



CORPORATE PRESENTATION
January, 2014

- Presentation
- Smart Grid
- Electromobility
- Testing Equipment
- Product Lines
- Engineering Services
- Clients
- R&D Projects
- Examples

Who we are:

CINERGIA is a knowledge-based engineering company that provides high technology products and services customized to the needs of our customers in the field of power conversion. Our areas of expertise are:

- Power electronics
- Digital control for power conversion
- Industrial communications and Automation

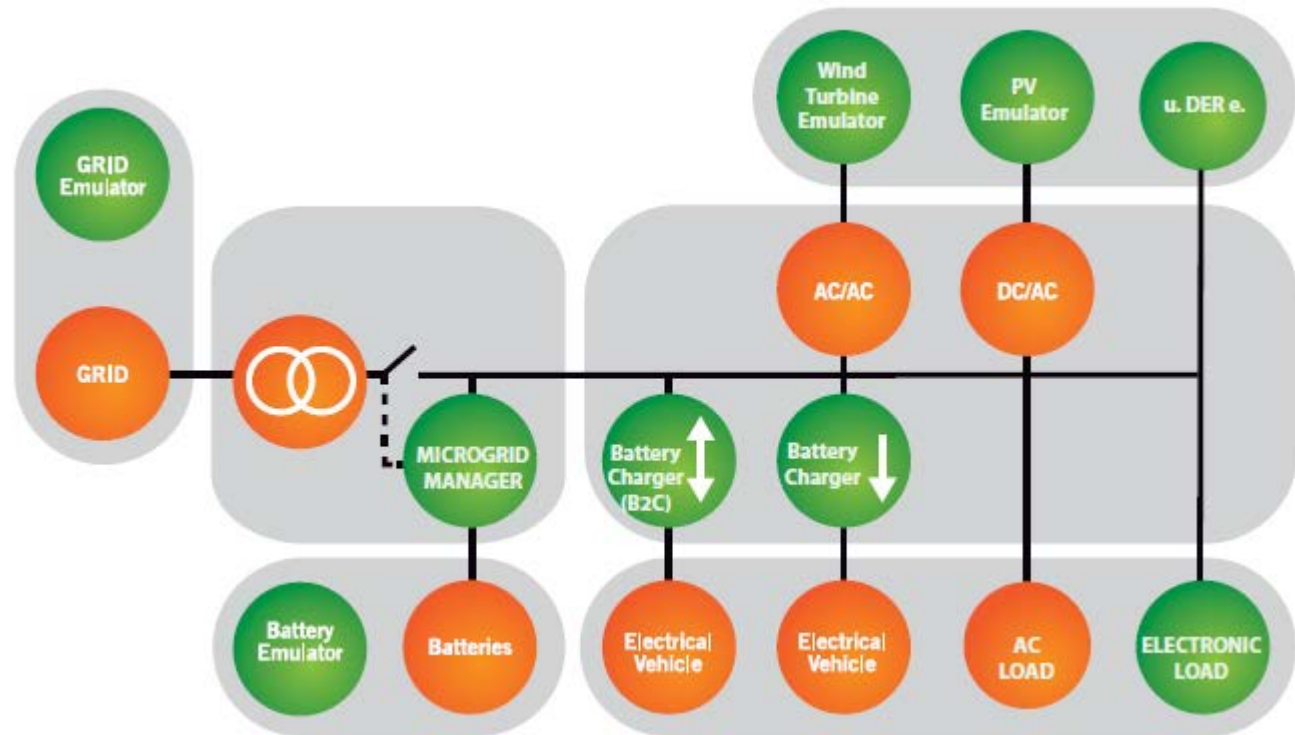
We have solutions in:

- Smart Grids
- Electromobility
- Testing equipment for R&D and Industrial laboratories



