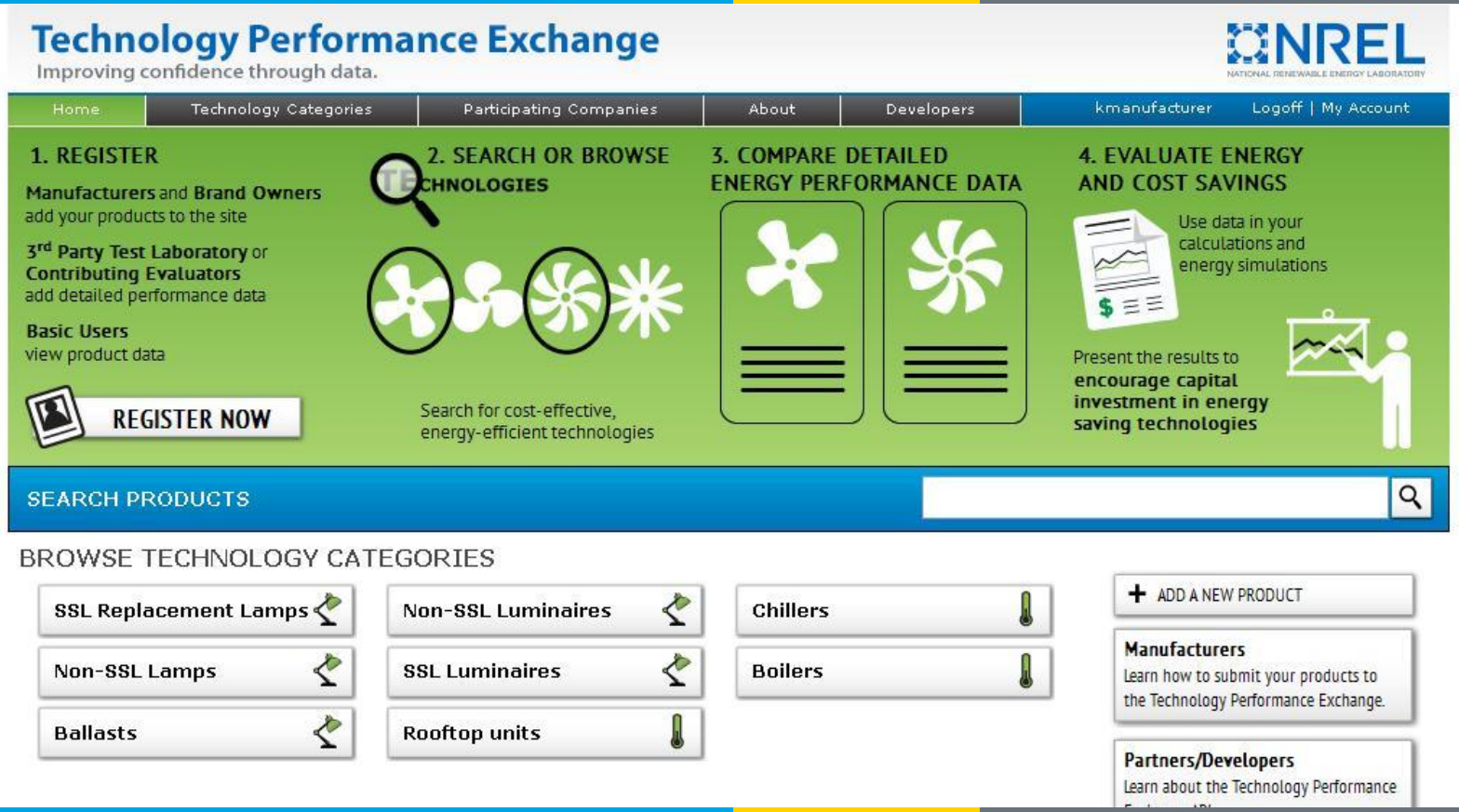

Technology Performance Exchange

TDM – Jason Koman (BTO)

TDM – Dave Catarious (FEMP)

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National Renewable Energy Laboratory

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April 2, 2013

Purpose & Objectives

Problem: Perceived fiscal risk associated with the installation of unfamiliar technologies impedes adoption rates for cost-effective, energy-saving products.

