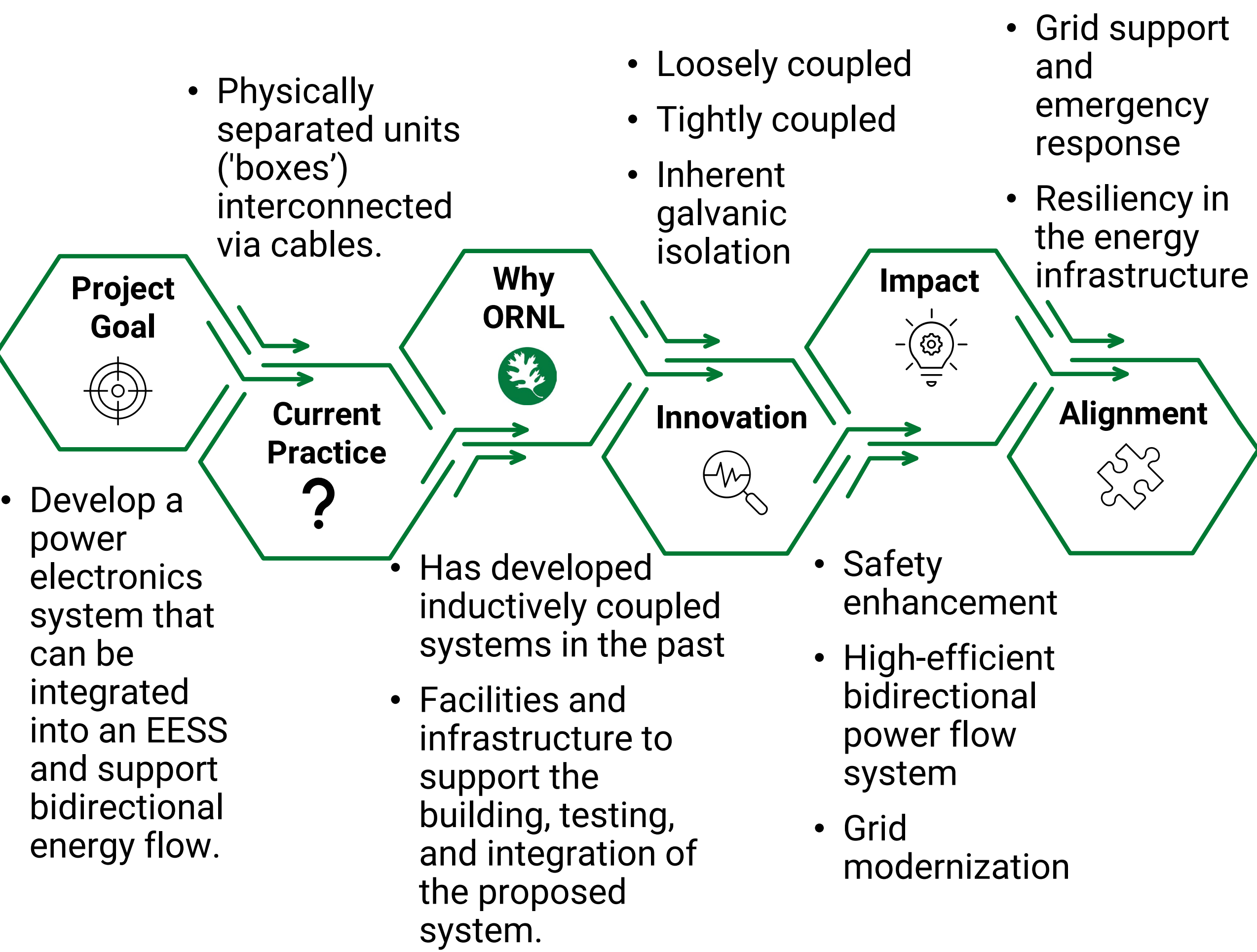
