Smart energy system has been widely accepted as the key pathway for the application of clean energy towards low carbon society. It is normally considered as a portfolio of technologies integrated with energy generation, storage and application driven by information based control mechanism. From the historical review of technology development, the correlation between Energy and Information is first analyzed via the concept of entropy. A novel theoretical perspective of energy digitization is then proposed from analogous linkage between energy storage and data storage. A smart energy road-map is further derived to show how energy eco-system can be self-organized with energy intelligence that is quantifiable with clear physical meaning. In the end, Fractal structure based evolution is concluded to be the key stage for smart energy system, as it drives the fundamental principal between energy and information from proposed theoretical framework.