†SUPPLEMENTARY INFORMATION:

Nicola Tesla in his initial patent united the ideas of obtaining an electrical output from an electrically conducting material by varying the magnetic influence and having a temperature dependent control over the magnetization/magnetic properties of the material [1]. He performed a simple experiment to demonstrate this concept by winding a conducting coil on the ends of a soft iron bar which was placed near a strong permanent magnet. Since both the magnet and the rod were at rest in principle no current should flow through the coil. However, when the system was heated an electrical output was obtained across the coil. This confirms that a change in temperature leads to a change in the magnetic field in the iron rod and the arrangement works in a similar approach to that of a solenoid or electrical generator. Imposing thermal changes requires a lower power input in contrast to changing the overall magnetic field. Hence the process reduces the power input and enhances the overall efficiency of the system.

SUPPLEMENTARY FIGURES:

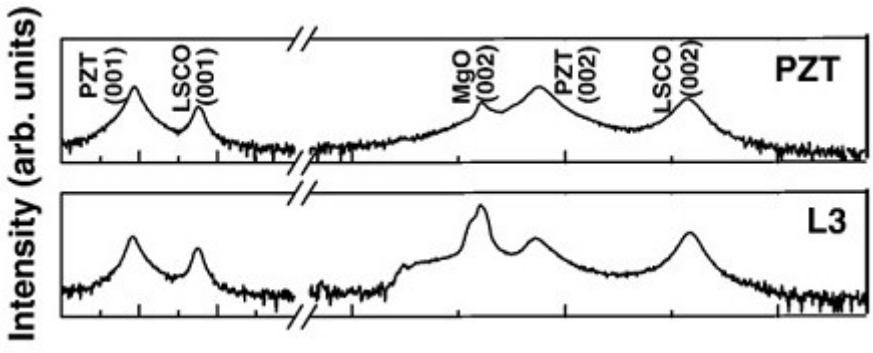

Figure S1: Room temperature X-ray diffraction pattern of tri-layered PZT/CFO/PZT (L3) [47].

PZT- $PbZr_{0.53}Ti_{0.47}O_3$, CFO-$CoFe_2O_4$, LSCO- $La_{0.5}Sr_{0.5}CoO_3$

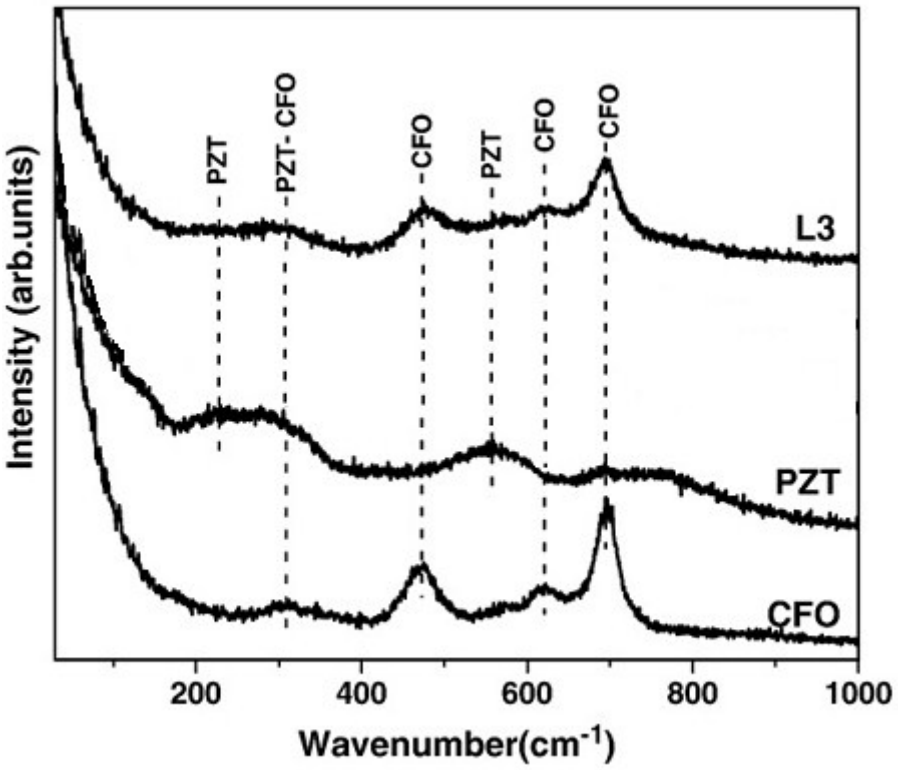

Figure S2: Raman spectra of tri-layered nanostructure (L3) grown on LSCO coated (001) MgO substrate [47]

