T&D Planning Topics
(Including T&D Deferral)

Or, “How I Learned to Postpone Projects Without Worrying”

Marc Patterson, Senior Engineer

IDAHO POWER®
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Project Deferral

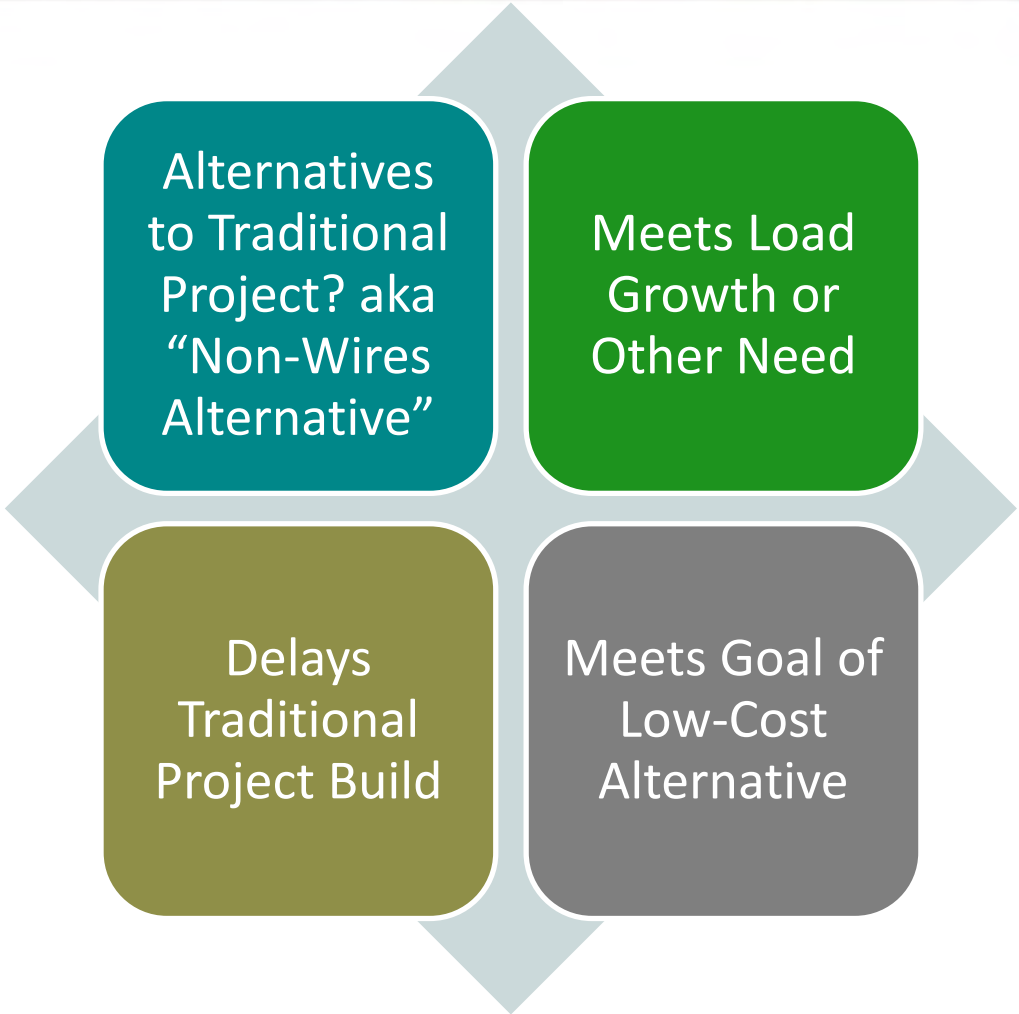
What is it?

When is it considered?

How is it implemented?

Projects Drivers & Solutions

- Planned load exceeds equipment capacity
  - Load growth
- Obsolete equipment
  - Additional functionality required
  - End of useful life
- Project solution based on need and long-term financial impact
  - Replace equipment (larger capacity, more functions, new life)
  - Additional equipment (move new load, add functions)



Project Alternatives

Cost-Benefit Analysis

Financial Impact to Postponed Projects

- Inflation increases costs of the delayed project
  - Wages and other expenses go up

INFLATION

- Future project's present worth is lower due to the cost of capital
- Delay in revenue requirement (cost of capital)
- Inflation is generally smaller than the cost of capital; net benefit to delay spending

PRESENT WORTH

Deferral Value

Project present worth (PW) costs:

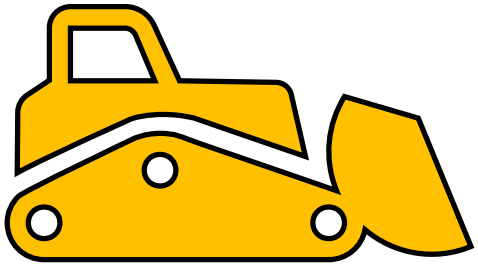
Based on need date and project cost

Deferred project PW costs:

Based on deferral date and future project costs

Deferral Value = Project PW Costs – Deferred PW Costs

What Projects Can't Be Deferred?



