Integrating Sustainability Requires Enhanced Communication, Collaboration, and Integration

Olga Dominguez - Associate Administrator
NASA Headquarters
Office of Strategic Infrastructure

Overview

- NASA's Major Challenges to Supporting Mission
- NASA's Sustainability Policy
- NASA Communities of Practice (CoP)
- Sustainability Requires a Systems Approach
- Each CoP Works to Meet One or More SSPP Goal
- Principles Used for Developing NASA's SSPP
- Communication, Communication, Communication
- 2010 Efforts to Improve Internal Collaboration and Integration
- A Path Forward for Integrating Sustainability within NASA

NASA's Major Challenges to Supporting Mission

1. material availability and obsolescence
2. aging infrastructure
3. increasing energy cost
4. greenhouse gas management
5. climate change impacts and adaptation
6. changing laws and requirements
7. environmental cleanup – Apollo Era
8. encroachment – neighbors need water, energy, safety, resources…
9. mandates without added resources

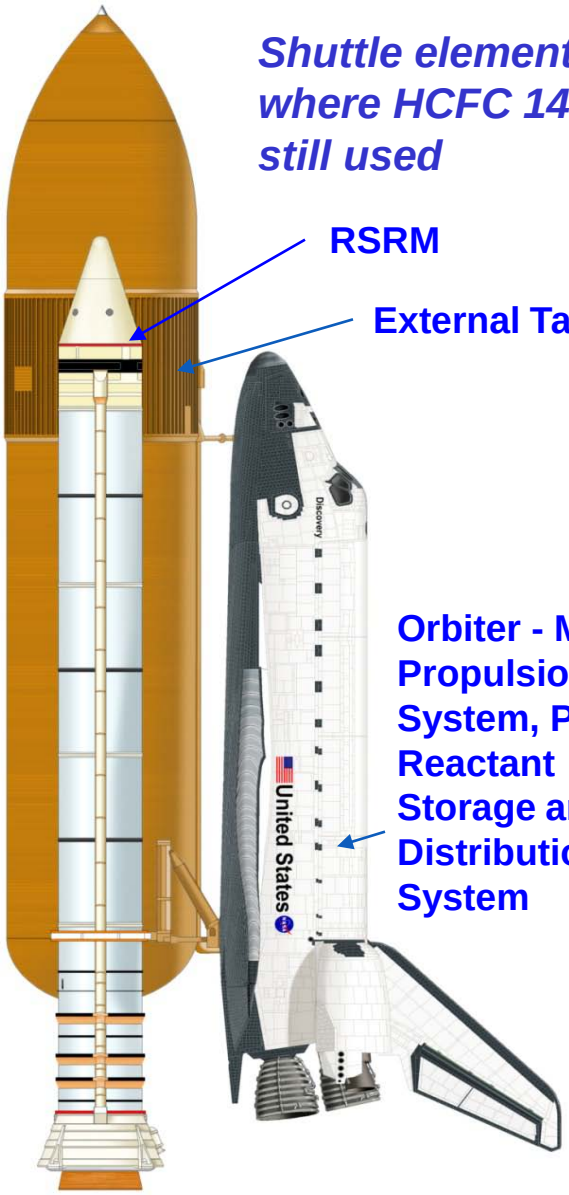
major challenge/ opportunity

1

material availability and obsolescence

Partial List of Materials and Processes of Concern

- Trichloroethane
- Precision Cleaning and Cleanliness Verification Processes Requiring ODSs (HCFC 225 and HCFC 225g)
- TPS and Cryoinsulation Containing ODS (HCFC 141b)
- Chromate Primers
- Cadmium Plating
- Hexavalent Chromium Conversion Coating
- Paint Strippers Containing Methylene Chloride
- Lead Based Solid Film Lubricants
- Paints Containing Perchloroethylene
- High-Level Volatile Organic Compound (VOC) Coatings
- Alkaline Cleaners Containing Hexavalent Chromium
- Hazardous Air Pollutant (HAP) Inks
- Methyl Ethyl Ketone
- Materials and Products Containing Perfluoroalkyl Sulfonates
- Materials Containing Brominated Flame Retardants
- Materials Requiring Perfluorooctanoic Acid (PFOA)



Shuttle elements where HCFC 141b is still used

RSRM

External Tank

Orbiter - Main Propulsion System, Power Reactant Storage and Distribution System

NASA’s Sustainability Policy

NASA's sustainability policy is to execute NASA’s mission without compromising our planet’s resources so that future generations can meet their needs.

Sustainability also involves taking action now to provide a future where the environment and living conditions are protected and enhanced and in that future NASA will have the resources it needs to perform its Mission.

NASA is committed to the intent of Executive Order 13514.

NASA is integrating sustainability principles and methods into existing systems, processes and decision-making, influencing both long-term planning and short-term actions.

Sustainability is becoming more integrated into NASA culture.

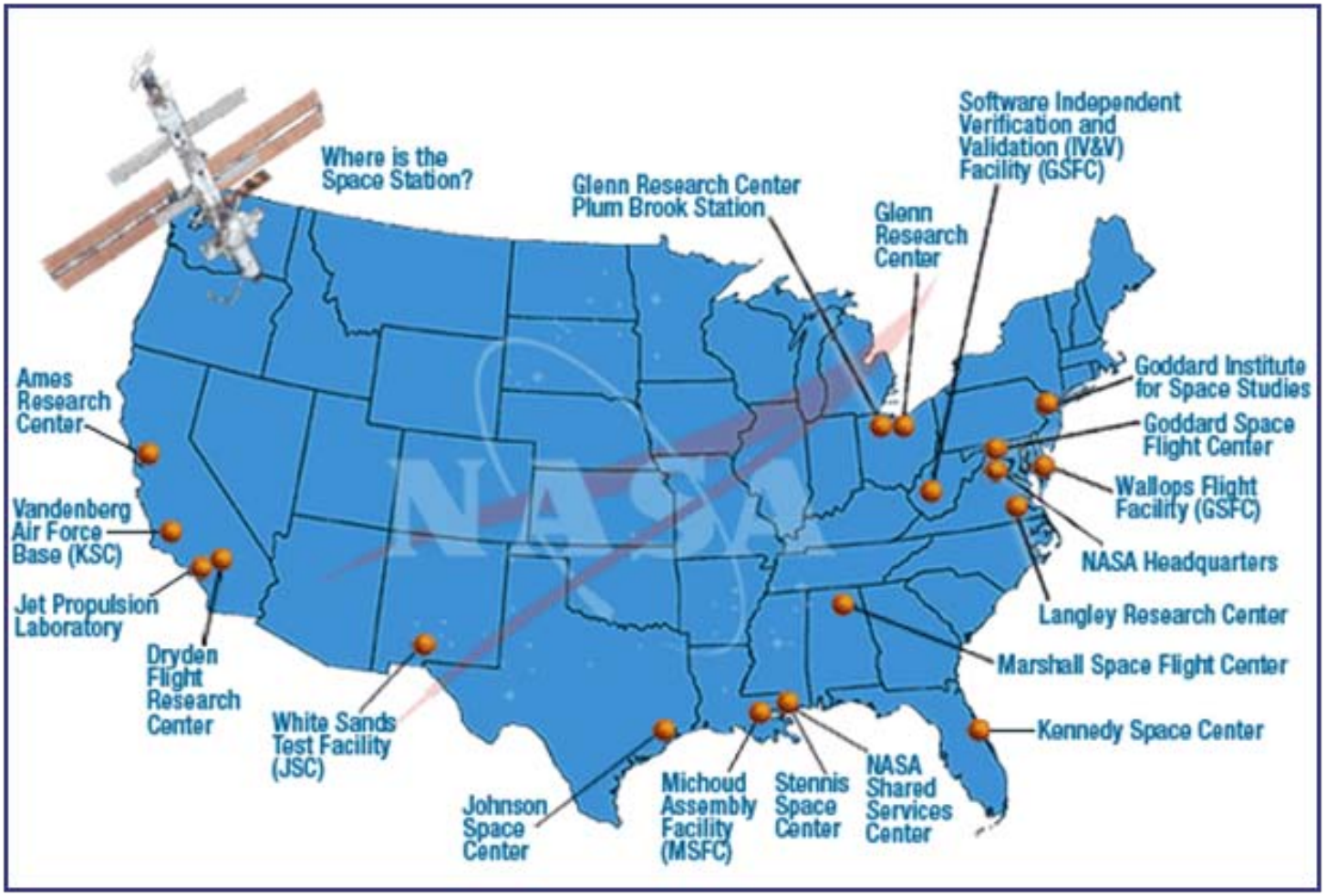
NASA Communities of Practice (CoPs)