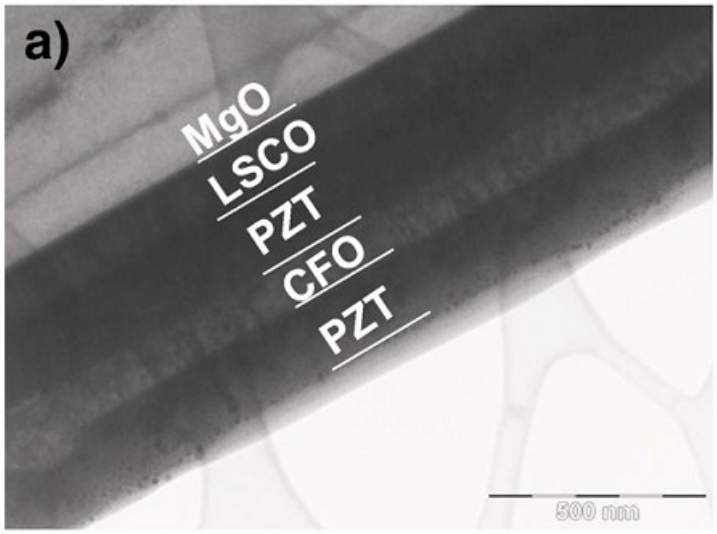

Figure S3: Cross-sectional TEM image of the PZT/CFO/PZT TLN [47]

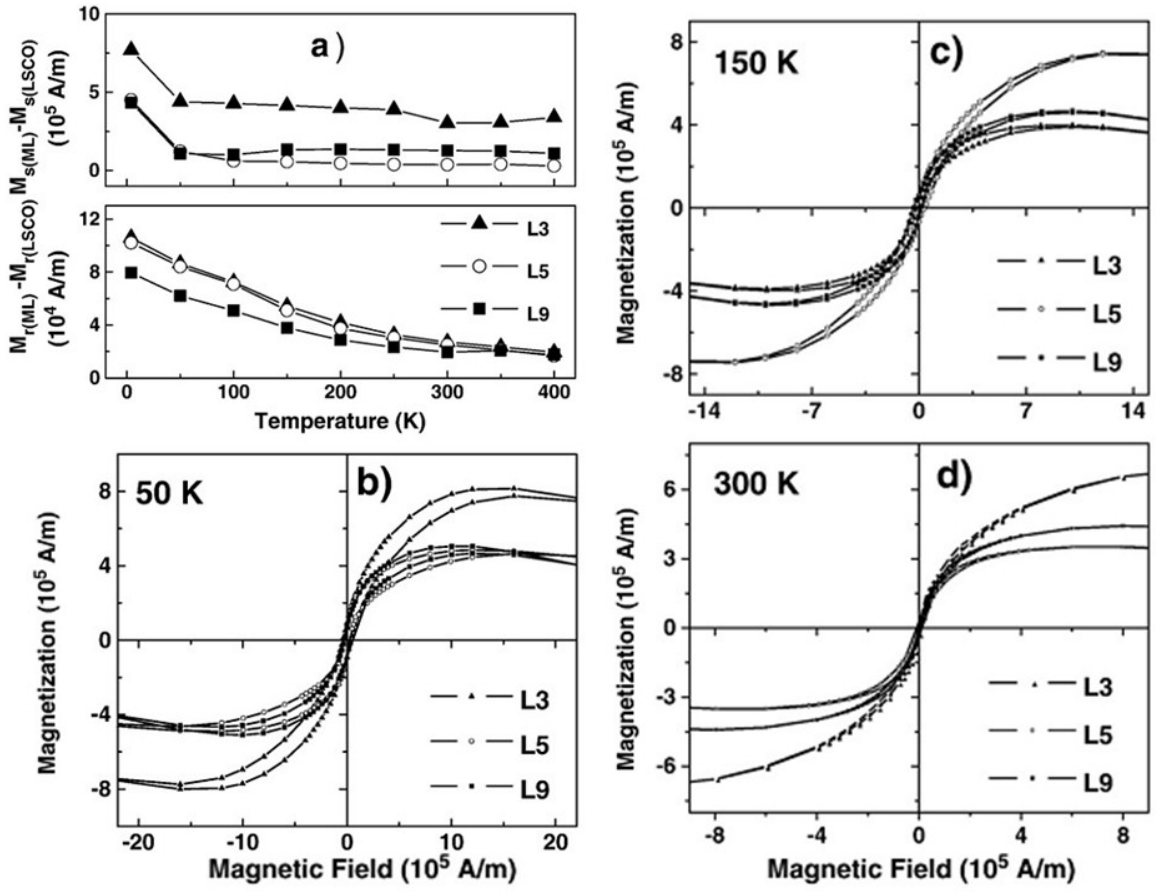

Figure S4: Temperature dependence of the remanent ($M_r(M_L)-M_r$ (LSCO)) and saturated ($M_s(M_L)-M_s$(LSCO)) magnetization, and magnetic loop at (b) 50 K, (c) 150 K, and (c) 300 K for L3, L5, and L9 multilayer structures. [47].