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Icelandic firm Nanom (previously Greenvolt) has raised $3 million in seed funding in their goal to apply nanotechnology to existing nickel-iron and lithium-ion batteries. In doing so, the company claims to add 9x the energy density, recharging rates and lifecycle capabilities to the century old technology.

The process is said to happen all without any massive disruption to the battery making process, "Just mix these nanoparticles into the battery chemical slurry and voil?. The results are even more dramatic in modern Lithium-Ion batteries - and just as easy-to-implement."

The funding arrives via an EU Green Deal funding, Iceland Venture Studio, and Village Global, whose network includes Bill Gates, Mark Zuckerberg, Jeff Bezos, and Reid Hoffman.

Looking beyond just battery technology, Nanom is reporting that their tech will enable any structure of surface to become an energy storage device. In the prototyping phase, Nanom created an electric boat where the hull of the structure became the power source. To put that into perspective, 15 metres of this construction would hold the same amount of juice of 5 Teslas.

"We are beyond excited to announce Nanom as a company and to emerge from stealth with such exceptional investors who have seen the unmatched potential of our technology to transform the world in such a profound way," said Armann Kojic, CEO of Nanom. "Imagine a wall in your house becoming a giant, safe battery that takes you off the grid. We can enable all of that today and in a way that is green for the planet and better than the current-generation of batteries on the market."

One of the main drivers of the energy transition is decarbonization through electrification. Since batteries play a key role in electrification, they have become essential to the global energy transition. They are now ubiquitous, powering everything from mobile phones to electric vehicles (EVs) and storing renewable energy in order to balance the grid. But how does a battery work and what are the technological developments in the battery sector?

The cathode and anode are the most important components of a lithium ion battery, which determine properties such as the battery"s voltage (electric potential, measured in volts), power density (how quickly a device can charge and discharge, watts6 per kg or W/kg), energy density (how much energy is stored in the battery, watt-hours/kg or Wh/kg) and safety characteristics.

Until recently, anodes have mostly been made of graphite and hence they have been light in weight. Since cathode materials are the largest and heaviest part of a battery, with a cathode-anode mass ratio of 3:1 or 4:1, efforts to improve energy density in batteries (and to lower their cost) have predominantly been focused on developing the cathode. The most common cathode types are LCO (lithium cobalt oxide), LMO (lithium

manganese oxide), LFP (lithium iron phosphate), NCM (lithium cobalt manganese), and NCA (nickel cobalt aluminum).

Table listing main type of lithium-ion batteries: LCO, LMO, LFP, NCM, NCA, in terms of their chemical formula, energy density, safely, life span, cost, power output.

On the other hand, in NMC technology, the trend is toward high nickel chemistries, which means increasing the nickel content of the cathode to over 90% and lowering the cobalt and manganese content to below 10%. NMC cathode composition is represented by NMCxyz, where xyz are the relative proportions of cathode material: x denotes the nickel content, y the manganese content, z the cobalt content, and x+y+z = 10. Nickel based chemistries are expected to be dominated by NMC9.5.5 cathodes and upward in the future, as the industry increasingly looks to reduce cobalt content in batteries.

Electricity grids are becoming larger and more complex, driving record growth in demand for energy storage systems,8 while on the transportation side, decreasing range anxiety and the rollout of fast charging networks are driving EV penetration, with global EV share of new vehicle sales expected to rise from 14% in 2022 to 30% in 2026.9