Partner Operational Guide and Commercial Disclaimers

Tool: How long will Athena keep you online

This guide standardizes how international distributors and installation partners should utilize the "How Long Will Athena Keep You Online?" configurator during the sales process. It includes the tool's operational logic, execution recommendations, and mandatory commercial disclaimers to protect GoodWe and its partners from liability.

1. Deployment Format
   - The "How Long Will Athena Keep You Online?" tool is deployed as a lightweight, single-page web application. The tool is built using standard HTML, CSS, and JavaScript, allowing it to be embedded directly into the website without requiring external database connections.
   - The user interface utilizes a responsive grid design, featuring a dual-column layout for desktop viewing that automatically collapses into a single column on mobile devices. The left column serves as the control panel where users select their system specifications and appliances. The right column operates as the results dashboard, displaying the calculated power load, estimated runtime, and mandatory disclaimers.

2. Athena Energy Planner: Terms of Use & Legal Disclaimers
   1. **General Estimation & Environmental Variables**
      All projected backup runtimes are theoretical estimates provided strictly for illustrative purposes and do not constitute a binding performance guarantee. Actual available energy and system runtime will fluctuate based on local ambient temperatures, the exact charge and discharge rates, and the natural degradation of the battery chemistry over its lifespan. Furthermore, system power outputs may actively derate to protect internal hardware based on temperature extremes or the battery's current State of Charge (SOC).

   2. **Inverter Limit and Surge Disclaimers**
      Appliances equipped with electric motors (e.g., refrigerators, portable air conditioners, and power tools) require a temporary power surge to start up. This required startup surge can be two to three times higher than the appliance's officially listed running wattage. Even if the combined listed wattage of all connected devices remains below the maximum inverter limit, attempting to start multiple motor-driven devices simultaneously may trigger the inverter's overload protection mechanism, causing the system to shut down.

   3. **Medical and Life-Sustaining Equipment Exclusion**
      While this calculator includes common household devices for illustrative purposes, the ESA-Athena system is not designed, medically certified, or intended to serve as a primary or guaranteed backup power source for life-sustaining medical equipment (including, but not limited to, oxygen concentrators, ventilators, or critical-care CPAP devices). Users relying on electrical power for critical medical needs assume all inherent risks and are strongly advised to secure dedicated, medically certified backup power solutions.

   4. **Appliance Specification Variance**
      The electrical draw values utilized in the Athena Energy Planner are based on broad industry averages for common household items. Actual power consumption will vary depending on the

specific manufacturer, model, age, efficiency rating, and maintenance condition of the user's actual appliances.

5. **Professional Assessment Requirement**
   This digital planner is an estimation tool and does not replace a formal site survey or professional electrical assessment. Users must consult with a certified installer or qualified electrician to verify system sizing, electrical compatibility, and compliance with local building codes and safety regulations prior to purchase and installation.

6. **Limitation of Liability**
   By utilizing this tool, the user acknowledges that all outputs are theoretical estimates. GoodWe, PVBM, and its authorized distribution partners assume no liability for any direct, indirect, incidental, or consequential damages—including but not limited to food spoilage, data loss, financial loss, or personal injury—resulting from power interruptions or discrepancies between the calculator's estimated runtime and actual system performance in the field.

7. **Right to Modify**
   The manufacturer reserves the right to update the calculator's underlying logic, appliance averages, and system specifications at any time without prior notice as product engineering and industry standards evolve.

Technical Explanation & Calculation Methodology

The Athena Energy Planner utilizes a linear mathematical model to estimate your system's backup runtime. To maintain transparency, the underlying calculation logic and system parameters are detailed below.

The Core Equation

The tool calculates estimated runtime using the following fundamental formula:

$$\text{Estimated Runtime (Hours)} = \frac{\text{Total Battery Capacity (Wh)}}{\text{Total Continuous Load (W)}}$$

- **Total Battery Capacity (Wh):** Calculated by multiplying the number of selected battery modules by the baseline capacity of the chosen system (e.g., 3.0 kWh for the ESA-Athena S3). This figure is then multiplied by 1,000 to convert kilowatt-hours (kWh) into watt-hours (Wh).
- **Total Continuous Load (W):** The sum of the maximum running wattages of all appliances you have added to your scenario.

System Design Parameters

The calculator operates strictly within the hard-coded limits of the respective inverter hardware:

- **ESA Athena S3:** Maximum continuous inverter output is capped at 3,000 Watts. The baseline battery capacity is 3.0 kWh per module.
- **ESA Athena Original:** Maximum continuous inverter output is capped at 1,500 Watts. The baseline battery capacity is 1.92 kWh per module.
- **Overload Protection Logic:** If the calculated Total Continuous Load exceeds the maximum continuous output of the selected inverter, the tool simulates a protective system shutdown and sets the runtime to "0 Hours (Overload)".

Technical Assumptions & Boundary Conditions

To provide a baseline consumer estimate, this calculator utilizes an idealized, lossless mathematical model. Please note the following technical assumptions:

- **100% Depth of Discharge (DoD):** The calculation assumes the entire battery capacity is accessible. In field operations, a small percentage of capacity is held in reserve to protect long-term battery health.
- **Ideal Efficiency:** The formula does not deduct standard DC-to-AC conversion losses (typically 3% to 5%) or ambient inverter self-consumption.
- **Static Load Profiles:** The tool treats appliance power draw as a constant, flat rate. In reality, appliance power draw fluctuates dynamically based on internal cycles (e.g., a refrigerator compressor turning on and off).
- **Nominal Temperature:** All calculations assume an optimal ambient operating temperature of 25°C (77°F).

Critical Assessment & System Boundary Limits

To ensure safe operation and accurate financial planning, users must clearly understand the following physical and operational constraints:

- **Generation & Yield Constraints (Financial Impact):** Solar energy generation is strictly governed by geographic location, seasonal weather, and installation orientation. Balcony-mounted systems frequently encounter structural shading (from overhangs, railings, or adjacent buildings) and rarely achieve the optimal tilt of traditional rooftop solar. Consequently, actual energy yields—and the resulting financial savings—may be significantly lower than theoretical or idealized models.
- **Structural & Spatial Limitations:** The chosen installation site must be structurally capable of supporting the combined weight of the solar panels, mounting hardware, and the Athena energy storage modules. All installations must adhere to local wind-load ratings, balcony weight limits, and building safety codes.
- **Thermal & Environmental Boundaries:** The battery and inverter modules are engineered to operate within specific ambient temperature ranges. Installation in environments exposed to extreme direct sunlight or sub-freezing temperatures will trigger automatic thermal derating. This protective mechanism temporarily reduces power output and charging capabilities, which will impact both backup reliability and daily financial yield.
- **Regulatory & Grid Compliance:** Integrating a balcony solar-plus-storage system with a household electrical circuit is subject to regional regulations, utility interconnection policies, and Homeowner Association (HOA) or property management rules. Users are solely responsible for ensuring complete regulatory compliance prior to purchase and installation.