

# ATTORNEY INVENTION DISCLOSURE PACKET

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## 1. INVENTOR INFORMATION

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- **Citizenship:** United States of America
- **Are there any co-inventors?** No

## 2. TITLE OF INVENTION

**Battery Internet Network (BIN™) — Wireless Energy Network Architecture for Authenticated, Metered, and Policy-Controlled Power Distribution**

*Working Title:* B.I.N.™ (Battery Internet Network) *Technical Subtitle:* Wireless Energy Network Architecture for Authenticated Power Distribution *Prepared for:* Courtland White

## 3. PURPOSE OF THE INVENTION

The BIN™ system solves the critical problem of residential power loss during catastrophic grid failures (e.g., storms, rolling blackouts, infrastructure failure). Traditional solutions (gas generators, whole-home solar/battery systems) are prohibitively expensive for many households, require maintenance, or rely on fuel supply chains.

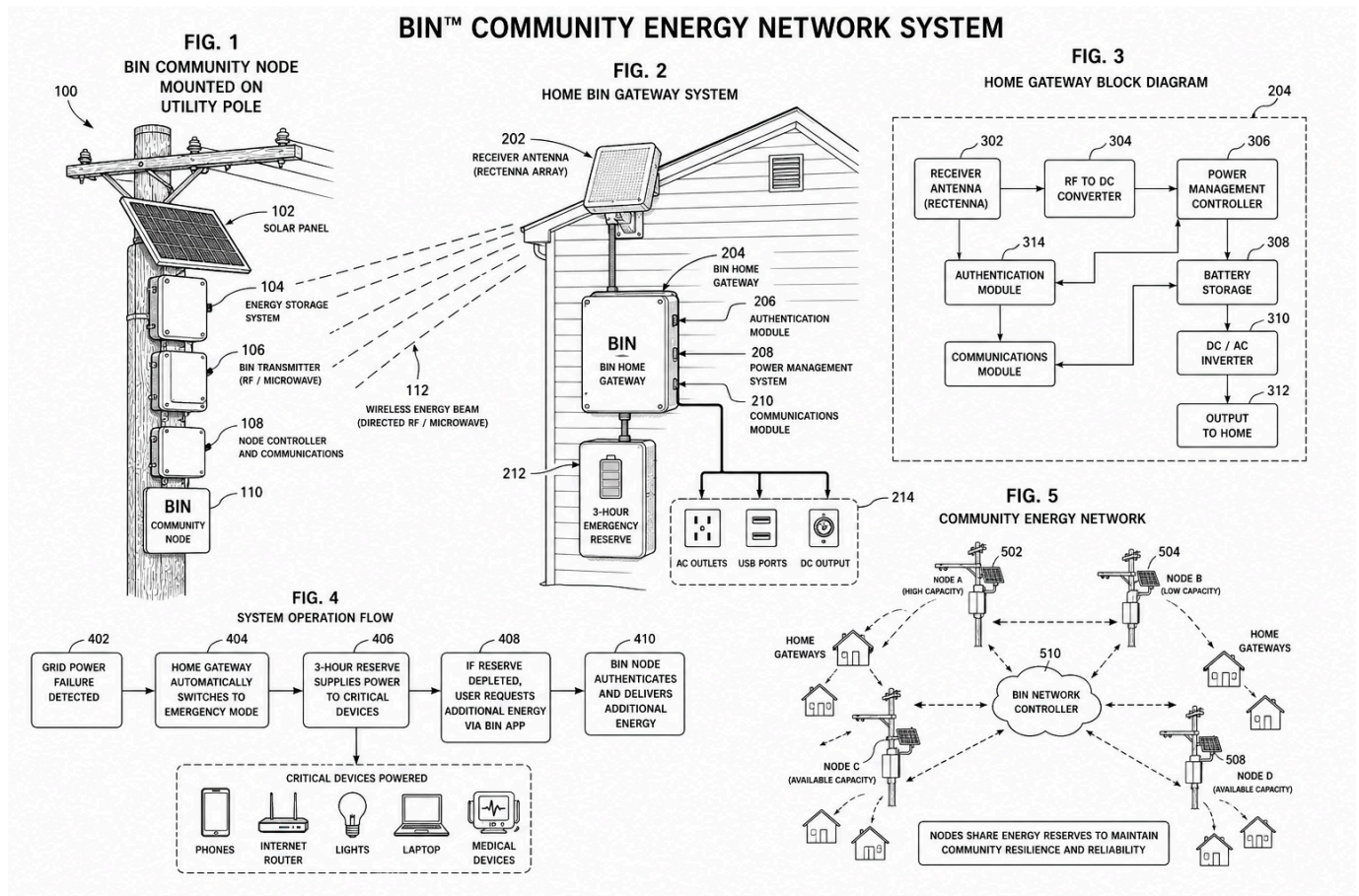
BIN provides a decentralized, neighborhood-level emergency power mesh network. It utilizes utility-pole-mounted solar/battery hubs that wirelessly beam directed RF/microwave energy to home-mounted rectennas during grid outages. This system ensures homes have sufficient power for critical devices (communications, lighting, medical equipment) without the need for large, expensive on-site battery installations.

## 4. DETAILED DESCRIPTION OF THE INVENTION

### 4.1 Description of Drawings

The following patent drawings illustrate the core architecture, operational flow, and safety mechanisms of the BIN™ system.

