S2: Specific energies of LIB cells and NIB cells

The below table lists optimized cell design parameters and computed practical specific energies of LIB and NIB cells (without cell packaging). The optimization was performed using the MATLAB fmincon (interior-point) solver. To ensure (near-)global optimality of the solution, the optimization solver was called from 500 randomly selected start points as described in the main part of the paper.

	Thickness anode [μm]	Porosity anode [%]	Porosity cathode [%]	Specific energy [Wh/kg]
LIB 10C	34.28	29.93	46.88	157.7
LIB 4C	49.85	27.31	41.07	198.6
LIB 0.25C	118.14	20.05	24.16	262.1
NIB present base scenario 10C	44.29	28.15	36.30	99.8
NIB present base scenario 4C	57.96	25.30	29.96	117.4
NIB present base scenario 0.25C	119.92	17.30	19.02	145.4
NIB present optimistic scenario 10C	50.34	27.75	34.50	103.5
NIB present optimistic scenario 4C	65.29	26.02	28.80	120.5
NIB present optimistic scenario 0.25C	130.17	17.94	17.55	147.6
NIB present pessimistic scenario 10C	39.15	30.15	41.03	85.8
NIB present pessimistic scenario 4C	49.83	25.26	33.52	108.3
NIB present pessimistic scenario 0.25C	110.65	17.97	20.41	143.0
NIB future base scenario 10C	36.03	27.51	38.96	176.8
NIB future base scenario 4C	50.69	25.37	33.22	207.2
NIB future base scenario 0.25C	112.55	17.68	20.33	249.8
NIB future optimistic scenario 10C	46.34	27.04	39.64	184.5
NIB future optimistic scenario 4C	58.88	24.19	30.80	213.5
NIB future optimistic scenario 0.25C	121.94	17.18	18.95	253.0
NIB future pessimistic scenario 10C	30.28	27.26	44.10	155.4
NIB future pessimistic scenario 4C	41.88	24.01	36.23	192.0
NIB future pessimistic scenario 0.25C	98.96	18.31	21.40	245.3