

## Overview

As the global consensus to achieve net-zero CO<sub>2</sub> emissions by 2050 becomes mainstream, the need for rapid decarbonization across all sectors is urgent. The transportation sector, responsible for 24% of direct CO<sub>2</sub> emissions from fuel combustion, is a significant focus area for this transformation. In India, the transport sector accounts for 13.5% of the country's energy-related CO<sub>2</sub> emissions, with road transport making up 90% of the sector's final energy consumption. This concentration is particularly notable in freight and public transport, which together constitute roughly 70% of the demand.

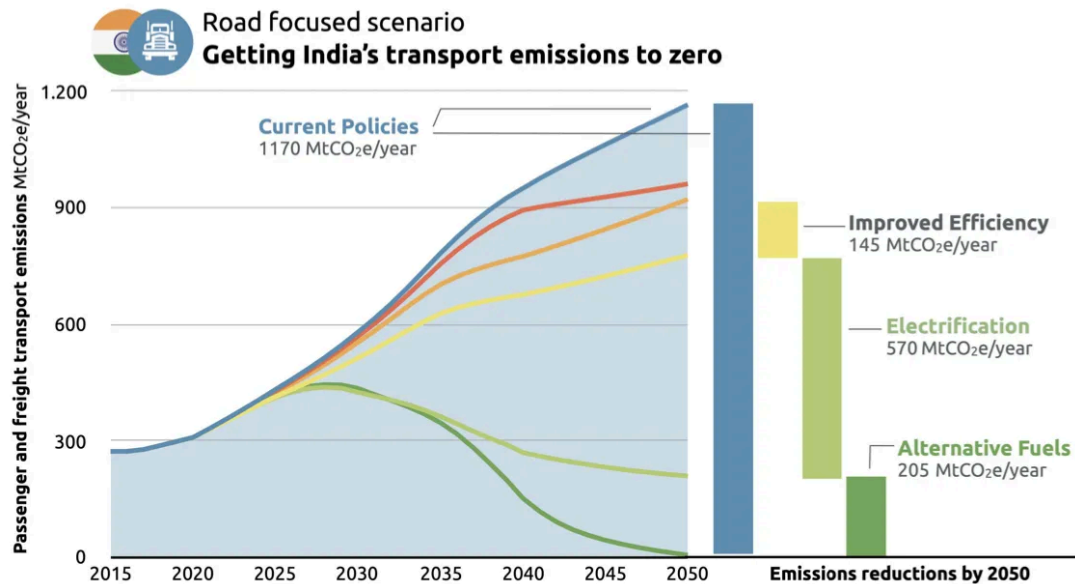
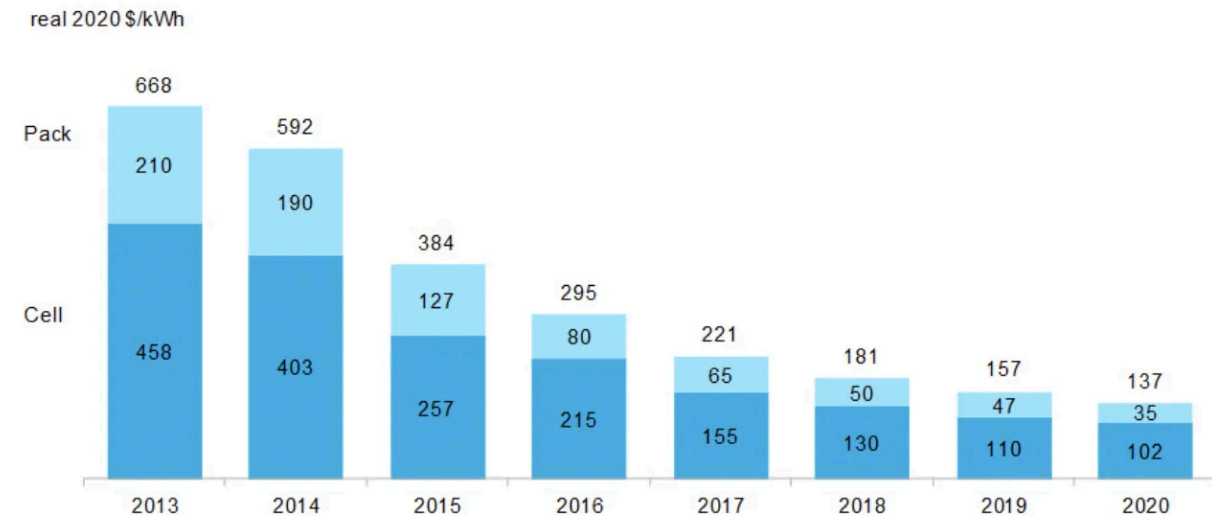


