

# Graz University of Technology TU Graz

## HVDC/DC Converter

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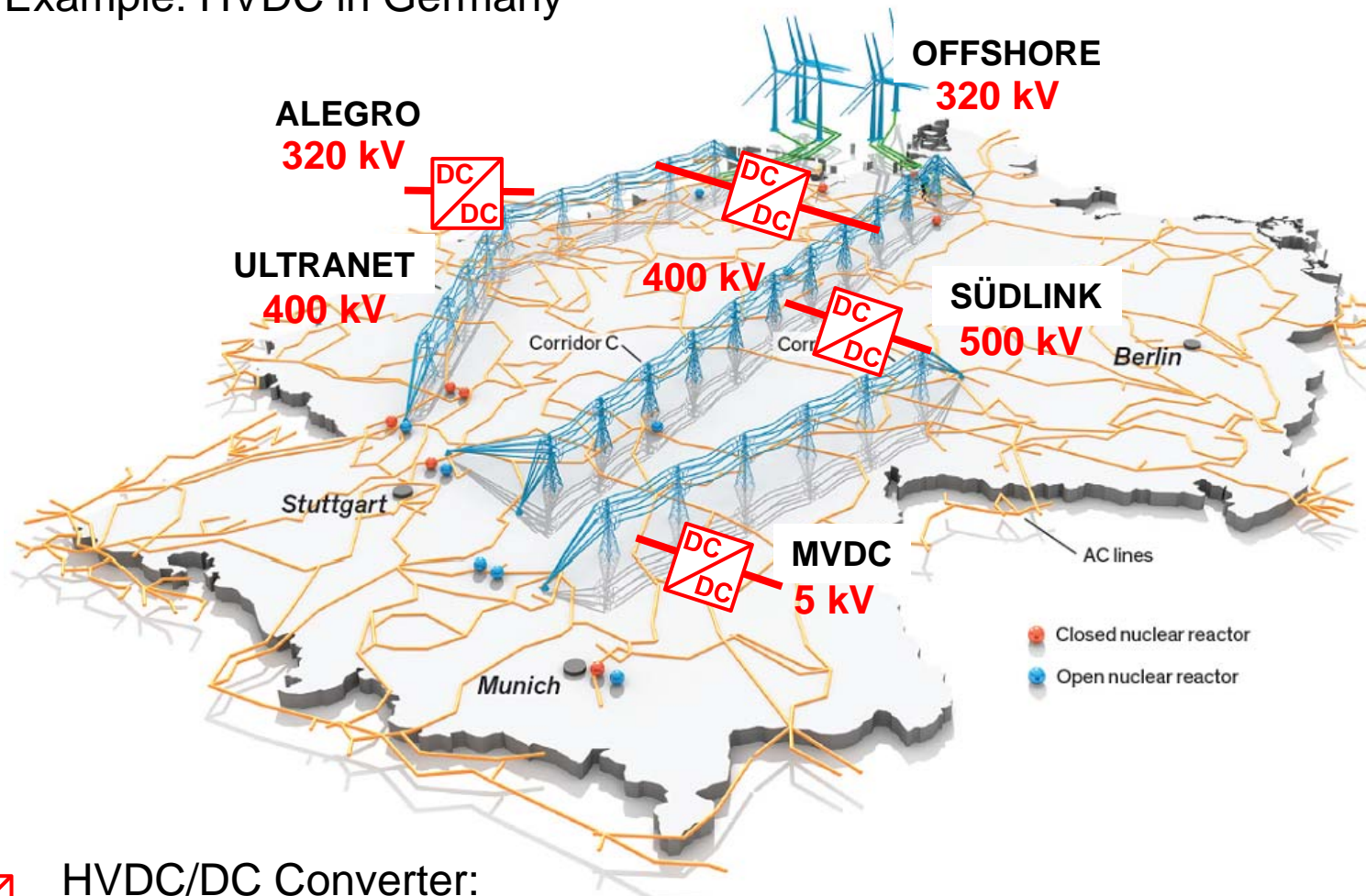
# GRIDCONV

HVDC/DC Converter  
Concept Study and Prototype



Institute of High Voltage Engineering and System Performance  
Electric Drives and Machines Institute  
Institute of Electronics  
Institute of Automation and Control  
Institute of Electrical Power Systems

