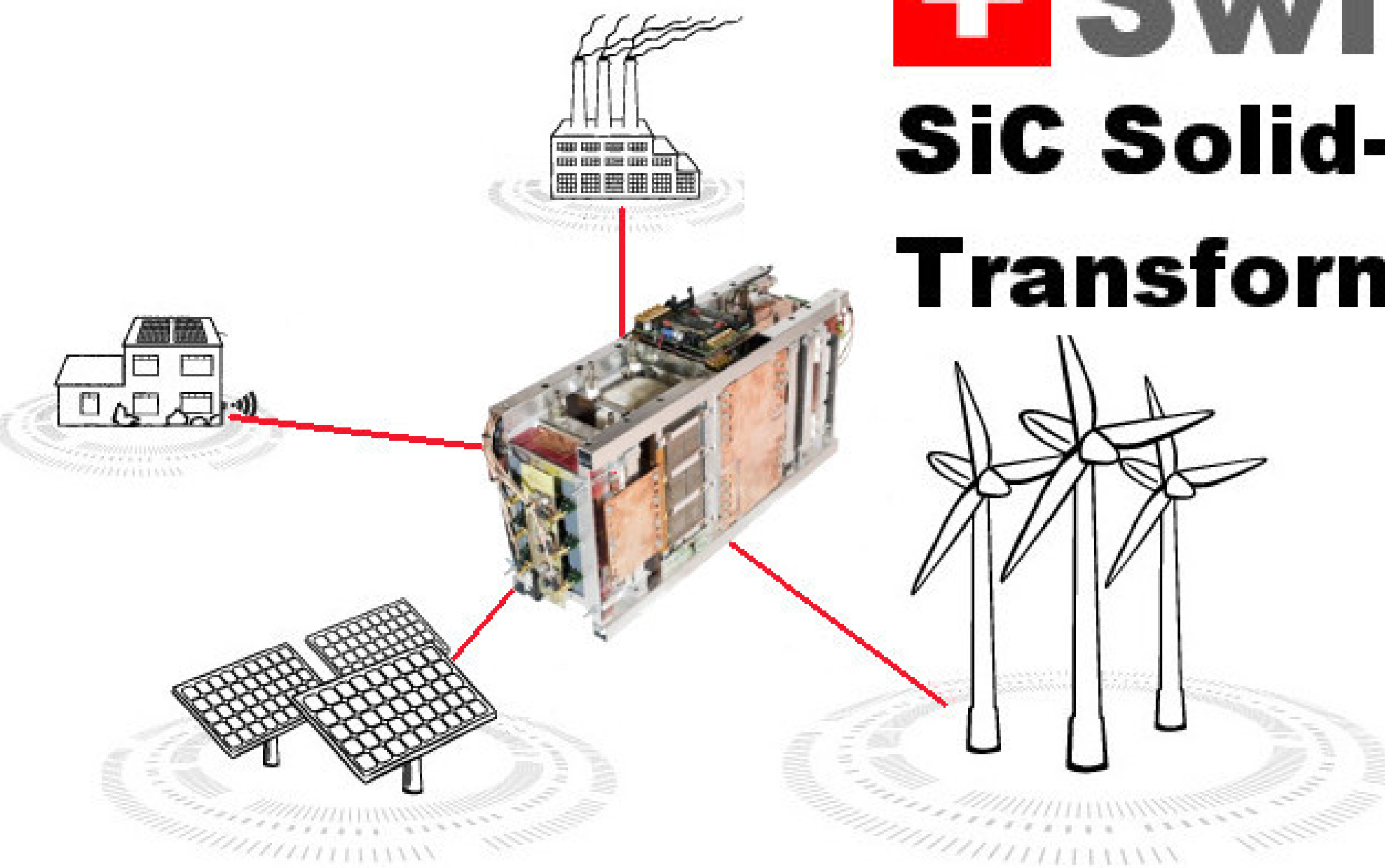


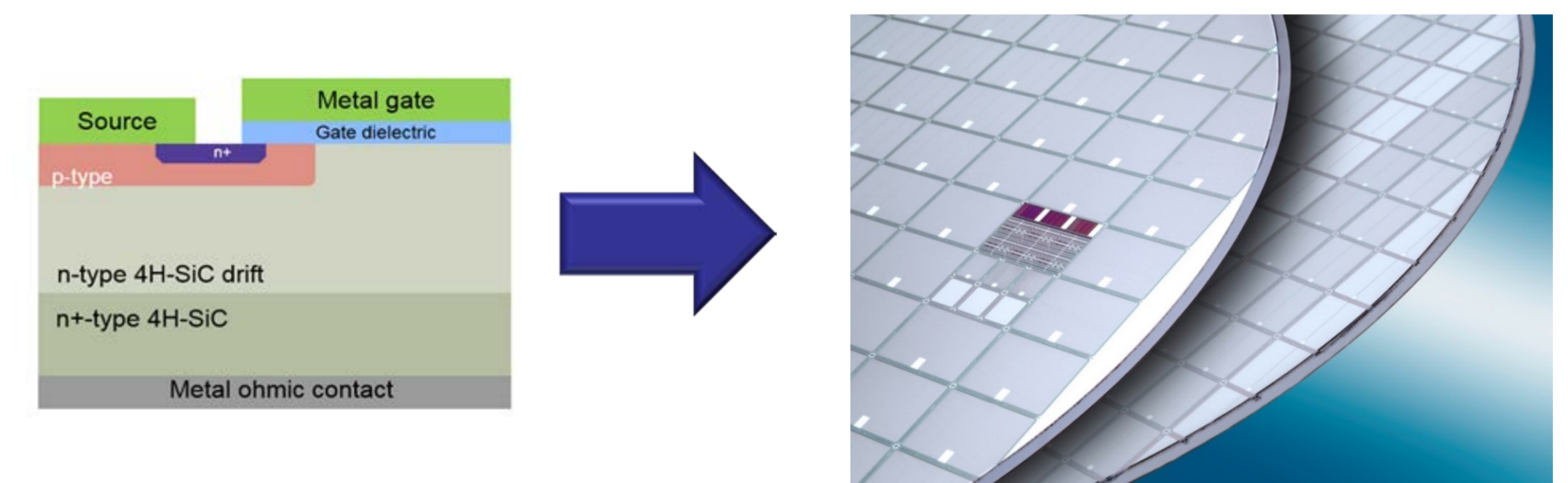
Swiss SiC Solid-State Transformer