## Part 1: System Architecture and Operation

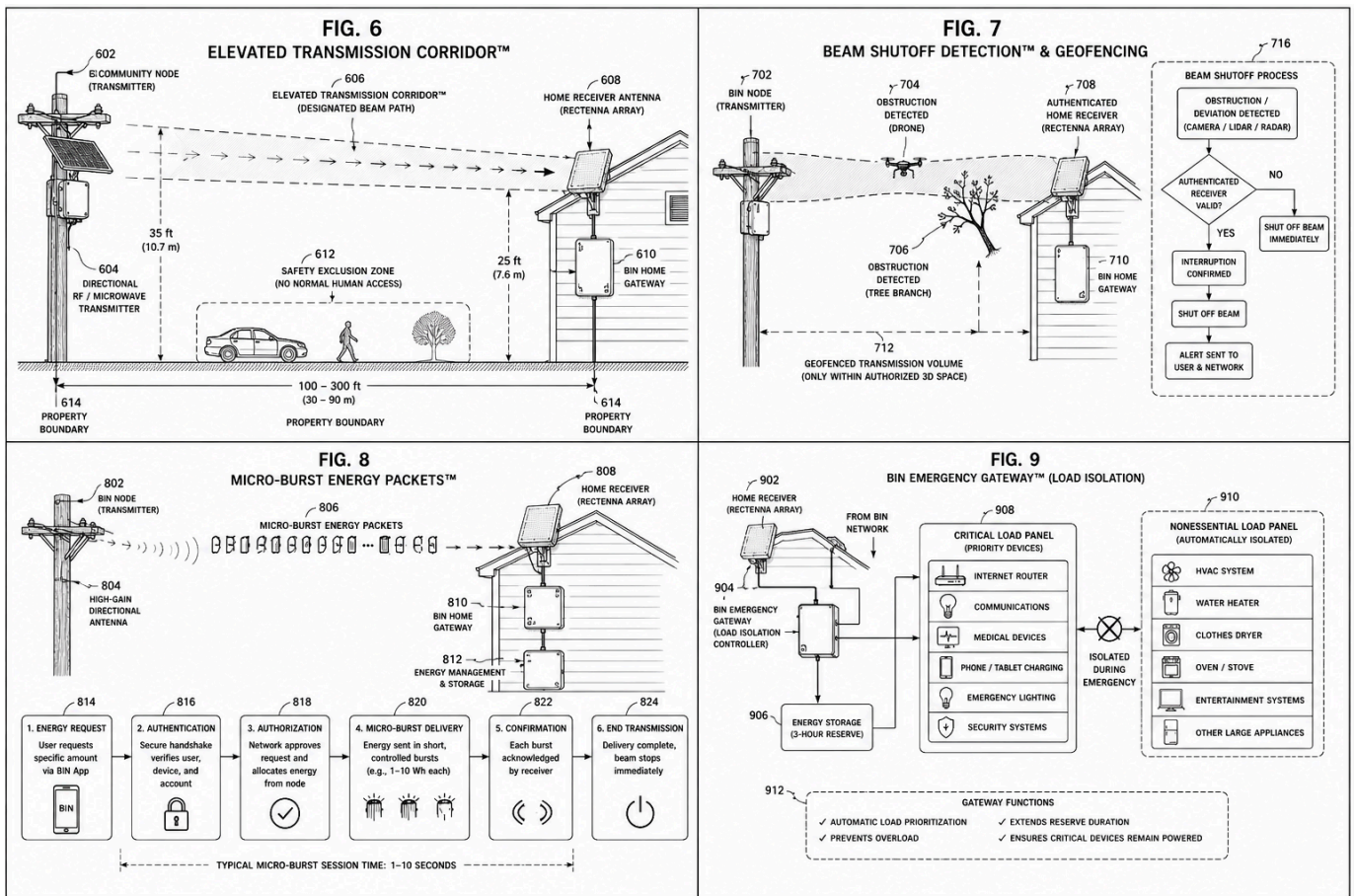


- FIG. 1 - BIN Community Node Mounted on Utility Pole:** Illustrates the primary energy generation and transmission hub, including the solar panel array (102), energy storage system (104), directed RF/microwave transmitter (106), and node controller (108) mounted on an existing utility pole.
- FIG. 2 - Home BIN Gateway System:** Depicts the residential installation, showing the roof-mounted rectenna array (202) receiving the wireless energy beam (112), connected to the Home Gateway (204) and the 3-hour emergency battery reserve (212), which powers critical AC/USB/DC outlets (214).
- FIG. 3 - Home Gateway Block Diagram:** A schematic showing the internal flow of the Home Gateway, detailing how the rectenna (302) feeds the RF-to-DC converter (304), managed by the power controller (306), stored in the battery (308), and inverted to AC (310) for home output, all secured by the authentication (314) and communications (312) modules.
- FIG. 4 - System Operation Flow:** A flowchart outlining the automated response to a grid failure (402), switching to emergency mode (404), utilizing the local reserve (406), and authenticating and delivering additional energy via the BIN app (410) if the reserve is depleted.

and requesting (408) and receiving (410) additional wireless energy via the BIN App.

- **FIG. 5 - Community Energy Network:** Illustrates the macro-level decentralized mesh network, showing how the cloud-based BIN Network Controller (510) manages energy sharing between high-capacity nodes (Node A) and low-capacity nodes (Node B) to maintain resilience across multiple home gateways.

