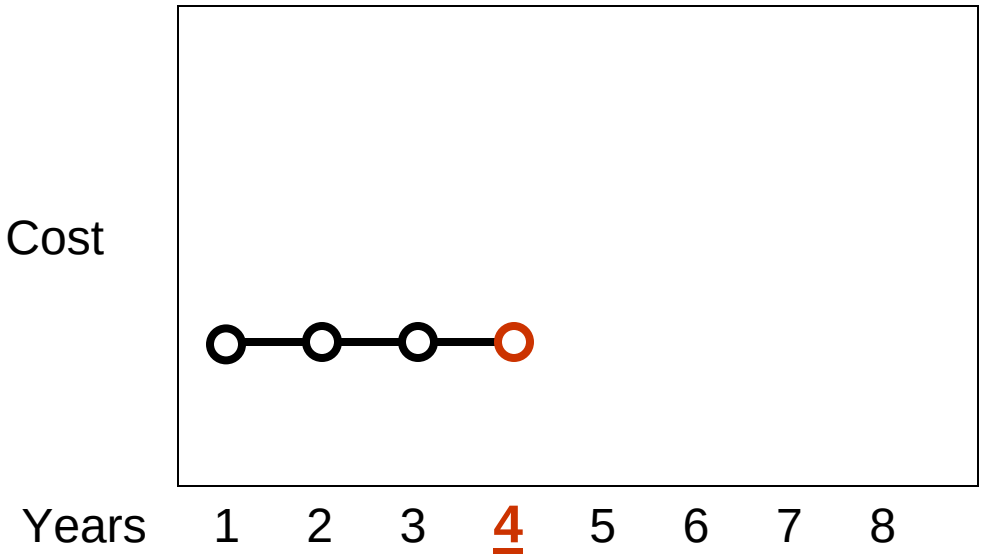
EPC Watch

watching the world of energy performance contracting

Measurement & Verification of Energy Performance Contracts

Basic Concepts I

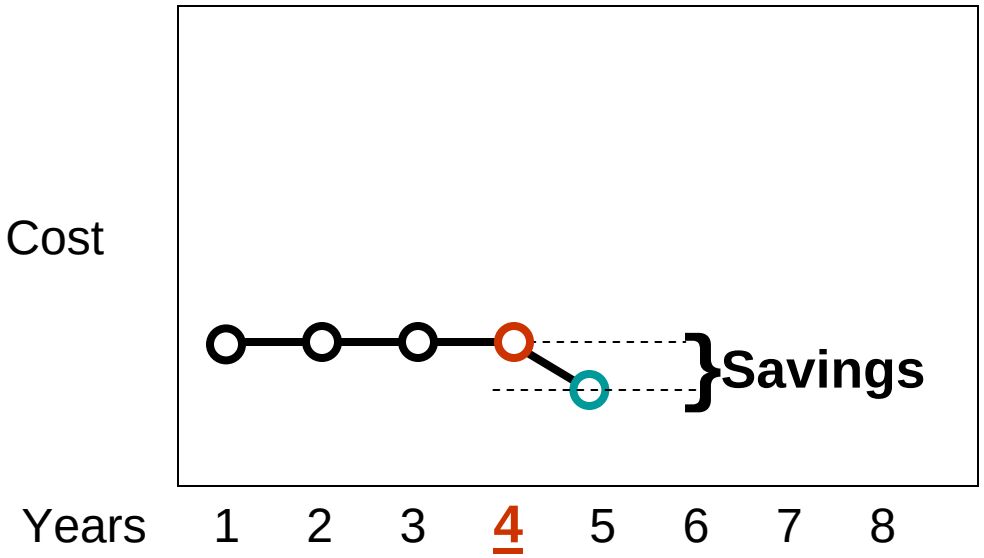
Credibility of Savings Calculation



In an simple world it would be easy to calculate savings.

In this example, there are no increases in energy loads from year to year.

