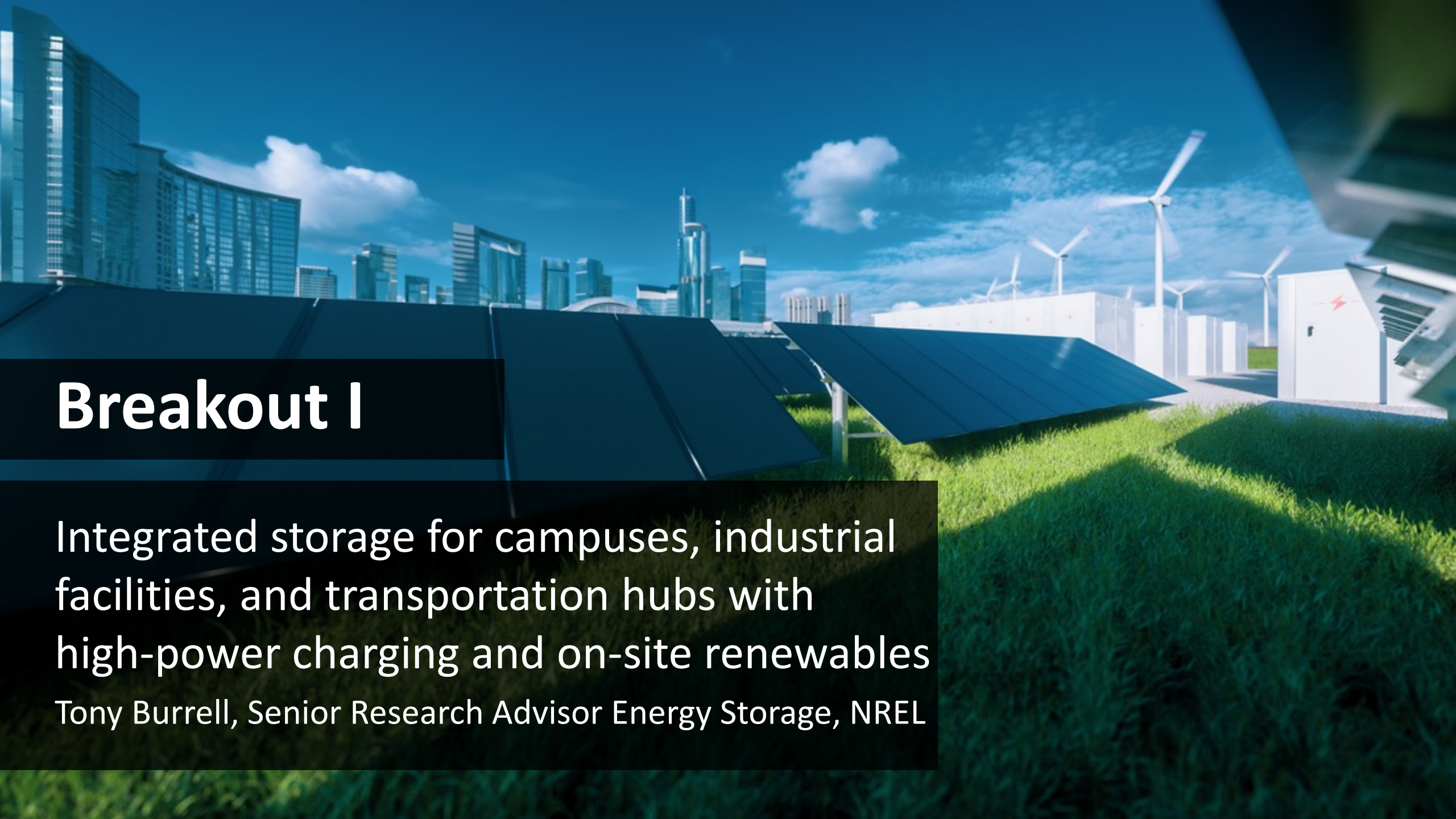
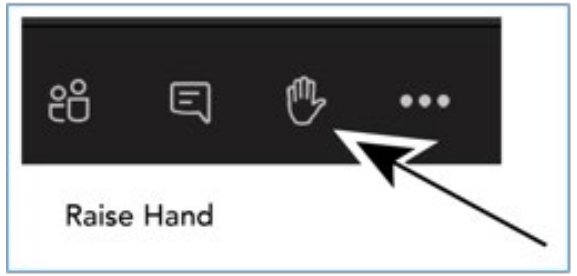