- Procurement
- Fleet Management
- Sustainable Acquisition
- Materials and Processes
- Master Planning
- Natural Resources
- Environmental Assurance
- Maintenance and Operations
- Information Technology / Data Centers
- Recycling
- Regulatory Communication
- Facility Design and Construction
- Energy Management
- Water Management

CoPs formed and grew up to meet internal and external goals, objectives, requirements.

Many CoPs have been around for many years. Some are relatively new.

NASA Center and Facility Personnel Comprise CoP Membership



CoPs are dispersed geographically throughout NASA.

Sustainability Requires a Systems Approach

Sustainability

- Regulatory Communication
- Maintenance and Operations
- Environmental Assurance
- Master Planning
- Energy Management
- Facility Design and Construction
- Water Management
- Materials and Processes
- Supply Chain Management
- Information Technology / Data Centers
- Fleet Management
- Recycling and Sustainable Acquisition
- Greenhouse Gas Management
- Climate Change Impacts and Adaptation
- Procurement
- Natural Resources

Because of the multi-disciplinary nature, a sustainability initiative/program needs the coordinated efforts from many communities.

Agency Team or CoP	Responsible NASA Organization for Team or CoP	SSPP Goal									
		1	2	3	4	5	6	7	8	9	10
Strategic Sustainability Working Group	OSI	1	2	3	4	5	6	7	8	9	10
Greenhouse Gas Management *	EMD	1	2	3							
Fleet Management	Logistics Management	1	2	3							
Energy Management	EMD and FED	1	2	3	4						
Design and Construction	FED	1	2		4						
Maintenance and Operations	FED	1	2		4						
Master Planning	TCRPM and EMD			3	4	5					
Natural Resources	EMD					5					
Climate Change Impacts and Adaptation *	FCRPM and EMD					5					
Water Management	EMD						6				
Procurement	Office of Procurement	1	2	3				7	8	9	
Recycling and Sustainable Acquisition (RSA)	EMD							7	8	9	
Supply Chain Management *	Logistics Management		2	3					8		
Center Chief Information Officers	Chief Information Officer									9	
Environmental Assurance and Green System Design	EMD										10
Materials and Processes	EMD										10

For most SSPP goals, several CoPs are needed to achieve objectives and targets

Principles Used for Developing NASA's SSPP

Whenever possible…

NO NEW TEAMS!	Utilize established teams, working groups, and communities of practice familiar with the functional area to get work done
NO NEW MANAGEMENT!	Advise existing management, boards, panels, working groups, etc. to ensure that sustainability principles are incorporated into decisions for functional areas
NO NEW REPORTING!	Revise existing reports and planning documents generated for the different functional areas to reflect the larger sustainability objectives
WORK WITHIN NASA CULTURE!	Define and frame NASA's sustainability approach in a way that blends with NASA culture
ALIGN WITH STRATEGY!	Link all sustainability goals, requirements, targets, and activities to the NASA Strategy
MINIMIZE ADDITIONAL RESOURCES!	Create opportunities within NASA's existing activities and projects to meet existing and emerging sustainability goals, requirements, and targets by supplementing with additional funding…

Communication, Communication, Communication

- Ongoing meetings of key CoP leads within the Headquarters Sustainability Working Group

- HQ CoP leads communicate updates to Center personnel through existing meetings, video teleconferences, etc.
- CoP members at Centers communicate upward to HQ CoP Leads
- Communication tools - SSPP as wiki

2010 Efforts to Improve Internal Collaboration and Integration

Senior Leadership

- Identify Center Sustainability Officers (CSOs) from Center senior leadership
- NASA's Senior Sustainability Officer will meet with CSOs at agency-level workshop to discuss new role
- Describe CSO responsibilities in agency policy - drafts developed now, finalized in 2011
- Make Headquarters Sustainability Working Group activities transparent in internal social networking tools such as NASA Spacebook
- Enhance communication within Centers and between Centers (e.g., post CoP membership to internal sites)
- Develop collaborative tools for inter-Center communication