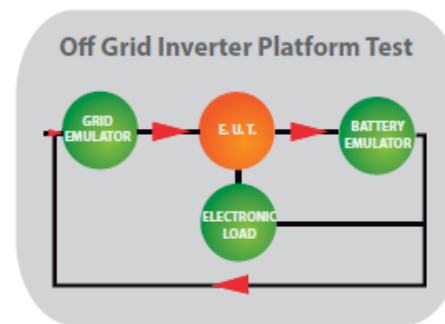
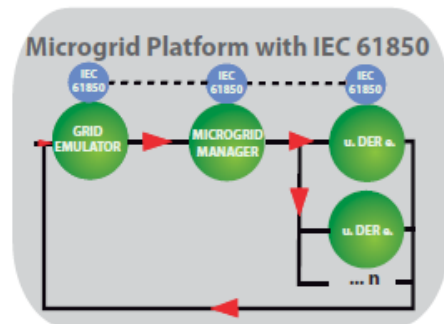
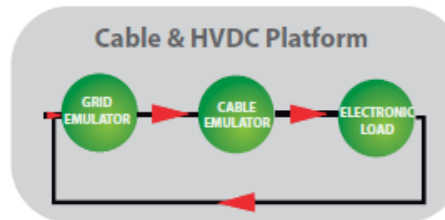
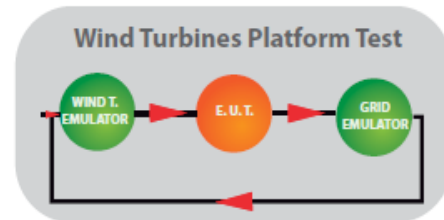
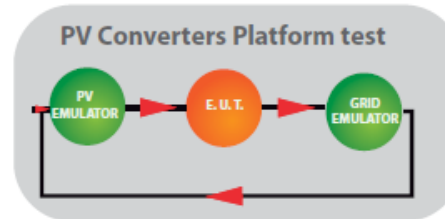
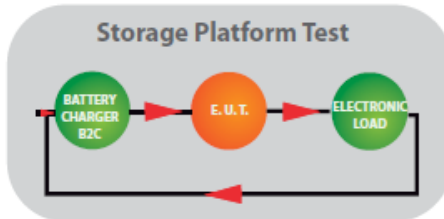
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Smart Grid Lab configuration:



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Some platforms for research and testing:



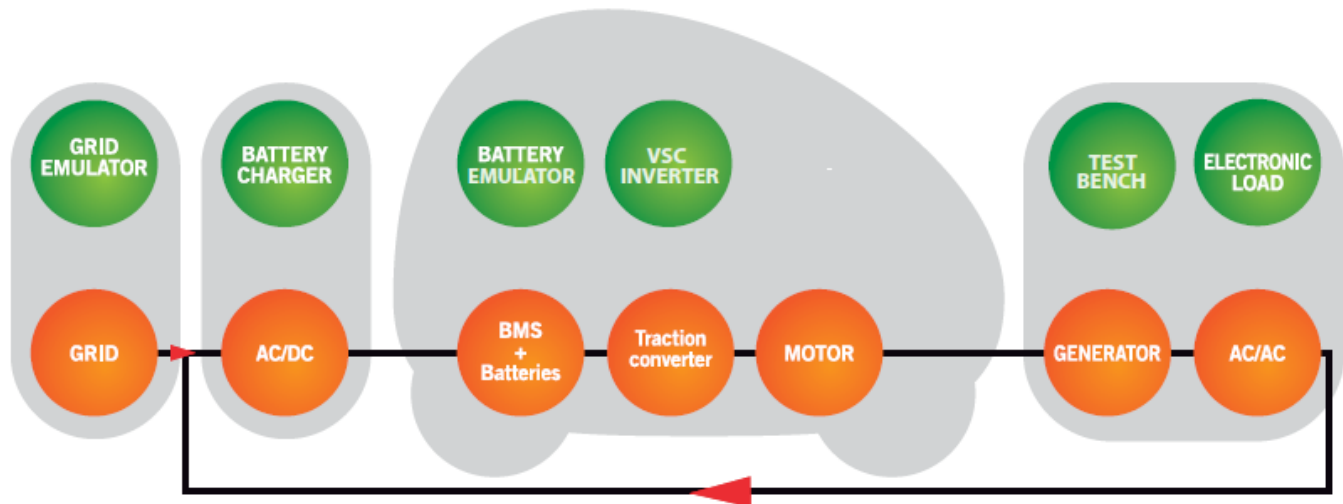
Product range:

