

Commercial & Industrial sector for Energy Storage Solutions in India: A Case Study of Exicom Power Solutions

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ABSTRACT - The report examines the role and value of energy storage in the context of electricity systems that are expected to absorb increasing quantities of time variable electricity generation from renewable sources in the years ahead. Particular attention is given to India with its vast renewable energy potential and limited interconnection with the major electricity loads. Energy storage technologies cover a wide range of levels of development from mature technologies like pumped hydro with over 50 years of operational experience, to technologies still under development such as solid-state batteries, flow batteries and flywheel-based energy storage solutions and all of these are reviewed.

The competitive analysis is done to understand the strengths and weakness of Exicom in respect to its competitors. A secondary market research is done on the total scope and potential of Energy storage solutions in India and then particularly in the Commercial & Industrial (C&I) sector. Analysis and Assessment of state-wise scope of Energy storage solutions in India is also done to know about the most prominent states in which energy storage solutions would be more efficient for the penetration in the C&I sector. The key drivers for the Energy storage solutions are Power Cuts and outages, Diesel Generator Replacement and low carbon emissions. The projections are done for the year 2020 and 2022 and conclusions are drawn in the end with Rajasthan, J&K, and Delhi being few of the states where there is high potential for energy storage solutions.

Electric Vehicles and Commercial & Industrial power back-up will have the highest contribution for the growth of energy storage solutions among other applications.

KEYWORDS: Energy Storage Solutions Market Analysis, Energy Storage System, Li-Ion Energy storage solutions, marketing strategy, B2B

1. INTRODUCTION

Exicom Power Solutions is a company with 24 years of experience in designing, engineering and manufacturing of complete range of power solutions for ever changing telecom requirement, Industrial, IT and other markets.

Exicom Tele-Systems Ltd. manufactures power supply equipment. The Company produces power supply equipment, machinery, and constructs power plants. Exicom operates in Gurgaon, India.

Exicom also designs and supplies Li-ion battery solutions for stationary backup applications.

ESS refers to small to large sized Energy Storage Systems which are usually based on battery. ESS market in India in 2017 was estimated to be over 5.5GW. The total energy storage market between 2018 and 2023 in India is estimated at 54 GW. Out of this, almost 50% of demand is expected from new energy applications such as renewable integration, frequency regulation, peak shaving, T&D deferral, diesel usage and optimization, telecom towers and electric vehicles. Hence there is sizable opportunity for advanced storage systems for these new applications.

ESS market mainly consists of three verticals:

- a) Behind the meter - Behind the meter market usually consists of solutions that don't interact with the grid and are usually solutions for load management / backup or peak handling.
- b) Front of the meter - Front of the meter solutions are usually grid interactive and provide grid support services etc.
- c) EVs and each of these areas of various vertical markets within themselves.

With energy storage demand expected to reach 70 GW by 2022, it is expected that India will also become one of the largest markets for advanced energy storage technologies in the next decade.

Certain problems like low energy access in rural areas, peak unmet energy demand leading load shedding, to ensure large scale renewable energy integration have also created the need of efficient battery energy storage system in India.

2. RESEARCH METHODOLOGY

- 1) Market research on the current competitors of Exicom Tele-Systems Limited, their market share in the Li-Ion Energy Storage System.
- 2) Competitive analysis based on products and services offered and analysis of different types of energy storage solutions in India.
- 3) Future prospect and opportunities of different types of energy storage solutions in India.
- 4) Market Assessment and analysis of Energy Storage Solutions in India and their possible implementation in the Commercial and Industrial Sector.
- 5) State wise differentiation and possibility of evolution of Energy Storage Systems in India.

Threat of substitute: Low, Li-Ion Battery energy storage system offer wide range of advantages over other types of BESS.

Threat of Complements: **Medium**, Government can impose certain laws and regulations, so the dependence on the complements is relevant.

Bargaining Power of Buyer: **HIGH**, the buyers are highly Price sensitive with no brand loyalty.

