

March 2019



Bharati Vidyapeeth Deemed
University College of Engineering



OptiXtal India Energy
Solution Pvt. Ltd.

A SURVEY REPORT ON

Identification of Technical Challenges in the Powertrain of Electric Rickshaws

OptiXtal India Energy Solution Pvt. Ltd.

Survey Results Report Template

Sponsor: OptiXtal Energy Solutions India Pvt. Ltd.

Survey Objectives: To identify problems faced by the owner/drivers of e-Rickshaws in the battery/ motor controller of the e-Rickshaw

Survey designed by: Prof. R. N. Holmukhe, BVDUCOEP Pune

Survey Conducted: Between 25 Dec 2018 and 5 Jan 2019

All Responses Submitted: 11 Feb 2019

Location of survey: [Gorakhpur, New Delhi, Indore, Allahabad, Lucknow]

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To identify problems faced by the drivers of e-Rickshaws in the powertrain of the e-Rickshaw

Abstract:

While the e-Rickshaw has emerged as a very popular mode of last mile transport, there are a number of gaps in information from both the manufactures and the end users viz. the e-Rickshaw drivers.

While there have been some surveys about the e-Rickshaw, the studies were restricted in sample size, geography technical parameters and a number of other factors.

With a view to plug the information gaps, BVDUCOEP with the sponsorship of OptiXtal India Energy Solutions Pvt. Ltd. embarked on a large scale study of the Awareness & Usage of the sub systems of the e-Rickshaw.

It is intended the survey will be an ongoing exercise.

Methodology & Sample Size:

Selected Students were identified and trained in the manner of asking questions and the responses were to be recorded in a structured questionnaire (Appendix 1). A number of instances, the questionnaire responses had to be discarded because the responses were inconsistent. After clearing out the questionnaires with the inconsistent responses, there were 123 acceptable responses.

The survey was conducted in the first week of January 2019. They survey was carried out at the following widely dispersed locations in North India:

- Delhi
- Gorakhpur
- Meerut
- Barabanki/Lucknow
- Allahabad
- Indore

Conclusions : The drivers/ operators of the e-Rickshaw seem to have little knowledge about the technology behind the e-Rickshaw and the maximum response to basic questions seemed to be “ Don’t Know”.

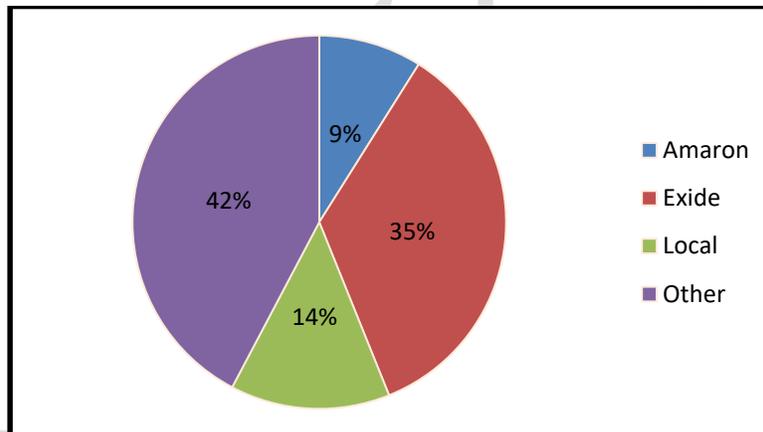
The expected life of the battery, based on the experience of drivers was between 6 - 8 months. In reality, the expected life of the battery was just a tad over 6 months.

We request the reader to read the rest of the report carefully and for further clarifications to contact info@optixtal.com .

