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Enabling a stronger, smarter and greener grid

Electrification for accelerated decarbonisation and improved system flexibility

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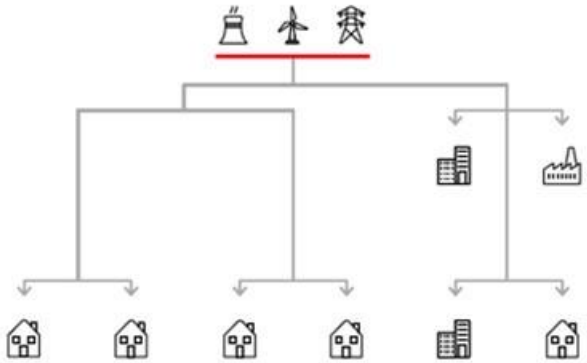
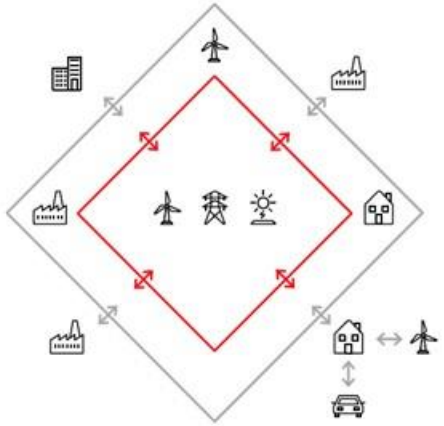
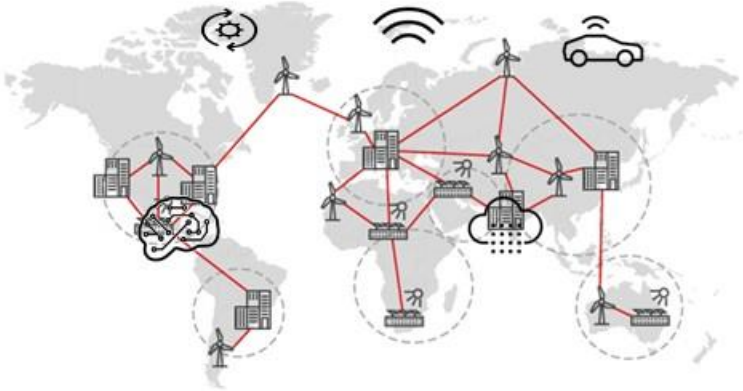
The evolution of power systems

Yesterday	Today	Tomorrow
		
– Humans fully in charge – Established principles and processes	– Lack of full control over generation and load – Emergence of autonomous systems	– More functionality given to “machines” – Emergence of AI[1] and its influence

From a few well controlled generating units to a myriad of distributed, autonomous generators and loads

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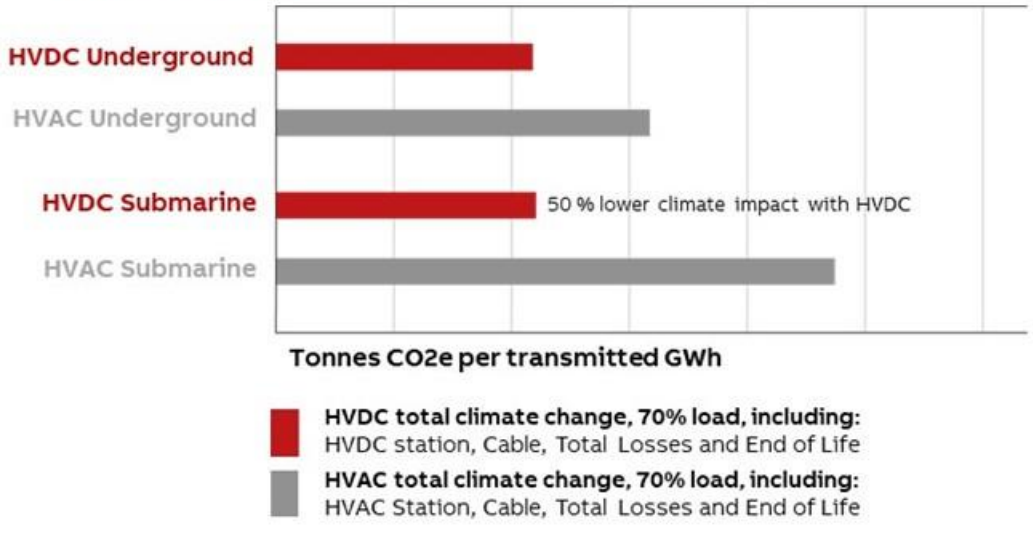
[1] Artificial Intelligence

