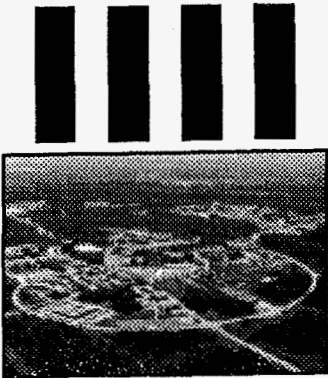


ANL/ES/VU--87006

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# Energy Systems Division Overview

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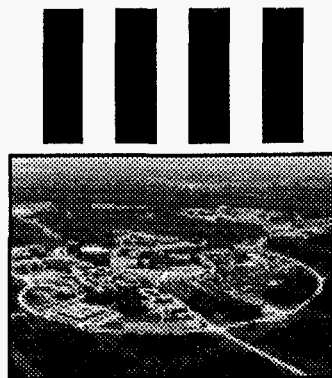
*Norm Sather*  
*1995 Energy Systems Division Review*

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED *ww*

MASTER

## **DISCLAIMER**

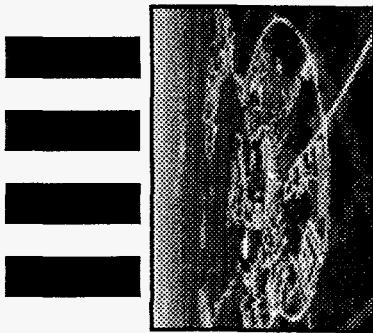
**Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.**



# Energy Systems Division Review

Tuesday, June 6

- 8:30 am Industrial R&D Partnerships
- 9:00 am Center for Industrial Technology Systems
- 9:15 am Industrial & Utility Technology Section
- 9:40 am Refinery of the Future Initiative
- 10:00 am *Break*
- 10:15 am Process Evaluation Section
- 10:40 am Salt Cake Processing
- 11:00 am Waste Management & Bioengineering Section
- 11:25 am Novel Processes and Products for Pollution Prevention
- 11:45 am *Lunch*

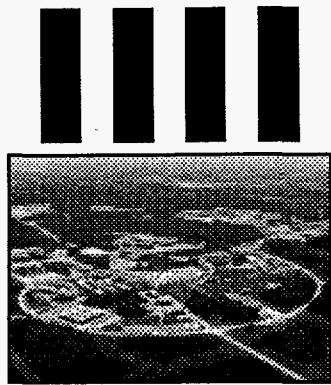


# Energy Systems Division Review

Tuesday, June 6

- |         |   |
|---------|---|
| 1:15 pm | Center for Environmental Restoration Systems    |
| 1:45 pm | Overview of Integrated Training Area Management |
| 2:00 pm | Ft. Riley Ecosystem Modeling                    |
| 2:20 pm | Hohenfels Remote Sensing                        |
| 2:40 pm | Hohenfels Multimedia                            |
| 3:00 pm | <i>Break</i>                                    |
| 3:15 pm | Hohenfels Geophysics Investigation              |
| 3:35 pm | Right-of-Way Erosion Evaluation Program         |
| 3:55 pm | CERS Approach to Environmental Restoration      |
| 4:30 pm | Executive Session                               |

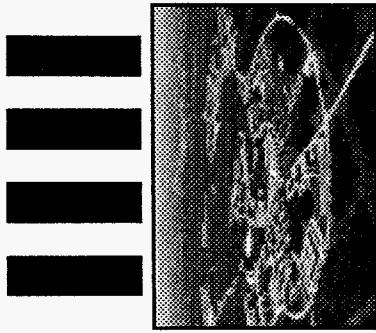




# Energy Systems Division Review

Wednesday, June 7

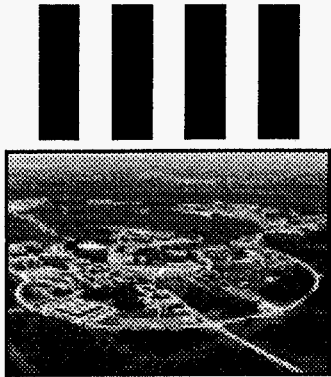
- 8:30 am Center for Transportation Research
- 8:45 am Technology Engineering Section
- 9:00 am Monatomic Nitrogen for Engine NO<sub>x</sub> Control
- 9:30 am Environmental & Economic Assessments Section
- 9:45 am Assessment of Lightweight Materials for Automobiles
- 10:05 am Energy and Emissions Effects of the Renewable  
Oxygenate Standard
- 10:25 am Break
- 10:40 am Advanced Systems Section
- 10:55 am Current Directions of Maglev Technology Development
- 11:25 am Impacts of Energy Policy on Different  
Socio-Economic Groups
- 11:45 am Using GIS for Energy Consumption Analysis
- 12:00 pm Lunch