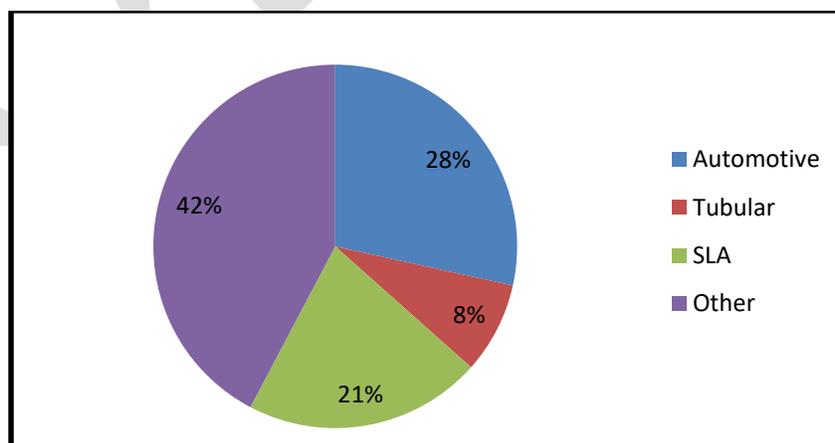
Responses to the Questionnaire

I. Battery Details:

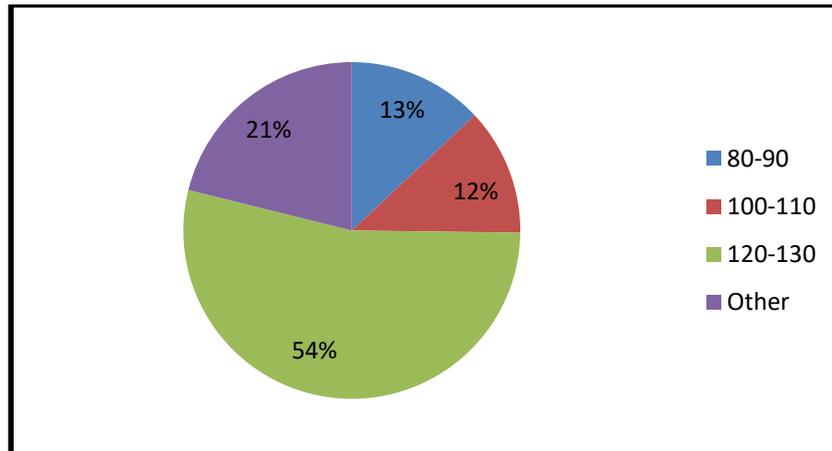
1. Manufacturer/ Brand



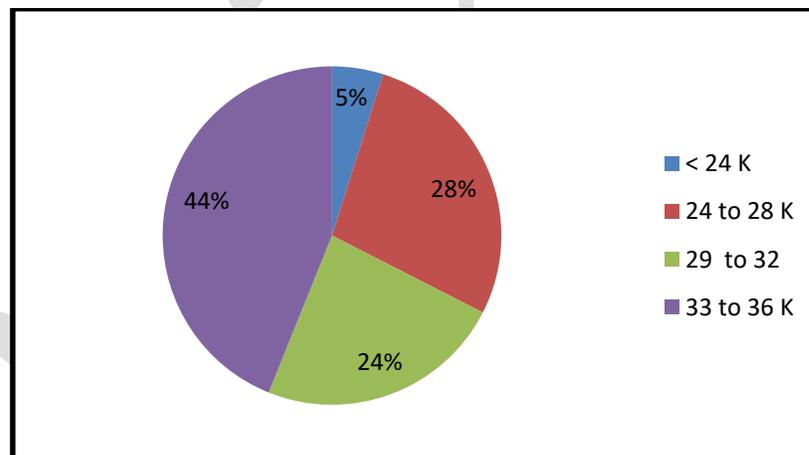
2. Type of Battery



- No. of Batteries: 4
- Voltage of Battery Set (Volts) : 48 V
- Capacity (AH) of a single battery

