Idea Description
Energy storage is critical to enable high penetration of renewable energy sources. However, current storage solutions which are based on chemical batteries have limited number of charge / discharge cycles leading to a high cost per kWh cycle and very long ROI. Additionally, although sun and wind are clean energy sources, chemical batteries are polluting.

Chakratec is developing an energy storage system with unlimited charge / discharge cycles, totally green and easily deployable. At the heart of the system is an array of innovative flywheel storage units. This array is managed by our smart management system allowing the customer to maximize his benefits by dynamically allocating storage resources for concurrent applications. The basic storage module has a capacity of 3.0 kWh and 2.0 kWp with scalability of about 0.5 MWh in a single container with further expansion to multiple containers.

Target Market
The product is targeting commercial and industrial storage applications.
The total addressable market as estimated by IHS is more than 10B$ in 2017.
The Main Applications targeted are: Energy Time Shift, Renewable Integration, Regulation, UPS, Peak Power Management, etc.

Advantages and Innovations
Chakratec has invested in a number of patent pending innovations in flywheel structure, materials and system architecture which enables its flywheel system superior performance over any battery based solution in a very competitive cost!
These innovations touch every critical system element such as Motor/Generator, Rotor topology, bearings and balancing system, and smart storage resources allocation.

Technical
a) Practically unlimited Charge Discharge Cycles (CDC).
b) The Capacity of the flywheel is constant over the entire lifetime of the unit unlike chemical batteries.
c) Flywheels enable Accurate Capacity Gauging.
d) Stable Depth Of Discharge (DOD) of up to 95% over the entire life time.
e) Very wide temperature operation range that do not require costly temperature and humidity conditioning.
f) Easy scalable

Economical
a) The Economic Benefits are achieved in terms of very low Cost per kWh Cycle
b) Multiple application stack algorithm utilizes the full economic benefit of unlimited cycles possible only with flywheels.
c) Long Life, under proper maintenance the storage has longevity of 20 years as opposed to costly battery replacement.
d) End Of Life (EOL) cost for the flywheel units are significantly smaller than the recycling cost of chemical batteries.
e) No costly and tedious environmental site approval process required, easy and low cost site and system setup

Environmental
a) The flywheel battery is green, recyclable and reusable at the End Of Life
b) Flywheels are not emitting any dangerous gases
c) No fire hazards as opposed to Li-Ion batteries

Funding
Chakratec has raised USD 1.2M from Capital Nature VC and IG-TEK.
Chakratec is has initiated round A funding of USD 5M for:
1 – BETA site deployment USD 0.5M
2 – Prototype productization USD 2.5M (incl. Long Term Operation Reliability, Safety (UL, VDE, CE),etc.)
3 – First production and customer shipment USD 2.0M

Timetable
Chakratec successfully built a technology demonstrator.
We are currently building a full spec prototype and plan to start ALPHA testing in H1/2015.
BETA site is scheduled for H2/2015.
Product productization, release and first customer shipment is scheduled for start of 2016.

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