NMSBA
Los Alamos National Laboratory
Sandia National Laboratories

2019 PERSPECTIVES

ANNUAL REPORT

$67.2M

Technical Assistance Provided by Labs

3,051

Businesses Assisted

8,778

Jobs Created and Retained

33

New Mexico Counties Supported

Cumulative numbers since the inception of NMSBA in 2000.

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NMSBA has reached all corners of the state and is invaluable to small businesses looking to refine production or develop a product. This is a great story for those looking to expand or relocate in New Mexico because businesses can tap into the expertise at Sandia and Los Alamos national labs to grow our economy and create jobs.

ALICIA J. KEYES
Cabinet Secretary
New Mexico Economic Development Department
State of New Mexico

New Mexico depends on a thriving small business community to move our economy forward. NMSBA provides invaluable support to small businesses to facilitate innovation and economic development. Now more than ever, we are thankful for NMSBA's important contributions to the State of New Mexico.

STEPHANIE SCHARDIN CLARKE
Cabinet Secretary
New Mexico Taxation and Revenue Department
State of New Mexico

Dear Governor Lujan Grisham and New Mexico State Legislators,

We are pleased to present the 2019 Annual Report for the New Mexico Small Business Assistance (NMSBA) Program. This report highlights just a few of the hundreds of successful projects from 2019 and quantifies the overall performance of NMSBA, both for the past year and since its inception in 2000.

During 2019, a total of 308 small New Mexico businesses participated in NMSBA. Thanks to the *Laboratory Partnership with Small Business Tax Credit Act*, the State of New Mexico, along with Los Alamos National Laboratory and Sandia National Laboratories, invested $4.7 million of national laboratory expertise and resources to help small businesses in 23 counties overcome technical challenges and grow.

The success stories in this report demonstrate the impact of NMSBA on small businesses from various industries in various counties around the state. Here are just a few points from some of the featured stories:

- A business received data to better understand the effectiveness of their zeolites in treating wastewater, leading to 10% company growth.
- Improvements made after evaluating processing and packaging techniques helped a company boost their sales, win a marketing grant, and expand their product line.
- A company and a group of ranches received assistance with prototyping a GPS-enabled ear tag that will provide remote monitoring of beef cattle at pasture resulting in over $100,000 in additional funding.

In 2019, $4.7 million of national laboratory expertise and resources helped small businesses in 23 counties.

Two projects received the *Honorable Speaker Ben Luján Award for Small Business Excellence* for demonstrating the most economic impact. Navajo Spirit Southwestern Wear has increased production and sales of their clothing line and added employees after receiving guidance on increasing automation. Guardian Sensors, after receiving assistance with testing of their safe in-line solar connectors, won prize money, provided research opportunities to New Mexico universities, and hired a new engineer.

NMSBA has helped New Mexico's small businesses create jobs, increase revenues, decrease operating costs, and attract new funding opportunities. Since 2000, the two national laboratories have provided $67.2 million in technical assistance to 3,051 businesses, enabling 8,778 jobs to be created and retained across the state's 33 counties.

Your continued support of NMSBA, which promotes collaboration between our national laboratories and small business community, leads to economic development throughout our great state. Thank you!

Sincerely,

MARIANN JOHNSTON
Los Alamos National Laboratory

JACKIE KERBY MOORE
Sandia National Laboratories

PROGRAM INFORMATION

OVERVIEW

In 2000, the New Mexico State Legislature created the *Laboratory Partnership with Small Business Tax Credit Act* for the purpose of "bringing the technology and expertise of the national laboratories to small businesses in New Mexico to promote economic development in the state, with an emphasis on rural areas." As a result, Sandia National Laboratories established the New Mexico Small Business Assistance (NMSBA) Program to provide technical support to small businesses throughout the state. Los Alamos National Laboratory began participating in NMSBA in 2007. Jointly, the labs are committed to solving small businesses' critical challenges with national laboratory expertise and resources; influencing New Mexico business development by building capacity, capabilities, and competencies; and acting as an advocate for small businesses through an entrepreneurial culture.