Impact of Project: Enable end users to quickly and confidently assess technologies and products by defining the requisite energy performance characteristics and developing the infrastructure to store those data.

Project Focus: Ensure that necessary energy performance data are easily accessible for a broad array of technologies to reduce investment risk and drive uptake of cost-effective efficiency measures.

Approach

Approach:

- Use a modular and collaborative approach to define the characteristics necessary to credibly predict energy performance
- Create the infrastructure necessary for stakeholders to find, share, and leverage submitted data

Key Issues:

- Interface with industry to facilitate data submission
- Coordinate with existing technology demonstration programs (BPA E3T, Navy Techval, etc.) to ensure scope is relevant to the market

Distinctive Characteristics:

- Necessary energy performance characteristics are identified up-front to ensure submitted data are relevant to the user
- Data provenance (provider, derivation, date, etc.) is clearly identified
- Products are NEVER rated or ranked; judgment of “goodness” and “trustworthiness” left to the end user
- Leverage and improve existing resources (ENERGY STAR, Lighting Facts, AHRI, etc.)

Accomplishments and Progress

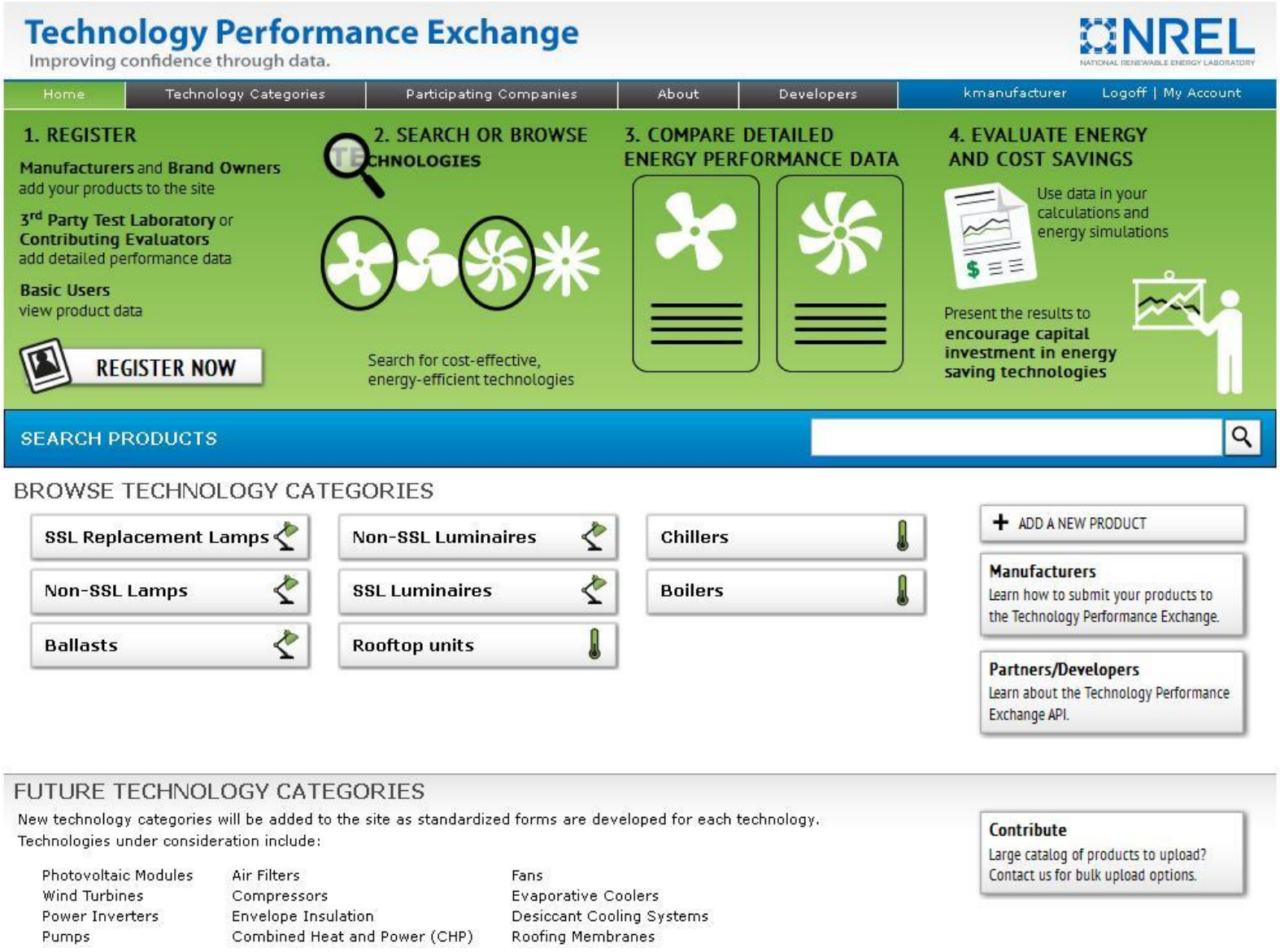
Accomplishments:

