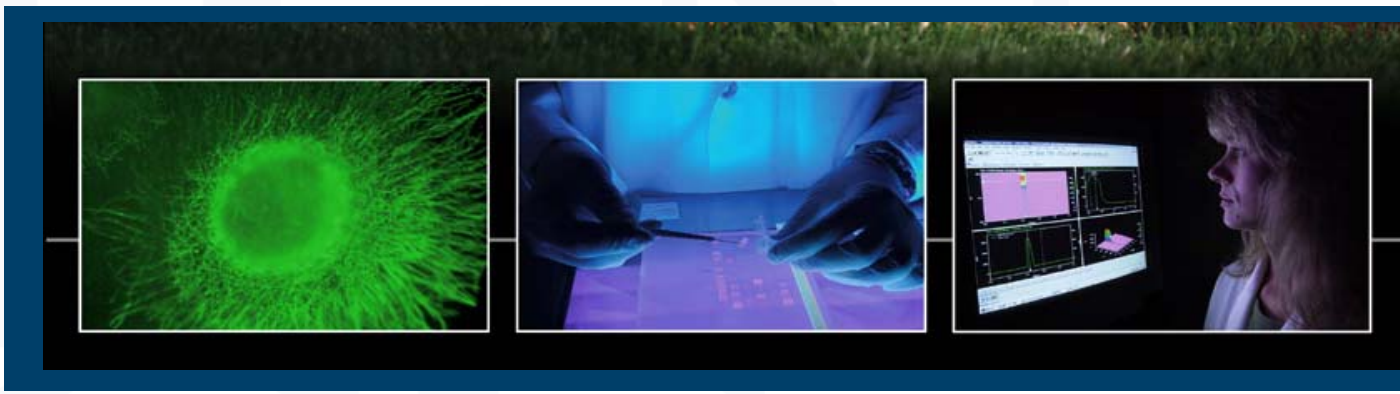
Session 332: Evaluation Use for Strategic Management in Environmental and Public Health Organizations

A Life-cycle Model for Federal Laboratories

Extending the Focus to Include Prospective Evaluation

Andrea Cherepy, EPA Office of Air and Radiation
Michael Kenyon, EPA Region 1
Dale Pahl, EPA Office of Research and Development



Thursday, November 6, 2008

American Evaluation Association

Session sponsors:
Research, Technology, and Development Evaluation TIG and Environmental Program Evaluation TIG

Overview

- **Trends affecting federal facilities & laboratories**
- **New policies and goals for federal facilities & laboratories**
- **EPA laboratory review**
  - Opportunities to improve laboratory efficiency and effectiveness
  - Life-cycle model for federal laboratories
- **Extending the evaluation focus for federal laboratories**
  - Prospective evaluation - needed to assess how emerging needs & trends affect alignment among planning, budgeting, and performance

Trends Affecting Federal Laboratories

1. Policies and goals that affect federal facilities — especially laboratories
2. Costs for facility construction, maintenance, repair
3. Rapid changes & improvements in laboratory technology
4. Infrastructure costs to support science conducted in labs
5. Need for interdisciplinary scientific teams
6. Need for partnerships to sustain collaboration

More about this in a minute . . .

What Are Laboratory Facilities?

Buildings & Systems . . .

+ Laboratories & Systems . . .

+ Science Teams & their Contributions

New Policies & Goals for Federal Facilities

- Established by the Executive Office of the President & by Congress
- Respond to growing awareness about the importance of sustainability and energy conservation
- Focus on sustainable design, conservation, and energy performance for federal facilities
  - Executive Order 13423
  - Energy Policy Act of 2005, and
  - Energy Independence and Security Act of 2007

Why Are these Policies & Goals Important?

- Consider a "minor" component of the U.S. economy
  - Federal agencies and their facilities—data are available for analysis . . .

- . . . What is the footprint[1] of federal agencies & their facilities?
  - In FY2007 these facilities spent $435 billion on goods and services
  - Own or lease more than 630,000 vehicles worldwide
  - Manage or own nearly 1 in every 5 acres in the U.S.
  - Single largest buyer and user of energy in the U.S.
    - *Spend > $3.5 billion annually to provide energy for facilities*
    - *Energy costs escalating significantly*
  - Real property portfolio of more than 1.2 million assets, including more than 550,000 buildings

[1] Source: Office of the Federal Environmental Executive. March 2008 presentation to EPA facility managers, Research Triangle Park, N.C.

