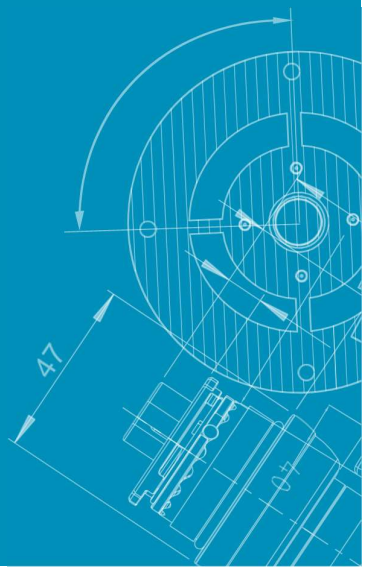
Compressed Air Solutions For EV Industry

The global automotive industry has undergone a significant transformation. Today's automated assembly systems include world class air compressors and advanced computer technologies. Because of this, the safest, most fuel efficient and reliable vehicles are on the market.

The introduction of compressed air technology to the automotive manufacturing industry has driven not only a rise in worker safety, but also an overall improvement in plant efficiency.



Growth of EV in India

The importance of reducing carbon emissions has become a world concern. Because of this, electric vehicles (EV) have become essential components of global de-carbonization plans. Despite the impact that COVID-19 has had on the world, the electric vehicle market has experienced substantial growth. EVs are gaining attention across the world as they help to reduce emissions and depletion of natural resources.

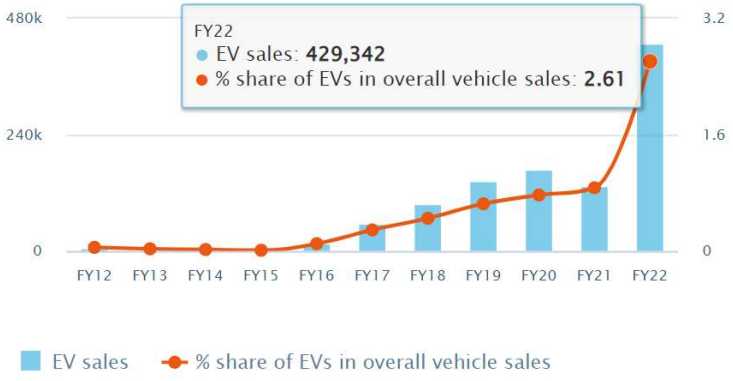


Figure 1: EV Sales in India

The Indian EV market is evolving fast as close to 0.32 million vehicles were sold in 2021. EV growth of 36% annually, reaching 245 million vehicles in 2030, which is over 30 times above today's level. In fact, compressed air Systems are used throughout the production process in assembly, service and maintenance. It is also utilized in the production of sustainable batteries for electric vehicles (EVs). The Indian automotive industry is the fifth largest in the world and is expected to become the third largest by 2030. Over the last three years, 0.52 million EVs were registered.

