PRD: AR + AI Home Energy Site Survey Tool

Company	Base Power Company
Product	AR-Guided Home Energy Site Survey
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1. Overview

This document defines the product requirements for the AR + AI Home Energy Site Survey, a mobile-first web application designed to solve a critical bottleneck in the customer onboarding and installation pipeline for Base Power Company. The current manual site survey process and platform (Typeform) is our single largest driver of customer support contacts and a significant drag on operational velocity.

This initiative will replace the existing static Typeform form with an interactive, AR + AI guided experience. Our vision is a frictionless, self-service site survey that delights customers and reduces additional contacts. The application will intelligently guide homeowners through the process, ensuring high-quality data capture on the first attempt, thereby accelerating our ability to deploy batteries and serve customers.

2. About Base Power Company

[Base Power Company](#) is an Austin-based energy startup. We are the only energy provider that offers affordable electricity plans bundled with an affordable automatic home battery backup. Our company's mission is to provide customers with reliable, abundant, and affordable energy. By installing and managing a home battery system, Base can send energy back to the grid during peak demand, sharing the earnings to make backup power more accessible and affordable for homeowners.

3. Problem & Opportunity

The site survey is the primary data collection step required to qualify a home for a battery installation. Our current process relies on a static web form (Typeform) that places a high cognitive load on the user, resulting in frequent errors, poor-quality photo submissions, and a high-touch, iterative review cycle with our support team.

- **Business Impact:** This is the #1 driver of customer support contacts for Base (10x any other issue) and directly gates our operational throughput. As we scale, the operational cost of this manual review will become untenable.
- **User Impact:** The process is confusing and frustrating for customers, creating a poor initial experience and delaying the installation they are excited about.

- **Opportunity:** By building an intelligent, guided experience, we can dramatically improve data quality, reduce operational overhead, and create a differentiated, positive first impression for new Base customers.

4. Objectives & Measurement

The primary objective is to deliver a self-service site survey experience that is both effective and user-friendly.

Objective	Key Result	Target
Reduce Support Load	% of surveys completed without support follow-up (One shot site survey)	> 85%
Improve Data Accuracy	% of photos approved on first submission	> 95%

5. Target Customer

The target user is a new Base customer who has placed a deposit for a battery installation. This demographic is broad and consists primarily of homeowners aged 35-75. While some are tech-savvy, a large percentage are not. They are motivated to complete the process correctly but need clear, unambiguous guidance to do so successfully.

6. Brand & Design Guidelines

All design and UI elements must adhere to the official Base Brand Guidelines, which include specifications for colors, fonts, logo usage, and overall tone.

- **Brand Guidelines Document:** 📕 Base_brand_external.pdf

7. Product Requirements

To view the incumbent solution, you can navigate to the following URL and click through the Typeform.
- **Typeform link to existing site survey process**: Link

7.1. Onboarding

1. **Entry Point:** The experience is initiated from a unique link sent to the customer's email. The email address is the sole identifier; no user accounts or passwords are required.

7.2. AR + AI-Guided Capture Flow

1. **Guided Navigation:** The application will use the phone's camera and AR overlays to provide clear, step-by-step instructions, directing the user to specific locations (e.g., "Walk to your main electrical panel").
2. **Framing Assistance:** Visual cues (e.g., on-screen brackets) will guide the user to frame each photo correctly.
3. **[Stretch goal] Automated Capture:** The photo will be captured automatically when the framing, focus, and lighting conditions are met, minimizing user input. A manual shutter will be available.

The application will guide the user through a logical sequence of tasks to minimize movement and group related items.

Part 1: Exterior Meter & Space Assessment *(User is guided to the exterior wall with the electrical meter)*

1. **Photo: Electricity Meter (Close-up).**
   a. Example Validation
      i. Instruction: "Let's start with your electricity meter. Please get close enough so the numbers on it are clear and legible."
      ii. AI Validation Checks:
         ● Does the image contain an object that is identifiable as an electricity meter (circular or rectangular, with a glass/plastic cover and visible dials or digital display)?
         ● Is there visible text or numbers on the face of the meter? Is the image sharp and not blurry?
         ● Is the meter the primary subject, filling a significant portion of the frame?
2. **Photo: Area Around Meter (Wide Shot).**
   a. Example Validation
      i. Instruction: "Now, please take about 10 steps back from the wall and take a wide photo showing the entire area around the meter."
      ii. AI Validation Checks:
         ● Is the previously identified meter visible within a wider shot of a building's exterior wall?
         ● Does the image show the ground, the wall, and any potential obstructions like windows, doors, or other utility boxes near the meter?
3. **Photo: Area to the RIGHT of Meter.**

a. Example Validation
   i. Instruction: "Staying where you are, please pan your camera to the right and capture the wall and any open space next to the meter."
   ii. AI Validation Checks:
      - Does the image show an exterior wall and adjacent ground space? Is it different from the previous wide shot?

4. **Photo: Area to the LEFT of Meter.**
   a. Example Validation
      i. Instruction: "Great. Now, please pan to the left and capture the wall and space on the other side of the meter."
      ii. AI Validation Checks:
         - Does the image show an exterior wall and adjacent ground space? Is it different from the two previous shots?

5. **Photo: Adjacent Wall / Side Yard.**
   a. Example Validation
      i. Instruction: "Let's see the whole side of the house. Please take a photo from corner to corner to show the entire wall."
      ii. AI Validation Checks:
         - Does the image show a long expanse of an exterior wall, likely including a corner of the house?

6. **Photo: Area Behind Fence (Conditional).**
   a. Example Validation
      i. Instruction: "If there is a fence on this side of the house, please take a photo of the area behind it."
      ii. AI Validation Checks:
         - Does the image contain a fence?
         - Does the image show the space between the fence and the house wall?

