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October 28, 2014

MEMORANDUM

TO: Council members

FROM: Ben Kujala

SUBJECT: BPA and Technology Innovation

BACKGROUND:

Presenter: Terry Oliver, Chief Technology Innovations Officer

Summary Terry Oliver will discuss BPA's R&D portfolio as well as the process for managing research at BPA. He will also share his perspective on the current state of utility research.

Relevance The research funded by BPA covers a broad range of subjects, including research on power system models, emerging technologies and economics. Many of the current projects may provide future resources and capabilities for the Council as well as others in the region.

Workplan: N/A

Background: The Technology Innovations process at BPA directs BPA's R&D funds. A significant amount of time is spent on identifying projects that are more likely to provide value to the region. Council staff has participated in the process of developing Technology Roadmaps and in evaluating research proposals submitted to BPA.

More Info: See the BPA Technology Innovations website at <http://www.bpa.gov/Doing%20Business/TechnologyInnovation/Pages/default.aspx>

Effective Management of BPA's R&D Management Process

Terry Oliver

Chief Technology Innovation Officer

Technology Innovation

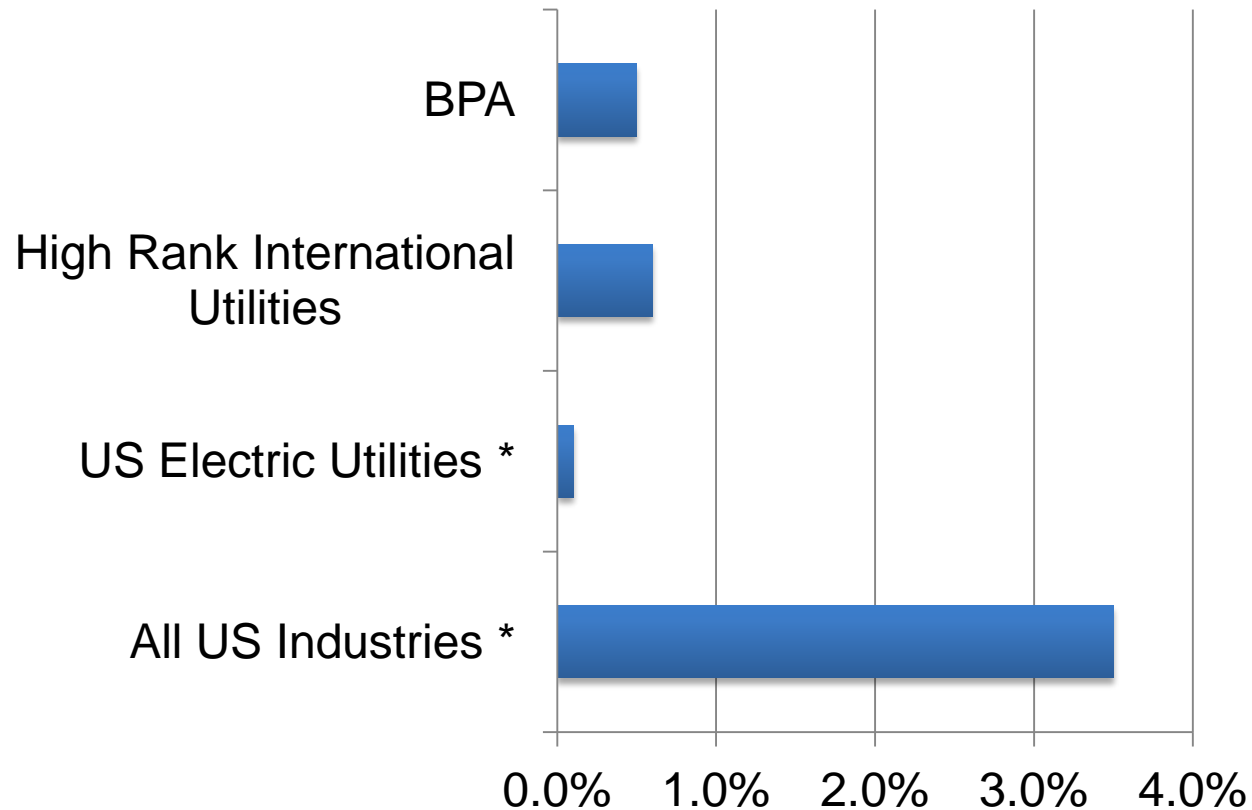
Bonneville Power Administration



Track Record 2007 - 2014

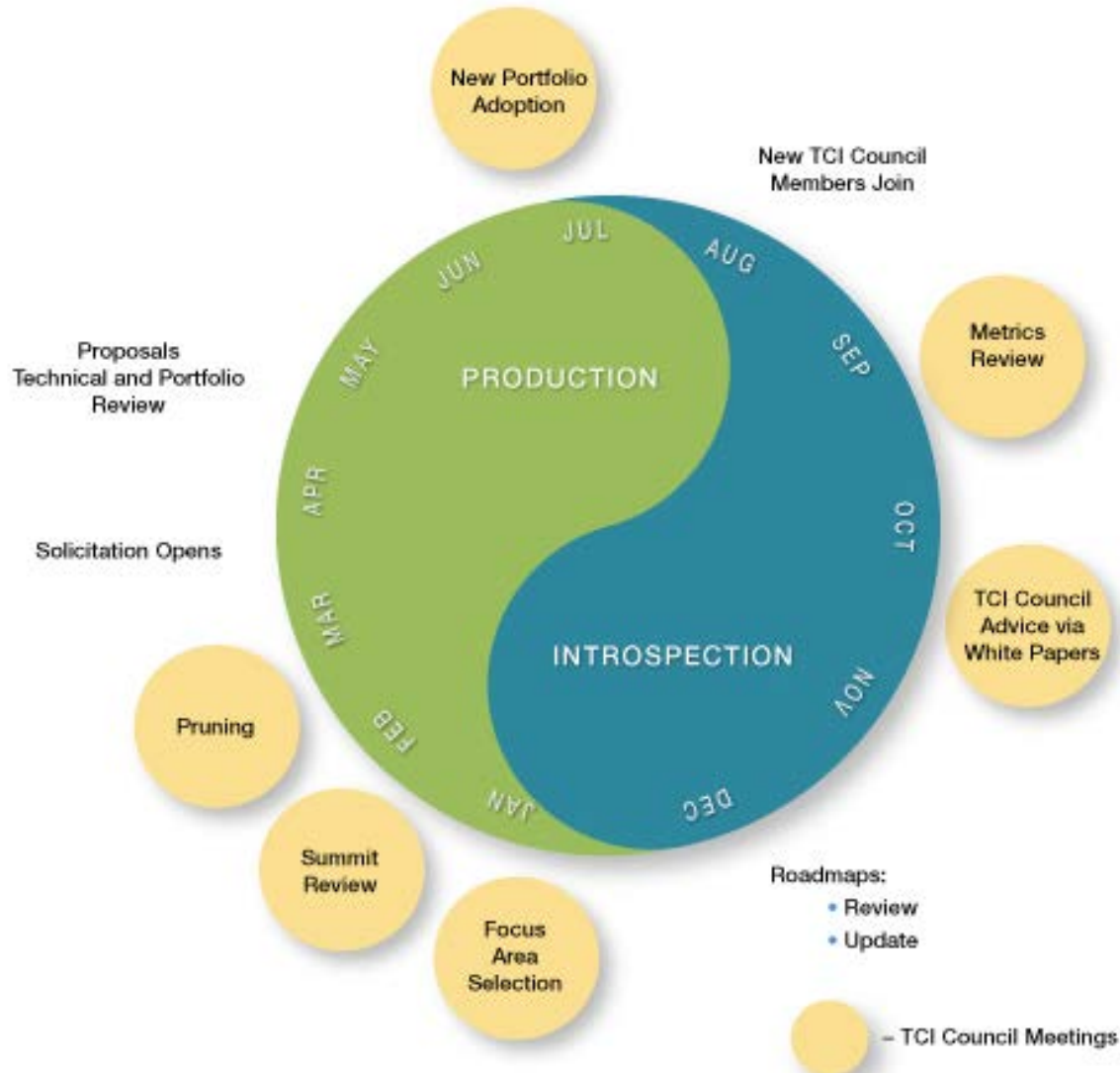
- Ramped budget from ~\$ 6 million with no portfolio to ~\$ 17 million with:
 - Best Practices from Intel, Boeing, GE, JPL, PNNL, et al
 - Technology Roadmaps
 - Portfolio
 - Stage Gates
 - Project Management
 - Pruning
 - Technology Application to BPA
- Results
 - Spend = ~\$70 million over past 7 years
 - ~ 200 projects through portfolio
 - ~ 20 projects delivered clear benefits to BPA
 - 2 projects' benefits paid the entire bill
 - Transmission conductor shunt
 - Operational Multi-Gigabit Ethernet on BPA Optical Fiber Network