- TPE beta site soft-launched (currently only test data)
- Scope includes eight technologies; two pending
- Bonneville Power Administration providing $324,000
  - Expand covered technologies
  - Integrate with the Building Component Library

Progress on Goals:

- Beta site launched on February 28, 2013
- Currently performing industry outreach activities
- Too early to measure progress against project metrics
  - Registered users
  - Unique site visits
  - Included products

Accomplishments and Progress



Accomplishments and Progress

Technology Performance Exchange

Improving confidence through data.

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RESULTS (10)

Narrow Your Results

Data Contributed By:
- Manufacturer/Brand Owner 10
- Contributing Evaluator 2
- 3rd Party Test Laboratory 1

Technology Category:
- Packaged Unitary Equipment 10
  - Rooftop Units 10

Nominal Cooling Capacity (kW): 47 – 238

Energy Efficiency Ratio ((BTU/h)/Watt):

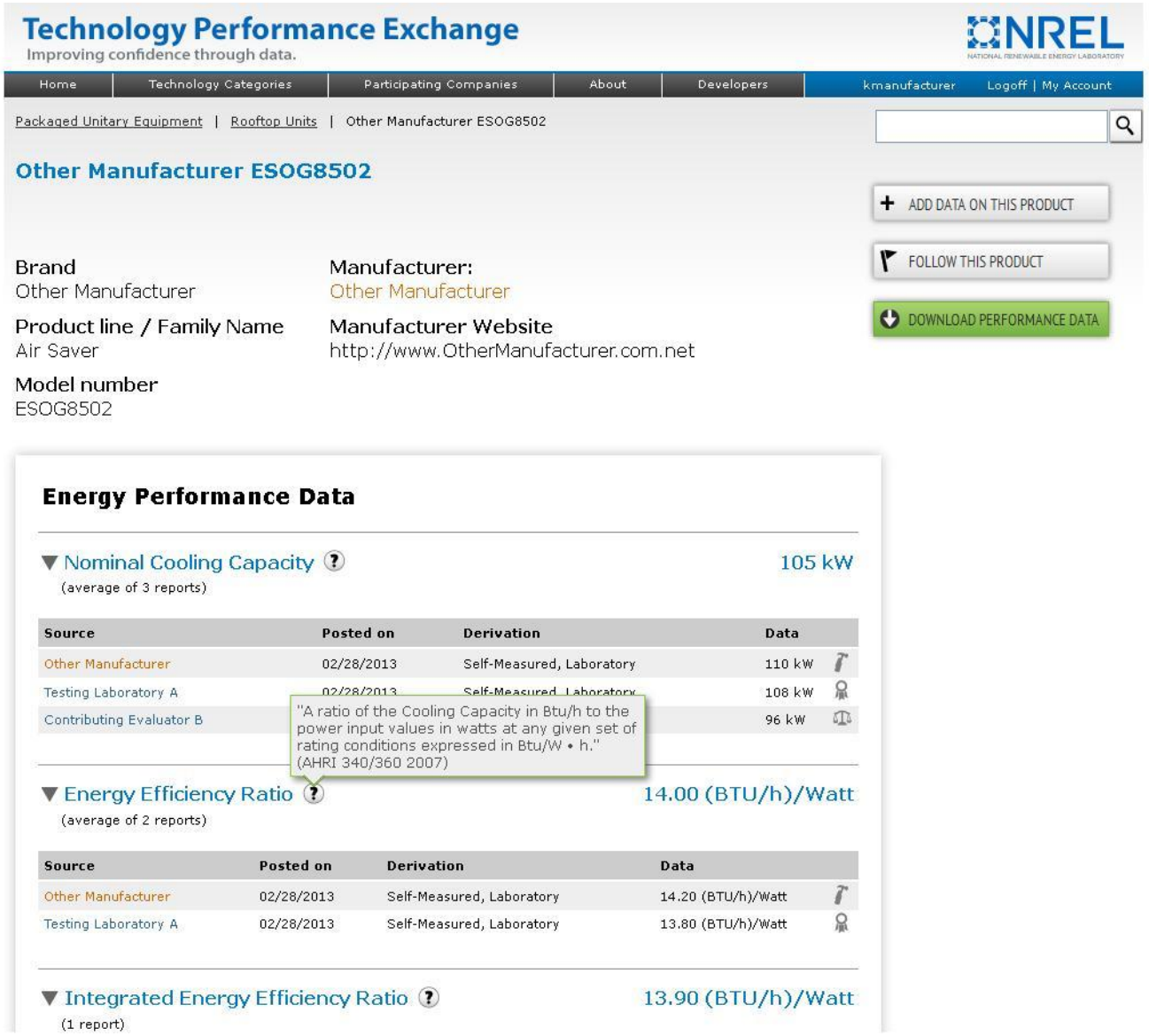
Integrated Energy Efficiency Ratio ((BTU/h)/Watt):

Refrigerant:

BRAND	PRODUCT LINE / FAMILY NAME	MODEL	Performance Data Highlights: Nominal Cooling Capacity (kW)	Energy Efficiency Ratio ((BTU/h)/Watt)	Integrated Energy Efficiency Ratio ((BTU/h)/Watt)	Refrigerant	COMPARE UP TO 4 PRODUCTS (Clear All)
Manufacturer B	Conditional	9654-HSLTF	217	10.2	N/A	R-22	☑
Manufacturer A	PACU	EFEO32	72	13.4	13.3	R-410A	☑
Other Manufacturer	Air Saver	ESOG8502	110	14.2			☑
			108	13.8	N/A	N/A	
			96	N/A	N/A	N/A	
Manufacturer B	Roof Sense	FHLS	47	N/A	14	N/A	☐
Other Manufacturer	Air Saver	HFLT9637	83	12.8	14.1	R-22	☐
Manufacturer A	PACU	HRQD98	84	16.4	15.2	N/A	☐

Data reported by a 3rd party test laboratory

Accomplishments and Progress



Technology Performance Exchange
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Packaged Unitary Equipment | Rooftop Units | Other Manufacturer ESOG8502

Other Manufacturer ESOG8502

+ ADD DATA ON THIS PRODUCT

FOLLOW THIS PRODUCT

DOWNLOAD PERFORMANCE DATA

Brand
Other Manufacturer

Manufacturer:
Other Manufacturer

Product line / Family Name
Air Saver

Manufacturer Website
http://www.OtherManufacturer.com.net

Model number
ESOG8502

Energy Performance Data

▼ Nominal Cooling Capacity (?) 105 kW
(average of 3 reports)