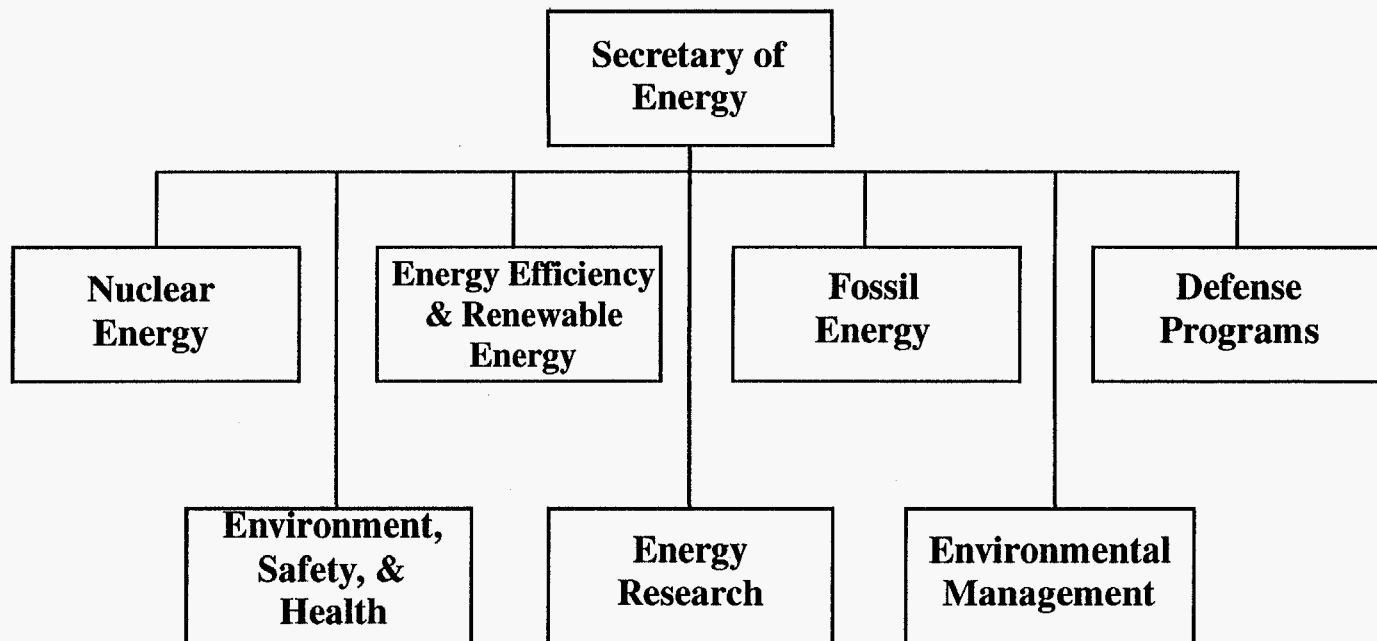
## **Division Mission**

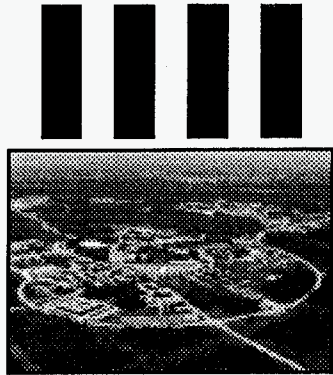
- Develop technologies for:
  - reducing energy use and environmental impacts for manufacturing and transportation
  - restoring contaminated or disturbed land
- Areas of emphasis:
  - renewable energy and fuel resources
  - pollution prevention and material recycling
  - integrated site restoration methods



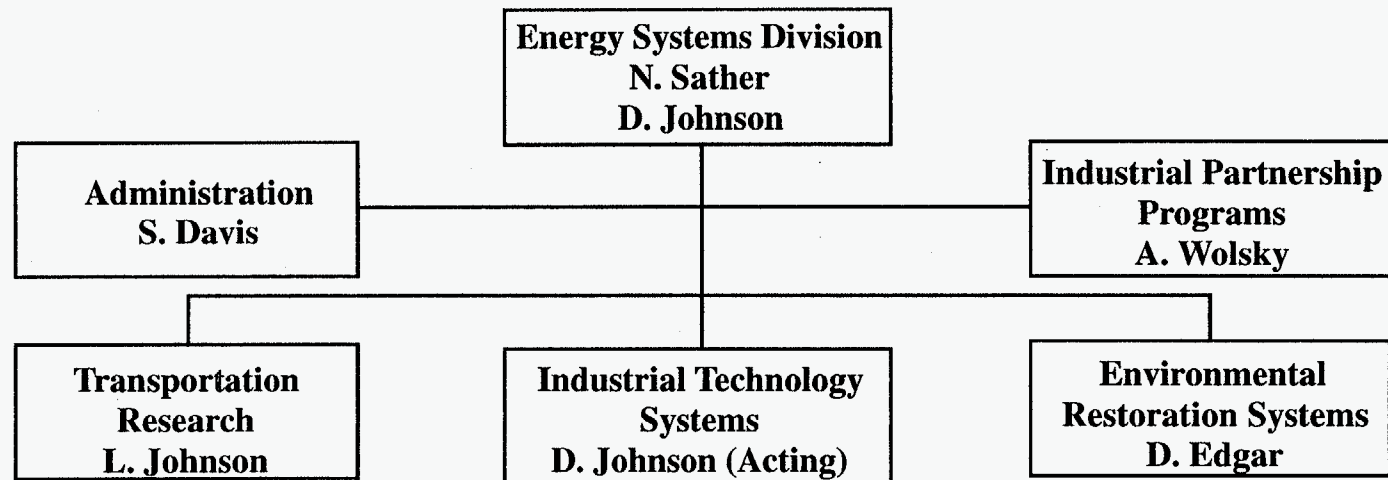


## The Division Has Major Programs in Four DOE Programmatic Offices





# The Division's R&D Focus is on Energy and Environmental Technology

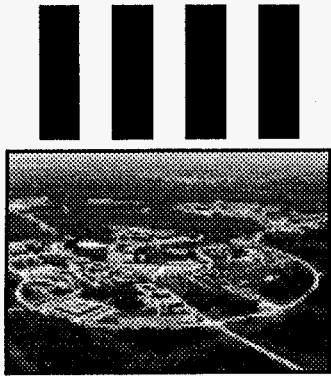


- Environmental & Economic Assessments
- Advanced Systems
- Technology Engineering