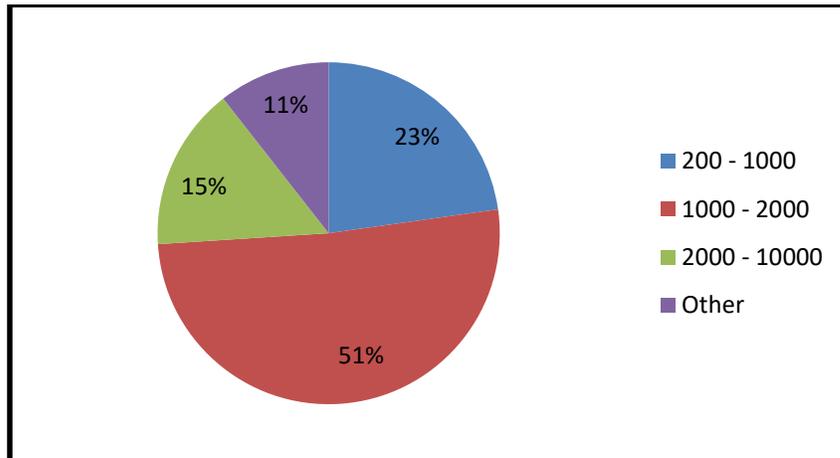


- Replacement Cost in Rs (For 4 batteries)

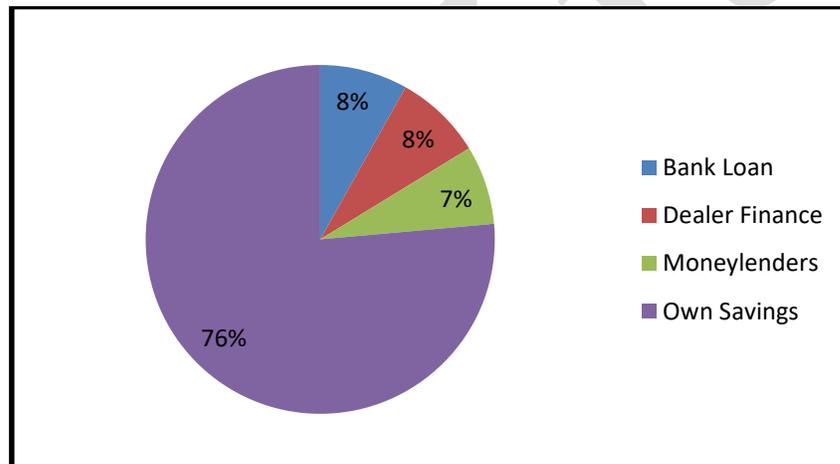


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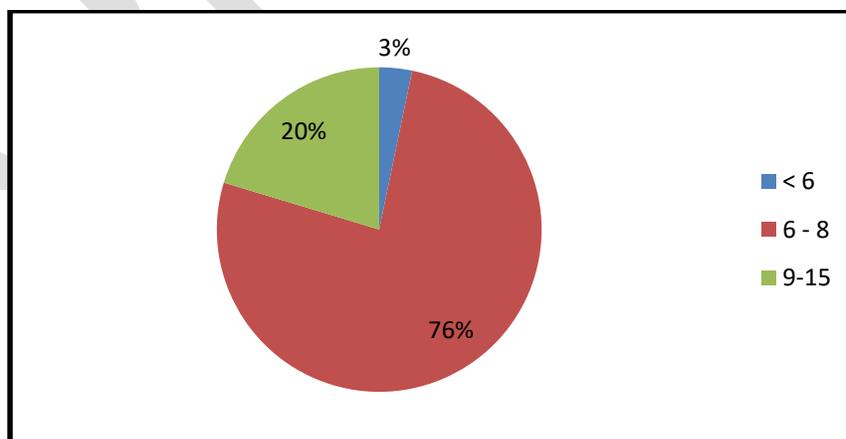
7. Discount for selling old batteries Rs (per battery)



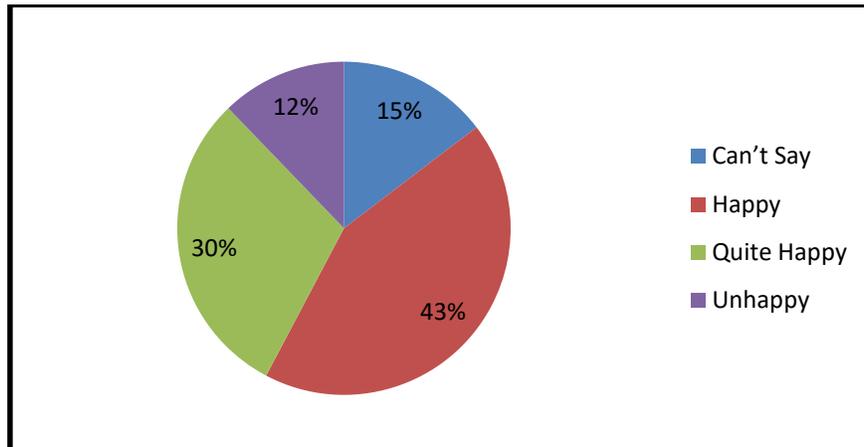
8. Finance Source for the Replacement batteries



