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**Energy Security: From Deal Killers to Game Changers**

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Five energy security "deal killers" are identified: 1) Global warming and CO2 emissions from fossil fuel combustion; 2) Intermittent energy sources (wind, solar) and the presence and stability of the grid; 3) Penetration of plant defenses to produce transportation fuels from biomass; 4) Mimicking nature: artificial photosynthesis for solar energy to fuels; and 5) Spent fuel from nuclear power reactors. Transformational basic research is required to successfully change the ground rules, to transform these "deal killers" into "game changers." T hey are: 1) Offsetting carbon capture and storage costs through enhanced oil recovery and methane generation from high temperature geothermal saline aquifers; 2) Electrical energy storage, through batteries and super-capacitors; 3) Genetic modification of plant cell walls, and catalytic methods for transforming plant sugars into fuels; 4) Separation of solar-induced electrons from holes, and catalysis to produce fuels; and 5) Closing the nuclear fuel cycle. Basic research can revolutionize our approach to carbon-free energy by enhancing nature to achieve energy security.