WINDSTAR MOTORS, INC.

EXAMPLE NAME

THIS IS A PUBLIC ANNOUNCEMENT

TO THE AMERICAN PEOPLE AND ALL GLOVERNMENT AGENCIES INCLUDING THE UNITED STATES POST OFFICE. PLEASE NOTIFY EVERYONE TO LOOK FOR WINDSTAR MOTORS, INC. PROTOTYPES IN 2021. COST SAVINGS AND CLEAN AIR FOR GENERATIONS TO COME.

A PLATFORM COMING IN 2021

DESIGNED TO REDUCE GOVERNMENT OPERATIONAL COST, WINDSTAR MOTORS, INC. A START-UP AUTO MANUFACTURING COMPANY IS INTRODUCING ONE (1) ZERO EMISSION COMPRESSED AIR ENGINE PROTOTYPE VEHICLE TO EACH GOVERNMENT AGENCY PER DEPARTMENT IN 2021 AT NO COST.

PROTOTYPE 2 DOOR/4 DOOR, CARGO VAN, PASSENGER VAN, SUV, FIRST RESPONDER VEHICLE.

WWW.WINDSTARMOTORS.COM **ADMIN@WINDSTARMOTORS.COM**

AIRCAR

To: American People

From: Windstar Motors, Inc.

Ronald B. Long, Sr.

Chief Executive Officer

PO BOX 6155

Miramar Beach, FL 32550

866-9247227 (9-AIRCAR)

admin@windstarmotors.com

AIRCAR

One Prototype at No Cost to Government Agencies per Department in 2021

Zero Emissions Compressed Air Engine

Prototype 2door/4 door car, cargo van, passenger van, SUV, First-Responder Vehicle

Table of Contents
AIRCAR

Item Description

Windstar Motors, Inc. has no relationships with any foreign countries.

Windstar Motors, Inc. has no affiliate relationships with any U.S. Government agencies nor organizations.

Windstar Motors, Inc. is a privately held U.S. Corporation.

AIRCAR

10,000 New Auto Manufacturing Jobs

Sole Source Provider of Engine Technology

My name is Ronald B. Long Sr. Chief Executive Officer, along with John T. Scanlan, President and James E. Kennar, Vice President of Windstar Motors Inc., we would like to give you the honor of introducing this technology of Zero Pollution Compressed Air Engine to the United States.

Windstar Motors Inc. is a new manufacturing corporation. This product will be manufactured exclusively in the United States. We are estimating 10,000 high paying jobs with excellent benefits. Windstar Motors Inc. has been careful not to put any information on the internet, social media or print ads.

Windstar Motors Inc. has selected several potential manufacturing sites in various states and will finalize the selection from the pending sites shortly after the announcement of the technology and the creation of new jobs at this requested meeting.

Windstar Motors, Inc.

U.S.A.
P.O. Box 6155
Miramar Beach, Florida 32550
Tel: 866 9247227 (9-AIRCAR)

Website: www.windstarmotors.com Email: admin@windstarmotors.com

Date: January 27, 2020

Subject: **LAUNCHING COMPRESSED AIR ENGINE VEHICLE**

To the American People,

Windstar Motors, Inc. is requesting your assistance. It is an honor and a privilege to share our Zero-Emissions Vehicle, (ZEV), technology to the United States of America. We want America to be the first to take the lead in assisting us to properly launch this compressed air engine vehicle technology. Our ZEV is powered by an engine that requires NO fossil fuels and is run entirely on compressed air. This technology has been around for years.

We understand the great challenges that lie ahead of our country. The solutions to these clean energy and pollution mitigation challenges are not confined to the U.S. Capitol, but are initiated, solved, and brought to fruition by entrepreneurs around the world. Entrepreneurs like Thomas A. Edison, George Washington Carver, Henry Ford, and the Wright brothers struggled to introduce their historically changing products to the global community. This is a milestone moment in which, it will take dedicated and passionate entrepreneurial efforts to make such technological advancements a reality.

This ZEV engine technology has ZERO EMISSIONS, including no Greenhouse Gas (GHG) emissions. Windstar Motors, Inc. has chosen to provide one prototype ZEV, at no cost, to our target market when their fleet is due for replacement vehicles. These ZEV prototypes shall be subject to U.S.

discretionary inspection and review. Upon acceptance, we will request a purchase order to deliver new vehicles.

