



Technology Performance Exchange<sup>TM</sup>  
Confidence through data.

# Reducing the Cost of Utility Technology Evaluation Programs

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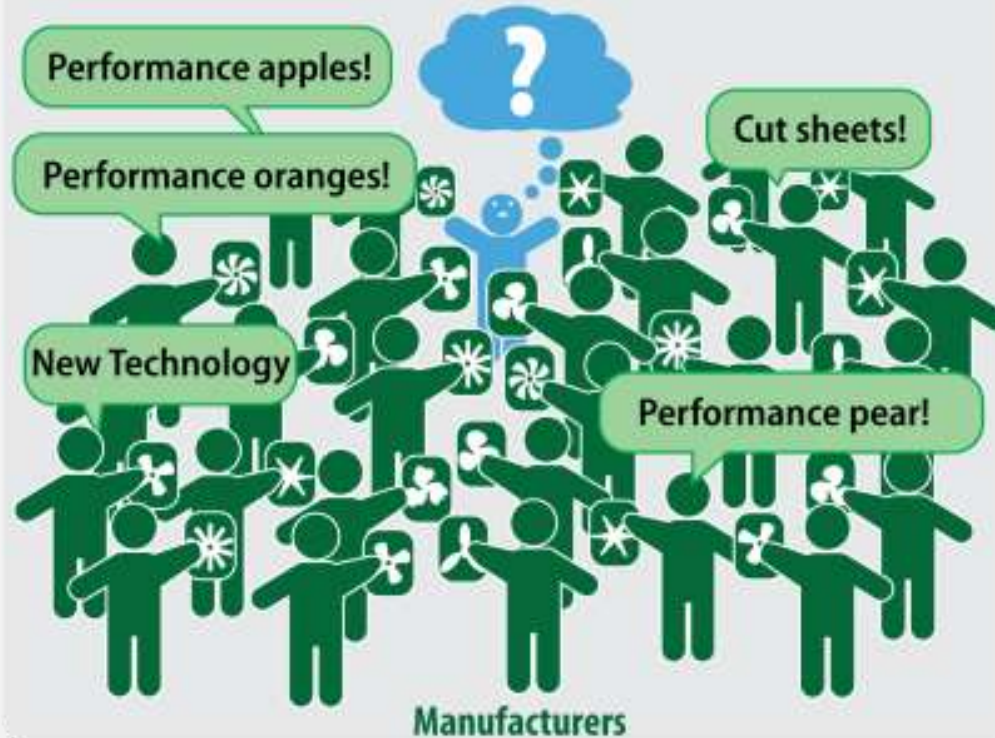
U.S. DEPARTMENT OF  
**ENERGY**

The Technology Performance Exchange was developed by the National Renewable Energy Laboratory with support from the U.S. Department of Energy's Building Technologies Office and Federal Energy Management Program, and the Bonneville Power Administration.

# Introduction

**PROBLEM: How do building owners/operators, utilities, and technology demonstrators make informed decisions on energy saving technologies?**