Center Personnel

A Path Forward for Integrating Sustainability within NASA

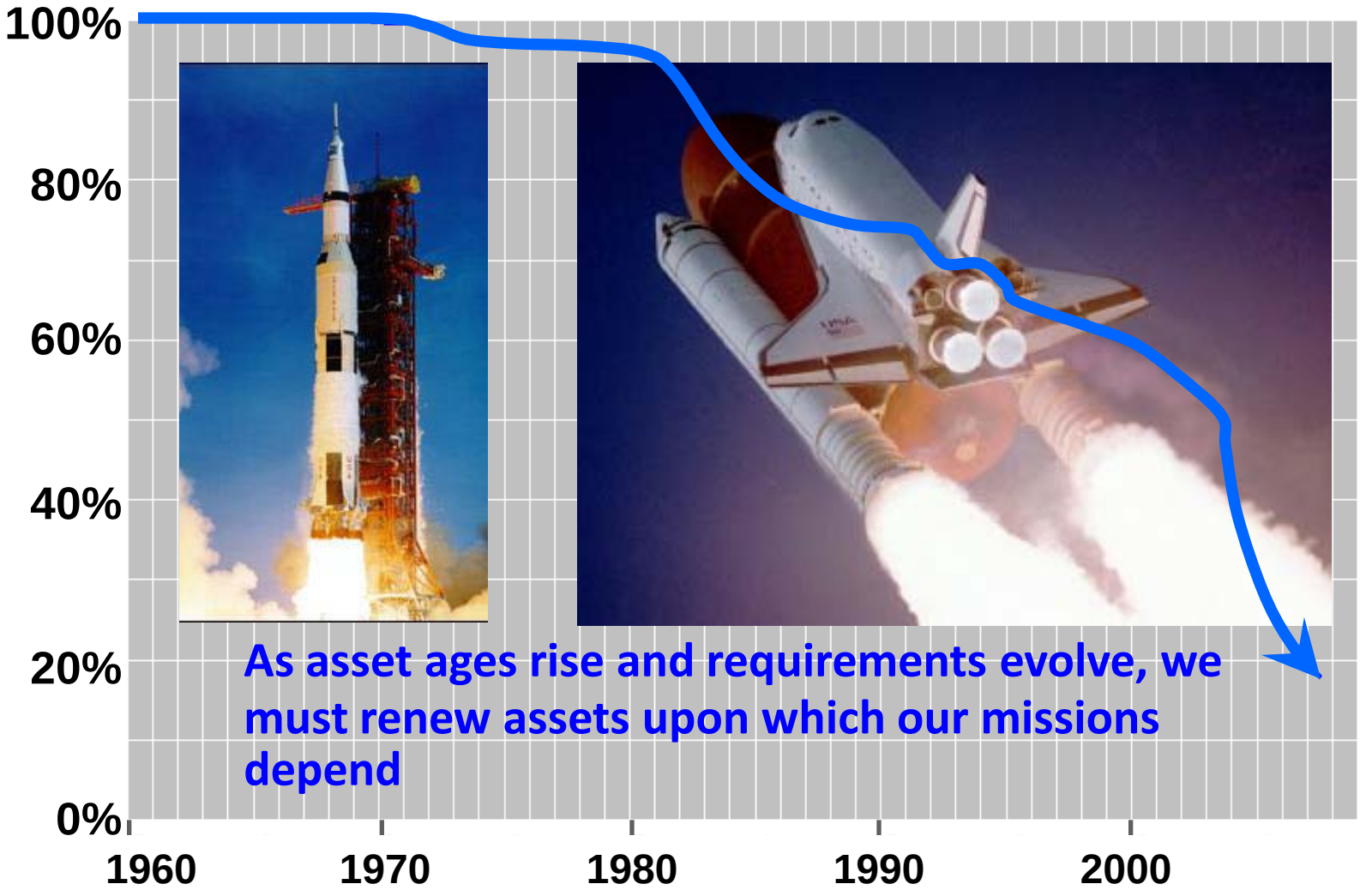
1. View external requirements through the lens of intent and create opportunities
2. Infuse sustainable thinking into existing systems (ops, design, acquisition, suppliers)
3. Design greener systems & processes for NASA programs & projects & institution
4. Develop new models, systems and processes that support and enhance NASA's Missions
5. Push the envelope of business as usual thru the sustainability lens