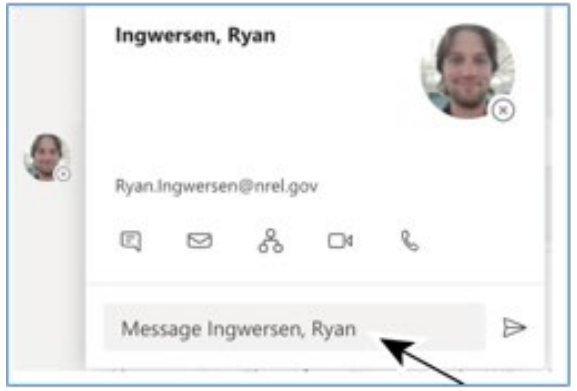
Breakout I

Integrated storage for campuses, industrial facilities, and transportation hubs with high-power charging and on-site renewables

Tony Burrell, Senior Research Advisor Energy Storage, NREL

Meeting Logistics





- **Please mute** yourself when not speaking.
- You are welcome to have your camera on for today's conversation.
- **Use the chat box** and raise hand features to ask questions or provide comments.
- The first part of the workshop will be recorded, but the breakout sessions will not to promote candid discussion (Chatham House rules)
- Use chat or direct message our Teams workshop coordinator Ryan if you have questions or concerns throughout the workshop
- **Teams does not support call-in users in breakout sessions.**
  - If you joined the meeting using your phone for audio, you will need to hang up when we start the breakout sessions, then rejoin phone audio once the breakout has started. You will need to do this again when the breakout sessions close and you rejoin the main session.
- There will be a slight delay when we start and end the breakout sessions. You will be automatically transferred to your chosen breakout session and back to the main session.
- If you **have a question** anytime during today's workshop and would prefer not to use the chat, send an email to aries@nrel.gov.

Objectives for This Breakout Session

1. Get your perspective on research needs for energy storage, areas of interest for energy storage advancement, and potential opportunities for collaboration.

2. Any additional feedback you would like to share on how we can make ARIES a more valuable research platform to help you achieve your goals.