Contact:

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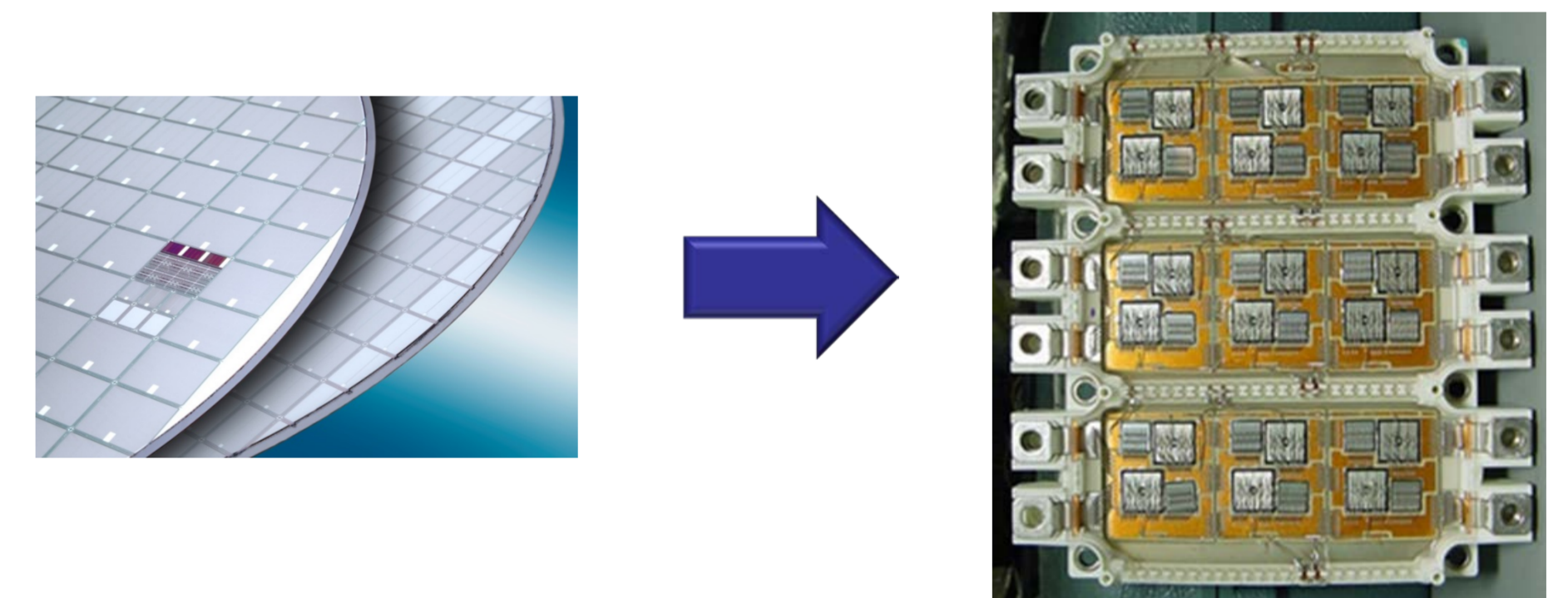