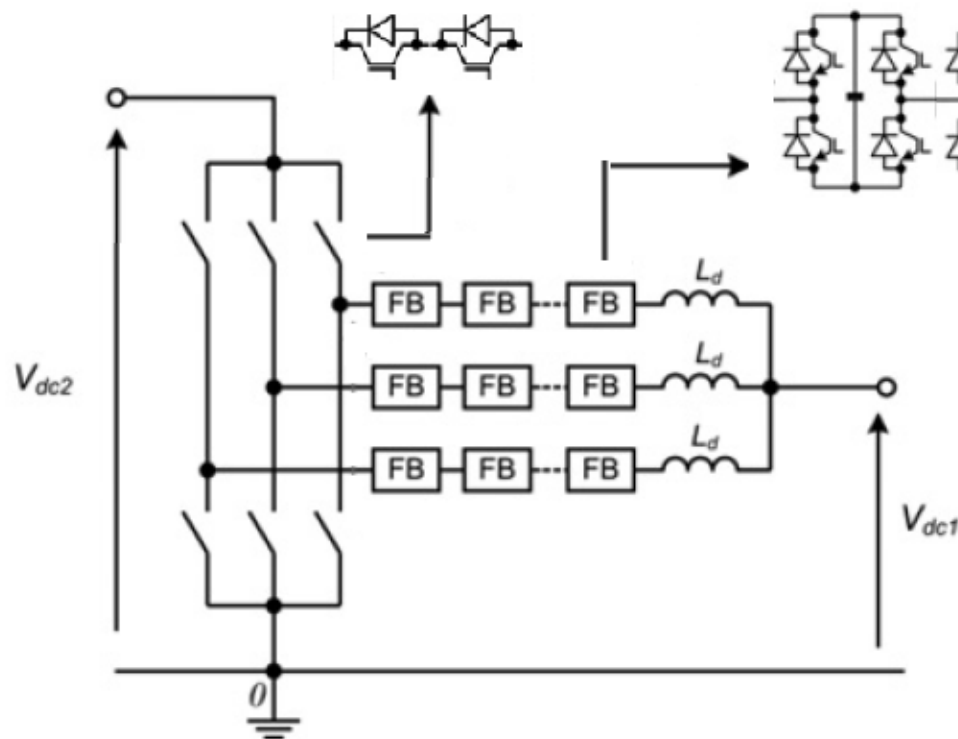
### Example: HVDC in Germany



HVDC/DC Converter:

Building a DC grid by connecting HVDC lines of different voltage levels

# HVDC/DC Converter: GRIDCONV project



- Modular design ✓
- Scalable converter topology ✓
- Redundance design ✓
- Prevention of DC fault propagation ✓
- High efficiency ✓
- Prototype: under investigation ✓

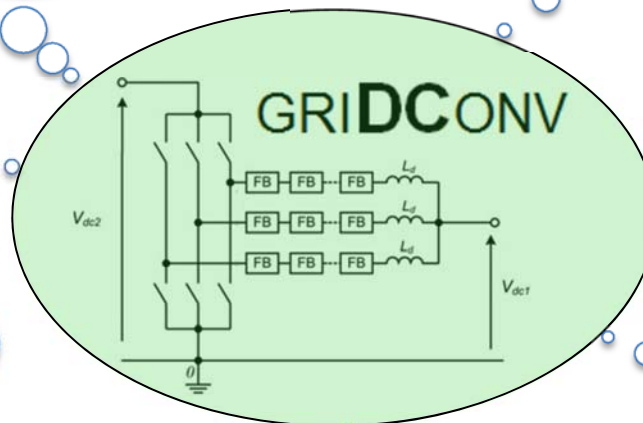
Hybrid cascaded series two-level dc-dc converter

## Innovations and R&D activities

HV aspects of converters:  
 layout, design, testing  
 Electrical insulating systems at DC stress  
 Insulation Coordination  
 Condition monitoring



Converter topologies: design, layout  
 Operational behaviour: normal, fault conditions, start/stop  
 Power semiconductors: selection, driver circuitry,  
 current control



Development of innovative drive  
 systems for the power switches  
 EMC: methods to reduce  
 electromagnetic interference



Controller and observer design for  
 uncertain systems  
 Networked control systems



Power flow control in DC-grids  
 and impact on AC-grids;  
 Dynamic operation: improvement of transient  
 stability, damping of inter-area oscillations