Investments in R&D as % of Revenue



* Source: US National Science Foundation 2012 data

Technology Innovation: Cyclical Process



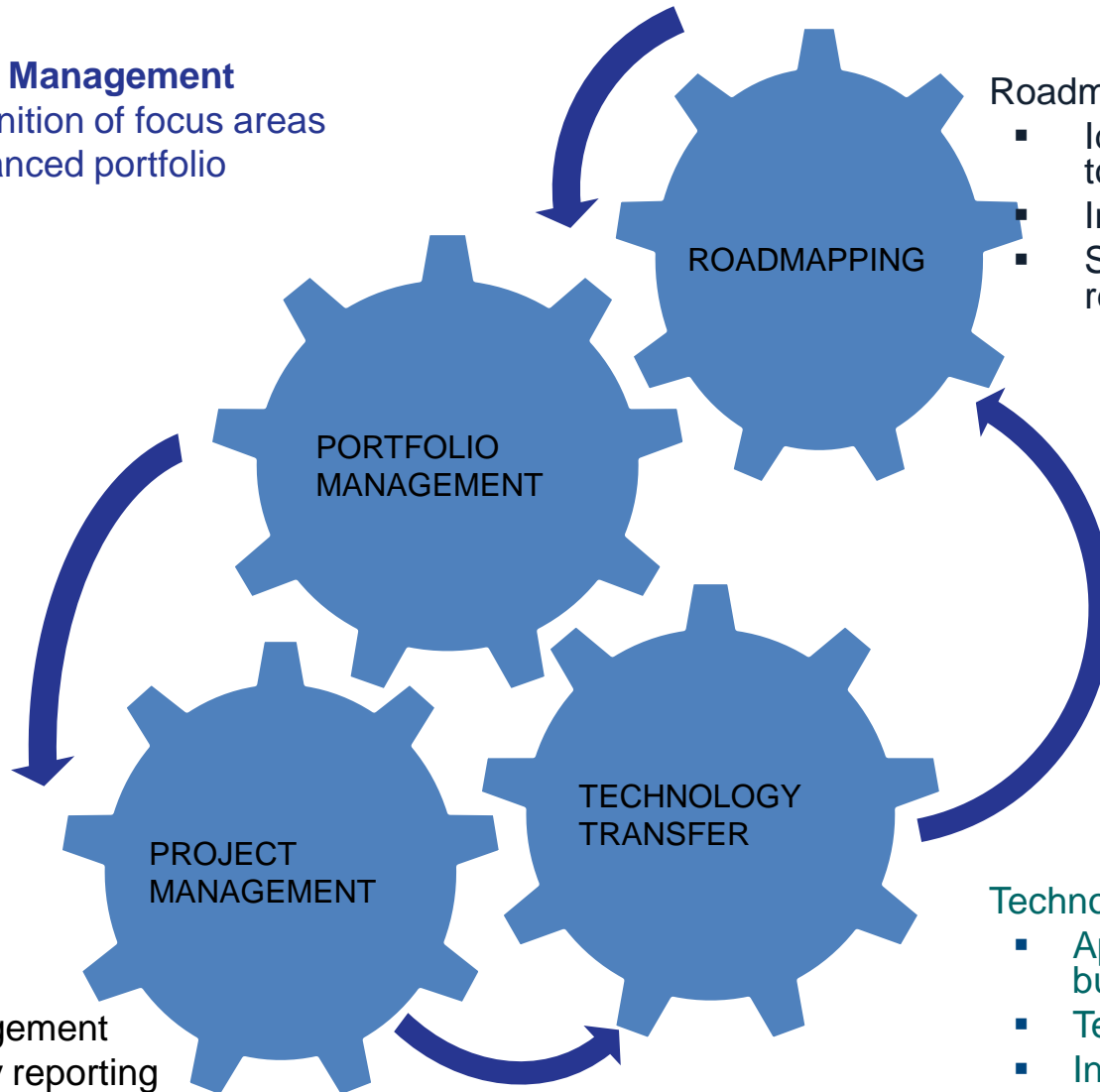
Technology Innovation Operations: Integrated Process

Portfolio Management

- Definition of focus areas
- Balanced portfolio

Roadmapping

- Identifies technologies matched to business challenges
- Integration of key agency targets
- Serves as the basis for the research portfolio



Technology Transfer

- Application of technology to meet business challenge
- Technology commercialization
- Intellectual property considerations