Building Owners/Operators, Utilities,  
and Technology Demonstrators



Credit: Marjorie Schott, NREL



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# Introduction

## Analysts

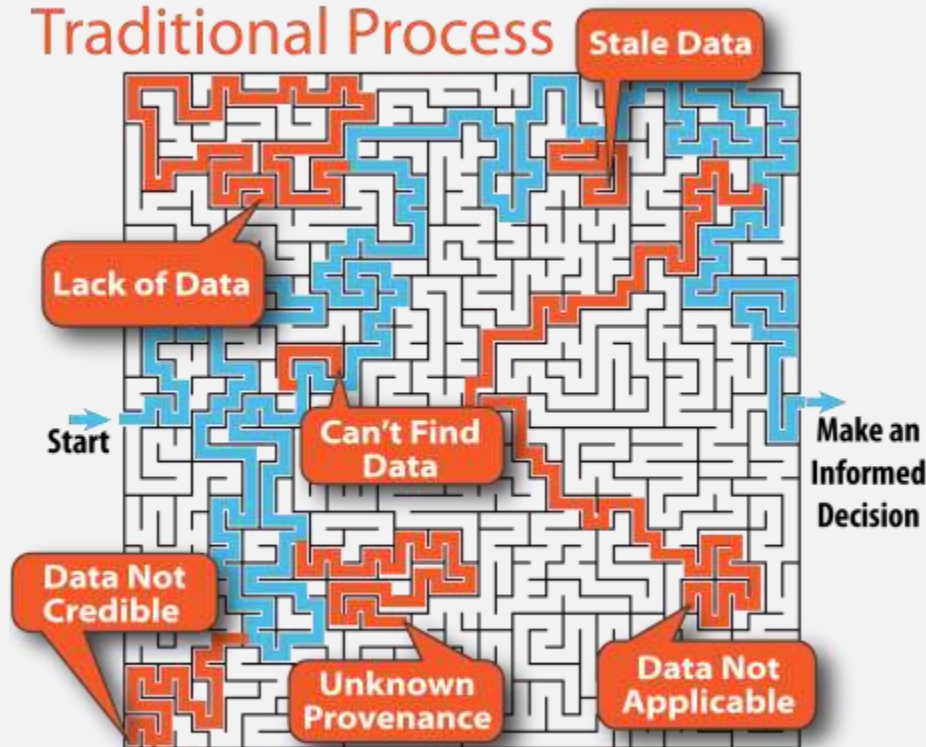
- Engineers
- Energy modelers
- Researchers



## Implementers

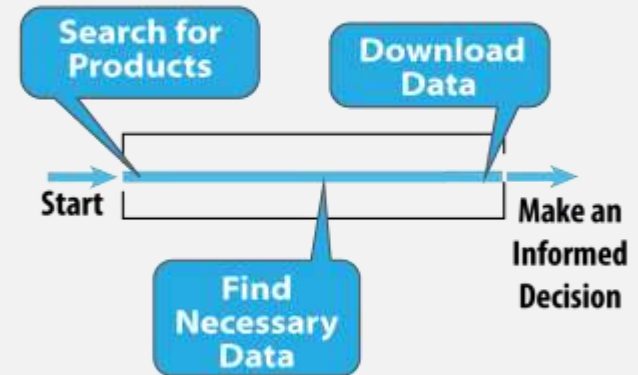
- Commercial building owners/operators
- Utilities
- Technology evaluation staff

## Traditional Process



credit: <http://www.mazegenerator.net/>

## TPE<sup>×</sup> Process




Credit: Marjorie Schott, NREL

# What is TPEX?




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# The Technology Performance Exchange



**Technology Performance Exchange™**  
Confidence through data.



**NREL**  
NATIONAL RENEWABLE ENERGY LABORATORY


Home
Technology Categories
Companies
About
Developers
Log in | Register

**1. REGISTER**



**Manufacturers and Brand Owners**  
add your products to the site

**3<sup>rd</sup> Party Test Laboratory or Contributing Evaluators**  
add detailed performance data

**Basic Users**  
view product data



REGISTER NOW

**2. SEARCH OR BROWSE TECHNOLOGIES**





Search for cost-effective, energy-efficient technologies

**3. COMPARE DETAILED ENERGY PERFORMANCE DATA**




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=====


**4. EVALUATE ENERGY AND COST SAVINGS**




















Use data in your calculations and energy simulations

Present the results to encourage capital investment in energy saving technologies



**SEARCH PRODUCTS**  

**BROWSE TECHNOLOGY CATEGORIES**

SSL Replacement Lamps 	Hot-Water Boilers 	DHP: Indoor Units 	<p><b>Manufacturers</b> Learn how to submit your products to the Technology Performance Exchange.</p> <p><b>Partners/Developers</b> Learn about the Technology Performance Exchange API.</p>
Non-SSL Lamps 	Steam Boilers 	DHP: Outdoor Units 	
Lamp Ballasts 	Compressors 	Heat Pump Water Heaters 	
Non-SSL Luminaires 	Rooftop Units 	Transformers 	
SSL Luminaires 	Gas-Fired Unit Heaters 	Photovoltaic Modules 	
Pumps 	Inverters 		