This is an all-hands-on-deck opportunity to provide an air powered vehicle to our country. We are attempting to provide long term operational budget relief for the U.S. government agencies. All ZEV manufacturing shall be conducted in the U.S. Based on our target market, we will be requesting formal designation as a sole source supplier.

We are anticipating approximately 20,000 new U.S. jobs encompassing 10,000 new jobs within the new ZEV manufacturing facilities, and approximately 10,000 new jobs to be formed by U.S. component suppliers. All ZEV employment shall be conducted in the U.S. We are planning to initially manufacture ZEV(s) for only federal and military U.S. government entities, in lieu of any civilian or private sector markets at this time.

With all government agencies working together, we can make great strides in strengthening America's future. We can drastically reduce unemployment. We can dramatically improve our air quality. We can significantly reduce foreign oil dependence. We can improve our overall economic outlook. Yes we can have a brighter future for America.

Sincerely,

Ronald B. Long Sr.
Chief Executive Officer
Cc: Windstar Motors, Inc. Board of Directors

OFFICERS

Ronald B. Long, Sr. CEO

John T. Scanlan, President

James Kennar, Vice President

Windstar Motors, Inc.

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Executive Summary

This ground breaking technology will be the first to drive on our highways. A new engine, powered by compressed air, aimed at both increasing fuel economy and decreasing emissions to ZERO, including air pollution and greenhouse (GHG) emissions for future new cars and trucks in the United States of America. Windstar Motors, Inc. will provide the clear strategy, which will allow a plan for future generations to build state-of-the-art ZERO Emission Vehicles (ZEV) within this 21st century.

Windstar Motors, Inc. is new to all other world auto manufacturers and leaders in the environmental community. We will provide an incredible step forward for our country and a formidable way for Americans to clearly declare fossil fuel independence with ZERO emissions.

With utmost certainty and relentless perseverance, Windstar Motors, Inc. will provide vehicle integration flexibilities that will significantly reduce the costs to manufacture, maintain, insure, and repair, including collision damage, auto vehicles as not ever seen before in the world auto industry. Windstar's state-of-the-art manufacturing facilities and thoroughly well-trained auto workers will produce a work environment driven first and foremost by, passion and dedication to expeditiously build great vehicles of exceptional quality and value.

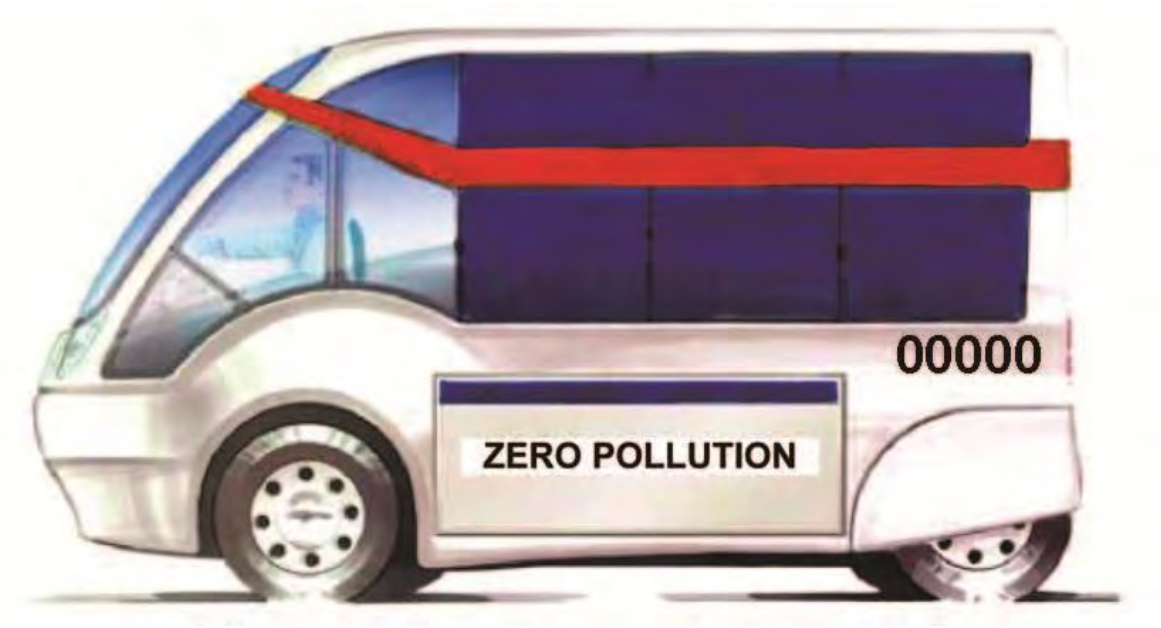
Windstar Motors, Inc. will lessen U.S. fossil fuel dependence with ZERO emissions, which is great for the United States of America and our planet, including climate change mitigation. By reducing fossil fuel dependence for a more secure energy future, this significantly enhances overall American competitiveness, and will create job prosperity with the integration of new generation ZERO Emissions Vehicles (ZEV) in the United States of America.

