

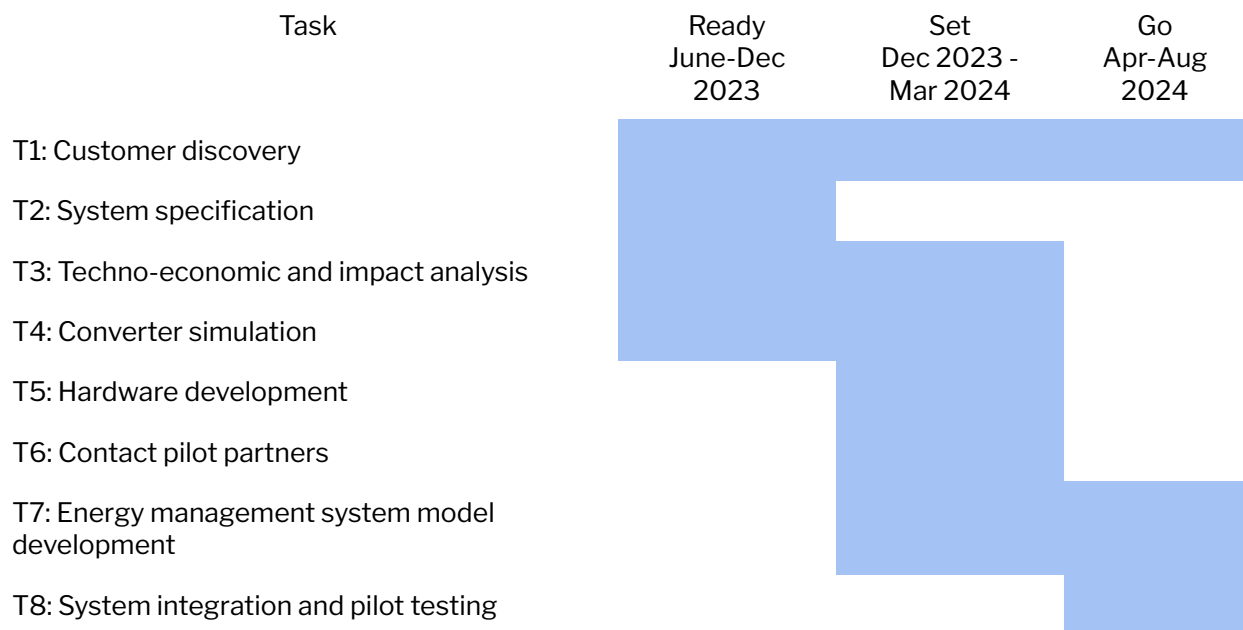
ICoN Energy Technical Assistance Request

Our team has successfully developed a functional simulation of our proposed converter in PLECS using ideal power sources and loads. We are now seeking technical assistance and collaboration with national laboratories and hardware prototyping centers to progress towards testing, validation, and real-world demonstration of our solution. Specifically, we are in need of support in the following areas:

- a) **System Level Modeling:** We require assistance in creating comprehensive models for flexible solar panels and batteries used in trucks. The models will be instrumental in integrating their respective physical aspects into our design. This enables us to preemptively identify potential failure scenarios and implement mitigation strategies before advancing to physical hardware testing.
- b) **Hardware in the Loop Testing:** Access to photovoltaic systems and battery models is vital to align our simulation with real-world conditions. We are looking for guidance and support to implement controller hardware in the loop testing, allowing us to thoroughly test the operation of solar panels and the battery management system in conjunction with our proposed control methodology, thus ensuring the proof of concept's viability before committing to physical hardware testing.
- c) **Thermal Management:** We anticipate thermal challenges during the prototype testing phase. Thus, we seek support to model and address these issues early in the design process. This assistance will facilitate informed component selection and the design of effective thermal management solutions.
- d) **Regulatory and Certification Consulting:** We require expertise in navigating the certification requirements essential for our proposed converter. By addressing these concerns at an early design stage, we aim to avoid potential delays during the certification process.
- e) **Hardware Testing (Benchtop and Pilot Testing):** Once we have a validated proof of concept, we need access to laboratory facilities and testing environments for both benchtop and full-scale prototype testing. Our objective is to evaluate the performance of our solution when powered by a photovoltaic system with a battery load. Additionally, access to trucks used in laboratory settings will enable us to gain insights into their physical systems, power requirements, and auxiliary power unit configurations, facilitating the integration of our solution for comprehensive testing.

- f) **Retrofitting:** Expert guidance is crucial as we consider integrating our solution into existing truck trailers to enhance both fuel and battery power utilization. Thus, we are seeking assistance in selecting and understanding the installation process of flexible solar cells to ensure proper placement on top of trailers.
- g) **Impact Analysis:** We need support in conducting a thorough impact analysis to assess how our solution addresses key concerns related to fuel and greenhouse gas emissions reduction, health, and cost-effectiveness.

A summary of the tasks that we plan to undertake during each phase is below.



In summary, we are seeking technical expertise and collaboration to advance our project from simulation to practical implementation. By addressing these critical areas of need, we aim to bring our innovative solution for solar-powered tractor trailers closer to realization, with the potential to significantly reduce emissions and enhance energy efficiency in the transportation sector.