Project Management

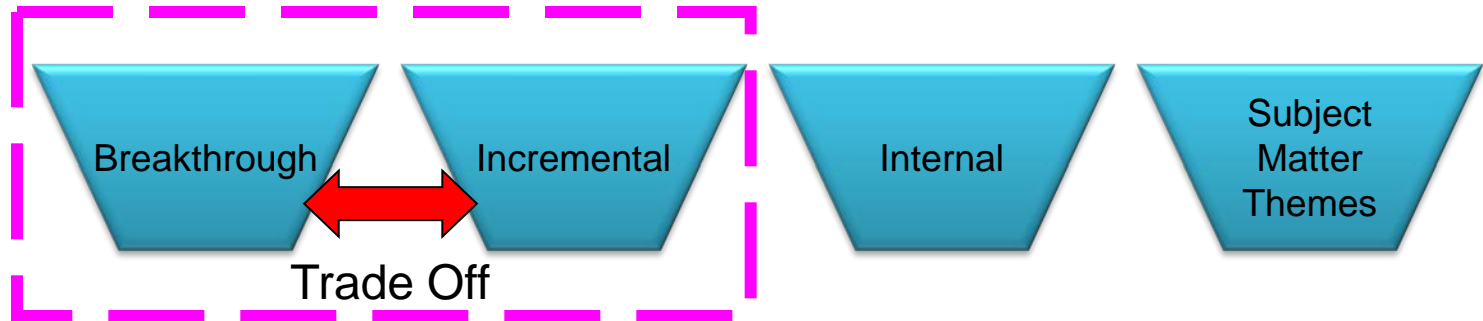
- Quarterly reporting
- Stage gate management
- Triple constraint management

