



# High-Conversion Cell-Level Power Converter

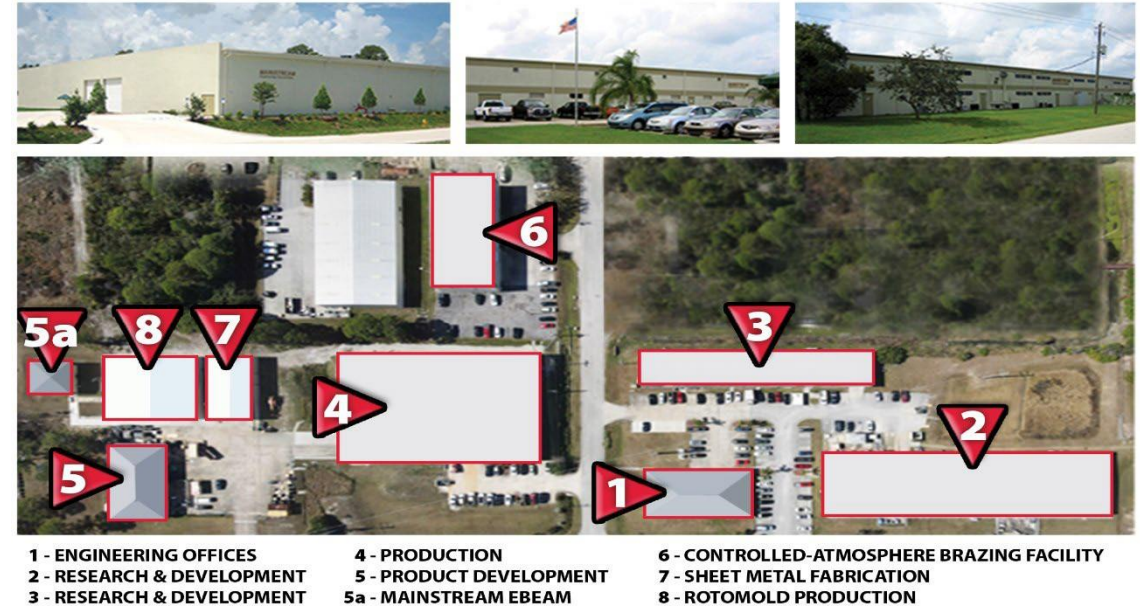
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# Mainstream Engineering Corporation

- ▶ Small business incorporated in 1986
- ▶ 170+ employees
- ▶ Mechanical, chemical, electrical, materials and aerospace engineers
- ▶ 100,000 ft<sup>2</sup> facility in Rockledge, FL
- ▶ Laboratories: electric power, electronics, materials, nanotube, physical and analytical chemistry, thermal, fuels, internal combustion engine
- ▶ Manufacturing: 3- and 5- axis CNC and manual mills, CNC and manual lathes, grinders, sheet metal, plastic injection molding, welding and painting
- ▶ Spinoff: Rivian Automotive
  - ▶ Founded in 2009 as Mainstream Motors



## Capabilities

- ▶ Basic and Applied R&D
- ▶ Transition from R&D to Production
- ▶ Manufacture Advanced Products

## Mission Statement

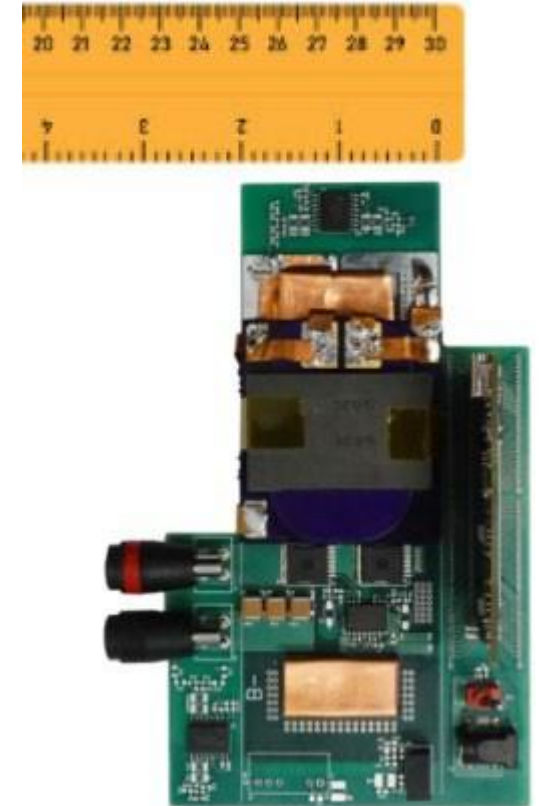
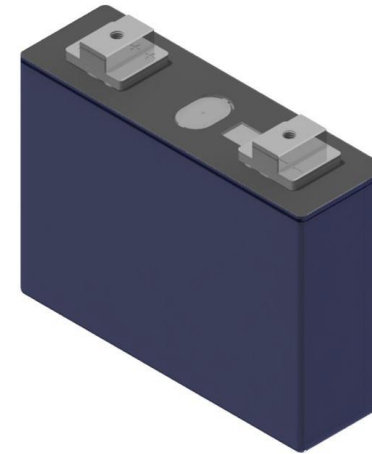
To research and develop emerging technologies.  
To engineer these technologies into superior quality, military and private sector products that provide a technological advantage.

# High-Conversion Cell-Level Power Converter

- ▶ DOE Phase I SBIR
- ▶ Perform Power Conversion at the cell level
- ▶ Cell Requirements
  - ▶ Prismatic cell  $V_T < 4\text{ V}$ , Capacity  $> 50\text{ Ah}$
  - ▶ General Dimensions (L×W): 2-3" × 5-6"
- ▶ Converter Requirements
  - ▶ Footprint confined to terminal face of cell
  - ▶ Ability to operate in series/parallel
  - ▶ Gain  $> 100\times$
  - ▶ Efficiency  $> 98\%$
  - ▶ Height  $< 2\text{''}$  off the terminal face

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# Path to Commercialization

## ▶ Markets

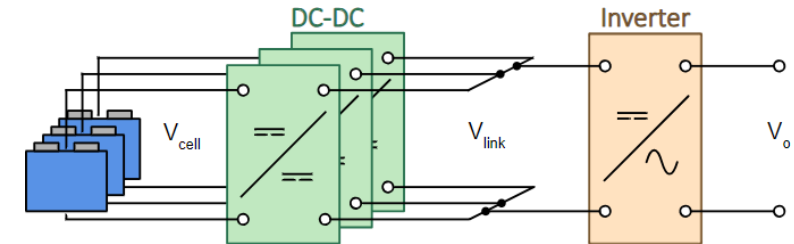
- ▶ Tribal Communities
- ▶ Portable Power Systems
- ▶ Vehicle Inverters

## ▶ Navajo Nation

- ▶ Remote Power Systems
  - ▶ 2 kW, 120/240 V
  - ▶ Scalable for future power needs
  - ▶ Agnostic to cell type (chemistry, capacity, etc.)
  - ▶ Easily serviceable

## ▶ Challenges

- ▶ Funding
- ▶ Customer outreach
  - ▶ Working with LARTA



Source: sacredpowercorp.com

Goal: Product for Tribal Communities