Olga Dominguez

NASA Assistant Administrator

Office of Infrastructure

Energy Security

- Federal Agencies are very energy dependent due the nature of our missions
- Rising costs and the volatile political environment in oil rich nations are risks to our energy supplies
- An aging electrical grid infrastructure both internally at our facilities and externally in the community posses a risk because energy may not be available at critical times
- Because of these reasons and because it saves $'s and helps our Nation become energy independent, we the Federal Government need to:

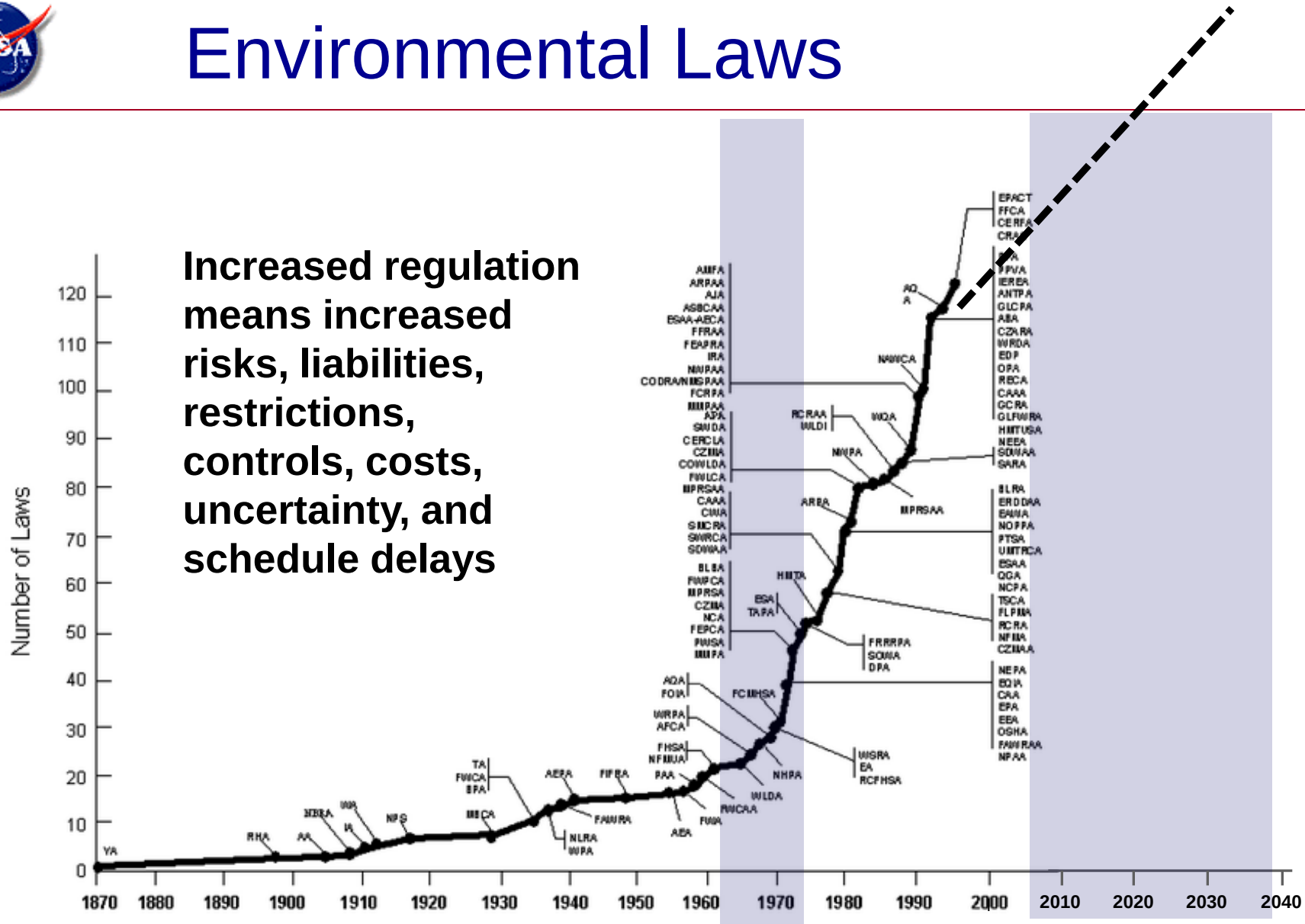
Conserve energy, become more efficiency and use alternative energy