Part 2: A/C Unit(s) *(User is guided to the exterior A/C unit(s))*

7. **Photo: A/C Unit Label.**
   a. Example Validation
      i. Instruction: "Please find the label on your A/C unit. We need a clear, close-up photo where the 'LRA' number is readable."
      ii. AI Validation Checks:
         - Does the image contain a metallic or paper label with printed technical specifications?

- Can the AI detect and read text on the label? Specifically, can it identify the acronym "LRA" or "RLA"?
- Is the label the primary subject of the photo?

8. **Photo: Second A/C Unit Label (Conditional).**
    a. Example Validation
        i. Instruction: "If you have a second A/C unit, please take a photo of its label as well. If not, you can skip this."
        ii. AI Validation Checks:
            - Same as step 7

Part 3: Main Electrical Panel *(User is guided to the main breaker box. Usually outside, in garage, or in closet)*

9. **Photo: Main Breaker Box (Panel Interior).**
    a. Example Validation
        i. Instruction: "Now, please find your main breaker box. Open the metal door and take a photo of all the switches inside."
        ii. AI Validation Checks:
            - Does the image show the inside of an electrical panel with multiple rows of breaker switches?
            - Is the entire set of breakers visible?

10. **Photo: Main Disconnect Switch (Close-up).**
    a. Example Validation
        i. Instruction: "Find the main switch, which is usually the largest one at the top. We need a clear, close-up photo of it to see the number on the switch (e.g., 100, 150, or 200)."
        ii. AI Validation Checks:
            - Does the image focus on a single, larger breaker switch, often labeled "Main"?
            - Is there a number (e.g., 100, 125, 150, 200) visible and readable on or near the switch?

11. **AI-First Data Entry: Main Disconnect Amperage.** The AI will attempt to read the amperage number (e.g., 100, 150, 200) from the photo of the main disconnect switch.
    a. **If successful:** The application will pre-fill the value and ask the user for confirmation (e.g., "We see your main switch is 200A. Is this correct?").
    b. **If unsuccessful or low confidence:** The application will prompt the user to enter the number manually.

12. **Photo: Area Around Main Breaker Box.**

          a. Example Validation
               i. Instruction: "Finally, please take a wide photo showing the area around the breaker box so we can see its location and any nearby obstructions."
              ii. AI Validation Checks:
                   ● Is the breaker box visible within a larger context (e.g., on a garage wall, in a closet)?

7.3. Real-Time Validation

1. **AI-Powered Checks:** On capture, an AI model will perform real-time validation to confirm:
   - **Object Correctness:** The photo contains the correct subject (e.g., a meter, not a mailbox).
   - **Image Quality:** The image is in focus and the labels are legible enough for human review.
2. **Feedback Loop:** The UI will provide immediate feedback:
   - **Success:** Positive confirmation and automatic advancement to the next step.
   - **Failure:** Specific, actionable feedback (e.g., "Image is too blurry. Please hold steady and try again.").
   - **Manual Override:** In case of repeated failure, the user must have an option to bypass the validation ("Use photo anyway").

7.4. Data Requirements

- The application must capture all items specified in the existing site survey checklist, including photos of the meter, A/C units, breaker box, and surrounding areas.
  - To see the existing site survey with all required photos: [Link](#)
  - To see a PDF of the above existing site survey typeform: [Link](#)

7.5. Submission & Data Access

1. **Final Review:** Users can review all captured images before final submission.
2. **Data Ingestion:** A single submission action transmits all data to the Base backend.
3. **API Access:** All survey data must be retrievable via a secure, internal API, keyed by customer email.

8. Technical Specifications

Category	Requirement

Project Type	Greenfield, designed for future integration.
Platform	**Mobile-First Web Application.** Native app (React Native) is a fallback, but only if absolutely necessary. If you believe that this can not be done using React + Next.js and other packages, contact JP (jp@basepowercompany.com) to discuss options.
Frontend	React / Next.js.
Backend	Next.js API routes, or Golang backend if necessary.
Database	PostgreSQL
File Storage	AWS S3
Cloud Platform	AWS
AI/ML	Any major provider (OpenAI, Google, Anthropic, etc etc.

Additional functional requirements

- A user must be able to go through the flow several times, and store data from each go.
  - [Stretch goal] A user should be able to pick up where they left off from a previous attempt

Additional non-functional Requirements

- Photos / data must be stored securely (trying to avoid a similar scenario to the Tea App Scandal), not on publicly accessible URLs

9. Out of Scope

- Integration with other internal Base systems.
- User accounts with passwords.
- Support for desktop browsers.

10. Success Criteria

1. **All required photos and data fields have been successfully captured and validated by AI.** This includes:
   - Electricity Meter (Close-up, Wide Shot, Left, Right, Adjacent Wall, and

Conditional Behind Fence)
- A/C Unit Label (including conditional second unit)
- Main Breaker Box (Panel Interior, Main Disconnect Switch Close-up)
- Successful AI-first data entry or manual confirmation of Main Disconnect Amperage
- Area around Main Breaker Box

2. **All captured data has been successfully recorded in a backend.**
3. **The survey data is retrievable via an internal API (securely), keyed by customer email.**
4. **The above criteria (1-3) is met when this tool is used on 10 different homes.**

11. Execution Plan

- **Development Timeline:** 1 week.
- **Stakeholders:** A dedicated technical stakeholder from Base Power Company will be available for the duration of the project. Please reach out with any questions during the development process. Our office is <5 minutes away from the Gauntlet AI offices, we are happy to come meet in person or to have you by the office.
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