



LEEP EDRIVE PRIVATE LIMITED

Door No, 2/414-A, Rangopanditha Agraharam
Gokul Nagar, Hosur – 635109
Tamilnadu, India.

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Startup Business proposal: Leep eDrive Private Limited (Leep)

www.leepdrive.in

➤ **Directors:**

- *Mr. K.S. Ramanujan.*
- *Mr.Piyush Shah*
- *Mr.G.Vasudevan*

➤ **Nature of Business :** To design, manufacture, supply, install and deploy electric vehicle power train drive kit and lithium electrical energy storage modules or any parts thereof for two wheeler, three wheeler, four wheeler and higher axle transport vehicles primarily for public and in addition for private use with the battery being one of a networked type. The project primarily aims at design, develop and manufacture electric propulsions systems and battery charging systems for electric vehicles using Li ion Batteries.

- As on date this project primarily addresses
 - Retrofit kit for electric propulsion for three wheelers – Passenger and Load vehicles. Have engineered the kit of capacity 3 Kw / 5 KW and 8.5 KW with Permanent Magnet Synchronous motors with additional torque boost for climbing ability.
- Development of Li ion LiFePO4 chemistry batteries of for electric propulsion and rated at voltage from 48 to 600 V. The requires cells are sourced from China.
 - Have developed the Battery management systems for batteries up to 72 V and energy storage up to 15 Kwh.
- The following development projects are in pipeline:
 - Developing the extended version of the Battery management systems for High voltage batteries for rating 96/240/360 & 600 V DC for Electric Bus and large commercial vehicles and energy storage beyond 100 Kwh. Cells supplies for this work tied up with suitable Chinese suppliers as of now.
 - Extending the High Voltage battery use for Energy storage linked with Renewable Photo Voltaic systems.

- Developing BLDC motor controllers to replace Chinese units and suitable for use with electric two wheelers. This development project is at an advanced state and need to be taken to testing and commercial production.
 - Have concluded a MOU with ARCI, a high tech development division of DRDO, Govt of India for indigenous manufacture of LiFePO₄ Li ion cells of rating 5 to 20 Ah as import substitution.
 - Developing Type-2 DC chargers with capability to charge Li ion batteries in 1 to 2 hours to full charge and rated up to 50 Kw rating

- LeeP eDrive Private Limited is registered as Startup Company in Nov 2018 and can avail the tax benefits available to a Startup company in India under the DIPP program in India.

- **Location of the Business** :2/414-A, Rangopanditha Agraharam, Hosur -635109, Tamilnadu, India as the manufacturing and retrofitting plant and market in Bangalore serviced from there.

- **Present company ownership profile:**
 - Founder directors– Mr.K.S.Ramanujan & Mr.G.Vasudevan
 - Technology infusion – Mr.K.S.Ramanujan.
 - Investment director – Mr.Piyush Shah along with four investors
 - Share capital subscribed: Rs 1.50 Crores.
 - Share capital ownership:
 - Mr.K.S.Ramanujan as Founding Director & MD & CEO : 83 %
 - Mr.G.Vasudevan as Founding director: 1 %
 - Mr. Piyush & investment associates: 16 %
 - Present valuation is expected at about Rs 5.00 Crores.
 - The total business revenue in the pilot development period between Nov 2018 to Mar 2021 is Rs 60 Lakhs through assorted set of paid samples for retrofit of drives in 3-wheelers, batteries for use in 2 and 3 wheelers, control systems for battery control deployed in the industry and deployment of energy storage systems for stored energy residential Photo voltaic systems up to 25 Kwh storage and voltage up to 72 V.

- **The plan moving forward:** There are four independent avenues of growth:
 - **Business Vertical-1:** Expansion of LiFePO₄ battery production with cells imported from the existing supply chain in China. Batteries for both Swapping Systems and fixed system on EVs. The market is expected to expand to about 5 Mwh with the batteries in range of 48 V to 600V and used in EV fitments. The life of these batteries would be about 6000 cycles or 150,000 kms. The expected market is expected to grow to 20 Mwh in the period 2022 – 2025. The 5 Mwhr market is values at Rs 8.0 Crores. ***A capital infusion of Rs 5.00 Crores to expand the existing pilot production line is needed to meet a battery assembly target of 5 MWh per year and certification needed from the appropriate Govt Agencies.***