Sub-Project 1: 3.3 kV MOSFETs and Diodes



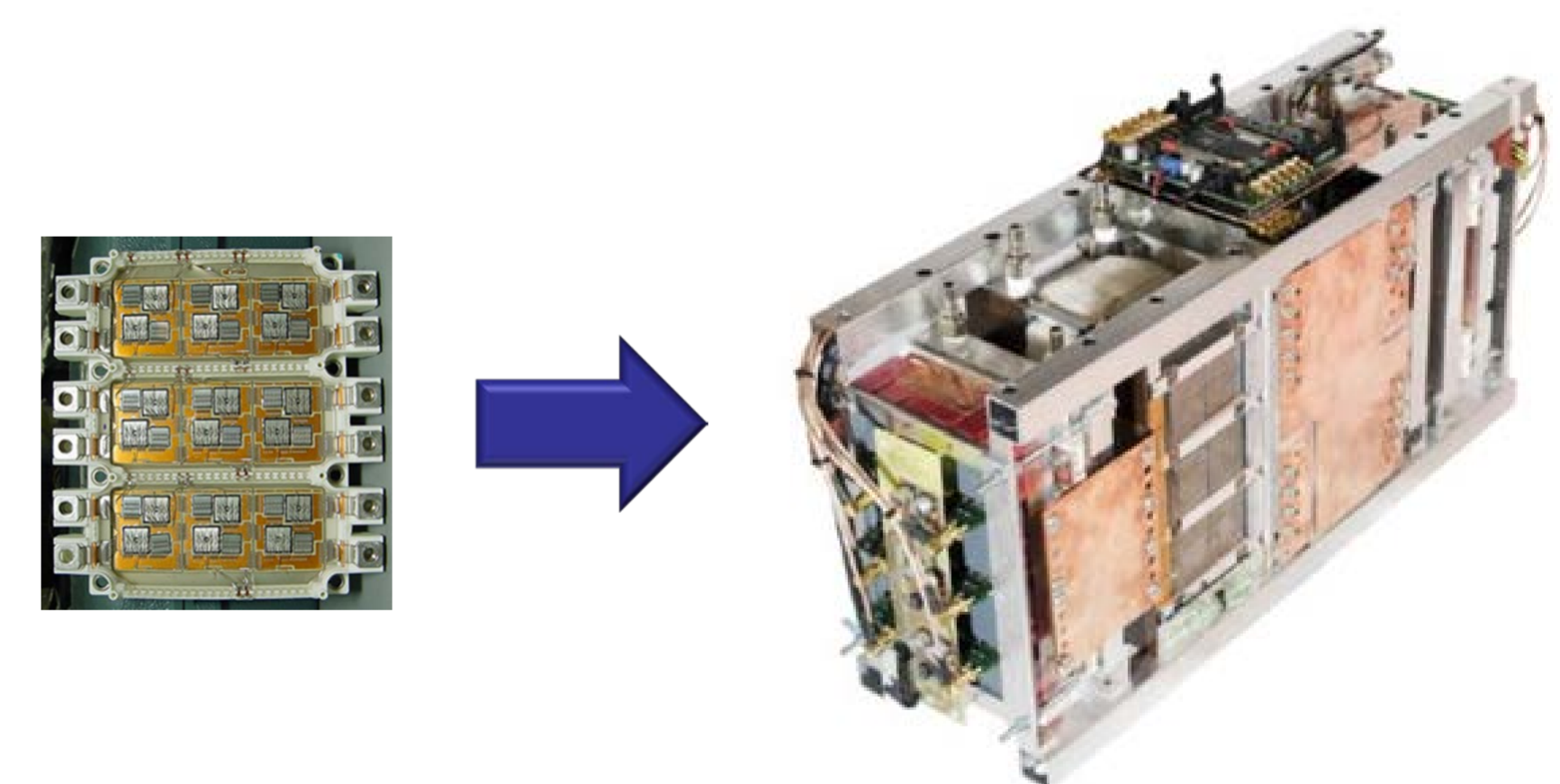
Prof. Dr. Jens Gobrecht, PSI
ABB Corporate Research