Sustainability steers you to different, creative, and flexible solutions

Discussion

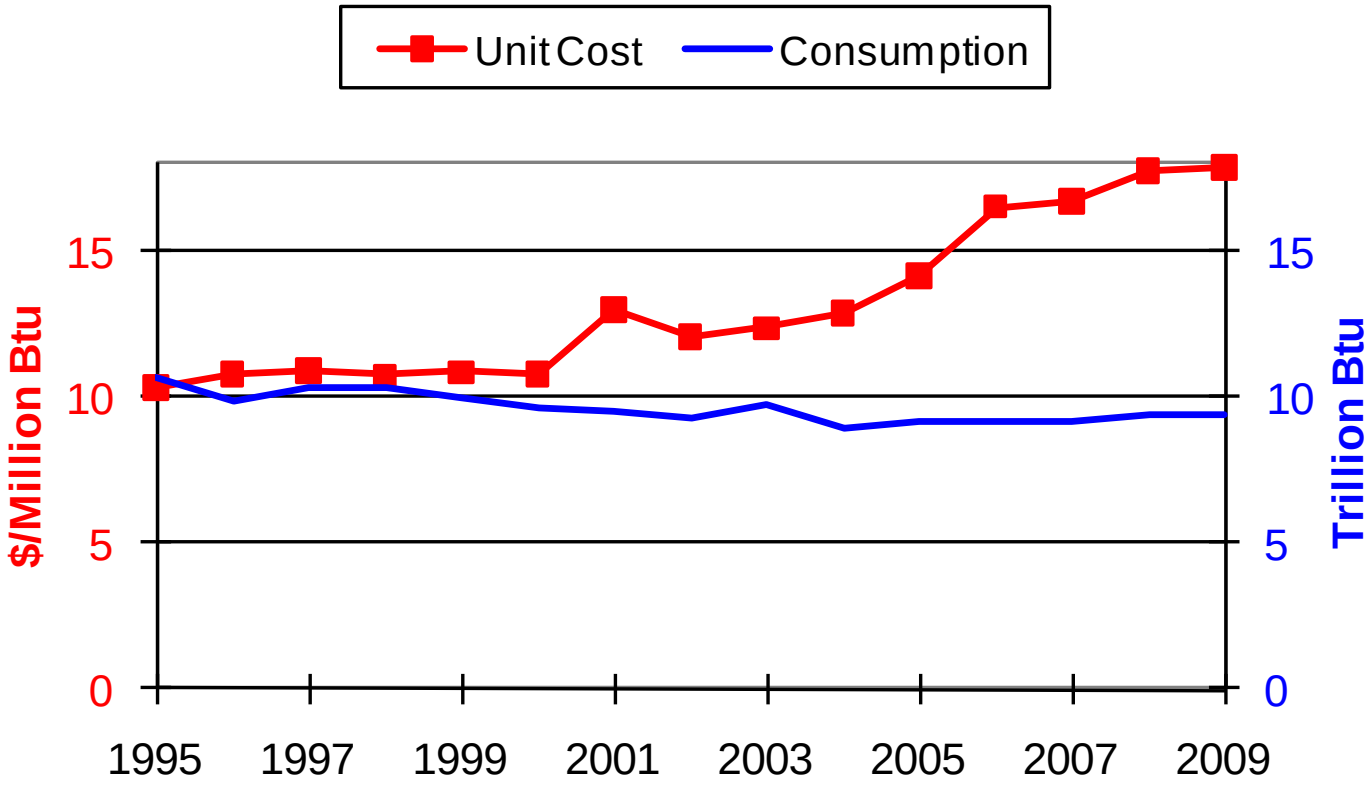
major challenge 2 aging infrastructure

Share of NASA facilities assets under 40 years old



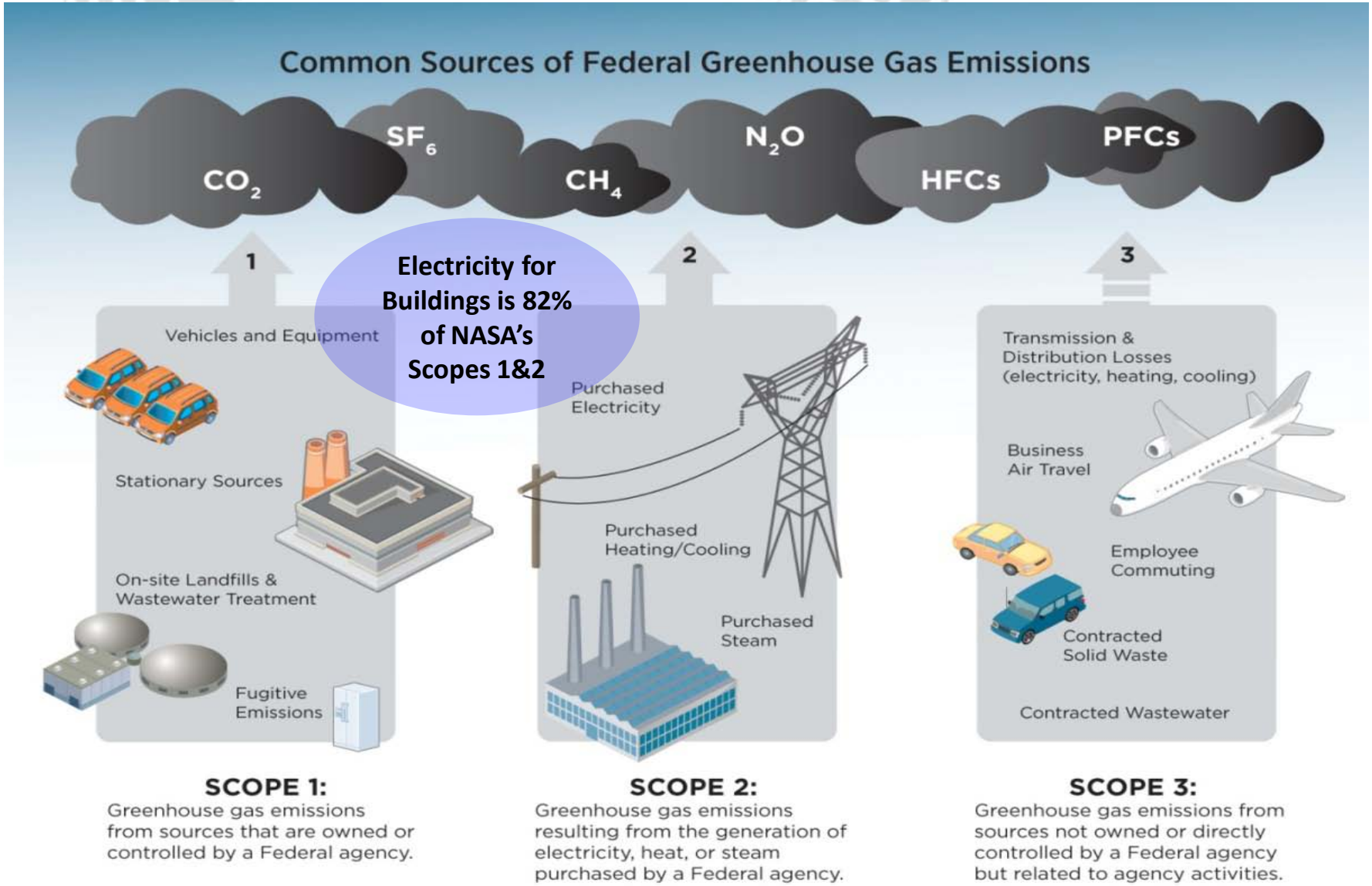
major challenge 3 increasing energy cost

In Since FY 1995, NASA's energy use is down 12% and unit costs are up 73%.



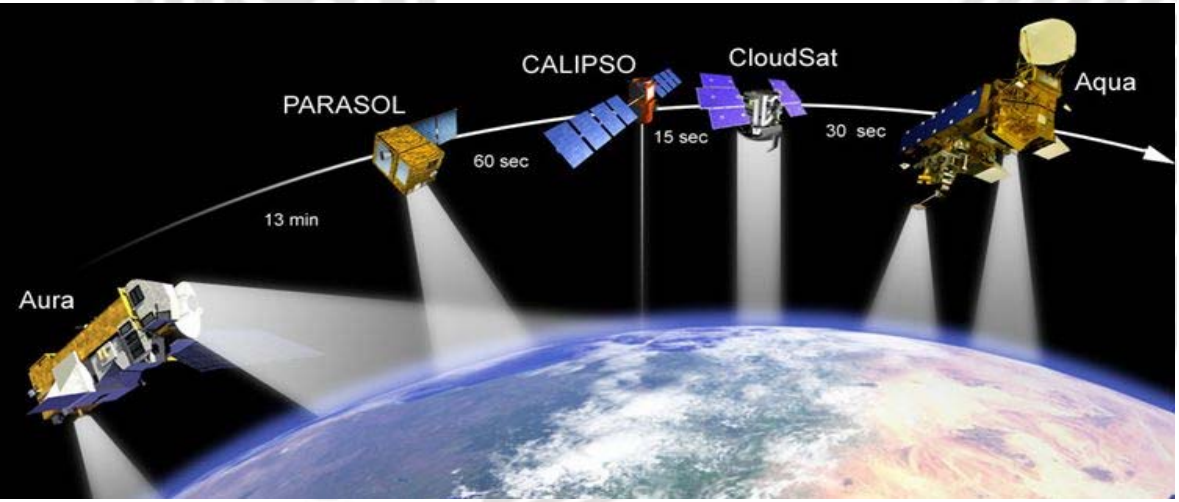
We are buying less energy yet still spending more.

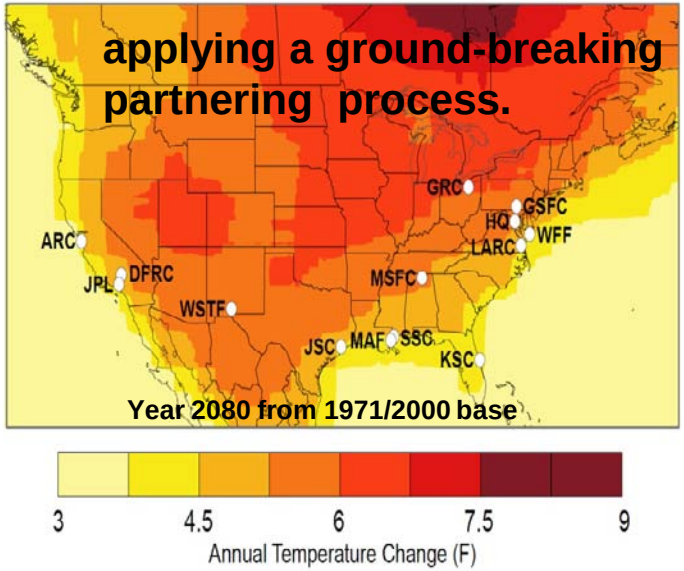
major challenge 4 greenhouse gas management



