



Let's Solve



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POV

## Battery-360

How about some disruption  
that saves us from the smoke?



# Battery-360 - How about some disruption that saves us from the smoke?

The simplest reason for the extensive use of batteries today, is the electric vehicle (EV). Another is heating, for homes and cooking. Here, we take a look at how just getting the battery component figured out can help our world combat climate change. While it is merely a humble battery, disruption in this space could help us find sustainable means for heating and transport, which are still significant contributors to greenhouse gases and global warming.

## What is the challenge?

To understand the challenge, we must first understand that there are two components to replacing combustion-based energy sources with batteries.

- Energy
- Longevity

They are the heart and soul of the battery use case. Whether for producing the required thrust in a motor, or the heat for a stove, oven, or furnace, you need a threshold voltage – that’s the energy. It needs to last for a certain period of time, and there, we have the longevity. Longevity here could also be the number of times the same battery can be reused.

With the innovation in Lithium Ion and Lithium Polymer batteries, we have Tesla promising EV long haul trucks with a range of 600 miles (965 km), which seems to have addressed both the Energy and the Longevity aspects. But that’s just one provider, with one use case. What about the rest of the world?

The true challenge is really how we can manage our batteries better. From raw materials to the process of recycling.

## What’s missing in the big picture

We lack visibility throughout a battery’s lifecycle. Identification of parameters such as geography, support history, and related information that could help:

- Get more from the battery's life through appropriate service and maintenance
- Give more from a consumer experience standpoint through seamless sharing of information between the different touchpoints a battery experiences during its lifecycle
- Give more back, by sharing information across the battery lifecycle to make sure the battery is retrieved at the end of life and recycled

By integrating the information pertaining to the battery there are more benefits to every aspect of the battery lifecycle, than what meets the eye initially. For example, sharing of information could also mean standardizing of battery specifications, which would significantly increase interoperability, compatibility, and most importantly, drive the cost of adoption down, which seems to be the biggest challenge in replacing fossil fuels.

In the longer run, information shared across the battery lifecycle could prevent counterfeiting, improve predictability of performance due to availability of battery history even before the date of manufacture. This is a very important point, and one of the biggest stumbling blocks to coping with the demand for new, powerful, and long-lasting batteries is the availability of raw materials, and the ultimate price the environment pays if inappropriately disposed of.

It is this lack of traceability of an individual battery through the landscape that contributes to the lack of large-scale adoption.

*Think of it this way.*

*If you did not have fuel stations along the road, too few, or few and far in between, would you buy a gasoline or diesel-powered car?*

## Battery-360 101

The premise of Battery-360 is a holistic view of the battery lifecycle. Here we envision the battery not as a device but as an entity, with an identity, a complete history, traceable authenticity, and something on the line of a passport that tells us where it's been, what it's been up to, and how it's coped along its lifecycle.

### Battery Identity

Every battery has an identification number that captures the brand, make, variant, manufacturing location, date, and batch number. This information exists. What does not exist is a centralized repository

of batteries around the globe – or a network of battery identity repositories that is searchable without human intervention. What we propose here is a solution that integrates information about batteries from around the world. We have use cases such as RFID tags, embedded microchips (most commonly used in pets), which could easily be appropriated to batteries.

## Battery Passport

Similar to the registration information of a vehicle, the Battery Passport is an aggregate of all the information pertaining to the battery. Nothing more than a table in a database that could contain:

- Battery ID
- Make
- Manufacture date
- Computer vision imagery of quality checks
- Distribution touchpoints
- Ownership history
- Service History
- Recondition/Remanufacture history
- Location of last ownership
- Location of last service

This information could allow battery manufacturers and service providers from around the world to identify, troubleshoot, service, recondition, remanufacture, or recycle. In turn, this transparency could reduce the risk of adversity arising from counterfeiting and incorrect servicing or reconditioning.

## Where we're heading with this

The long-term vision of battery-360 is to transition batteries from being products, to services. Like how aircraft engines are today. While aircraft engines are large and extremely expensive, they can still be installed, serviced, and replaced at any service center. Likewise, we envision batteries-as-a-service where end consumers pay a fee to use a battery instead of buying one.

To promote such a service, there are some prerequisites:

- Global standards for design and manufacture of batteries (much like the current lithium-ion batteries that conform to a size and voltage standard (3.7 volts and sizes such as 18650, 26650, 14500 etc), including raw materials, composition, and other specifications.
- Globally standardized battery identification and authentication (preferably micro-chip-based, to enable large-scale identification of individual batteries in battery packs)
- Analytics solutions that provide insights into the battery lifecycle, usage, and statistics thereof

## The Bottom line

Battery-as-a-service can help drive adoption of electronic replacements for use cases where fossil fuels have historically been the sole energy source. However, it would mean reimagining the way we manufacture, distribute, use, service, and recycle batteries. Ultimately, to help governments combat climate change, we need to standardize, socialize, and harmonize battery manufacturing, service, reconditioning, and recycling batteries. In essence, adopting what we call Battery-360.

### About the Author



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Venkat Sarma is Lead for Smart Plant & Operations Group with experience of over 24 years in building Practice & Teams along with engaging Global Clients for sales, marketing, business development, digital, IoT & project management combined with deep Domain understanding across Industries. He has over 19 years of experience in core industry having worked in L&T Parent Group in projects which include Plant process & automation systems as well as shop floor.

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