## Part 2: Safety and Operational Protocols

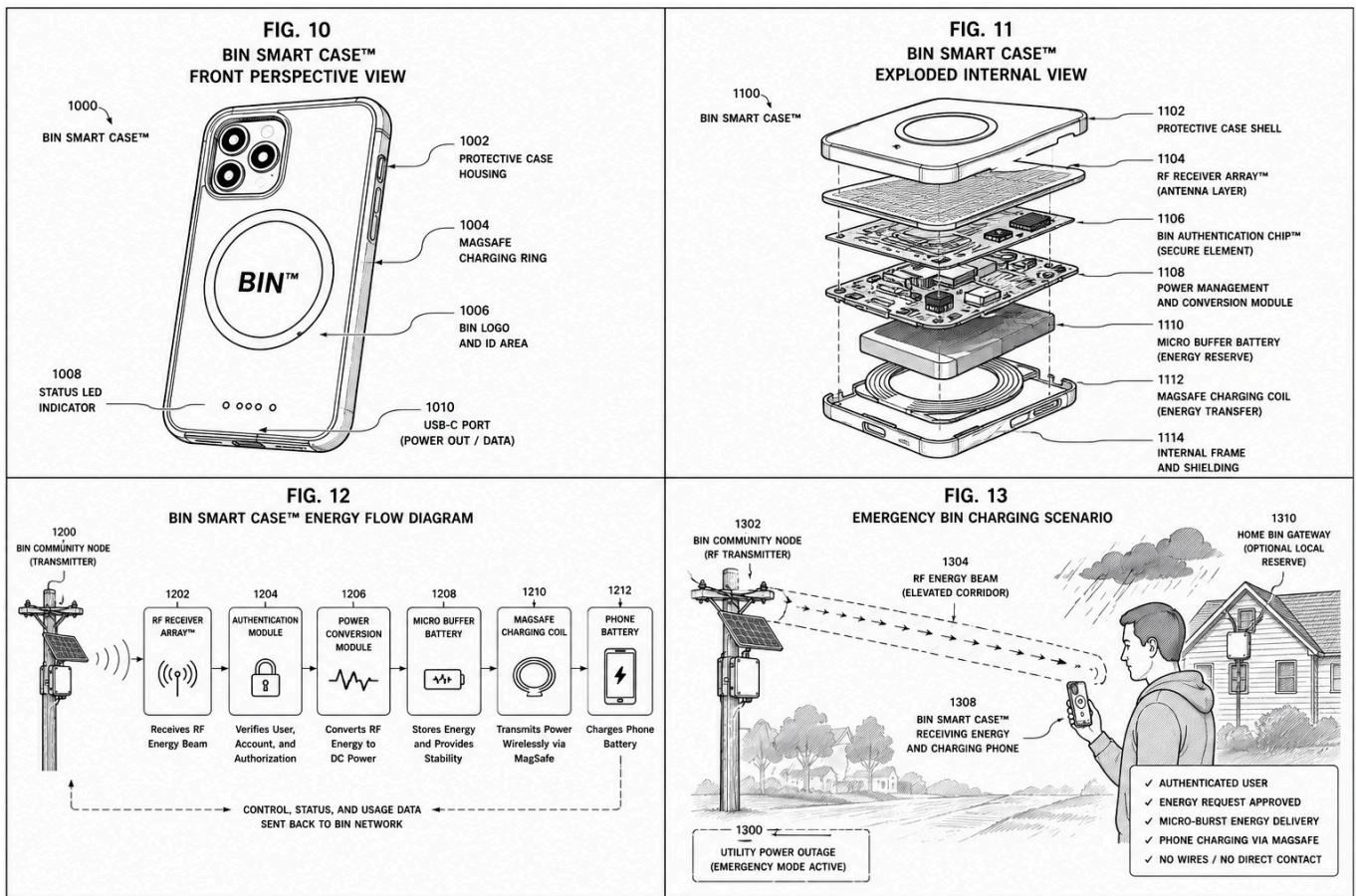


- **FIG. 6 - Elevated Transmission Corridor™:** Illustrates the designated beam path between the utility pole transmitter (at approx. 35 ft) and the home receiver (at approx. 25 ft). This elevation creates a safety exclusion zone, ensuring the energy beam travels safely above normal human access, vehicles, and property boundaries.
- **FIG. 7 - Beam Shutoff Detection™ & Geofencing:** Details the safety protocol where any obstruction (e.g., a drone or falling tree branch) entering the geofenced transmission volume triggers an immediate cessation of the energy beam. The flowchart outlines the logic: if an obstruction is detected or the receiver is invalidated, the beam shuts off instantly.
- **FIG. 8 - Micro-Burst Energy Packets™:** Depicts the sequence of energy delivery. Instead of continuous transmission, energy is sent in short, controlled bursts (packets)

following a strict authentication and authorization handshake via the BIN App, minimizing active RF exposure time.

- **FIG. 9 - BIN Emergency Gateway™ (Load Isolation):** Shows the electrical architecture at the home. The BIN Gateway intercepts the incoming wireless power and routes it *only* to a critical load panel (internet, medical devices, emergency lighting), automatically isolating nonessential, high-draw appliances (HVAC, water heaters) during an emergency.

### Part 3: BIN Smart Case™ — Wireless Energy Receiving Phone Case



- **FIG. 10 - BIN Smart Case™ Front Perspective View:** Depicts the exterior of the BIN Smart Case™ (1000), a protective phone case housing (1002) featuring a MagSafe charging ring (1004), BIN logo and device ID area (1006), status LED indicator (1008), and USB-C pass-through/data port (1010). The case requires no modification to the user's phone.
- **FIG. 11 - BIN Smart Case™ Exploded Internal View:** Illustrates the layered internal architecture of the case (1100), including the protective case shell (1102), RF Receiver Array™ antenna layer (1104), BIN Authentication Chip™ secure element (1106), power management and conversion module (1108), micro buffer battery energy reserve



- **FIG. 14 — BIN Indoor Modem™:** Depicts the wall-mounted indoor energy access point (1402) with its status indicator panel (1404). The internal architecture consists of four modules: the RF Energy Transmitter (1410) responsible for energy packet distribution; the Authentication Processor (1412) for identity and access verification; the Energy Packet Controller (1414) managing burst timing and allocation; and the Network Interface (1416) providing BIN network connectivity. The BIN Indoor Modem functions as a Wi-Fi access point analog — but instead of transmitting internet data packets, it transmits authenticated **Energy Packets™** to BIN Smart Case™ devices within its coverage zone.
- **FIG. 15 — Stadium BIN Hot Spot Network:** Illustrates the deployment of multiple BIN Indoor Modems throughout a stadium venue, creating overlapping **BIN Charging Zones™**. Hot spots are positioned at the Scoreboard (1502), Section B Upper Level (1506), Section C VIP Lounge (1508), Food Court (1510), and Main Entry (1512). Each hot spot creates a designated coverage zone (energy area), with the concourse and public areas served by overlapping coverage. Premium zones (VIP Lounge) provide larger coverage radii and higher energy allocations for premium subscribers.
- **FIG. 16 — BIN Smart Case™ Charging Sequence:** A five-step sequential flow diagram illustrating the complete energy delivery process in a BIN Hot Spot environment: (1) **Authentication** — the BIN Indoor Modem verifies user identity, subscription, and access rights; (2) **Energy Packet Allocation** — the modem allocates energy packets based on user priority and available capacity; (3) **Burst Transmission** — the modem transmits controlled micro energy bursts in short intervals to reduce RF exposure and improve efficiency; (4) **BIN Smart Case Receives Packets** — the BIN Smart Case™ captures and converts energy packets to DC power; (5) **Device Charging** — converted power is wirelessly delivered via MagSafe to charge the phone battery.
- **FIG. 17 — Emergency Evacuation Hub (Stadium Mode):** Depicts the stadium operating in full emergency mode following a power grid failure. Three designated **BIN Safe Zones™** (Safe Zone A, Safe Zone B, Safe Zone C) are established throughout the venue, each served by a BIN Indoor Modem operating on battery/solar backup. Emergency services provided include device charging, emergency alerts, public announcements, information center access, and family communication. A dedicated BIN Charging Station is visible, with citizens actively charging devices and receiving emergency information. The tagline “Power. Connectivity. Safety. Anytime. Anywhere.” encapsulates the dual-use value proposition of the BIN infrastructure.