- Grid Emulators
- Load Emulators /Electronic Loads
- Battery Emulators
- Battery Chargers (Uni & Bidirectional)
- PV Emulators for testing PV inverters.
- Wind Turbine
- Cable Emulators
- uDERe (universal DER element)
- Microgrid Manager
- IEC 61850 Interface



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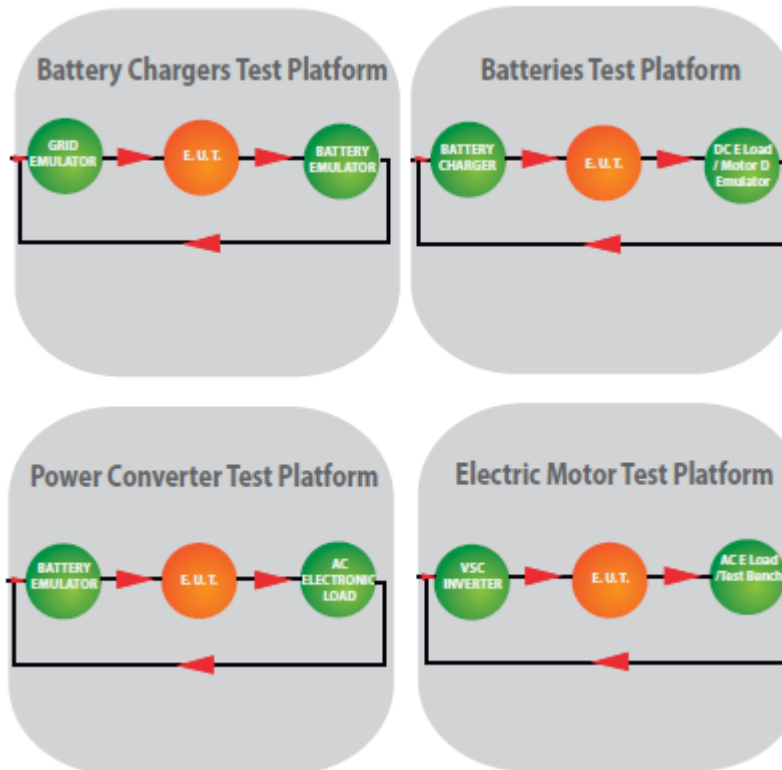
Electric Vehicle Lab:



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Some platforms for research and testing:

Product range:



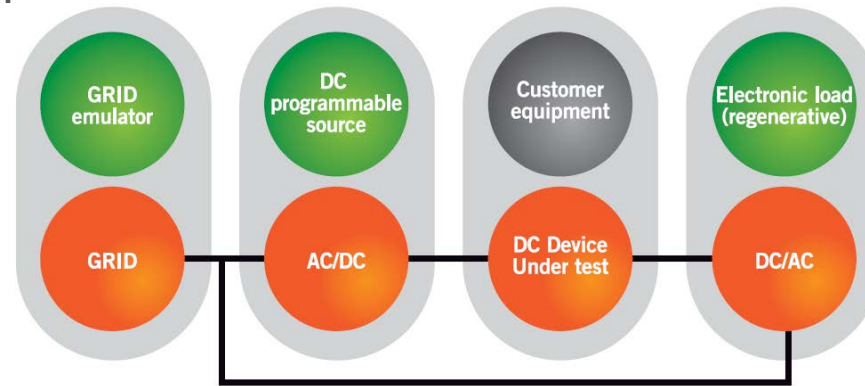
- Battery Emulators
- Motor Drive Emulators
- Test Benches
- Battery Chargers
- Load Emulators /Electronic Loads
- Grid Emulators
- VSC Inverters