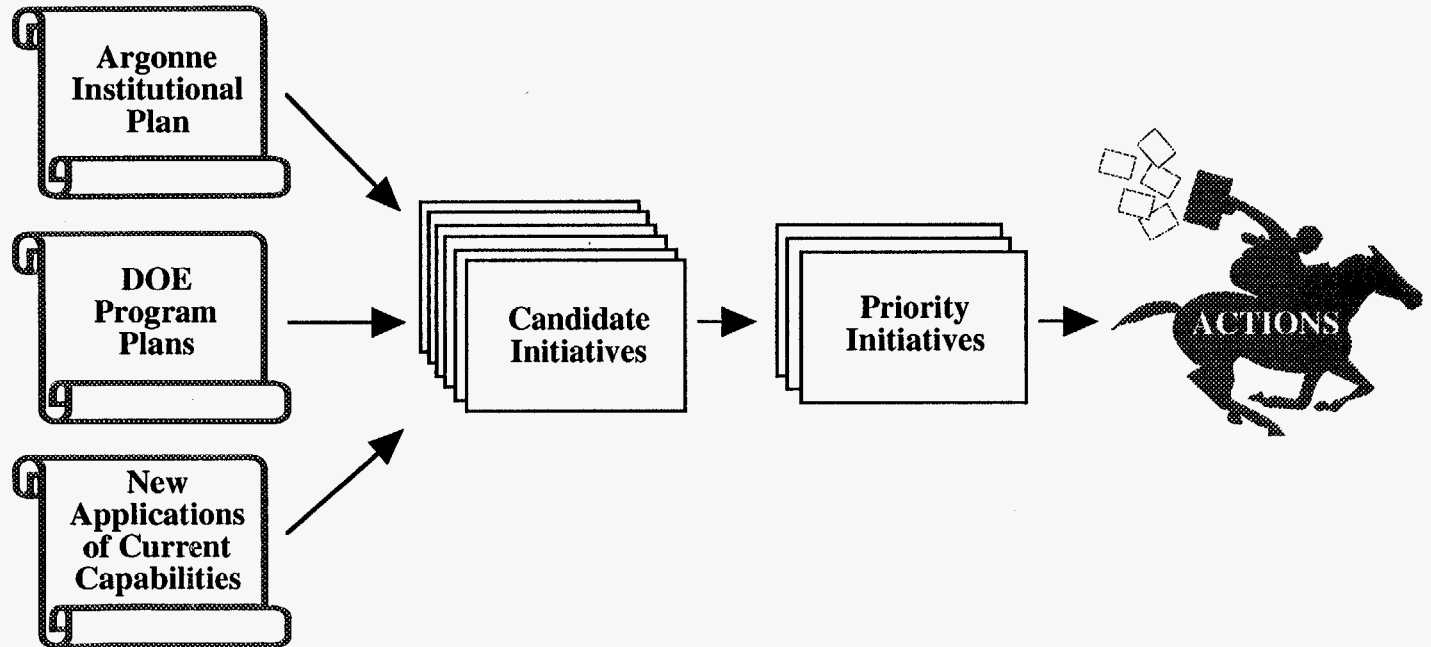
- Waste Management & Bioengineering
- Industrial & Utility Technology
- Process Evaluation

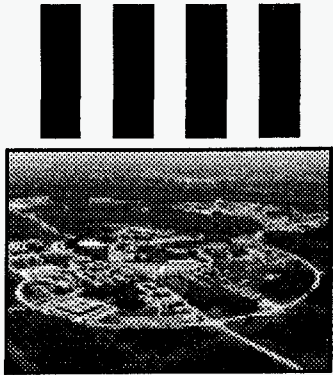
- Geosciences
- Environmental Chemistry
- Land Reclamation
- Ecology & Natural Resources
- Engineering & Technology Evaluation





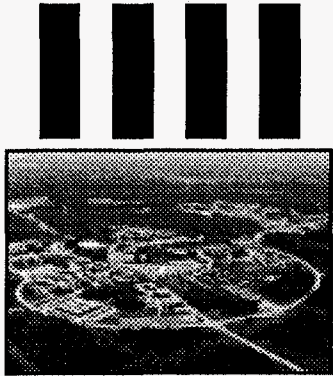
# New Initiatives are Developed by a Strategic Planning Process





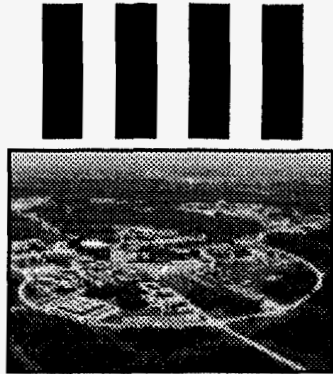
## Argonne Strategic Objectives

- Industrial Competitiveness
  - Manufacturing technology
  - Industrial applications of X-ray and neutron sources
  - Cooperative R&D agreements
- Energy Resources
  - Fission reactor technology
  - Energy efficiency
  - Renewable energy
  - Fossil energy
  - Superconducting technology
  - Fusion energy



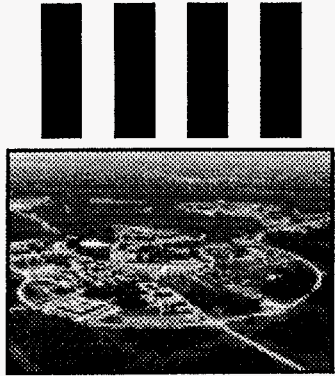
## Strategic Objectives (cont.)

