HECSY
HIGHPOINT ENERGY CONTROL SYSTEMS

HECSY CONSULTING SERVICES

YOUR GUIDE TO CREATING A CUSTOMIZED RENEWABLE MICROGRID

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Phase One: Feasibility Study

THE INITIAL PHASE IN ASSESSING WHETHER YOUR PROPERTY/LOCATION CAN SUSTAIN A MICRO-GRID WOULD BE TO CONDUCT A FEASIBILITY STUDY

HECSY's Engineers Will:

- Assess and estimate your load through an energy analysis/audit
- Determine the appropriate size for onsite generation and storage solutions
- Examine the electrical system layout and identify necessary modifications to the current infrastructure for microgrid implementation
- Analyze system protection measures and metering capabilities
- Review existing control systems to ensure they are compatible with the new microgrid controller and outline an initial sequence of operations
- Formulate a conceptual strategy for making electrical system adjustments and incorporating distributed energy resources
- Estimate initial pricing on a rough order of magnitude basis
- Develop preliminary pro forma financial models

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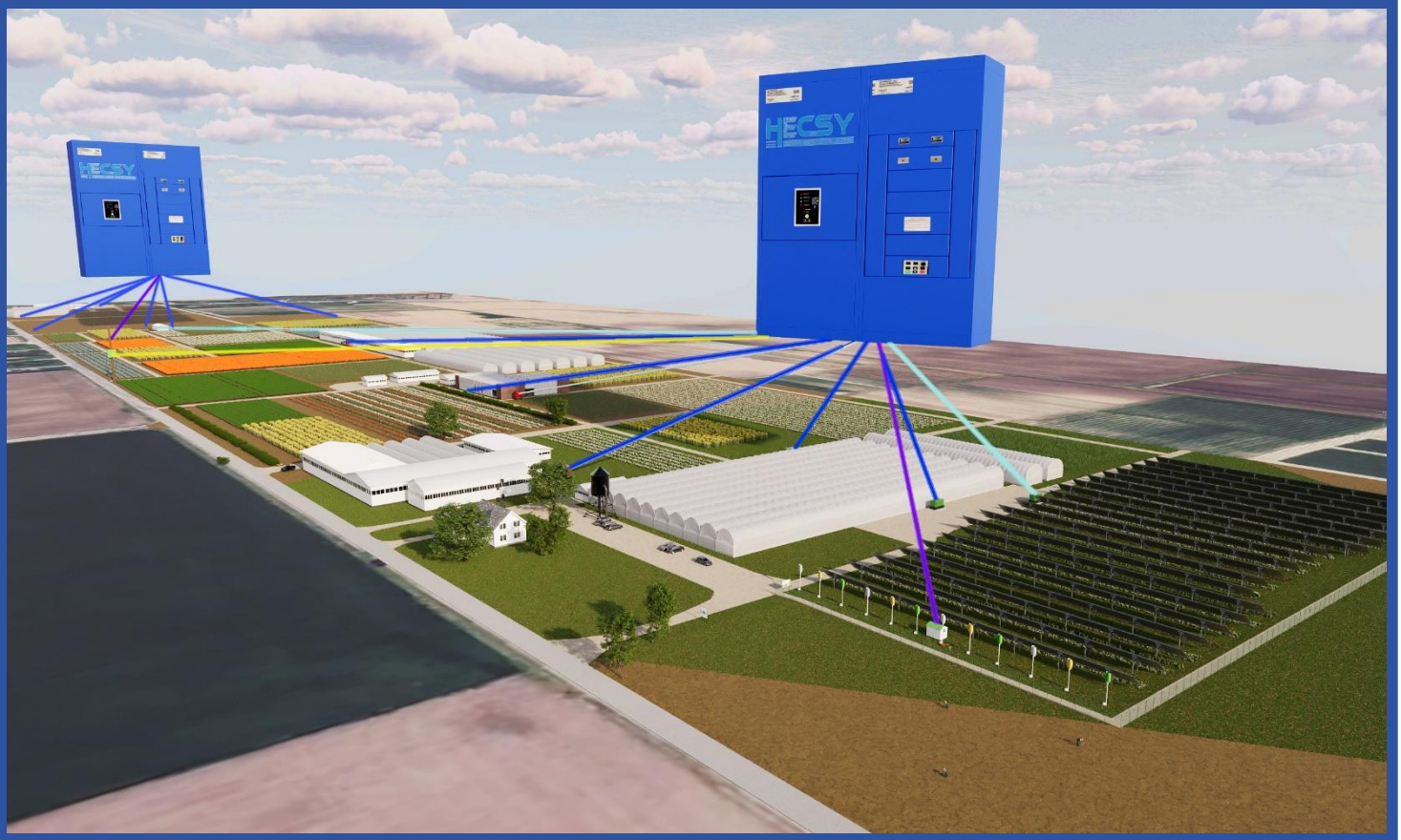
Phase Two: Project Design, Financial Analysis & Costs

