A Growth Model for the Electric Power Network

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We introduce [1] a model for the dynamic self-organization of the electric grid. The model is characterized by a conserved magnitude, *energy*, that can travel following the links of the network to satisfy nodes' *load*. The load fluctuates in time causing local overloads that drive the dynamic evolution of the network topology. Our model displays a transition from a fully connected network to a configuration with a non-trivial topology and where global failures are suppressed. The most efficient topology is characterized by an exponential degree distribution, in agreement with the topology of the real electric grid. The model intrinsically presents self-induced break-down events, which can be thought as representative of real black-outs.

[1] A. Sciré et al. Europhys. Lett., **71**, 318 (2005).