MISSION

Our mission is to deliver now and for future generations ZERO Emissions Vehicle (ZEV) technology that significantly reduces the need for fossil fuels with a conscientious commitment to responsibly assist the world with cleaning up our planet and restoring its fragile environment.

VISION

ZERO Emissions Vehicles (ZEV) shall be provided with the lowest possible costs to our great nation with exceptional quality and timely delivery to further clean our air and save our planet from pollution. We strongly believe our ZERO Emissions Engine (ZEE) technology proposed to be integrated first and foremost in vehicles for the government agencies. These solutions will provide highly significant contributions to our nation's National Energy Management Plan and Environmental Protection objectives, which will simultaneously also reduce U.S. unemployment with good paying, high-skilled jobs. In conclusion, U.S. ZEV integration will shore up America's efforts to provide cost savings, pollution free, and greenhouse gas (GHG) free vehicles to truly make a major impact to save energy, reduce oil dependence, and drastically reduce emissions to ultimately take significant strides in the right direction to protect our planet.



Prototype 2door/4 door car, cargo van, passenger van, SUV, First-Responder Vehicle

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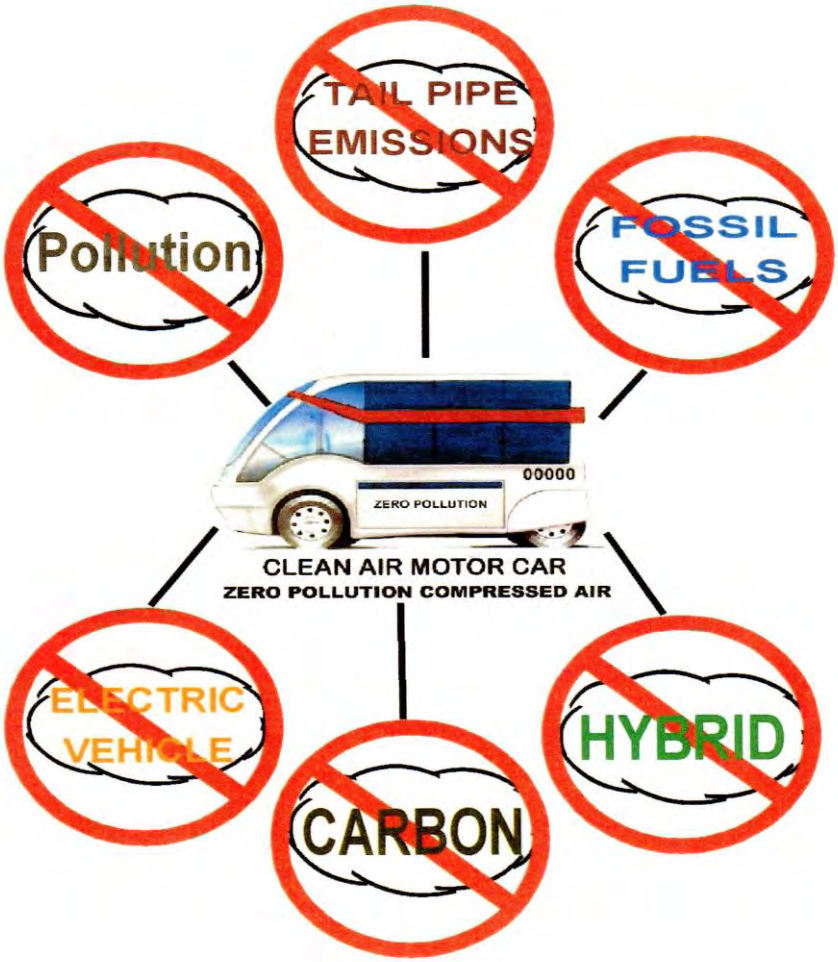
TAIL PIPE EMISSIONS
Pollution
FOSSIL FUELS
00000
ZERO POLLUTION
CLEAN AIR MOTOR CAR
ZERO POLLUTION COMPRESSED AIR
ELECTRIC VEHICLE
CARBON
HYBRID

AIRCAR

Information

Document

For

Introduction

Prototype Available in 2021

Windstar Motors, Inc.