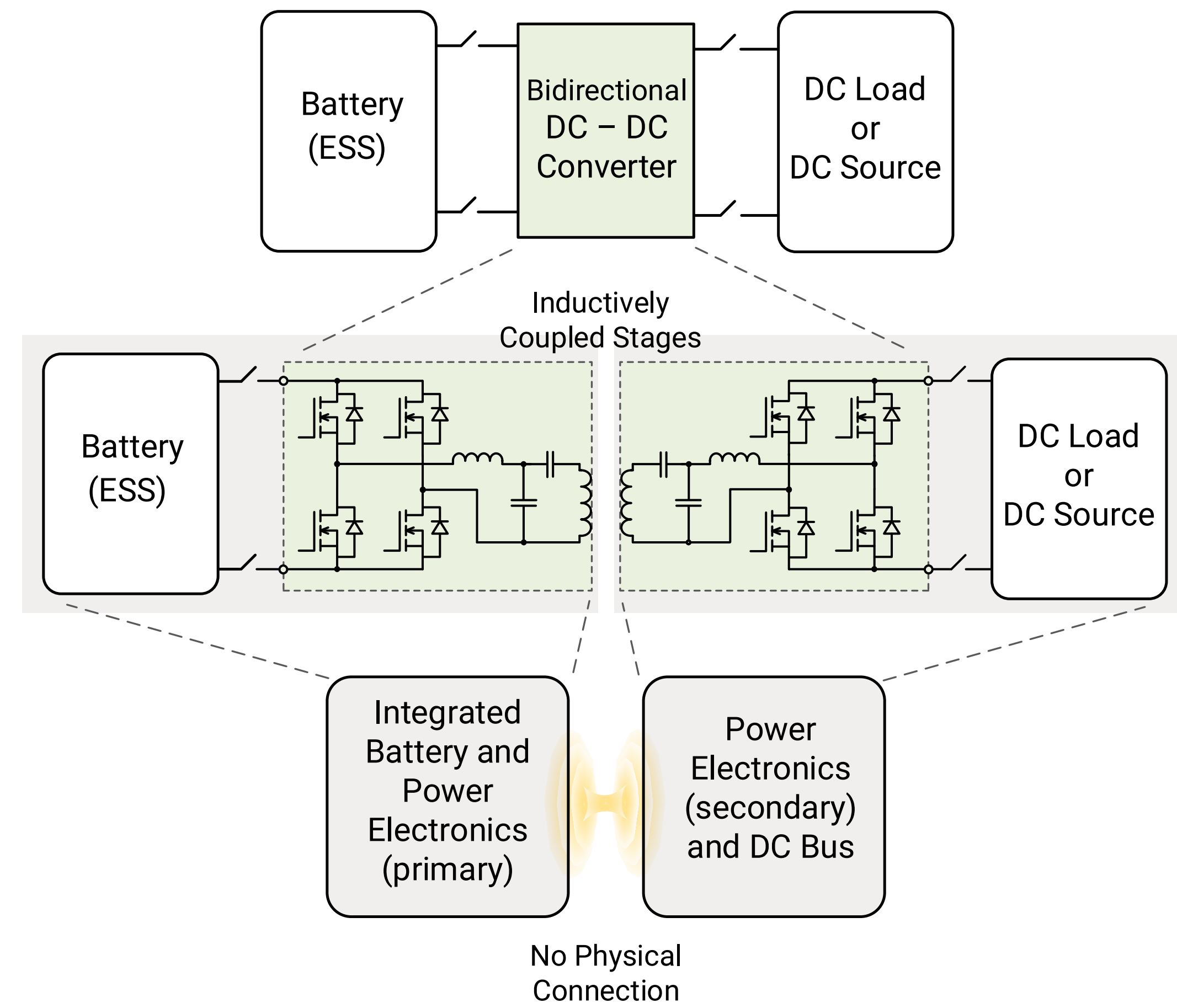