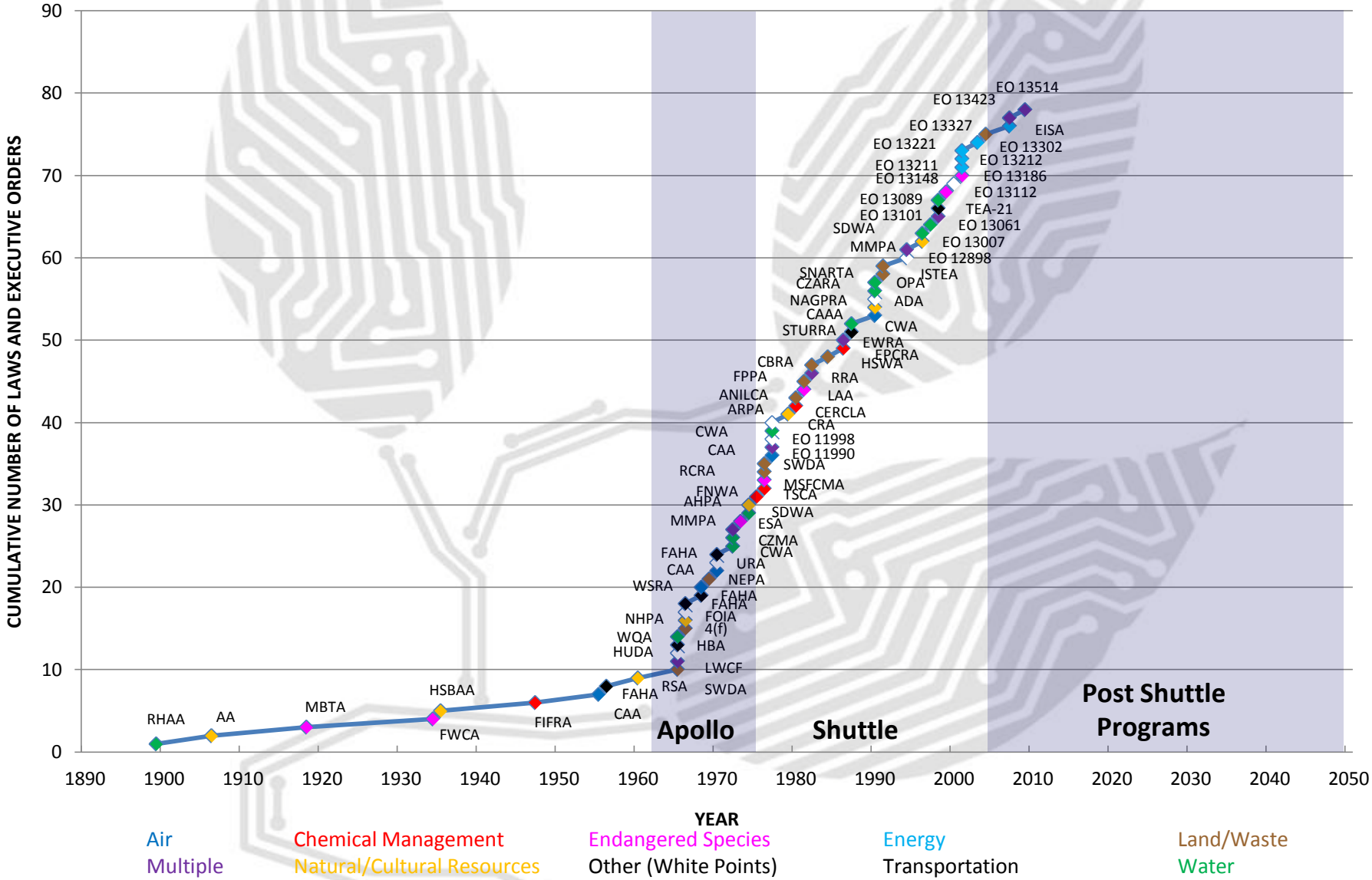
major challenge 5 climate change impacts and adaptation

Leverage a unique perspective & renowned climate expertise... to quantify real risks…