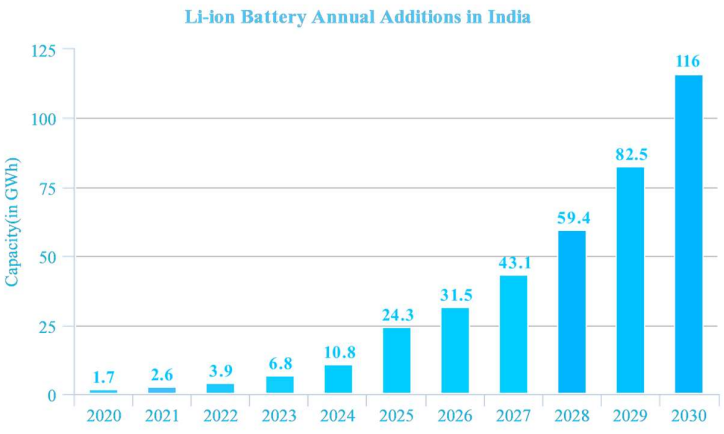
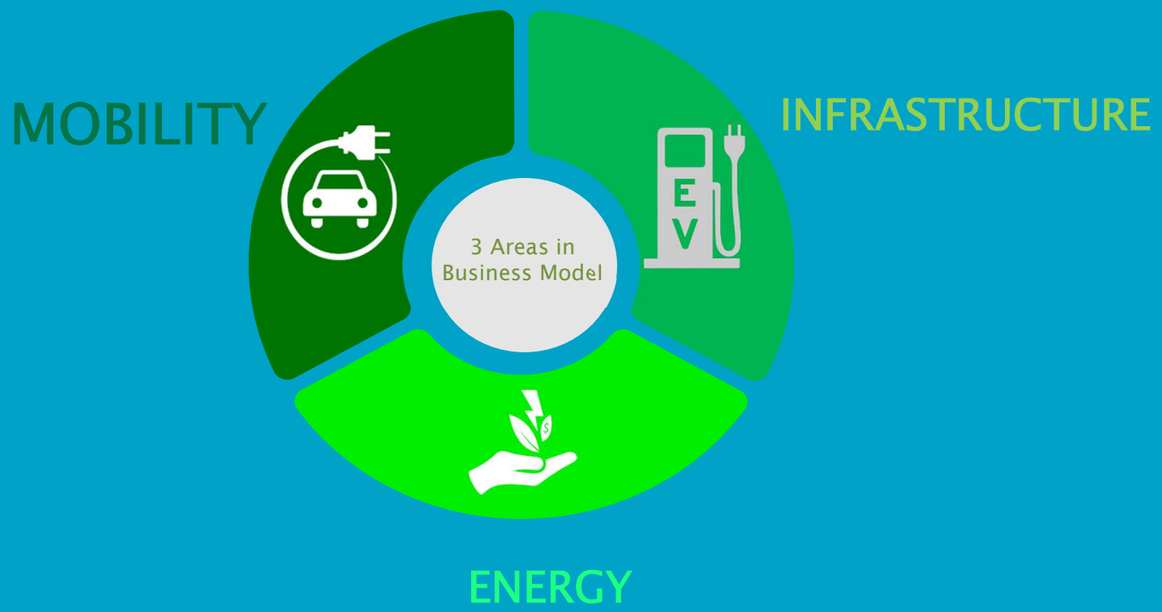


Figure 2: Li-ion Battery Demand in India

Compressed Air Solution For EV Industry

Compressed air is essential to the safe and reliable operation of critical applications on most commercial vehicles. However, hybrid and fully electric vehicles now demand much more of their ancillary systems in comparison to traditional diesel drivetrains.



ZT: Oil Free Rotary Screw Air Compressor

For the painting plant, Atlas Copco's, oil-free rotary screw air compressor is best, which is highly energy efficient and provides clean 100% oil-free compressed air to avoid any contamination during the painting application.
Oil-free screw air compressors are best for the assembly and testing applications as well.
Oil-free screw air compressor ZT VSD with BD desiccant air dryer is an optimal solution for the painting plant, where air quality is of utmost.

Figure 1: ZT Compressor

MOBILITY

Mobility is the segment where the actual increase of electric vehicles on the road will take place. Your business in mobility will focus on business models that use electric vehicles to provide services to the customers.

The requirement of EV companies is dry and clean compressed air for a number of different operations at their plant including painting applications Atlas Copco's compressors, dryers, filters helps the EV companies in their production plants, painting plants. However, the challenge is the demand for compressed air is varying at the point of use.
Our air experts along with the company's team studies the demand pattern and recommends the right compressed air solutions, which can help them to reduce energy costs and increase the productivity of the plant. Which helps EV companies to improve their business.

Figure 3: Desiccant air dryer

Atlas Copco's **desiccant air dryer** has a robust and compact design that ensures the reliability of production processes and the quality of customer's end products by providing moisture-free air.

GA VSD: Oil Injected Rotary Air Compressor

Atlas Copco oil-injected VSD rotary air compressor in combination with refrigerant air dryer is best solution for the production plant.