Figure 23. Emissions from passenger and freight transport in the Road focused scenario, showing emission reductions obtained from improved efficiency, electrification of vehicle fleets, and alternative fuels.

Exponent Energy is at the forefront of this transformative shift in the transportation sector. By leveraging cutting-edge technology, Exponent aims to overcome the significant barriers hindering the widespread adoption of electric vehicles (EVs) in India, particularly in commercial applications. The company's innovative solutions promise to make EVs more accessible, efficient, and practical for everyday use, driving a more sustainable future for transportation.

**Figure 1: Volume-weighted average pack and cell price split**



Source: BloombergNEF

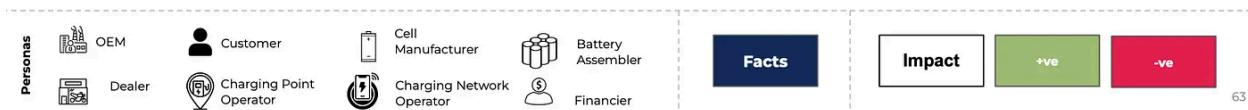
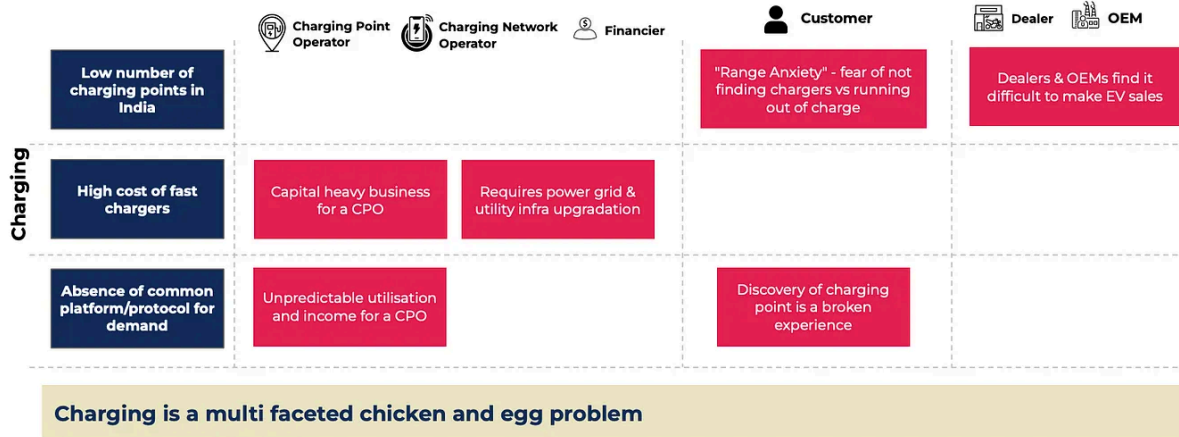
### Problem

Despite the clear environmental and economic advantages of EVs, several challenges have impeded their broader adoption in India:

**Charging Infrastructure:** The availability and speed of charging infrastructure are the biggest bottlenecks. Sparse charger networks and long charging times negate the operational and financial benefits of EVs. Commercial vehicle operators, who earn by the hour, cannot afford to wait 5-7 hours for a full charge. They need a solution that allows them to quickly recharge and get back on the road.