While each company utilizes NMSBA in a different way, all use it as a means to maintain or grow their businesses. NMSBA services are provided at no cost to the participating small businesses in the form of lab staff hours valued at up to $40,000 per calendar year for businesses located in rural counties and $20,000 for businesses located in urban counties (Bernalillo and Santa Fe Counties). The total amount of assistance is capped at $2.4 million annually for each laboratory. NMSBA may not provide assistance that is available in the private sector, and no equipment or cash can be given to a participating company.

FUTURE DIRECTION

NMSBA helps companies solve problems. It enables businesses to adapt and grow in a quickly changing landscape as well as helping businesses capitalize on emerging opportunities. NMSBA supports the State of New Mexico's efforts to cultivate business growth in rural areas. The Program also focuses on developing industry clusters identified by the State including Aerospace and Defense, Biosciences, Cyber Security, Intelligent Manufacturing, and Sustainable and Green Energy. New Mexico's small businesses will continue to use NMSBA as a valuable resource to increase their resilience and create innovations. As these businesses grow, they will bring new products and services to market, attract financing, and create meaningful jobs.

During 2019, NMSBA helped 308 small businesses across the state reach business goals, develop their products for commercial use, and increase profitability.

NMSBA makes a statewide impact by:

- Enabling New Mexico small businesses to access cutting-edge technology
- Increasing New Mexico small businesses' technical sophistication and capabilities
- Sharing knowledge and resources between laboratory personnel and small businesses to address issues and develop real-world applications

TYPES OF SMALL BUSINESS ASSISTANCE

Individual Projects

Individual NMSBA projects involve a single New Mexico for-profit small business. Projects address business-specific challenges that can be solved with national laboratory expertise and resources. Technical assistance challenges are wide ranging; however, the majority include testing, design consultation, and access to special equipment or facilities. Requests for individual projects are accepted year-round until funding is exhausted.

Leveraged Projects

Leveraged NMSBA projects allow a group of small businesses that share technical challenges to collectively request assistance. Leveraged projects address issues that are too large or complex to solve through an individual project. Proposals for projects are reviewed semi-annually by the NMSBA Advisory Council.

Contract Projects

Legislation allows NMSBA to contract with entities that have the capability to provide small business assistance services not available in the private sector. For the benefit of New Mexico's small businesses, NMSBA has contracts for specific services with the New Mexico Manufacturing Extension Partnership and the state's three research universities.

The New Mexico Manufacturing Extension Partnership provides training and assessments in the areas of quality and lean manufacturing principles.

The Arrowhead Center at New Mexico State University evaluates small business capabilities and technologies using subject matter experts throughout the university.

The New Mexico Tech Department of Management interfaces with a variety of disciplines taught at the university to help accurately assess the current competitive position of small business technologies.

The University of New Mexico Management of Technology program at the Anderson School of Management evaluates the commercial potential of small business technologies and identifies commercialization challenges and pathways.

The University of New Mexico School of Engineering addresses technical challenges faced by small businesses in computer science and chemical, biological, electrical, computer, civil, nuclear, and mechanical engineering.

KURT SOLANDER
Los Alamos National Laboratory

CHRISTOPHER BASSETT
Owner/Manager

RIO ARRIBA COUNTY

What I enjoyed most about collaborating with NMSBA and Los Alamos was their ability to teach me how to be a better farmer using the latest science available.