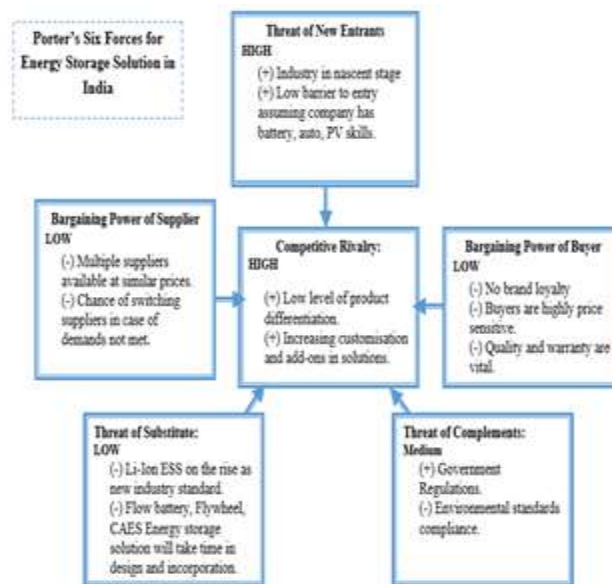


Figure 1: Porter's Six Forces Analysis Framework

3. RESEARCH ANALYSIS

3.1 The porter's six forces analysis for the Li-Ion Energy Storage Solutions in India is shown below. The reason for choosing this marketing tool is to do a complete analysis of the Energy storage industry and thus to know about the factors that directly or indirectly effect the industry.

Competitive Rivalry: High, we can conclude that there is a high level of competitive rivalry in the Li-Ion Energy storage solutions in India.

Threat of New Entrants: High, as the industry is in a very nascent stage, but this is subjective to certain conditions.

Bargaining Power of Supplier: Low, Due to the presence of multiple suppliers of batteries. Most of the batteries are imported from China, Canada etc.

3.2 SWOT Analysis is done to know about the positives and negatives of Exicom Tele-Systems Limited in comparison to its competitors. It tells us about the prominent strategies to follow to yield better result in the future



Figure 2: SWOT Analysis Framework

3.3 TOWS Analysis is performed to know about the inter relation between the strengths and opportunities so as how they will complement each other and using the strengths to overcome the threats and weakness.

Internal Factors	Strengths(S)	Weaknesses(W)
External Factors	<ul style="list-style-type: none"> • Only Company in India to provide Battery Management System (BMS). • Customized solutions. • Government Tenders. • Pan India support 	<ul style="list-style-type: none"> • Low internet presence and on E-commerce websites. • Transition to different type of energy storage will take significant amount of time and R&D.
Opportunities(O)	<p style="text-align: center; font-weight: bold;">SO Strategies</p> <ul style="list-style-type: none"> • Already aggregators to bank on the growth in energy storage market, electric vehicles and in C&I sector. 	<p style="text-align: center; font-weight: bold;">WO Strategies</p> <ul style="list-style-type: none"> • Already aggregators so have an upper hand in R&D.
Threats(T)	<p style="text-align: center; font-weight: bold;">ST Strategies</p> <ul style="list-style-type: none"> • Government tenders and only company to have its own BMS. Can compete on price. 	<p style="text-align: center; font-weight: bold;">WT Strategies</p> <ul style="list-style-type: none"> • R&D for substitute Energy storage solution and product promotion on e-commerce websites

Figure 3: TOWS Analysis Framework

3.4 Market Analysis

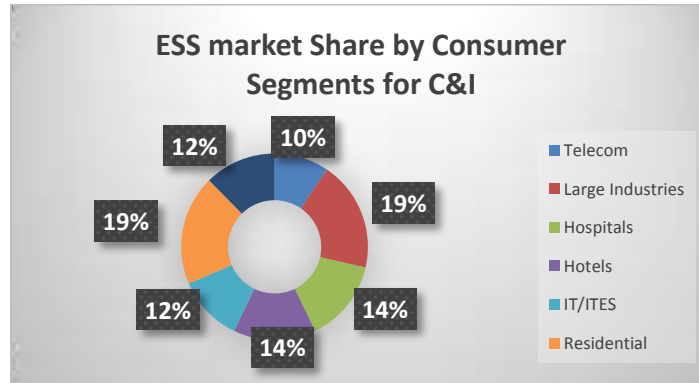


Chart 1: ESS Market Share for Consumer Segments

We can see that Residential and large industries have the highest share of 19% followed by hotels and hospitals at 14%.