# The Technology Performance Exchange

## Data Entry Forms

- Minimum parameters necessary to support a robust analysis
- Product specific
- Identified through engineering analysis
- Analysis tool agnostic

The screenshot displays a data entry form with the following sections:

- Fan Power Input (W) ?**: A text input field and a dropdown menu currently set to "- None -".
- Cooling Performance Map Download ?**: A "Download Template" button.
- Cooling Performance Map Upload ?**: A "Choose File" button (showing "No file chosen") and an "Upload Excel Spreadsheet" button. A dropdown menu is open, listing various data sources: "Self-Measured, Field" (highlighted), "- None -", "Non-Measurable Physical Property/Design Criteria", "Self-Measured, Laboratory", "Measured By Others, Field", "Measured By Others, Laboratory", "Calculated Using Self-Measured Field Data", "Calculated Using Self-Measured Laboratory Data", "Calculated Using Others' Measured Field Data", "Calculated Using Others' Measured Laboratory Data", "Reported by External Source, Derivation Unknown", and "Calculated Using External Data, Derivation Unknown".
- Heating Performance Map Download ?**: A "Download Template" button.
- Heating Performance Map Upload ?**: A "Choose File" button (showing "No file chosen") and an "Upload Excel Spreadsheet" button. A dropdown menu is open, currently showing "- None -".

At the bottom of the form, there are two buttons: "SAVE AND COMPLETE LATER" and "SUBMIT".

Credit: Daniel Studer, NREL

# Performance Map Example

Basic Information	
Brand Owner	
Brand	
Product Line/Family Name	
Model Number	

Legend	
	Fill this information in first
	Provide DHP indoor unit cooling performance information in these cells for the conditions specified


Performance Map																						
Outdoor Air Dry-Bulb Temperature	Indoor Air Wet-Bulb Temperature																					
	13.9°C			16.1°C			17.8°C			19.4°C			21.1°C			22.8°C			24.4°C			
	CC	SC	EI	CC	SC	EI	CC	SC	EI	CC	SC	EI	CC	SC	EI	CC	SC	EI	CC	SC	EI	
-5.0°C																						
-3.9°C																						
-1.1°C																						
1.7°C																						
4.4°C																						
7.2°C																						
10.0°C																						
12.8°C																						
15.6°C																						
18.3°C																						
21.1°C																						
23.9°C																						
26.7°C																						
29.4°C																						
32.2°C																						
35.0°C																						
37.8°C																						
40.6°C																						
43.3°C																						

CC: Cooling Capacity (kW)  
 SC: Sensible Capacity (kW)  
 EI: Energy Input (kW)

Credit: Daniel Studer, NREL

# Data Provenance

How can we ensure data credibility?