- Science and Technology
  - Supporting and basic research and development
  - Major research facilities
  - Education
- Environmental Quality
  - Global environmental change
  - DOE facilities
- National Security



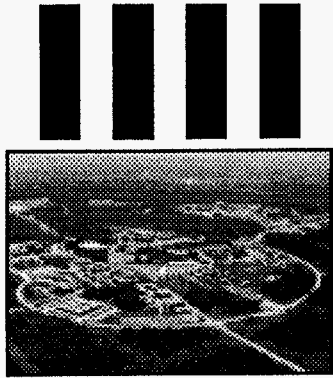
## Planning Assumptions

- Emphasis on efficient use of energy and renewable sources of energy
  - reduced energy requirements for industrial processes
  - conversion and use of industrial and consumer wastes
  - alternatives to petroleum for fuels and chemicals
- Emphasis on environmental concerns
  - pressures to clean up contaminated sites
  - goal of “zero” emissions



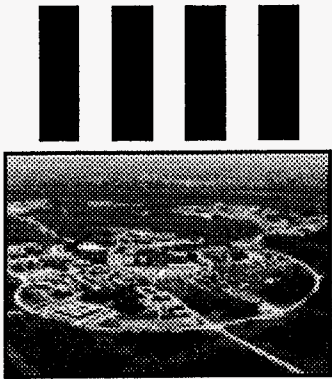
## Planning Assumptions (cont.)

- Critical need for new energy and environmental technologies
- Collateral mission of the DOE national laboratories to improve competitiveness of U.S. industry



## **The Selection Process for Division Priority Initiatives Focuses on Two Key Questions**

- Can we make a substantial technical contribution?
- Does the potential for success justify the resources required?



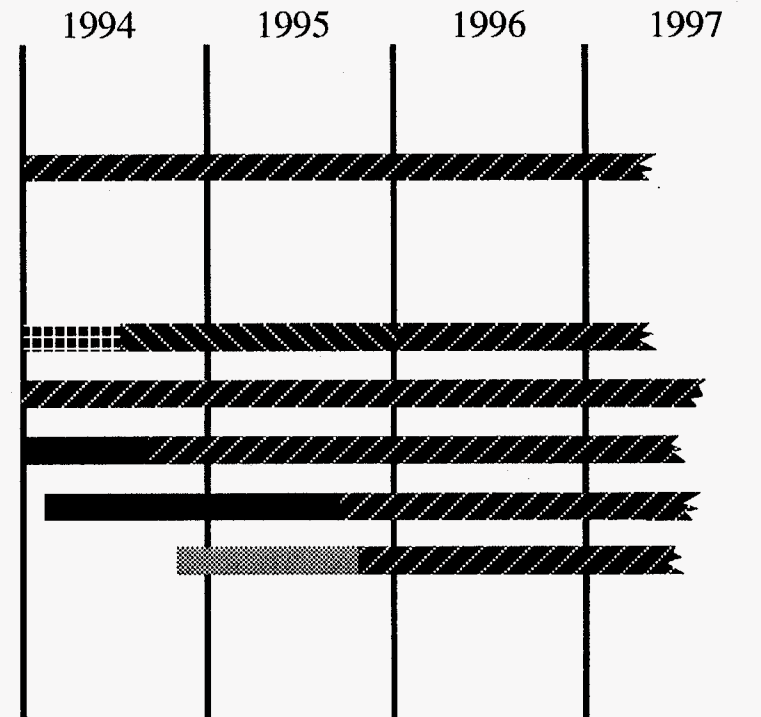
# All Available Resources are Used to Develop Priority Initiatives

## Waste Conversion and Use

- Automobile recycling

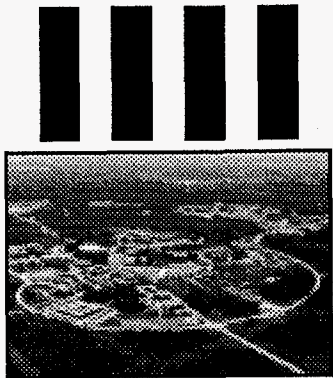
## Environmental Restoration

- In-situ groundwater treatment
- Microbially influenced corrosion
- Membrane separations
- Use of foams for in-situ biotreatment
- Application of stratigraphy for enhancing remediation



- Concept development
- ▤ Proposed laboratory discretionary funding
- ▨ Laboratory discretionary funding