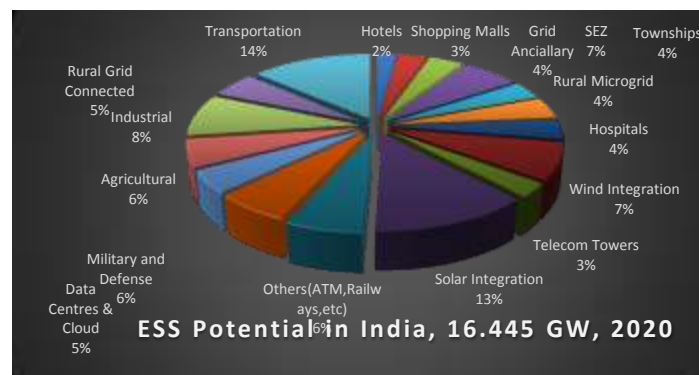


Chart 2: ESS Potential in India Segment wise

- The total projected ESS potential is 16.445 GW with the highest potential for transportation at 14% i.e. 2.23GW, which gives rise to boom of Energy Storage for Electric Vehicles.

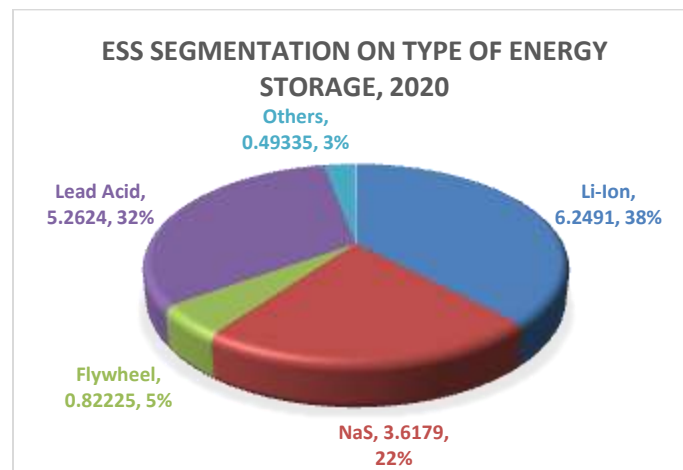


Chart 3: ESS Market Segmentation on Type of Energy Storage Solutions, 2020

The potential for Li-Ion Battery Energy storage system is likely to increase in the upcoming years due to the benefits it offers.

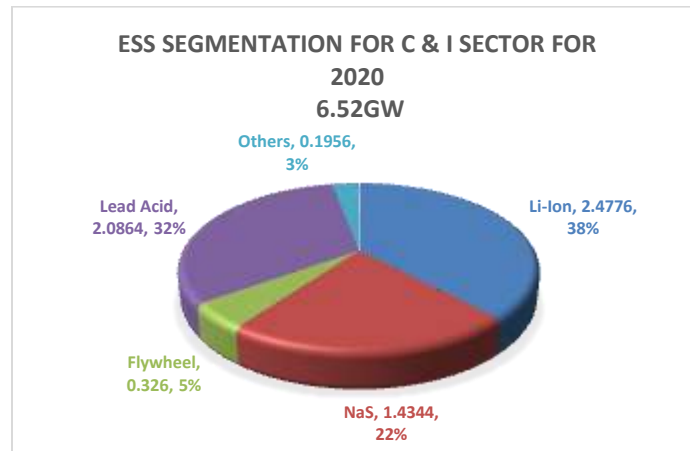


Chart 4: ESS Market Segmentation for C&I sector, 2022

- Li-Ion Battery energy storage system will have 2.47 GW, 38% of the total C&I sector.
- Sodium Sulphide will contribute to 1.43 GW of the C&I sector.
- Lead Acid battery energy storage system will have 2.0864, 32% of the total ESS for C&I sector.