Figure 2: GA VSD

INFRASTRUCTURE

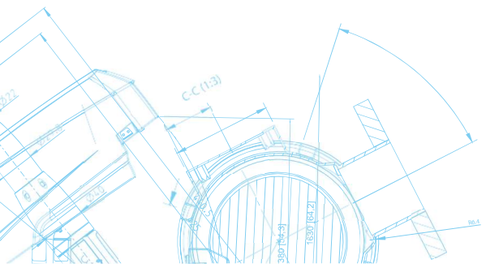
The key barrier for large scale adoption of electric vehicles in India was lack of public charging infrastructure. Thus, India needs to have a robust backbone for charging infrastructure across the length and breadth of the country with considerations of traffic and population density. Infrastructure segment includes charging infrastructure, battery swapping stations, and businesses build on traction battery.

The growth in electric vehicles led to the coming up of the charging businesses.

Lithium-ion batteries for electric cars

The annual lithium-ion battery demand for automotive applications in India to increase from 2.3 GWh in FY2020-21 to 104 GWh by FY2029-30 on the back of favorable government policies including Faster Adoption and Manufacturing of Hybrid & EV (FAME) and various state-level EV policies. Each electrical or hybrid driven vehicle requires large amounts of lithium-ion battery cells. The Government of India's target of 30% of new vehicle sales to be electric by 2030 and 34 GW/136 GWh of battery storage needed to add 450GW of renewables in India by 2030. These li-ion battery cells are assembled in a battery pack to be integrated into electric driven vehicles.

Each battery cell contains several parts such as the anode, cathode and electrolyte. Our equipment is designed to support the manufacturing of these parts. From mining raw materials to preparing these materials to be used in the battery cell. Combine air and gas compressors with the right dryers, filters, and gas generators. At the lowest life cycle costs, our installation supplies a constant high quality of dry, unpolluted air.



Onsite nitrogen generation for battery production

Nitrogen has several applications in EV battery cell production. It is used in both the manufacturing of battery components and in the assembly of the battery cell. The inert and pure properties of nitrogen prevent any contamination of the raw materials.

Some examples of use:

- mix raw materials
- cool materials
- to inject electrolytes
- and for the pressing of materials by creating an inert environment.

On-site generation of industrial gases allows the production of the exact amount and purity of gas required for the application. On-site generation ensures the availability of industrial gases at a fixed low cost and reduces CO2 emissions drastically. External suppliers do not require to deliver liquefied gases by trucks anymore.

Benefits of Atlas Copco's Onsite Nitrogen Generation

- Onsite Nitrogen Production
- Continuous Availability
- Cost Savings
- High Purity Nitrogen Supply
- Advanced monitoring, control & connectivity

ENERGY

Research shows that a private vehicle stands idle for an estimated 95% of its lifetime. This very fact builds the premise for energy as a value area. Batteries in electric vehicles store electricity. When not in use for commuting, electric vehicle owners can trade/ sell/ utilize the stored power and earn additional revenues.

Reduce petroleum imports and thus increase national energy security

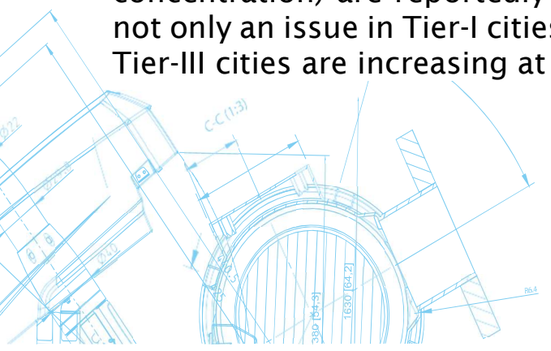
Import of crude oil accounts for about 85% of India's petroleum supply. Reduction of oil imports will also help decrease the country's Current Account Deficit (CAD).

Reduce India's carbon footprint by leveraging higher efficiency of EVs over ICE vehicles and enabling effective renewable energy off-take

EVs are almost 5 times more efficient than similar ICE vehicles (NITI Aayog & World Energy Council, 2018). The total greenhouse gas (GHG) emission reduction potential from the vehicles supported under the second phase of Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME) is estimated to be about 7.4 million tonnes of carbon dioxide emissions over the deployed vehicles' lifetime (NITI Aayog & RMI, 2019). Furthermore, India's renewable energy generation capacity (including hydro) has reached more than 129 gigawatts (GW), equivalent to about 35% of the total power generation capacity (CEA, 2019). Thanks to strong policies to increase the share of non-fossil fuel-based electricity, the emission intensity of grid electricity in India can be further reduced. Not to mention the potential application of EVs for energy storage could help ensure grid stability as dependence on variable renewable energy sources increases.