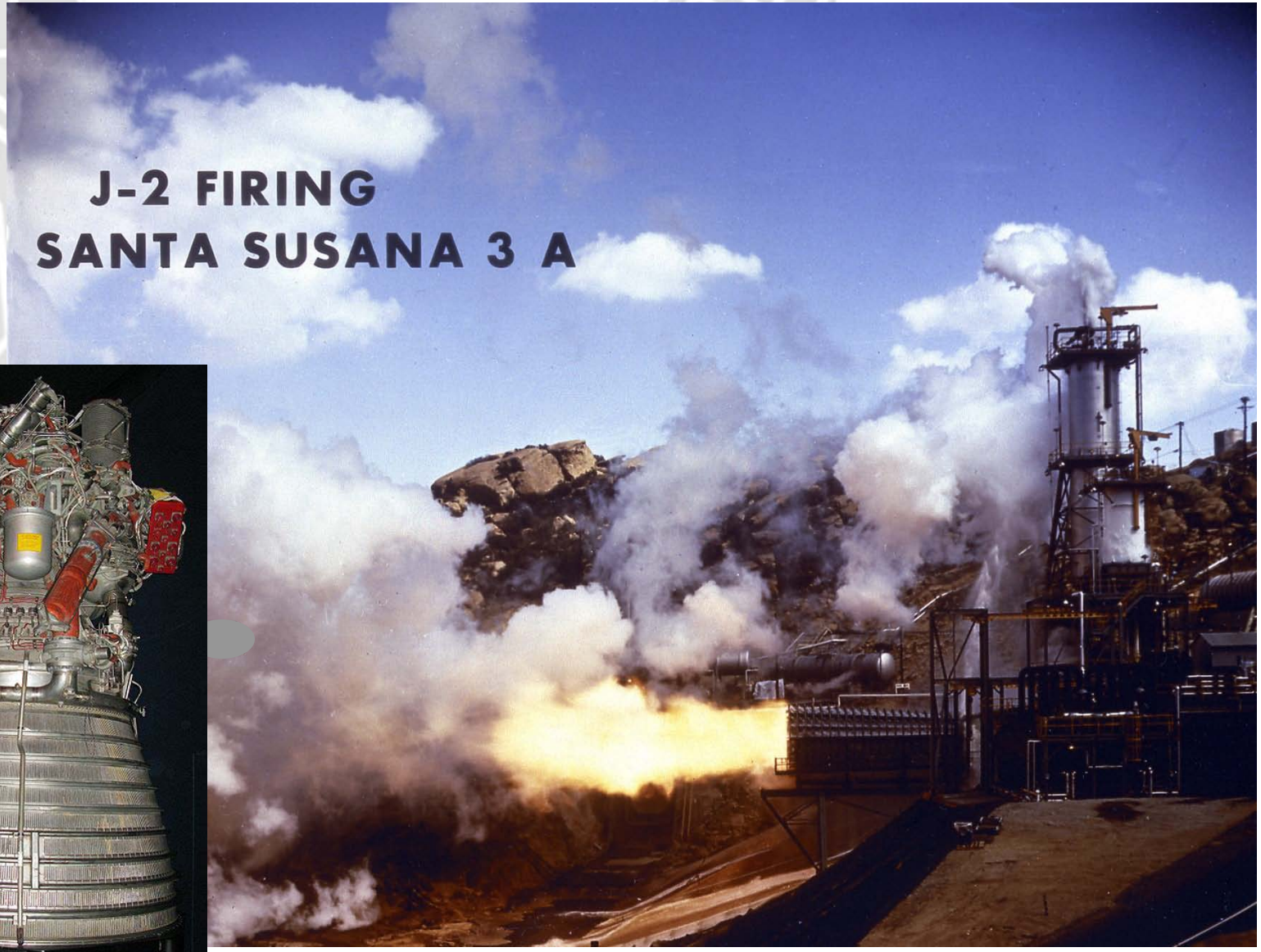


major challenge 6 changing laws and requirements

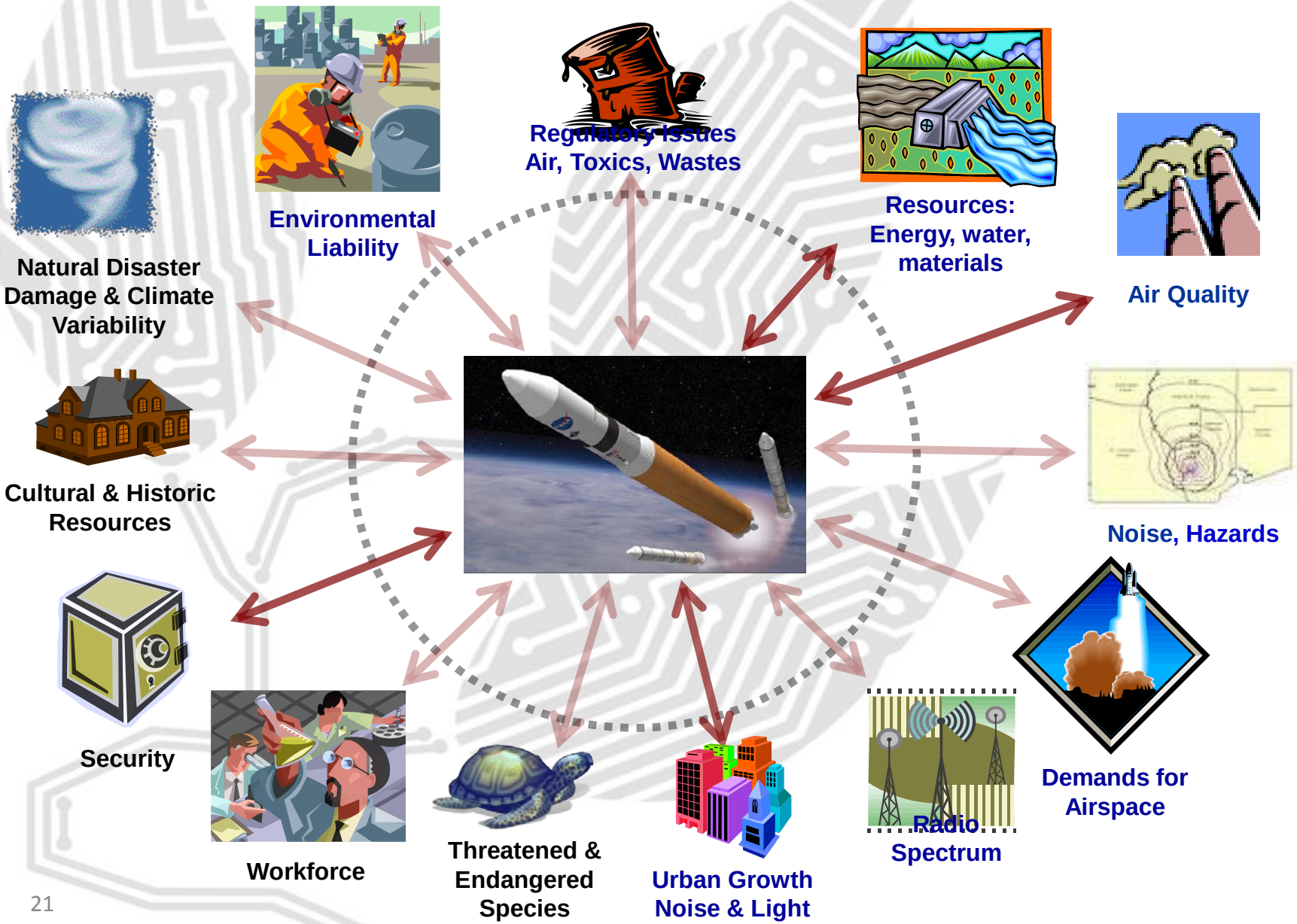


major challenge

7 environmental cleanup Apollo Era

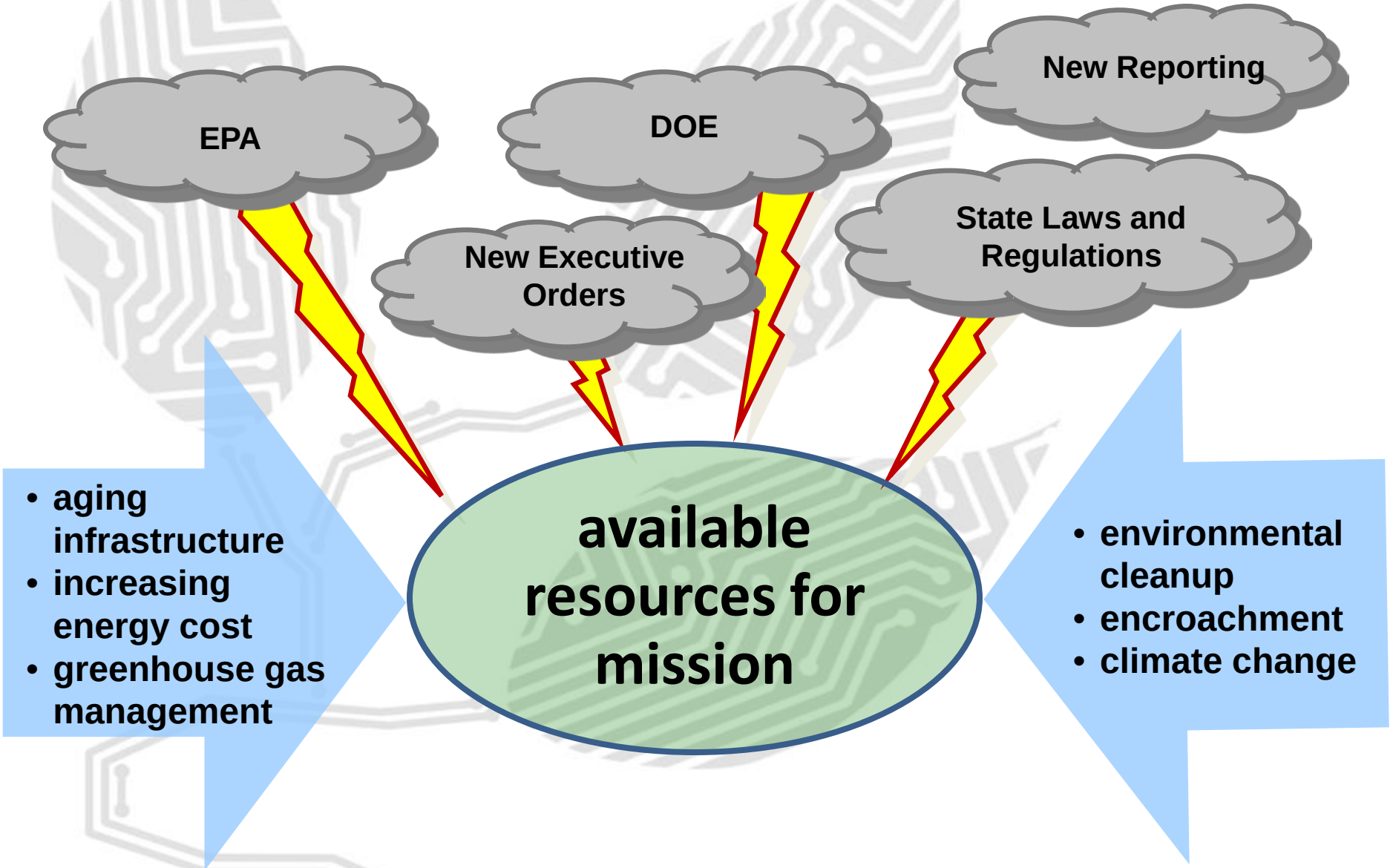


major challenge 8 encroachment



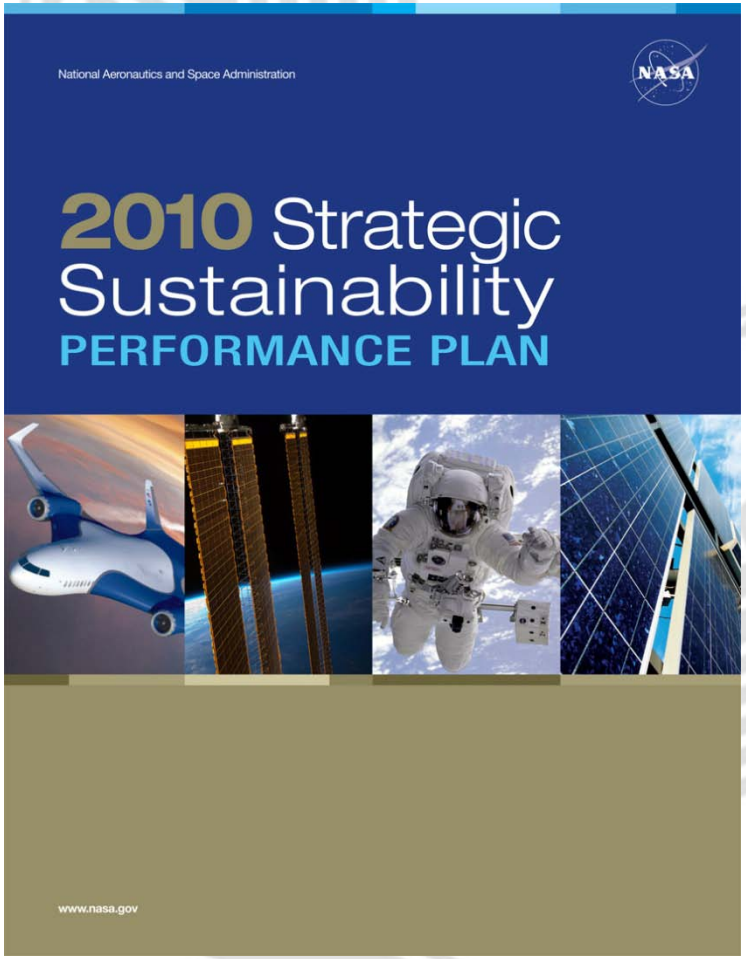