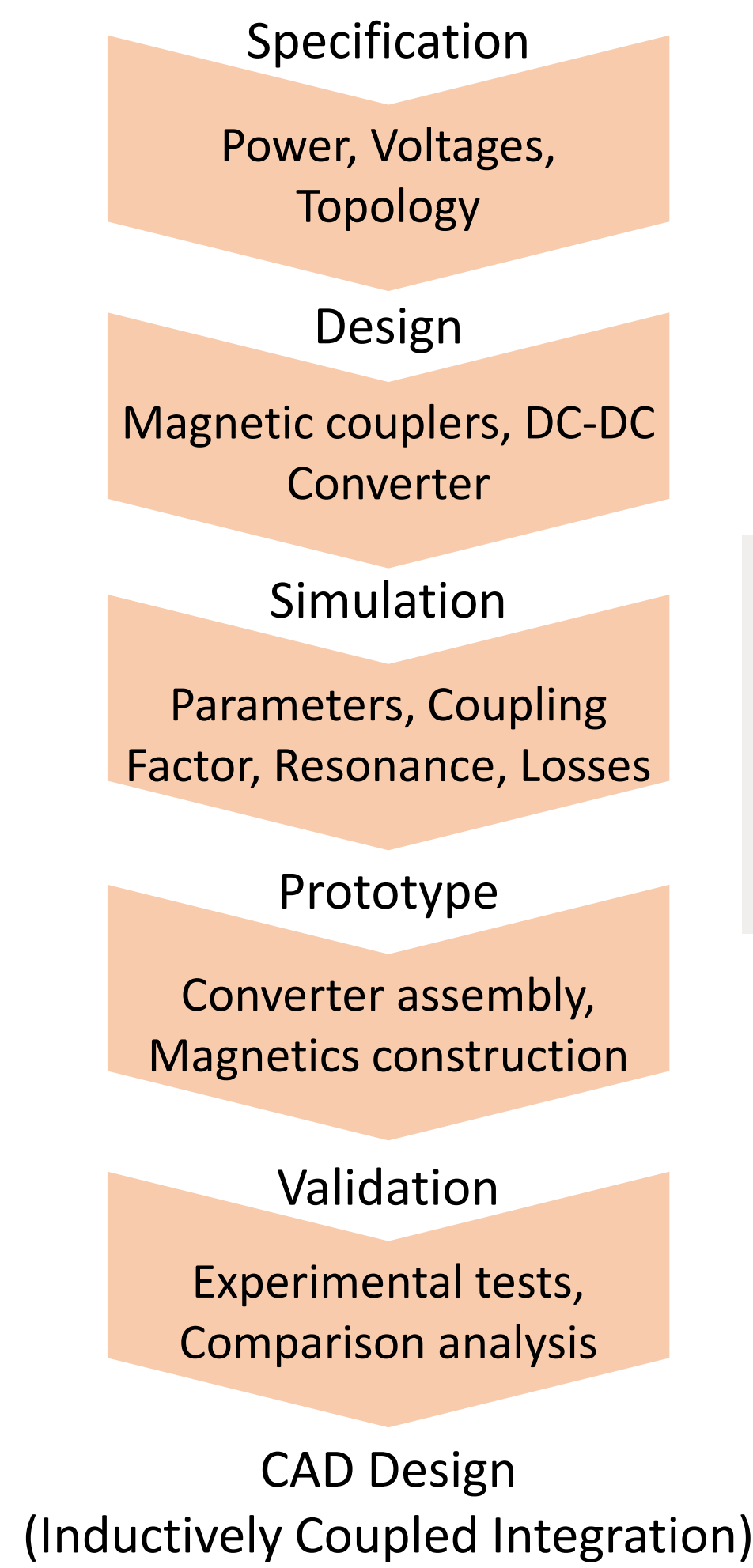


