SCIENCE CHINA
Information Sciences

• Supplementary File •

Towards Proof-of-Prospect consensus mechanism for maximizing consumers' satisfaction in distributed energy systems

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Appendix A Supplementary web resources

This section compiles a curated list of web resources that provide detailed data on the energy consumption associated with blockchain and the Ethereum network:

- Cambridge Centre for Alternative Finance (CCAF)

Description: CCAF is a research centre at the Cambridge Judge Business School, University of Cambridge. The CCAF is dedicated to the study of technology-enabled and innovative instruments, channels, and systems emerging outside of traditional finance.
Website: https://ccaf.io/ (Accessed on March 11, 2025).

- Blockchain.com — Be early to the future of finance

Description: Blockchain.com is a leading resource for information on blockchain technology and its impact on finance.
Website: https://www.blockchain.com (Accessed on March 11, 2025).

- Ethereum.org: The Complete Guide to Ethereum

Description: This guide offers an in-depth understanding of Ethereum, including its technology and applications.
Website: https://ethereum.org/ (Accessed on March 11, 2025).

Please note that the availability and content of these online resources may change over time. The information cited in this study was accurate as of the last access date provided above.

Appendix B Supplementary data

Table B1 and Table B2 contain additional data that support the findings of the paper.

Table B1 Parameters for initializing the PoP consensus mechanism

α	β	γ	τ	l_1	T	I	J	r^{on} (c)	$r^{\text{off}}(c)$
0.88	0.88	2.25	100	0.80	5	14	29	5.00	15.00

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Table B2 Power parameters of prosumers

	p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9	p_{10}	p_{11}	p_{12}	p_{13}	p_{14}	c_1	c_2
Unit	101	201	202	203	204	301	302	401	402	403	404	501	502	503	102	205
$z_{i/j}^{max}$ (kW)	60	50	55	55	50	45	50	30	20	25	15	100	100	100	35	30
E_i^{max}/E_j^{min}(kW·h)	248.3	600	500	490	536	600	393	350	290	380	272	300	200	150	450	390
$p_i^{\mathrm{sup}}/p_j^{\mathrm{dem}}$(c)	8.31	13.43	9.52	11.28	8.34	11.87	9.13	12.29	12.58	13.05	10.64	7.68	8.85	14.39	7.5	11.63
	c_3	c_4	c_5	c_6	c_7	c_8	c_9	c_{10}	c_{11}	c_{12}	c_{13}	c_{14}	c_{15}	c_{16}	c_{17}	c_{18}
Unit	206	207	208	211	212	215	216	217	306	307	308	309	312	313	314	405
$z_{i/j}^{max}$ (kW)	20	35	30	40	40	15	45	30	35	30	40	40	25	30	35	35
E_i^{max}/E_j^{min}(kW·h)	130	1880	210	1700	1660	480	1840	1260	1230	650	655	195	115	2405	250	990
$p_i^{\mathrm{sup}}/p_j^{\mathrm{dem}}$ (c)	7.42	12.84	8.2	7.07	7.47	10.17	9.11	8.22	11.75	9.94	9.68	12.39	7.73	11.21	11.18	8.43
	c_{19}	c_{20}	c_{21}	c_{22}	c_{23}	c_{24}	c_{25}	c_{26}	c_{27}	c_{28}	c_{29}					
Unit	406	407	408	409	410	411	412	504	507	508	509					
$z_{i/j}^{max}$(kW)	30	40	40	25	35	35	40	35	30	20	35					
E_i^{max}/E_j^{min}(kW·h)	740	0	150	260	530	575	1255	300	1000	800	200					
$p_i^{\mathrm{sup}}/p_j^{\mathrm{dem}}$ (c)	9.81	6.18	6.02	9.54	11.37	12.51	6.58	9.82	9.08	5.71	8.11					