major challenge 9

mandates without added resources



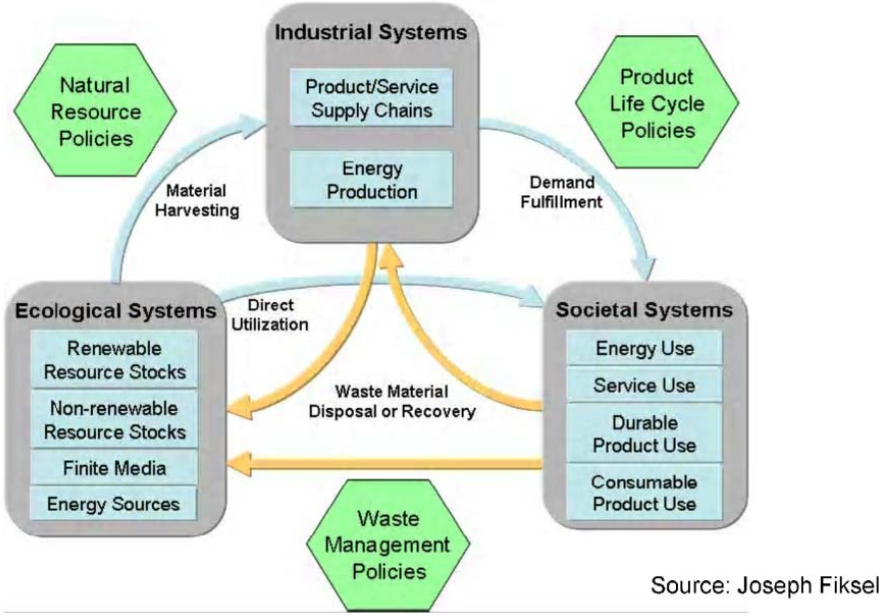
1 View external requirements through the lens of intent and create opportunities

EO 13514 required NASA to prepare and submit to CEQ and OMB a multi-year Strategic Sustainability Performance Plan.