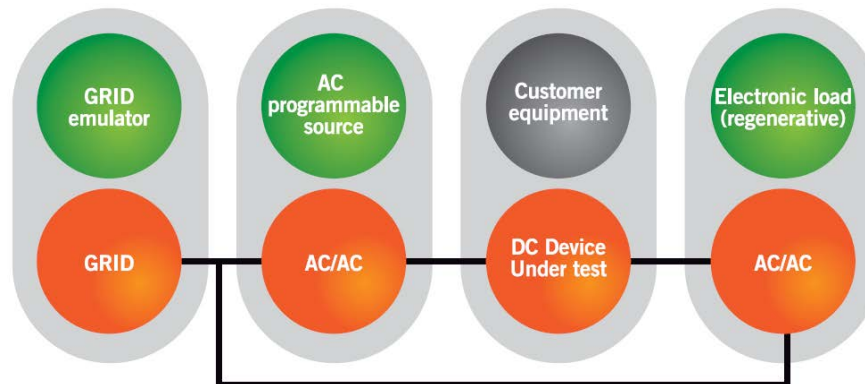
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Platforms for academic, R&D and Industrial Labs:

DC platform



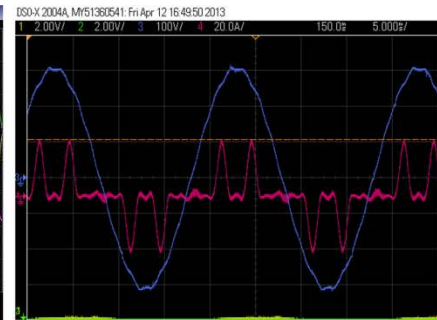
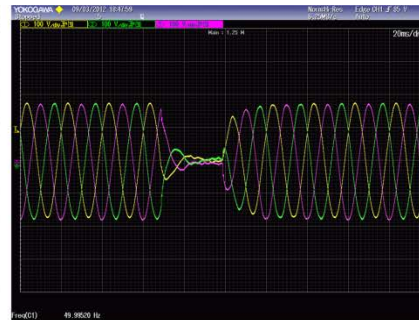
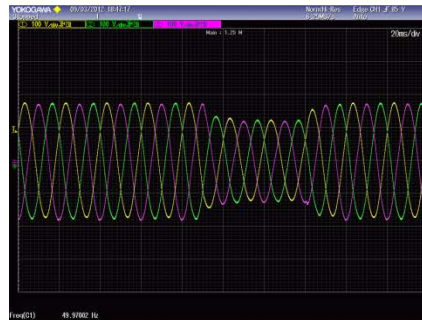
AC platform