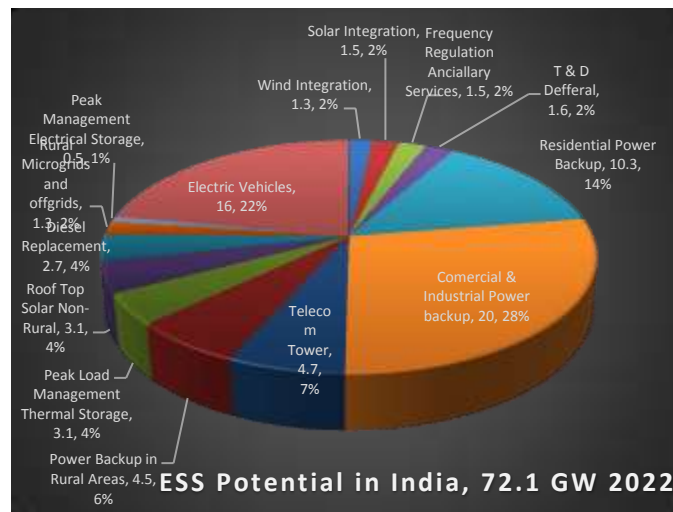


Chart 5: ESS Market Potential for C&I sector in India, 2022

- We can clearly see that C&I sector has a huge potential and share in the energy storage solution with the maximum being in Commercial and industrial power back-up (28%, 20GW) and in electric vehicle application (22%, 16GW).
- Residential power back-up will also contribute with 14%, 10.3GW for total ESS potential in India for 2022.

So, it is clearly observed that Li-Ion Battery Energy storage solutions despite of their high initial cost, will certainly hold the strongest potential in India due to the number of benefits it provides in the long run like high efficiency, high roundtrip efficiency, and environment friendly nature.

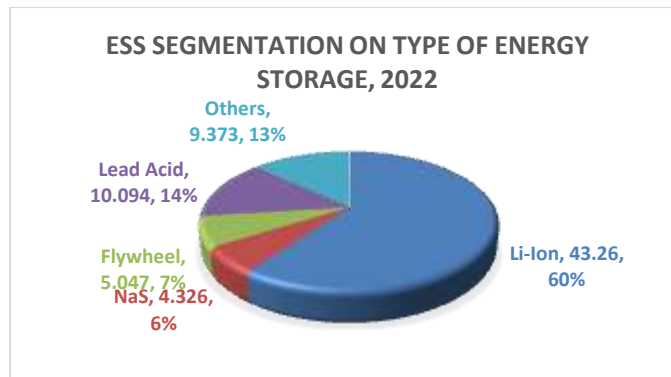


Chart 6: ESS Market Segmentation on Type of Energy Storage Solutions, 2022

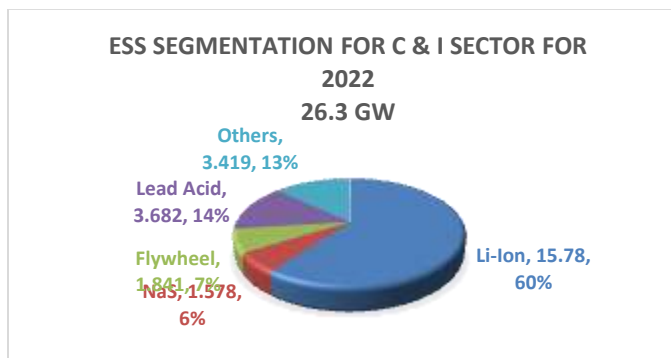


Chart 7: ESS Market Segmentation for C&I sector, 2022

- Li-Ion Battery energy storage system will have 15.78 GW, 60% of the total C&I sector for 2022.
- Sodium Sulphide will contribute to 1.578 GW of the C&I sector.
- Lead Acid battery energy storage system will have 3.682, 14% of the total ESS for C&I sector.

We can clearly observe that Li-Ion have the highest share in Energy storage solutions in the C&I sector

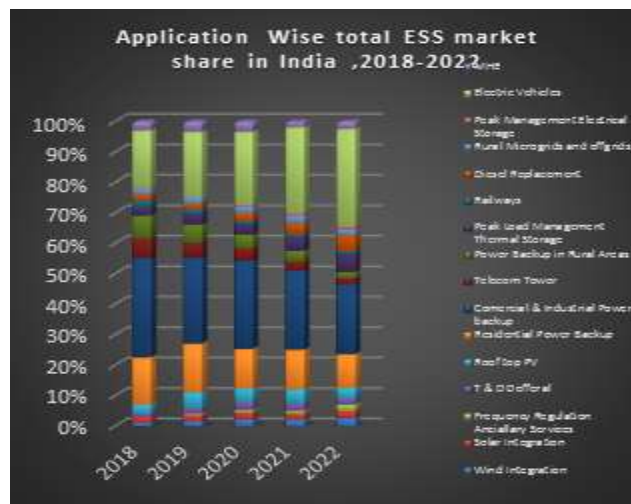


Chart 8: ESS Market Share for C&I sector, 2022

In year 2018, C&I power backup occupies the highest market share at 32.5% and this trend is projected to continue over the years.