## 4.2 Core Components

The system consists of the following primary sub-systems:

1. **BIN Community Node:** A hardware unit mounted on existing utility poles. It includes a solar panel array (102), an energy storage system/battery (104), a directed RF/microwave transmitter (106), and a node controller/communications module (108).
2. **BIN Home Gateway System:** Installed at the residential user's property. It features a receiver antenna/rectenna array (202) mounted on the roof/exterior, which connects to the BIN Home Gateway (204). The gateway includes an authentication module (206), power management system (208), and DC/AC inverter (310).
3. **Emergency Reserve Unit (BIN Emergency Gateway™):** A small, 3-hour emergency battery reserve (212) attached to the Home Gateway. Crucially, this gateway isolates critical loads (medical equipment like CPAPs, internet routers, phone charging, and emergency lighting) rather than feeding the entire home's electrical panel. This load-isolation keeps the required power levels for wireless transmission low and safe.
4. **BIN Network Controller:** A cloud-based or decentralized control layer (510) that manages the community mesh network, allowing nodes with excess capacity to wirelessly share energy reserves with depleted nodes to maintain community resilience.
5. **BIN Indoor Modem™ (BIN Hot Spot):** A wall-mounted or ceiling-mounted indoor energy access point that functions as a Wi-Fi access point analog for energy. Rather than transmitting internet data packets, it transmits authenticated **Energy Packets™** to BIN Smart Case™ devices within its coverage zone. It contains an RF Energy Transmitter (1410), Authentication Processor (1412), Energy Packet Controller (1414), and Network Interface (1416). Deployable in stadiums, airports, hospitals, community centers, schools, churches, and emergency shelters.
6. **BIN Charging Zone™ (Stadium Hot Spot Network):** A designated geographic area served by one or more BIN Indoor Modems, creating an **energy coverage zone** analogous to a Wi-Fi coverage cell. Multiple overlapping BIN Charging Zones form a **BIN Hot Spot Network** within a venue. Premium zones (e.g., VIP areas) provide larger coverage radii and higher energy allocations based on subscription tier.

#### 4.3 Method of Operation and Safety Protocols (The "How It Works")

1. **Grid Failure Detection:** The Home Gateway automatically detects a failure in the primary utility grid (402).
2. **Emergency Mode Activation:** The system automatically switches to emergency mode (404), drawing initial power from the 3-hour local reserve to power critical devices (phones, internet router, medical devices) (406).
3. **Authentication & Request:** If the local reserve is depleted, the user utilizes the BIN mobile application to request additional energy. The Home Gateway sends an authenticated request to the nearest BIN Community Node (408).

4. **Wireless Power Delivery via Elevated Transmission Corridor™:** The BIN Community Node authenticates the request and utilizes the directed RF/microwave transmitter to beam energy directly to the home's rectenna array (410). This transmission occurs exclusively between an elevated pole-top transmitter (e.g., at 35 feet) and a roof-mounted receiver (e.g., at 25 feet), creating a designated aerial **BIN Energy Corridor™** that remains far above pedestrian and vehicle traffic.
5. **Micro-Burst Energy Packets™:** Rather than transmitting large, continuous streams of energy, the node delivers power in short, controlled bursts (e.g., a 5 kWh micro-burst) upon authenticated request, significantly limiting the duration of active RF exposure.
6. **Beam Shutoff Detection™ & Geofencing:** The system employs **Geofenced Energy Paths™** and advanced interruption detection. If an object (tree branch, drone, bird) enters the transmission path, or if the receiver's GPS coordinates/alignment change, the system detects the interruption and shuts off power immediately.
7. **Mesh Balancing:** If a specific BIN Community Node (e.g., Node B) is low on capacity, a high-capacity neighboring node (e.g., Node A) wirelessly beams power to Node B to balance the community network.

## 5. NOVELTY AND DIFFERENTIATION (Why it is patentable)

While the individual technologies (batteries, solar panels, RF power transmission) exist in the prior art, the **specific combination and application** of these technologies is highly novel.

Key differentiators from existing prior art (e.g., Tesla Powerwall VPPs, Ossia RF charging) include:

- **Emergency-Triggered RF Beaming:** Unlike continuous wireless charging systems, BIN utilizes directed RF power transmission from utility poles to homes *exclusively* as an emergency backup mechanism triggered by grid failure.
- **Physical Node-to-Node Mesh Balancing:** While Virtual Power Plants (VPPs) logically reallocate energy on the grid, BIN physicalizes this by wirelessly beaming power between pole-mounted nodes to balance community energy reserves.
- **Micro-Burst Energy Packets™:** The system delivers power via short, controlled bursts based on authenticated requests, rather than continuous broadcasting, limiting RF exposure and creating a micro-transaction energy marketplace.
- **Elevated Transmission Corridor™ & Beam Shutoff Detection™:** BIN establishes a specific, elevated, geofenced energy path with immediate shutoff capabilities upon interruption, a critical safety mechanism not present in standard ambient RF charging prior art.

- **Load-Isolated Emergency Gateway:** The Home Gateway specifically isolates critical loads (medical, communications) rather than feeding the main electrical panel, making the low-power RF beaming mathematically viable and safe.

## 6. SWOT ANALYSIS FOR PATENT STRATEGY

This SWOT analysis outlines the commercial and technical landscape to assist in drafting claims that maximize commercial value and block competitor workarounds.

### Strengths (Internal, Positive)

- **High Barrier to Entry:** Combines three complex disciplines (RF engineering, distributed energy resources, and cryptographic software), making it difficult for competitors to easily replicate the entire system.
- **Cost Advantage:** Drastically lowers the cost of home resilience by centralizing the expensive battery/solar hardware on community poles, requiring only a cheap rectenna and gateway at the home.
- **Scalability:** Can be deployed rapidly on existing utility pole infrastructure without requiring extensive home renovations or electrical panel upgrades.

### Weaknesses (Internal, Negative)

- **Regulatory Hurdles:** High-power directed RF/microwave transmission in residential neighborhoods will require significant FCC and health/safety regulatory approvals.
- **Line of Sight Dependency:** RF power beaming typically requires a clear line of sight between the pole transmitter and the home rectenna, which may be obstructed by trees or new construction.
- **Conversion Efficiency:** RF power transmission suffers from energy loss over distance; the system must overcome the physical limits of rectenna conversion efficiency.