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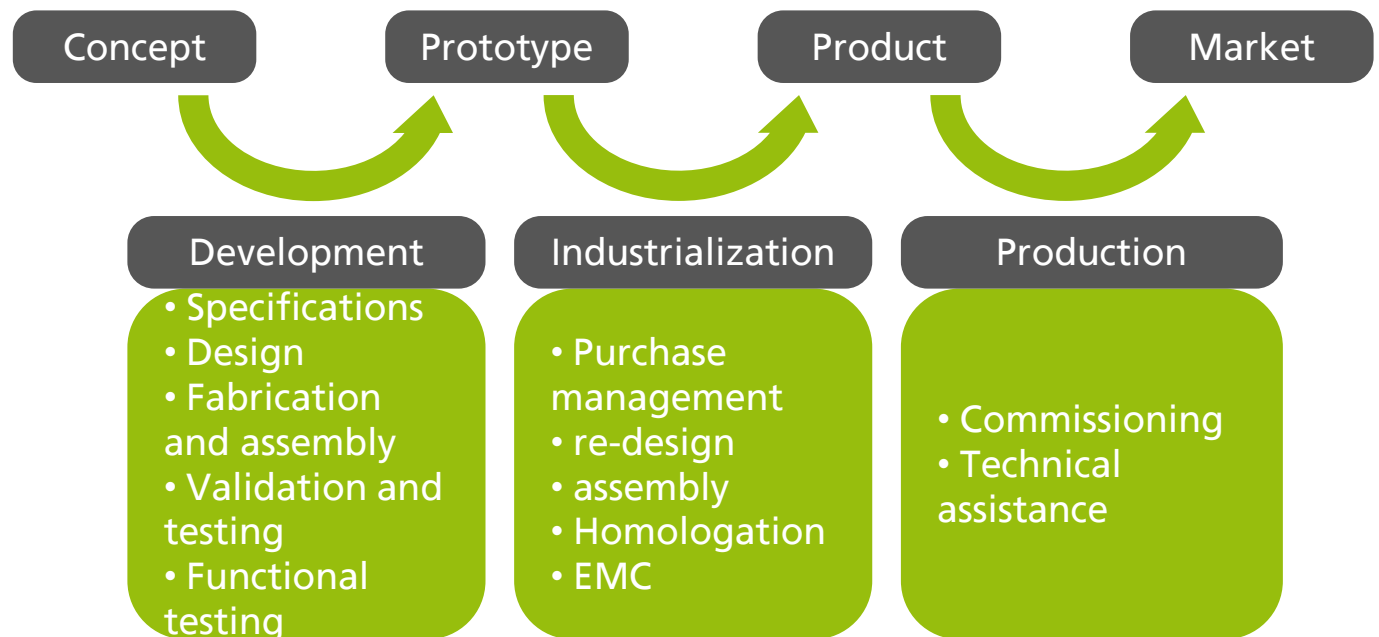
Some examples of Custom Equipment for Research and Testing:

- Test Benches for Motor Control Development
- Modular Multilevel Converters
- HVDC & FACTS Power Electronics Platforms

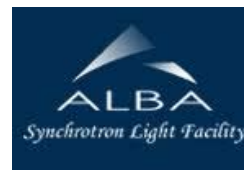


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- Power Electronics Engineering and Consulting
- Custom Development
- Commissioning and Technical Assistance
- EMC (Electromagnetic Compatibility)
- Energy Efficiency and Quality of Supply
- Industrial Communications and Automation



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Some R&D Projects:

- **MEDOW** : Multi-terminal DC grid for offshore wind generation
- **NOVARE 2010**: V2M (vehicle to microgrid)
- **Formula Student 2013**: electric car competition
- **EMERGE**: converter for a multipolar generator
- **Greenlysis**: control of a microgrid
- **Charge & Ride**: energy efficiency in rail system
- **E3V**: efficiency in electrical vehicles
- **DER IREC 22@ MICROGRID**: investigation on the IREC's microgrid supplied by CINERGIA



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Grid Emulators

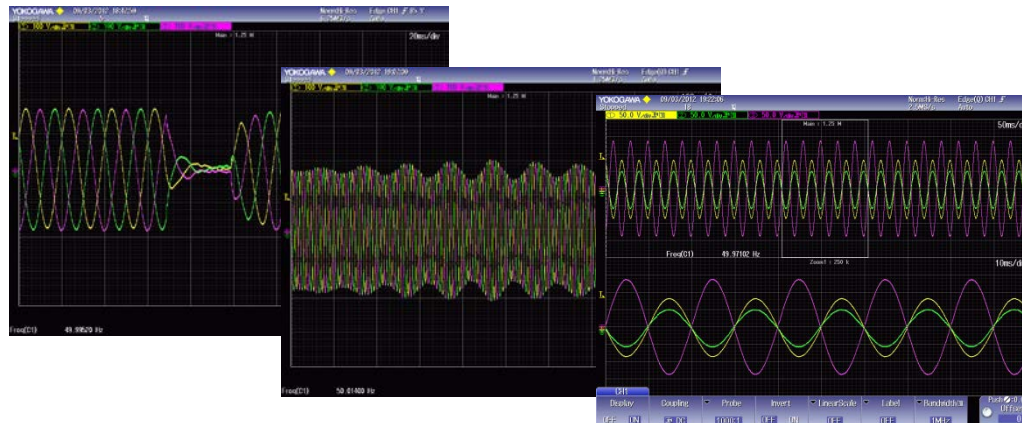
Grid emulators are designed to emulate Electrical Grids in normal and fault condition operation.