CHRISTOPHER BASSETT
Owner/Manager
Freshies of New Mexico, LLC

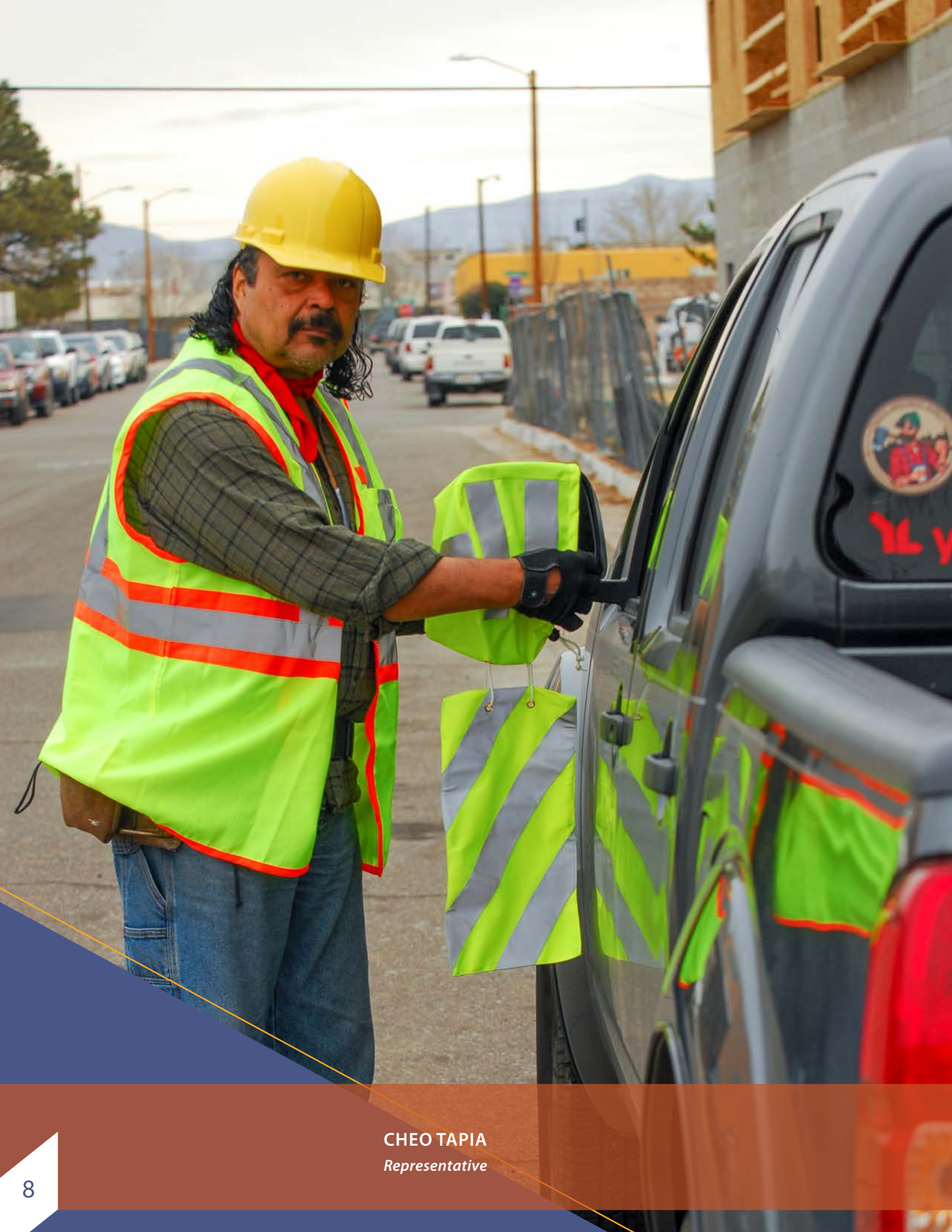
FRESHIES OF NEW MEXICO

Having farmed in Washington, Oregon, California, Colorado, the Dominican Republic, and Panama, Christopher Bassett and Taylor Dale Bassett founded Freshies of New Mexico in 2008. Their family farm grows certified organic fruits along the Rio Grande. Produce includes apples, peaches, cherries, apricots, blackberries, tomatoes, melons, and oyster mushrooms.

Growing fruit in northern New Mexico is a risky business. During mild winters fruit trees bloom early, but inevitable late frosts can freeze the buds before they set, destroying the crop. Freshies lost its entire peach crop in 2011 to such a late frost.

