

GLOBAL ENERGY CRISIS AND CHANGES IN ELECTRIC POWER SYSTEM

Limited natural resources, permanent rise in energy consumption as well as dire need to reach carbon-neutral and climate-neutral economy introduced considerable changes in energy sector. With decarbonization in industry and transport, and with increased energy needs of computers, internet and data storage, global electricity consumption is bound to double by 2050. At the same time, energy transition with renewable power sources and battery storage requires a great deal of mineral resources, often exceeding the global reserves above and below the ground, with the corresponding extraction processes which jeopardize the environment and introduce often overlooked impact on the climate changes. While being the main driver of all human endeavors, energy is responsible for considerable pollution and it consumes huge amounts of mineral resources. On the way from the source to the consumer, energy is repeatedly converted into electromechanical and electronic converters. Power converters and transmission lines make use of a great deal of mineral resources, even to the extent where certain transition paths are impassable due to the lack of sufficient metals and minerals. Preliminary considerations, developments and various options regarding the energy-mix are followed by a case study that considers electrical power system of Republic of Serbia.