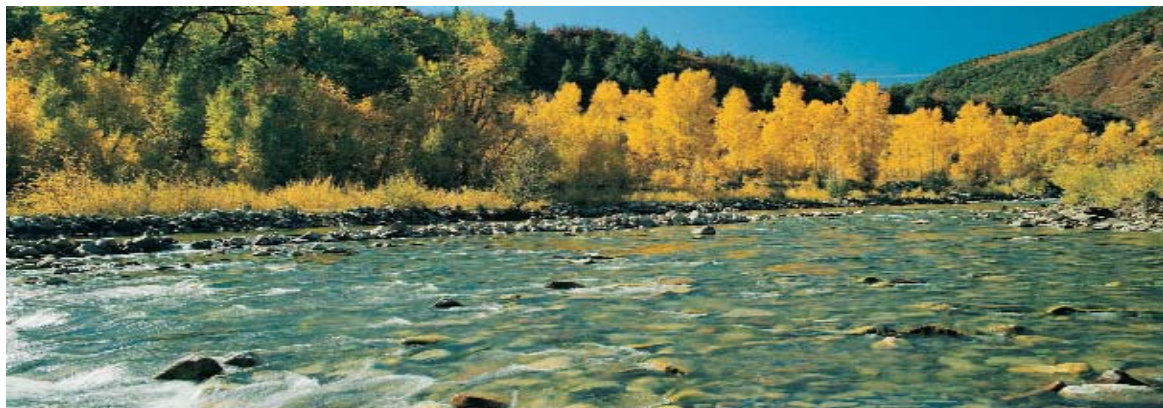
New Policies & Goals for Federal Laboratories

- **At the July 2008 meeting of the Federal Laboratory Consortium, Executive Order 13423 was discussed**
  - Agency laboratories across the federal government are encountering challenges in responding to energy performance goals for their facilities
    - **WHY?** Laboratory buildings consume from 5 - 10 times the energy of typical office buildings
- **At EPA, meeting energy goals requires**
  - A reduction in energy consumption across its facilities by an average of 3% per year through the year 2015
  - This equates to a total reduction of 30% from EPA's FY 2003 baseline
    - EPA facility managers indicate that, as agency laboratories respond to recent energy reduction challenges, fixed and operating costs are increasing significantly

