6. The Dense Energy Ultra Cell (DEUC) energy storage device of claim 1, wherein all the layers are stacked directly on and contacting each other forming a multi-layer thin film of greater than or equal to 100 layers.

7. The Dense Energy Ultra Cell (DEUC) energy storage device of claim 1, wherein all the layers are stacked directly on and contacting each other forming a multi-layer thin film of greater than or equal to 1,000 layers.

8. The Dense Energy Ultra Cell (DEUC) energy storage device of claim 1, wherein all the layers are stacked directly on and contacting each other forming a multi-layer thin film of greater than or equal to 2,000 layers.

9. The Dense Energy Ultra Cell (DEUC) energy storage device of claim 1, wherein the dielectric energy storage layer includes solidified CCTO-X precursor ink which is comprised of modified calcium, copper, titanate, oxide ($CaCu_3Ti_4O_2$) and aluminum oxide (Al_2O_3) nano-particles, in a compound mixture where the aluminum oxide nano-particles are positioned in-between the calcium, copper, titanate, oxide CCTO grain boundaries forming resistive layers of Al_2O_3 which connect to the insulating layer (Al_2O_3) that bifurcates the energy storage layer.

10. The Dense Energy Ultra Cell (DEUC) energy storage device of claim 9, wherein the Al_2O_3 nano-particles and the insulator layer create high resistivity between the electrode layers that is greater than 10^4 ohms resulting in a breakdown voltage of the DEUC Element that is above 50 volts and a reduced self-discharge of less than 20% per year in the DEUC Element.