**Range Anxiety:** Current EV models often run for 60-80 km and require over 4 hours for a full charge. At the 50 km mark, drivers experience range anxiety, limiting their daily travel and reducing the overall efficiency of EV operations.

## Downstream effects of EVs on the ecosystem (India Specific)



### Value Proposition

By addressing the key barriers to EV adoption—charging infrastructure, range anxiety, and high costs—Exponent Energy is well-positioned to drive significant growth in the Indian EV market. Their innovative approach promises to make EVs a viable and attractive option for a broader demographic, paving the way for a more inclusive and sustainable energy transition. Enter Exponent Energy, offering a solution that directly addresses these critical challenges.

Their e<sup>^</sup>pumps can charge e<sup>^</sup>packs from 0% to 100% in just 15 minutes, significantly enhancing the operational efficiency of commercial vehicles. Exponent's proprietary Battery Management System (BMS) optimizes battery performance and longevity by managing charge and discharge rates, extending battery life to 4-5 years regardless of cell chemistry. This rapid charging technology also enables the use of smaller, more cost-effective battery packs, making EVs more affordable and appealing in price-sensitive markets like India. Exponent Energy offers a comprehensive, cell-agnostic energy solution with a 3000+ cycle battery pack warranty, integrating advanced battery technology with a seamless charging experience for maximum reliability and performance.



### e<sup>^</sup>pack

3000 cycles of rapid charging tested  
17.2% SoH battery degradation



### e<sup>^</sup>bms

10X Voltage sensing accuracy (2mV error)  
Fastest balancing BMS in the world

## Market Opportunity and Revenue Potential, First principle Approach.

The Indian EV market presents a substantial growth opportunity, driven by government policies and increasing consumer demand for sustainable transportation. The market, valued at approximately \$1.45 billion in 2020, is projected to grow at a CAGR of 44%, reaching over \$150 billion by 2030. Within this market, commercial vehicles (3Ws and 4Ws) and two-wheelers (2Ws) are key segments. As of now, the market includes 20,902 intracity buses, 992,800 four-wheelers (passenger and cargo), 347,830 three-wheelers (passenger and cargo), and 12 million two-wheelers projected to be sold by 2030. This brings the total number of EVs to approximately 13.36 million units by 2030. Currently, EV adoption is accelerating with around 400,000 EVs sold in FY22, and with the projected growth rates, the market is poised for exponential expansion over the next decade.



## Energy Consumed by the vehicles

Vehicle Category		Capacity (in kWh)	2023 projected sales	Total EV units to be sold in 2030	Total EV energy spend in 2023	Total EV energy spend in 2030
	2-Wheelers	3	10,44,905	1,19,71,105	\$ 74.12M	\$ 2206.72M
	3-Wheeler (Passenger+Cargo)	9	42,288	3,47,840	\$ 21.37M	\$ 372.20M
	3W Rickshaw	3	2,23,758	8,88,742	\$ 79.34M	\$ 1591.14M
	4W (Passenger + Commercial)	25	59,665	4,08,123	\$ 15.76M	\$ 277.77M
	4W Cargo	21	1,674	5,84,689	\$ 2.43M	\$ 1106.80M
	Bus	180	2,388	20,902	\$ 42.66M	\$ 361.13M

Charging revenue assumptions include \$10 per session for intracity buses, \$5 per session for four-wheelers, \$2 per session for three-wheelers, and \$1 per session for two-wheelers, with varying charging frequencies. Annually, this translates to 7.5 million sessions and \$75.2 million in revenue for intracity buses, 357.4 million sessions and \$1.79 billion for four-wheelers, 125.2 million sessions and \$250.4 million for three-wheelers, and 2.16 billion sessions and \$2.16 billion for two-wheelers. The total annual revenue potential for charging infrastructure is approximately \$4.27 billion.