Source	Posted on	Derivation	Data
Other Manufacturer	02/28/2013	Self-Measured, Laboratory	110 kW
Testing Laboratory A	02/28/2013	Self-Measured, Laboratory	108 kW
Contributing Evaluator B			96 kW

"A ratio of the Cooling Capacity in Btu/h to the power input values in watts at any given set of rating conditions expressed in Btu/W • h." (AHRI 340/360 2007)

▼ Energy Efficiency Ratio (?) 14.00 (BTU/h)/Watt
(average of 2 reports)

Source	Posted on	Derivation	Data
Other Manufacturer	02/28/2013	Self-Measured, Laboratory	14.20 (BTU/h)/Watt
Testing Laboratory A	02/28/2013	Self-Measured, Laboratory	13.80 (BTU/h)/Watt

▼ Integrated Energy Efficiency Ratio (?) 13.90 (BTU/h)/Watt
(1 report)

Project Plan & Schedule

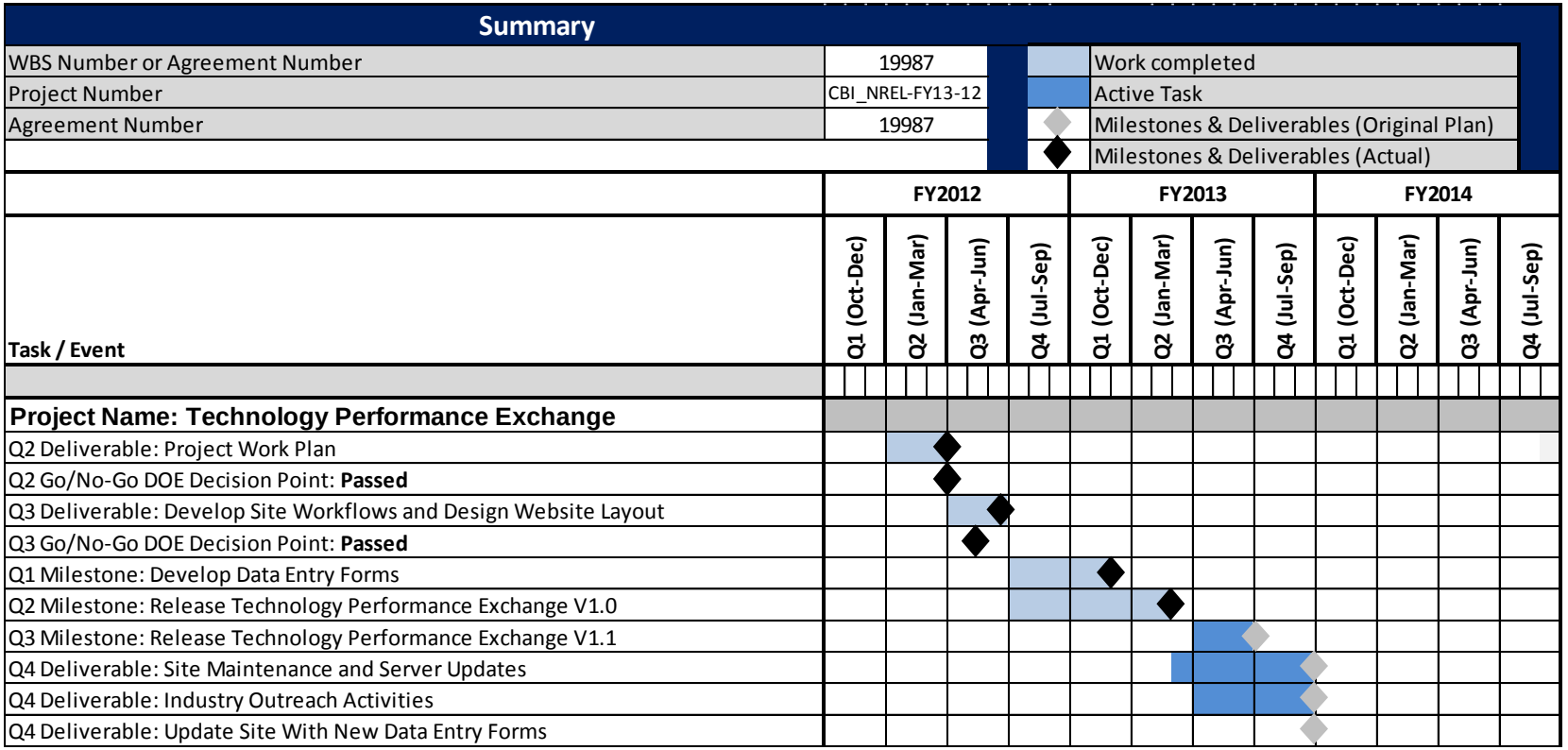
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Project Start Date: January 27, 2012