### 6.5 Prior Art Conflicts & Differentiation Strategy (BIN Smart Case™)

The concept of wireless power receivers integrated into phone cases is an active patent area. We have identified several key prior art references that the BIN Smart Case™ must navigate:

1. **Energous Corp (US10075017B2):** Claims external wireless power receivers with spaced-apart antenna elements for charging mobile devices.
2. **Ossia Inc (US8854176B2 / US9142973B2):** Claims systems providing wireless charging to electronic devices via focused microwave energy using adaptively-phased arrays.

3. **Qualcomm Inc (US20110115431A1):** Claims selective wireless power transfer based on parameters.
4. **Freevolt / Drayson Wireless (US20160181873A1):** Claims RF energy harvesters with antennas arranged to receive ambient RF energy.

**The BIN Smart Case™ Differentiation Strategy:** While the prior art broadly covers RF-to-DC conversion in phone cases, the BIN Smart Case™ differentiates itself through its **Integration with an Authenticated Emergency Mesh Network.**

- **Not Ambient Harvesting:** Unlike Freevolt, the BIN case does not harvest ambient RF; it receives targeted Micro-Burst Energy Packets™ from a specific BIN Community Node.
- **Network Authentication Layer:** Unlike general Energous or Ossia receivers, the BIN Smart Case™ includes a proprietary BIN Authentication Chip™ (Secure Element) that actively negotiates access, verifies subscription status, and requests specific energy allocations from the utility-pole-mounted network before transmission begins.
- **Dual-Stage Storage & Delivery:** The case utilizes a Micro Buffer Battery to store the received RF energy before transmitting it via MagSafe to the phone, smoothing out the Micro-Burst delivery method required for public safety compliance.

## Opportunities (External, Positive)

- **Grid Instability:** Increasing frequency of extreme weather events and aging grid infrastructure creates a massive, immediate market demand for emergency resilience.
- **Government Subsidies:** High potential to qualify for federal infrastructure grants (DOE, FEMA) aimed at improving community resilience and energy equity in underserved neighborhoods.
- **Tribal & Municipal Contracts:** Sovereign tribal nations and progressive municipalities are actively seeking independent microgrid solutions outside of traditional utility monopolies.

## Threats (External, Negative)

- **Incumbent Retaliation:** Massive energy incumbents (Tesla, Enphase, traditional utilities) have the capital to aggressively design around the patent or challenge its validity if BIN threatens their home-battery market share.
- **Alternative Tech:** Rapid advancements in solid-state batteries or cheap sodium-ion batteries could eventually make whole-home battery storage affordable enough to render wireless emergency power unnecessary.
- **Prior Art Overlap:** The individual components (RF beaming, microgrids) are heavily patented; the risk of an examiner rejecting the application based on obviousness

(combining known elements) is high without very specific, narrow claims.

## 7. ADDITIONAL INVENTIVE CONCEPTS

The following two inventive concepts are proposed as additional patentable elements of the BIN™ system. These concepts expand the scope of the invention and should be considered for inclusion as separate claims or continuation patent applications.

### 7.1 BIN AI Load Forecasting Engine™

**Concept Description:** The BIN AI Load Forecasting Engine™ is a machine learning software module embedded within the BIN Network Controller that proactively manages community energy reserves by predicting grid failure events *before* they occur. Rather than waiting for a grid failure to trigger emergency mode, the system continuously analyzes multiple data streams to anticipate outages and pre-position energy reserves accordingly.

**Technical Operation:** The Engine ingests and cross-correlates the following data inputs:

- **Historical weather pattern data** (e.g., hurricane tracks, ice storm forecasts, heat dome events) from NOAA and commercial weather APIs.
- **Grid failure frequency and duration history** for the specific geographic region, sourced from utility outage records.
- **Real-time community energy usage patterns** from all connected BIN Home Gateways and nodes.
- **Node-level battery state-of-charge data** across the entire community mesh.

Using this data, the Engine calculates a **Community Resilience Forecast Score™** — a predictive metric indicating the probability of a grid failure event within the next 6, 12, 24, and 72-hour windows. When the score exceeds a configurable threshold, the system automatically:

1. Instructs all BIN Community Nodes to maximize solar charging and minimize non-critical energy disbursements.
2. Sends proactive push notifications to BIN App users advising them to charge critical devices and confirm their emergency load priorities.
3. Pre-authorizes energy allocation credits for Medical Priority Homes to ensure they receive power first when the event occurs.

**Novelty and Patentability:** No existing prior art combines a community-level wireless emergency power mesh network with a proactive AI-driven load forecasting engine that pre-positions energy reserves based on weather and grid failure predictions. The specific combination of (a) a distributed pole-mounted energy mesh, (b) a machine learning

forecasting module, and (c) automated pre-event energy pre-positioning constitutes a novel and non-obvious method claim.

**Proposed Claim Language (for attorney review):**

*A method of proactively managing a distributed wireless community energy network comprising: receiving real-time weather forecast data and historical grid failure data; applying a machine learning model to calculate a predicted grid failure probability score; and automatically pre-charging a plurality of pole-mounted community energy nodes in response to said score exceeding a predetermined threshold.*

## 7.2 BIN Node Aggregation Protocol™

**Concept Description:** The BIN Node Aggregation Protocol™ is a patentable method by which multiple geographically adjacent BIN Community Nodes coordinate their directed RF/microwave transmitters in a phased-array configuration to deliver a combined, more powerful, and more efficient energy beam to a single home receiver. This protocol is activated when a single node lacks sufficient capacity to meet a home's emergency energy request, or when distance or environmental conditions reduce single-node transmission efficiency.

**Technical Operation:** When the BIN Network Controller determines that a single node cannot adequately serve a home's energy request, it executes the following aggregation sequence:

1. **Node Selection:** The Controller identifies 2 or more neighboring nodes with available capacity that have a viable line-of-sight transmission path to the target home's rectenna array.
2. **Phase Synchronization:** The Controller transmits precise timing and phase-angle instructions to each participating node's transmitter via the BIN mesh communications network. Each node adjusts its transmission phase so that the RF wavefronts from all participating nodes arrive at the target rectenna array in constructive interference — maximizing received power at the home receiver.
3. **Coordinated Micro-Burst Delivery:** The aggregated nodes deliver a synchronized Micro-Burst Energy Packet™ to the home. The home's rectenna array and RF-to-DC converter receive the combined signal, yielding significantly higher power output than any single node could deliver.
4. **Dynamic Re-Aggregation:** As node capacities change or as the target home's needs are met, the Controller dynamically reassigns node participation, releasing nodes back to serve other homes in the community.