Credibility of Savings Calculation

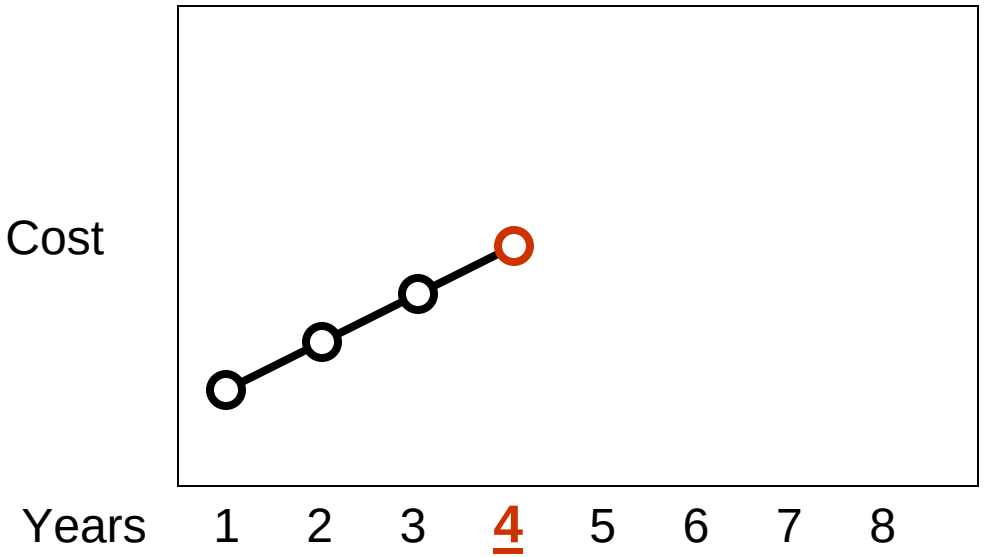


In year 4 we implement energy conservation measures (physical or operational) and achieve some savings.

These are easy to measure, as seen in the calculation below.

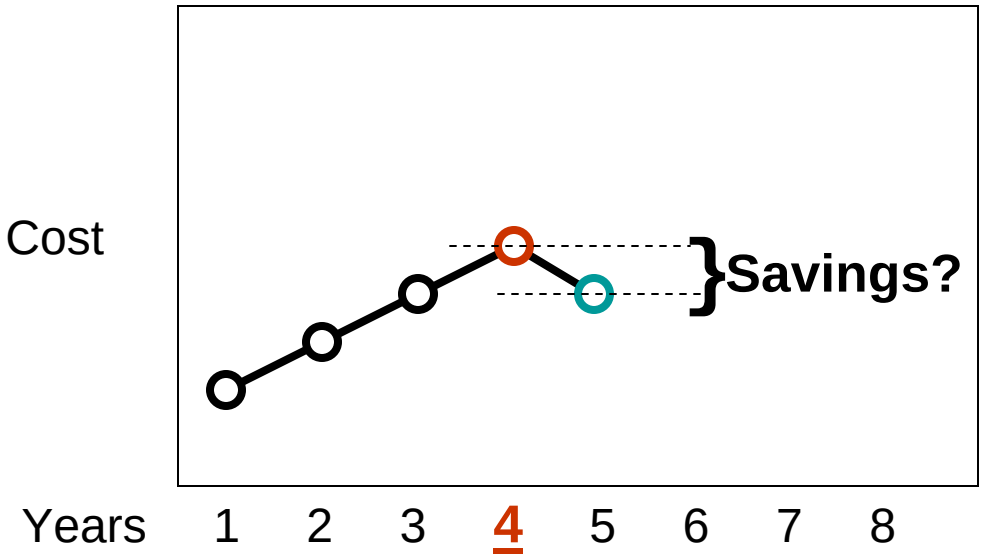
Energy Savings = Year 4 – Year 5

Credibility of Savings Calculation



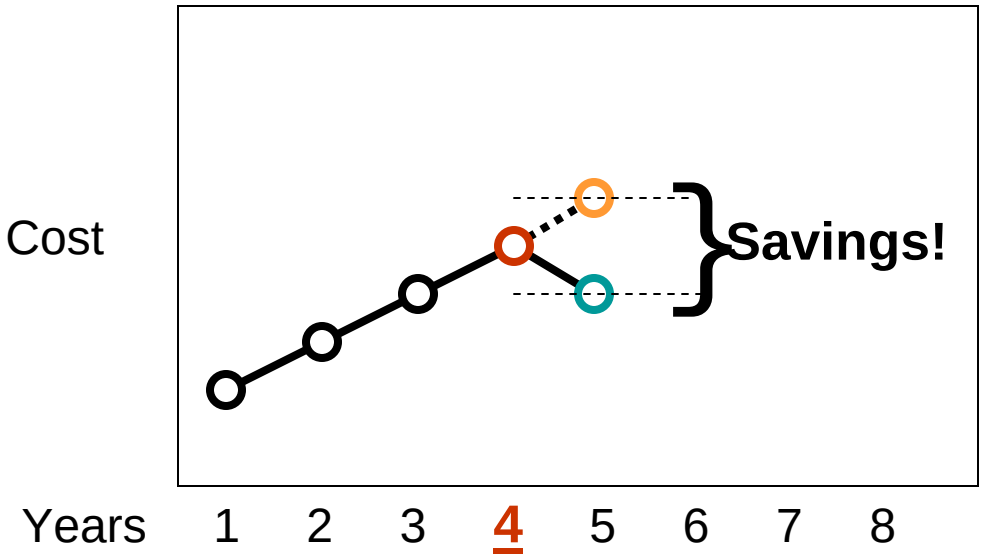
However, in many cases energy use is a moving target. In this example we show a consistent increase in rates and building square footage each year (again very simplified for this example).

