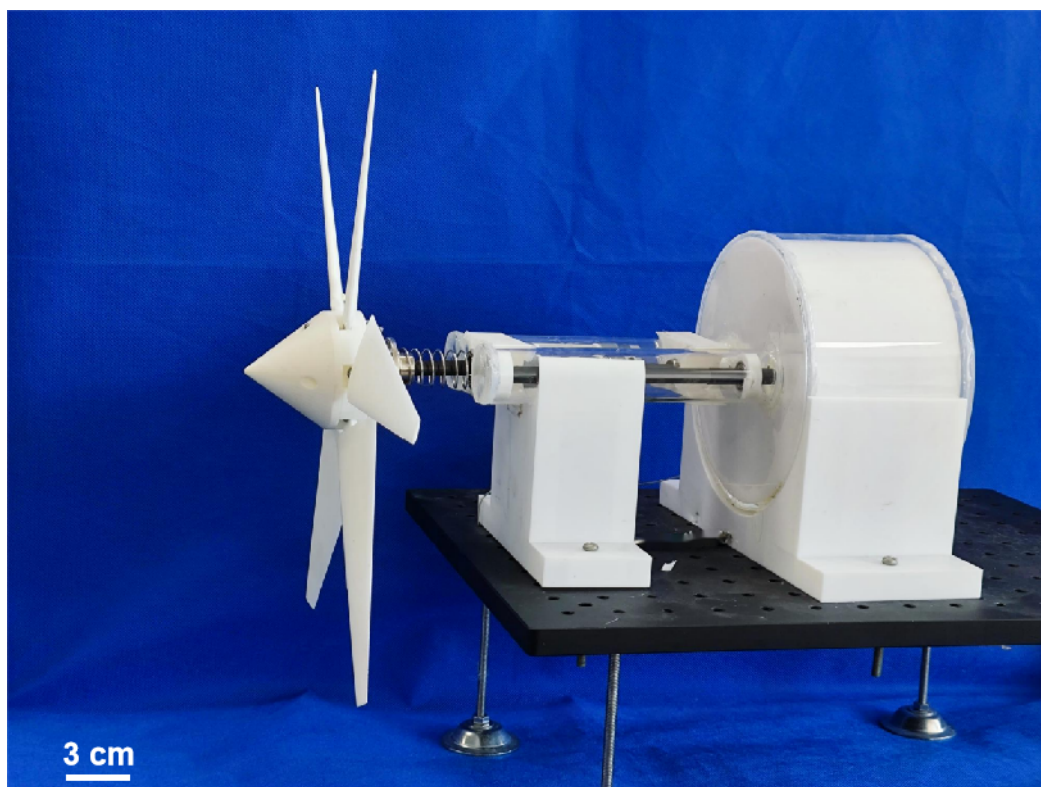


Switchable Tribo-Electromagnetic Composite Generator Based on Magnetic-Spring Dynamic Coupling for Low-Velocity Flow Energy Harvesting

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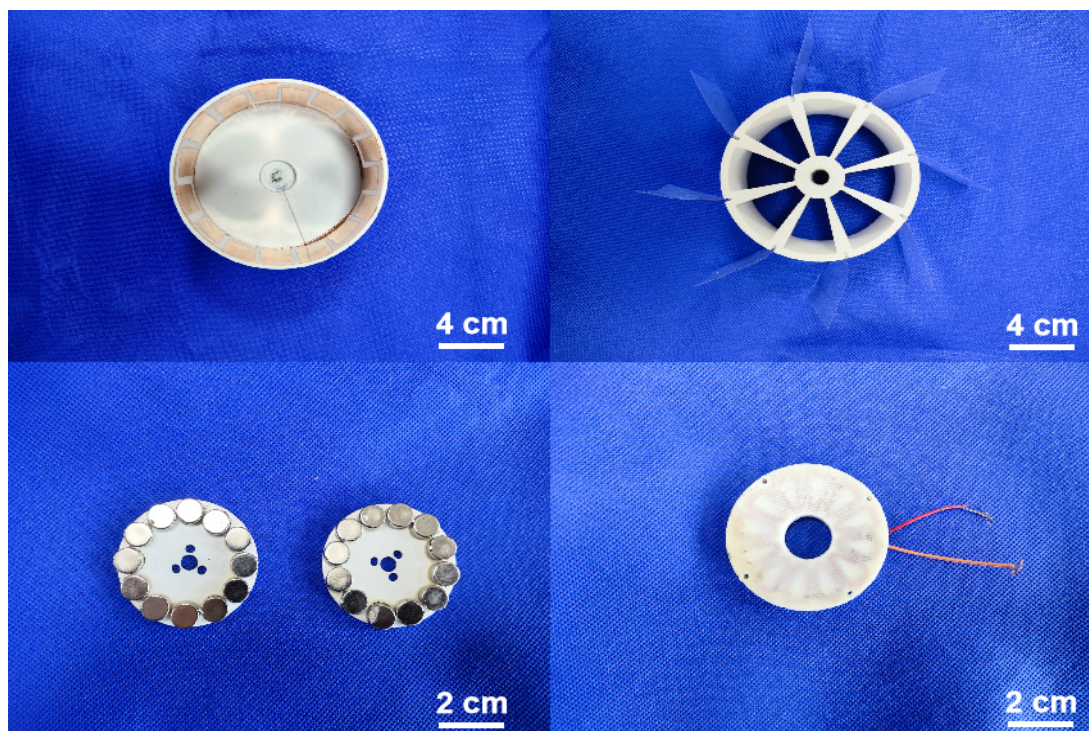