**Novelty and Patentability:** While phased-array antenna technology is well-established in telecommunications (e.g., 5G beamforming), its specific application to a **community emergency power delivery network** using **pole-mounted solar/battery nodes** performing **coordinated constructive-interference RF power transmission** to residential rectennas is a novel and non-obvious combination. No prior art applies phased-array aggregation to a neighborhood-scale emergency energy mesh network.

**Proposed Claim Language (for attorney review):**

*A system for aggregated wireless power delivery in a community energy network comprising: a plurality of pole-mounted energy nodes each comprising a directed RF transmitter; a network controller configured to identify a target residential receiver; and a phase synchronization module configured to coordinate the transmission phase of each of said plurality of nodes such that RF wavefronts arrive at said target receiver in constructive interference, thereby delivering a combined power output exceeding the capacity of any single node.*

## 8. PRIOR ART AWARENESS

The inventor is aware of the following general prior art spaces, which the patent attorney should review to assist in drafting narrow, defensible claims:

- **RF Power Beaming:** US5068669A (APTI/BAE Systems), US8854176B2 (Ossia Inc.)
- **Virtual Power Plants/Microgrids:** US20200052492A1 (Tesla Inc.), US11258301B2 (Sunverge Energy)
- **Pole-Mounted Solar:** US10523151B2 (Lonnie Kornovich)

## 8. EXPANDED PRIOR ART REFERENCE TABLE

The following table consolidates all prior art identified across both the community energy system and the BIN Smart Case™ research phases. Counsel should conduct a formal USPTO Patent Public Search and classification search before filing, using the CPC/IPC classifications identified below.

**Relevant CPC/IPC Classifications:**

- **H02J50/00** — Wireless supply or distribution of electric power
- **H02J50/20** — Microwave/RF wireless power transmission
- **H02J50/40** — Wireless power using two or more transmitting or receiving devices
- **H02J50/80** — Wireless power involving data exchange
- **H02J50/90** — Detection or optimization of receiver position

- **H02J7/40-7/42** — Battery charging systems involving exchange of charge-related data

Ref.	Patent / Publication	Assignee	Risk Level	Why It Matters
1	US10103552B1	Energous Corp	<b>CRITICAL</b>	Protocols for authenticated wireless power transmission. Describes wireless power network management, credentials, access control, charging priorities, schedules, receiver/transmitter databases, cloud services, and device authorization.
2	US10223717B1	Energous Corp	<b>CRITICAL</b>	Payment-based authorization of wireless power transmission service. Directly relevant to BIN's subscription/public access model.
3	US10128695B2	Energous Corp	<b>HIGH</b>	Hybrid Wi-Fi and power router transmitter. Describes a transmitter functioning as a power router using RF signals to charge devices — directly relevant to BIN's "router" framing.
4	US8854176B2	Ossia Inc	<b>HIGH</b>	Foundational RF wireless power system using

				transmitter/receiver arrangements and data exchange.
5	US20150263548A1	Intel Corp	<b>MEDIUM</b>	Systems and methods for wireless power distribution allocation. Relevant to multi-device power allocation, charge requests, and allocation logic.
6	US8115448B2	WiTricity Corp	<b>MEDIUM</b>	Broad wireless power systems including communication and priority concepts.
7	US7825543B2	MIT	<b>MEDIUM</b>	Foundational resonant wireless energy transfer reference.
8	US20150214775A1	Samsung Electronics	<b>MEDIUM</b>	Method for controlling wireless power transmitter and receiver. Relevant to BLE/ZigBee out-of-band communication and charging coordination.
9	US8947042B2	Qualcomm Inc	<b>MEDIUM</b>	Wireless power and data transfer for electronic devices. Relevant to combining wireless power with data exchange and

				device-specific charging profiles.
10	US20140292090A 1	Intel Corp	<b>LOW</b>	Implementing wireless power transfer with 60 GHz mmWave communication. Relevant to millimeter-wave wireless power.
11	US9021277B2	Powercast Corp	<b>MEDIUM</b>	Powering devices using RF energy harvesting. Foundational RF energy harvesting and receiver-side conversion.
12	US10211680B2	Energous Corp	<b>MEDIUM</b>	Method for 3-dimensional pocket-forming. Relevant to RF beam/pocket forming for targeted wireless power delivery.
13	US10116170B1	Energous Corp	<b>LOW</b>	Methods and systems for maximum power point transfer in receivers. Relevant to receiver-side RF power extraction optimization.
14	US20200052492A 1	Tesla Inc	<b>MEDIUM</b>	Scalable hierarchical energy distribution grid (virtual power plant).

15	US10523151B2	Lonnie Kornovich	<b>LOW</b>	Pole-mounted solar energy system.
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## 9. BIN PROTOCOL STACK ARCHITECTURE

One of the most powerful and defensible aspects of the BIN™ system is its **software-defined, layered energy control architecture**. The invention should be framed not merely as a wireless power system, but as a **policy-controlled energy networking system** that treats wireless power as an account-based, metered, routable, and safety-governed service — analogous to how the Internet Protocol stack manages data.

The BIN Protocol Stack consists of the following layers (from top to bottom):

Layer	Name	Function
Layer 7	<b>Application Layer</b>	BIN App, user interface, energy marketplace, emergency alerts, subscription management
Layer 6	<b>Session Layer</b>	Energy Session management — time-limited, cryptographically signed energy sessions with session ID, authorized wattage envelope, duration, safety limit, device ID, user ID, and policy class
Layer 5	<b>Authentication Layer</b>	Zero-trust device attestation, BIN Authentication Chip™ verification, Energy Entitlement Token™ issuance and validation
Layer 4	<b>Network Layer</b>	Energy Route Table management — maps receiver IDs to power beams, frequency/channel, antenna subset, priority class, safety zone, target wattage, and session state
Layer 3	<b>Control Layer</b>	Power Quality of Service (Power-QoS) — assigns service classes: Emergency/Medical,

		Critical Communications, Paid Premium, Ordinary Consumer, Background Trickle
Layer 2	<b>Transport Layer</b>	Micro-Burst Energy Packet™ scheduling, beam formation, phase synchronization for Node Aggregation Protocol™
Layer 1	<b>Physical Energy Layer</b>	Directed RF/microwave transmission via elevated corridor, rectenna reception, RF-to-DC conversion

**Critical Differentiator for Claims:** This protocol stack is **physics-agnostic** — the authentication, entitlement, allocation, and ledger layers can operate over RF, microwave, resonant inductive, optical, ultrasonic, or hybrid power links. This abstraction is a key patentable concept that distinguishes BIN from prior art, which is typically tied to a specific physical transmission method.