Credibility of Savings Calculation



Should we calculate savings the same as before?

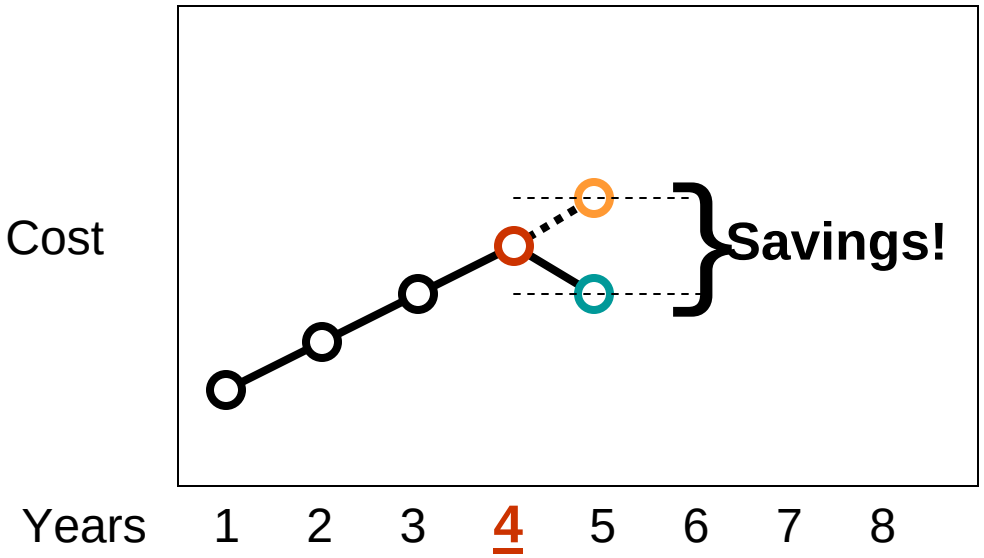
Credibility of Savings Calculation



As you can see, that would not be reasonable. If nothing was done, you can assume that the costs would have continued to increase.

With the new measures in place we have to calculate what the old costs "would have been."

Credibility of Savings Calculation

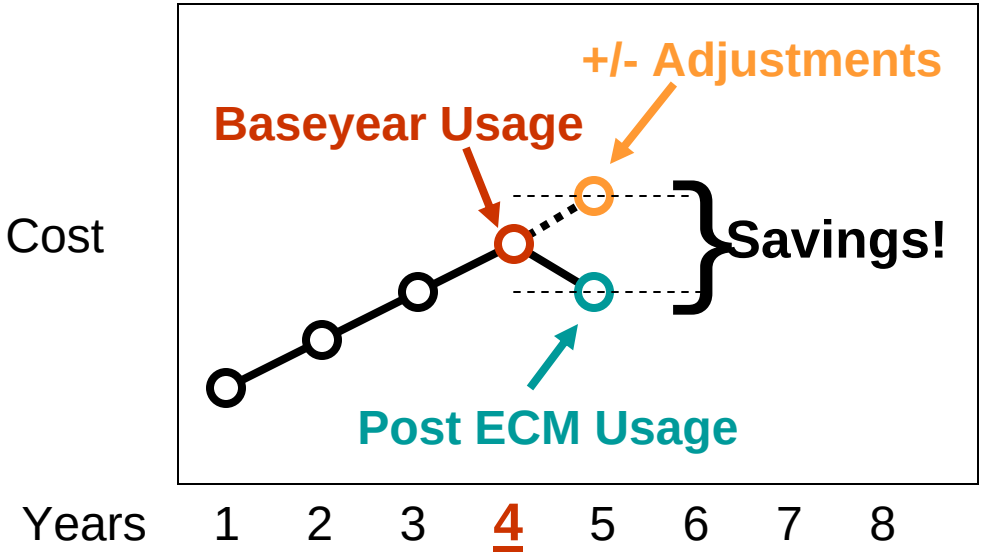


Another term for these "calculated savings" is "cost avoidance."

To determine these savings we use the calculation shown below.

