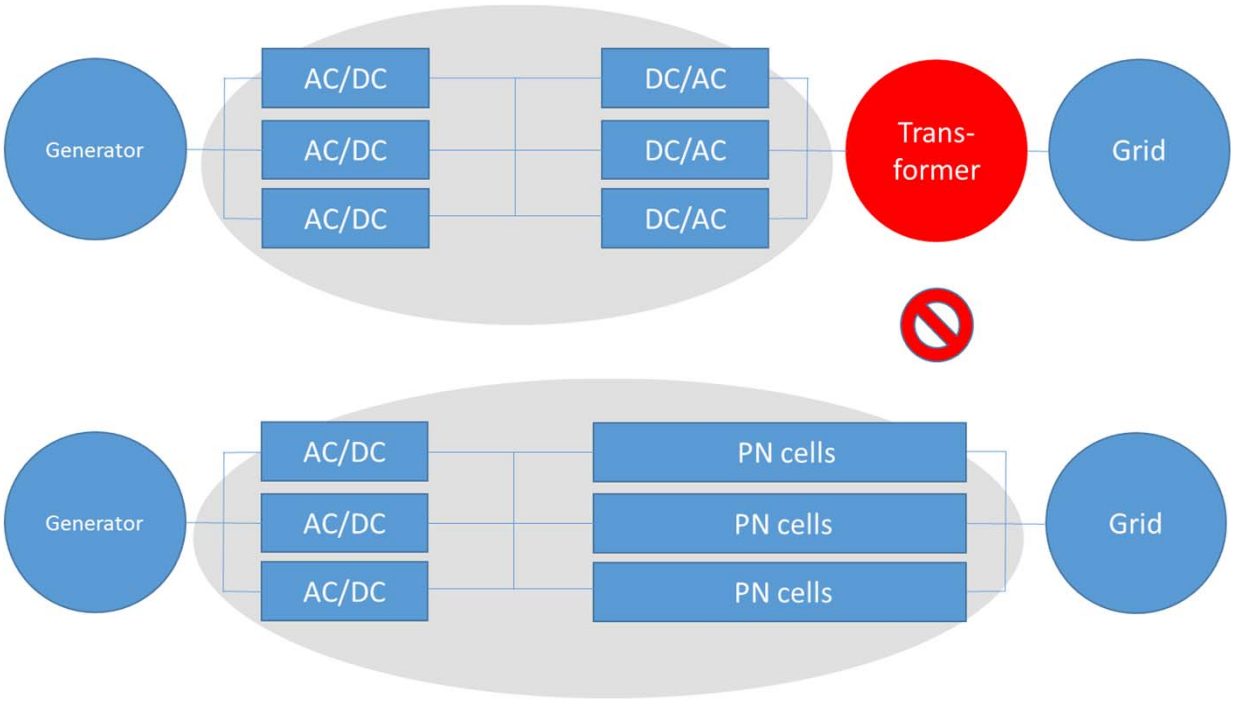
PN-Cell based Converters
- A new circuit is proposed and named PN-Cell



Value Proposition

Simple serial connection of PN-Cells – Enabled by two fold functionality (i), (ii) of proposed PN-Cell:

(i) transfer DC power energizing the next cell plus

(ii) transfer AC power for the load

Only one DC source – removing need of complex voltage balancing

Standard multilevel PWM is used – simple to add new levels

Simplifying modular multilevel converter for motor drives and replacement of bulky grid transformers with light weight solid state converters.

Business Opportunity

Can replaces existing 3-level converters with a simpler circuit and offer a solution for transformer less based DC to AC conversion providing a high voltage gain and high power conversion efficiency e.g. 6.5 kV DC to 33kV AC. Application area include motor drives and renewable systems interfacing to 33kV and 66kV grid. Proposed circuit is flexible and not limited to applications mentioned here.

Technology Summary

Conversion of electric voltage levels by solid state electronics has increased impact on our society and usage of low frequency passive transformers in voltage conversion are not always first choice. Solid state electronics offer a improved condition of the voltages for the load side and current on the grid side that can be optimized beyond passive transformer solutions. The application area of solid state electronics is limited by voltage range of used semiconductors, and at higher voltages the low frequency transformer is still the favorite, however new types of semiconductor materials as SiC and circuits as MMC open up for increased usage of solid states electronics. Here is introduced a compact modular multilevel converter cell able to convert lower levels of DC voltages into higher levels of both DC and AC voltages, offering a reduced weight and increased quality of system voltage and currents compared to transformer solutions.

Current State of Development

Patent application filled. Circuit analysis and simulation done. Hardware demonstrator built. Application specific demonstrators needed.

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Seeking

- Funding/Investors
- Licensee
- Partner/Research Collaboration
- IPR Sale

Patent Pending