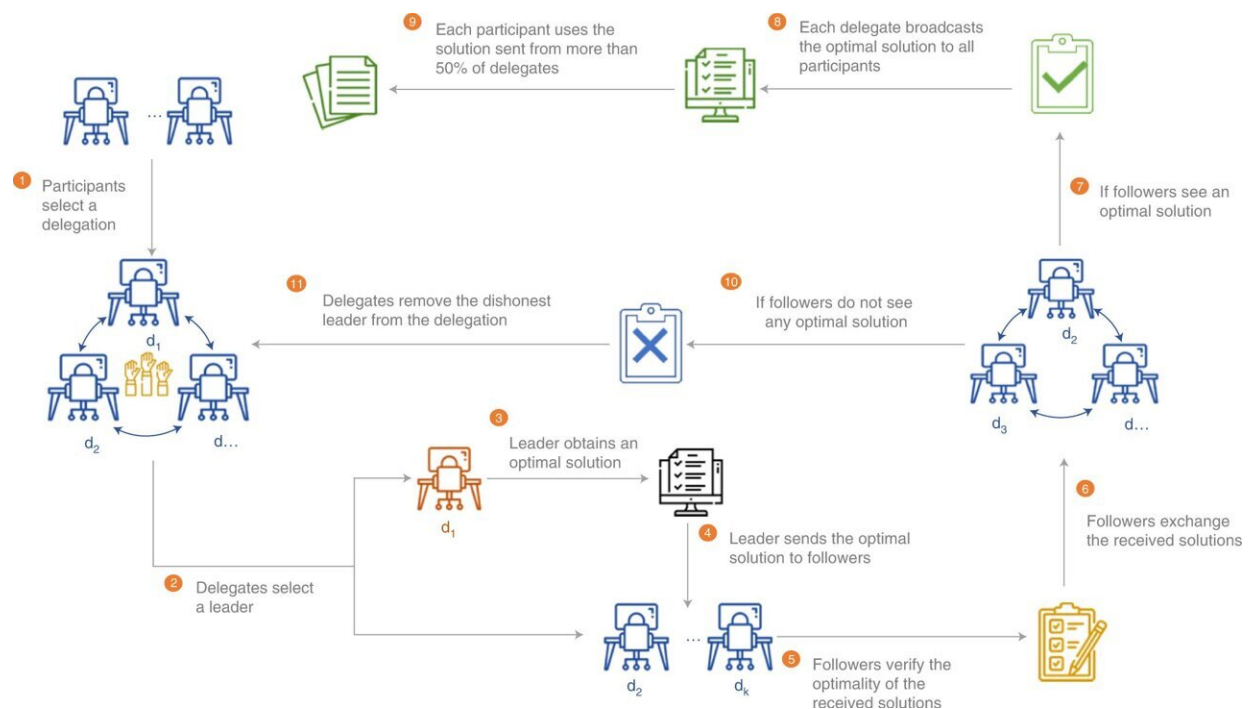# Making blockchains more efficient: Calculate a useful task as part of the consensus mechanism

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Flow chart of PoSo. Credit: *Nature Energy* (2022). DOI: 10.1038/s41560-022-01027-4

A combined team of researchers from Shanghai Jiao Tong University and Tsinghua University has found a possible way to make blockchain processing more efficient—by calculating something useful as part of

the consensus mechanism. In their paper published in the journal *Nature Energy*, the group suggests a useful task that could fit the bill would involve calculations engaged in optimizing energy systems. Mahmoud Mahmoud, with North Carolina A&T State University, has published a News & Views piece in the same journal issue outlining the work done by the team in China.

Blockchains have been in the news of late due to their use in securing decentralized transactions, such as those used by the cryptocurrency system Bitcoin. One criticism of such systems has been the large amount of energy wasted in performing useless calculations. Such calculations are performed as part of the consensus mechanism that ensures trust between two or more entities engaging in transactions.

With blockchains, two consensus mechanisms have been developed: "proof of work" and "proof of stack." In the former, those involved in a transaction must perform a trivial task, such as solving a puzzle. In the latter, random entities validate transactions. In this new effort, the researchers are proposing that rather than generating random puzzles, the proof of work approach could calculate something useful, such as energy optimization strategies for a given system.

The team suggests calculating energy optimization strategies is a good match for blockchains due to their inherent energy inefficiencies. They propose the replacement for the puzzle generator could be named Proof of Solution (PoSo). And to make their point, they have tested the idea using two real-world scenarios. The first involved calculating the best way to distribute electricity production for the University of Manchester—a campus with several different ways to generate electricity. Such a system would have to determine which generators to use under different scenarios. The second test idea involved much the same task for the city of Suzhou, China.

The researchers suggest that in addition to doing something useful during the consensus part of blockchain transactions, such a system would also be more difficult for nefarious types to game.

More information: Sijie Chen et al, A blockchain consensus mechanism that uses Proof of Solution to optimize energy dispatch and trading, *Nature Energy* (2022). DOI: 10.1038/s41560-022-01027-4

Mahmoud N. Mahmoud, Putting proof of work to work, *Nature Energy* (2022). DOI: 10.1038/s41560-022-01034-5