- ▩ Division program development funding
- ▧ Projected sponsor funding



# All Available Resources are Used to Develop Priority Initiatives

## Transportation Systems

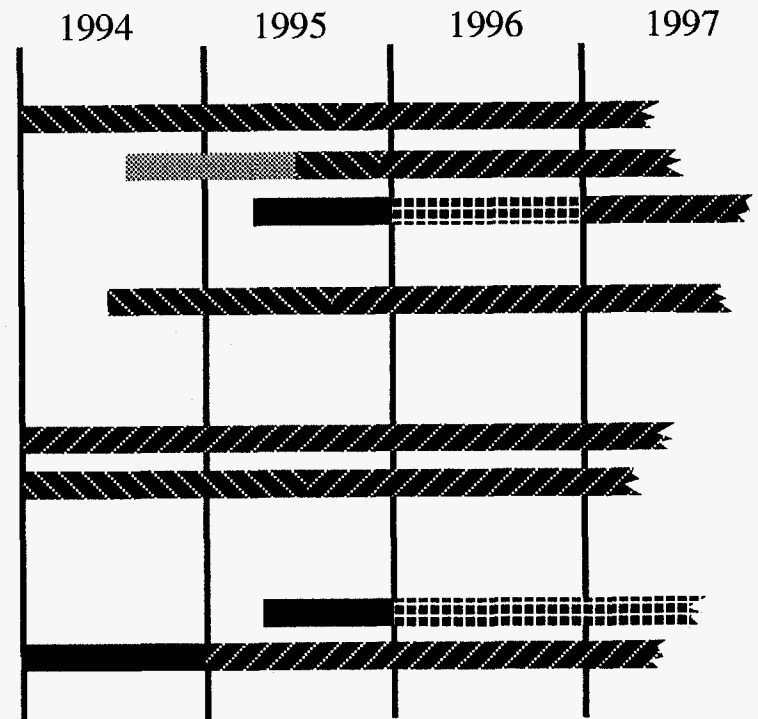
- NO<sub>x</sub> control technology
- AI for automobile engine diagnostics
- Sensor systems for emission monitoring
- Intelligent transportation systems

## Renewable Energy

- Alternative feedstocks
- Biocatalysis

## Advanced Industrial Processes

- Hydrogen production and storage
- Refinery of the future



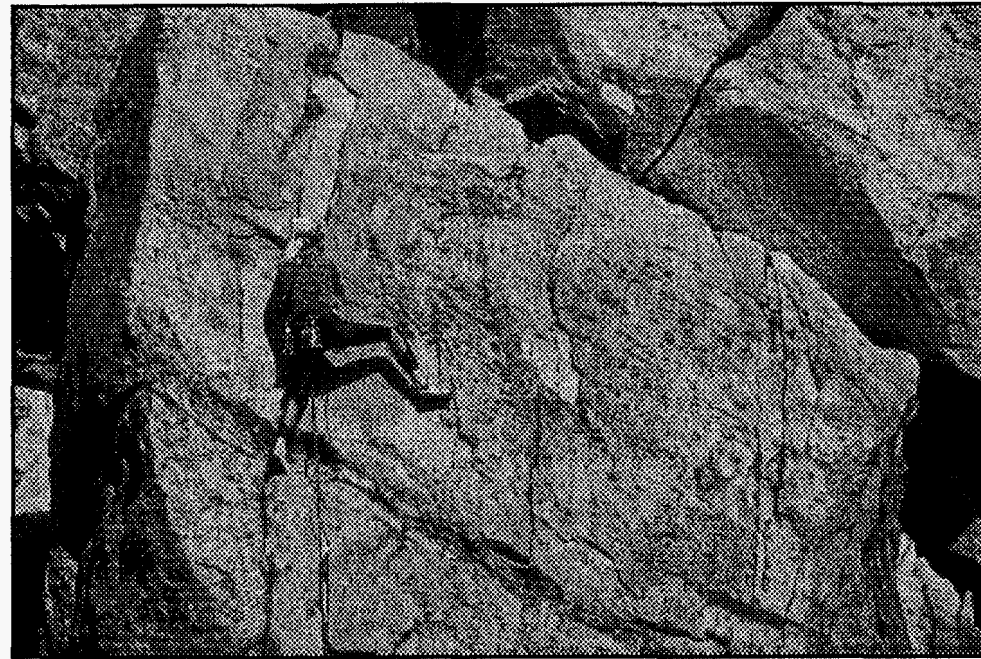
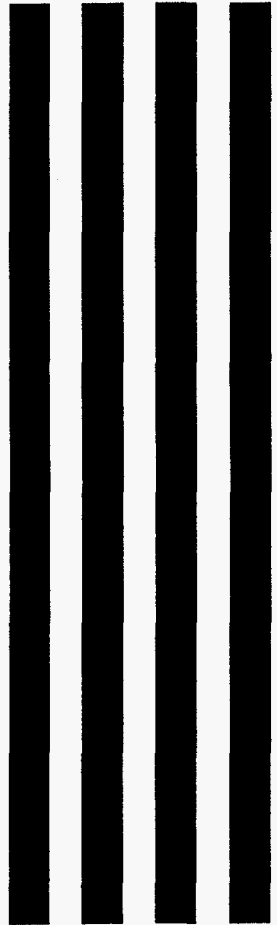
- Concept development
- ▣ Proposed laboratory discretionary funding
- ▨ Laboratory discretionary funding

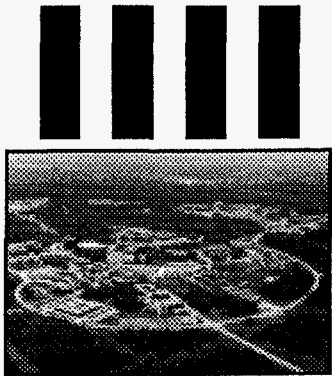
- ▤ Division program development funding
- ▧ Projected sponsor funding