Team: Marcio L. Magri Kimpara, Rafal Wojda, Prasad Kandula, Ethan Crisp, Lois Goodman

1 Project Overview

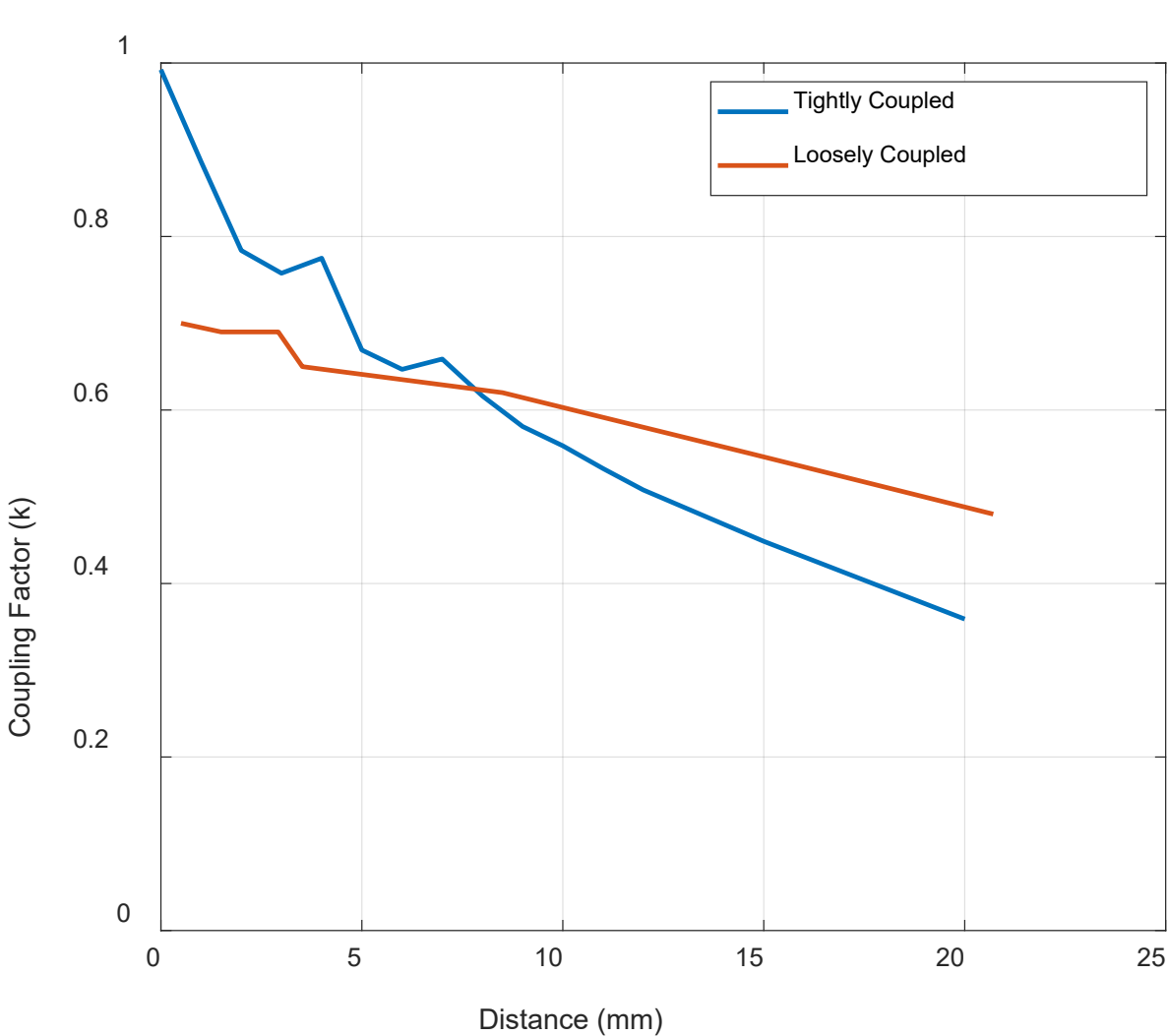
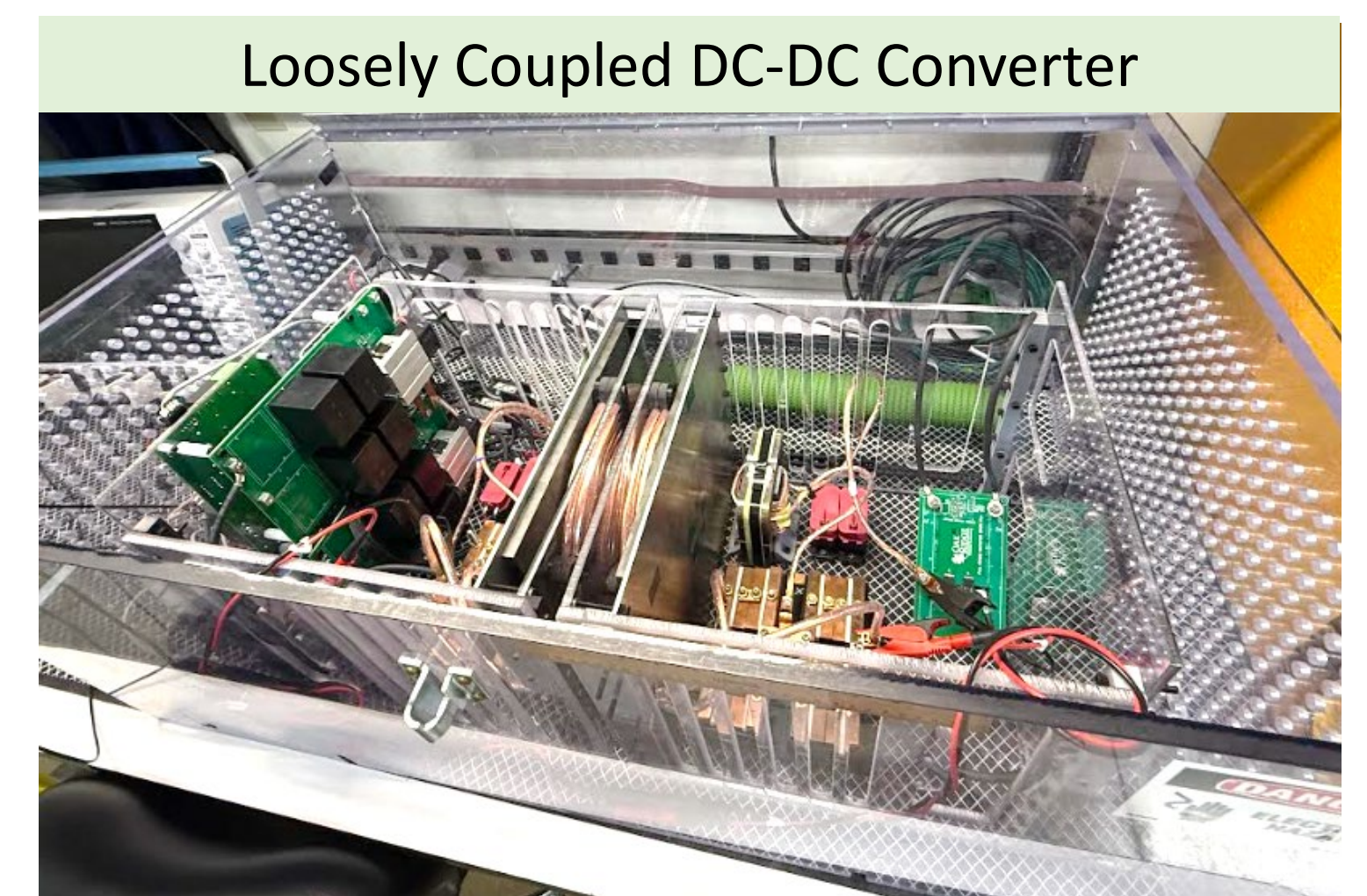