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VEHICLE ENGINE POWER SYSTEM

This vehicle is powered by a compressed air engine system based upon proven state-of-the- art technology. This non-combustion engine is the product of over (15) fifteen years, including aggressive research, development and engineering. These engines have been successfully integrated into both urban and rural vehicular applications overseas while providing zero pollution emissions. The nitrous oxide and carbon dioxide emissions are zero. In other words, Greenhouse Gas (GHG) Emissions are ZERO.

MANUFACTURING

Windstar Motors, Inc. vision for manufacturing is to construct manufacturing plants in the United States of America only. These manufacturing plants shall provide approximately 10,000 good paying jobs. In addition, subcontracted manufacturing, including parts and assemblies shall too take place in the United States. It is anticipated that the subcontracted manufacturing will provide about 10,000 additional jobs. The design, engineering, infrastructure, government contracts, manufacturing and distribution of our vehicles shall be performed by small, minority and/or woman owned U.S. businesses that meet the applicable federal certification requirements. The number one goal is to produce high quality and safe Zero Emission Vehicles built totally within the United States and have the capability to provide practical performance, including considerable range, for everyday use.

NEW TECHNOLOGY TRAINING

Training for this technology will be established by Windstar Motors, Inc. and will create an opportunity for new jobs and opportunities. The trainees will undergo a comprehensive certification process that will ensure quality service and repair for the zero pollution compressed air vehicles. A concerted effort will be made to re-tool an existing facility in the United States, including repair and service of these new vehicles.

CHARGING STATIONS INFRASTRUCTURE

Initially, the compressed air charging stations will be installed in target market facilities at their request. The ZEV vehicles will be recharged at those facilities. Windstar Motors will subcontract a company to supply these facilities creating new jobs throughout the U.S. Once the target market has received the prototype and accepted it from their testing and upon the delivery of their new vehicles, Windstar Motors will install the air compressed charging stations at every fleet facility location. Example would be Federal, Military, Post Office, Fire Station, Police Station, etc.

EVOLUTION OF NEW TECHNOLOGY

This ZEV technology that will grow to superior levels over time. Windstar Motors, Inc. will prioritize the start with infrastructure fleet vehicles. After proven acceptance by the U.S. public, Windstar Motors, Inc. will transcend this technology to various other vehicles including: cars, sports cars, 2/4-door car, station wagons, mini-vans, crossovers, SUVs, 2/4-wheel drive light trucks, light buses and beyond.

PROPOSAL

Windstar Motors, Inc. requests an opportunity to introduce a Propulsion Validation Testing Program to the target market to be made available to the United States Postal Service for ZEV review.

SAVINGS

With a significant reduction of fossil fuel consumption through the integration of this ZEV technology by the government agencies, it is anticipated that the fuel savings alone will be significant. In addition, it is believed that the new ZEV replacement vehicles will be substantially more prudent with regards to further cost comparison savings associated with not only the initial procurement price, but also importantly, much lower ongoing maintenance costs and sustainability costs, including much quicker vehicular accident repair and/or modular sub-assembly replacement. In summary, the state-of-the-art ZEV(s) will equip government agencies to operate more effectively on a daily basis while substantially reducing monetary expenses and producing Z E R O vehicular emissions, including no greenhouse gases, GHGs, whatsoever.

EMPLOYMENT/JOB CREATION

This ZEV technology will create substantial new employment opportunities in the United States of America where manufacturing will be performed, as well as producing secure jobs for individuals working for the sub-component manufacturers necessary to build the vehicles. Many other U.S.

industries will also prosper well, including steel, aluminum, magnesium, copper, carbon-fiber, carbon- ceramics, composites, plastics, rubber, glass, tire and many other associated manufacturing industries. The positive economic impact of introducing these manufacturing operations into the United States will be highly significant with regards to prosperity.

ENVIRONMENTAL IMPACT

Windstar Motors, Inc. understands the United States of America's desire to affect the world's environment in a positive manner. This ZEV compressed air engine technology is not currently being used for vehicles in the U.S. However, Windstar Motors, Inc. believes this new technology requires prioritized utilization, which is especially critical when dealing with daily/local delivery vehicles to burn no fossil fuels and emit ZERO EMISSIONS as an ongoing reality concept that is vital to the future of our world.