# **Finding New Footholds in a Competitive World**





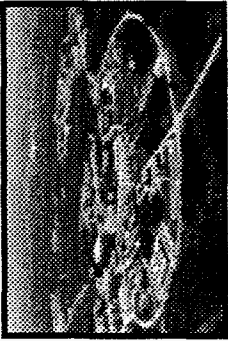
# The Energy Systems Division Has Seven Research Focus Areas

- Heat transfer, separations, and environmental control technology
- Waste minimization and pollution prevention via materials recycling
- Chemical process and site remediation technology
- Methods for restoring environmentally degraded sites
- Automobile engine, fuels, and materials technology
- Advanced transportation systems
- Transportation policy analysis and technology assessment



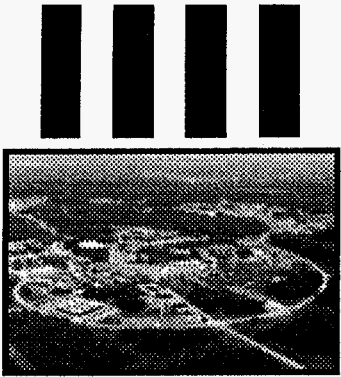
## **In Summary, the Energy Systems Division**

- Performs applied research on energy and environmental technology for government sponsors and industrial companies
- Strives to achieve the highest level of innovation, quality, and accomplishment in its research efforts
- Maintains a strong focus on its core technical capability areas
- Contributes to and provides leadership for pursuing DOE's and Argonne's research mission



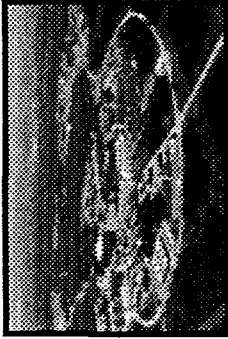
# Organizational Changes

- Responsive to DOE Headquarters' structure
- Supports Laboratory realignment
- Mission focus



## ES Reorganization

- Technology Development/Technology Evaluation
- Center concept
- Office of Industrial RD&D Partnership Programs



# Division Accomplishments

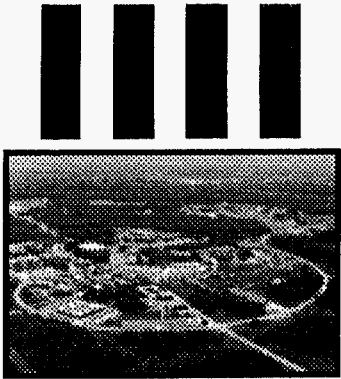
- Invention disclosures 58
- CRADAs 17
- Patents applied for 9
- Publications
  - Refereed journal articles 76
  - ANL reports 63
  - Formal reports 12
  - Conference proceedings 128
  - Presentations 200+



# Division Response to Last Review Committee Report

## 1. Technical Issues

- Pipeline rights-of-way  
*“Extend to...electric utility system”*
- Marketability of Polylactic Acid  
*“Market studies and commercial development... responsibility of partner”*



## Division Response to Last Review Committee Report (cont.)

- MHD ship propulsion  
*“ANL must explore options for the future of this project and personnel”*
- Student Engineering Research  
*“This project should receive better recognition by ANL upper management and DOE”*

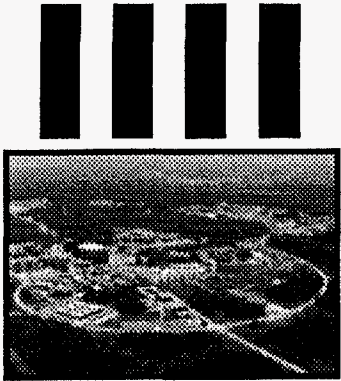




# Division Response to Last Review Committee Report (cont.)

## 2. Administrative Issues

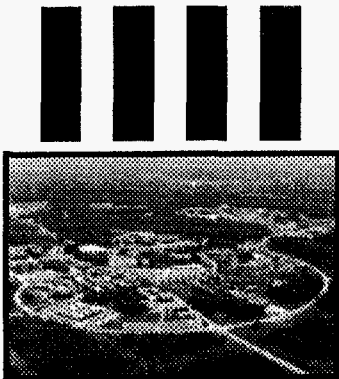
- Technicians  
*“Increasing technical support”*
- Relationship with industry  
*“Sell the skills... directly to industry, establish research partnerships, attract non-federal funding”*



# Division Response to Last Review Committee Report (cont.)

## 2. Administrative Issues (cont.)

- Superstars  
*“Needed...to enhance its reputation”*
- Staffing  
*“Avoid over-extension...too many projects...  
generalists vs. specialists”*



# The Energy Systems Division Has Seven Research Focus Areas

## *Center for Industrial Technology Systems*

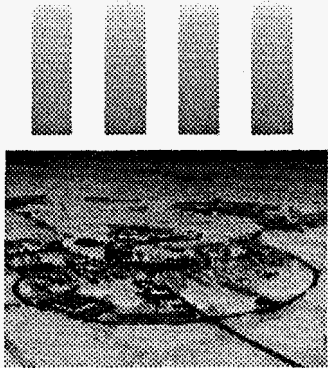
- Heat transfer, separations, and environmental control technology
- Waste minimization and pollution prevention via materials recycling
- Chemical process and site remediation technology