Reduce vehicular emissions of particulate matter (PM) and other pollutants and GHGs

Twenty-two of the 30 most polluted cities (in terms of PM2.5 concentration) are reportedly in India (IQAir, 2018). This is not only an issue in Tier-I cities; pollution levels in Tier-II and Tier-III cities are increasing at alarming rates.



VSD Compressor

The Variable Speed Drive (VSD) air compressor is the ideal solution for the fluctuating demand with almost 50% energy saving over fixed-speed air compressors.

Variable Speed Drive reduces the overall load on the power grid and minimizes sudden spikes in demand that can overload the grid and cause an outage. As a result, governments and power companies may provide incentives for manufacturers to upgrade to energy-saving systems such as a VSD air compressor. These incentives can significantly offset the costs of upgrading to a new VSD air compressor and accelerate the payback period.

The optimal design of a compressed air system will reflect the specific needs of your processes, your facility and your approach to capital projects. To learn more about how Variable Speed Drive can address your needs, talk to an air system professional.

ZT: Reliability and robustness at low operational cost

For the painting plant, Atlas Copco's, oil-free rotary screw air compressor is best, which is highly energy efficient and provides clean 100% oil-free compressed air to avoid any contamination during the painting application. Oil-free screw air compressors are best for the assembly and testing applications as well. Oil-free screw air compressor ZT VSD with BD desiccant air dryer is an optimal solution for the painting plant, where air quality is of utmost.

Specifications

Motor Power	90 kW – 160 kW
Working Pressure	7.5 bar(e) – 10 bar(e)
Capacity FAD	762 m³/h – 1542 m³/h

GA VSD/VSD+: Innovative, smart, reliable solution for energy saving

Atlas Copco oil-injected VSD rotary air compressor in combination with refrigerant air dryer is best solution for the production plant. Atlas Copco's GA Variable Speed Drive+ (VSD+) technology closely matches the air demand by automatically adjusting the motor speed. Combined with the innovative design of the iPM (Permanent Magnet) motor, this results in average energy savings of 50% and an average cut of 37% in the lifecycle cost of a compressor.

Specifications

Motor Power	7.5 kW – 75 kW
Working Pressure	5.5 bar(e) – 13 bar(e)
Capacity FAD	25.9 m³/h – 814 m³/h

BD Desiccant Dryer: Reliability and robustness at low operational cost

Atlas Copco's desiccant air dryer has a robust and compact design that ensures the reliability of production processes and the quality of customer's end products by providing moisture-free air.

Specifications

Avg. Power Consumption	8.4 kW – 35.3 kW
Inlet Flow FAD	1296 m³/h – 5760 m³/h

Elektronikon®: intelligent control and monitoring

The blowers are integrated with Elektronikon® controller system, using "Internet of Things" technology to enable remote monitoring and energy conservation. To ensure maximum machine safety and easy networking, the Elektronikon® system controls both the blower and the integrated converter. The advanced control system maximizes the reliability of your blower installation. Monitors overall system performance with service indications, malfunction alarms and safety shutdowns.

Smart AIR solutions that suit all your need

To guarantee the quality of your cement products, you keep a check on every aspect of your production process. So why would you leave the performance of your compressor room to chance?