- **Bad candidates**
  - Replacement of damaged or obsolete equipment
  - Mandatory relocations (i.e., highway widening)
  - System additions for new customers
    - Line extension to new manufacturing facility
    - Line tap into new subdivision

What Projects Can Be Deferred?

- **Good candidates**
  - Growth projects
    - Dependent on growth rate (slower growth is better)
    - Dependent on load and energy profile

Filtering Potential Projects

Select	Select growth-driven projects for review
Identify	Identify additional drivers per project
Review	Review growth parameters driving project
Confirm	Confirm load and energy profile

Project Selection Steps

Timeframe	Determine desired deferral time period
Size	Select size of storage or storage + solar needed
Land	Determine potential for land and connection requirements
Load	Validate capability to meet critical loading needs

Example Project Review

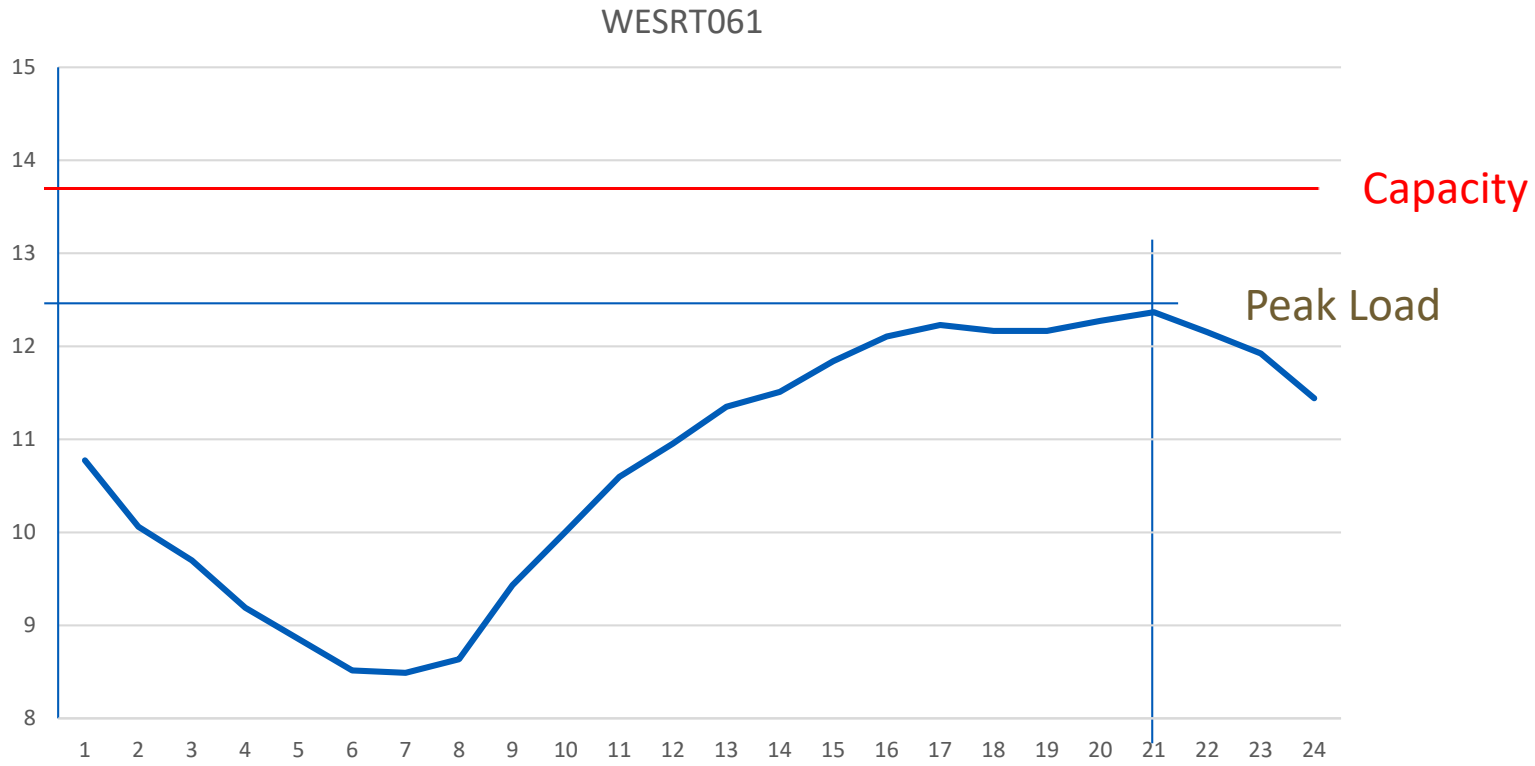
Peak occurs summer at 9 p.m.