- Electric Vehicles has the second largest market share in the ESS in 2018 and has an increasing trend over the years. EV's will have the highest market share by 2022
- Residential power back up applications have the third highest ESS market share in 2018 and are expected to continue with the trend.
- Rooftop PV, MHE, telecom towers, diesel replacement will also account for significant part of growth.

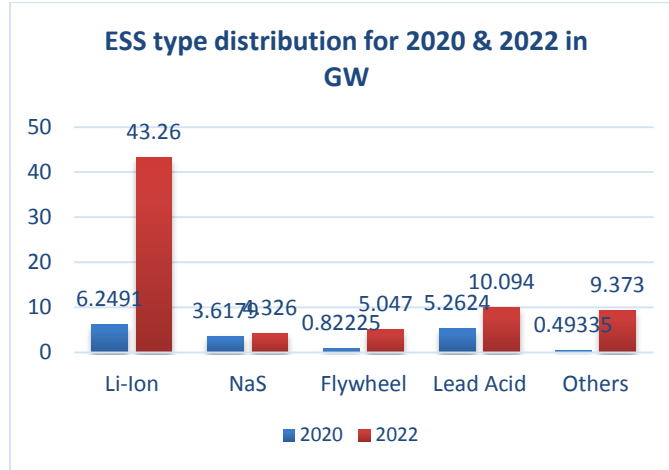


Chart 9: ESS Type of Distribution

We can observe that the potential for Li-Ion Battery energy storage system will increase by around 600% in two years.

- Li-ion will account to 43.26 GW and 6.2491 GW of energy storage in 2022 and 2020 respectively taking up the highest share by 2022.
- Lead acid Energy storage solutions will observe a growth of around 90% in two years by 2022.
- Lead Acid share will increase from 5.26 GW to 10.094 GW.
- Flywheel share will also increase with a significant growth of 500% from 0.82 GW to 5.047 GW by 2022.
- Other type of ESS will also contribute significantly. They would contribute to around 9.373 GW by 2022 of the total ESS potential. This will include Compressed Air Energy Storage, Pumped Hydro Energy Storage and thermal energy storage.

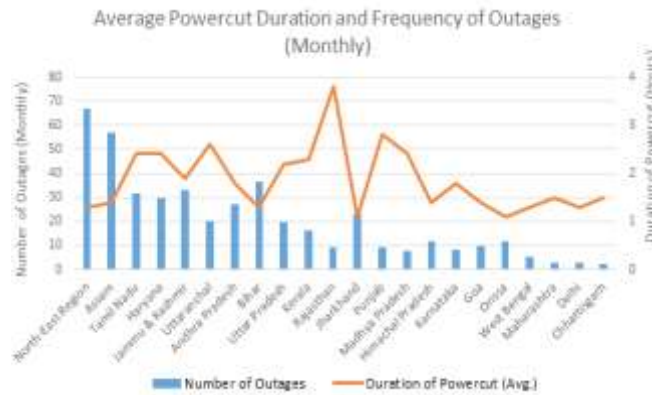
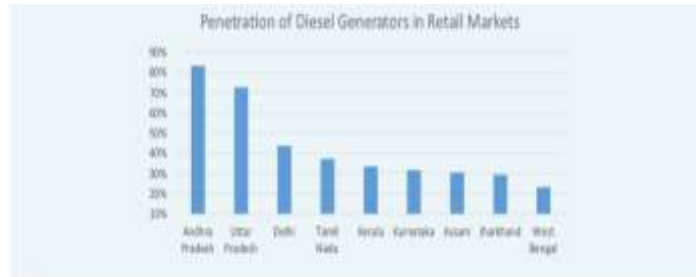


Chart 10: Average Power cut Duration and Frequency of Outages

Power-cut in India has been a key driver for adoption of battery-based backup systems. Most of the Indian states still suffer from prolonged electric outages, particularly during summer months which is shown in the figure above, which gives a high potential and scope for utility of Energy Storage Solutions in India. As we can see, Rajasthan has the highest duration of power cut followed by Punjab, Uttaranchal and North East Region like Assam, Bihar also have high level of power outages. So, Energy Storage Solution is much needed and would be more beneficial in these states.