EPA Laboratory Review

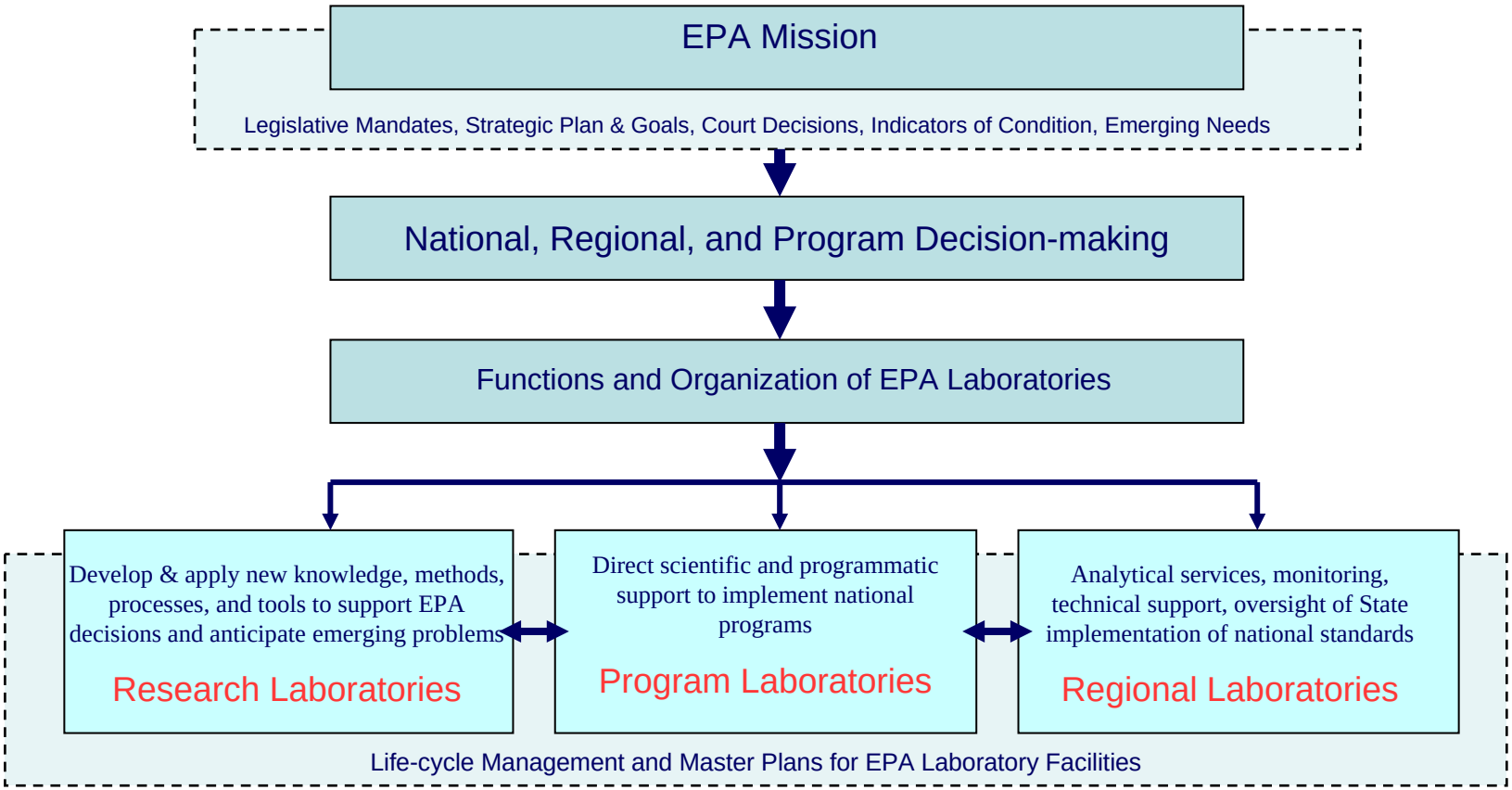
- **EPA's Administrator requested a review of the agency's laboratories**
  - In the near-term, the review focused on identifying efficiency and effectiveness opportunities at individual laboratories
  - In the long-term, the review will assess and evaluate the agency's laboratory needs over the next ten years, and determine if the existing laboratories are able to meet these needs

Note that this requires a PROSPECTIVE evaluation component



EPA Laboratory Review

3 Types of EPA Laboratories . . . 39 Facilities at 26 Locations



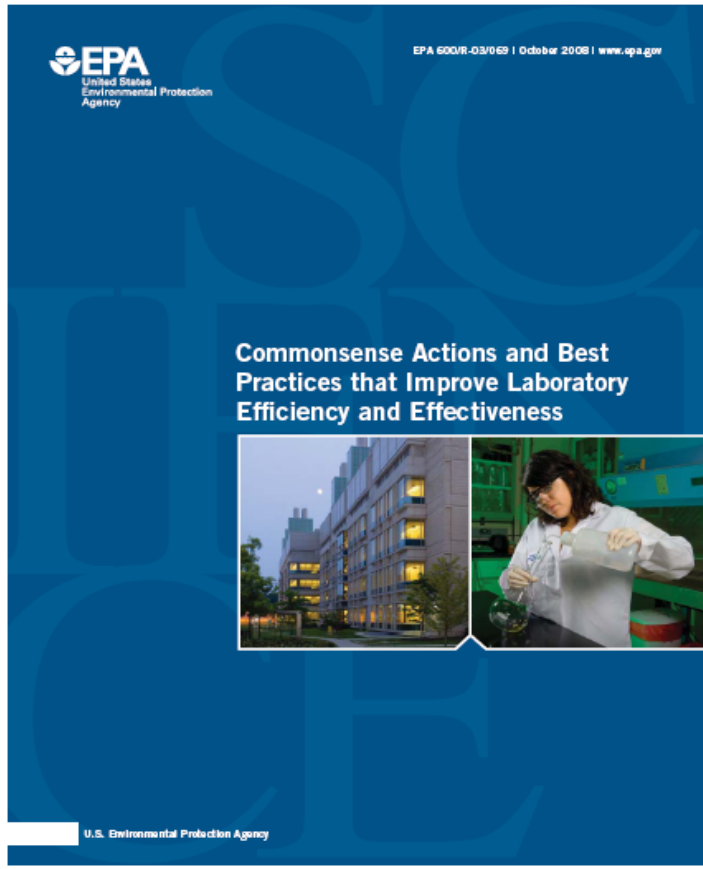
EPA mission, legislative mandates, and needs for decision-making help determine laboratory functions and contributions