Portfolio Management: Balanced Portfolio

Assessing
BPA
Role in
Technology
Development



Balancing
of
Portfolio
Issues

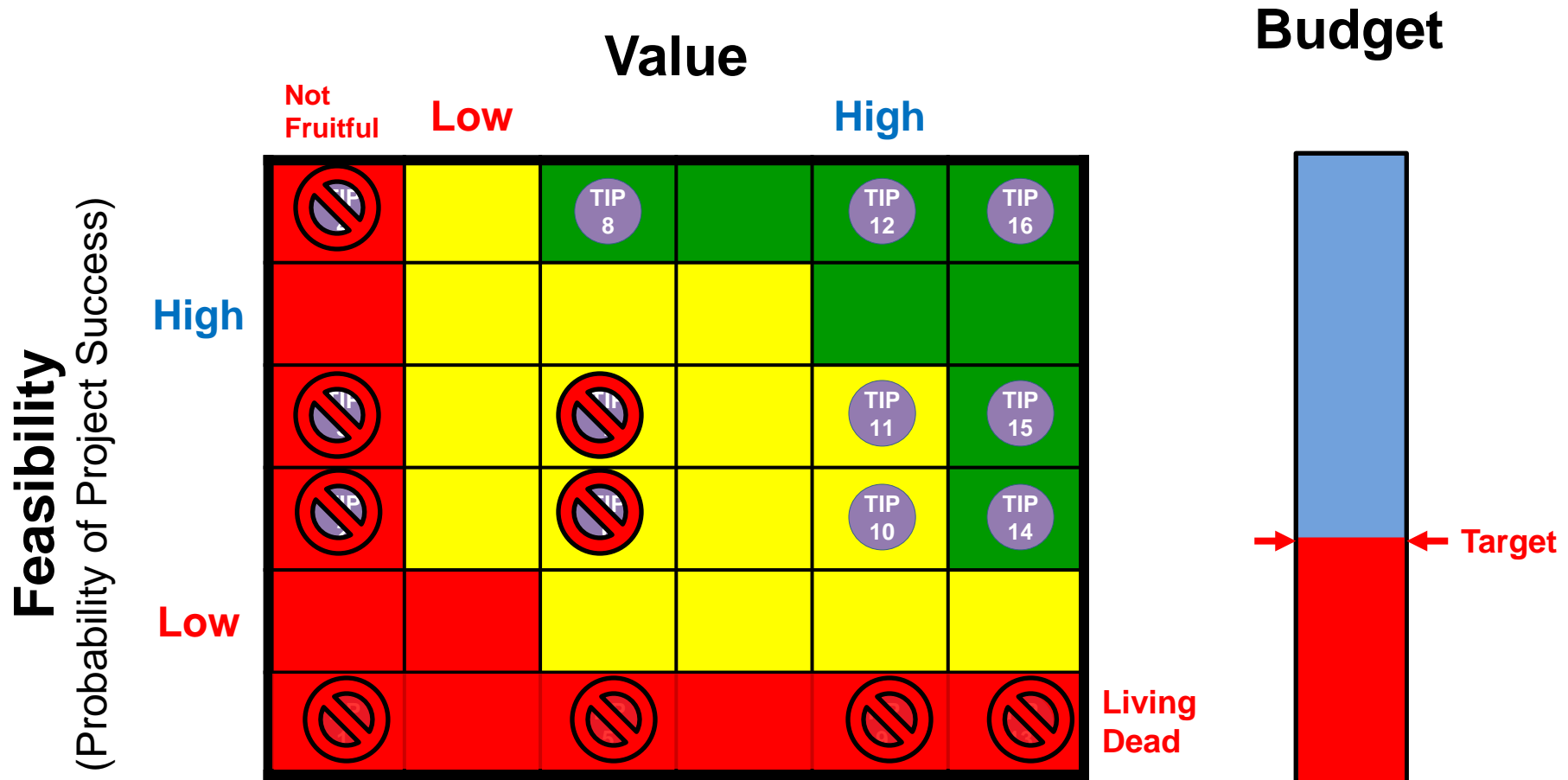


Improving
Effectiveness
of R&D
Investment



Size of Project Investment

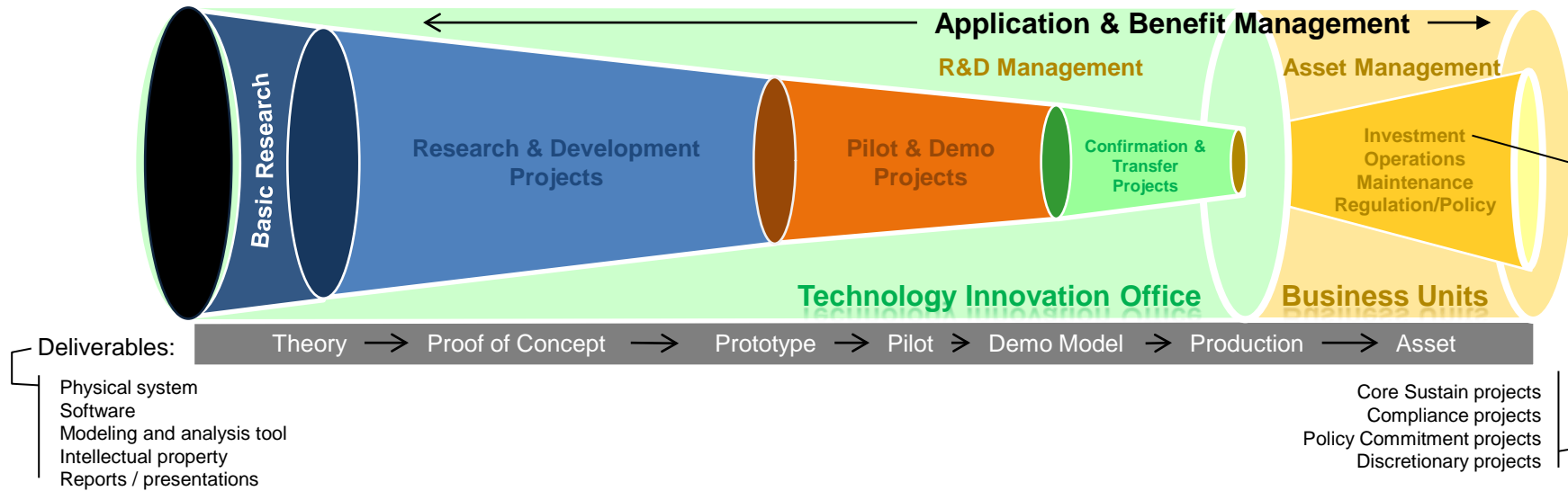
Go/Stop Decision



Decision Rule:

- #1: Stop all "Living Dead" then stop projects following order until meet target.
- #2: Stop "Not Fruitful"
- #3: Stop in the order of Low Value and then Low Feasibility

Benefit Pipeline From Technical Idea to Asset



Benefit Framework

Benefits	Basic Research	Research & Development	Pilot, Field Test & Demonstration	Commercialization	
				Confirmation / Transfer	Deployment
Benefit categories and items	Benefits Measure and Assessment at Different TRL levels (or R&D stages)				
	More Qualitative Non Monetary Value		More Quantitative Monetary Value		

TI Practice with Benefit Management

Roadmaps & Focus Areas

Business Challenges

Technology and Capability Gaps

Project Management

Portfolio Management

Outcomes

Technology Transfer

Applications contributing to BPA business lines

Asset Management

Other Applications

Goals:

- Develop a benefit framework translating business challenges and technology gaps into measurable benefits throughout technology innovation pipeline.
- Track, realize, and monitor the identified and measured benefits of the project and portfolio outcomes systemically

