Meeting R&D Needs of the Electric Utility Industry: EPRI’s Portfolio Process

Geoffrey J. Blanford, Ph.D.
April 24, 2014

IEA Workshop, Paris, France
EPRI’s Mission

Advancing safe, reliable, affordable and environmentally responsible electricity for society through global collaboration, thought leadership and science & technology innovation
EPRI Overview

- Members represent more than 90% of generation in the US, as well as public agencies and 40 countries worldwide
- In 2012, around $380 million was invested with EPRI (25% int’l)
- Technical programs are organized into sectors:  
  - Environment and Renewables (13%)
  - Generation (i.e. fossil) (17%)
  - Power Delivery and Utilization (24%)
  - Nuclear (38%)
  - Technology Innovation (cross-cutting) (8%)
Multi-tiered Advisory Structure

Board of Directors
(industry executives + external stakeholders)

Advisory Council
(external stakeholders)

Research Advisory Committee (RAC)
(member representatives)

Sector Councils

ENV / RNW
GEN

Area Councils

program areas

program areas

PDU
NUC
Research Advisory Committee (RAC)

• Provides guidance on EPRI’s technology strategy

• Identifies major science and technology needs and priorities of the electricity industry

• Serves as the integrating advisory group on industry issues for EPRI’s four Sector Councils
Advisory Council

• Includes leaders from regulatory, academic, environmental, and scientific organizations, along with the finance and business sectors

• Advises EPRI management on trends in political, economic and social issues

• Ensures research relevance and balance in serving the public interest
Interactive Decision-making

• Most allocation decisions occur at the sector/program level
  – Members elect to join specific programs
  – Semiannual advisory meetings on research direction
  – Supplemental projects address emerging issues
• At the same time, EPRI seeks to tailor its program offerings to align with both tactical and strategic member concerns
• Technology Innovation (TI) program complements “bottom-up” sectoral programs with a strategic, “top-down” allocation to cross-cutting and/or early-stage research
• Overall portfolio, especially TI, is reviewed by high-level advisors
Program Areas in Four Research Sectors

**Power Delivery and Utilization**
- Transmission Lines and Substations
- Grid Operations and Planning
- Distribution
- Energy Utilization
- Cross-Cutting Technologies
- Information and Communication Technologies

**Nuclear**
- Advanced Nuclear Technology
- Chemistry, Low-Level Waste, and Radiation Management
- Equipment Reliability
- Fuel Reliability
- Long-Term Operations
- Materials Degradation/Aging
- Nondestructive Evaluation and Material Characterization
- Risk and Safety Management
- Used Fuel and High-level Waste Management

**Generation**
- Advanced Fossil, Carbon Capture, Utilization and Storage
- Combined Cycle
- Environmental Controls
- Major Component Reliability
- Materials and Chemistry
- Operations and Maintenance
- Power Plant Water Management

**Environment**
- Air Quality
- Energy and Environmental Analysis
- Land and Groundwater
- Occupational Health and Safety
- Renewable Energy
- T&D Environmental Issues
- Water and Ecosystems

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Technology Innovation Program
Scouting and Exploration

Exploratory Research in High Risk/High Reward Areas
2014 Technology Innovation Program

Breakthrough Technologies

Accelerate Development for Potentially Transformative Innovations
## 2014 Technology Innovation Program

### Strategic Programs

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Thought Leadership

Examples - Power System Transformation

The Integrated Grid

Distributed Energy Resources

Phase One studies designed to support Portfolio research
Trade-offs

- From its inception in 1972 until deregulation in the 1990’s, EPRI’s portfolio was allocated almost entirely top-down.
- In current model, members “vote with dollars” for most programming; only around 10% is allocated top-down.
- Decentralized portfolio build has market efficiency.
- On the other hand, it risks missing longer-term issues.
- Key challenges:
  - Objective function: what is the goal of R&D planning?
  - How well does market-based allocation perform?
  - How can top-down allocation best complement?
Together...Shaping the Future of Electricity