Large single load added; otherwise, slow growth <0.85%

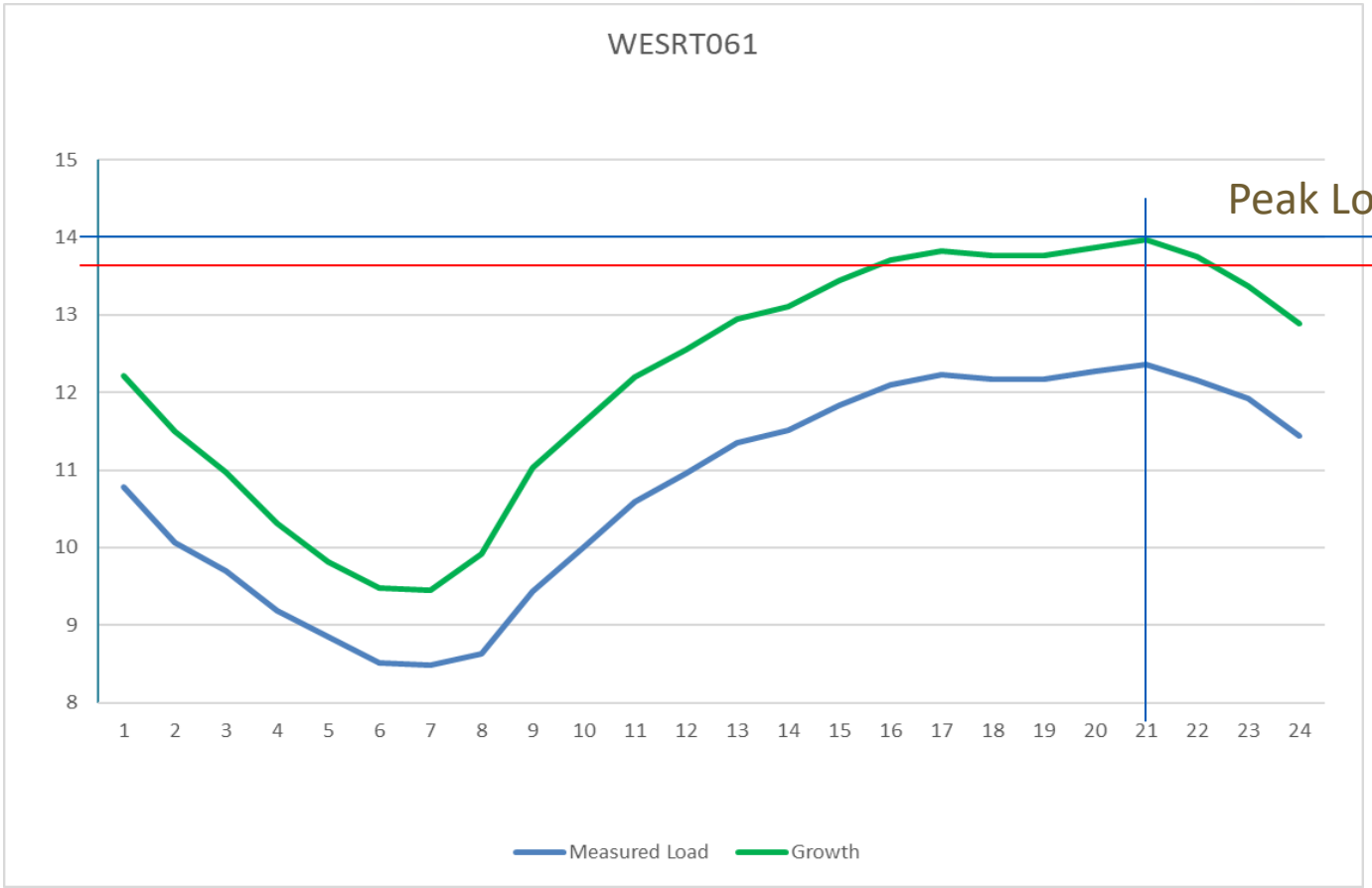
Land area available for storage

Project cost = $968,037 (in 2023 dollars)

