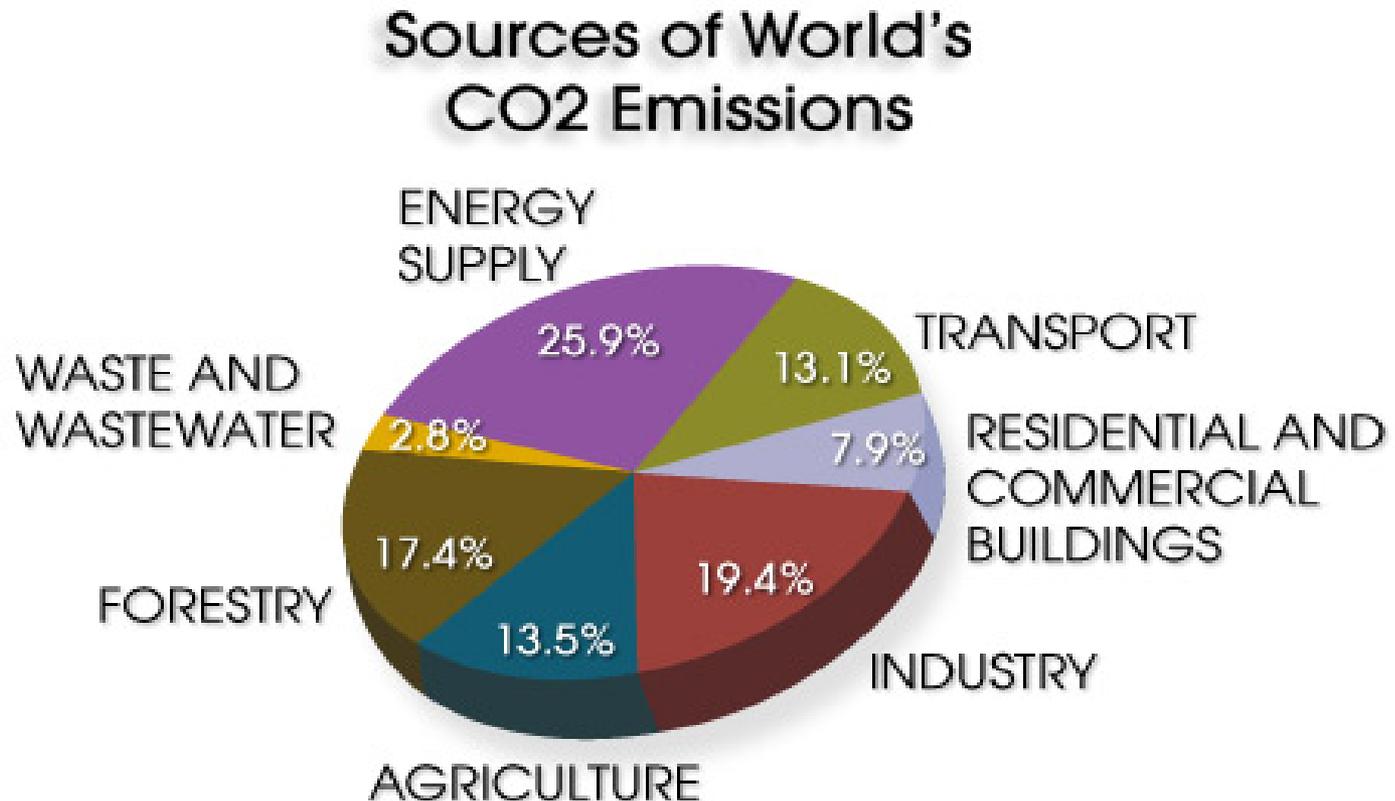


(A) Prime Environmental Concern

Burning of Fossil Fuels

7 Billion Tons CO₂/year

Burning of Fossil Fuels: The Breakdown



Adapted from Technical Summary. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