## *Center for Environmental Restoration Systems*

- Methods for restoring environmentally degraded sites

## *Center for Transportation Research*

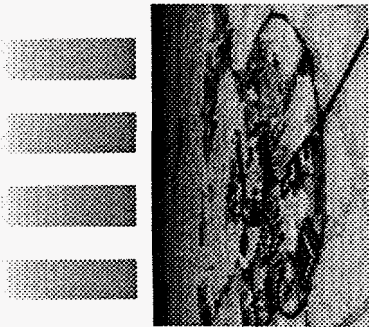
- Automobile engine, fuels, and materials technology
- Transportation policy analysis and technology assessment
- Advanced transportation systems



# **Division Summary**

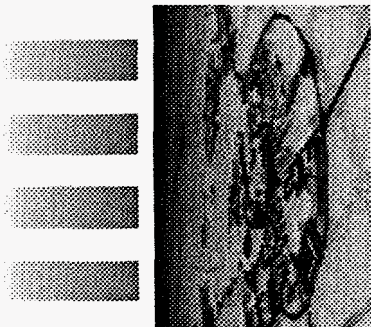
## ***Energy Systems Division***

***Sandy Davis***  
***1995 Energy Systems Division Review***

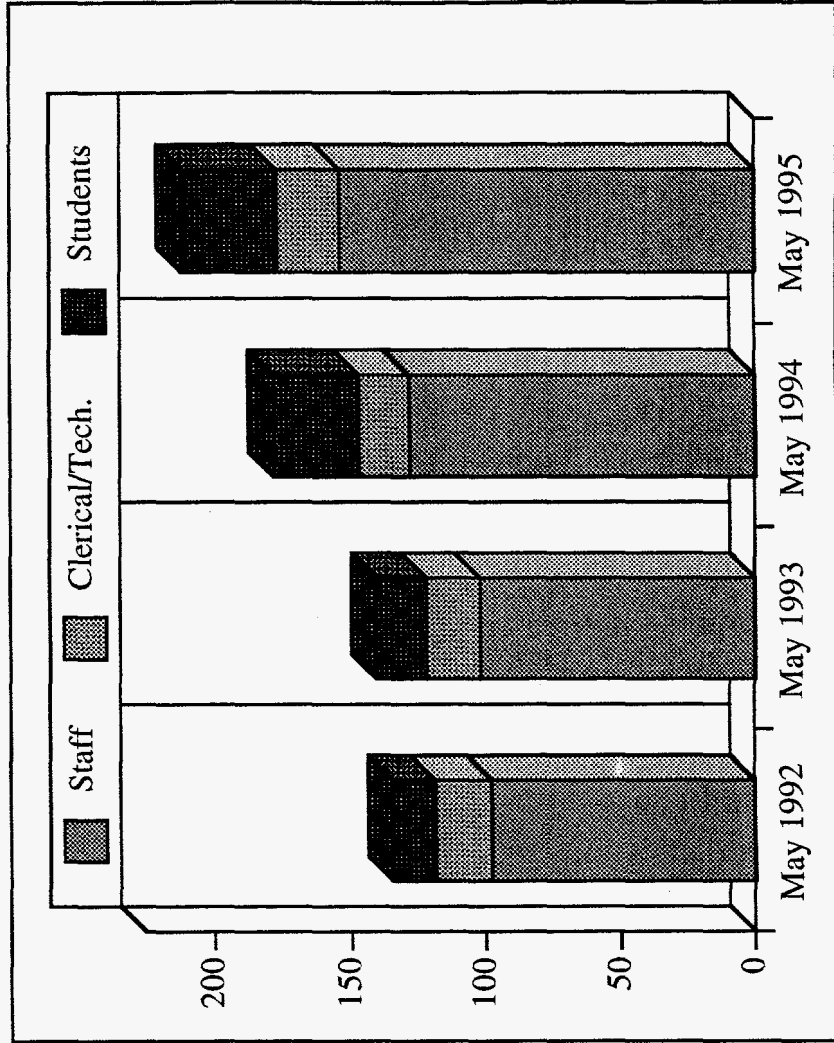
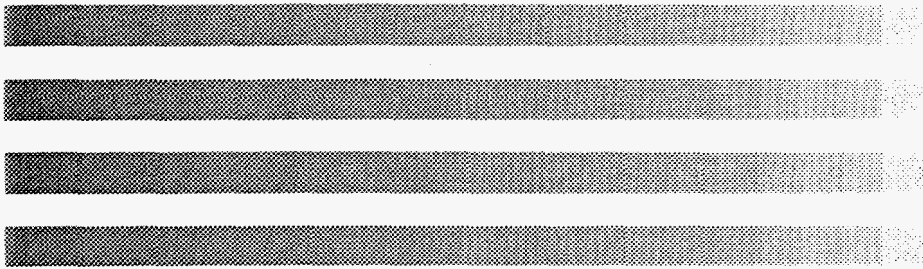


