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# DC Microgrids as Enabling Technology for Future Power Electronics Development

***Abstract:*** *Environmental pollution, the depletion of natural resources and constant grow of electric energy consumption are greatest problems today. Efforts are being made to use cheaper and more sustainable energy such as photovoltaic power, wind power and other forms of renewable energy sources (RES) that can replace fossil fuels. The Low Voltage dc (LVdc) is naturally applicable in a scenario with a high penetration level of RESs, battery-based energy storage systems, home appliances, and EVs. It may lead to reduced power electronics stages, higher efficiency and resilience, cost reduction in energy distribution. Also, dc-dc conversion simplifies the application of resonant circuits, which along with wide-band gap semiconductor application, creates an opportunity to design extremely high-power density converters. This will have a crucial role in future electronic waste reduction. This work represents the current state of the art of the LVdc concept and benefits for industrial implementation.*
**Key words:** DC Microgrids; Highly Efficient Systems, High Power Density Converters

## LVDC

There are many steps towards creating a more resilient, efficient and sustainable energy supply system. Power electronics devices play a dominant role and are key enabling technologies in many applications such as DC electric vehicle fast charging infrastructure, future electric aircraft, electric vertical take-off and landing (eVTOL) aircraft and many others is one of the major domains that drives the development of power electronics. Also, scaling of data center power supplies is driving the demand for power electronics-based power solutions. This infrastructure is in the development phase and efficient power electronics solutions play a key role here. Power density is becoming a key parameter considering the trend of weight and size optimization. The whole thing is approaching the concept of "power electronics on a chip". In most cases, size and weight reduction leads to cost reduction once the technology reaches the maturity to scale up mass production. LVDC systems can be considered as enabling technologies for all above mentioned directions.

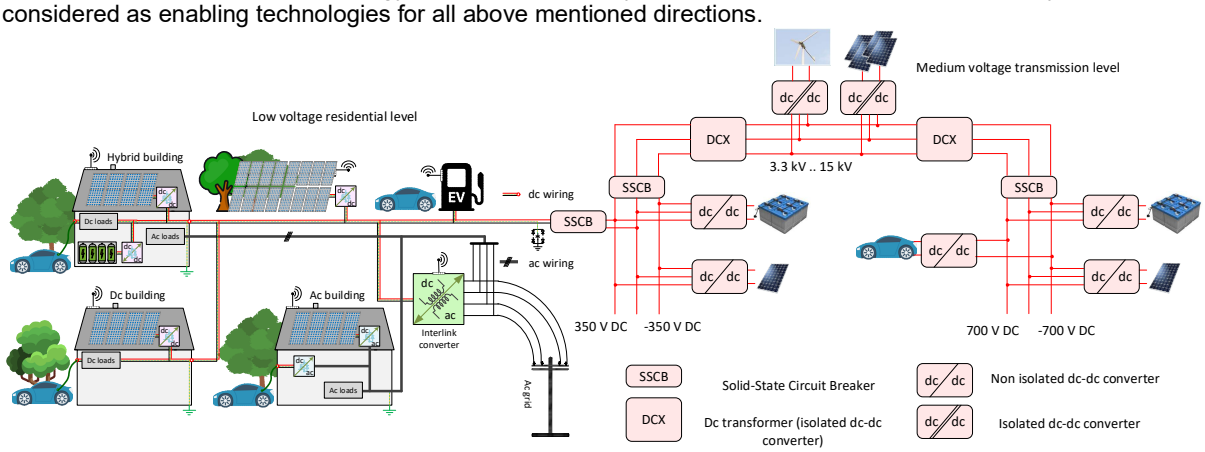


Fig.1. Vision of the future hybrid microgrid structure.

## Conclusions

The final work and presentation will be dedicated to the state of art review of LVDC implementation and benefits for industri.

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