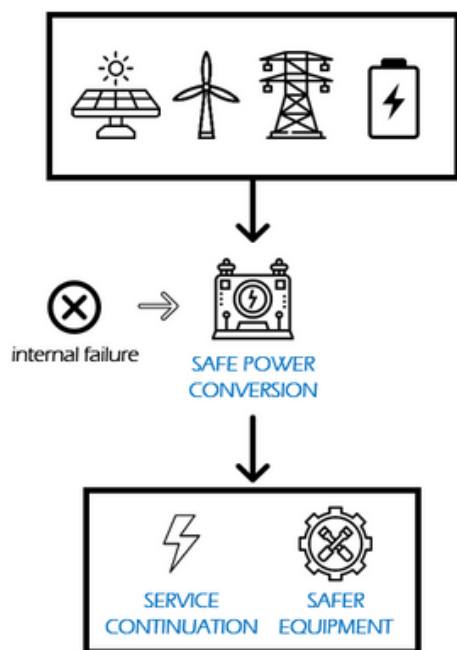


# VERSATILE AND RESILIENT POWER CONVERTER

TOWARDS A SYSTEM BASED ON RENEWABLE ENERGY

## THE CONCEPT



## ADDED VALUE

- Reliable electrical network in remote areas
- Security and quality of the service

## TRL

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## PRODUCT DESCRIPTION

- **Power converter** adapted to handle **renewable energy** efficiently: from generation, storage to the electrification and integration of new vehicles
- **Fault-tolerant** converter: Remains in operation after any of its internal component fails, thanks to its redundant internal structure and reconfiguration hardware
- Minimizes redundant components
- It **reduces** considerably the initial **capital investment**, as well as the **costs of implementation and maintenance**

## APPLICATIONS

Our power electronic converters:

- Can replace redundant equipment by our fault-tolerant systems
- Can be implemented in remote areas
- Makes implementation of electric vehicles, renewables, management and batteries for storage more feasible

## DESIRED PARTNERS

Industrial partners in the field of power electronics and investors.

## EXPECTED BENEFITS

- 40% capital cost reduction
- Reliability of the electrical network
- >50 % extended lifespan
- Implementation of renewables

technical details

## COMPETITIVE ADVANTAGE

The technology provides several advantages comparing to current solutions, such as the cost reduction, the reduced energy losses due to system failure, increasing the O&M time to repair of the equipment (allowing continuous operation under such conditions) and an extended lifetime. This technology is based on a new internal configuration of the semiconductor-based switches which compose the power converter, and also the redundant components can be used for both converters DC/DC and DC/AC, unlike other cases.

With the appropriate management system, higher levels of resilience, efficiency and operational capacity can be achieved. The internal reconfiguration of the system in case of failure or change of operation is automated when a series of indicators are detected leading to isolate the faulty component and maximizing the efficiency of the device during its operation.

## MAIN BENEFITS

The system is based on a new internal configuration of semiconductor-based switches on the power converter. With the appropriate management, higher resilience, efficiency and operational capacity can be achieved.

Our innovation has the following benefits:

- **Capital cost reduction:** We estimate that our system will save 40% of the cost compared to redundant systems. The proposed fault-tolerant converter is about 5-10% more costly than no-fault tolerant inverters (without redundancy). However, including a redundant converter implies almost double the capital investment.
- **O&M cost reduction:** By including the additional components, the system may continue operating although a failure occurs, reducing maintenance needs.
- **Life Extension:** The lifetime will be increased. In preliminary analysis, the structure without redundancy got 3.53 years at continuous full-load condition operation meanwhile the proposed concept got 7.65 years.
- **Efficiency:** Similar in both technologies.

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