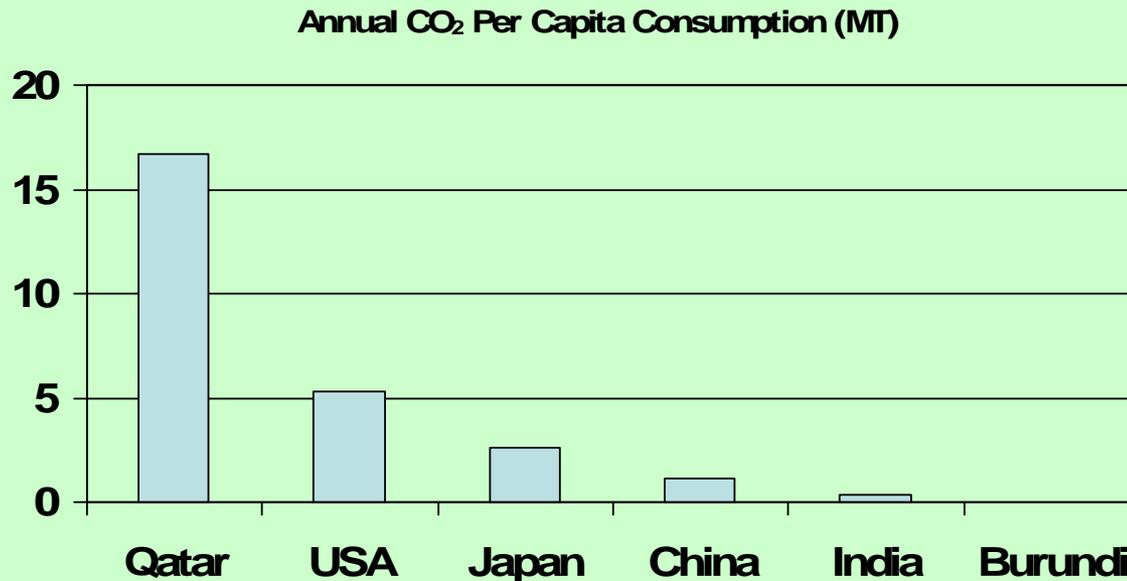
Burning of Fossil Fuels

- Power generation: Powder River Basin, Wyoming: more than 1 million tons coal mined per day
 - = 150-170 freight trains/day @ 133 coal cars/train
- Cement production: 5-10% of global CO₂ production

PBS Frontline: *Heat*, October 21, 2008

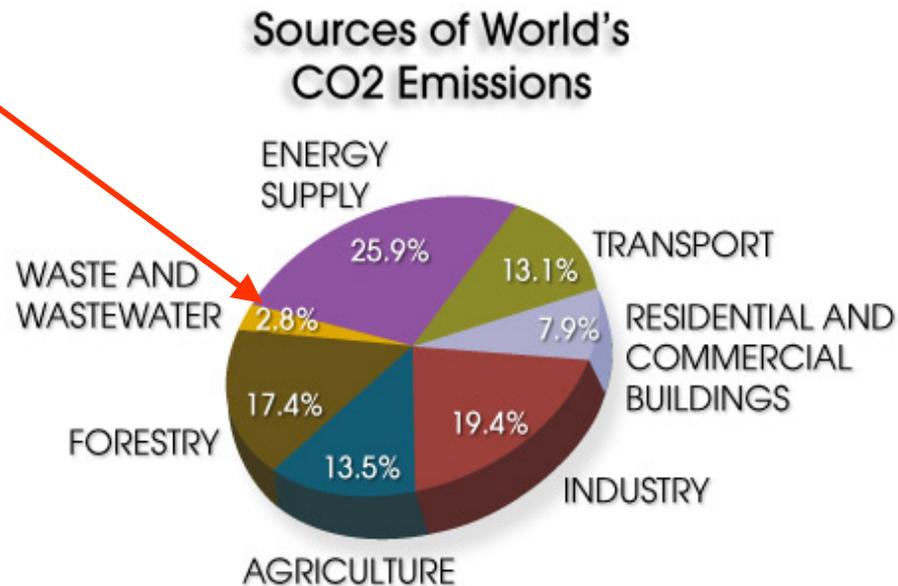
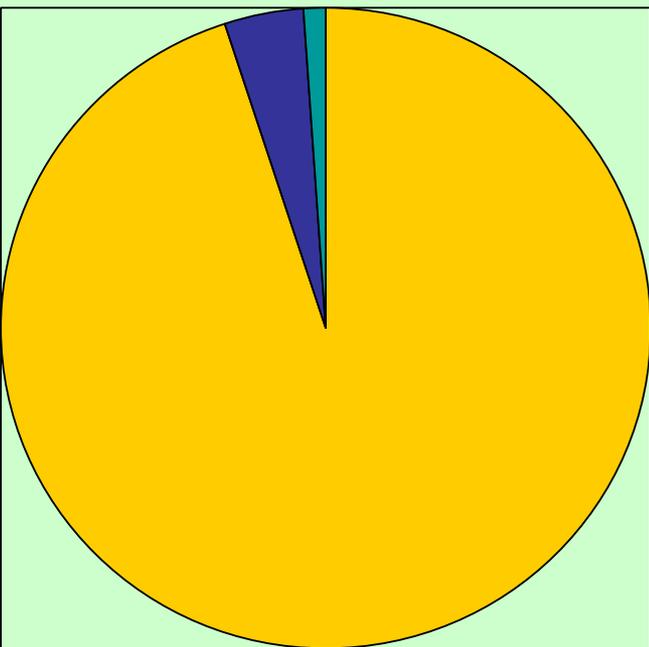
Who's Responsible?

- 23 wealthiest countries (14% of world population) → 60% world's carbon emissions since 1850 (*World Resources Institute, 2008*)
- U.S.: 5.32 tons/person-yr, India: 0.35 tons/person-yr (*Carbon Dioxide Information Analysis Center, ORNL*)



What about the Contribution to GHG Emissions by Environmental Clean-up Projects?

Site Clean-Up: ? %



So, why focus on “Green Remediation”?

- Co-lead the societal paradigm shift toward the Global/Sustainability Thinking and Action that’s required:
 - acceptance of our common reality,
 - expression of compassion towards the world’s majority,
 - emphasis upon well-being expressed as GNH versus production and accumulation indexed as GDP,
 - stewardship of our earth, its resources and inhabitants,
 - equitable sharing of the global commons and resources, and
 - collaborative and democratic problem solving.
- Demonstrate analytical concepts and develop tools to share with others to aid and facilitate their swift response to global climate change.

And...

- Prepare for the implementation of the upcoming CEQA guidelines that will require making determinations of significance re: GHG emissions at (new) clean-up projects.
- Make clean-ups truly better—with net environmental, economic, and social benefits to the human and non-human species inhabiting our local communities, ecosystems, the biosphere/ecosphere.

Besides, it's the right thing to do.