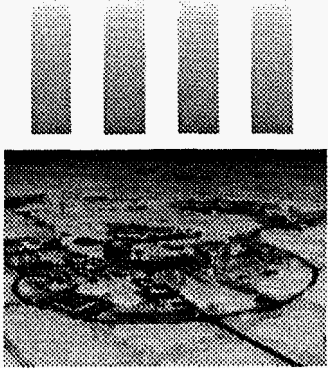
# Presentation Outline

- Personnel
- New Facilities
- Financial Status



# ES Division Personnel

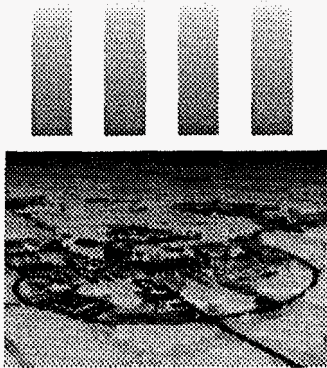




# Energy Systems Division

## *Staff and Academic Levels*

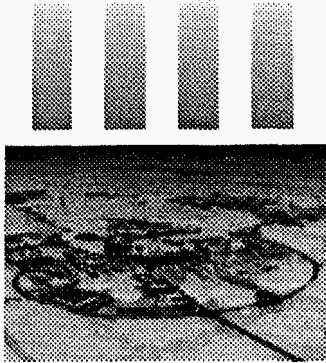
	Ph.D.	Master	Bachelor	None
Senior Scientist/Senior Engineer	6	0	0	0
Scientist/Engineer	42	23	6	0
Assistant Scientist/Assistant Engineer	9	8	4	1
Engineer/Scientist Associate/Assistant	0	7	14	1
Project Coordinator	1	2	0	0
Post-docs/Pre-docs	6	3	0	0
Totals	64	43	24	2



## Staff Promotions since Last Review

James Frank	Bioengineer
Robert Larsen	Transportation Systems Engineer
Joseph Libera	Mechanical Engineer
Christine McGhee	Staff Assistant
Marianne Mintz	Transportation Systems Planner
Robert Peters	Environmental Systems Engineer
Margaret Singh	Environmental Scientist
Frank Stodolsky	Mechanical Engineer
Robert Sullivan	Environmental Information Analyst
Pamela Sydelko	Environmental Scientist
Michael Vogt	Assistant Engineer
Patrick Wilkey	Civil Engineer





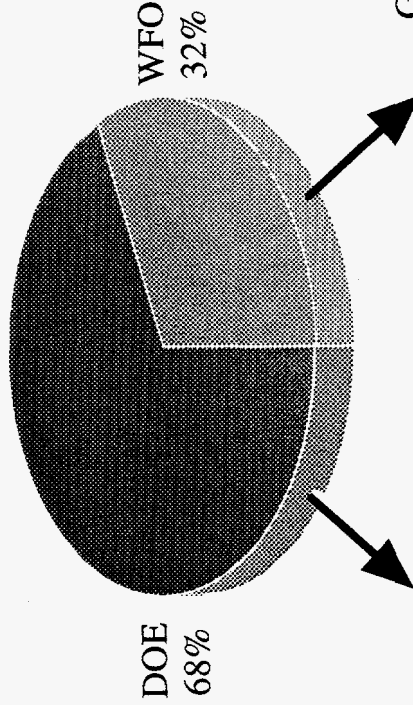
# Energy Systems Division

## *Gender Ratio*

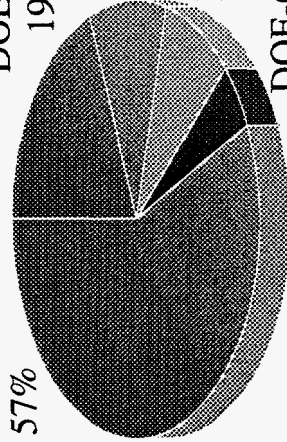
	Male	Female
Senior Scientist/Senior Engineer	6	0
Scientist/Engineer	63	8
Assistant Scientist/Assistant Engineer	17	5
Engineer/Scientist Associate/Assistant	17	5
Project Coordinator	3	0
Post-docs/Pre-docs	5	4
Totals	111	22

# FY 1995 Budget Breakdown

\$33.5 Million



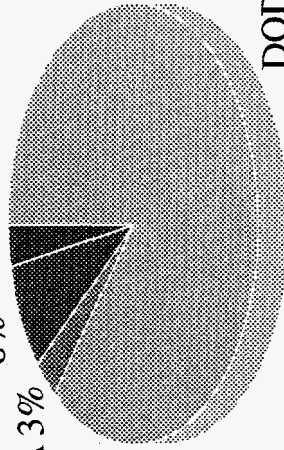
DOE-EERE  
57%



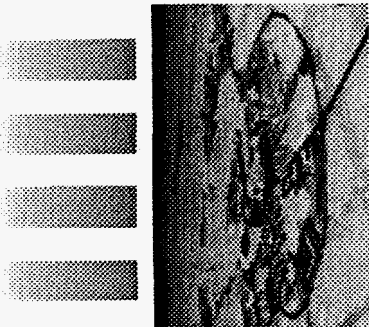
\$22.7 Million

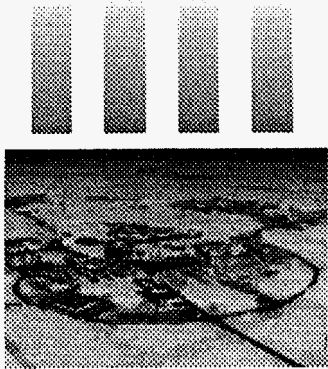
GRI  
8%

OFA 3%  
Other 3%



\$10.8 Million





# Energy Systems Division Funding by Sponsor

