



## **BEL 2024 BEL Electrify Ammonia and Fertilizer High-Level Plan**

Green ammonia presents an outstanding emerging-stage technology opportunity that can win support within rural communities. Over the past two years, BEL has leveraged its network of stakeholders to explore and amplify business and technology opportunities surrounding green ammonia and to drive demand for ammonia and fertilizer produced by electricity as hydrogen hubs progress and IRA tax credits take hold. BEL is uniquely qualified to support rural, distant and remote state, local governments, and regions to embark on initiatives to identify, evaluate, and implement pathways for the deployment of clean ammonia as an integral component of decarbonized electricity generation, transportation, and agriculture in our respective states.

Our strategy over the past several years to advance this initiative has been in three parts:

### **1) Advance research, development, and deployment on issues related to electrified ammonia**

Academic research on ammonia ranges from increasing the efficiency of electrified ammonia production to researching how it performs in combustion turbines. BEL is bridging the gap between researchers and electric producers on the ground, serving as a translator between grid operators and the academic community. To that end, BEL has engaged with universities to understand their research and how it can best advance the market for electrified ammonia.

### **2) Coalition building, networking and information sharing**

BEL has engaged electric cooperatives, businesses, and association with an interest in ammonia. Highlights of this effort include:

- Developed of branded web page: <https://be-league.org/electrify-ammonia-initiative/> and supported research articles (TD World) and grant proposals (US DOE).
- Created interest group of cooperatives including Tri-State Generation and Transmission, Hoosier Energy, Seminole Electric, Great River Energy, and Runestone Electric Cooperative.
- Briefed the Bicameral Electrification Caucus on ammonia electrification in the Farm Bill.

### **3) Facilitate direct connection and negotiation between companies and electric providers**

Interacting with local utilities and broader stakeholders is not always straightforward. Ideal deal structures can depend on understanding electric rates that flow from generation and transmission cooperatives to distribution cooperatives through energy markets that are

somewhat complex. The project has spent significant resources making connections, and is positioned to continue this effort with specific jurisdictions.

In 2024, we are working to develop and enhance critical organizational networks, focusing on facilitating discussions and actions that benefit ammonia producers, rural cooperatives, and farmers in rural areas.

Our objectives include:

- Ensuring direct access to the lowest price clean electricity possible, including through electric demand rate reductions in response to load signals by supporting producer registration and operation as “load modifying resources.”
- Pursuing relevant grant opportunities to support integrating electrifying ammonia into energy conversations and including it in the conversations where have already received planning grants.
- Building collaborative partnerships for ammonia recognition. Additionally, we will build upon our 2023 Federal proposals related to ammonia and explore new opportunities, such as the DOE’s Energy Futures grant, with potential partners including those in Hawaii and in an Appalachian Regional Commission hydrogen hub.

In alignment with past efforts, in 2024, our program objectives focus on pivotal market-making activities:

- Advance ammonia production research, development, and deployment - we aim to address the critical problem of reliance on fossil fuels for fertilizer production by developing cleaner, electrified ammonia production processes.
  - o We will work to accomplish this by identifying and working with stakeholders that are both potential electricity suppliers for the process, that are working to produce ammonia using electricity, and potential project developers and buyers to see common ground on projects that will bridge cost gaps and create win-wins for new opportunities in this sector.
- Ammonia coalition-building, networking, and information sharing – we’ll target the urgent need for shared knowledge and collaborative efforts in sustainable energy, essential for the widespread adoption of new technologies.
  - o We will build on last year’s success to further engage stakeholders as opportunities begin to materialize. Examples include stakeholders in Hawaii and Alaska who became engaged at the end of 2023 with a DOE Energy Futures Grant. We will continue to work with the interested electric cooperative community and vendors we have ongoing relationships with and additional partners continue to emerge as tax credit guidance is finalized and the technology matures.
- Facilitating direct connections by connecting industry players and electric providers to address the gap in creating locally produced, resilient energy solutions.

These objectives are vital in tackling the urgent issues faced today:

- Cleaner fertilizer production. Transitioning to electricity-based fertilizer production mitigates the environmental impact of traditional methods.
- Moving to long-term energy storage and grid balancing technologies. Using ammonia, generated by excess renewables as an energy storage solution is essential for managing the intermittent nature of renewable energy sources.
- Creating a local source for liquid fuel. Promoting ammonia as a locally-produced resource supports both community resilience and economic development.

The program is timely, coinciding with the establishment of IRA tax credits, providing a unique opportunity for demonstrating domestic production of sustainable energy solutions. It addresses the immediate need for more sustainable practices in energy and agriculture, positioning our initiatives at the forefront of environmental stewardship, emerging technology, and energy policy.

**BEL plans to execute to deliver on these critical program milestones for 2024:**

Milestone 1: Include electrifying ammonia in planning grant proposals, including DOE Energy Futures Grant (Hawai'i and Alaska), and Appalachian Regional Commission hydrogen hub grants, and others that may become available in 2024.

Milestone 2: Organize and deliver production-side strategy to connect electric producers with companies that manufacture ammonia.

Milestone 3: Create coalition of stakeholders to drive demand for the product, including end-use off-takers seeking collective buying strategies.

BEL is now in conversations on green ammonia initiatives with members of each of these groups, who have indicated they would welcome BEL's engagement and facilitation:

- University of Minnesota – the researchers U of MN West Central Research and Outreach Center who are implementing significant demonstrations and have recently submitted grants to DOE on this topic.
- Colorado State University – researchers are focused on studying combustion processes and ways to use ammonia to create spinning shaft energy for shipping, and potentially electric generation.
- University of Kansas – FEWtures study, focused on agricultural and rural and economic development.
- Electric cooperatives, including Tri-State Generation and Transmission, Hoosier Energy, Seminole Electric, Great River Energy, Cordova Electric Cooperative and Runestone Electric Cooperative.

- The State of Hawaii
- The Appalachian Regional Commission
- Georgia Tech
- Remo
- Clean Air Task Force