Benefits Management

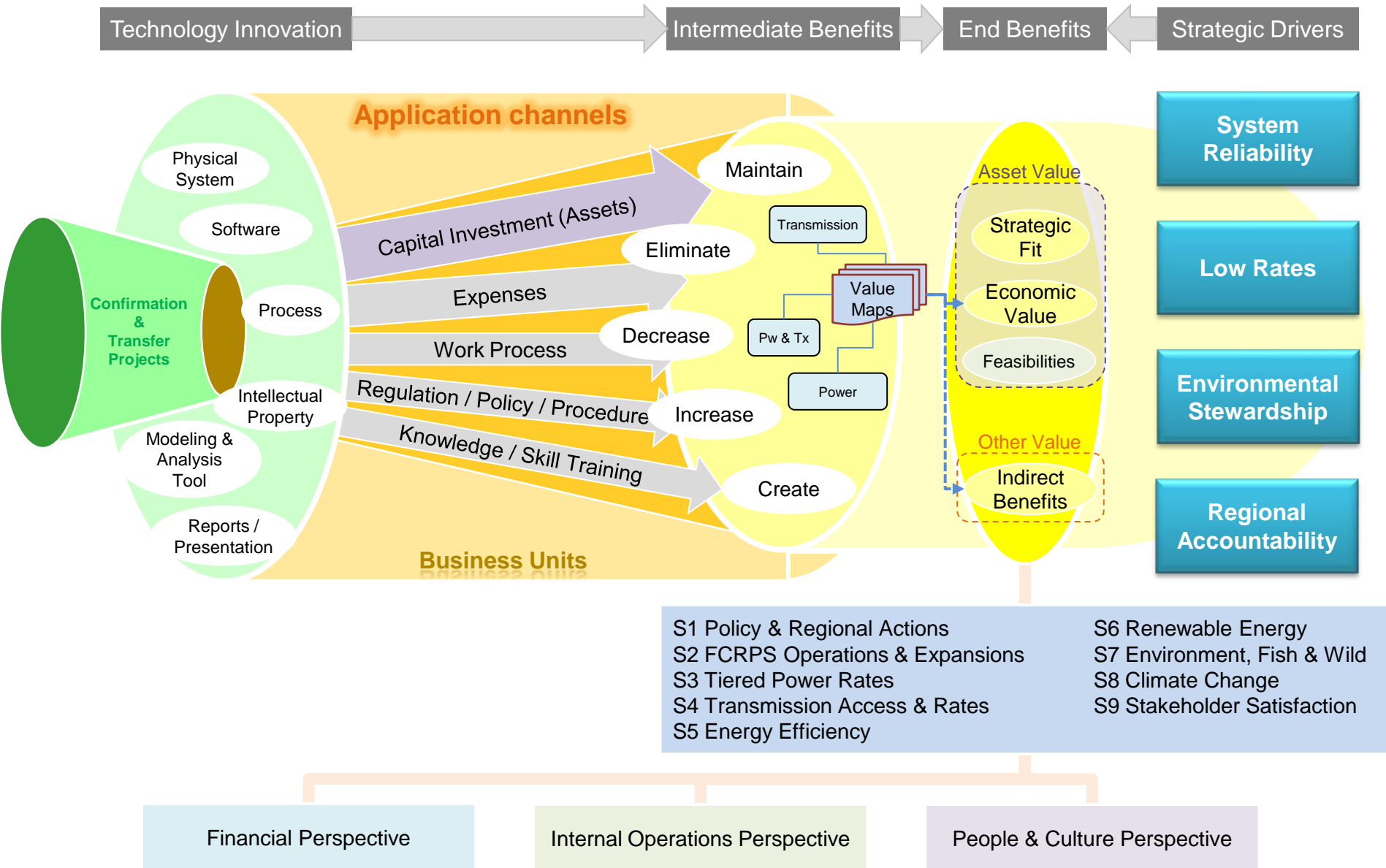
- Identify
- Measure
- Plan
- Realize
- Track

Benefit Framework

- Benefit eligibility guidance (rules on the identification, categorization, valuation and validation)
- Benefits logic maps
- Treatment of benefits throughout TRL and TI cycles
- Measurement tools
- Roles and responsibilities for benefit forecasting, tracking and reporting