Source: CEEW analysis of data collected from world bank enterprise survey dataset

Chart 11: Penetration of Diesel Generators in Retail Markets

If we take into consideration the use of diesel generators in India for power backup in retail segment, we find Andhra Pradesh, Uttar Pradesh and Delhi have the highest usage of diesel generators making the Energy Storage market for diesel replacement more prominent in these states.

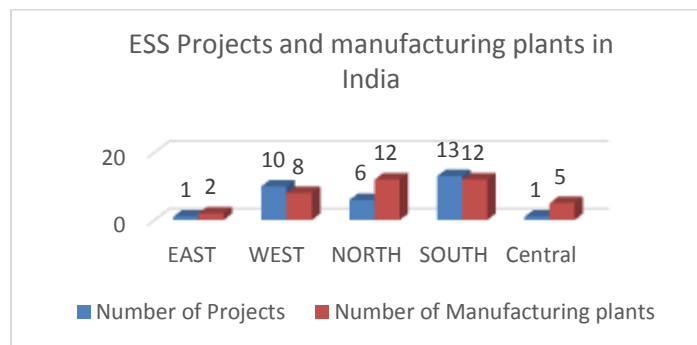


Chart 12: ESS Projects and manufacturing plants in India

- Most number of energy storage projects and manufacturing plants are in South (13,12) followed by North (6,12) and West (10,8).
- East has the lowest number of energy storage projects at 1 & 2 respectively.
- Central has nominal amount of ESS projects and manufacturing plant at 1 & 5.

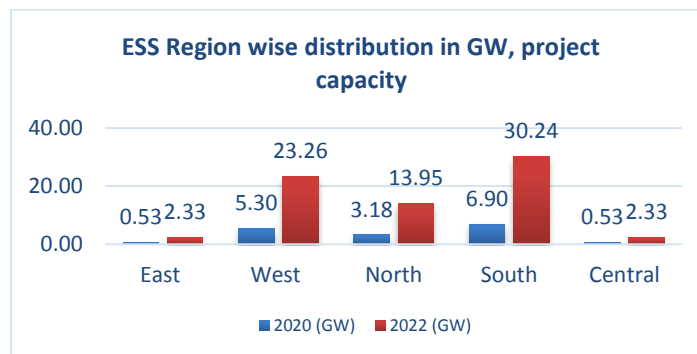


Chart 13: ESS Region wise Distribution in GW Capacity

- South has highest distribution share for 2020 and 2022 with 6.9 and 30.24 GW.
- West is second with 5.3GW and 23.26 GW for 2020 and 2022.
- North has the third highest distribution share for 2020 and 2022.

4. CONCLUSIONS

1. C&I segment has a lot of scope for BATTERY energy storage solutions in India.
2. Considering all the analysis done above and taking into consideration different factors, Energy Storage has the highest scope in the following states for the Commercial and Industrial sector.
 - Rajasthan
 - Andhra Pradesh
 - Uttar Pradesh
 - Punjab
 - Jammu and Kashmir
 - New Delhi
3. Li-Ion battery energy storage system has the highest share and potential in the future and will account to 43.26 GW of the total 72.1 GW ESS potential by 2022.
4. Most of the energy storage projects are in North, South and West regions.
5. Power-cut and Diesel Generator replacement are one of the key drivers for adoption of energy storage systems in C&I sector.
6. Electric Vehicles and Commercial & Industrial power back-up will have the highest contribution for the growth of energy storage solutions among other applications.

5. RECOMMENDATIONS

- The current energy storage solutions of Exicom Tele-Systems Limited are based on Li-Ion Batteries. Evolution to another type of energy storage solution will take a significant amount of time for design and implementation.
- The primary operation of Exicom is in Telecom Sector. Enhancement to Commercial and Industrial sector will need a strategical and tactical approach to counter the already established players in the market.
- Exicom should focus on their presence on e-commerce platforms like Amazon, Indiamart etc. for their BATTERY ENERGY STORAGE SOLUTION.

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