Why is Energy Efficiency Important

Reduces cost of operation
Provides more maneuverability
Releases the US from foreign dependency
Reduces Mission Risks and
Increases Opportunities
Protects our Future

Environmental Laws

Increased regulation means increased risks, liabilities, restrictions, controls, costs, uncertainty, and schedule delays



Source: J. A. Cusumano, New Technology for the Environment, Chemtech, 1992, 22(8), 482–489

Environmental Laws

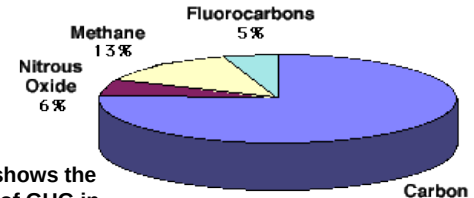
Give us many conflicting signs and directions.
Meeting our Mission objectives comes first.

Does it matter from where the issues & risks come?

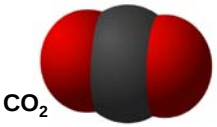
They exist.

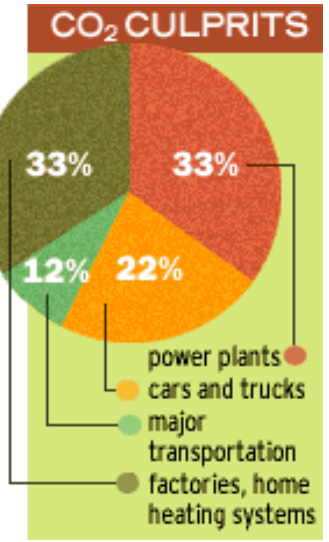
We must deal with the consequences and the effects.

New Regulations/Opportunities



This graph shows the distribution of GHG in Earth's atmosphere. Carbon Dioxide is clearly the majority.
www.abcnews.com/sections/us/global106.html





- New requirements for Green House Gas management
  - Energy effectiveness needed vs. efficiency
- External reporting requirements will expanded data collection
  - Yielding opportunities for creative/sustainable/green thinking and solutions
- External reduction goals will require changes leading to creative and effective options
  - Projected reductions necessitate solutions beyond “low hanging fruit” to green engineering and out of the box thinking
  - The need to balance gains to meet external goals - mission risk and limited resources leads to creative greener solutions