To avoid late frost crop loss, Bassett invested in greenhouses with supplemental heaters. To efficiently utilize the heaters, Bassett contacted NMSBA, which partnered Freshies with Mike Steinzig, Gary Goddard, Kurt Solander, and other scientists at Los Alamos National Laboratory. The team developed and installed temperature monitoring equipment, also collecting information on wind speed/direction, and soil moisture and chemistry. This data is available to Bassett online at any time over his phone.

Freshies is able to utilize the information to anticipate freeze events, and automate the use of heaters only when frost is imminent, saving money on fuel and personnel to start the heaters at the appropriate time, day or night. This, and the additional data collected, has allowed Freshies to expand plantings to even earlier blooming varieties such as apricots, increasing profits and providing local produce that might not otherwise be available to the communities of northern New Mexico.



CHEO TAPIA
Representative

BERNALILLO COUNTY

GLOBOSOCKS

Without the technical assistance that UNM provided through NMBSA to my company we would not be in such a strong position to serve the safety market as we are now. Dr. Walsh and his students are top notch.

GREG WEBB
President & COO
Globosocks, LLC

Too many Americans every year experience vehicle malfunctions and are forced to pull off to the side of an often-busy street or highway. Once out of their car or truck, these individuals risk being struck and injured by an increasingly distracted driving population. To minimize roadside injuries and fatalities, Globosocks invented the SafetySock, a durable, bright, and reflective device hung off a vehicle's side view mirror. The SafetySock enables other drivers to see a vehicle on the side of the road, particularly during low-light situations.

Armed with a prototype, Globosocks was determined to understand the competitive market for their innovative product. Greg Webb reached out to NMSBA, which connected him to Professor Steve Walsh at the University of New Mexico's Management of Technology (UNM-MOT) program.

Walsh and his team provided a path for the company to improve its product further and acquire more users, such as city/state workers who maintain streets and sidewalks, truck drivers, and emergency personnel. The UNM-MOT team included Devan Romero and Quan Huynh (mentors); Christopher Loehn (project lead); and Francisco Mansi and Alejandro Cappelan (both visiting Fulbright Scholars from Mexico).

As a result of this technical assistance, Globosocks acquired a $150,000 vendor contract with the City of Albuquerque to provide SafetySocks and training for the city's fleet drivers. The company is also in the process of developing a contract with the State of New Mexico for their fleet. Globosocks expects to hire one or two trainers for these contracts.

STEVE WALSH
University of New Mexico

Honorable Speaker Ben Luján AWARD for Small Business Excellence

KENNETH G. BLEMEL
Vice President

NIKOLAS BERRY
Electrical Engineer

CHARMAINE TUNELL
Business Development Director

MICHAEL SPACH
Mechanical Engineer

KENNY D. BLEMEL
Program Manager

BERNALILLO COUNTY

I highly recommend NMSBA because this organization has access to institutions like the national laboratories, which can help improve and validate important technologies, particularly those designed to provide alternative energy sources around the world.

KENNY BLEMEL
Program Manager
Guardian Sensors, Inc.

GUARDIAN SENSORS

As fossil fuel resources diminish, alternative technologies like solar continue to expand. Since 2008, solar installations in the United States have grown 35 fold to an estimated 62.5 gigawatts—enough energy to power 12 million homes.

Interestingly, solar arrays used to capture solar power do not have reliable built-in protection against electrical arc-faults caused by corrosion or improper installation that could cause fires. To address this problem, Guardian Sensors, Inc. (GSI) developed electrical, in-line connectors that automatically predict and prevent photovoltaic arc-faults, before they can ignite electrical fires.

To validate this technology, Kenny Blemel reached out to NMSBA, which partnered him with Ken Armijo at Sandia National Laboratories. Armijo and his team took a three-tiered approach to improve and validate the company's novel connectors that proactively minimize the possibility of electrical fires caused by corrosion or other malfunctions. First, the team helped design a high-fidelity prototype to activate at temperatures above 85°C (185°F). Second, they tested and validated the pressure required to separate the connector, which extinguish a fire-inducing arc. Third, the prototype was tested to determine that it worked reliably as designed.