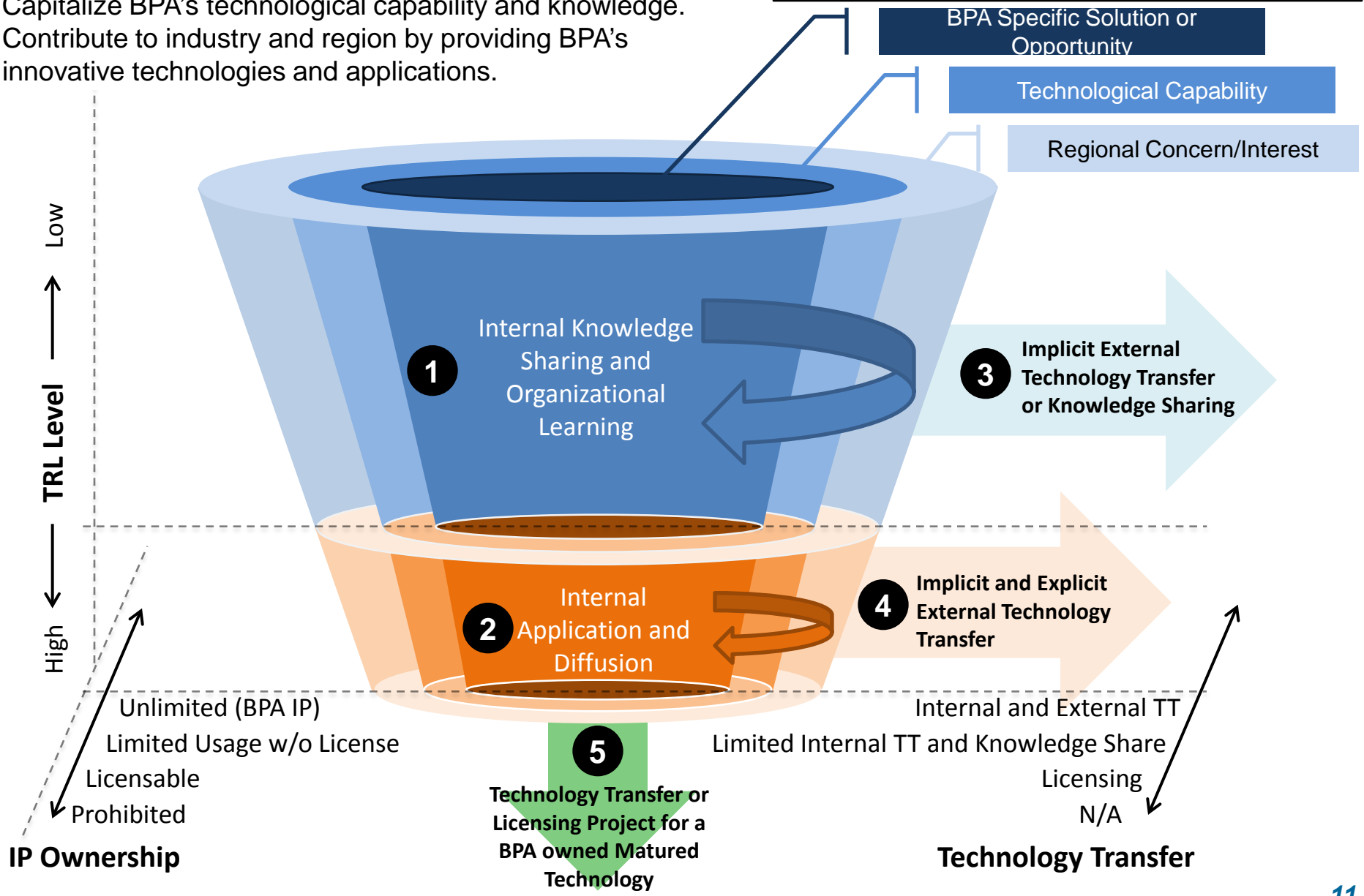
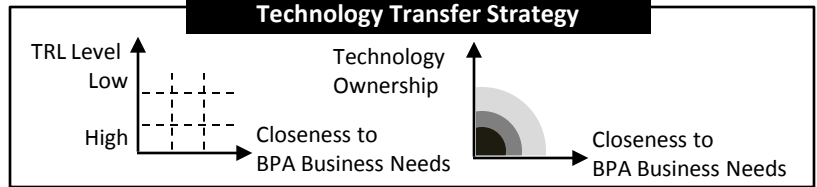
Organizational Strategy and Strategic Decision Making