Sub-Project 2: Integrated 3D Cooling for SiC Power Module Packaging



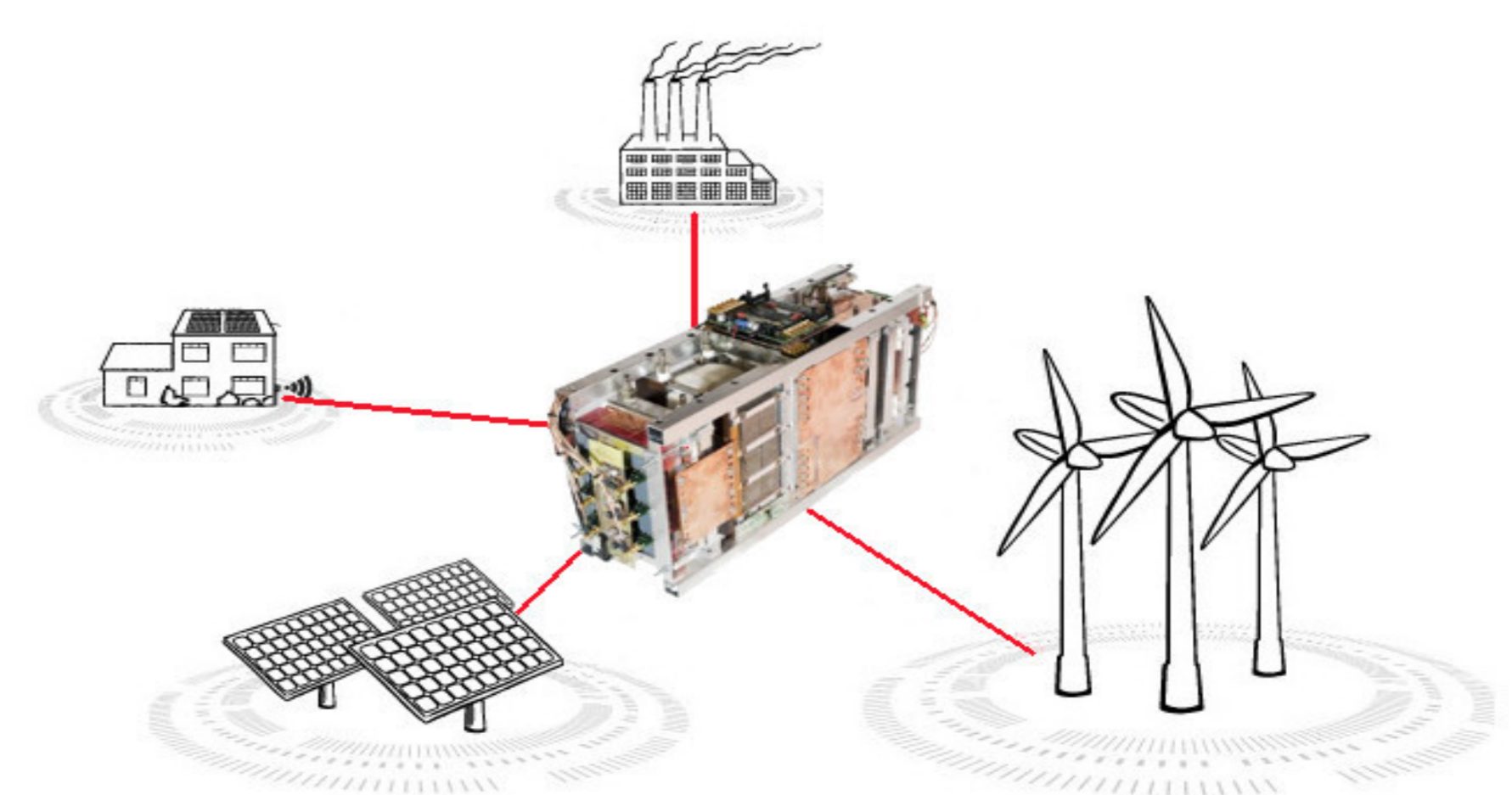
Prof. Dr. John Thome, EPFL
Dr. Bruno Agostini, ABB Corporate Research