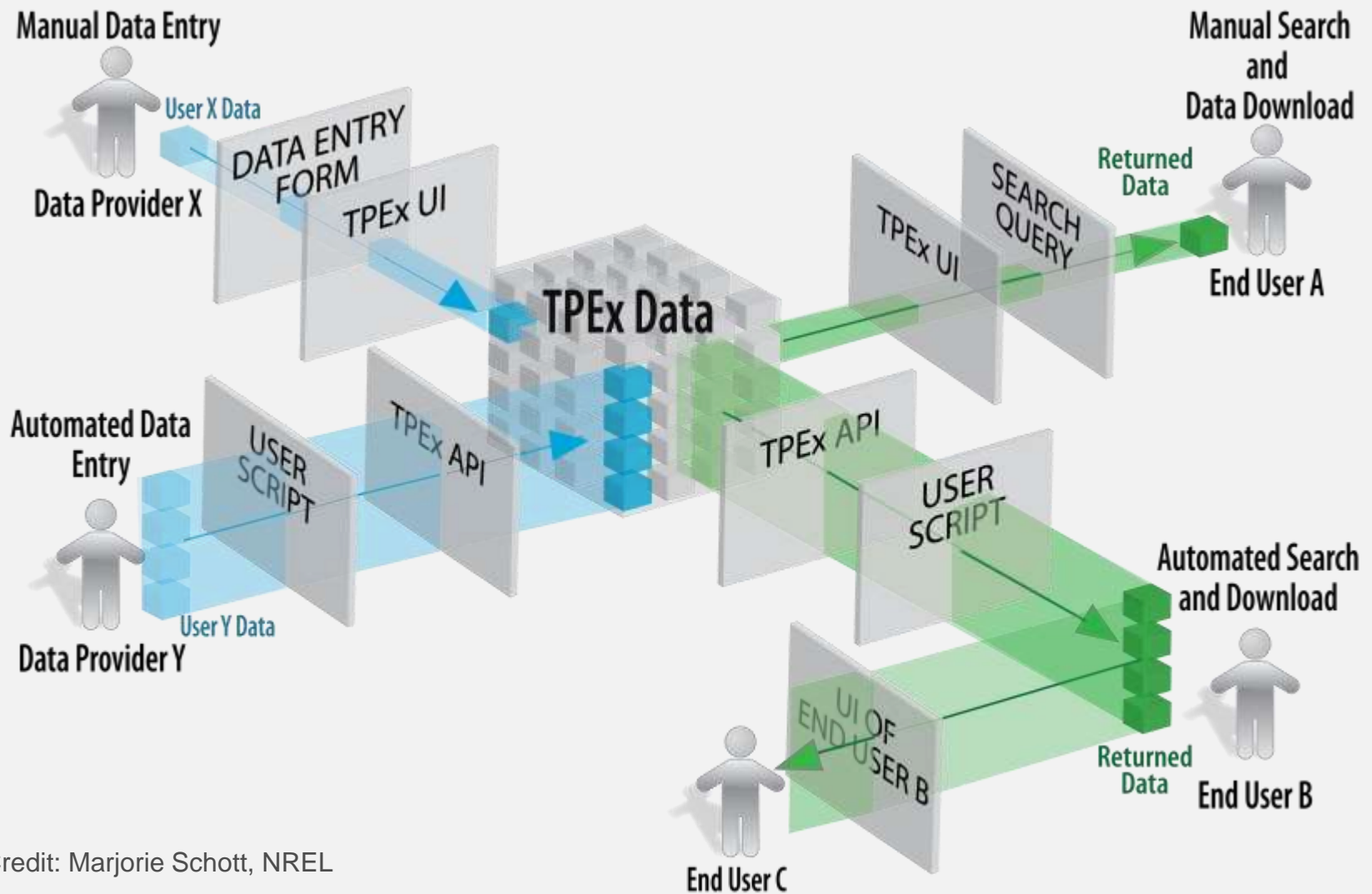
<b>▶ Weighted Efficiency at 240 Volts</b> ?			<b>96.41 %</b>
(1 report)			
<b>▼ Nominal Input Voltage</b> ?			<b>389.51 Vdc</b>
(1 report)			
Source	Posted on	Derivation	Data
National Renewable Energy Laboratory	12/20/2013	Calculated Using External Data, Derivation Unknown	389.51 