## Competitive Landscape for Exponent Energy

Exponent Energy operates in the rapidly growing EV charging infrastructure market, which is essential for supporting the widespread adoption of electric vehicles. The market is highly competitive, with several established players and numerous startups vying for a share. Below is a detailed analysis of the competitive landscape, categorized into four broad business models:

1. Charging Point Provider,
2. Chargers and Equipments
3. Charger Management Software (CMS) Providers
4. Aggregators.



Tata Power EZ Charge, with its extensive network and strong brand, faces challenges in slower charging speeds and higher costs, while ChargeZone focuses on high-speed urban infrastructure but has a smaller, less rural network. In Chargers and Equipment, Okaya Power offers a comprehensive range but at higher costs, and ABB and Delta Electronics lead in technology and R&D but are priced for high-end segments. CMS Providers like Numocity excel in data analytics but have limited reach, and Telio EV offers comprehensive platforms with smaller customer bases.

Aggregators such as ElectricPe and EV Finder provide diverse charging options and wide coverage but rely heavily on third-party infrastructure, affecting control over quality and reliability.

## Exponent Energy's Right to Win

### Technological Innovation:

- **Proprietary Fast-Charging Technology:** Exponent's e<sup>^</sup>pumps can charge their e<sup>^</sup>packs from 0% to 100% in just 15 minutes, significantly reducing downtime.
- **Battery Management System (BMS):** Ensures optimal battery performance, extends battery life to 4-5 years, and is chemistry agnostic, ensuring wide compatibility.

### Cost Efficiency:

- **Enhanced Total Cost of Ownership (TCO):** By improving charging times and battery longevity, Exponent reduces operational costs, making EVs more financially viable for commercial operators.

### Scalability and Market Fit:

- **Targeted Market:** Focus on commercial vehicles and last-mile logistics, where rapid charging can significantly enhance operational efficiency.
- **Strategic Partnerships:** Collaborations with OEMs like Altigreen ensure seamless technology integration and broader market reach.

### Comprehensive Solution:

- **Holistic Approach:** Exponent Energy provides a full-stack solution that includes battery technology, charging infrastructure, and management systems, ensuring reliability and performance.
- **Flexible and Scalable:** The technology is adaptable to various vehicle types, from two-wheelers to heavy-duty trucks, providing broad market potential.

## Business/Revenue Model of Exponent Energy

Exponent Energy's business model is designed to capitalize on the growing demand for efficient and rapid EV charging solutions. The company generates revenue through multiple channels, leveraging its proprietary technology and strategic partnerships. Below is a detailed analysis of Exponent Energy's revenue streams and business model.

### Key Revenue Streams

Exponent Energy generates revenue through multiple channels: charging fees, subscription services, partnerships and licensing, maintenance and support services, and data and analytics services. Charging fees vary by vehicle types. Subscription services offer discounted rates and priority access for fleet operators, tailored to the number of vehicles and usage. Partnerships and licensing involve collaborations with OEMs to integrate Exponent's Battery Management System (BMS) and charging technology, generating revenue through licensing fees and revenue-sharing agreements. Maintenance and support services provide annual contracts and pay-per-service models for ongoing support and software updates. Data and analytics services offer fleet operators insights to optimize vehicle performance and charging patterns, available through subscription-based access.

## Revenue Projections from only Charging Fees.

Using the latest data and market projections, we can estimate the revenue potential for Exponent Energy across its key revenue streams.

### Annual Charging Revenue:

- **Charging Fees Calculation:**
  - Assume each e^pump has 4 nozzles and serves 384 charging sessions per day (4 nozzles \* 96 sessions per nozzle).
  - Average spending per vehicle per charge: \$1.5
  - **Daily Revenue per e^pump:** 384 sessions \* \$1.5 = \$576
  - **Monthly Revenue per e^pump:** \$576 \* 30 days = \$17,280
  - **Annual Revenue per e^pump:** \$17,280 \* 12 months = \$207,360