HECSY PROVIDES YOU WITH A COMPREHENSIVE PRELIMINARY DESIGN, FINANCIAL ANALYSIS, AND MORE REFINED PROJECT PRICING

HECSY's Engineers & Analysts Will:

- Evaluate and analyze site loads.
- Record and assess the current electrical layout and related systems.
- Perform studies on short-circuit, coordination, arc flash, and load flow.
- Analyze and determine the proper sizing of on-site assets, including solar PV, battery energy storage, fuel cells, wind turbines, and generators.
- Design and integrate the microgrid electrical system with the existing electrical infrastructure, addressing grounding, protection, control, and civil engineering aspects.
- Develop designs for microgrid control systems and the topology of the communication network.
- Act as the Owner's Engineers and Consultants for utility interconnections, ensuring compliance with code requirements and permitting while creating detailed project pricing and analyzing ROI for the project.



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ADDITIONAL PROJECT ENGINEERING AND ANALYSIS

Projects utilizing a Battery Energy Storage System (BESS) as the primary source.

Battery Energy Storage System (BESS) Analysis

- Assesses the capabilities of the Battery Energy Storage System (BESS) under various conditions, including the energization sequence for site loads starting from a no-load state ("black start"), battery runtime in relation to loads, inverter overload thresholds, limits on real and reactive power, and current imbalance constraints.

This is for complex projects with multiple stakeholders and the need for technical oversight.

Design Assurance

- Skilled HECSY engineers will evaluate design packages at different stages of completion to ensure that microgrid system integration, functionality, and constructability align with requirements and project objectives.

Verification that designs comply with electrical codes and standards.

Evaluation of Distribution Infrastructure

- Identify the modifications needed for the current infrastructure to support a microgrid.
- Create a conceptual blueprint for making electrical system adjustments.

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Analyzing Automation and Control System Integration to Improve efficiencies

Evaluation of System Controls and Metering

- Evaluate the current metering hardware for protection control automation
- Design the network architecture
- Formulate a strategy to enhance digital connectivity between assets
- Review the existing control systems to ensure they are compatible with the new microgrid controller

To gain a clearer insight into current load types, their controls, and oversight.

Load Management Assessment

- Assess current loads, classify them, and establish their priority
- Analyze the current load control approach

HECSY will evaluate what is existing and recommend the path to energy modernization

MPS (Modernization, Performance, Safety)

- Create a comprehensive evaluation of the existing electrical infrastructure that outlines and records current performance
- Identify gaps in the safety and reliability of the power system.

Comprehending the functions of fault protection within current electrical systems.

Analysis of Short Circuits

- Calculate the fault current levels throughout the power system
- Compare interrupting duties of analyzed devices with the available fault currents

To gain a clearer insight into current load categories and their management.

Safety Equipment

- Assess the time-current coordination of the protective devices in the electrical system, such as relays, fuses, circuit breakers, and the equipment they serve.
- The final report will provide recommended settings for all adjustable devices.

HECSY STEP BY STEP PROCESS

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