Downstream: Application Channels and End-Benefits

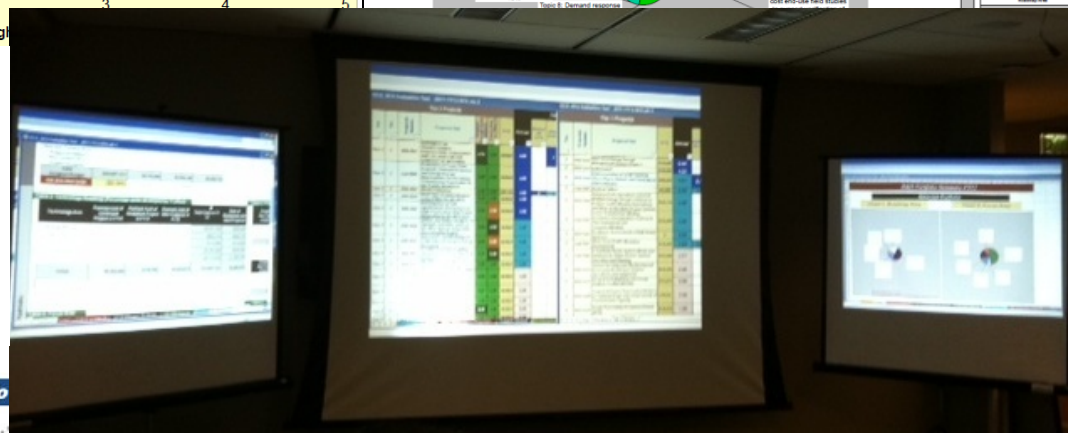
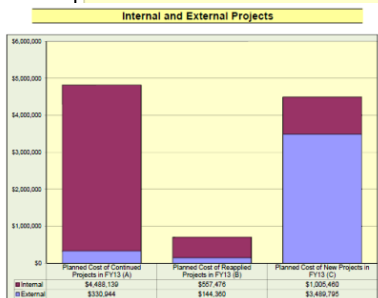
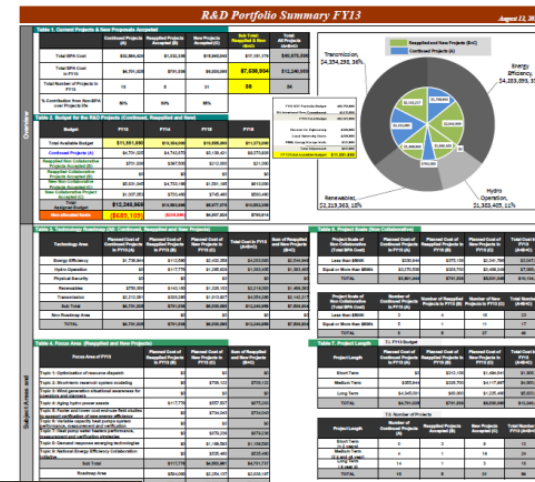
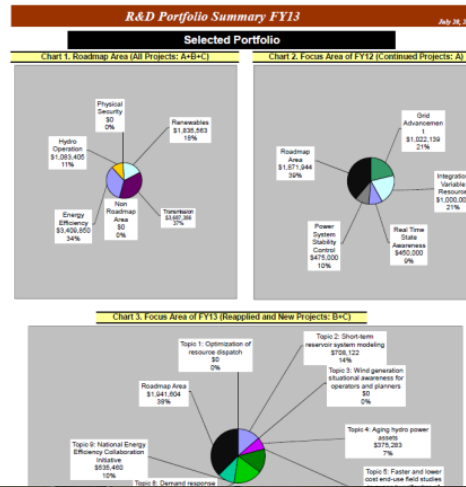
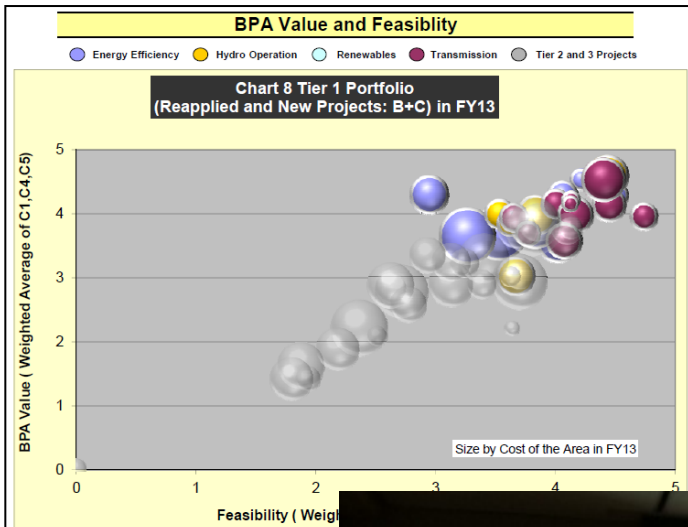


Technology Transfer Objectives/Strategies

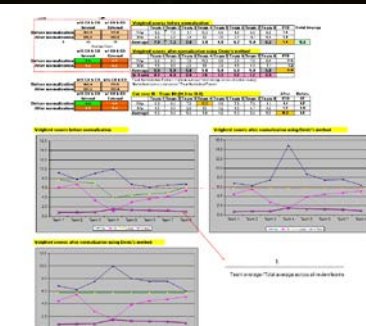
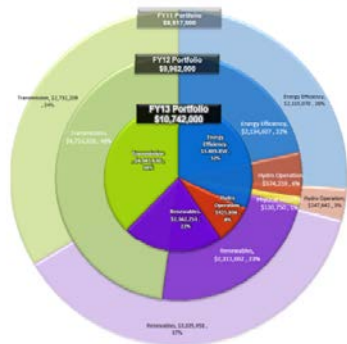
- Effectively diffuse a technology/application (outcomes of R&D projects) to BPA business.
- Capitalize BPA's technological capability and knowledge.
- Contribute to industry and region by providing BPA's innovative technologies and applications.



Portfolio Management: Portfolio Selection



FY11-13 R&D Portfolio



Tier 2/3 Portfolio FY13

Project	Category	Phase	Start	End	Budget	Status
...

Tier 1 Projects of FY13 Portfolio

Project	Category	Phase	Start	End	Budget	Status
...