Near-Term Laboratory Review

(Conducted 2006 – 2008)

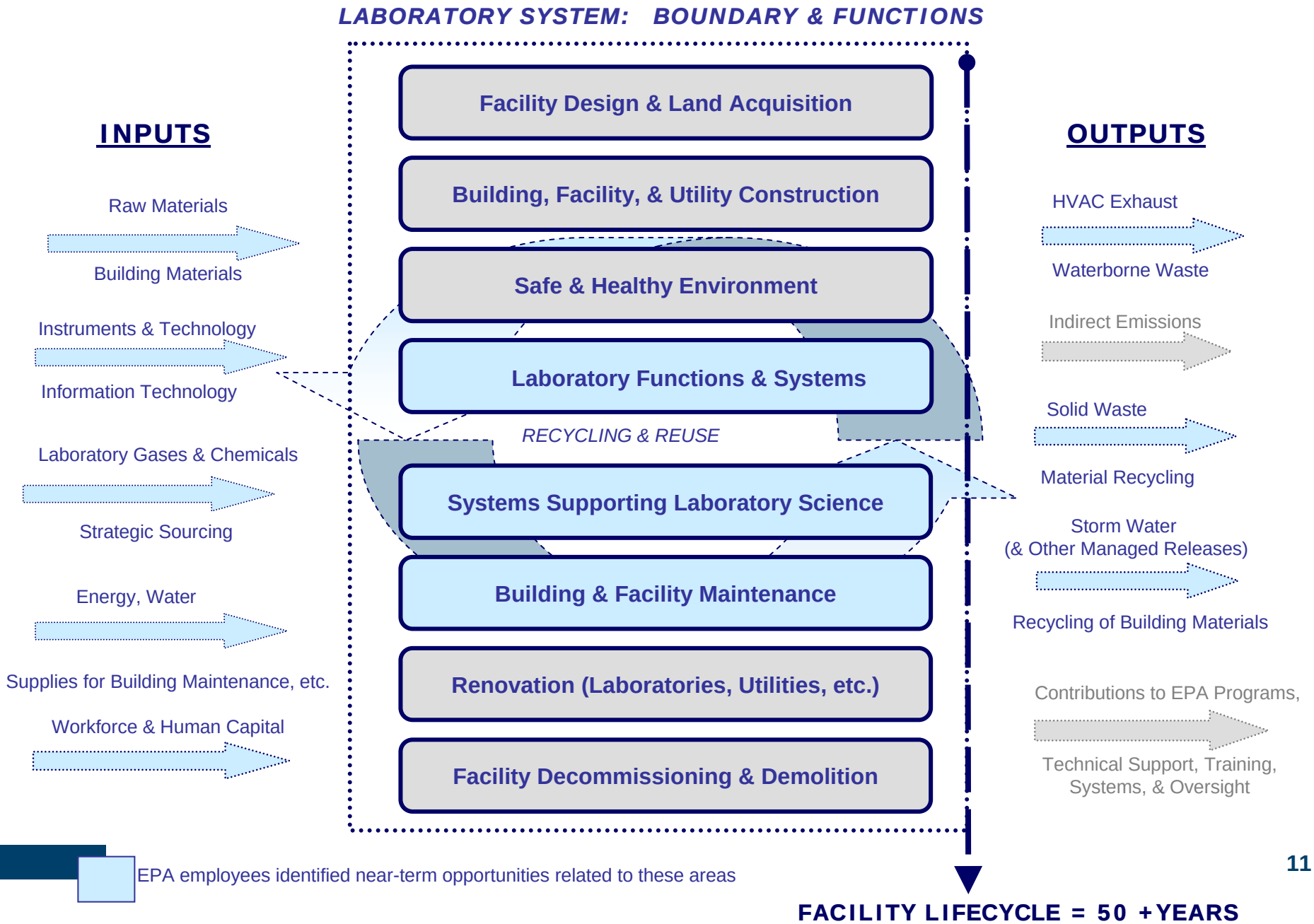
- Purpose was to identify actions & best practices that improve efficiency and effectiveness at individual EPA laboratories