## 10. PROPOSED CLAIM LANGUAGE (For Attorney Review)

The following draft claim language is provided to assist counsel in evaluating patentability and drafting formal claims. These are inventor-prepared drafts and require professional legal refinement.

### 10.1 Independent System Claim (Draft)

*A wireless energy distribution system comprising: a pole-mounted energy router having an RF/microwave energy transmitter, a communication interface, a processor, and memory storing instructions that: (a) receive an energy request from a receiver device; (b) authenticate the receiver device using a cryptographic device certificate and an Energy Entitlement Token™; (c) generate a time-limited energy session record specifying an authorized wattage envelope, session duration, safety boundary, device identifier, and user account identifier; (d) determine a power allocation according to a Power-QoS policy table assigning a service class to the receiver; (e) schedule directed beam transmission according to a safety map verifying occupancy, obstruction, and exposure conditions; (f) update a metered energy ledger recording joules delivered, session ID, device ID, user account, location, and entitlement class; and (g) terminate or hand off the energy session upon detecting obstruction, receiver movement, session expiration, or emergency status change.*

## 10.2 Independent Method Claim (Draft)

*A method of authenticated wireless energy delivery comprising: receiving an energy request from a receiver device entering a wireless energy coverage zone; verifying a cryptographic device certificate and an Energy Entitlement Token associated with the receiver; selecting an energy allocation under a Power Quality of Service priority rule; forming a directed wireless power transmission toward the receiver through a designated elevated transmission corridor; monitoring delivered energy and updating a tamper-evident metered energy ledger; and dynamically adjusting or terminating the energy session based on safety sensor data, receiver movement, battery state, subscription status, or emergency mode activation.*

## 10.3 Computer-Readable Medium Claim (Draft)

*A non-transitory computer-readable medium storing instructions that, when executed by a processor of a wireless energy router, cause the processor to: authenticate a receiver device using zero-trust attestation requiring device identity verification, user authorization, safety validation, and continuous revalidation; allocate wireless power transmission according to a policy-controlled energy session specifying service class, wattage envelope, and safety boundary; and maintain a metered energy ledger recording all energy delivery events with cryptographic session identifiers.*

## 11. ATTORNEY QUESTIONS — ITEMS REQUIRING INVENTOR CLARIFICATION

The following questions must be answered by the inventor before or during the attorney meeting. These answers will directly affect the scope and strategy of the patent claims.

Issue	Questions to Answer Before Filing
<b>Physics of power transmission</b>	Is BIN limited to RF/microwave, or does it include resonant inductive, optical, ultrasonic, or hybrid methods? What frequencies and power ranges are contemplated?
<b>Safety compliance</b>	What safety sensors, exposure limits, beam shutoff rules, and foreign-object detection methods are intended?
<b>Authentication architecture</b>	Are credentials stored locally, in the cloud, in a secure element, or in a decentralized ledger? Are device certificates used?

<b>Energy Entitlement Token</b>	What exact fields are in the token? Who signs it? Can it be transferred? Can it authorize multiple devices?
<b>Metering method</b>	How is delivered power measured — transmitter-side, receiver-side, or both? How is fraud prevented?
<b>Handoff protocol</b>	How does a receiver maintain charging when moving between nodes? What data is transferred between nodes during handoff?
<b>Emergency mode triggers</b>	What conditions trigger emergency mode? How are critical/medical devices identified and pre-authorized?
<b>Public access model</b>	Is payment required, optional, or one example? Does the system support free municipal, tribal, enterprise, or relief-based access?
<b>Hardware implementation</b>	Does the router integrate Wi-Fi data routing, or is "router" a functional analogy for energy sessions only?
<b>Prototype status</b>	Are there schematics, simulations, software flowcharts, mockups, experiments, or test data available?
<b>Energy accounts and credits</b>	What fields define a BIN Energy Account? Are Energy Credits denominated in joules, watt-hours, time, priority credits, or another unit?
<b>Mesh and node-to-node sharing</b>	Does sharing mean physical energy transfer, demand redistribution, roaming handoff, entitlement transfer, or reserve-balancing among stations?
<b>AI allocation</b>	What prediction inputs are available (weather alerts, outage feeds, battery state, usage history, emergency declarations)? Is AI required or optional?
<b>LifeLink protocol</b>	Which device classes qualify for permanent or emergency override access, and what anti-fraud, safety, and revocation controls apply?
<b>Energy Passport and geofencing</b>	What networks may honor the roaming credential, and how are location boundaries verified and enforced?

### Utility pole embodiment

What hardware, power limits, safety boundaries, and communications links are contemplated for pole-mounted units specifically?

## 12. CURRENT STATUS AND PUBLIC DISCLOSURE

- **Has the invention been built or tested?** No Hardware has been built, Only an Operating Software
- **Has the invention been disclosed to the public?** (e.g., YouTube, social media, trade shows, investors without an NDA). *Note: If yes, please provide the exact date of the first public disclosure, as you only have 1 year from that date to file a US patent.* [Date / No]
- **Is the invention currently being sold or offered for sale?** [Yes/No]

## 14. BIN HOT SPOT™ ECOSYSTEM — COMMERCIAL AND EMERGENCY DEPLOYMENT

The BIN™ system extends beyond residential emergency power into a comprehensive **dual-use public energy infrastructure platform**. This section describes the commercial and emergency deployment model for the BIN Indoor Modem™ and BIN Hot Spot™ network, which constitutes a separate and independently patentable embodiment of the BIN architecture.

### 14.1 BIN Hot Spot™ Concept

The BIN Hot Spot™ is conceptually analogous to a Wi-Fi hotspot, but for energy. Users enter a designated BIN Charging Zone™ and their BIN Smart Case™ automatically begins receiving authenticated Energy Packets™ from the nearest BIN Indoor Modem™. No cables, no outlets, and no user action beyond presence in the zone is required after initial authentication.

