

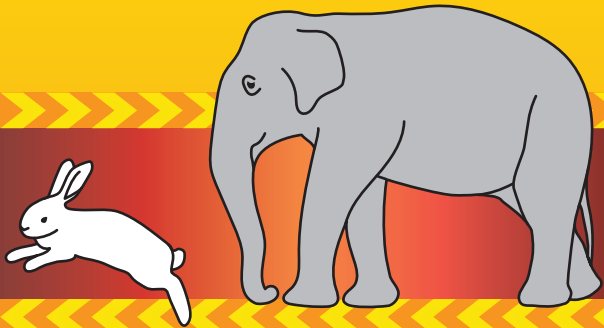
# New Plasma-Based HVDC Converters

## Advantages

- Smaller size and lighter weight
- Simplified hardware, reduced cost
- Inherent surge and fault protection
- Higher voltage improves efficiencies

## Applications

- Connecting transmission grids
- Solar PV farms
- Undersea cable installations
- Offshore wind platforms and wind farms
- Long distance HVDC power transmission



**“Our plasma-based electrical transformers will be  $\frac{1}{10}$  the size and less than  $\frac{1}{2}$  the cost of current units.”**

## About Tibbar Plasma Technologies

Tibbar Plasma Technologies, Inc. is located in Los Alamos, New Mexico. Our highly experienced staff includes plasma theorists, experimentalists, engineers and technicians. Over two years, we will be receiving \$3.5 million in funding from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to develop revolutionary plasma-based electrical transformers.

With help from private investors, we will continue to model optimum designs for AC to DC Devices that range from 380 V DC for commercial buildings to the next generation of ultra high HVDC 1100 kV stations carrying over 7000 MW.

**We are currently seeking venture capitalists who have the vision to invest in the future of HVDC power. Please contact us to learn more.**

Call us at 505-662-0867 or visit:

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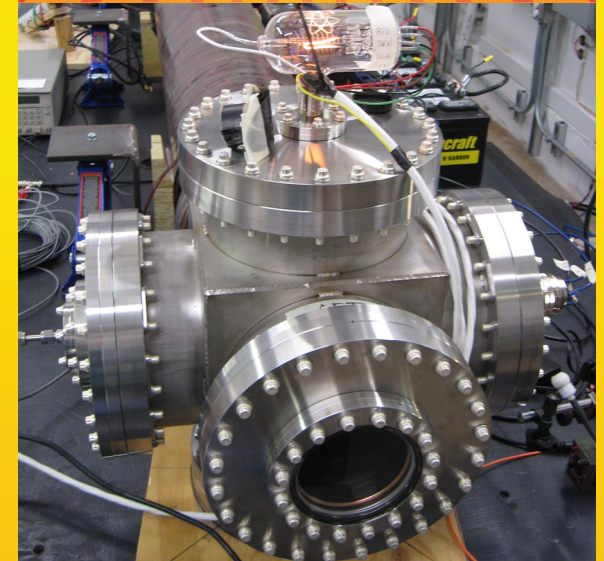
## We're Out Standing in Our Field!



**From Albuquerque:** From I-25 N, take NM-599 N (Santa Fe Relief Route) to US-285 N/US-84 W. In Pojoaque, take the NM-502 W/Los Alamos exit. Continue on NM-502 and take a sharp left onto DP Rd in Los Alamos.

**From Santa Fe:** Follow US-285 N/US-84 W. In Pojoaque, take the NM-502 W/Los Alamos exit. Continue on NM-502 and take a sharp left onto DP Rd in Los Alamos.

# TIBBAR PLASMA technologies



## New Plasma-Based HVDC Converters

### High Power/High Voltage

- ⚠ **3-Phase AC to DC**
- ⚠ **3-Phase AC to AC**
- ⚠ **DC to 3-Phase AC**
- ⚠ **and DC to DC**

# Meet Shiner: Pulsed Power 480V 3-Phase AC to DC

## A Novel Solution

Tibbar Plasma Technologies, Inc. is currently developing a revolutionary new plasma-based technology for High Voltage Direct Current (HVDC) converters. Our plasma-based electrical transformers will be  $\frac{1}{10}$  the size and less than  $\frac{1}{2}$  the cost of present day technologies. Plasma-based electrical transformers have the potential to reduce the cost of transforming power by a factor of 2x-10x. Shiner is a prototype to test our concept.

## How it Works

Shiner uses three primary helical electrodes inside a cylindrical vacuum chamber, with two DC electrodes as endcaps, and a solenoid coil wrapped around the outside of the cylinder.

The helical coils induce output current and voltage through secondary electrodes at the ends of the plasma chamber. The current induced along the axis produces an output voltage and current at the ends of the chamber, which enables efficient conversion of 3-Phase AC to DC, DC to DC, DC to 3-Phase AC, or 3-Phase AC to 3-Phase AC.

1. Vacuum Chamber is filled with a low pressure gas.
2. Solenoid generates an axial magnetic field.
3. 3-Phase AC input is fed through primary electrodes inside chamber to generate plasma.
4. Current flows through the plasma between the endcap secondary electrodes.
5. Current and voltage data from secondary electrodes is recorded.