ENGINE RESEARCH AND DEVELOPMENT

These ZEV engines are the result of over eleven (11) years of research, development and testing overseas, resulting in production of a ZERO EMISSIONS propulsion system that has the power and endurance to fulfill the extreme demands placed on vehicles utilized by the government agencies.

ENGINE VALIDATION TESTING PROGRAM

We propose a PHASE I testing program consisting of ONE (1) prototype vehicles for Engine Validation Testing in pre-selected government agency locations and time periods to be determined by the government agencies. These locations shall be selected so that the prototype vehicles can be tested to accommodate a wide variety of climate conditions. During and after completion of the Engine Validation Testing Program, the government agencies are asked to provide comments related to engine and drivetrain performance, including recommendations for desired improvements thereof. Upon acceptance of the government agencies requested modifications and additions by both parties, an agreement will be consummated that provides the terms and conditions for future vehicle manufacturing and delivery, including a specifically applied government agency procurement specification.

SUMMARY

We strongly believe that the government agency's utilization of this ZEV technology will conclude with win-win solutions while importantly providing a positive, highly significant contribution to the U.S. Department of Energy and Environmental Protection Agency objectives. Simultaneously, the government agency introduction of this ZEV technology to the U.S. will provide many good

paying jobs, while implementing cost saving, pollution free vehicles to help save energy, reduce emissions, and reduce fossil fuel dependence for the largest vehicle delivery fleet in the world.

SMALL BUSINESS

The design, engineering, infrastructure, government contracts, manufacturing and distribution of our vehicles shall be performed by small, minority and/or woman owned U.S. businesses that meet the applicable federal certification requirements.

REPAIR AND SERVICE

Windstar Motors will establish a repair and service program to train and certify our target markets' mechanics and repair technicians based on Windstar Motors' factory warranty.

BATTERY

The vehicle is activated by a 12V battery.

HYDROGEN

The vehicle will not be powered by Hydrogen

DIESEL

The vehicle does not run on diesel.

NON-HYBRID

The vehicle is a non-hybrid. It solely runs on compressed air.

Windstar Motors, Inc.

Target Market

Prototype at No Cost to Government Agencies

AIRCAR

Federal

United States Postal Service (USPS)

Department of Transportation (DOT)

Department of Energy (DOE)

Administrator of the Environmental Protection Agency (EPA)

Department of Defense (DOD)

Pentagon

Border Patrol

National Guard

Military Branches

U.S. Army

U.S. Navy

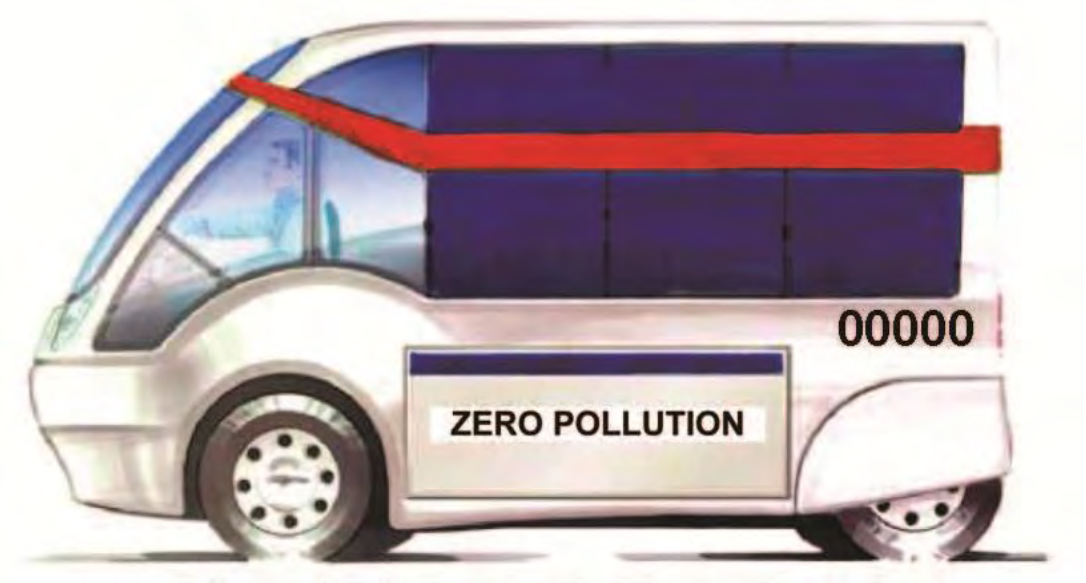
U.S. Air Force

U.S. Marines

U.S. Coast Guard

Municipalities

States, Counties, Cities



Windstar Motors, Inc.