Understand External Requirements

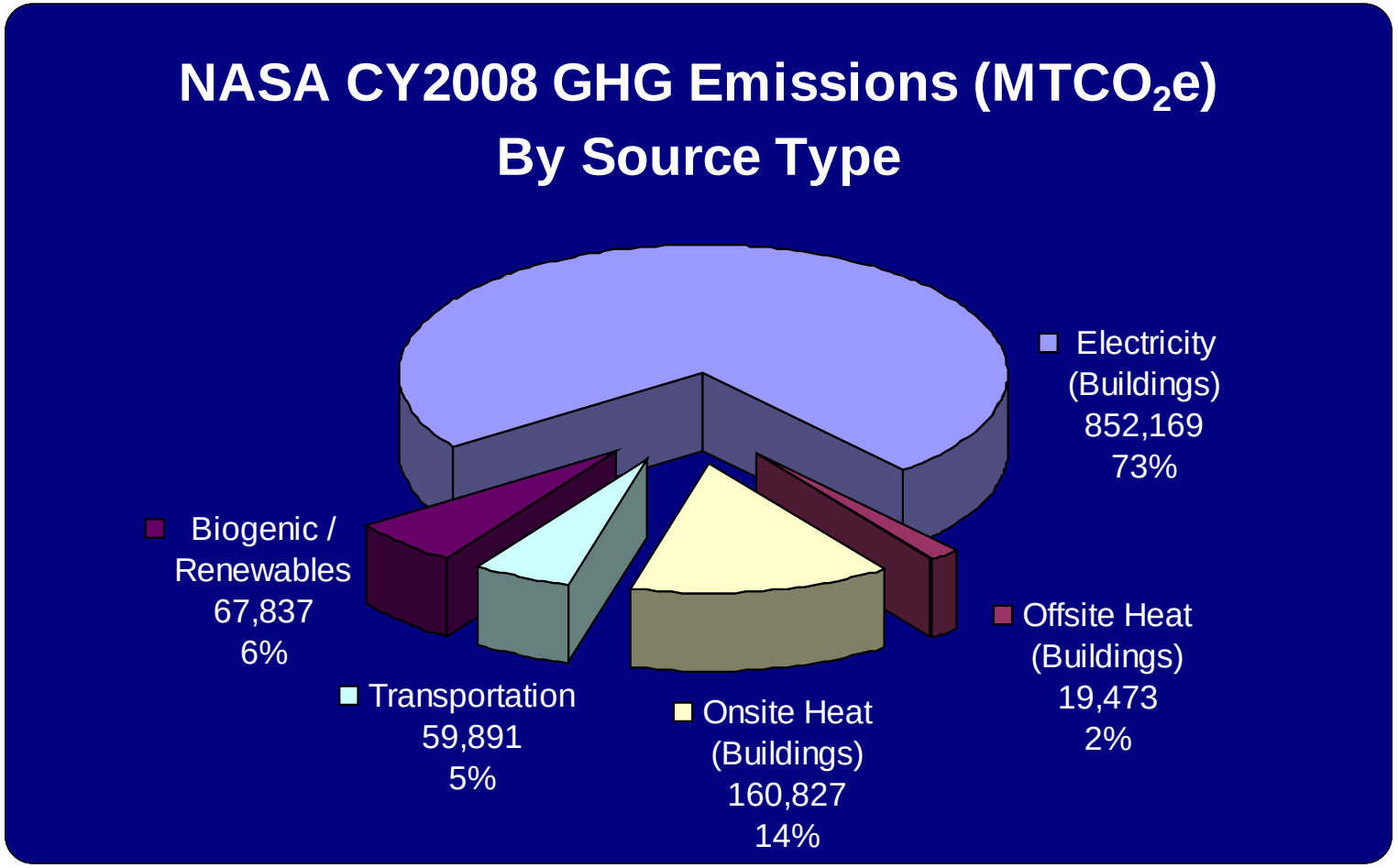
Topic	Requirement
energy intensity	reduce Btu/gsf 3% annually from FY 2003 baseline for FY 2006-2015 (30%)
water intensity	reduce gal/gsf 2% annually from FY 2007 baseline for FY 2008-2020 (26%)
renewable energy	increase percentage of total electricity from renewable sources 3% FY 2007-2009 5% FY 2010-2012 7.5% FY 2013+

Understanding Internal Requirements

- We have 2 sets: Mission and Institutional
- **Institutional** needs to meet external regulations, reduce operating costs, and provide a safe workplace
- **Mission** needs are survival and operations without logistical support

