Elevating Commercial EVs: Cutting-Edge Technology Redefines Airport Snow Removal in 2025

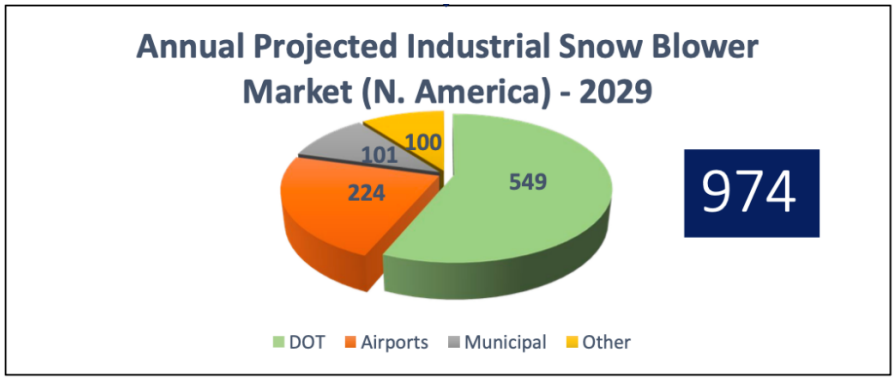
Increasingly, EV technology is answering the call to move beyond consumer vehicles to power some of the largest industrial equipment on Earth. Globally, the industrial commercial vehicles market is massive. Market research anticipates the current global market for electric vehicles at $70.9 billion in 2024. The commercial electric segment will expand to $256.6 billion by 2030, driven by industry demand and even by government incentives and mandates motivated by the increasing needs for economy and efficiency and rapidly expanding sustainability goals.

Within this giant sector is a vital and underserved market for commercial snow removal vehicles to ensure safe and uninterrupted access to airport runways, public roads, and municipal facilities in every weather condition. Industrial snow removers fill a critical need and represent a significant market opportunity over the next five years.

According to Maia Research, the North American market for industrial snow blowers was a $592 million market in 2023 that will continue to grow by 5% CAGR from 2024 to $808 million in 2029. But this is only a part of the equation: As North America accelerates its transition to EV, incentive funds from the U.S. government in the form of federal funding, early fleet obsolescence, ESG funding and energy transition should bring another $166 million to the table for commercial snow removal EV. This increases the anticipated size of the sector by 46% from 2022 to 2029 and creates a total North American market of $974 million by 2029.

Within the U.S., there are 517 airports. Of these, 381 are north of the snow beltline, and are thereby required by regulation to answer these needs.

According to Maia, the industrial snow blower market has four primary segments: DOT, Airports, Municipal Buildings, and Others.



Source: Maia Research, "North America Industrial Snow Blowers Industry Market Research Report"

As expected, the most significant part of this sector are departments of transportation (DOT), which encompasses North American roadways. 56.4% of industrial demand is with the DOT segment. Support for DOT EV is progressively growing, aided by the innovation of companies such as Kodiak Technologies. A big engineering challenge is the need for pervasive charging. However, the second largest category is an underserved sector that report addresses–commercial EV snow and ice removal for airports, which comprises 23% ($224 million) of the anticipated 2029 market sum.

As this report will demonstrate, the ability to answer the needs of industrial snow removal for North American Airports represents both an environmental priority and a remarkable opportunity for manufacturers, airport authorities, and participants in the clean energy transition who can commercialize EV solutions to meet this need.

Weather-related cancellations and delays cost travelers, airports, and airlines millions of dollars annually.

According to the Federal Aviation Administration (FAA), inclement weather is the most significant cause of flight delays. We are perpetually vulnerable due to our airports being heavily intertwined – a weather delay in any location creates a domino effect and an outward ripple that impacts many other locations. According to the FAA, every hour of downtime costs an airport an estimated $60,000, in addition to the cost and burden to airlines and travelers. Why is the airport segment so important for industrial snow blower manufacturers? As we know, airport travel is a pervasive and vital function within our business ecosystem and our modern society. Yet air travel remains at the mercy of our weather conditions. In fact, bad weather causes nearly 70% of all flight delays of greater than 15 minutes in an average year.

Although there are many varieties of weather delays in the national airspace, snow removal remains a supreme factor for most U.S. airports for an inarguable reason: The FAA requires any airport with the possibility of snowfall that conducts more than 40,000 take-

off and landing operations in a year must have a comprehensive snow and ice removal plan and snow removal vehicles to execute those plans.

The plan must allow for clearing 1 inch of snow in 30 minutes, with snow entirely removed (not piled to the sides). Any equipment used must be able to accomplish this need and, of course, to do so in extreme weather conditions. Within the U.S., there are 517 airports under FAA control with thousands of takeoffs and landing annually. Of these, 381 are north of the snow beltline. These 381 airports must meet all FAA snow removal requirements.

The "Big 2" Obstacles to Industrial EV.

For EV to replace diesel- or gas-powered vehicles, we must answer the two foundational needs: 1) Sufficient charging infrastructure and 2) Ruggedized vehicles to power these giant machines and to operate properly in extreme weather conditions. To date, the lack of pervasive charging infrastructure has been the biggest impediment to large-scale EV adoption in North America (and throughout the world). Airports and municipalities, usually control an entire mass transit system that supports a single municipality such as New York City, or Salt Lake City UT. These large customers of commercial vehicles have the need and wherewithal to partner with vehicle manufacture to create solution to the charging challenges.

