Electrode engineering begins from live biomass: a “smart” way to construct smart pregnant hybrids for sustainable charge storage devices

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Fig. S1. N$_2$ adsorption/desorption isotherm and pore-size distribution plot of Fe$_3$O$_4$@YE-C.

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Fig. S2. (a-b) SEM and (c) TEM images of unclean samples after the ion-diffusion procedure. (e-f) SEM observations of remained products after an acid washing treatment toward Fe\textsubscript{3}O\textsubscript{4}@YE-C.

Fig. S3. EIS spectrum of single Fe\textsubscript{3}O\textsubscript{4}@YE-C electrode.
**Fig. S4.** (a-b) SEM and (c-d) TEM images of cycled Fe$_3$O$_4$@YE-C electrodes.

**Fig. S5.** (a) Optical, (b-c) SEM and (d-e) TEM images of Co(OH)$_2$ NWs grown on the graphite sheet. (f) CV plots, (g) constant charge/discharge profiles and (h) long-term cyclic performance of Co(OH)$_2$ NWs cathode.