Credit: Daniel Studer, NREL

- Organization Type
- Organization Name
- Posting Date
- Derivation Method



# Data Accessibility

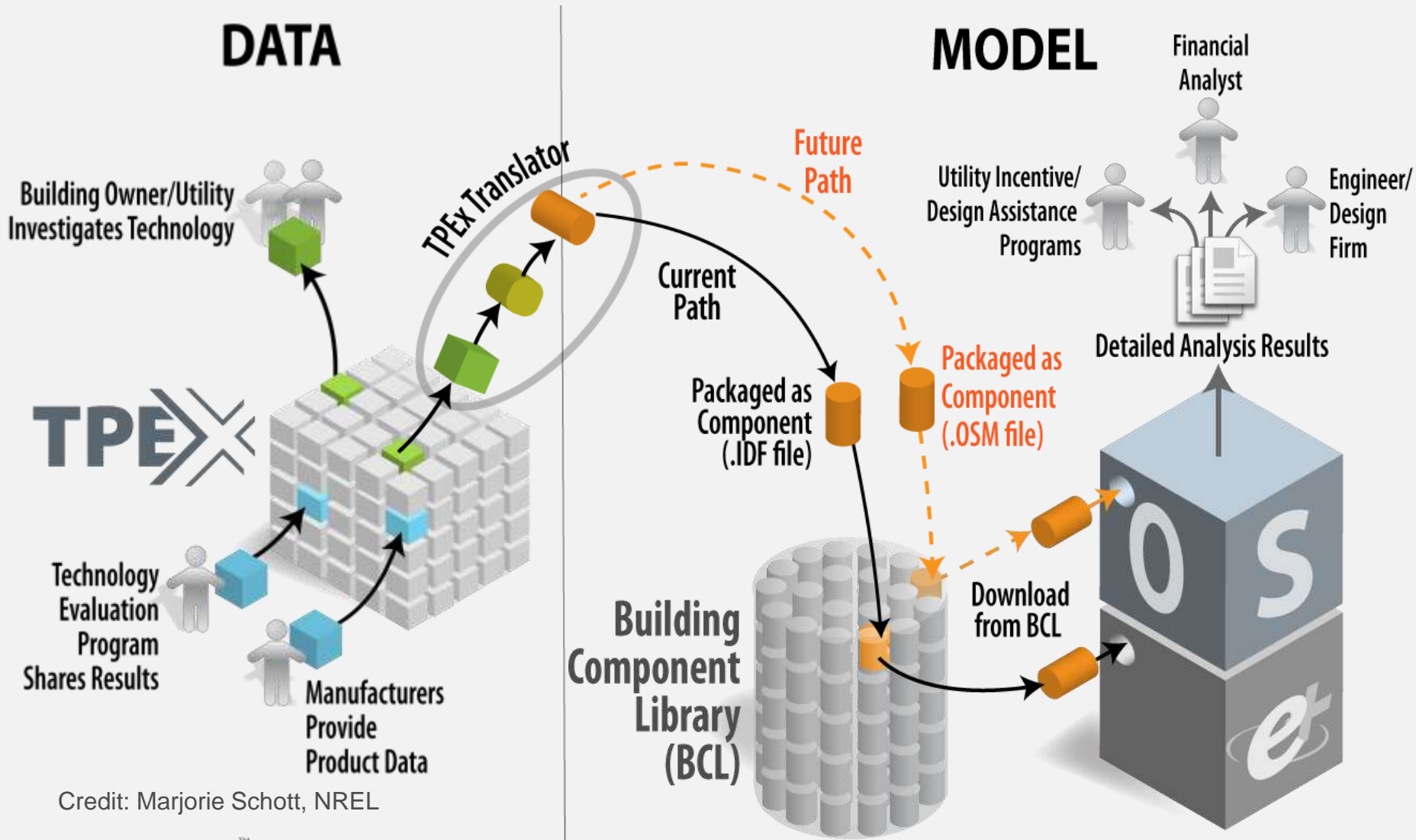


Credit: Marjorie Schott, NREL



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# Lowering Analysis Barriers