- **Business Vertical-2:** Pilot scale production of the motor controller being developed for BLDC motor to power electric 2-Wheelers & 3-W passenger vehicles. This will be at a power level of 1.5 – 3.0 Kw rating and the market is expanding with the idea of substitution of the 100 % Chinese sourced controllers now in India. In the period 2022-2025 this will fan out as a business revenue of Rs 30.00 Cr. A pilot scale production of about 40,000 units per annum is envisaged considering a 10 % import substitution of the 400,000 units that will be sourced by the 2W- EV industry expanding in India. ***A capital infusion of Rs 12.00 Crores is needed to build a motor controller and testing line for pilot scale production operations controller existing development work in progress and certification needed from the appropriate Govt Agencies.***
- **Business Vertical-3:** Pilot scale production of the retrofit/electric propulsion kit with drive, gearbox and controller for 3-wheel light commercial vehicles (alternatively 4-wheel vehicles) for goods transport up to 750 kgs load. These parts can be supplied with batteries assemble up to 20 Kwh storage and used for these mini load haulers. A pilot project to build 6 of these and put them on road trials would need ***a capital infusion of about 2.5 Cr for build the necessary infrastructure to retrofit / engineering changes 3-W 750 Kgs & 1000 Kgs 4-W E-LCV that would facilitate engineering infrastructure and test beds and as well get this E-LCV certified by ICAT/ARAI.*** The end point of this pilot project would also be 6 such vehicles, 3 units of 3-W and 2 units of 4-W E-LCVs for extensive load test and certification. Estimated pilot project phase including certification by ICAT/ARAI is 9 months.
- **Business Vertical-4:** Manufacture and built fast charger system for EV to meet low voltage EV batteries (48V / 72 V) and High Voltage Batteries (120 V and higher up to 600 V DC) for fast charging all class of EVs. These systems can dispense fast charge at about 60 minutes to 120 minutes for full charge of the EV battery. The present developed prototypes can be taken to commercial scale manufacture and can form an annual business revenue of Rs 3-4 Crores in the period 2022 - 2023. ***A capital infusion of Rs 2.50 Crores is needed to build a DC charger manufacture and testing line for commercial scale operations controller based on the existing development work in progress and certification needed by the appropriate Govt Agencies.***
- **Business Vertical-5:** The Energy Storage Systems businesses for residential, commercial and public utility systems are slowly building up in India with the user market being the renewable generation through Photo voltaic systems. With India poised to grow to over 50 Gwhr of Photo Voltaic system generation, an estimated 15% of this annual capacity (7.5 million Kwhr storage) has to be backed up with storage for non-solar hours use through the grid. A 10 % market supply of this need spans out to a market revenue of about 1800 Crores including the safety system and needed switch gear costs. A production line facility to meet this demand will need establishment of an international supply chain and a value-added Indian contribution of 33% of this equivalent to Rs 600 Crores on engineering and deployment. ***The production facility would need a capital infusion of nearly Rs 50 crores for assembly and testing & support and certification needed as BIS by the appropriate Govt Agencies.***

- **Business Vertical-6:** This long-term plan is built around the MOU concluded with ARCi a division of DRDO, Govt of India. A 30 MWhr per annum LiFePO4 Li ion cell manufacturing facility would involve setting up of a cell manufacturing line costing about 12-15 Million dollars of machinery sourced from Korea or Japan and about Rs 40 Crores investment for plant & infrastructure for this line. An overall investment of Rs 200 Crores is foreseen with the possibility of Govt of India coming in with a grant type of support of 15 to 20 % as part of the “Make in India” initiative. ***The facility would need 18 months to set up and a total capital investment including the support expected from Govt of India estimated at Rs 200 Crores.*** As part of the signed MOU, and the cells being developed by ARCi is expected to be deployed in filed EVs that Leel eDrive Pvt ltd is already having as a proof of performance before the technology developed is put to commercial scale use. The estimated annual revenue at the rated capacity of 30 MWhr is about 50 Crores.

➤ **Pictures of the technology built - The Prototype:**

□ **Retrofitted three wheeler with electric propulsion**

- Direct drive electric
- 6.5 to 7.5 Kwh energy storage Li battery
- 90 to 100 kms range