It can generate different types of faults and disturbances.

- Three phase power grid (3F+N) from 0 to 480Vac
- Power grid with variable frequency from 0 to 400Hz
- DC Voltage Source from -800 to 800Vdc

It can generate common disturbances as:

- Power grid with voltage harmonics control 3, 5, 7, 11, 13 and 19 (direct/reverse)
- Flickers (programmable amplitude and frequency) and overvoltage
- Generation of interruptions and voltage dips (type A, C and D)
- Three phase power grids with programmable variations in frequency



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Microgrid Manager

MicroGrid Manager is a bidirectional converter that charges and discharges batteries from or to the grid. It also allows the transition from island mode to connected mode.

When in Connected Mode, the converter follows active and reactive setpoints allowing the energy balance.

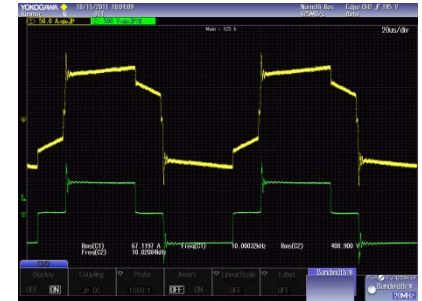
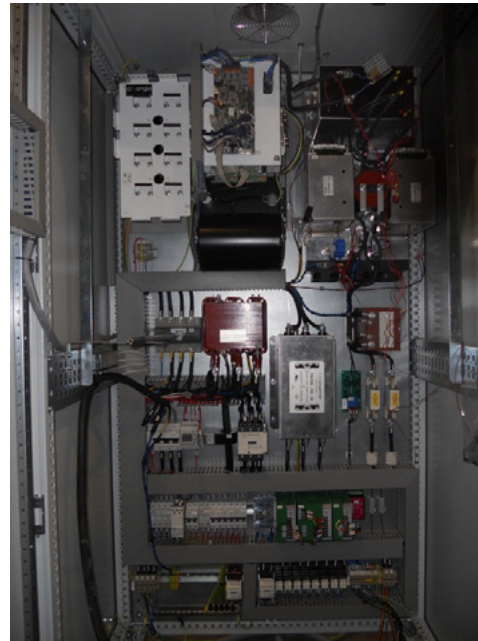
In Island Mode, the converter fixes the grid requirements: voltage and frequency.



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Battery Charger:

- 700Vdc and 72A
- High frequency galvanic isolation.
- CAN Communications with BMS
- User interface with touch screen



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Fast battery chargers, designed for charging hybrid trucks

AC / DC converter with IGBT technology and isolated 14KW.

Features:

- 700Vdc and 20A
- 3 load levels: fast, slow, equalization
- Communications with the battery (BMC) and automatic level of required loading.
- Friendly use: direct connection to the vehicle, power and full load
- Calculation of energy delivered to the battery in kWh with an accuracy of 1%
- Protections: thermal, short circuit, EMC
- Battery disconnection



Examples: custom power converters

A real Micro Grid with emulated elements

The uDERe (universal DER element) emulates the electrical behaviour of any device at its connection to the grid.

They can work as a source of voltage, current or power.

Emulated devices:

- Distributed generation: solar, wind
- Storage (batteries,..)
- Programmable Electronic load,

Advantages:

- Allows testing with full power
- Not depends on the weather
- Reduction of testing time
- Consumption: only the losses



