Bradley.ai™

Product Requirements Document for Bradley.ai MVP

AUTHOR	STATUS	UPDATED	VERSION
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Problem

Commercial and Industrial (C&I) businesses face massive friction when evaluating Distributed Energy Resources (DER), with traditional feasibility studies taking months and costing tens of thousands in consulting fees.

The current DER feasibility analysis process is fundamentally broken:

- **Time-intensive:** Traditional studies require 3-6 months to produce preliminary (30%) designs
- **Capital-intensive:** Upfront consulting fees range from $25K-$100K+ before any real commitment
- **Opaque process:** "Black box" methodology with limited client visibility into analysis
- **Manual & error-prone:** Heavy reliance on manual data collection and spreadsheet-based calculations
- **Limited comparison:** Difficult to evaluate different technology and financing options side-by-side

This friction acts as a major barrier to DER adoption, delaying or preventing cost-saving and environmentally beneficial energy solutions from being implemented across the C&I sector.

Vision & Opportunity

Transform months of DER analysis into minutes of AI-powered insights, democratizing access to institutional-grade energy feasibility studies.

The market opportunity is substantial:

- **$280B+ DER market** projected by 2030 with increasing C&I adoption
- **Soft costs represent 40-60%** of total project development expenses
- **Growing regulatory pressure** for corporate decarbonization and ESG compliance
- **Energy resilience** becoming critical business continuity requirement

Core Value Proposition

"The first generative AI-powered Expert Agent SaaS solution that analyzes organizational energy consumption profiles and recommends highly optimized DER solutions in hours instead of months."

Target Use Cases

Primary: C&I Facility Owners/Operators

Who: Facility Managers, CFOs, Sustainability Officers, Business Owners

Goal: Reduce operational costs, meet ESG targets, improve energy resilience

Pain: "The DER evaluation process is a black box that takes months and costs too much upfront"

Secondary: Energy Analysts/Consultants

Who: Internal energy engineers, financial analysts, consulting partners

Goal: Efficiently manage project portfolios, deliver quality reports faster

Pain: "Manual data collection and custom financial modeling is repetitive and time-consuming"

Tertiary: Demo/Prospect Users

Who: Potential clients evaluating the platform

Goal: Understand platform capabilities without commitment

Pain: "Need to see the output quality before investing time in data entry"

Proposed Solution

An AI-powered, web-based SaaS platform that guides users through intelligent data collection and delivers institutional-grade DER feasibility studies with 30% conceptual designs and financial projections.

Top 3 MVP Value Props:

🔋 The Vitamin

Comprehensive DER system analysis covering solar, CHP, storage, fuel cells, and nuclear options with automated specifications and balance of plant design

💊 The Painkiller

Eliminate months of waiting and $50K+ consulting fees - get institutional-grade feasibility study in hours for fraction of traditional cost

💉 The Steroid

AI-powered recommendation engine analyzing thousands of system configurations with real-time financial modeling and decarbonization impact analysis

Core User Journey

Data Input → AI Analysis → System Design → Financial Model → Report Generation

Technology Stack

Frontend Framework
- React 18.2.0
- TypeScript 5.2.2
- Vite 5.2.0

UI & Styling
- Material-UI (MUI)
- Tailwind CSS 3.4.3
- React Icons

State & Routing
- React Context API
- React Router DOM 6.23.1
- js-cookie (persistence)

Development Tools
- ESLint
- Prettier
- React Toastify

Application Architecture

Presentation Layer: React Components + MUI + Tailwind CSS

State Management: Context API + Specialized Form Contexts

Routing & Navigation: React Router + Role-based Access Control

Data Persistence: Cookie-based Session + Future Backend Integration

Future Backend: AI Analysis Engine + File Storage + Database

Goals & Success Metrics

GOALS	SIGNALS	METRICS	TARGETS (Y1)
User Engagement	Users complete workflow	Funnel completion rate Time to complete workflow	>75% completion rate <60 minutes average
Business Adoption	Active paying customers	Monthly active domains Demo-to-client conversion	>500 active domains >15% conversion rate
Platform Utilization	Report generation volume	Reports generated/month Repeat usage rate	>1000 reports/month >40% repeat usage
Customer Satisfaction	User feedback quality	Net Promoter Score Support ticket volume	NPS >50 <5% users need support