Sub-Project 3: SiC SST Cell Prototype



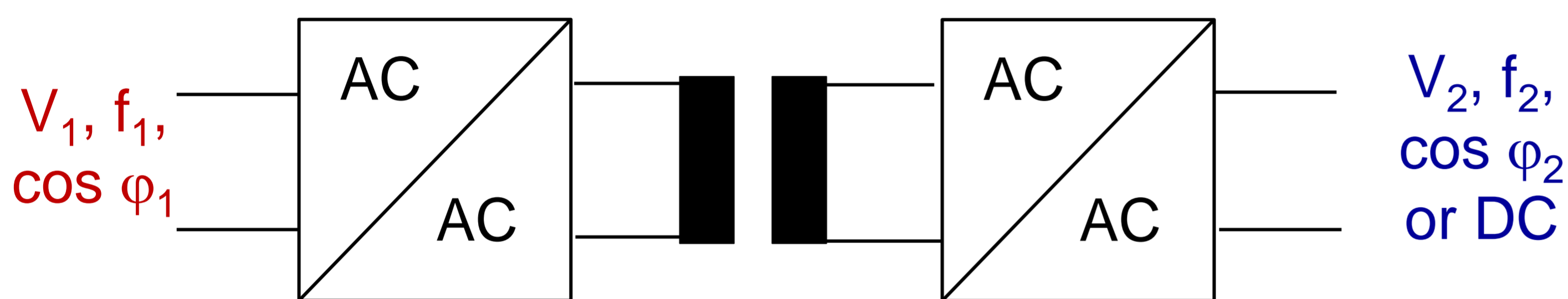
Prof. Dr. Johann Kolar, ETHZ
Dr. Florian Krismer, ETHZ

Sub-Project 4: Application & Sustainability of SiC SSTs in the Swiss Electrical Grid



Prof. Dr. Nicola Schulz, FHNW
Dr. Daniel Brand, BKW Energie AG

Why Solid-State transformers?



- Fluctuating renewable energy feed-in can de-stabilize the grid
- This requires a «smarter» electrical grid:
 - Local & dynamic voltage stabilization
 - Dynamic control of power flow
 - Better exploitation of existing grid structures
 - Integration DC-based systems
- Solid-state transformer (SST):
Combines all functions in a single device

Why Silicon Carbide (SiC) ?

- Silicon SSTs: max. 10 kHz / 4.5 kV
- Novel SiC SST: 50 kHz / 10 kV
- SiC device technology and power electronics are not mature yet
- Comprehensive and multi-disciplinary R&D is required to realize SiC SSTs

Value Chain Covered

Semiconductor physics → materials science
→ system engineering