Optimizer 4.0 central controller

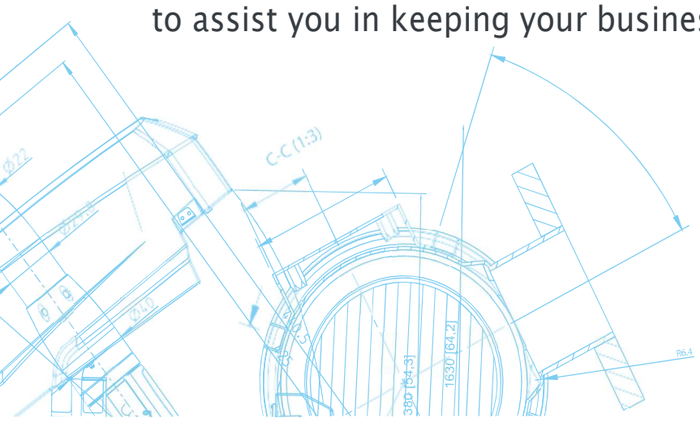
Operating multiple compressed air equipment calls for the best management in order to reduce the energy consumption and the best utilization of all the equipment. Optimizer 4.0 provides the continuous connectivity and control for multiple compressors and blowers supported by the latest connectivity standard “Internet of Things 4.0“ that can provide full performance monitoring from the plant central control room.

SMARTLINK

SMARTLINK is our 24/7 remote monitoring system that connects your compressor & blower Room. room to Atlas Copco service experts, to give you complete insight into your compressed air network. SMARTLINK warns you of potential problems upfront to avoid production interruptions, and helps you to save energy and prevent unexpected costs. Additionally, SMARTLINK can provide you with data allowing you to benchmark the compressed air usage of multiple plants in relation to their productivity.

Service

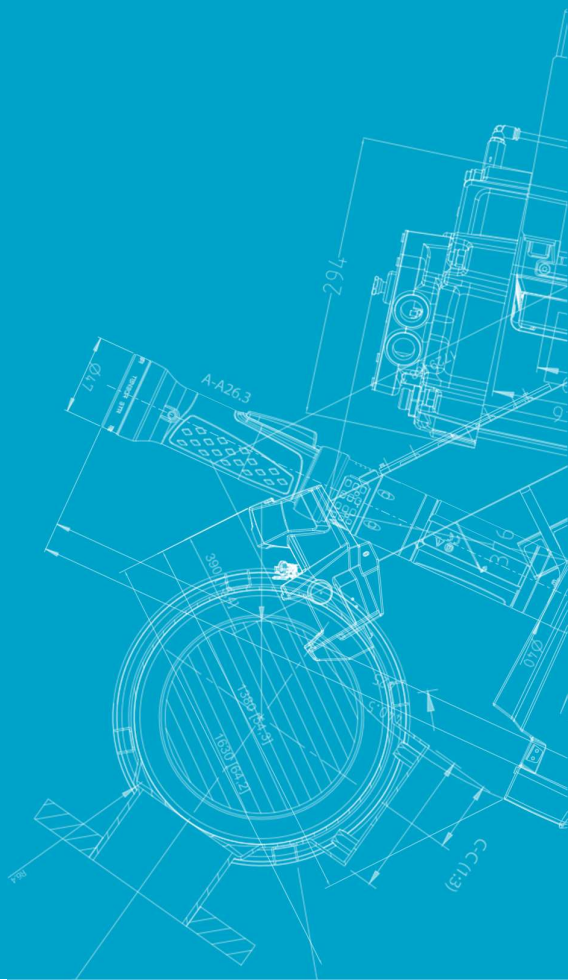
Total customer care is our ultimate goal. From spares to proactive monitoring and control, to auditing and optimization, we have the aftermarket service that suits your needs. Our dedicated service experts are available to assist you in keeping your businesss up and running in the most efficient way.



Conclusion

Atlas Copco is committed to providing the right compressed air solutions to the Electric Vehicle Industry for a greener and sustainable world. This commitment is also becoming stronger with the same vision and goals related to carbon reduction and CO2 emission. With our global experience, presence and green compressed air systems, electric vehicle companies can improve their productivity with the best setup of compressor room and thus reduce the overall cost.

Atlas Copco have all the product offerings such as oil-free screw air compressor, oil-injected air compressor, refrigerant & desiccants type dryers with required line filters suitable to achieve air quality and support the emerging electric vehicle (EV) industry. To maximize efficiency and reduce your carbon footprint, Atlas Copco offers not only energy recovery units, which use the waste heat generated by the compression process offered on both technologies, but also energy audits of existing equipment as well as control solutions for central plant and remote systems.



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