Figure S1 Overall view of the SEHCG assembly. TENG stator component. TENG rotor component. EMG dual-disk structure. Sealed EMG coil module.

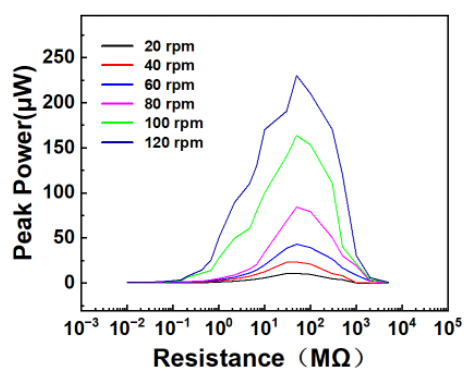


Figure S2 Peak power output of TENG at different rotational speeds

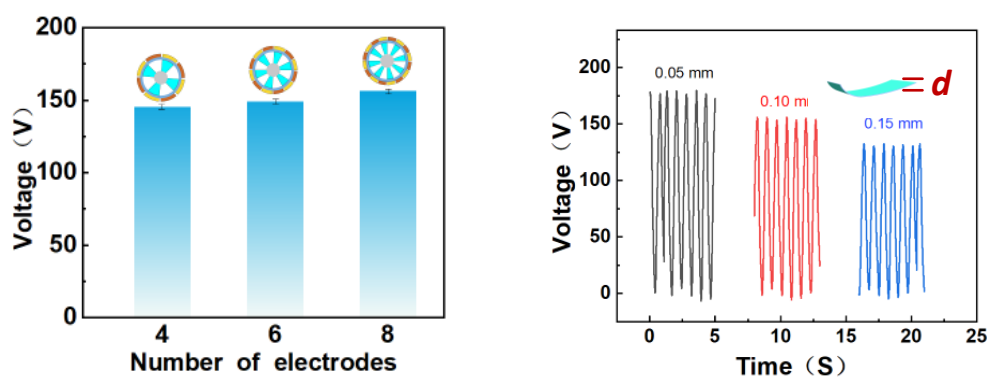


Figure S3 Performance comparison under varying numbers of magnetic pole pairs. Output performance vs. triboelectric film thickness

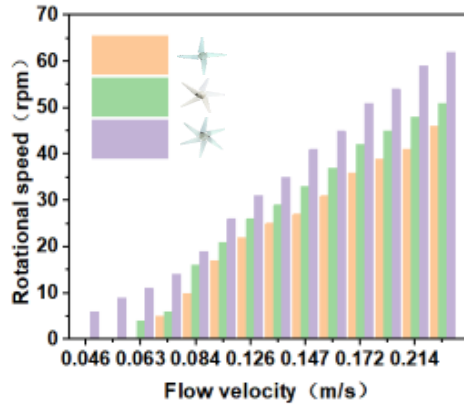


Figure S4 Starting flow velocity with varying numbers of blades

Feature	Simultaneous Hybrid Generators (Reported in Literature)	Switchable Hybrid Generator (This Work)
Operational Mode	TENG and EMG work simultaneously	TENG and EMG work in a time-shared manner, switching adaptively
Primary Objective	Achieve superposition of instantaneous output power	Extend the effective operating flow/energy range
Ideal Application	Environments with stable and sufficient energy input	Environments with highly variable and often low energy input

Table S1. Conceptual Comparison Between Simultaneous and Switchable Hybrid Generators