Credit: Marjorie Schott, NREL

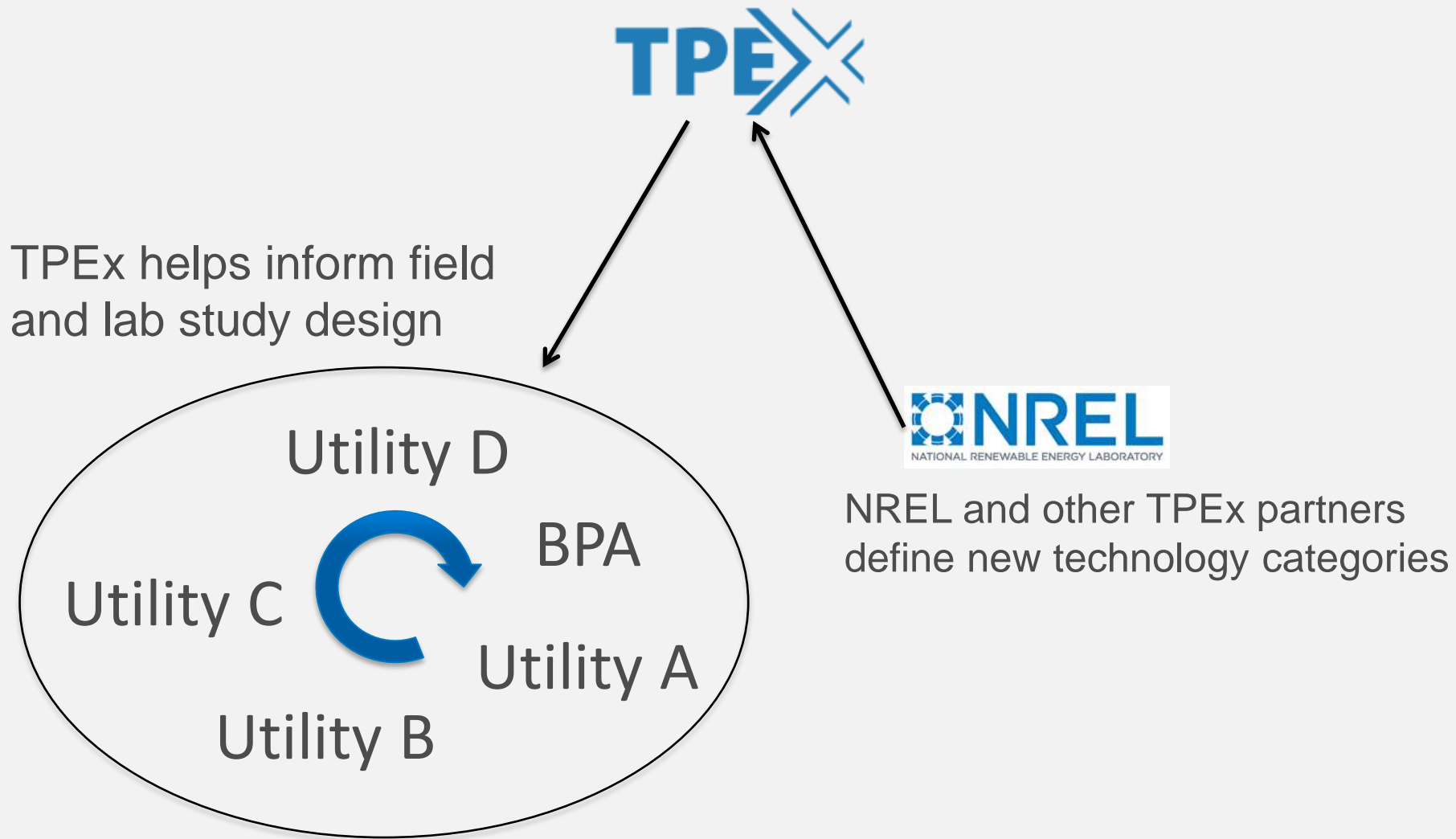


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# Benefits to Utilities

- Data aggregator
  - Combine *similar* data from many sources
  - Allow users to analyze performance before field demonstration
  - Verify with limited field testing, if necessary
- Qualified product list development/ maintenance