Load Profile



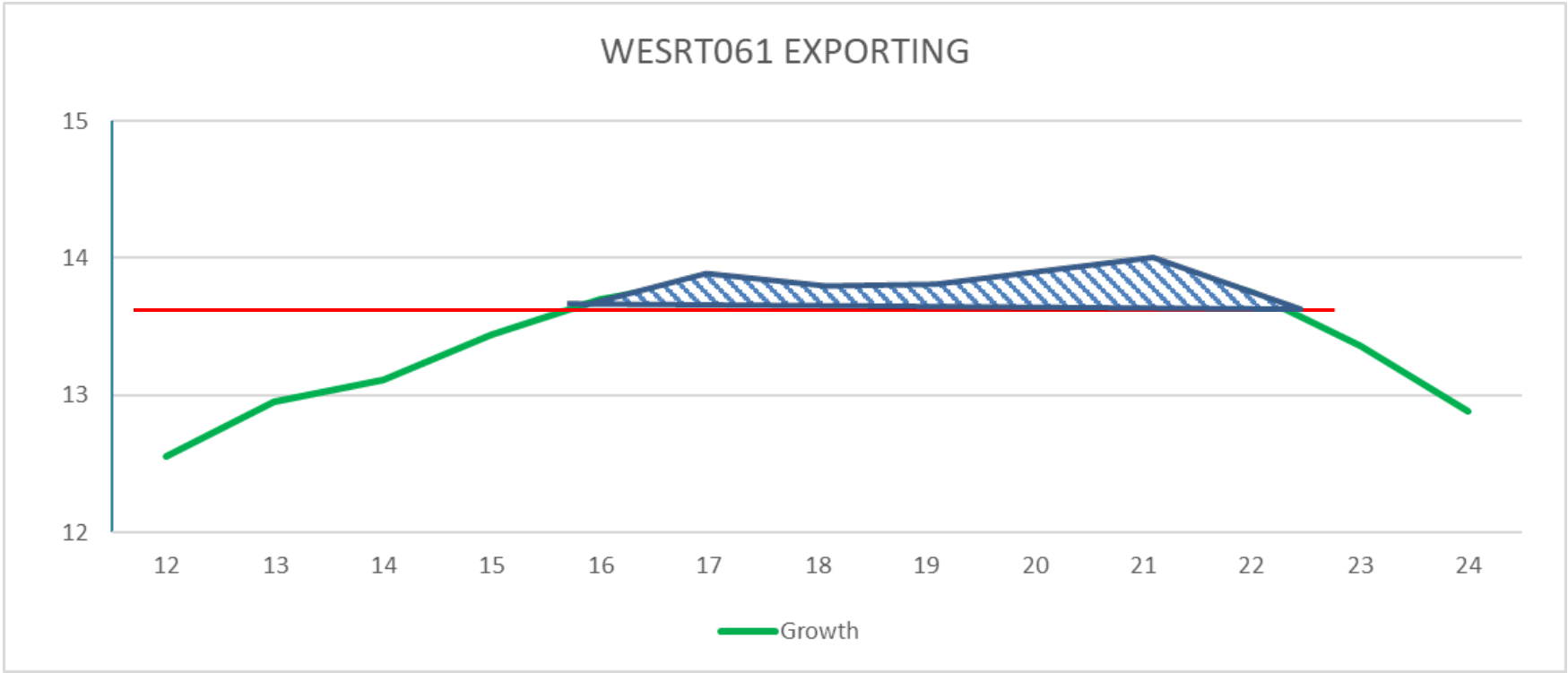
Load Profile



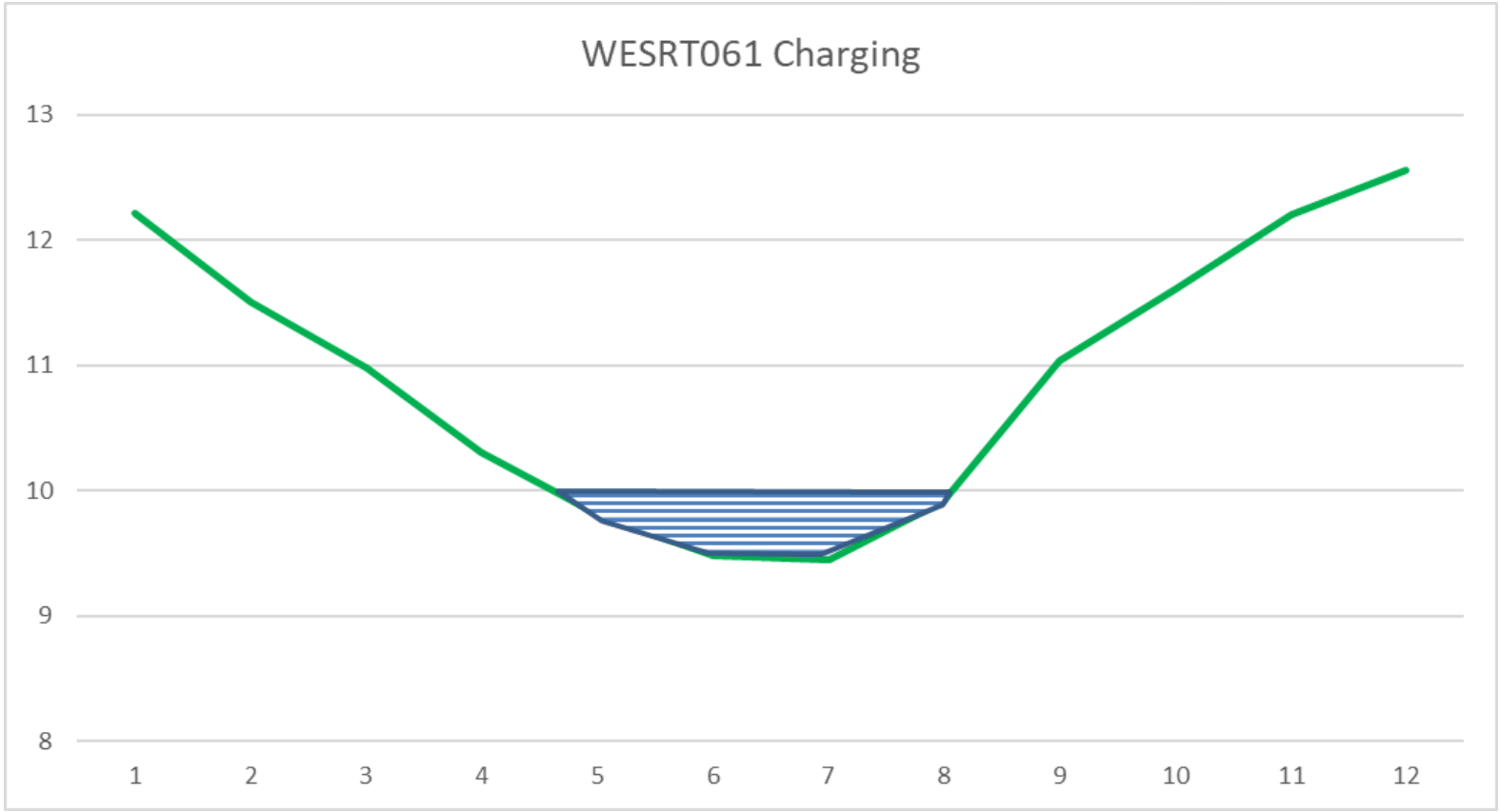
Peak Load

Capacity

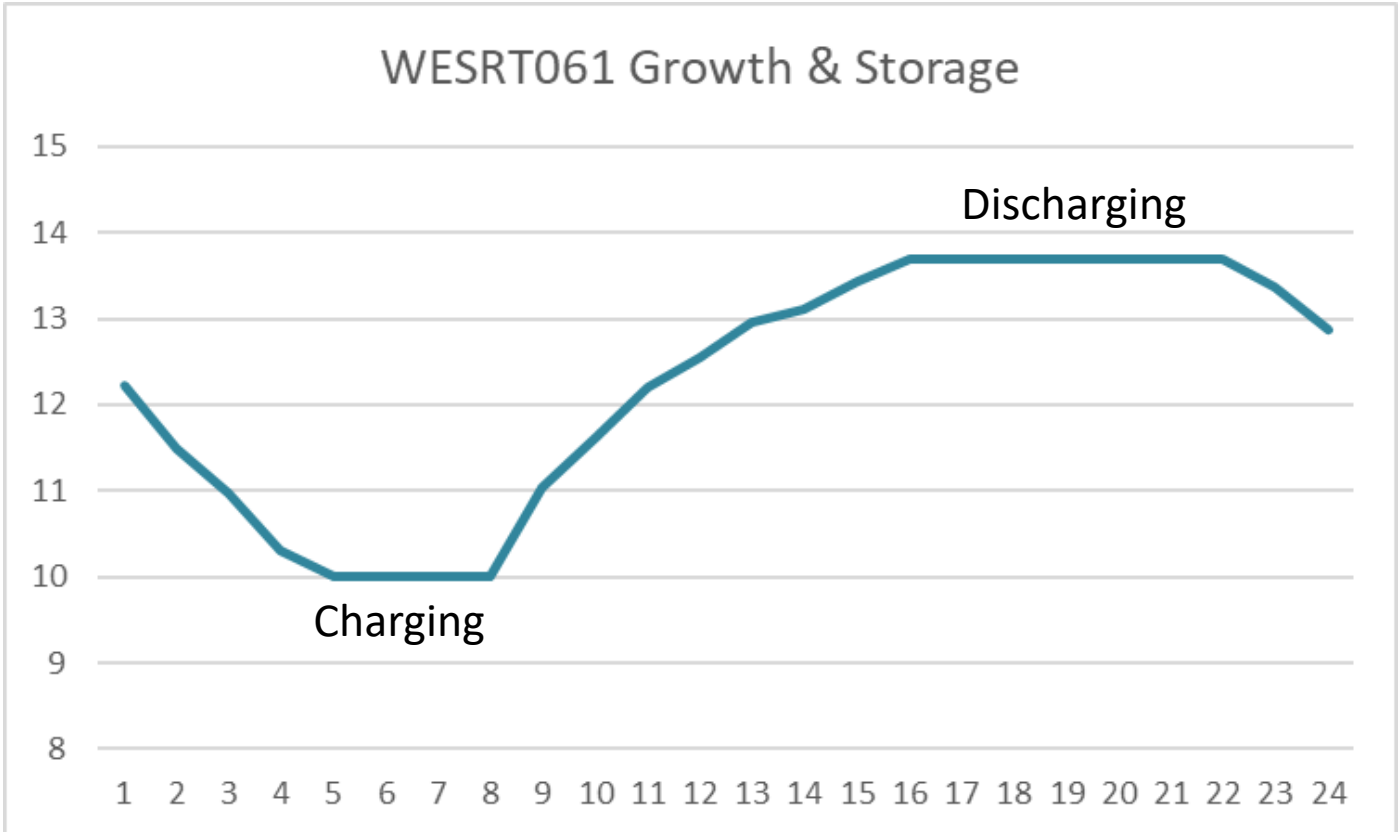
Storage Peak Shaving



Storage Recharging



Load Profile With Storage



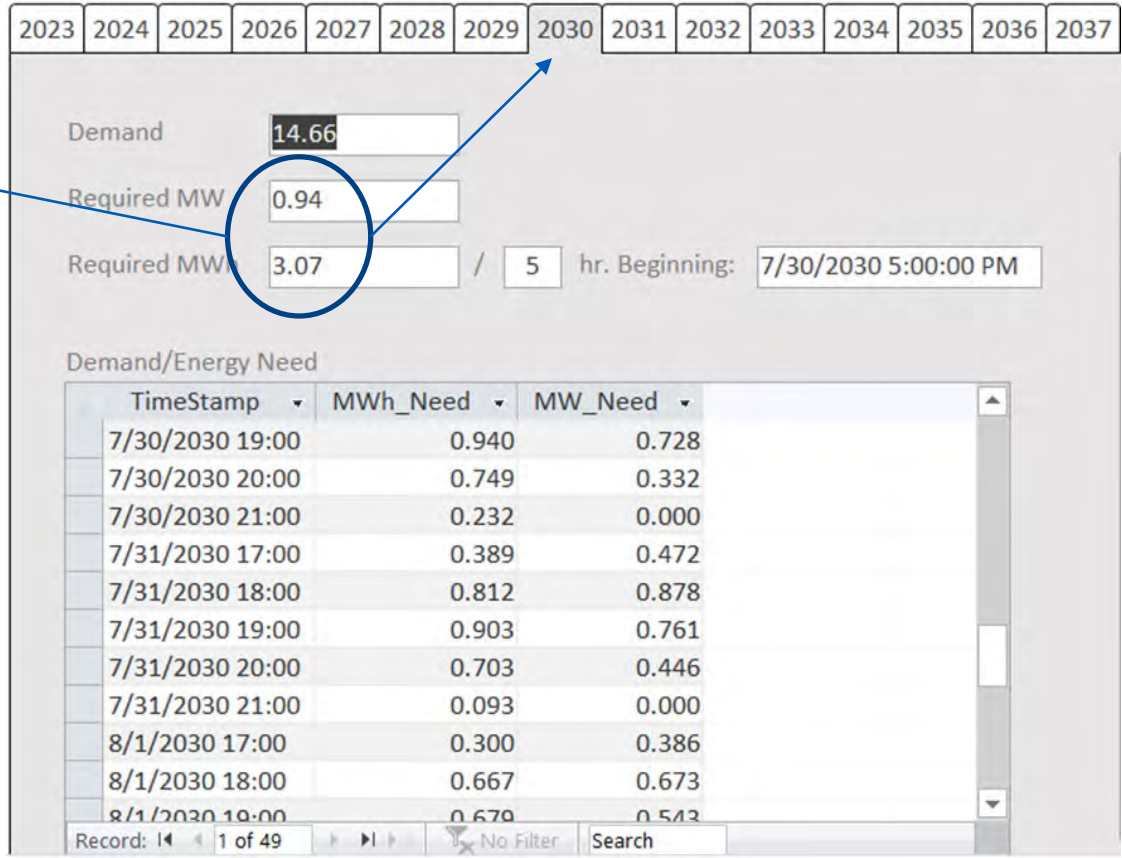
Deferral Timeline

- Estimate energy profile with load growth for future years
- Compare storage daily export/import energy required
  - Does the system have capacity to recharge storage?
  - Is storage capacity adequate for peak reduction required?
  - When is the system unable to fully recharge the storage?

- Future project need date determined by when load exceeds storage ability to prevent overload

Deferral Limit

- Storage – 0.96 MW; 4Hr (3.8 MWh)
- Compare storage daily export/import energy required for each year
- Establish project deferral date