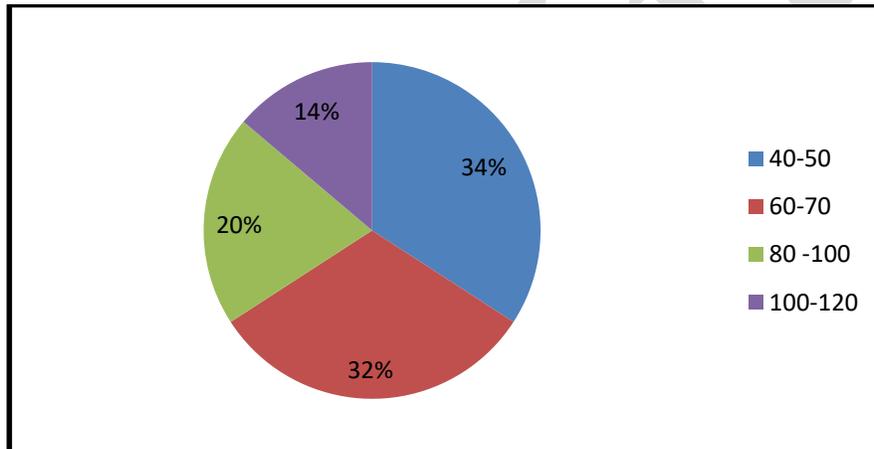
9. Expected Battery Life (in months)



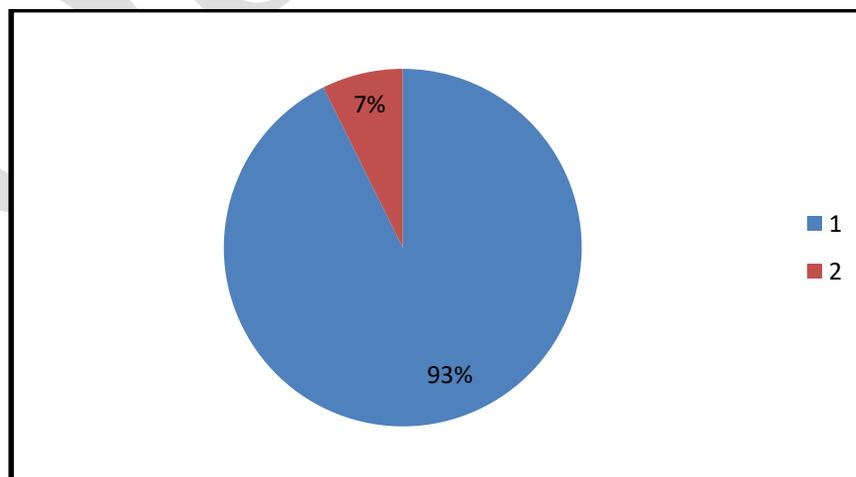
10. Support with company/dealers when getting warranty replacement