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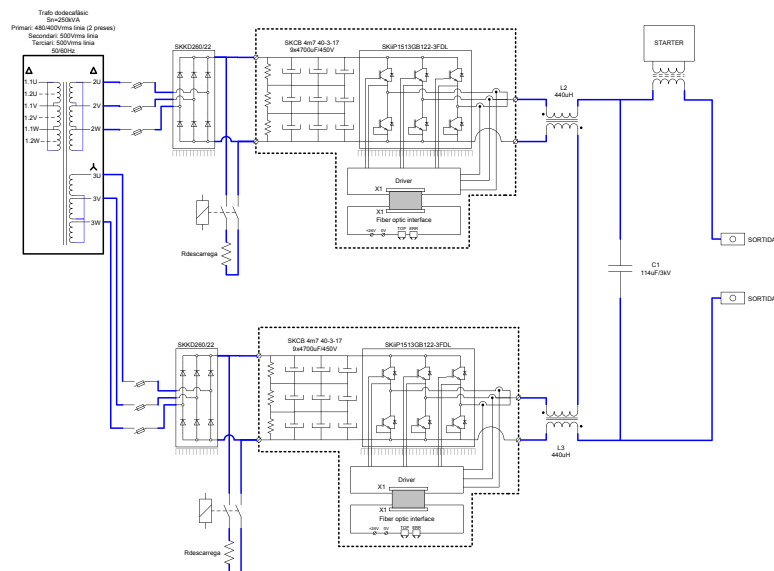
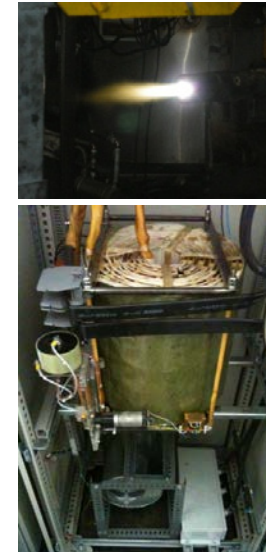
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Plasma

Design and implementation of 200kW plasma generator (1400V, 280A output)

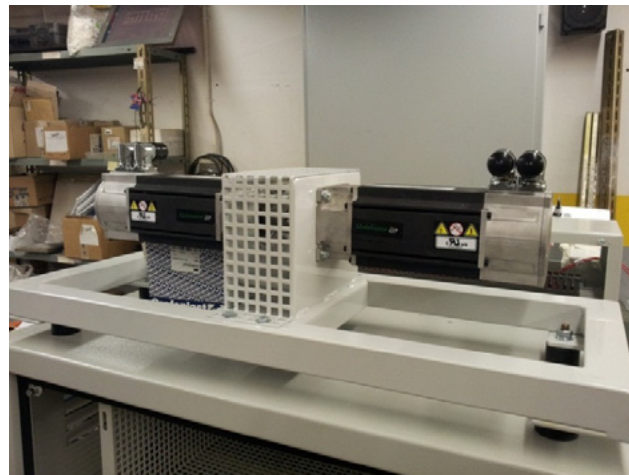
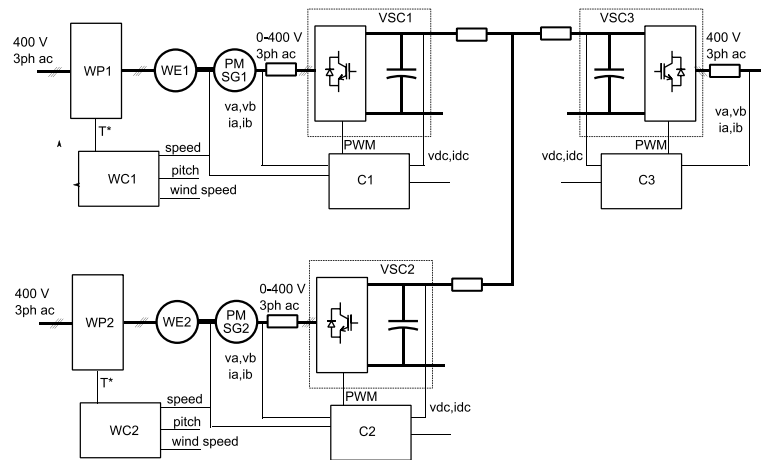
- Waste Gasification application
- Buck multilevel topology
- Isolated output
- Tesla coil ignition for plasma (40MHz 30kV)
- IGBT technology



Examples: custom power converters

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Platforms for R & D in HVDC.





Thanks!

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