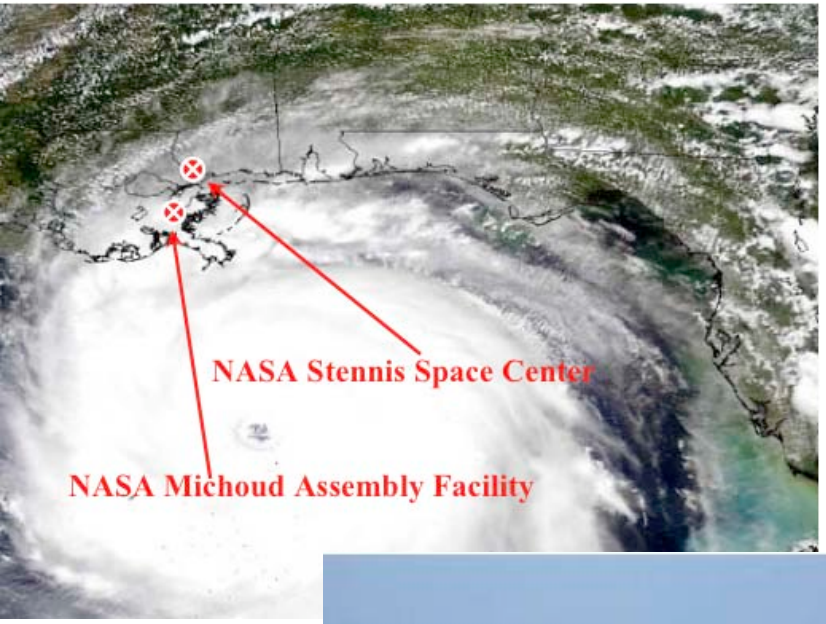
Understand You Institutional Baseline

Accomplishing NASA's mission while maintaining a healthy environment



Source: NASA greenhouse gas emissions inventory, EMD, 2008

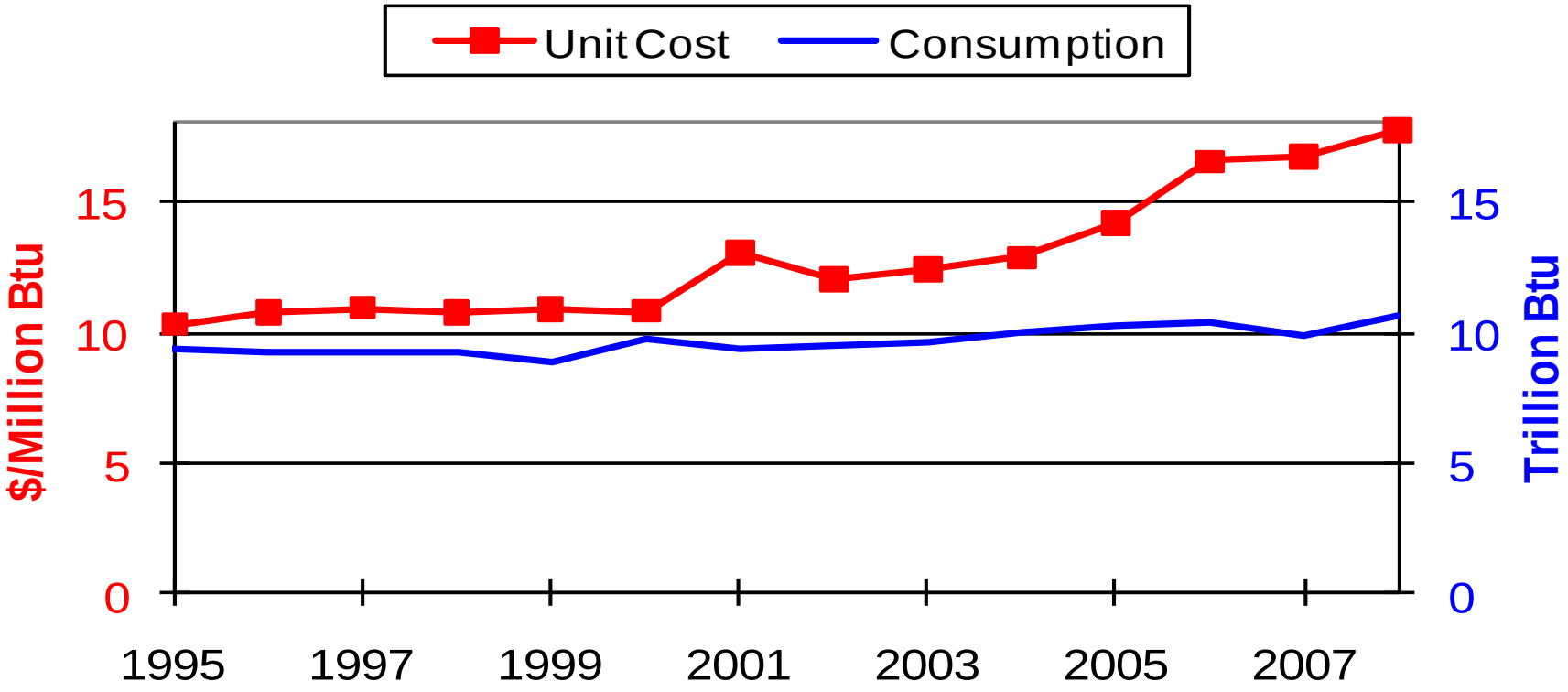
Understand The Impacts



KSC Impact from Nor'easter

Katrina

Understand The Impacts



- Rising energy unit costs erodes available funding for mission
- $167M NASA facility energy cost in FY 2008
- Trend: Buying less yet spending more
- Since FY 1995, use down 12% of BTU per sq ft & unit costs is up 72%