Requirements

Requirements are organized by critical user journeys for the Client workflow (primary use case):

Authentication & Access Control

PRIORITY	REQUIREMENT	DESCRIPTION
P0	Multi-role Authentication	Support Client, Analyst, and Demo user types with role-based routing
P0	Credential-less Demo Access	Immediate demo access via single button click on login page
P0	Session Persistence	Maintain user session and workflow progress across browser sessions
P1	User Registration	New user signup with email validation

Client Workflow - Data Collection Journey

STEP	PRIORITY	KEY REQUIREMENTS
1. Organizational Profile	P0	Company details, industry, annual energy spend, facility operations, address collection
2. Energy Profile	P0	Electric/gas bill upload, interval data handling, LOA generation, thermal needs assessment
3. Goals & Priorities	P0	Priority ranking (financial vs. environmental), investment goal setting
4. Site Assessment	P0	Location confirmation, site characteristics, solar suitability, drawing uploads
5. Financial Information	P0	Ownership preference (Own vs. Third-party PPA), financing options, existing contracts
6-7. Processing	P0	Data verification status, analysis progress indicators
8. Recommendations	P0	Interactive visualizations, financial projections, downloadable reports

Navigation & Progress Management

PRIORITY	REQUIREMENT	DESCRIPTION
P0	Visual Progress Tracking	Sidebar showing all 8 steps with completion status and current position
P0	Sub-step Navigation	Horizontal stepper showing sub-steps within current main step
P0	Non-linear Navigation	Users can click back to any previously visited step
P0	Conditional Branching	Dynamic form routing based on ownership preference selection
P1	Progress Persistence	Save user progress at each step completion

Analyst Dashboard

PRIORITY	REQUIREMENT	DESCRIPTION
P0	Project Overview	Dashboard showing all client projects with status and progress
P0	Project Management	Detailed project view with client data and analysis controls
P1	Resource Library	Shared documents and tools for analysts
P1	Account Settings	Analyst profile and preference management

Demo Experience

PRIORITY	REQUIREMENT	DESCRIPTION
P0	Standalone Demo	Completely isolated demo workflow with no dependencies on client data
P0	Interactive Preview	Editable table with real-time graph updates showcasing analysis capabilities
P1	Demo-to-Client Conversion	Clear call-to-action to transition from demo to full client signup

Non-Goals

- **Detailed Engineering Design:** Platform provides 30% conceptual designs, not final engineering drawings
- **Project Financing:** Financial projections only; not a financing marketplace or lender platform
- **Construction Management:** Analysis and recommendation only; no project execution tools
- **Multi-site Portfolio Management:** Single facility focus for MVP; portfolio features in future releases
- **Real-time Energy Monitoring:** Feasibility analysis tool, not an operational energy management system

Future Backend Integration Points

While the current implementation is frontend-heavy, the following backend services will need integration:

🔐 Authentication Service

Replace hardcoded credentials with secure user management, JWT tokens, and password recovery

💾 Data Persistence Layer

Database integration for storing user profiles, project data, and analysis results

📁 File Storage Service

Secure upload and storage for utility bills, site drawings, and generated reports

🤖 AI Analysis Engine

Core AI service for DER system optimization, financial modeling, and report generation

Appendix

Technical Considerations

- **Performance:** Lazy loading of step components to minimize initial bundle size
- **Accessibility:** MUI components provide WCAG compliance foundation
- **Browser Support:** Modern browsers with ES2018+ support
- **Responsive Design:** Mobile-first approach with Tailwind CSS utilities