CLEAN AIR MOTOR CAR

ZERO POLLUTION COMPRESSED AIR

The compressed air car does not produce or emit any of the above gases or any pollutants at all.

75% of current tailpipe exhaust is made up of the below:

Carbon Monoxide CO (Poison)

Carbon Dioxide CO2 (GREENHOUSE GAS)

Nitrogen Dioxide NO2 (Formation of Acid Rain)

Sulfur Dioxide Formaldehyde CH20 (Embalming Fluid)

Windstar Motors, Inc.

AIRCAR

The initial markets that Windstar Motors, Inc. will target for manufacturing zero pollution compressed air technology vehicles include the U.S. Postal Service, U.S. Marine Corps, U.S. Air Force, U.S. Navy, U.S. Army and U.S. Coast Guard, The National Guard, The Pentagon, US Department of Defense, US Department of Energy, NASA, Space Force, and all airports. The goal is to effectively produce vehicles for our target markets, the government and private entities which will allow us to gradually introduce the technology to the public prior to the eventual introduction on a mass transportation level. Government entities include federal, state and local. Every level of government is interested in alternative energy choices that lower costs and improve the quality of the environment.

Target Markets Available 2021

Prototype 2door/4 door car, cargo van, passenger van, SUV, First-Responder Vehicle

Windstar Motors, Inc.

AIRCAR

Prototype 2door/4 door car, cargo van, passenger van, SUV, First-Responder Vehicle

Benefits

To the

Delivery Fleet U.S.

Delivery Fleet Replacements

ZERO Emissions Vehicle (ZEV)

United States
Benefits from
ZERO Emissions Engine Technology

Technology

Manufactured in the United States of America.
Approximately 10,000 new jobs in new U.S. manufacturing facilities
Anticipating 10,000 new jobs with U.S. part suppliers
USPS is the largest and first fleet in the world to showcase this Technology.

Air Quality

ZERO Emissions
ZERO Pollution
ZERO Greenhouse Gases, GHGs
Patent Technology for government fleets to move towards meeting Environmental Protection Agency (EPA) Initiatives.

Fossil Fuels

Reduction in fossil fuel dependence
Greater than 50% reduction in government fleet annual fossil fuel costs
Formidable Technology for government fleet to move strongly in the right direction to meet both Department of Energy (DOE) and Environmental Protection Agency (EPA) initiatives.

Vehicle Safety

Integrated State-of-the-Art Safety Features to enhance government fleet public safety.
Meet and exceed current U.S. Federal Motor Vehicle Safety Standards (FMVSS)

State-of-the-Art Vehicle Features

Allows Fleet Management to more efficiently operate and manage with Real-Time data.

ZERO Emissions Vehicle (ZEV) IRS Financial Credits As Follows:

Windstar Motors, Inc. will make a formal request to the IRS to add a compressed air engine to the following notice:

Notice 2009-89 Section 1. PURPOSE This notice sets forth interim guidance, pending the issuance of regulations, relating to the new qualified plug-in electric drive motor vehicle credit under § 30D of the Internal Revenue Code, as in effect for vehicles acquired after December 31, 2009. Specifically, this notice provides procedures for a vehicle manufacturer (or, in the case of a foreign vehicle manufacturer, its domestic distributor) to certify to the Internal Revenue Service ("Service") both: (1) That a motor vehicle of a particular make, model, and model year meets certain requirements that must be satisfied to claim the new qualified plug-in electric drive motor vehicle credit under § 30D and (2) The amount of the credit allowable with respect to that motor vehicle.

U.S. IRS Tax Credits

U.S. IRS Tax Credits in the amount of $7,500 per new ZEV, which equates to $1.35 Billion when encompassing 180,000 USPS delivery vehicles.

U.S. CARB State Carbon Credits

Conservatively speaking, each new ZEV is worth at least 8 carbon credits. The full retail rate is $5,000 per carbon credit. With a very conservative 40% discount or -$2,000 per carbon credit, this equates to $24,000 per new ZEV, which blossoms into about $4.32 Billion when applied to 180,000 ZEVs.

