HVDC technology is gradually becoming a standard in electrical energy transportation. Even more, in some situations it's the best practical solution. The research work presented hereafter is dedicated to the exploration of the basic notions, the induced gains, the basic components, the basic and extended structures, the applications and the real implemented projects of such technology. An overview on the research works concerned by the challenges of this expandable technology and an economic study of the deployment of real electrical transportation lines and their feasibility in Algeria are presented.