

CleanTech Blueprint for the Future



Coalition for Innovation, supported by LG NOVA

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The views and opinions expressed in the chapters and case studies that follow are those of the authors and do not necessarily reflect the views or positions of any entities they represent.

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Preamble

The Coalition for Innovation is an initiative hosted by LG NOVA that creates the opportunity for innovators, entrepreneurs, and business leaders across sectors to come together to collaborate on important topics in technology to drive impact. The end goal: together we can leverage our collective knowledge to advance important work that drives positive impact in our communities and the world. The simple vision is that we can be stronger together and increase our individual and collective impact on the world through collaboration.

This “Blueprint for the Future” document (henceforth: “Blueprint”) defines a vision for the future through which technology innovation can improve the lives of people, their communities, and the planet. The goal is to lay out a vision and potentially provide the framework to start taking action in the areas of interest for the members of the Coalition. The chapters in this Blueprint are intended to be a “Big Tent” in which many diverse perspectives and interests and different approaches to impact can come together. Hence, the structure of the Blueprint is intended to be as inclusive as possible in which different chapters of the Blueprint focus on different topic areas, written by different authors with individual perspectives that may be less widely supported by the group.

Participation in the Coalition at large and authorship of the overall Blueprint document does not imply endorsement of the ideas of any specific chapter but rather acknowledges a contribution to the discussion and general engagement in the Coalition process that led to the publication of this Blueprint.

All contributors will be listed as “Authors” of the Blueprint in alphabetical order. The Co-Chairs for each Coalition will be listed as “Editors” also in alphabetical order. Authorship will include each individual author’s name along with optional title and optional organization at the author’s discretion.

Each chapter will list only the subset of participants that meaningfully contributed to that chapter. Authorship for chapters will be in rank order based on contribution: the first author(s) will have contributed the most, second author(s) second most, and so on. Equal contributions at each level will be listed as “Co-Authors”; if two or more authors contributed the most and contributed equally, they will be noted with an asterisk as “Co-First Authors”. If two authors contributed second-most and equally, they will be listed as “Co-Second Authors” and so on.

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The Coalition is intended to be a community-driven activity and where possible governance will be by majority vote of each domain group. Specifically, each Coalition will decide which topics are included as chapters by majority vote of the group. The approach is intended to be inclusive so we will ask that topics be included unless they are considered by the majority to be significantly out of scope.

We intend for the document to reach a broad, international audience, including:

- People involved in the three technology domains: CleanTech, AI, and HealthTech
- Researchers from academic and private institutions
- Investors
- Students
- Policy creators at the corporate level and all levels of government



Chapter 7:

Case Study: Next-Gen Batteries for Energy Independence

Author: Dr. Irene Chen

Overview

Electricity demand is accelerating due to the rapid rise of AI, data centers, and global electrification. The International Energy Agency (IEA) projects a [28% increase in global electricity use by 2030](#). While attention often focuses on electric vehicles (EVs) and industrial applications, smartphones alone account for a hidden but significant load: 4.7 billion users consume an estimated 25.7 TWh/year: equivalent to Ireland's annual electricity consumption.

Magvolts Energy offers a novel solution: biodegradable, modular batteries that offload grid demand for mobile devices and deliver sustainable, mineral-free energy at scale.

Stakeholder

Below are the stakeholders for whom it is believed this is most relevant to.

- Smartphone users
- Clean tech investors
- ESG-focused corporations
- NGOs and disaster relief organizations
- Energy access advocates
- Consumer electronics companies
- Policy and regulatory agencies
- Retailers and distribution partners

Challenges / Gaps

Some of the challenges and/or gaps that exist with batteries that are in use today include:

- **Critical Mineral Dependency:** Most batteries rely on scarce resources such as lithium, cobalt, and nickel.
- **Toxic Waste & End-of-Life Disposal:** Current solutions produce hazardous e-waste.
- **Energy Access Barriers:** Infrastructure limitations prevent reliable power access in many regions.
- **Scalability & Distribution:** Existing battery systems are not optimized for instant, flexible deployment at small scale.

Our New Vision

Magvolts introduces a biodegradable battery system made from biomaterials and non-toxic compounds. The design combines single-use energy pods with a reusable base unit, creating a clean, decentralized energy solution suitable for:

- Consumer electronics
- Emergency kits
- Off-grid and last-mile energy needs

These batteries naturally degrade without releasing harmful chemicals, eliminating recycling costs and e-waste. Their modularity allows scalable deployment through retail or vending channels.