Planning and Strategy

- Take the external requirements and meet them while reducing Mission Risk
- The Laws and Regulations target four areas
  - Energy Awareness Training
  - Energy Intensity Reduction
  - Water Intensity Reduction
  - Increase in Use of Renewable Energy Sources
- Doing this right means more $'s for mission, a healthier environment and reduced mission and institutional risks

Planning and Strategy

Strategic Planning

- Analyze FY 2009 Performance
- Energy Awareness
- Perform Evaluations/Audits
- Identify easy targets (low hanging fruits)
- Secure funding to implement projects
  - Internal Funding: Appropriations
  - External Funding: ESPC/UESC, Enhanced Use Leasing

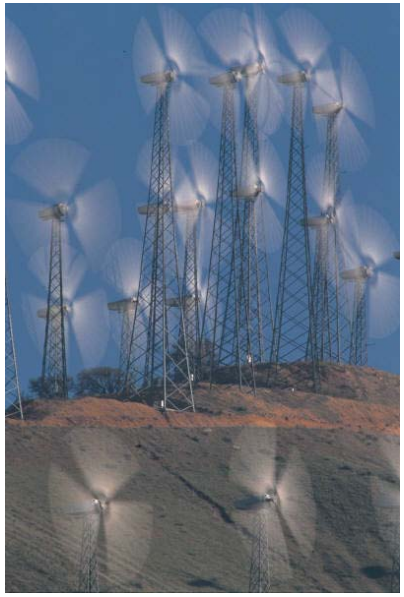
Implementation

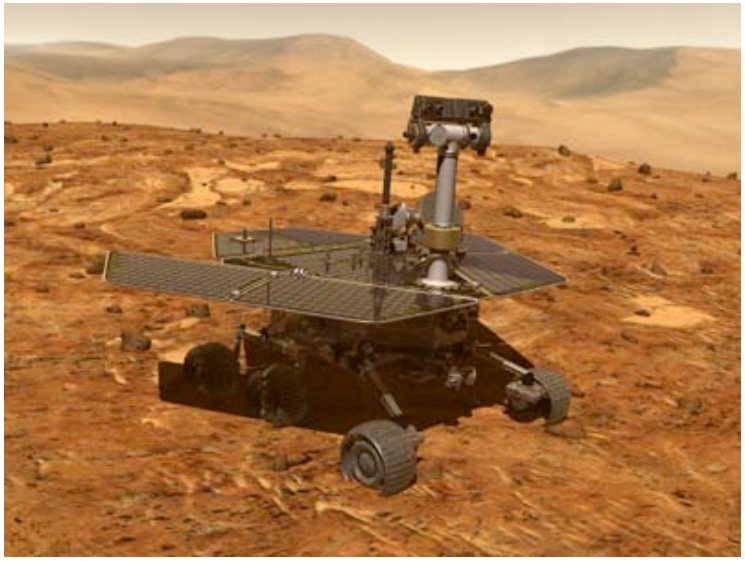
Policy

- Sustainable Building Design & Construction
  - NASA require LEED Silver certification minimum on all building designs & construction & rehabilitation
- Add sustainable criteria into decision making
- Require Green energy construction and purchases

Success comes from being creative and listening to folks on the ground

Creativity in Meeting Energy Needs





LEED Certified Buildings

MSFC Building 4601, Office Building - Gold

GSFC-GB Building 34, Exploration Sciences Building - Gold

Sustainability Base at ARC - Platimun

JPL Building 321, Flight Projects Center, LEED® Gold

Renewable Energy

KSC 0.95 MW PV System

Renewable Energy

JSC Gilruth Center Daylight Harvesting Fixtures

JSC Gilruth Center Solar Thermal Collectors

WSTF – 50KW PV Solar Parking Structures

Why Do It - Our Missions

We both operate in hostile environments were having energy means life