Project Planned Completion Date: September 30, 2013

Schedule and Milestones: All deliverables/milestones on time and on budget

Go/No-Go Decision Points: Both passed in FY 2012



Project Budget

Project Budget:

- FY 2012: $223,000 BTO; $200,000 FEMP; $423,000 total
- FY 2013: $201,000 BTO; $290,000 FEMP; $491,000 total

Variances:

- No variance

Cost to Date:

- On schedule; 60% spent in FY 2013
- 40% remaining

Additional Funding:

- Bonneville Power Administration IAG
  - $222,870 FY 2013
  - $100,889 FY 2014

Budget History					
FY 2010		FY 2011		FY 2012	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
N/A	N/A	N/A	N/A	$423,000	$0

Project Integration, Collaboration & Market Impact

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Partners, Subcontractors, and Collaborators:

- Partners: Bonneville Power Administration
- Subcontractors: Aten Design Group, Holliday Electrical Mechanical Engineering
- Key Collaborators: Acuity Brands, AMO, ASHRAE SPC 205, BPA, Carrier, CEE, DoD ESTCP, E Source, EPRI, ETCC, GSA GPG, Navy TechVal, Taylor Engineering, Trane, SMUD, Walmart

Technology Transfer, Deployment, Market Impact:

- Ongoing interaction with 23 stakeholders
- Coordinate and leverage utility, state, and federal technology evaluation efforts
  - Working with BPA to integrate the Technology Performance Exchange into its E3T program

Project Integration, Collaboration & Market Impact

Communications:

- Emerging Technologies Coordinating Council Quarterly Coordination Meeting (September 2012)
- SPC 205 Meeting, 2013 ASHRAE Winter Conference
- Project factsheet: www.nrel.gov/docs/fy13osti/56457.pdf
- BTO site: www1.energy.gov/buildings/commercial/technology_performance.html
- EPRI Program Advisory Meeting
- Open invitation for peer review

