Electronic Supplementary Information

All-organic ArPTU/PEI composite dielectric films with high-temperature resistance and high energy storage density

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**Figure S1.** ArPTU synthesis equation and SEM images of ArPTU particles.

**Figure S2.** NMR spectra of ArPTU in DMSO-d$_6$. 
Figure S3. XRD patterns of composite films with different ArPTU contents.

Figure S4. SEM images of PEI and 1 wt.%, 3 wt.% and 5 wt.% ArPTU composite films cross-section.
Figure S5. TGA curves of PEI and PEI/2 wt.% ArPTU films.

Figure S6. (a) Stress-strain curves and (b) Young's modulus of PEI/ArPTU composite films.
Figure S7. Temperature-dependent loss and dielectric constant of PEI and PEI/ArPTU composite films.

Figure S8. The leak current of ArPTU/PEI composite films at 150 °C.
Figure S9. TSDC curves of PEI and PEI/ArPTU composite films.

Figure S10. P-E loops of PEI/ArPTU composite films at 25 °C.
Figure S11. P-E loops of PEI/ArPTU composite films at 150 °C.

Figure S12. Cyclic performance of PEI/2 wt.% ArPTU films.