11. Range of a fully charged battery bank (km)

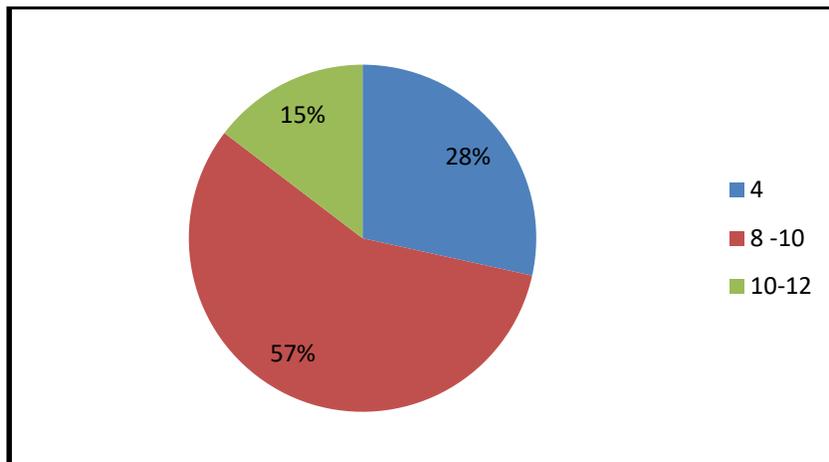


12. How often do you "top up" the charge during the day

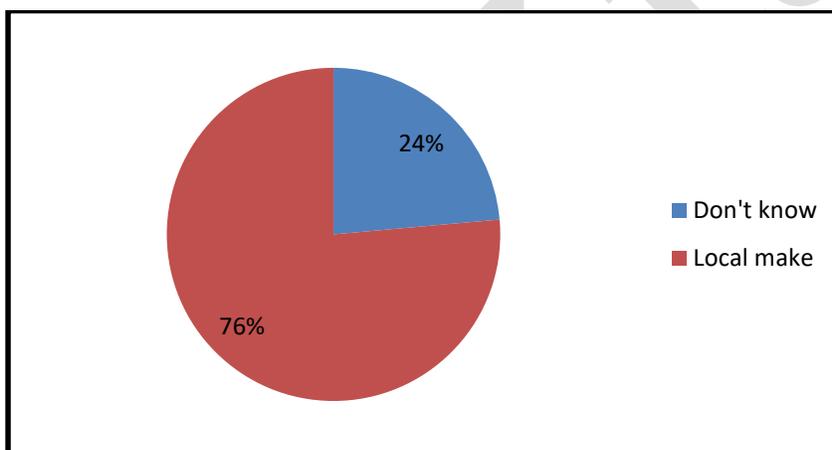


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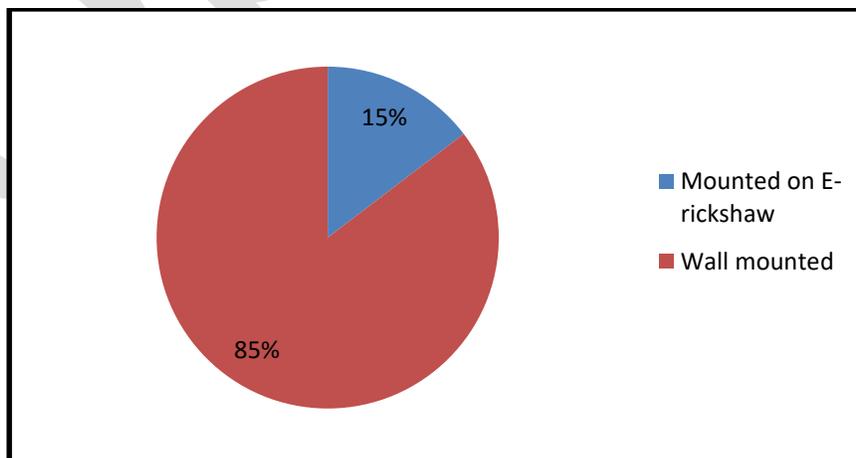
13. How long do you “top up” (in hours)?