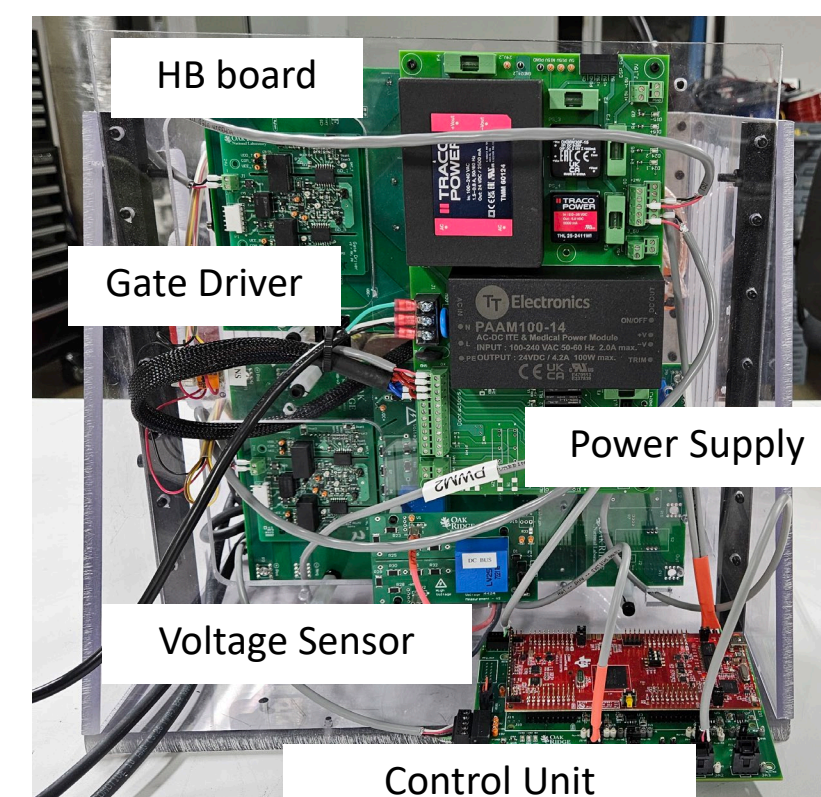
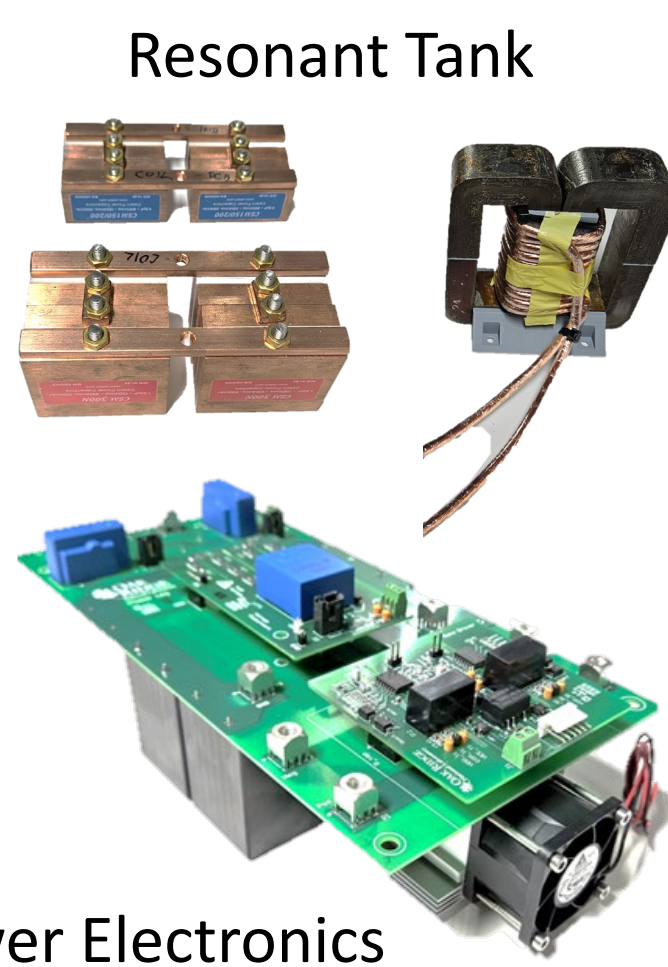
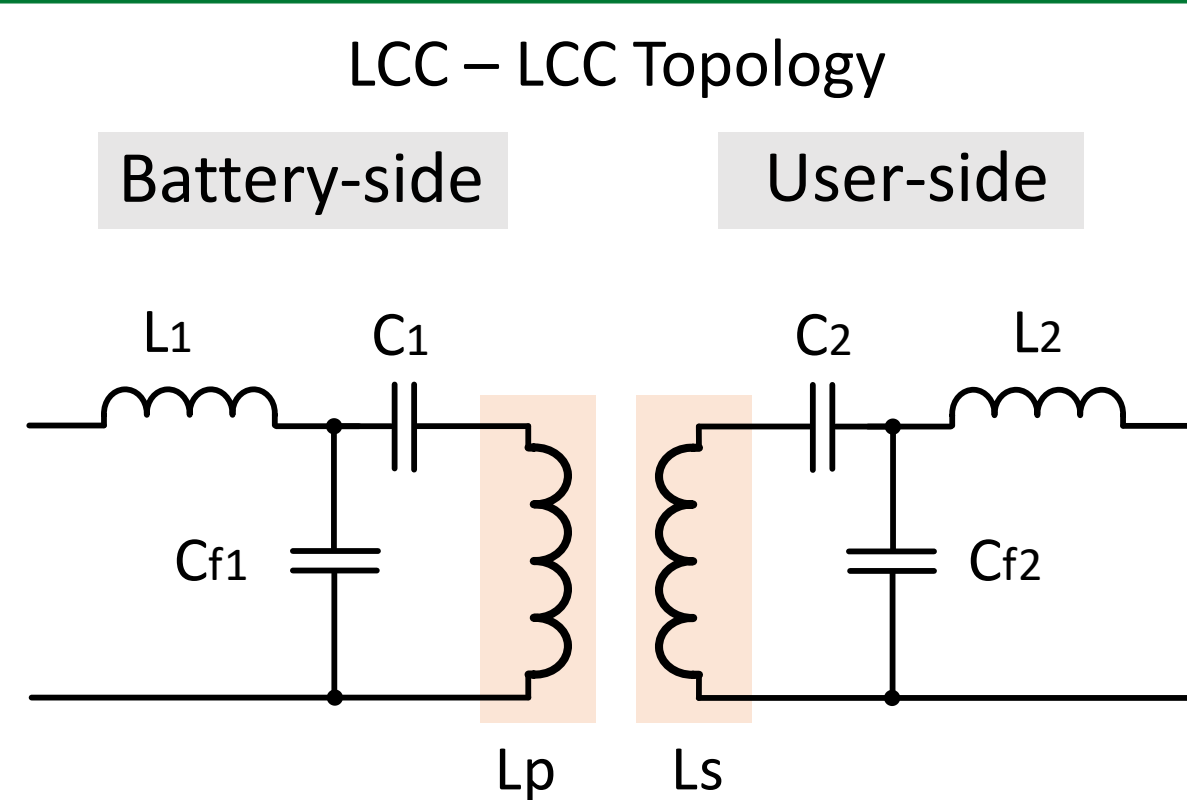


