

The invention relates to an energy supply system (2) having a first energy supply network (4) in the form of a power network (36) for transporting electrical energy (46), and a second energy supply network (6) having a transport system (60) for fluid operating materials (56), said energy supply system comprising at least one energy-generating unit (8), by way of which by means of electrical energy and carbon-containing material (50, 54, 58) the fluid operating materials can be produced and can be fed into the second energy supply network, and further comprising at least one local energy management unit (10), by means of which fluid operating materials extracted from the second energy supply network can be converted into electrical energy (74, 76, 78) and can be fed into a local power network (90). The second energy supply network (6) has a transport system (62) for the return transport of carbon dioxide-containing residual gases (58), which are incurred during the energy recycling of the fluid operating materials (56) by one or more energy consumers (11) and/or energy management units (10).