- Opportunities identified by EPA labs include high-value actions, best practices, and processes
  - Actions accomplished (2004 – 2007)
  - Potential actions planned (2008 – 2011)



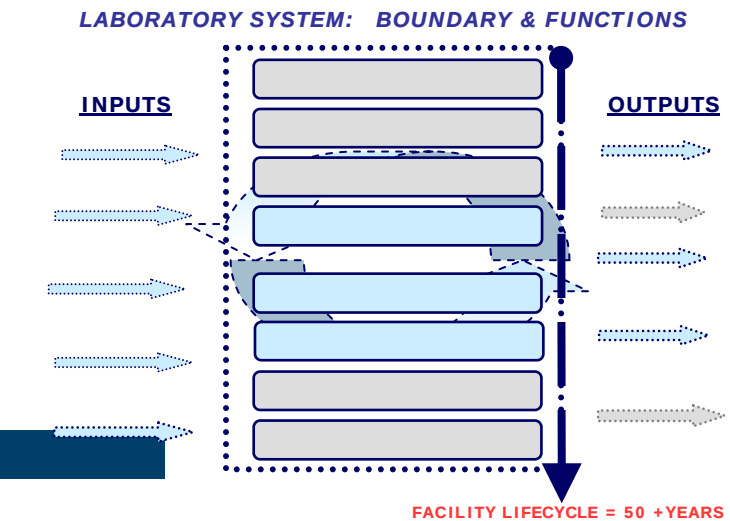
Continued on the next slide . . .

Life-cycle Framework for Laboratory Facilities



Framework Illustrates Important Observations

- **Life-cycle framework is similar to sustainable design approaches developed by international A & E[1,2] firms and by AIA Committee on the Environment**
  - Framework helps illustrate
    - Laboratory lifecycle and economic lifetime ≥ 50 years
    - > economic lifetime transforms decisions: sustainable design, lab management, efficiency
    - Typical laboratories support multiple "programs"
    - To demonstrate alignment among planning, budget, and accountability, expanding traditional evaluation to include a prospective component is essential



Why is this important?

[1] Architecture and Engineering

[2] See, for example The HOK Guidebook to Sustainable Design. Mendler & Odell, AIA. John Wiley & Sons, 2000.