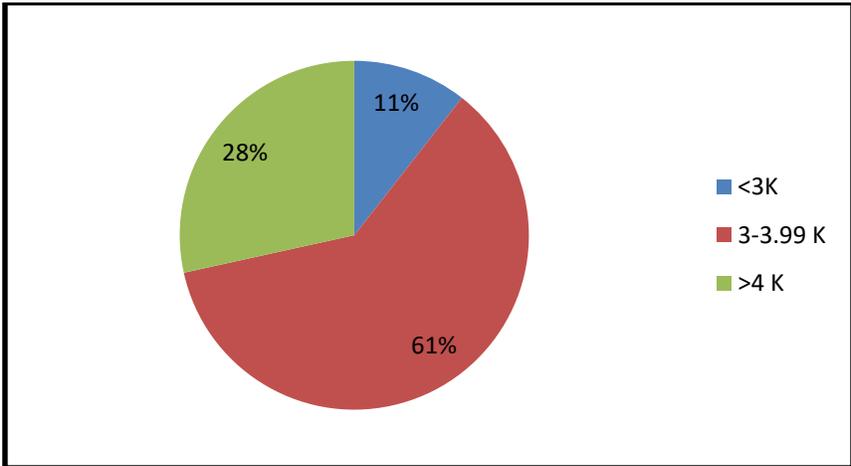
14. Charger Brand



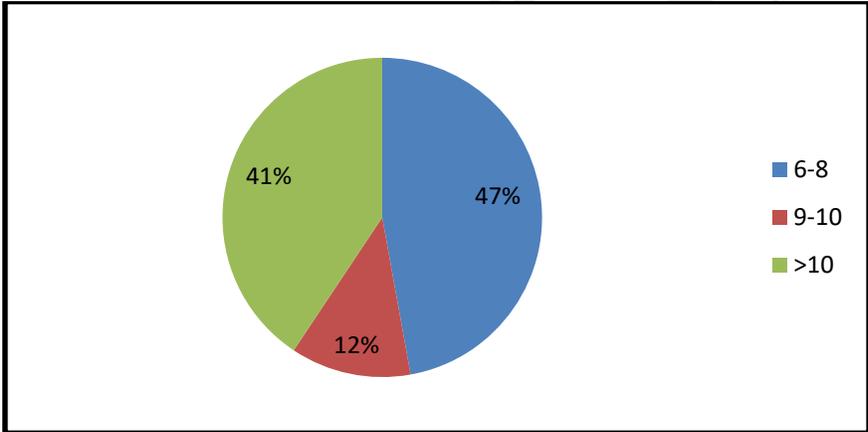
15. Type of Charger Used



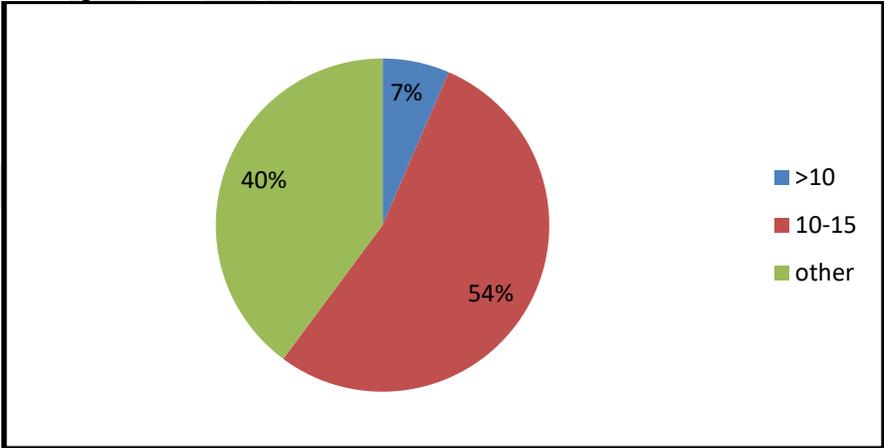
16. Cost of Charger



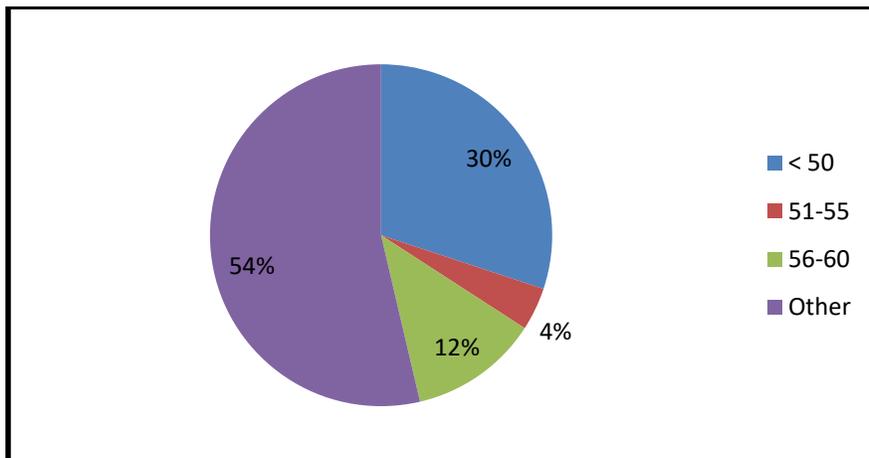
17. How long to fully charge ? (hours)