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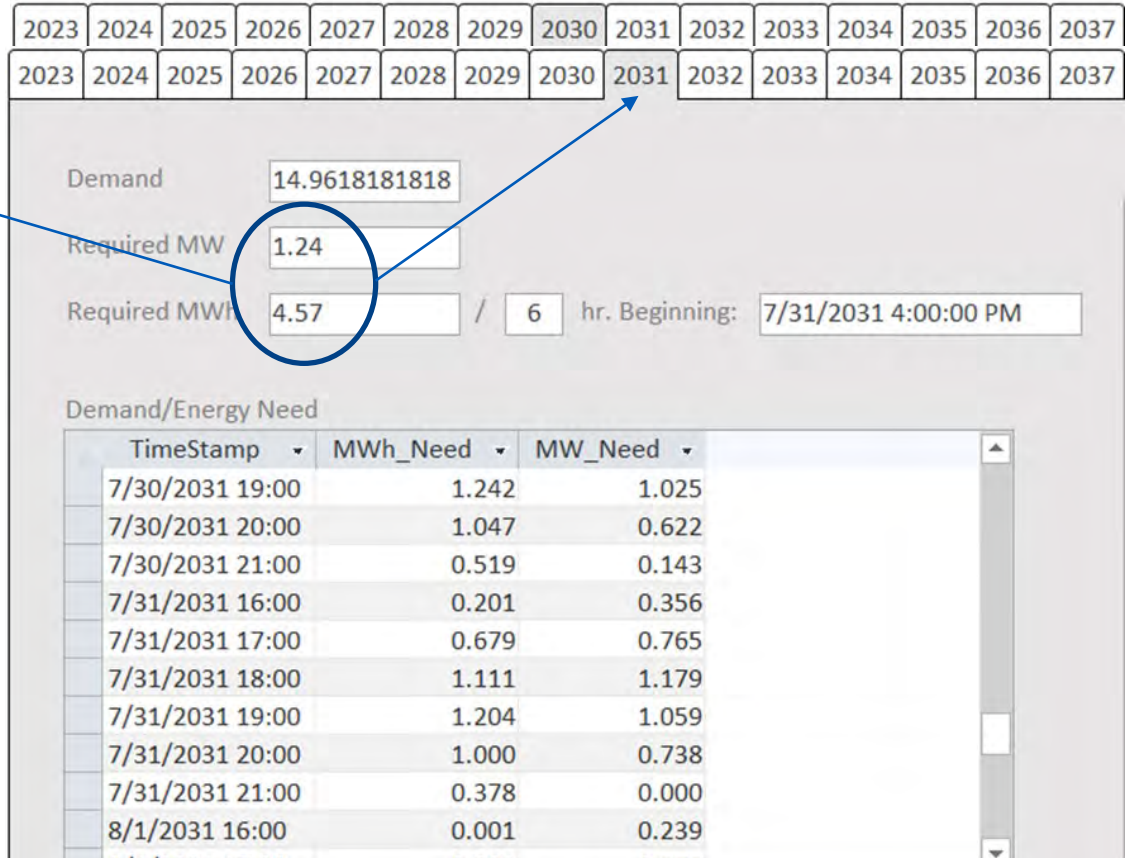


TimeStamp	MWh_Need	MW_Need
7/30/2031 19:00	1.242	1.025
7/30/2031 20:00	1.047	0.622
7/30/2031 21:00	0.519	0.143
7/31/2031 16:00	0.201	0.356
7/31/2031 17:00	0.679	0.765
7/31/2031 18:00	1.111	1.179
7/31/2031 19:00	1.204	1.059
7/31/2031 20:00	1.000	0.738
7/31/2031 21:00	0.378	0.000
8/1/2031 16:00	0.001	0.239