Examples of Use Cases

Consumer Electronics & Personal Power:

- Emergency phone chargers (retail or vending-based)



- Disposable batteries for wearable medical devices
- Smart sensor patches (biodegradable, single-use)
- Festival wristbands with GPS or lighting

Emerging Markets & Off-Grid Applications:

- Energy kits for rural villages (lighting, radios)
- Off-grid school kits (lights plus charging)
- Solar backup extension packs
- Pay-per-use kiosks for modular battery access

Potential Benefits

- **Grid Offloading:** With 100M users, Magvolts could redirect **0.55 TWh/year** from the grid. This can reduce peak electricity demand, prevents blackouts, and lightens grid investment needs — especially vital as EVs and AI data centers surge.

- **Mineral Independence:** Entirely cobalt-, lithium-, and nickel-free. These critical minerals are geopolitically volatile, environmentally damaging to mine, and expensive. Cutting them out means supply chain security and ethical sourcing at scale.
- **E-Waste Elimination:** Fully compostable, no toxic disposal required. Over 15 billion disposable batteries end up in landfills yearly. Magvolts eliminates this toxic waste stream — safer for people, soil, and water.
- **Equity in Access:** Deployable in infrastructure-poor regions. Billions live without stable electricity. Magvolts empowers education, health, and communication tools in the most underserved areas.
- **Modular Scalability:** Easy to distribute and swap. Enables flexible deployments — whether it's disaster zones, festivals, off-grid homes, or military outposts — without costly infrastructure.

Potential Risks & Mitigations

Risk	Mitigation
Limited energy density	Focus on low-power, high-frequency applications
Adoption friction	Partner with retail chains and NGOs for pilot programs
Regulatory hurdles	Work with compliance experts on biodegradable standards
Cost comparison with lithium-based	Emphasize total lifecycle cost, not just upfront pricing



Next Steps for Magvolts Energy

The global energy landscape is at a critical inflection point. Battery innovation must now prioritize **sustainability, equity, and resilience** — and Magvolts Energy is ready to lead that shift.

While we continue refining our prototypes and scaling up production readiness, here's how different stakeholders can engage with and amplify this mission:

For Consumers

Your purchasing power matters.

Demand energy products that are biodegradable, safe, and ethically sourced. As Magvolts reaches market readiness, your interest helps shape a future where powering your devices doesn't require sacrificing the planet.

For Business Partners & OEMs

Let's collaborate on integration.

Whether you design outdoor gear, off-grid lighting, or portable electronics — Magvolts' modular battery pods can be customized to fit your use case. Early integration partners can help pilot real-world deployments and co-develop performance specs.

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For Investors & Philanthropic Funds

You can help launch a new battery category.

Magvolts is seeking pre-seed capital to build early manufacturing capability, scale pilot studies, and expand IP protection internationally. This is a rare opportunity to back a mission-driven battery tech before infrastructure gets locked in.

For Policy Makers & LG Coalition Stakeholders

Support alternatives that reduce critical mineral dependency.

Magvolts offers a scalable, zero-cobalt path forward that aligns with circular economy goals, energy equity priorities, and national security interests. Encourage procurement pilots, green innovation funds, and tech incubation programs to include emerging materials-based solutions.

For Academic & Research Collaborators

Partner on materials testing, lifecycle analysis, and deployment metrics.

Our open approach to fundamental research invites universities and national labs to explore biodegradable systems alongside us — especially where battery chemistry intersects with environmental science and circular materials.

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Author (In order of contribution)

Irene Chen, Founder of Magvolts Energy

Dr. Irene Chen is the founder and CEO of Magvolts Energy, developing a novel biodegradable battery system to eliminate critical minerals and toxic e-waste. Her patent-pending modular design powers single-use energy pods for off-grid, IoT, and consumer devices—no charging or lithium required. A PhD-trained materials engineer with industry roots at Intel and Lockheed Martin, she bridges breakthrough science with real-world impact.





For more information about the Coalition for Innovation, including how you can get involved, please visit coalitionforinnovation.com.

[View the Next Chapter](#)