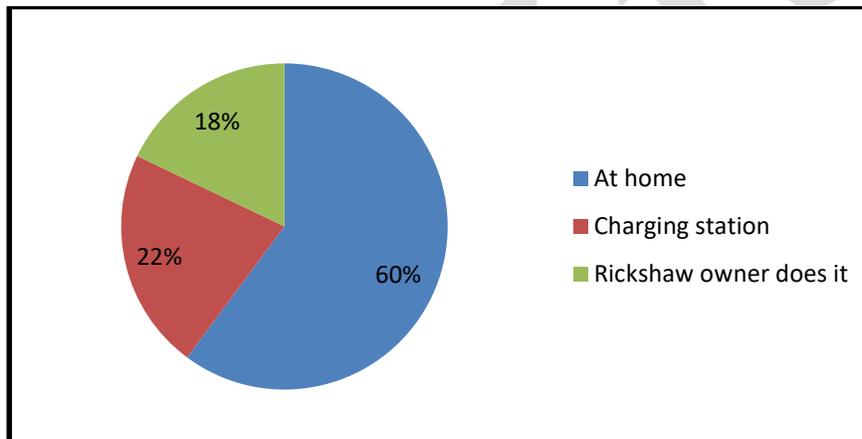
18. Charger Output Current



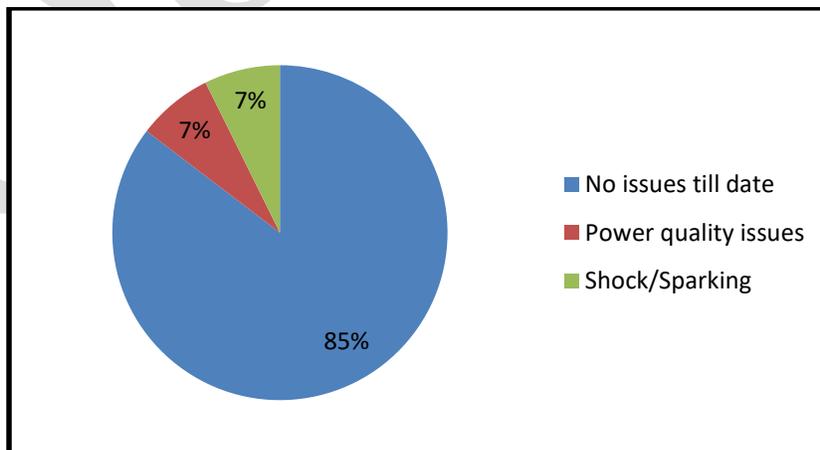
19. Charger Output Voltage



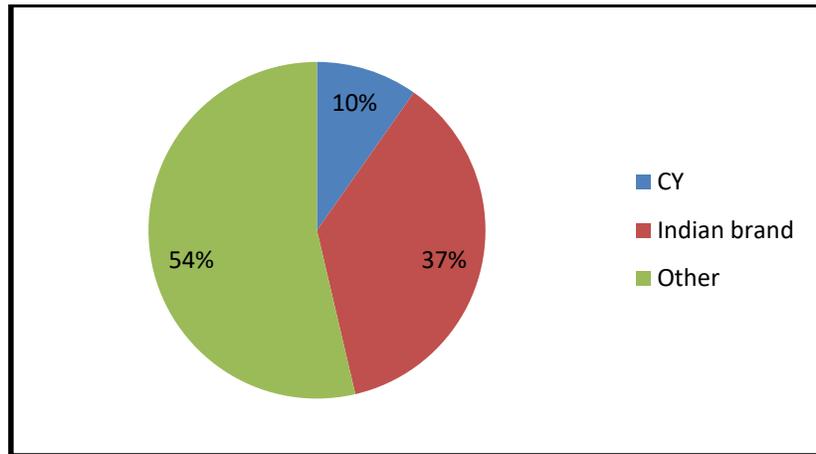
20. Where you do battery charging?