2 Methods



3 Results

Parameter	Value
Power Rating	30 kW
DC input	600 V
DC output	600 V
Switching Freq.	20 kHz
Resonant Tank	$L = 116 \mu\text{H}$
	$C = 1.3 \mu\text{F}$
	$C_f = 0.5 \mu\text{F}$



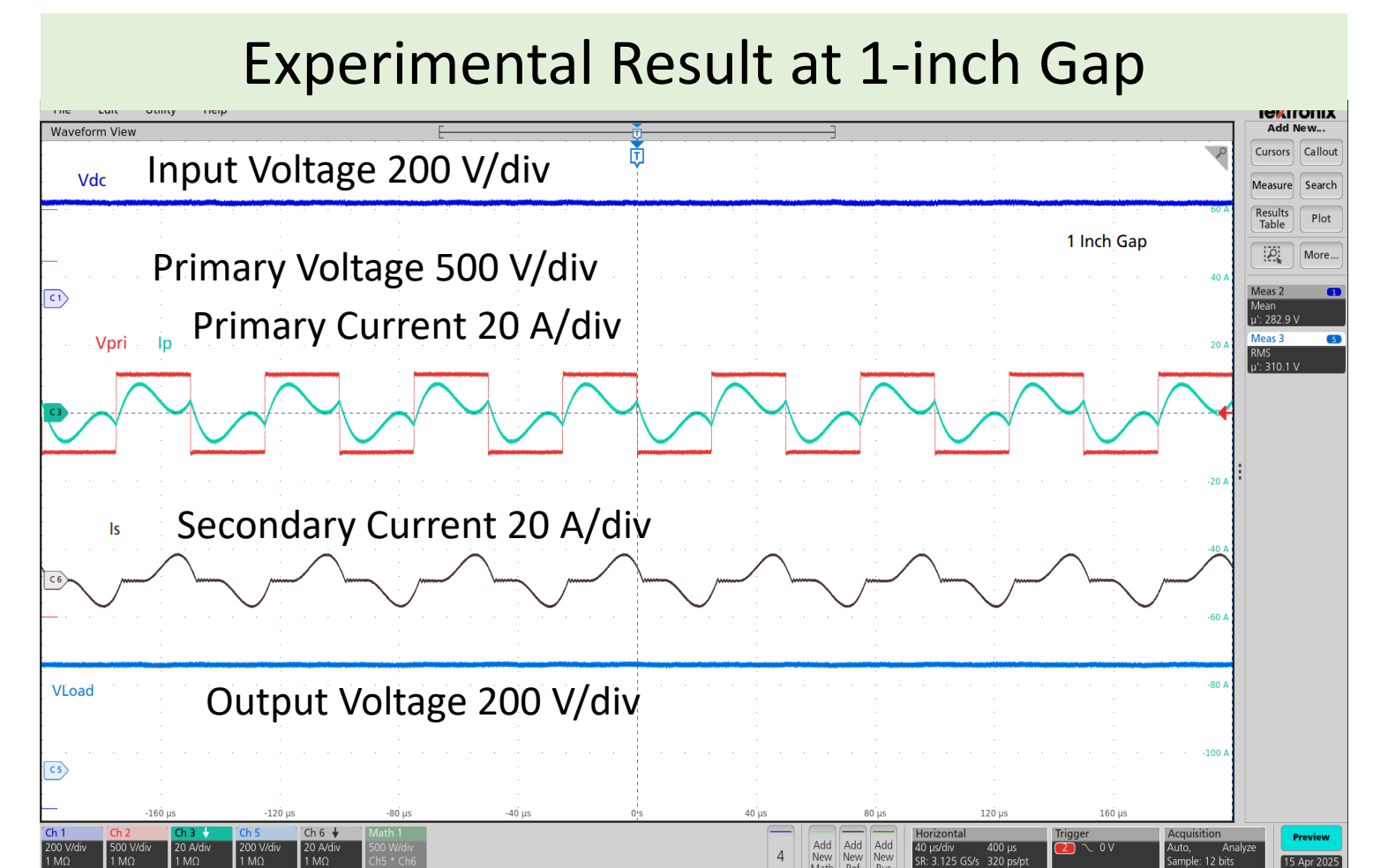
Loosely Coupled

- 450 W losses
- Turns: 24 (double layer)
- Size: 11 in x 11 in x 1.7 in



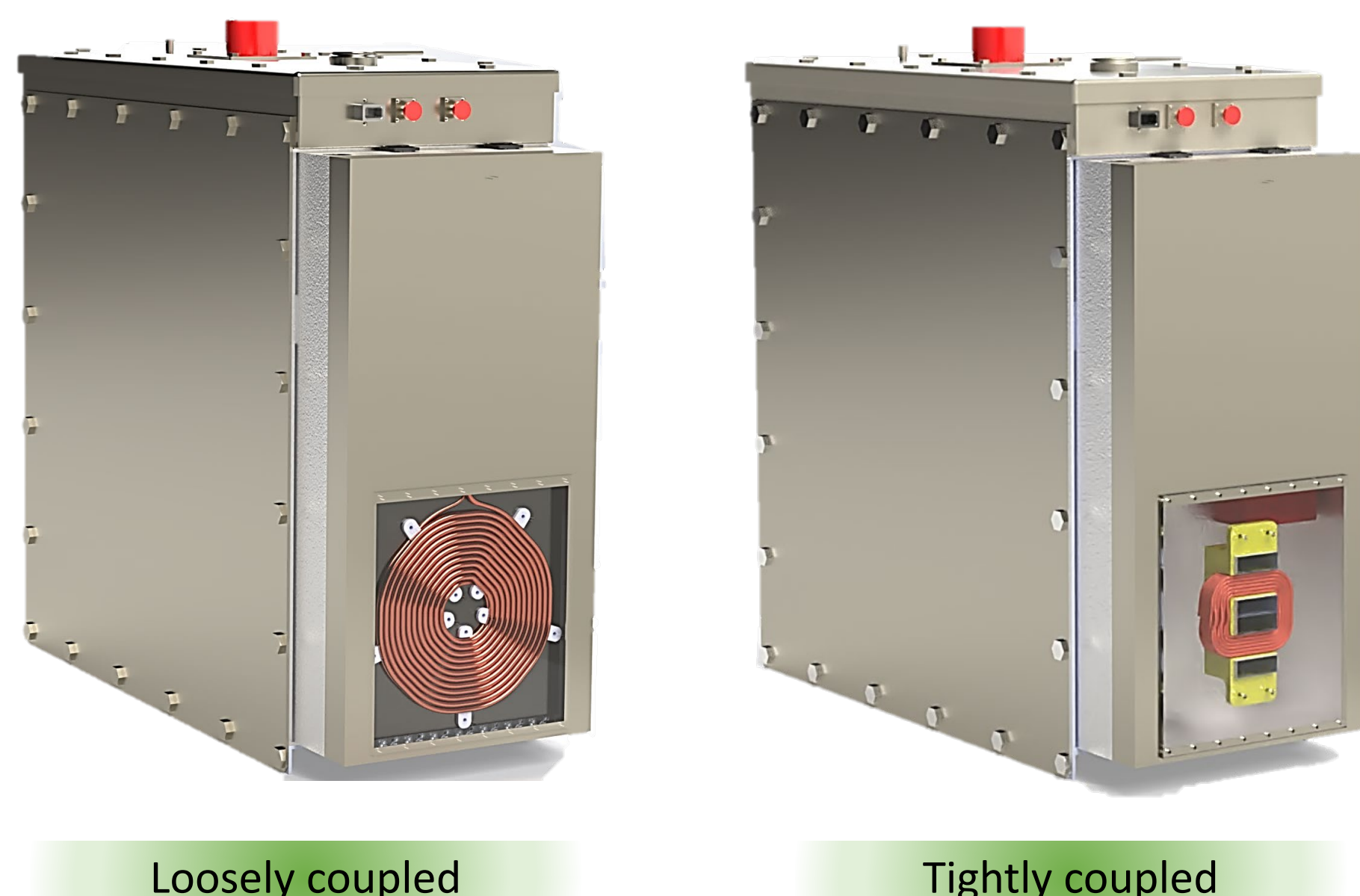
Tightly Coupled

- 185 W of losses
- Turns: 28 turns
- AMCC 400 cores
- Size: 6.7 in x 2.5 in x 2.95 in



4 Discussion

- Reduced risk of electric shock
- Flexible design for a variety of use cases
- Eliminates hazards and wear on electrical contacts
- Suitable for Mobile Energy Storage Systems (MESS)



Representation of the DC-DC converter stage integrated with a BESS (50 kWh NMC Li-ion - 36"x38.7"x16.8" / 500Kg)

5 Project Outcomes

- Simulation models and comparative analysis;
- CAD models and assembly diagrams;
- Bidirectional LCC resonant DC-DC converter prototype;
- Publications;
- Integrated solution;

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