Behind-the-Meter Solutions Use Case

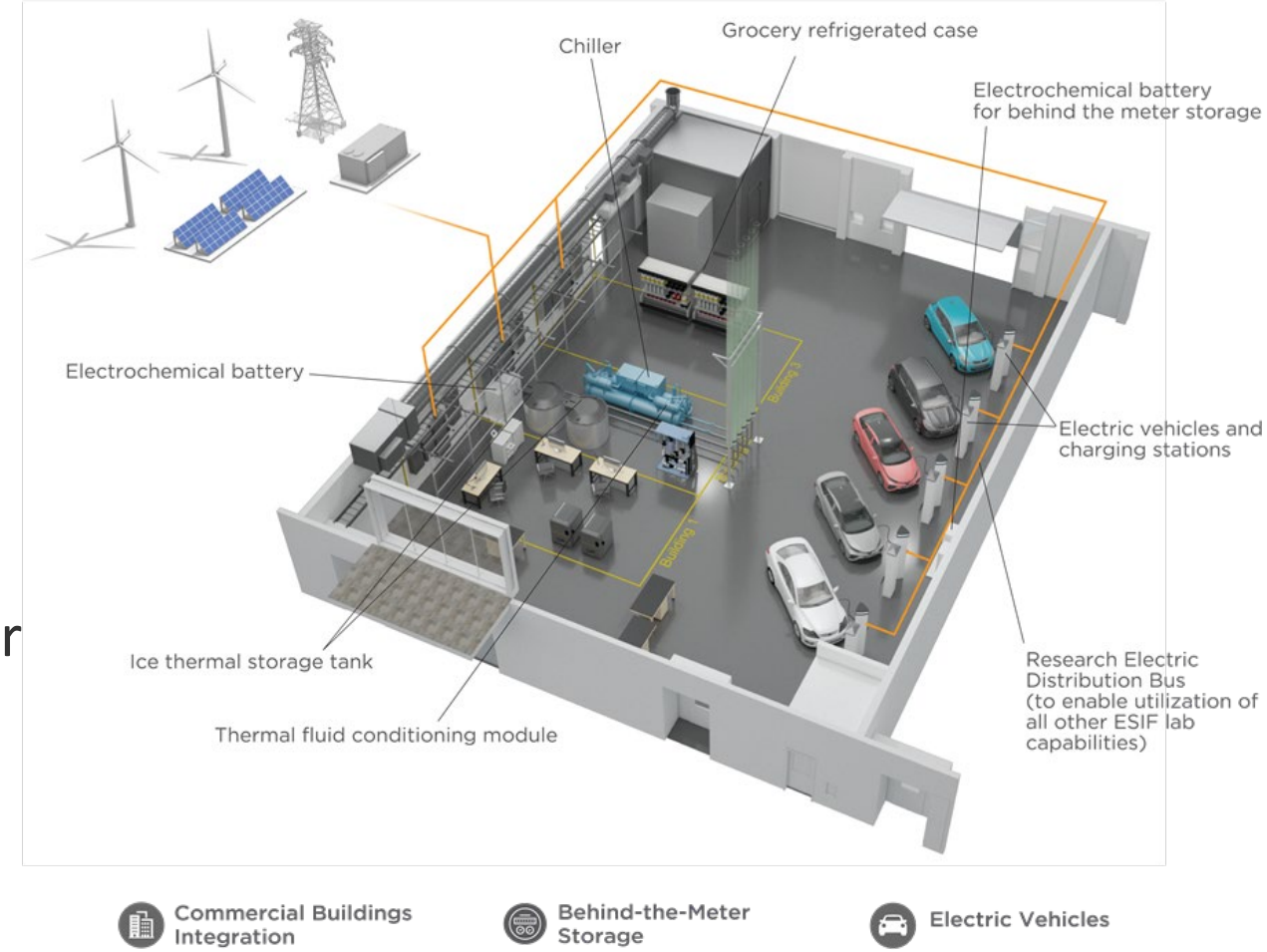
Dallas-Fort Worth (DFW) airport is one of the busiest in the world. ARIES answers key technical questions around how DFW can integrate multi-MW-scale electrified transportation, buildings, and energy storage solutions.

DFW Goals:

- Reduce operating costs
- Increase reliability and resilience
- Reduce emissions to reach net-zero carbon by 2030
- Increase passenger throughput
- Optimize capital infrastructure expenditures that also meet EPA nonattainment requirements.

Unique ARIES Capabilities Develop and Prove Integrated Energy System Solutions

- **Virtual buildings** to interact with real hardware
- Emulated climate for **HVAC & R equipment**
- **Diverse integrated technologies** such as PV emulators, electric vehicles, and chargers (350+ kW)
- Electric and thermal connections to other laboratories.
- **2-MW-13-MW emulation** capabilities with varying generation sources today with **20-MW ARIES expansion underway**