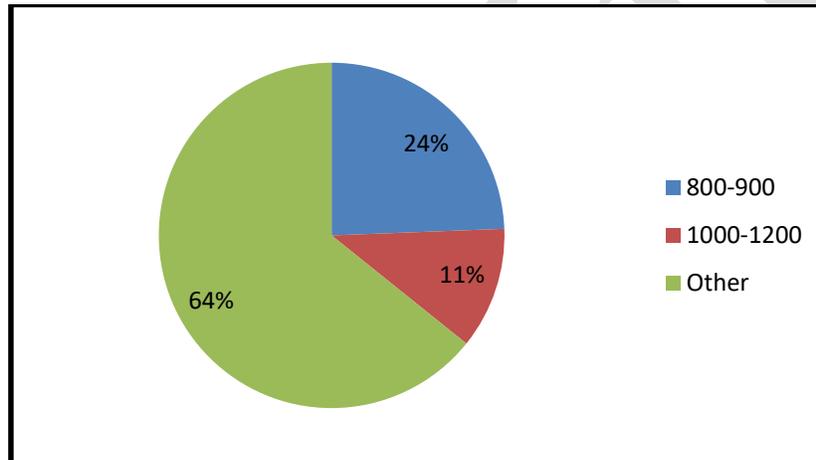
21. Issues with Charger safety



22. Motor Brand



23. Motor Rating (in Watts)



Appendix 1

Identification of technical challenges in use of Electric Vehicles battery

**Note: Questionnaire to be asked only of e-Rickshaw owner / driver who has changed the battery at least once*

Name of Driver /Owner: _____ Mobile No: _____

I. Battery Details :

Manufacturer/ Brand	Exide	Amaron	Eastman	Don't Know	Other
Type of Battery	Automotive	SLA	Tubular	Don't Know	Other
No. of Batteries	1	2	3	4	Other
Voltage of Battery Set (Volts)	12	24	36	48	Other
Capacity (AH) of a single battery	80	90	100	120	Other

II. Battery Costs:

Replacement Cost in Rs (For 4 batteries)	< 24 K	24 to 28 K	29 to 32	33 to 36K	Other
Discount for selling old batteries Rs (per battery)	< 500	5 - 700	7 - 900	1K - 1100	Other
Finance Source for the Replacement batteries	Dealer Finance	Own Savings	Bank Loan	Moneylenders	Other
Expected Battery Life (months)	< 5	6 - 8	9 - 11	> 12	Other
Support with company/dealers when getting warranty replacement	Unhappy	Somewhat Unhappy	Can't Say	Quite Happy	Happy
Range of a fully charged battery bank (km)	40	50	60	70	Other
How often do you " top up " the charge during the day	0	1	2	3	Other
How long do you "top up" (hours)?	1	2	3	4	Other

III. Charger:

Brand :				Local make	Don't Know
Type of Charger Used	Wall mounted	Mounted on E-Rickshaw			Other
Cost of Charger	<3K	3-3.99 K	4-5 K	> 5K	Other
How long to fully charge? (hours)	< 6	8	10	>10	Other
Charger Output Current	6	8	10	12	Other
Charger Output Voltage	< 50	51-55	56-60	>61	Other
Where you do battery charging?	City center	Outskirts	At home	Rickshaw owner does it	Other

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Issueswith Charger safety	Shock	Sparking	Power quality issues	No issues till date	Other
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III. Motor:

Brand :	CY	Other China brand (name)	Indian brand (name)	Don't know	Other
Rating (in Watts) :	<800	900	1000	1200	Other

Name of e-Rickshaw Manufacturer: **Mobile Number:**

Interviewed By: _____ **Roll No :** _____

City _____