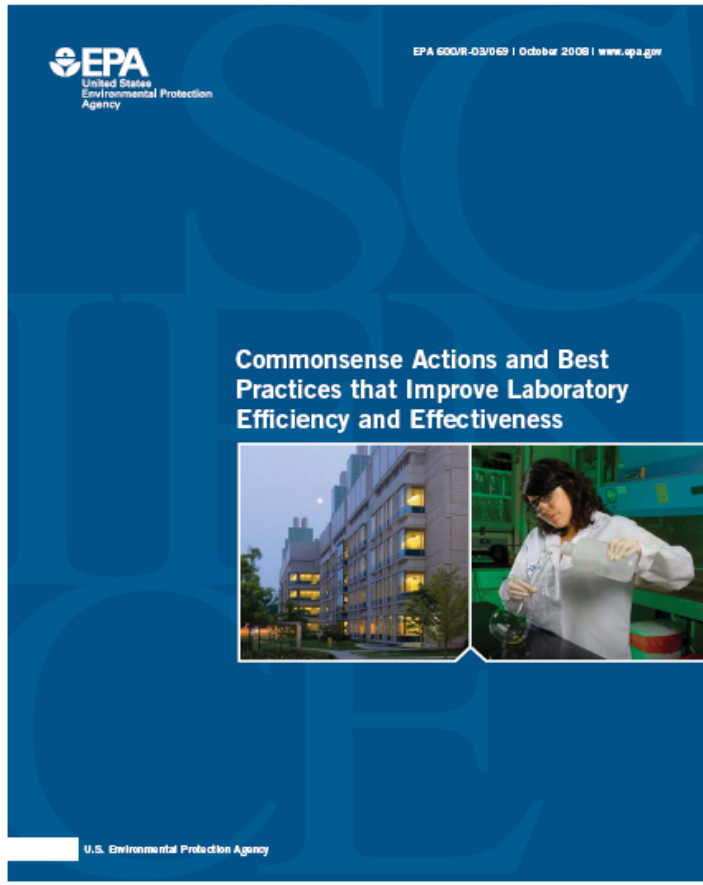
Near-Term Laboratory Review

(Conducted 2006 – 2008)

- Opportunities reflect considerable experience by EPA employees to develop & implement innovative approaches that improve efficiency and sustainability

- Benefits span a wide range
  - Conservation of resources
  - Reduced energy consumption
  - Annual avoided costs from hundreds of thousands of dollars to a few hundred dollars

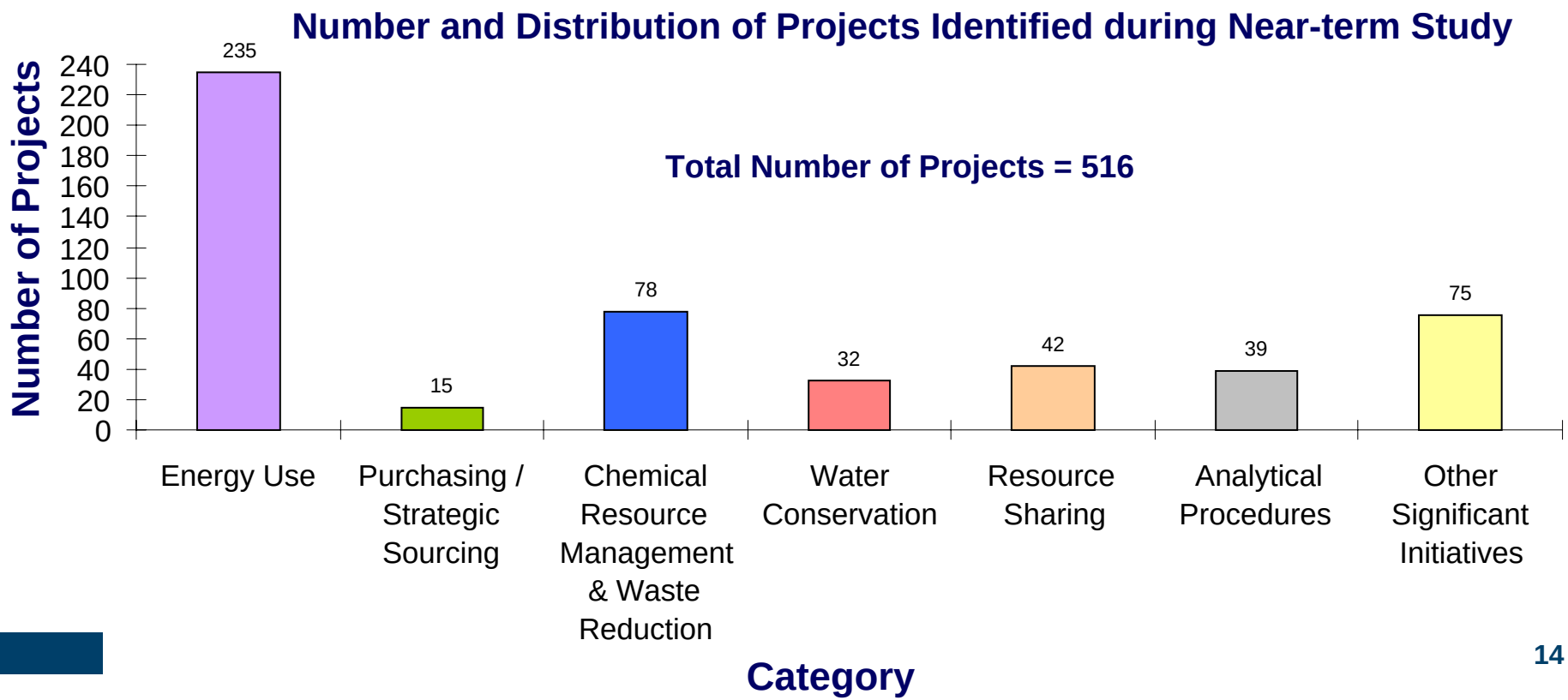
- Life-cycle framework for laboratory facilities developed