Energy Savings = Baseyear Usage – Post ECM Usage +/- Adjustments

Credibility of Savings Calculation



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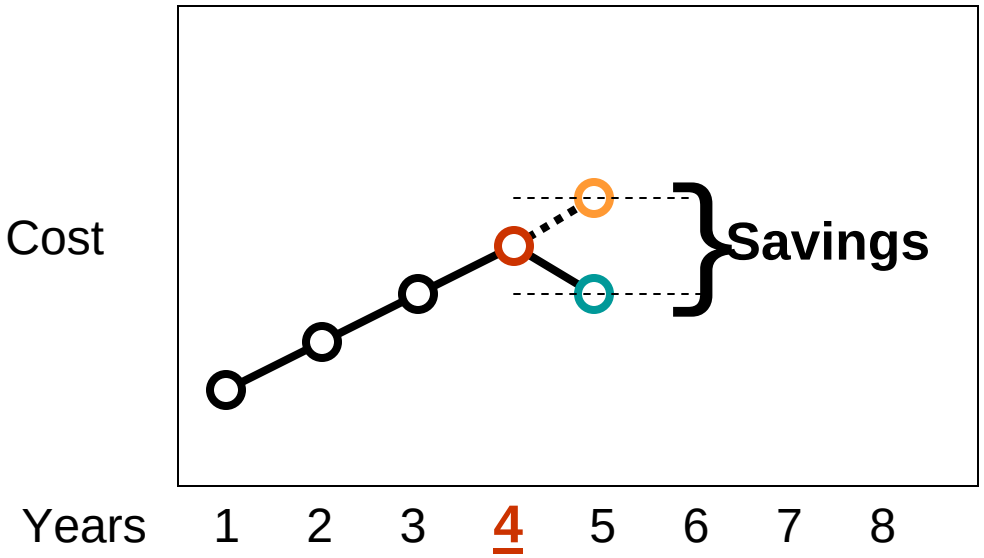
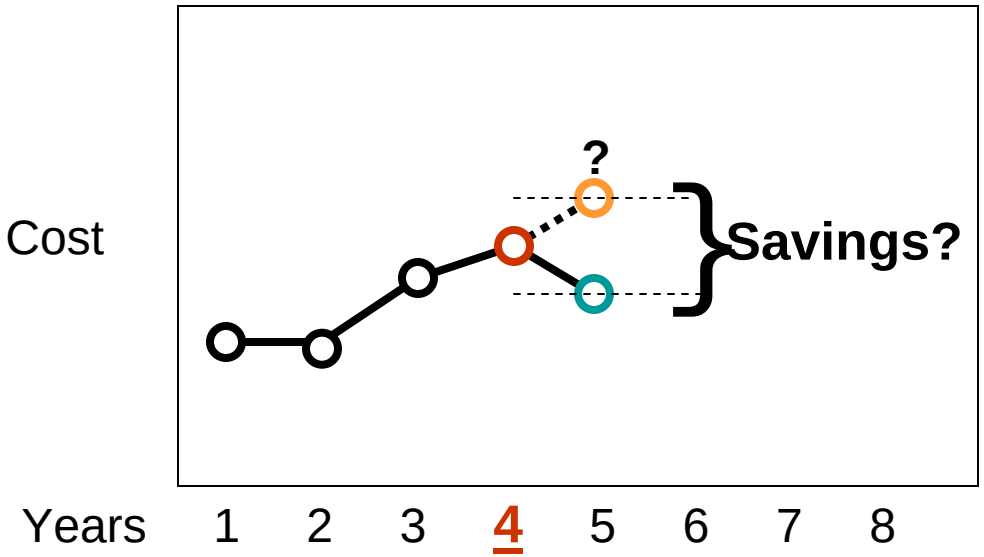