### 14.2 BIN Burst Charging™ — Key Technical Differentiator

Rather than transmitting continuous RF energy, the BIN Indoor Modem™ delivers power via **BIN Burst Charging™** — a timed micro-burst protocol where energy is transmitted in precisely controlled intervals:

- **Burst Duration:** Approximately 25 milliseconds per burst

- **Inter-Burst Pause:** Variable, controlled by the Energy Packet Controller
- **Continuous Verification:** Between each burst, the modem re-verifies user identity, subscription status, available capacity, and priority level

**Technical Advantages of BIN Burst Charging™:**

- Reduced RF exposure per unit time (critical for FCC/health compliance)
- Improved energy conversion efficiency at the receiver
- Granular real-time authentication and fraud prevention
- Enables dynamic priority adjustment between users mid-session
- Creates a metered, auditable energy transaction record per burst

**14.3 Stadium Deployment — BIN Charging Zones™**

The stadium deployment model illustrates the commercial scalability of the BIN Hot Spot™ network:

Zone	Location	Coverage Radius	Service Tier
Section A	Concourse BIN Hot Spot	50 feet	Standard
Section B	Food Court BIN Hot Spot	100 feet	Standard
Section C	VIP Lounge BIN Hot Spot	200 feet	Premium
Scoreboard	Overhead BIN Hot Spot	Stadium-wide	Broadcast/Emergency
Main Entry	Entry BIN Hot Spot	75 feet	Public/Day Pass

Premium subscribers receive higher charging priority, larger energy allocations per burst session, and preferential access during high-demand events.

**14.4 Revenue Model — Normal Operations**

During normal commercial operations (concerts, sporting events, festivals, conventions), the BIN Hot Spot™ network generates revenue through a tiered access model:

- **BIN Daily Pass:** \$4.99 — standard charging access for the event duration
- **BIN Premium Pass:** \$9.99 — priority charging, faster burst rates, emergency priority designation

- **BIN Subscription:** Monthly/annual plans for frequent venue visitors
- **Venue Licensing:** Stadiums, airports, and convention centers license the BIN Indoor Modem™ infrastructure from BIN™, creating a recurring B2B revenue stream

## 14.5 Emergency Evacuation Mode™ — Disaster Response

The most strategically significant feature of the BIN Hot Spot™ deployment is its automatic conversion to an **Emergency Evacuation Hub™** during disaster events. When a power grid failure or emergency is detected:

1. The BIN Indoor Modem™ network automatically switches to battery/solar backup power
2. The venue is divided into designated **BIN Safe Zones™** (Safe Zone A, B, C, etc.)
3. Emergency services are activated: device charging, emergency alerts, public announcements, information center, and family communication
4. All users receive emergency priority access regardless of subscription tier
5. The venue becomes a **BIN Emergency Energy Hub™** — a temporary community resilience center

## 14.6 BIN Community Evacuation Network™ — City-Scale Emergency Infrastructure

At the city or regional scale, the BIN™ system enables a **BIN Community Evacuation Network™** in which municipalities, tribal nations, and emergency management agencies pre-designate public venues as **BIN Emergency Hubs™**:

- **Eligible Venues:** Stadiums, convention centers, schools, churches, community centers, airports, transit hubs
- **Hub Equipment:** BIN Indoor Modems, battery banks, solar backup arrays, emergency communications equipment
- **Activation Trigger:** Automatic upon grid failure detection, or manual activation by emergency management personnel
- **Services Provided:** Device charging, emergency alerts, public announcements, shelter information, family communication coordination

**Note for Counsel:** The BIN Community Evacuation Network™ concept may constitute an **entirely separate patent family** from the residential BIN Community Node system. The inventor recommends discussing whether to file this as a continuation application, a continuation-in-part, or a separate utility patent application.

## 14.7 Patentability Analysis — BIN Hot Spot™ Ecosystem

The BIN Hot Spot™ ecosystem introduces the following novel claim dimensions not present in the prior art identified for the residential BIN system:

Novel Element	Patentability Basis
<b>BIN Burst Charging™ with inter-burst re-authentication</b>	No prior art combines timed micro-burst RF energy delivery with continuous per-burst user re-verification
<b>Venue-scale BIN Charging Zone™ network with tiered coverage radii</b>	No prior art describes a multi-zone, subscription-tiered indoor RF energy hotspot network with variable coverage radii per service tier
<b>Automatic Emergency Evacuation Mode™ conversion</b>	No prior art describes a commercial wireless energy venue network that automatically converts to a public emergency power hub upon grid failure detection
<b>BIN Safe Zone™ designation and mapping</b>	No prior art describes the automatic geographic designation and user notification of emergency energy safe zones within a venue during a disaster event
<b>BIN Community Evacuation Network™</b>	No prior art describes a city-scale pre-designated network of public venue emergency energy hubs activated by grid failure

## 15. EXECUTIVE SUMMARY FOR COUNSEL

B.I.N.™ is best framed not as a generic wireless charger or a simple community solar system, but as a **software-defined, authenticated, policy-controlled energy networking system** that treats wireless power as an account-based, metered, routable, and safety-governed service. The following framing principles should guide claim drafting:

What to Avoid	What to Emphasize Instead
Claiming broad "wireless electricity" or RF beam charging	Claim the specific protocol stack and control-plane architecture
Relying solely on "power router" terminology (already in Energeous prior art)	Define the new Energy Session Layer, Energy Route Table, and Power-QoS system

Claiming authentication or payment alone (already in Energos prior art)	Claim zero-trust energy sessions, tokenized Energy Entitlement Tokens, and metered ledgers
Claiming the community pole-mounted solar/battery system alone	Claim the specific combination with authenticated emergency RF delivery and load isolation
Broad mesh networking claims	Claim the specific BIN Node Aggregation Protocol™ with phase-synchronized constructive interference

The strongest and most defensible patent position for BIN™ lies in the **intersection of three domains** that no prior art combines: (1) a community-scale pole-mounted solar/battery emergency infrastructure, (2) a directed RF/microwave elevated transmission corridor with geofenced safety protocols, and (3) a software-defined, layered energy control architecture with zero-trust authentication, metered energy sessions, and AI-driven pre-positioning. This three-way combination, applied specifically to residential emergency power resilience, represents the core of BIN™'s patentable novelty.

#### *End of Disclosure Packet*

*This disclosure packet is prepared to assist the inventor in communicating their invention to a licensed patent attorney. It does not constitute legal advice, a patentability opinion, a freedom-to-operate opinion, or a substitute for the counsel of a registered patent attorney or agent.*