DOE Program Review and Use Case

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Howling Comet Energy Systems
4/3/2024
DOE’s Solar District Cup

- Gain Experience with Innovative Renewable Energy Design
- Develop Real-World Solutions
- Engage with Industry Professionals
- National Recognition
UT Dallas’ Goals

● Most Sustainable Research University in America
● “A responsible global citizen that enthusiastically attends to our duty to create a sustainable environment,”
● Platinum STARS Rating
Solar Plus Storage

- Ground-Mount, Rooftop, Carport, Parking Structure and Agrivoltaics
- EV DC fast chargers
- Fleet Electrification (F-150 Lighting)
- Energy Resilience (Backup Power)
- Prioritize Economic, Academic, and Reputational Value
Data Provided

- Campus Plans and Reports
- Load Data
- Authority Having Jurisdiction (Zoning)
- Electric Distribution Heatmaps
Software

- Aurora Solar
- HelioScope
- System Advisor Model
- ReOPT
- Solar PV Financial Models
Results

- 5 Main PV Sites
- Energy Storage as Backup-Only
- Input from Multiple Industry Professionals
- Comprehensive Report
## Financials

- Solar Financial Models
- SAM
- System Cost
- Construction loan
- Taxes
- Incentives
- PPA
- IRR
- Customer Savings

### Financials Table

<table>
<thead>
<tr>
<th>System Models</th>
<th>OWC (%)</th>
<th>AC (%)</th>
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</thead>
<tbody>
<tr>
<td>Construction Cost</td>
<td>$100,000</td>
<td>$90,000</td>
</tr>
<tr>
<td>Real Property &amp; Equipment</td>
<td>$20,000</td>
<td>$18,000</td>
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<tr>
<td>Projected Annual Cash Flow</td>
<td>$30,000</td>
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<tr>
<td>Construction Loan Amount</td>
<td>$120,000</td>
<td>$110,000</td>
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<tr>
<td>Construction Loan Rate</td>
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<tr>
<td>Construction Loan &amp; Operating Cost</td>
<td>$140,000</td>
<td>$130,000</td>
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<tr>
<td>Project Surcharges</td>
<td>$30,000</td>
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### System Costs

- Aggregate Capital Costs: $120,000
- Aggregate O&M & Warranty: $20,000
- Financial on Capital: $50,000
- Aggregate Development Costs: $40,000
- Site Plan Fees: $10,000
- Construction Loan Cost: $100,000
- Operating Cost: $20,000
- Aggregate Project Cost: $140,000

### Customer Conventional Power

- Utility Change in Sales: $20,000
- Demand Charge Reduction (kWh/Year): $3,000
- Annual Utility Bill Reduction (kWh/Year): $5,000
- kWh Conserved (kWh/Year): 30,000
- Contract Value (kWh/Year = Rented Capacity): $20,000

### MACRS Depreciation Information & Table

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<thead>
<tr>
<th>Year</th>
<th>MACRS Basis</th>
<th>Depreciation</th>
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Development Plan

- Zoning and Compliance
- Land Use
- Potential Complications
- Project Timeline
Design Philosophy

- Five total solar panel installations
- Carport, rooftop and ground mounted
- Balancing efficiency and public interest
Parking Lots A and B

- Size of 4.8 MW
- Priced around 3.50 per watt
- Designed to be public-facing
- Bifacial
Northeast Fields

- Size of 2.96 MW
- Most Economical System
- Single Axis Tracking
Rooftop Solar

- Green Hall, Admin building and Student Services Building
- 1.2 MW Between All 3
Questions?