Financial Credits Summarized:

Conservatively speaking, potentially $31,500 per new ZEV replacement unit equating to approximately $5.67 Billion total based upon 180,000 light-duty delivery trucks in monetary funds to the United States Post Office (USPS)

ZEV Credit Description	Unit Qty	Unit Credit	Credit Amount
U.S. IRS ZEV credits	**180,000**	**$ 7,500**	**$1.35 Billion**
U.S. CARB State Carbon Credits	**180,000**	**$24,000**	**$4.32 Billion**
Financial Credit Totals	**180,000**	**$31,500**	**$5.67 Billion**

Additional State & Local Incentive Rebates

In addition, there are state and local rebate incentives, depending on where the new replacement ZEV light-duty truck is placed into service. For example, the state of California has a $5,000 ZEV rebate and a $1,500 vehicle retiring rebate combined as $6,500 total per ZEV. As the case with any state or local area, there may be other limitations, which may be subject to fleet vehicle quantity limits, when placed into service over specific time frames.

STANDARD FEATURES FOR ZEV TECHNOLOGY

This ZERO Emissions vehicle is to be crafted in a practical manner by Windstar Motors Inc.'s Vehicle Subsidiary working in unison with government agencies, to thoroughly integrate interface requirements to build the "Next Generation Light-Duty Delivery Truck.

The government agencies delivery fleet replacement ZEV shall be built to operate in all weather conditions within the U.S.

CONFIGURATION FEATURES

Engines: ZERO Emissions Compressed Air
Drivetrains: All-Wheel Drive
Lower Chassis: Modular Flat Floor Skateboard
Compressed Air Engine, Compressed Air Tanks, Suspension, & Running Gear
Modular Interchangeability with Upper Chassis

Upper Chassis: Modular Cab/Cargo Box
Modular Interchangeability with Lower Chassis

Driver Configuration: Right Hand (Curbside)
Side Doors (2): 1 Street-side
Aft End Door: 1 on center
Exterior Top Color: Approved White with Vehicle Wrap Graphics
Exterior Primer Color: Flat White

Warranty: **5 Years/100,000 Miles Bumper-To-Bumper**

A. Ordinary maintenance items or adjustments, parts subject to normal wear and replacement, and certain other items are excluded.
B. Unlimited Claims including Genuine Original Equipment Manufacturer (OEM) parts
C. Warranty repairs shall be under the Service Contract.
D. All types of Corrosion caused by normal operational wear and use.
E. Emissions Systems Not Required and Not Applicable.

Service Contract: A Maintenance Service contract will be provided. Genuine OEM parts shall be used to preserve and insure quality, safety, and performance.

OPERATIONAL FEATURES

Power Windows

Power Door Locks

Intermittent Wipers

Power Steering

Lighting: All LED, Light Emitting Diode, including straight forward headlights, tail-lights, brake lights, directional signal lights, side marker lights, side marker lights, front interior lighting, cargo interior lighting, Rear Frequent Stop Warning lights, and daytime driving lights.

Mirrors: Dual Powered Flat & Convex Side Mirrors on RH Driver's Side
Dual Powered Flat & Convex Side Mirrors on LH Passenger's Side
Both Front & Side Facing Turn Signal Indicators on both side Flat Mirrors

Climate Control: Interior Cooling/Heating & Defrost

COMMUNICATION FEATURES

Communication Management System
Minimum 8-Inch Monitor Vehicle Monitoring, Vehicle System Controls

Polarized Sunglasses Visual Acuity Compliance

USB Auxiliary Interface for Data Exchange

GPS: Global Position System including Central location Real-Time Data Collection

Transmits vehicle operational system data Transmission Real-Time vehicle location data Transmits Real-Time delivery/pickup data Navigation, Including Real-Time traffic data Integrated Speed Limiter

Camera System 1 For Driving:

360 Degrees & Water-proof for all weather operation

Backup Rearward Camera

Front Forward Camera

Side Camera on each Side Mirror(s) assembly

Visual on CMS Screen

Camera System 2 Driver Monitor:

Camera on Forward Windshield View

Camera on Driver

Camera on Cargo Area

Park Assist:

Front & Rear Blind Spot Warning System

Audible Warning & Visual on CMS Screen)

1st Audible Warning: 10 feet,

2ND Audible Beeping: 7 feet,

Continuous Audible: 3 feet or less.

