ABSTRACT  This article presents an overview of AC-DC and DC-DC power converters topology used in the context of the application of "smart transformer". It describes the characteristics of individual solutions with an emphasis on multi-level converters connected to the medium voltage AC grid and it allows to apply commonly available and relatively inexpensive low-voltage semiconductor switches. Such systems maintain high efficiency as well as high frequency of switching. This allows to reduce a volume of passive elements in the filters, reducing the volume and price of the device. Use of the multi-level solution in DC-DC converter allows operation at high frequency, and thus to reduce the size, weight and cost of the transformer.

Keywords: power electronics, smart transformer, multi-level converters