Overview: Results from Near-term Study

(Conducted 2006 – 2008)

- EPA laboratory employees identified 516 opportunities; typically, these are technical recommendations that improve laboratory efficiency and effectiveness



Recommendations from Near-term Study

About commonsense actions and best practices that improve efficiency & effectiveness

1 Energy Use

- Re-commission laboratory heating, ventilation and air conditioning (HVAC) systems & convert continuous air volume (CV) systems to variable air volume (VAV) systems
- Implement operations & maintenance best practices (e.g., upgrade to T-8 lights, implement temperature setbacks, turn off lights & equipment when not in use, develop & implement employee awareness programs)
- Pursue Energy Savings Performance Contracts, when appropriate & advantageous for Agency

2 Efficient Purchasing/Strategic Sourcing of Equipment & Supplies

- Finalize strategic sourcing initiative for laboratory commodities; measure success of effort
- Explore opportunities for extending strategic sourcing to other laboratory purchase areas (e.g., gases & large equipment)

3 Chemical Resource Management & Waste Reduction

- Continue development of microanalyses coupled with green chemistry
- Share chemical stocks through consolidation of chemical inventory systems or through other improved means of cross-communications
- Continue implementation of recycling, especially as additional markets for recyclables open

4 Water Conservation

- Develop & implement water management plans at all laboratories
- Consider installation of water metering within facilities
- Assess efficiencies of major water use systems within facilities (e.g., heating, ventilation, HVAC systems, & water treatment systems)

continued on the next slide . . .

Recommendations from Near-term Study

About commonsense actions and best practices that improve efficiency & effectiveness

5 Improvements in Resource Sharing

- Develop & implement purchasing efficiencies (e.g., agreements with other organizations for analytical services, use of EPA contracts expertise to ensure that equipment purchases are fully integrated, establish IAGs with other federal organizations to utilize excess space at their facilities, pursue cross-laboratory & division partnerships for capital equipment acquisitions)
- Find opportunities where laboratories can team up to accomplish work
- Implement principles of centralized & shared equipment resources across laboratories

6 Efficient Analytical Procedures

- Use automated sample preparation instrumentation that reduce time, chemicals, & waste
- Explore innovative analytical instrumentation that maximizes the number of analyses performed
- Remove regulatory and/or other barriers to use more efficient and effective methods to generate data

7 Other Significant Activities

- When multiple facilities share a common location, integrate functions to improve efficiency
- Provide greater flexibility in work schedules for lab and field sampling staff to improve the effectiveness and efficiency of support for scientific programs
- Reduce instrument service agreements through life cycle planning & oversight of repair requirements
- Use indefinite quantity contracts (IDIQ) to provide flexibility in use of contract services