An even more challenging problem than adequate charging is the issue of ruggedization. EV technology is now being called to answer the needs of massively complex machinery with the resilience to operate in record cold temperatures and horrific conditions. Thankfully, the momentum in EV development is growing to answer progressively more of these needs. For example, the New York City Transit Authority, based in an area of many weather extremes, recently contracted with EV fleet manufacturer New Flyer for a contract of up to 2090 electric busses, with multiple hundred to be delivered as quickly as New Flyer can surmount its current 2024 manufacturing backlog. These are positive signs.

Stepping forward.

Today, a new solution for industrial snow blower technology is emerging in the form of a new venture, Kodiak Technologies. Kodiak Tech is an Innovation Partnership with the engineering futurist organization Chang Industrial and its dba, Chang Robotics. The venture is an outgrowth of the acquisition of Kodiak America, established in 1971. It has already begun its hybrid and EV evolution and has existing client relationships with several dozen U.S. airports. To ensure the utmost excellence and power in its EV development, the organization has partnered with Roush, a 50-year fixture in advanced vehicles and machinery for mobility solutions in aerospace, defense, and theme parks.

According to Kodiak Tech co-founder and CEO Matthew A. Chang, Kodiak will accept 2025 orders starting this May and will deliver completed machines in time for the 2025 snow season.

Thankfully, there are several manufacturers now coming forward with designs for hybrid and EV technology for the industrial/commercial snow blower space. Of these, however, Kodiak brings some unique advantages to this critical space, such as

- Buy American Compliance. Kodiak equipment meets the criteria of 70+ percent sourcing of all components and materials from within the U.S.
- Full electric capability that is also able to operate as a Diesel or Hydrogen hybrid to support airports' evolutions to full electrical capability as quickly and gracefully as possible.
- 7,000-plus Ton Capability.
- BESS (Battery Energy Storage System) Solutions that can charge or collect energy from the grid or from a power plant and discharge that energy when needed to provide electricity or other grid services.

Kodiak Tech is uniquely equipped to solve the primary impediments to EV adoption at this level of industrial scale, as follows:

Problem or Industry Issue	Kodiak Tech Solution	Intended Result
Lack of at-scale charging technologies for large, industrial equipment	Provide EV vehicle prototype for use at airports and mountain roads during snowy conditions- replacing diesel powered equipment	10+ mph of continuous use in medium to heavy snowfall conditions. Two hours of use with a 20-minute recharge
High upfront acquisition cost to purchase electric snowplowing equipment when compared to diesel power	Kodiak Tech sales and maintenance support	Assist with federal, state, and grant funding to meet the "gap" between the replacement cost for diesel equipment and the Kodiak Tech EV vehicles
Long lead time to a working prototype	Demonstration prototype available October 2024	Environmental or sustainability building block for any airport or DOT

Source: Kodiak Technologies

The Future for industrial EV Snow Removal is Bright.

Airports are only one of the key sectors in need of innovative snow removal support. However, as a first implementation, the ability to address this vital and underserved sector is a critical step toward also making commercial snow blowers available for DOT, Municipalities and Mass Transit systems.

Kodiak Technologies is making its first formal presentation of the new technology at the Snow Symposium in Buffalo, New York, April 22-24. Following the Symposium, the company will begin a series of educational webinars to support airport operators with the procurement of federal, state and grant funding to aid their transition to the new hybrid and EV vehicles for their airports.

Investment opportunities to support the expansion of Kodiak Technologies are also possible.

In all, while snow removal at scale in high-requirement settings represents one of EV's most challenging advancements, the future of Industrial EV technology is increasingly bright.

Trade Shows and customized sales presentations

Kodiak Technologies, in collaboration with Chang Robotics and Roush, unveiled its revolutionary heavy-duty electric vehicle (HEV) designed specifically for commercial and industrial snow removal at the Snow Symposium summit April 22nd to 24th. The American-made snow blowers represent a significant leap forward in sustainable snow removal solutions with hybrid and fully battery powered. Later this month in Pittsburg company representatives will meet prospective fleet managers and airport executives.

Press activity highlights “Unmatched Power and Performance”

EVInfo: America’s Most Powerful Battery Electric Vehicle to Enter US Airports, from Kodiak Technologies, in Partnership with Chang Robotics and Roush
Yahoo Finance: More than 35 Airports have entered investigative discussions about first industrial snowblower vehicles, anticipated in early 2025
Airport Improvement: Chang Robotics’ IP Studio to Power the World’s First Hybrid Industrial Snowblowers in Partnership with Kodiak Technologies and Roush

Early Enthusiasm from Airports

A top 20 prospect list is being developed with the goal of making progress with all 20 each month. The unveiling at the Snow Show generated significant interest from the airport

industry. 100 airport operators previewed the design, with more than 35 airports engaging in discussions for potential deployment. These airports were attracted to the vehicle's power, sustainability, and possible federal grant programs.

Taking Pre-Orders and Supporting Grant Procurement

Following a successful introduction at the Snow Symposium, Kodiak Technologies is accepting pre-orders for the HEV. The company's prototype is on track for completion in November of this year. Additionally, Kodiak Technologies has scheduled a series of educational webinars in late-June, July, and August. These webinars will focus on assisting airports with procuring federal, state, and grant funding specifically for the adoption of the new hybrid and electric snow removal vehicles.

The first Kodiak HEV is currently under construction and is expected to be operational for demonstrations in November. There have already been several requests for demonstrations at airports and with the media.

For more information, visit [www.KodiakTech.io.](www.KodiakTech.io)