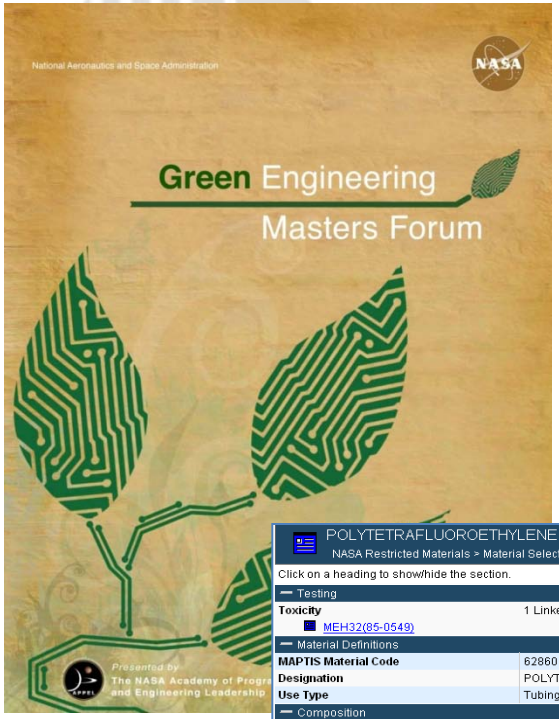
- Started formal sustainability planning process within NASA
- In 2011, it will streamline and consolidate reporting requirements
- Initiated conversations and coordination between different NASA offices
- Aligned activities, efforts, and projects outlined in SSPP with NASA budget submission
- Initiated inclusion of sustainability into other NASA plans, policies, and activities

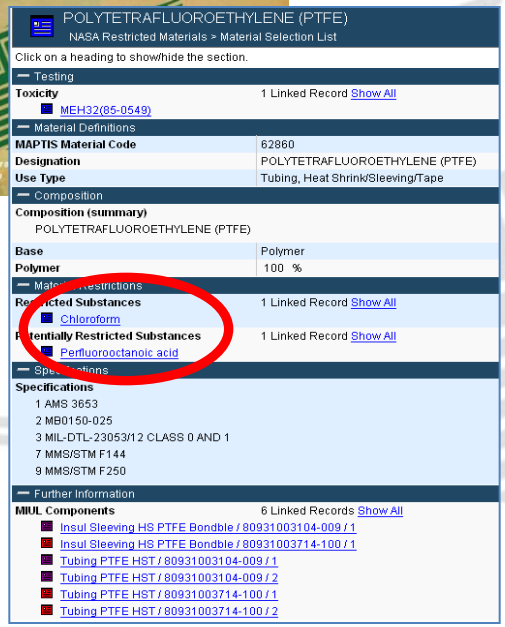
2 Infuse sustainable thinking into existing systems (ops, design, acquisition, suppliers)



Source: Joseph Fiksel

3 Design greener systems & processes for NASA programs & projects & institution





POLYTETRAFLUOROETHYLENE (PTFE)
NASA Restricted Materials > Material Selection List

Click on a heading to show/hide the section.

Testing

Toxicity	1 Linked Record Show All
MEH32(85-0549)	

Material Definitions

MAPTIS Material Code	62860
Designation	POLYTETRAFLUOROETHYLENE (PTFE)
Use Type	Tubing, Heat Shrink/Sleeving/Tape

Composition

Composition (summary)	
POLYTETRAFLUOROETHYLENE (PTFE)	
Base	Polymer
Polymer	100 %

Material Restrictions

Restricted Substances	1 Linked Record Show All
Chloroform	
Potentially Restricted Substances	1 Linked Record Show All
Perfluorooctanoic acid	

Specifications

Specifications
1 AMS 3653
2 MB0150-025
3 MIL-DTL-23053/12 CLASS 0 AND 1
7 MMS/STM F144
9 MMS/STM F250

Further Information

MIUL Components	6 Linked Records Show All
Insul Sleeving HS PTFE Bondble / 80931003104-009 / 1	
Insul Sleeving HS PTFE Bondble / 80931003714-100 / 1	
Tubing PTFE HST / 80931003104-009 / 1	
Tubing PTFE HST / 80931003104-009 / 2	
Tubing PTFE HST / 80931003714-100 / 1	
Tubing PTFE HST / 80931003714-100 / 2	

Restricted or Potentially Restricted Substances

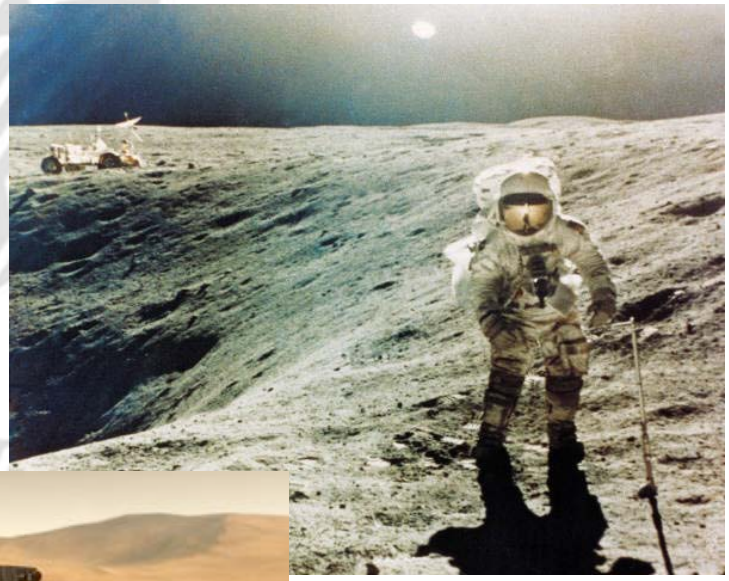
Source: NASA-MSFC, MAPTIS-II

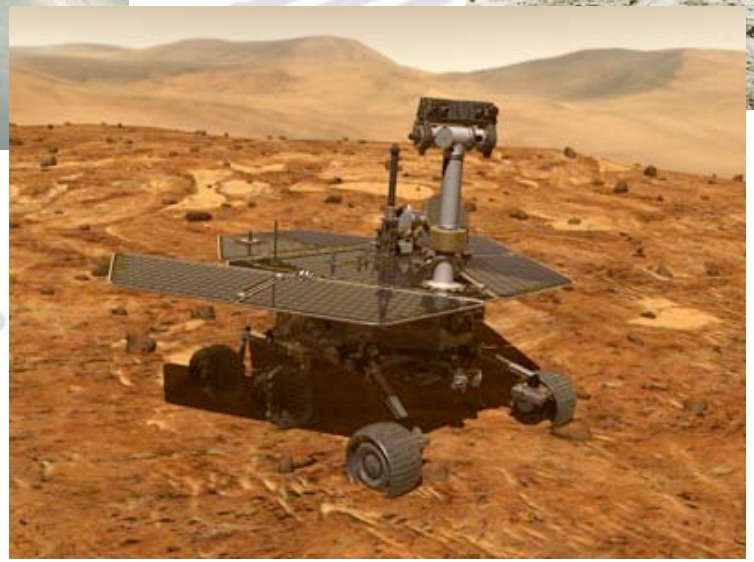
Kennedy Space Center 0.95 MW PV System

Sustainability Base Ames research Center

4 Develop new models, systems & processes that support and enhance NASA's Missions

Harvard Business Review – September 2009 – Why ***Sustainability*** is Now the Key Driver of ***Innovation***





New territory to explore

5 Push the envelope of business as usual thru the sustainability lens

- Use the opportunity side of risk to design using Green Engineering, Green Chemistry, Green Energy Management…
- Design and Plan to requirements, outcomes and goals desired to drive innovation and use of sustainable resources
  - Design to Outcomes and Goals not metrics
- Measure success & individual performance using sustainable results