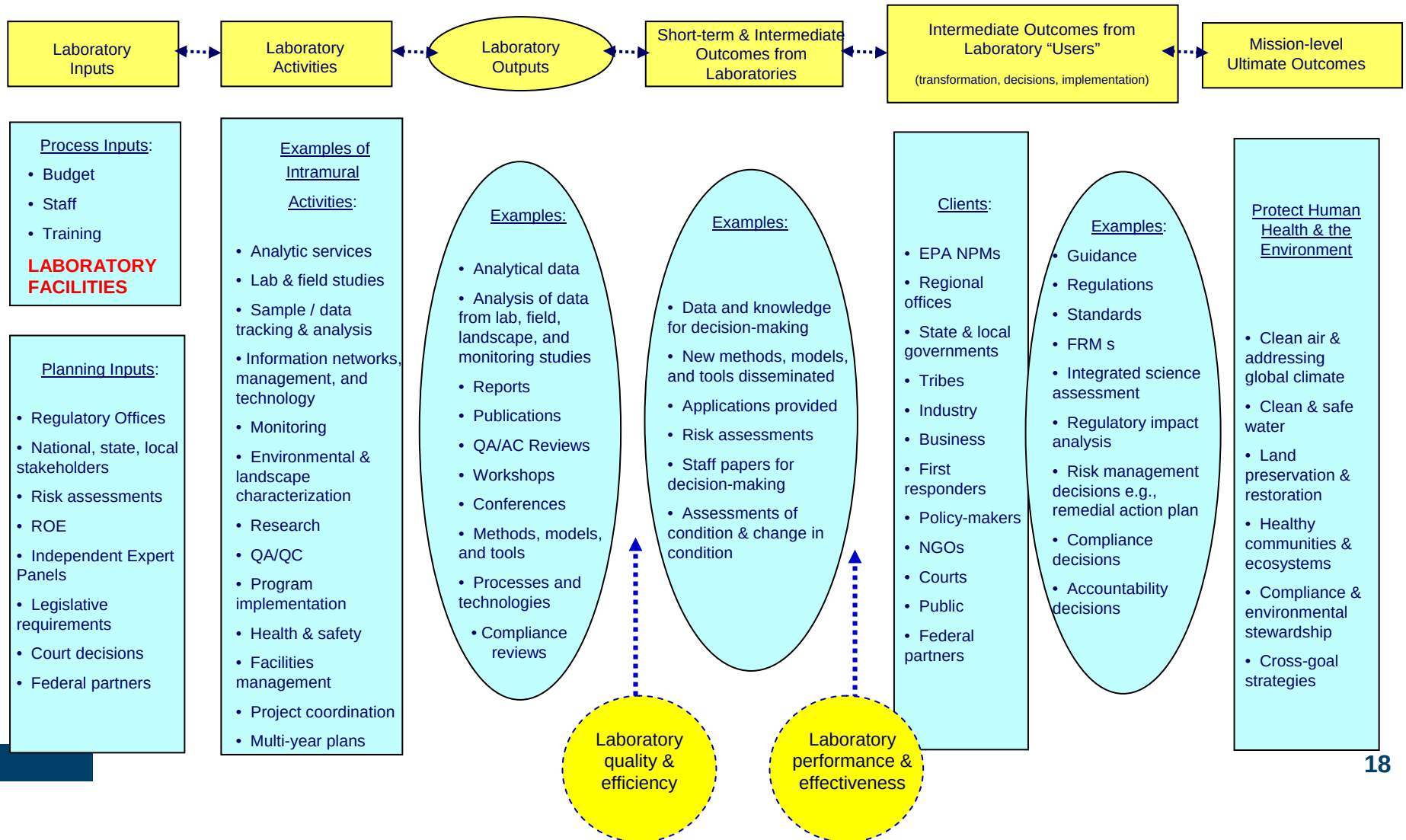
Why is a Prospective Focus Important?

- Alignment among planning, budget, and accountability is a fundamental principle of the Government Performance and Accountability Act
- Many of the trends affecting laboratories may affect performance and accountability
- The traditional (retrospective) evaluation focus needs to include a prospective component to assess how emerging mission-level needs and trends affect
  - Future laboratory capability and capacity
  - Contribution of laboratory science to agency missions
  - Alignment among planning, budgeting, and performance

Traditional Evaluation Focus for Lab Contributions to EPA Mission

Adapted from Figure 4 – 1, page 54, **Evaluating Research Efficiency in the U.S. Environmental Protection Agency, *NRC, 2008)***

Programs Are Implemented & Evaluated from LEFT to RIGHT



Extending the Focus to Include Prospective Evaluation

Adapted from Figure 4 – 1, page 54, **Evaluating Research Efficiency in the U.S. Environmental Protection Agency,** ***NRC, 2008)***