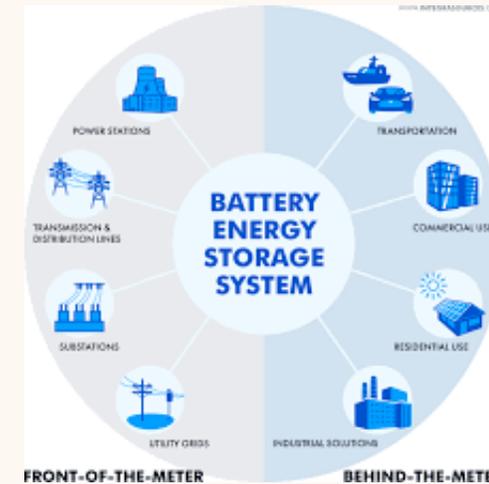


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## These breakthroughs could takes batteries to the next level Part 2



An energy storage alternative  
to lithium-ion?

# China brings the world's largest sodium-ion battery system online



**Datang Group Holdings Limited**  
大唐集團控股有限公司

**The system consists of 42 battery storage containers using 185Ah sodium-ion batteries, 21 power conversion systems (PCS) and a 110kV booster station.**

**There was no mention of a partridge in a pear tree.**



Image: China Southern Power Grid Energy Storage

- The Datang Group – a state-owned power generation company - claims it has connected the world's largest sodium-ion battery energy storage system (BESS).
- The initial system capacity is 50MW/100MWh with a plan to eventually double it.
  - To put the capacity into context – the system's ability to provide 100 MW of power for an hour is equivalent to powering 100 average American homes for a month or so.

# Sodium-ion versus lithium-ion



**Sodium is much more abundant than lithium. It is also easier and more environmentally friendly to mine. Although currently a more costly technology, it has the potential to be lower costs 17 – 30%.**



- Sodium-ion has a lower energy density making it less suitable for EVs.
  - Energy density is a measure of how much energy a battery can store relative to its size. Lower density means bigger batteries for an equivalent amount of power.
- Sodium-ion also has a better round-trip efficiency (RTE) and cycle lifetime at extreme temperature.
  - RTE is the amount of energy put into a battery versus what it can dispatch. Cycle lifetime gauges how many times a battery can be fully discharged before it no longer holds a charge.
  - Cycle times: sodium-ion around 5,000, lithium-ion best case in the 3,000 range.
  - RTE: sodium-ion 92%, lithium-ion 90+% - under normal conditions a wash.
- Eliminates potential for fires from thermal runaway.



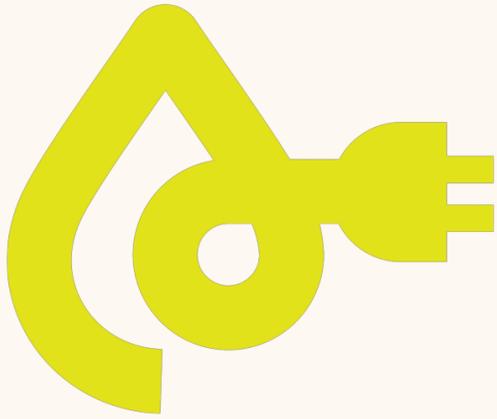
## Why is China looking for a lithium-ion alternative?



**The escalating trade wars are having an impact on China. It fears the potential of being cut off from lithium supplies.**

**Given China's recent conduct, that fear isn't unwarranted. Given the power to do so, I would cut them off until they changed their conduct.**

- The record-breaking BESS is part of a national effort to build large-scale energy storage projects using non-lithium technology.
- China is dominant in lithium-ion battery manufacturing, and they dominate in lithium refining.
- What they lack is a dominant domestic supply of lithium. China is estimate to only hold about 6% of the world's lithium reserves.



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## Unbiased and Unfiltered

- An honest assessment of the climate change effort.
- I cover what's working – but more important - the issues/roadblocks that the industry would prefer to ignore.
- A must-read for anyone with a desire to understand what's really going on with renewable energy and climate change.



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