Deferral Value Example

A. Determine present worth (PW) of traditional project
B. Determine PW of deferred traditional project

Deferral value (2023 Dollars) = A – B

$968,037 - $668,342

Ability to defer WESRT061 project from 2023 to 2031

Deferral value PW (2023 Dollars) = $299,695

Other Potential Projects

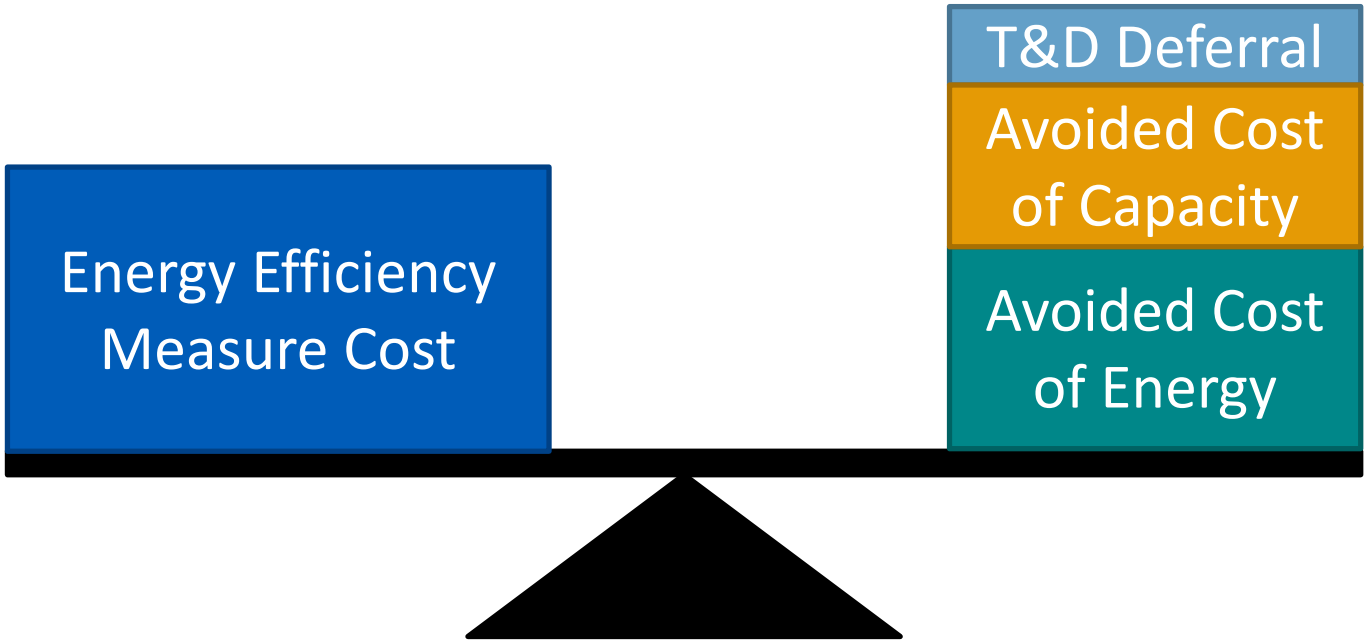
Year	Project Description	Battery Cost	Project Costs	Years Deferred	Deferral Value	Battery MW
2025	HDSP Transformer	$ 2,354,642	$ 1,622,984	5	$ 377,350	2.0
2026	HPVY Transformer	$ 11,595,761	$ 1,432,863	2	$ 143,916	10.0
2024	MDRS Transformer	$ 18,811,961	$ 1,985,397	2	$ 199,412	15.0
2025	STAR Transformer	$ 11,773,213	$ 2,318,548	3	$ 442,357	10.0
2023	STRD Transformer	$ 6,634,457	$ 1,834,918	3	$ 269,385	5.0
2023	WESR Transformer	$ 1,326,569	$ 968,037	8	$ 299,695	1.0

T&D Deferral Impact on IRP

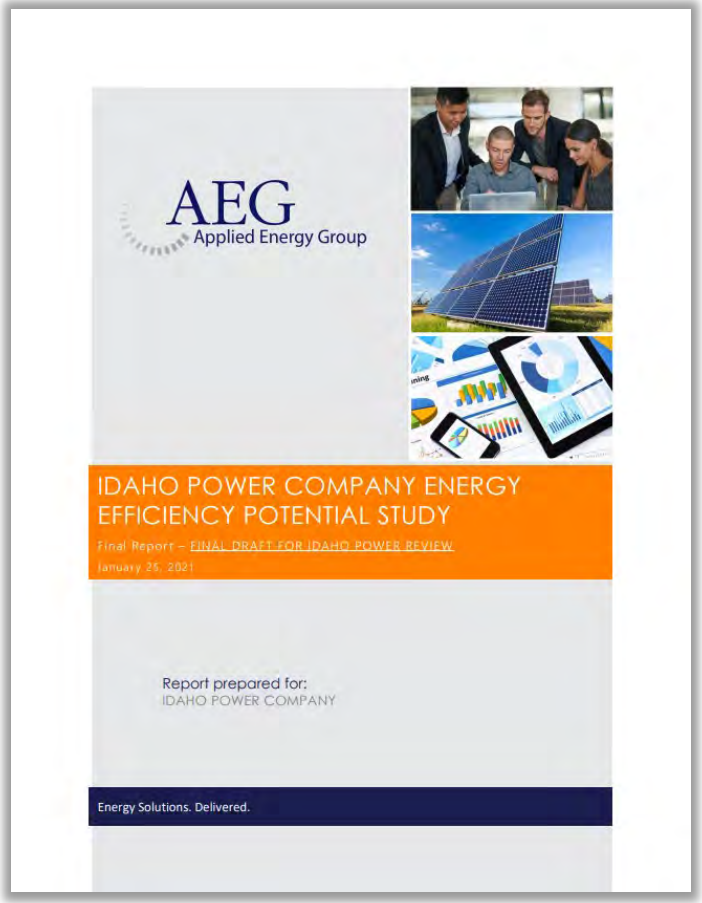
- If the IRP selects storage as a resource
  - The T&D deferral value at specific locations and dates will advise placement
    - Storage size limited to local area capacity
    - Yearly limits for number of locations
  - Storage costs will advise placement
    - Costs are size dependent (per megawatt cost, smaller projects > large projects)

T&D deferral value has the potential to lower the overall cost of storage.

T&D Deferral – Energy Efficiency



T&D Deferral – Energy Efficiency



Storage – Value Streams

Aurora Model

T&D Analysis

No Market

Arbitrage/Energy

T&D Deferral

Line Loss Reduction

Regulation Reserves

Frequency Regulation

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T&D Analysis

No Market

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Frequency Regulation

Solar Hosting Capacity

- Eventually a saturation point will be reached (similar to some areas in California)
- Steps that increase hosting capacity
  - Recent smart inverter settings requirement
  - Integrated volt var optimization
- Saturation does not limit demand forecast in current IRP