Continuous innovation is changing the transmission paradigm

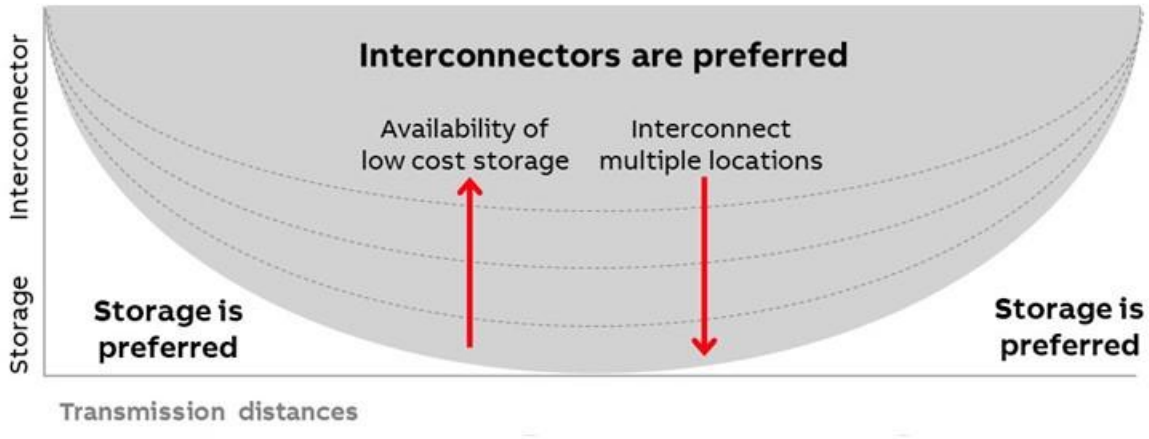
HVDC brings many environmental benefits



*100 km submarine cable 900MW, German electricity mix

An HVDC link can reduce climate impact by half* in terms of carbon footprint compared to an AC transmission link, thanks to lower transmission losses

Interconnections and storage are complementary

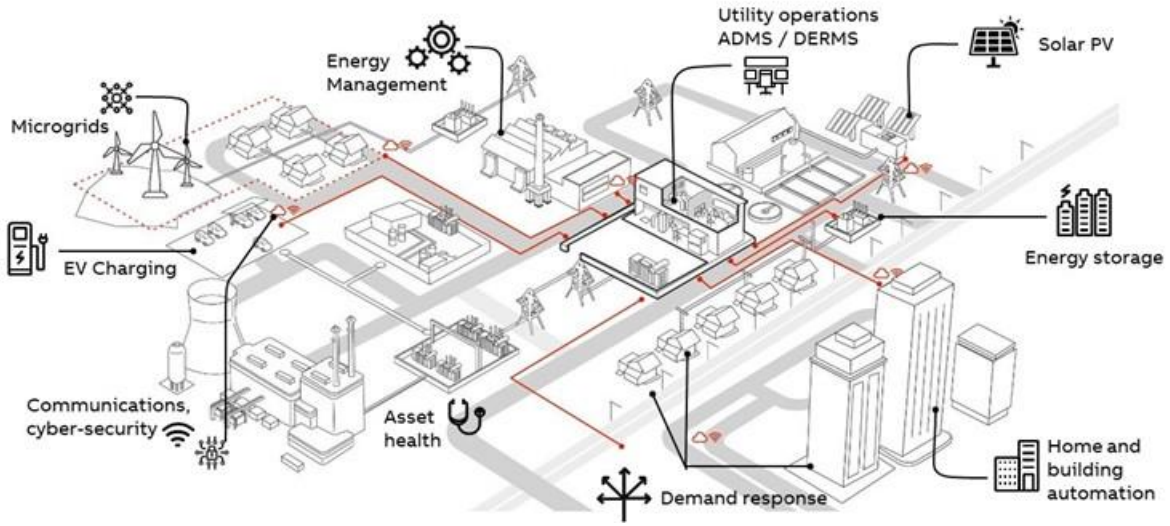


HVDC supports large scale integration of renewables and transmission of power over long distances – overhead, underground, subsea
It minimizes energy losses at higher voltage levels and brings significant footprint savings – line/ROW[1] and converter stations

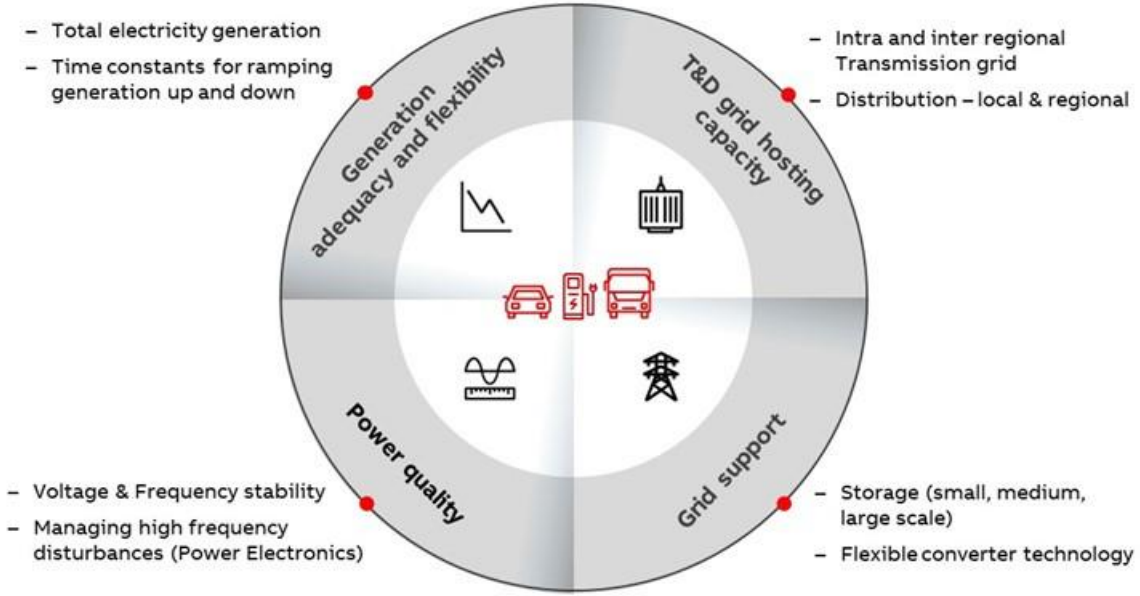
[1] ROW=Right of Way
GWh Gigawatt hour ; MW: Megawatt; km: Kilometer

Grid Edge Technologies integrate distributed energy and address new loads

Managing new complexities



E-mobility impact on the grid



ADMS: Advanced Distribution Management System
DERMS: Distributed Energy Resource Management System
EV: Electric Vehicle

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