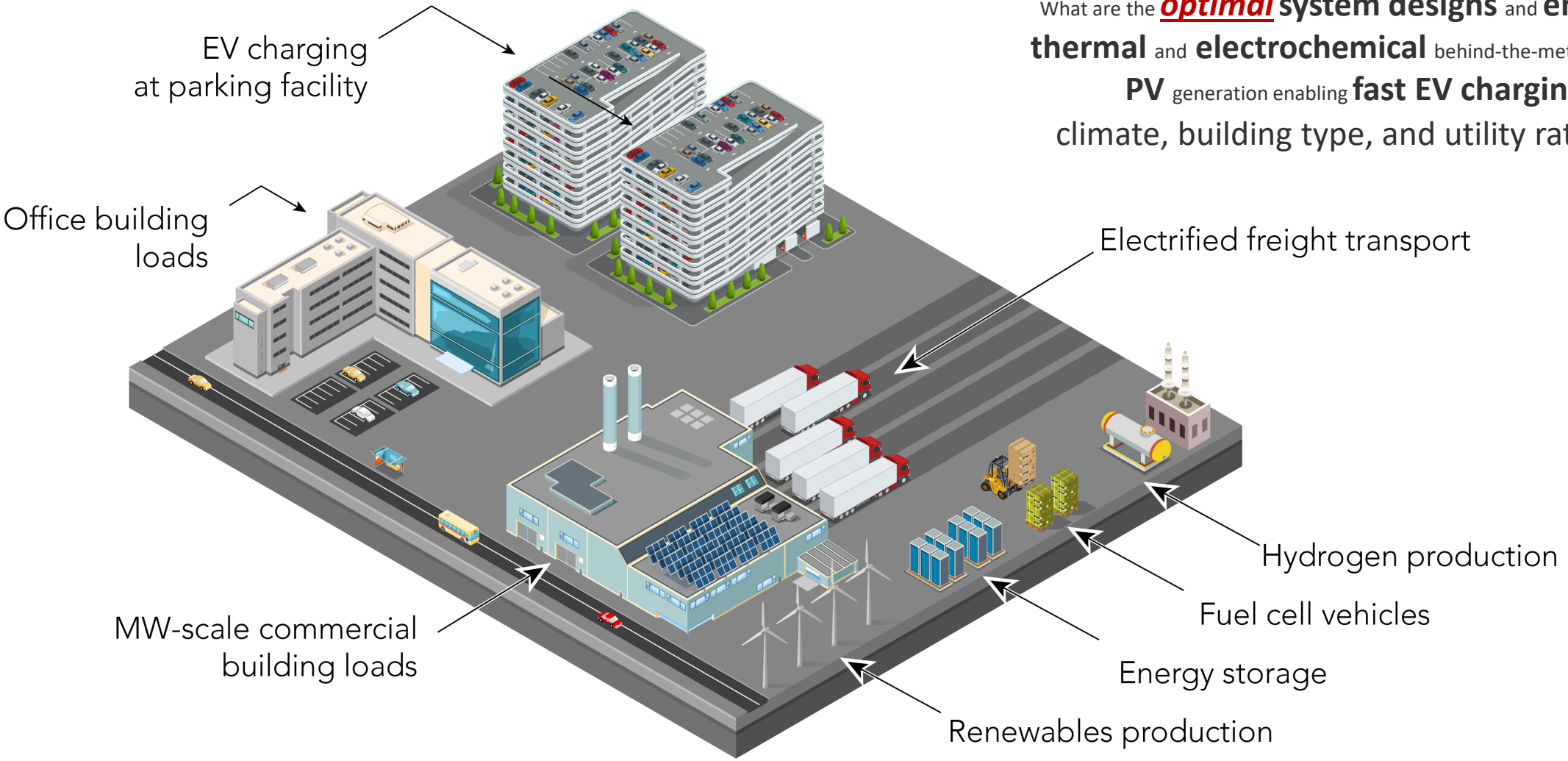


Future Opportunities

- Most of these systems are optimized individually or in the case of PV and batteries as a pair. However, the system requires a more holistic set of controls and interconnects based upon the desired outcome.
- Questions that ARIES can help address:
  - How do I control multiple supply and load based assess with storage in the mix?
  - What are the consequences (cost, lifetime, etc.) if the focus shifts? (e.g. resiliency events)
  - How can we plan future energy related renovation/new projects that will work in a systematic fashion to achieve ambitious goals?
  - How do I de-risk projects and/or identify vulnerabilities?

Future Opportunities – Industrial Facility

What are the ***optimal*** **system designs** and **energy flows** for **thermal** and **electrochemical** behind-the-meter-storage with on-site **PV** generation enabling **fast EV charging** if we vary climate, building type, and utility rate structure?



Discussion

Contact

Email: aries@nrel.gov
Web: nrel.gov/aries