As a result of this technical assistance, GSI received $225,000 in prize money and vouchers from the Department of Energy's American-Made Solar Prize and was able to provide research opportunities to the University of New Mexico, New Mexico State University, and New Mexico Tech. The company is also negotiating with private investors and companies who have expressed interest in licensing the technology. GSI has also hired a recently graduated mechanical engineer from UNM.

KEN ARMIJO
Sandia National Laboratories

MAEVE GARIGAN

Founder and CEO

DOÑA ANA, HIDALGO, QUAY, SIERRA, AND TORRANCE COUNTIES

The engineering talent available from the national laboratories through the NMSBA is incredible—these engineers are accustomed to working with people with different backgrounds and are dedicated to resolving even the most complex of problems.

MAEVE GARIGAN
Founder and CEO
Roper Solutions, Inc.

MONITORING RANGE ANIMALS LEVERAGED PROJECT

Ranchers still take care of cattle much the same way as they have for hundreds of years, relying on manual inspection to keep tabs on their herd. This is both labor intensive and prone to mistakes, as it is easy to lose track of cattle in the remote areas where they are born and raised. The typical value of a cow is $1,300 and there are nearly 500,000 beef cattle in New Mexico with annual direct loss of $11M due to cattle dying unexpectedly.

To address this problem, this leveraged project focused on prototyping a GPS-enabled ear tag with non-invasive biometric sensors. Derek Heeger of Sandia National Laboratories was the principal investigator and led the engineering team's work, directly supporting Roper's developmental "Cowboying as a Service" product that provides remote health and location monitoring of beef cattle at pasture.

With this product, ranchers such as Roper's proposal partners Double Spring Ranch, JX Ranch, Keeler Ranches, and McKenzie Land & Livestock, can maximize herd fertility and nutrition, dramatically reduce management time, sustainably manage grazing, and pinpoint animals that are sick or distressed.

Since receiving NMSBA assistance, Roper has won $104,000 in additional funding including a $50,000 grant from the National Science Foundation and the $25,000 grand prize at the Johns Hopkins University Student Startup Challenge. With beta prototyping currently underway, Roper looks forward to revolutionizing beef production by providing a high-tech answer to an age-old question: "Where's the beef?"

DEREK HEEGER
Sandia National Laboratories

Honorable Speaker Ben Luján
AWARD
for Small Business Excellence

CARL BALLENGER
General Manager

VIRGINIA YAZZIE BALLENGER
Designer/Owner

MCKINLEY COUNTY

Change is difficult when issues have deep roots in your business culture. With the help of the NMSBA and New Mexico Manufacturing Extension Partnership, my business is making huge strides, allowing growth to flow. If you are not using such services, you should be. They are a gold mine for manufacturers.

CARL BALLENGER
General Manager
Navajo Spirit Southwestern Wear

NAVAJO SPIRIT SOUTHWESTERN WEAR

Opened in 1984, Navajo Spirit Southwestern Wear manufactures and sells clothes inspired by the rich culture of the Navajo. This clothing line was originally shown at prestigious Native American art shows, such as the Santa Fe Indian Market and the Heard Museum Indian Fair. Various retailers have also carried the clothing line over the years, such as QVC and the Smithsonian Gift Catalog.

Owner and designer Virginia Yazzie Ballenger, along with general manager Carl Ballenger, wanted to improve manufacturing methods so that they could function as a modern small business. They reached out to NMSBA, which connected them with Denise Williams Monaghan at the New Mexico Manufacturing Extension Partnership. Monaghan and her team worked with the company to balance automation with their existing manufacturing processes so the company could grow. Improvements include automating inventory processes, using computer tablets to track orders, and internal messaging to improve communication.

One example of innovation was using a visual stream mapping project to brainstorm what to do about leftover material from manufacturing Native American graduation dresses. The session—held not in person but virtually on computers—resulted in converting scraps into products, such as tablet covers, Christmas decorations, golf club covers, and makeup pouches.

As a result of this technical assistance, the company has begun to expand. Production has increased by 18%, leading to sales increasing by 48%. The owner has also hired three more employees.