CMS Screen Showing Front and Rear of Vehicle with the following color ranges: Green 7-feet (3 meters), Yellow 3-foot (1 meter), Red 1.5 feet, (.5 meter)

SAFETY FEATURES

Seat Belts: Quick Release 3-Point Retractable Lap & Shoulder RH Driver & LH Passenger

Seat Belt Pre-Tensioner: RH Driver & LH Passenger

Seat Belt Reminder: Audio Warning (RH Driver Seat Sensor & LH Passenger Seat Sensor)

TPMS: Tire Pressure Monitoring System

VSA: Vehicle Stability Assistance

ABS: Anti-Lock Braking System

DDL: Daytime Driving Lights

Airbags: Dual Front on RH Driver Side and LH Passenger Side

Black Box: Crash Recording System

Backup Warning: Pulsing Audible Alarm

Portable Fire Suppression: 2.5 lb Halgard™ Red Fire Extinguisher with Fixed Mount **Cargo System:** Including barrier, with sliding door, between cab area and cargo area **Cargo Stowage System:** Consisting of Multi-Level Shelving, Racks, etc

VERY FEW MOVING PARTS, LOW MAINTENANCE AND EASY REPAIR. PLATFORM/FRAME HAS INTERGRATED AIR TANKS. EXHAUST IS COLD CLEAN AIR. CAN BE USED FOR AIR CONDITIONING

3D PRINTING AUTOMOTIVE

Prototyping has historically been the most common use case for 3D printing in the automotive industry. Thanks to the vastly increased speed at which prototyping can be carried out using 3D printing, rapid prototyping has become virtually synonymous with 3D printing, and the technology has revolutionized the product development process.

With 3D printing, automotive designers can quickly fabricate a prototype of a physical part or assembly, from a simple interior element to a dashboard or even a scale model of an entire car. Rapid prototyping enables Windstar to turn ideas into convincing proofs of concept. These concepts can then be advanced to high-fidelity prototypes that closely match the end result, and ultimately guide products through a series of validation stages toward mass production.

Engineers use manufacturing aids to make manufacturing and assembly processes simpler and more reliable, reducing cycle times and improving worker safety. Historically, automotive factories and part suppliers use thousands of custom jigs and fixtures, each tailored and highly optimized for end-use. The result is a proliferation of custom tools, adding significant cost and complexity to the manufacturing process.

Outsourcing the production of these custom parts to machining service providers who produce the parts from a solid billet of plastic or metal can delay production by weeks, while the long lead times also make it hard to adapt to changes on the factory floor.

Additive 3D manufacturing can cut the lead time to a few hours and also dramatically reduce costs when compared to outsourcing parts to an external vendor. As complexity doesn’t incur additional costs, the parts can also be better optimized for their end-use. New, resilient 3D printing materials will allow Windstar to replace metal components in many cases with 3D printed plastic parts or to prototype and test the tools before committing.

Spare parts have historically represented a challenge for the automotive industry. Demand by nature is sporadic and unpredictable, making the value of producing spare components a debatable financial decision in some instances. However, the value of products is more precarious and repairs more difficult in the absence of readily available spare parts. Producing spares in anticipation of later demand also requires great expenditure on storage.

3D printing is well-positioned to make a significant positive impact on the automotive industry's spare parts problem.
With the use of CAD, designs for all parts can be kept as a digital copy, making the need to keep inventory obsolete. With the proliferation of benchtop 3D printers, a spare part could potentially be produced in-store upon customer request. The accessibility of the technology will encourage suppliers to open up new spaces to provide an easy supply of 3D printed components and spare parts.

Windstar's vision is to change the car manufacturing landscape by fabricating printable automotive chassis and other metal structures at localized AM production centers. According to a company spokesperson, the process is called computational manufacturing. Computers design the parts; engineers optimize the design and then they are 3D printed to order.

Rather than building huge new production plants, Windstar plans to establish "microfactories" that cover around 100,000 square feet. This in essence will localize manufacturing across the U.S. These will produce 10,000 or so vehicles a year but sit closer to where their customers are. These microfactories can be small, because Windstar's vehicles won't require things like metal stamping facilities (the vehicles are made of composites). Traditional vehicle manufacturing facilities usually cost around $1B. If we centralize the node manufacturing, and design concept, our microfactories would cost less, and we will include certification and training centers in urban communities left behind. An example of cities that we are considering are Compton, CA. Stockton, CA, Warren, MI (former GM plant), Columbus, GA., Kansas City, MO., Greensboro, NC and Jacksonville FL.

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NO FOSSIL FUELS

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