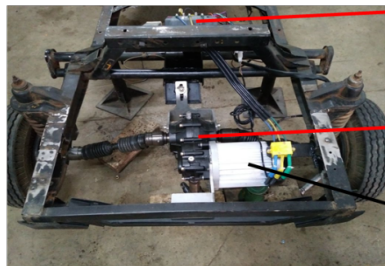
Rear view of mounting of motor

Battery

Motor controller

8:1 split axle differential

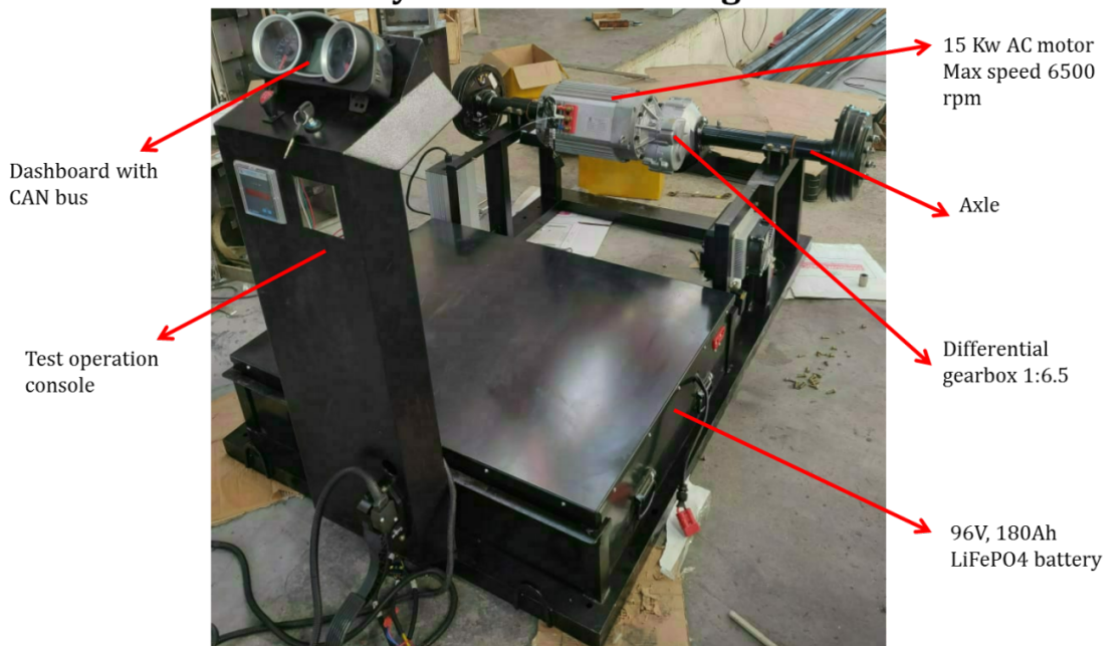
2.5 KW motor with 150 % overdrive provision





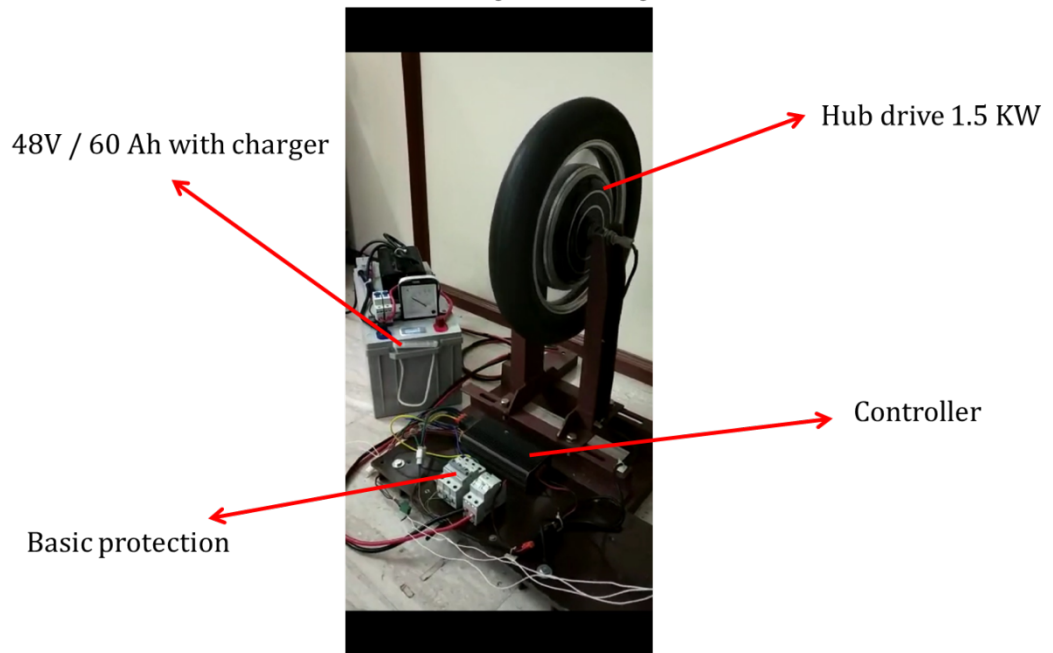
The first complete retrofitted 3-W operating in Bangalore as proof of engineering

□ 15 KW eDrive for dynamometer testing



A demonstrative 15 KW drive with a 18 Kwh battery built as proof of scalability of the engineering design and capable of fitment to four wheelers.

❑ **BLDC controller and Battery built by LeeP**



A demonstrative 1.5 KW drive with a 3.0 Kwh battery built as proof of scalability of the engineering design and capable of fitment to individual drives

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