DENISE WILLIAMS MONAGHAN
New Mexico Manufacturing Extension Partnership

NICK MENDOZA

CEO

SANTA FE COUNTY

NMSBA enables small businesses to access expertise and facilities that otherwise would be prohibitively expensive or just difficult to find. This assistance made all the difference in my company's ability to flourish and grow.

NICK MENDOZA
CEO
OneForNeptune, LLC

ONEFORNEPTUNE

Fish jerky may sound like a new fad invented in America, but this treat has been around since Vikings carried dried cod as provisions on their longships as they sailed into uncharted waters. Originally a marine scientist, Nick Mendoza founded OneForNeptune to bring to market fish jerky, an alternative to beef jerky created from sustainable seafood, free of gluten, dairy, GMOs, and preservatives.

As OneForNeptune readied its product for sale, the company experienced a quality issue, with a very small percentage of fish jerky spoiling. To correct this problem, Mendoza contacted NMSBA, which connected him with the Arrowhead Center at New Mexico State University (NMSU).

Kristin Morehead and the NMSU team evaluated the fish jerky product, processing, and packaging techniques being used. They ascertained a simple, immediate improvement to the manufacturer's package sealing process, ensuring packaging safety and seal integrity to eliminate the problem for OneForNeptune.

As a result of this technical assistance, OneForNeptune has boosted their monthly revenue and brought the total number of units sold to over 60,000. The increased confidence in product integrity has enabled the company to begin talks with 200 more retail locations, helped along by a $150,000 marketing grant. OneForNeptune is expanding their product line to include new flavors and even plans to establish a final packaging plant in New Mexico, creating new jobs in the Land of Enchantment.

KRISTIN MOREHEAD
Arrowhead Center at New Mexico State University

PROGRAM METRICS

VALUE OF PROGRAM ASSISTANCE IN 2019

In 2019 the State of New Mexico, along with Los Alamos National Laboratory and Sandia National Laboratories, invested **$4.7M** helping **308** small businesses in **23** counties to solve technical challenges. The following table contains the number of small businesses that received assistance from NMSBA, dollar value of the assistance for calendar year 2019, and cumulative value from 2000 to 2019.

	Los Alamos*	Sandia	Total
Number of Small Businesses Served			
2019	**130**	**192**	**308****
Rural	60	68	122**
Urban	70	124	186**
2000 - 2019	**1,048**	**2,344**	**3,051****
Rural	730	1,397	1,912**
Urban	318	947	1,139**
Value of Assistance Provided			
2019	**$2,274,776**	**$2,399,981**	**$4,674,757**
Rural	$1,284,877	$1,229,397	$2,514,273
Urban	$ 989,899	$1,170,584	$2,160,484
2000 - 2019	**$25,965,181**	**$41,237,641**	**$67,202,821**
Rural	$21,995,094	$29,841,880	$51,827,972
Urban	$ 3,970,087	$11,395,761	$15,374,849

**Los Alamos began participating in NMSBA in 2007. **Some companies are served by both laboratories.*
Note – In 2019, Santa Fe County moved from being a rural county to an urban county.

ACCOUNTABILITY & ECONOMIC IMPACT

NMSBA, enabled by the *Laboratory Partnership with Small Business Tax Credit Act*, is accountable to the State of New Mexico for its expenditures. NMSBA measures its economic impact through client surveys conducted by Research and Polling, Inc., and economic analysis provided by Robert Grassberger, PhD Economist.

ECONOMIC IMPACT FOR BUSINESSES FROM NMSBA PROJECTS	2000 - 2018*
Small Business Jobs Created and Retained	8,778
Average Reported Salary (2018)	$49,803
Increase in Revenue	$395,902,951
Decrease in Operating Costs	$202,623,463
Investment in NM Goods / Services	$140,040,267
New Funding / Financing Received	$175,913,605
Return on Investment (ROI)**	For every $1.00 of tax credit invested, the State receives a return of $1.49.