### Current Infrastructure:

- Number of e^pumps: 60
- **Annual Revenue from Current Infrastructure:** 60 e^pumps \* \$207,360 = \$12,441,600

### Planned Infrastructure by 2025:

- Number of e^pumps: 1,000
- **Annual Revenue from Planned Infrastructure:** 1,000 e^pumps \* \$207,360 = \$207,360,000

## Founding Team

The success of Exponent Energy can be largely attributed to the strength and expertise of its founding team. Co-founder and CEO Arun Vinayak, former Chief Product Officer at Ather Energy, brings extensive experience in product development, industrial design, and user experience, and is passionate about accelerating EV adoption by solving critical infrastructure challenges. Co-founder and CTO Sanjay Byalal Jagannath, also from Ather Energy as the former Head of Supply Chain and Operations, has a strong background in supply chain management, operations, and logistics, focusing on developing scalable and efficient charging solutions. Together, they leverage their deep technical knowledge and proven track record of innovation to drive Exponent Energy's mission forward.

## Risks and Challenges for Exponent Energy

As with any high-growth technology startup in a rapidly evolving industry, Exponent Energy faces a range of risks and challenges. These can be categorized into technological risks, market risks, operational risks, and regulatory risks. Understanding and mitigating these risks is crucial for sustaining long-term growth and achieving market leadership.

### Key Risks and Challenges

1. **Technological Risks:**
  - **Battery Degradation:** Rapid charging can lead to accelerated battery degradation if not managed correctly. Despite Exponent's advanced Battery Management System (BMS), ensuring long-term battery health remains a challenge.

- **Thermal Management:** Effective thermal management is critical to prevent overheating during rapid charging. Any failure in thermal management systems could lead to safety hazards, such as battery fires.
2. **Market Risks:**
    - **Adoption Rate:** The adoption rate of EVs, particularly commercial vehicles, may not meet projections due to high upfront costs and range anxiety. Consumer behavior and market dynamics can significantly impact the demand for Exponent's charging solutions.
    - **Price Sensitivity:** The Indian market is highly price-sensitive. Exponent must ensure that its pricing strategy remains competitive while maintaining profitability, especially in comparison to traditional fuel options.
  3. **Operational Risks:**
    - **Infrastructure Deployment:** Scaling up the charging infrastructure from 60 to 1,000 e^pumps by 2025 is ambitious and requires significant capital investment and logistical coordination. Delays or cost overruns in infrastructure deployment could hinder growth.
    - **Supply Chain Management:** Reliable and timely procurement of components for charging stations is essential. Any disruptions in the supply chain could impact the production and deployment schedules.
  4. **Regulatory Risks:**
    - **Policy Changes:** Government policies and incentives play a crucial role in the EV market. Changes in policy or reduction in subsidies could negatively impact the adoption rate of EVs and the demand for Exponent's charging solutions.
    - **Compliance:** Exponent must comply with various regulatory standards and safety protocols. Non-compliance or changes in regulations could lead to fines, legal challenges, and reputational damage.

## Conclusion

Exponent Energy presents a compelling investment opportunity in the rapidly growing EV market, driven by its innovative fast-charging technology and strategic focus on commercial vehicles and last-mile logistics. The company's unique value proposition of reducing charging times to just 15 minutes and enhancing battery longevity addresses the most significant barriers to EV adoption, such as charging infrastructure availability, range anxiety, and high upfront costs. With an expected market size reaching over \$150 billion by 2030 and a detailed revenue model projecting substantial growth, Exponent Energy is well-positioned to capture a significant share of the market. Despite facing several risks and challenges, including technological, market, operational, and regulatory risks, Exponent Energy's proactive approach to risk management demonstrates their readiness to sustain long-term growth. Through continuous R&D investment, flexible pricing models, strategic partnerships, and robust compliance programs, the company is well-equipped to navigate the complexities of the EV market. Investing in Exponent Energy not only offers the potential for substantial financial returns but also supports the broader goal of achieving net-zero CO2 emissions and fostering environmental sustainability.