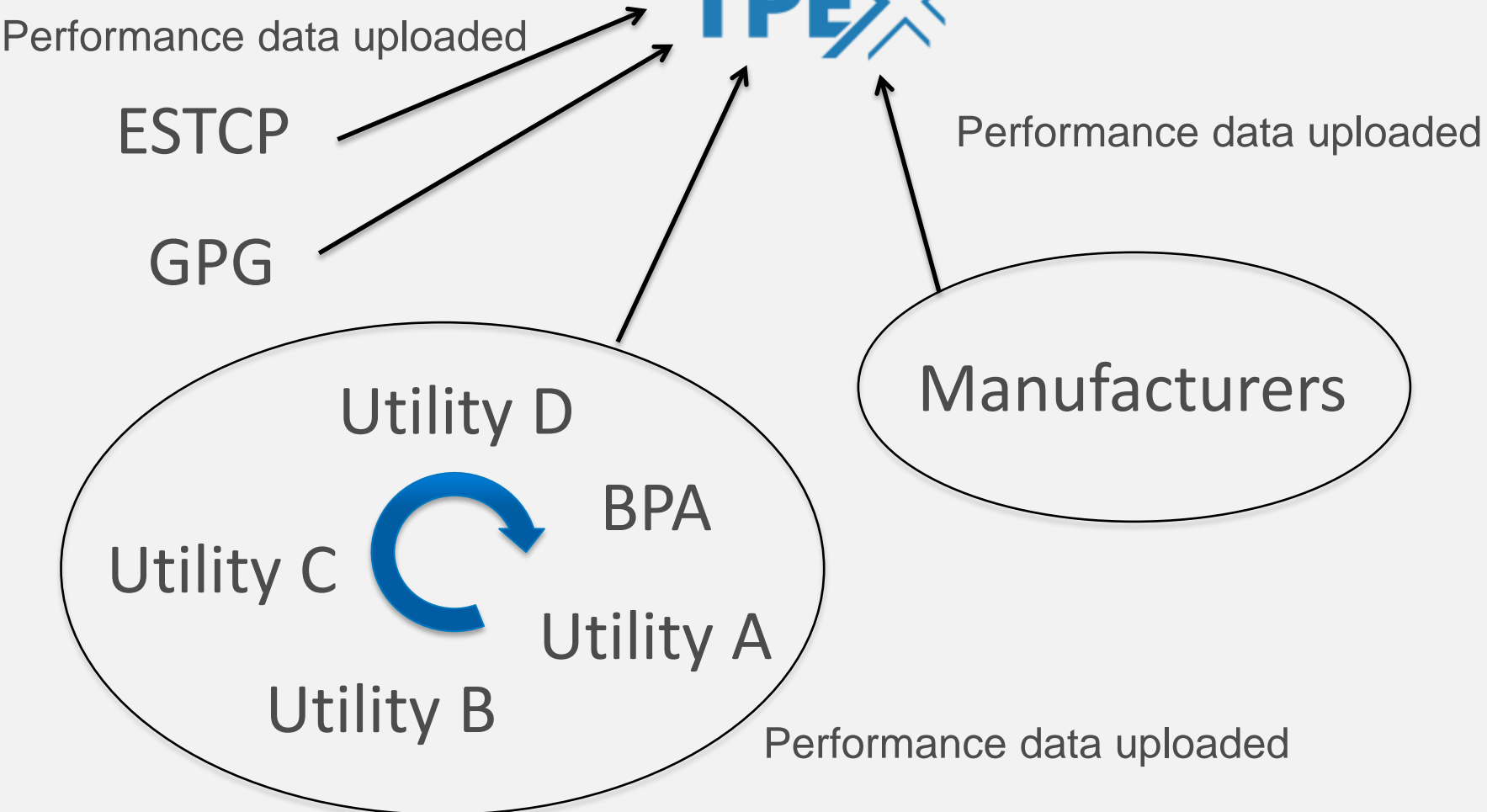
# Utility/TPEX Interactions



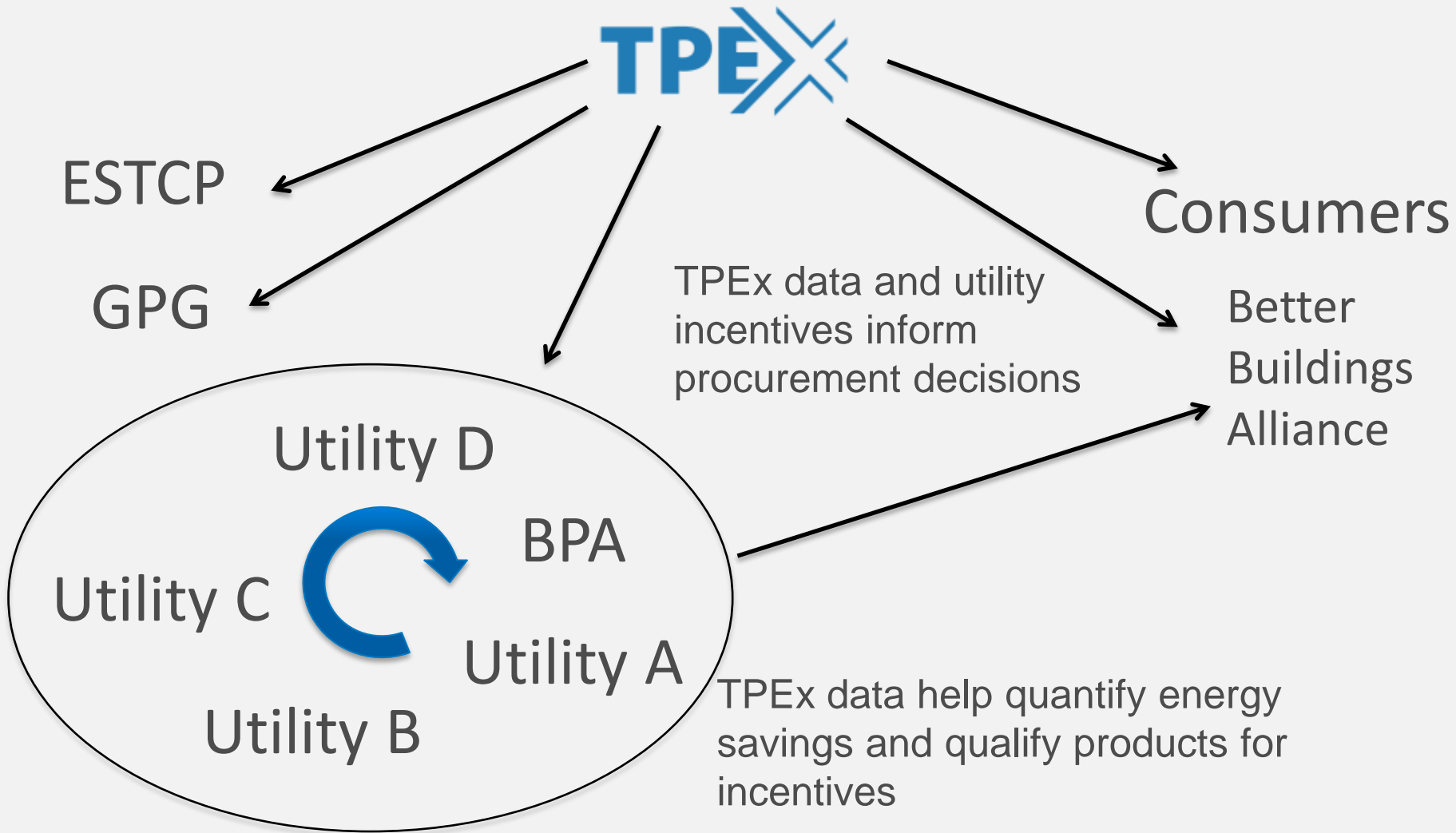
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# Utility/TPEX Interactions



# Utility/TPEX Interactions



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# Project Status

- TPEX is live at [www.TPEX.org](http://www.TPEX.org)
- 17 technology categories implemented (18 & 19 in-progress)
- DOE [RFI](#) requesting manufacturer performance data
- 20,000+ product datasets
- Public commitments from Target, Walmart, the Bonneville Power Administration, and LG Electronics
- Ongoing interactions with additional manufacturers and utilities

# Next Steps

- Seeking additional commitments from
  - Product manufacturers: Provide data
  - Retailers: Request vendors provide data to TPEX
- Working with utilities to pilot TPEX integration in technology demonstration workflows
  - Interested in identifying additional partners





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# Questions?