Supporting Information

Healable and Shape-memory Dual Functional Polymers for Reliable and Multipurpose Mechanical Energy Harvesting Devices

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**Figure S1.** Schematic illustrating the preparation of HSP.

**Figure S2.** Schematic of bending angle during shape-memory process of HSP.
Figure S3. Optical microscope images of the sample at (i) original, (ii) damaged, and (iii) healed states.

Figure S4. Schematic of aromatic disulfide metathesis reaction.

Figure S5. Output voltage and current versus the load resistance.
Figure S6. The output voltage of the HSP-TENG with Ag electrode at original and healed states.

Figure S7. The healing process of the HSP-TENG with an additional PDMS layer on the device surface. (I), (II) and (III) represent the original, broken, and healed device, respectively.
Figure S8. (a) Photograph of a prototype of a self-powered fire alarm and escape indicator system based on HSP-TENG with PDMS layer. (b) Photograph of the temperature response process of the self-powered fire alarm and escape indicator system from (I) room temperature to (II) 90 °C. (c) $V_{oc}$ generated by the HSP-TENG in self-powered fire alarm and escape indicator system driven by treading on movable floor.