Project Integration, Collaboration & Market Impact

- Improve current technology evaluation processes

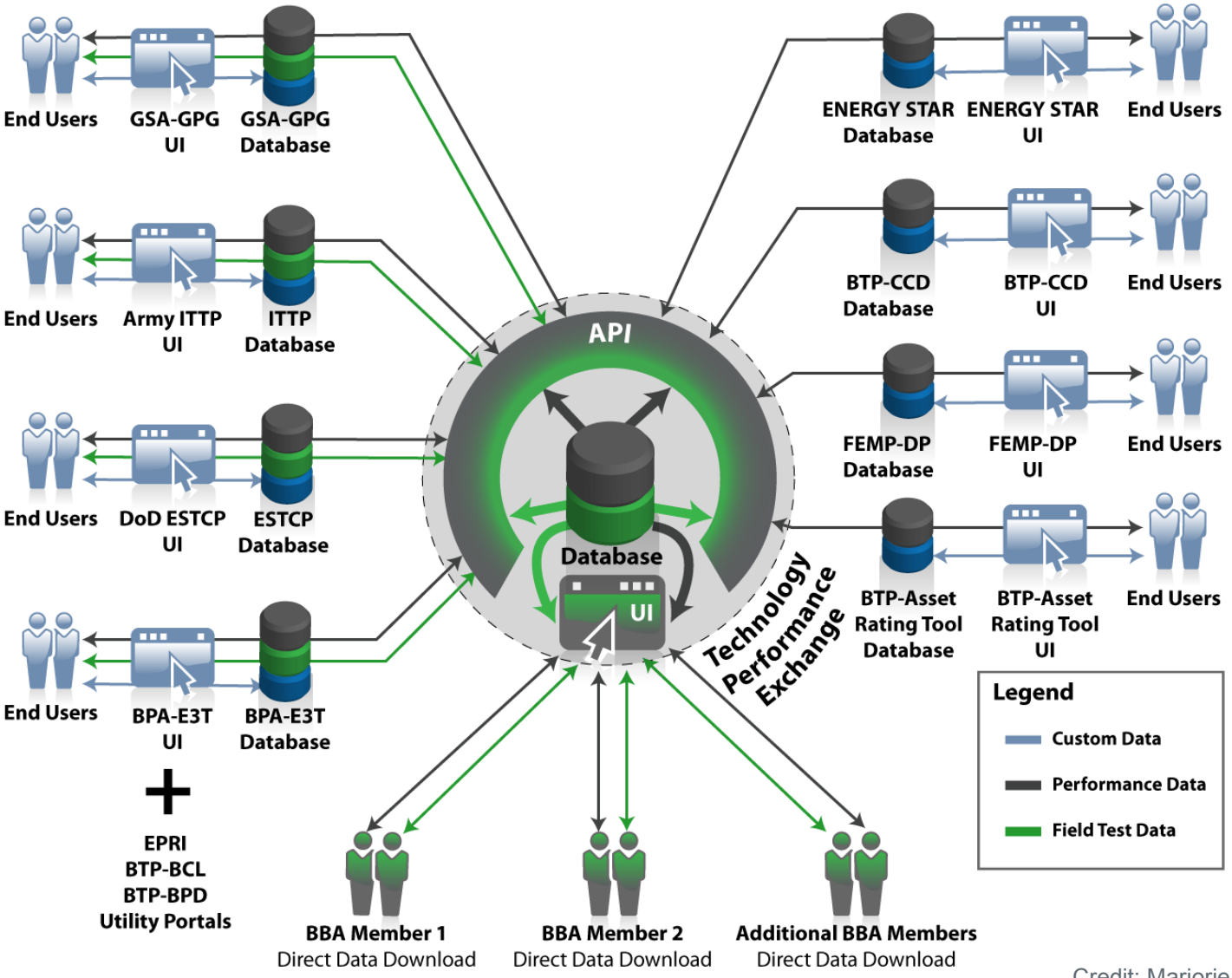
Current State	Technology Performance Exchange
Technology evaluators cannot effectively share results (raw data)	Support information sharing
Technology evaluation efforts often repeated (costs duplicated)	Remove replication and lower the cost/data burden through a stakeholder partnership
Barriers exist between energy simulation and laboratory & field testing	Powerful analytical methods can be tightly integrated with field testing

Next Steps and Future Plans

Next Steps and Future Plans:

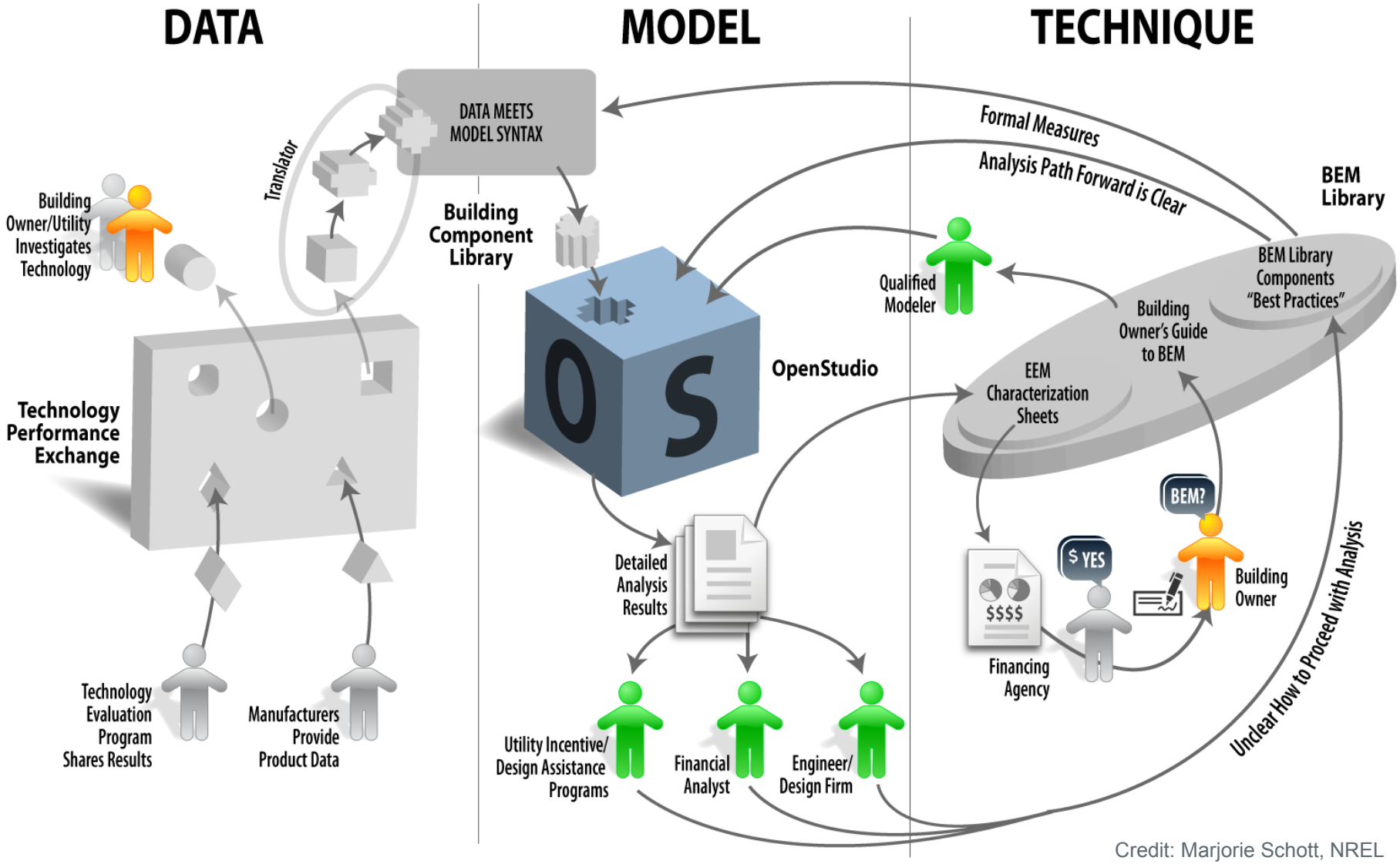
- Outreach and engagement
  - Stream millions of performance data points via API
  - Amplify impact of utility incentive programs
- Technology Performance Exchange V1.1
  - Upgraded workflows/expanded scope
- Work with BPA to expand included technologies
  - Expanded scope
- Integrate data flows with Building Component Library
  - Seamless information flow from performance testing to whole-building analysis
- Foster 3rd party application development
  - Increase use of energy data in procurement decisions

Next Steps and Future Plans



Credit: Marjorie Schott, NREL

Next Steps and Future Plans



Credit: Marjorie Schott, NREL