

PHYSICS FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: ENERGY

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Climate threats enforce a rapid change of life-style and the replacement of many traditional appliances and technologies. Technology and, within it, physics will play a decisive role in the transformation toward a carbon-free energy supply. There are only a few options for carbon-free energy generation. They will be briefly discussed. One feature of clean energy generation is that electricity will become the new form of primary energy. Another feature is that the epoch of fossil fuels will be replaced by the epoch of the minerals. The lion's share in future electricity generation will be carried by wind and solar energies. The consequence is that secured power is replaced by volatile power generation leading to the 3rd feature of future electricity use – consumption follows generation. The consequences of intermittent production and low power density of wind and photo-voltaic power will be discussed along the experience gained in Germany. The German experience seems to be transferable to other European countries.