

Energizing Your Tax Base With Battery Energy Storage Systems

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What is a Battery Energy Storage System?

Battery storage, or battery energy storage systems (BESS), are devices that enable energy from renewables, like solar and wind, to be stored and then released when the power is needed most.

Lithium-ion batteries, which are used in mobile phones and electric cars, are currently the dominant storage technology for large scale plants to help electricity grids ensure a reliable supply of renewable energy.

How Does a BESS Work?

A BESS can be charged by a renewable energy source, such as a solar or wind facility.

Intelligent battery software uses algorithms to coordinate energy production and computerized control systems are used to decide when to store energy or to release it to the grid. Energy is released from the battery storage system during times of peak demand, keeping costs down and electricity flowing.

Where Can a BESS be located?

A BESS can be “co-located” with a solar or wind facility or it can be standalone.

Co-location can be with a rooftop or ground mounted solar facility. When co-located, the BESS helps unlock the full efficiency of the renewable energy source.

Large scale Battery Energy Storage Systems are typically located near a large energy substation or power lines.

How Long Do the Batteries Last?

As with any Lithium-ion Battery there is degradation over time.

The typical BESS is designed with a 20 – 30 life expectancy – after that it will be removed and the site will be restored to its previous condition

It is possible to purchase Service Contracts with companies like TESLA that will service the batteries to guarantee no more than 1% degradation a year.

Does the Commonwealth encourage the Development of Battery Energy Storage ?

DOER's State of Charge Study, performed under the Energy Storage Initiative, found that peak demand accounts for a disproportionately high percentage of the cost of electricity for ratepayers in the Commonwealth. Solar alone does not necessarily coincide with peak demands, and as such may not address a root cause of higher electricity costs. *Guideline on Energy Storage.*

Benefits of Energy Storage

Some of the specific benefits of energy storage when implemented in conjunction with solar photovoltaic systems include:

- improved power quality (e.g. reduced voltage flicker associated with clouds temporarily shading solar installations);
- substation upgrades often associated with installing solar;
- the ability to shift solar energy production to peak demand.

Guideline on Energy Storage

A Hybrid Facility

In discussing the value and cost of a Battery Energy Storage Facility, it's important to recognize that the value is a hybrid of real and personal property.

- Between 80% and 90% of the facility is personal property;
- Between 10% and 20% of the facility is real property

The value of the portion of the facility that is real estate must be added to the real estate value (we'll discuss this a little later).

Storage & Discharge

In discussing the costs and value of a BESS there are two basic elements:

- The amount of power that it can store;
 - Typically measured in mW or kW
- The amount of useful energy available in a single discharge;
 - If a 50kW capacity battery has a 4-hour duration, then the complete cycle equivalent would be $50 \text{ kW} \times 4 \text{ hours} = 200 \text{ kilowatt-hours (kWh)}$.

Personal Property Valuation

In determining the value of the personal property component, the analysis begins with the life expectancy and depreciation schedule for each element.

- There is some debate regarding life expectancy and depreciation;
 - Some consultants will view the issues from the engineering perspective and so will only rely on useful life and not consider economic life (which is determined by the lease).

Real Estate Valuation

The real estate should be treated as a “Special-Use Property”;

- The real estate value is determined by adding the Lease Fee Value to the Projected Value of the Reversionary Interest;
- The Lease Fee Value will decrease each successive year of the Lease;
- The Projected Value of the Reversionary Interest will depend on whether there is a reuse value (i.e. a sports stadium) or a vacant parcel of land.

Should You Enter a PILOT?

General Laws Chapter 59, Section 5, Clause 45th provides in part that “a solar or wind powered system or energy storage system, or a combination therein, that has entered into an agreement for payment in lieu of taxes associated with the system with the municipality where the system is located” is exempt from personal property taxation.

The arguments “pro” and “con” are similar to those that are involved in the consideration of whether a municipality should enter into a Solar PILOT.

Some Things to Keep In Mind

What do you do with “Contribution in Aid of Construction”?
This can be a sizeable amount of money.

If you choose to negotiate a PILOT, the principles set forth in IGR 21-24 apply:

- The PILOT can only apply to the personal property portion of the facility;
- The PILOT’s purpose is not to provide a tax break, but rather to stabilize the projected revenue stream over the life of the agreement.

Some Things to Keep In Mind

Because the real estate value is a function of the Lease Fee Value you need a copy of the Lease.

Be realistic about the projected value of the reversionary interest:

- The Lease has a term of thirty (30) years and provides that at the end of term the facility has to be removed and the site returned to its pre-development state.
- The development of Battery Energy Storage Facilities is an emerging industry – it really should not be viewed as a power plant.

Some Things to Keep In Mind

A co-located BESS is really part of the value of the solar or wind facility to which it is co-located and should be valued as part of that facility.

The cost difference of a BESS that can store energy for 2 hours or 10 hours is basically the cost of additional Lithium-ion Battery Cabinets.

A valuation consultant can help inform your decision, but at the end of the day, it is really your judgment and experience that should be relied on to determine the assessed value.

Thank You!

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