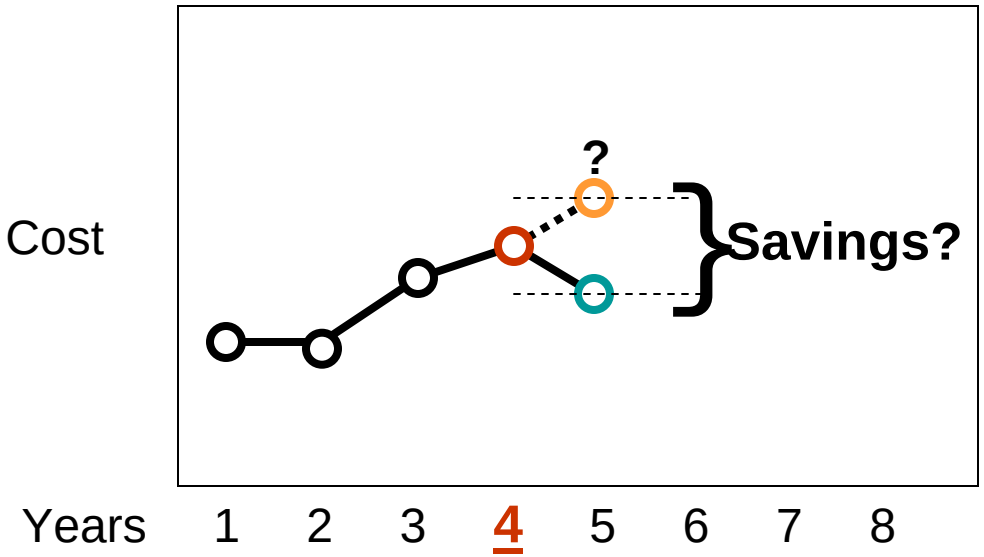
Even with this fairly simple example it is easy to see where costs “would have been.”

Credibility of Savings Calculation



In reality, the graph would look more like this and you would have to rely on a good calculation method to determine what the baseline would have been.

Credibility of Savings Calculation



The key issue
then becomes:

Managing *Baseline Adjustments*.

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IPMVP

International Performance Measurement & Verification Protocol

Industry's Best Practices for Measuring & Verifying Energy Savings

This is where the IPMVP comes in. It provides an industry tested methodology for determine cost avoidance in energy efficiency projects.

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- **Established at beginning**
- **A plan for each facility**
- **Baseline Management**
- **Savings Reports**

M & V PLAN

For Project XYZ

Based on

IPMVP

Best Practices

Every energy performance contract should have an M&V Plan.

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"An M&V Plan is central to proper savings determination and the basis for verification." The M&V Plan "fundamentally defines the meaning of the word 'savings' for each project" and should include the following elements:

- A description of the ECM and its intended result
- An overview of the intended IPMVP option to be used
- Measurement methods and equipment to be used
- Commissioning of the newly installed ECM's
- Documentation of post ECM energy and operating data
- Savings report
- Costs of M&V operations and equipment

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Sample Monthly Savings Report

Project Facility: Washington Middle School

Billing Period:	**July 05**					
Type Utility:	**Electric**					
Meter #	**061125**	Energy (KWH)	Demand (KW)	Energy Cost	Demand Cost	Other Costs
Base Period		174,300	603	$7,608.90	$4,097.10	$367.45
Adjusted Baseline		176,657	621	$8,369.79	$4,506.81	$407.39
Current Data		159,219	606	$8,112.14	$4,499.55	$407.39
Avoidance		17,438	15	$888.45	$108.90	$0.00
Total Savings	**$997.35**					

This is an example of what you could expect to see in a savings report. It shows the original base period, the adjusted baseline, and the current use. Both demand and consumption are addressed in the report.

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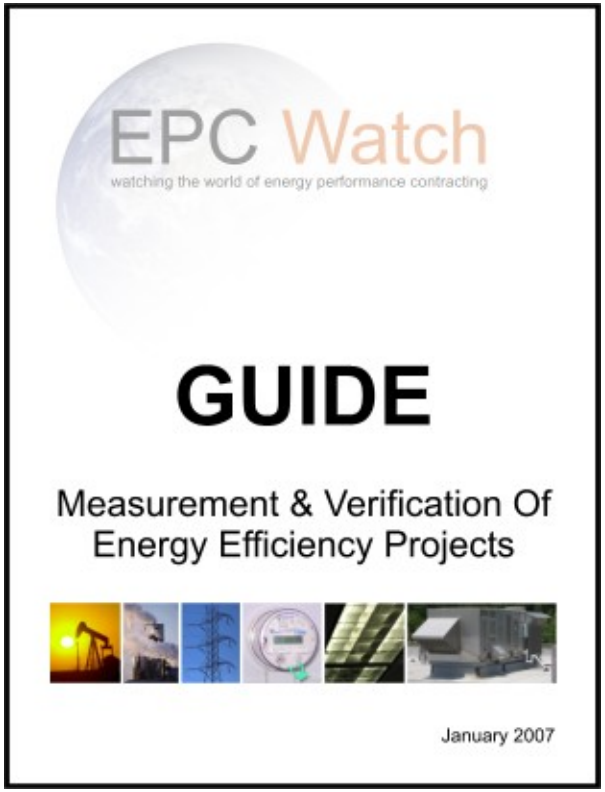
For more information on measurement and verification, download a copy of our guide.



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