** Economic surveys are performed six months to one year after completion of projects.*
*** ROI is based on salaries of jobs created and retained.*

BENEFITS TO NEW MEXICO SMALL BUSINESSES

New Mexico small businesses achieved positive results after receiving technical assistance from NMSBA. Feedback from companies that participated in the 2018 economic impact client survey revealed that:

55% DEVELOPED A NEW PRODUCT OR TECHNOLOGY

52% IMPROVED OVERALL OPERATIONS

54% EXPANDED OR IMPROVED A PRODUCT OR SERVICE

54% BECAME MORE COMPETITIVE IN THE MARKETPLACE

49% IMPROVED THE EXPERTISE OR CAPABILITIES OF EMPLOYEES

NMSBA identifies the areas of technical expertise that the national laboratories and their contractors utilized in NMSBA technical assistance projects, as well as the industry sector for the participating companies. The counties in which the small businesses are located are tracked to gain a better understanding of the reach of the program across the state.

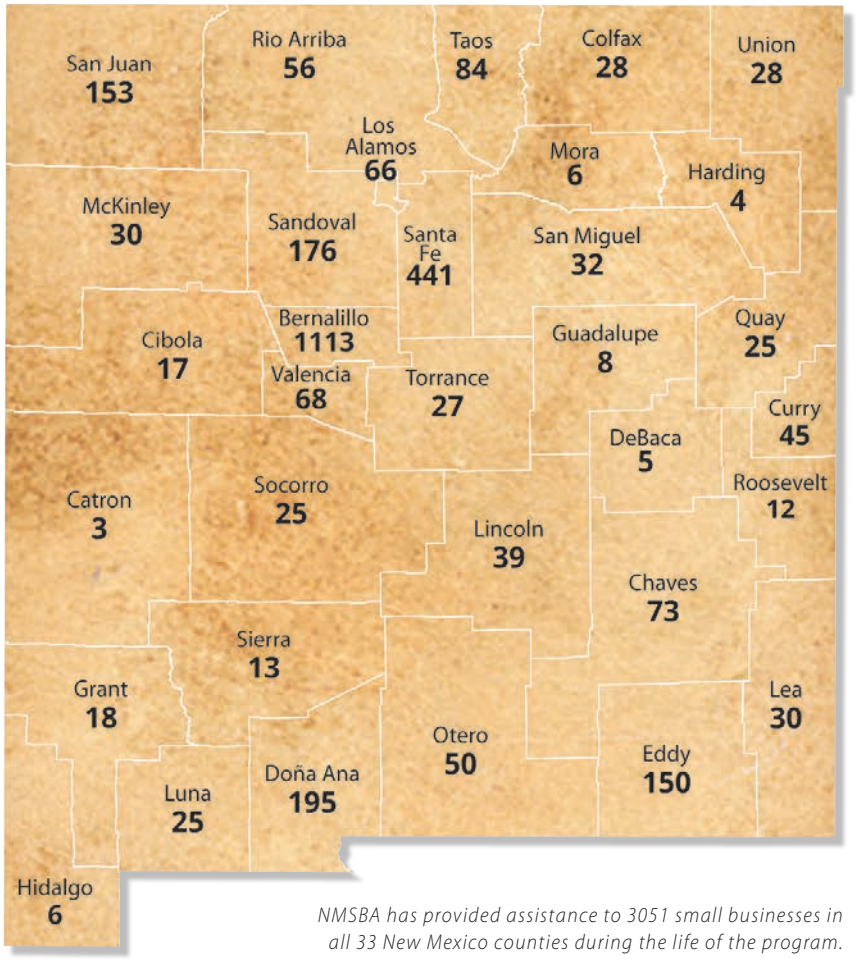
LABORATORY CAPABILITIES UTILIZED IN 2019

Manufacturing.....27.1%
Engineering.....23.2%
Advanced Modeling and Simulation...13.6%
Earth and Environmental Sciences..... 7.3%
Biological & Medical..... 5.9%
Math and Computer Science..... 5.9%
Energy..... 5.1%
Materials Science..... 4.0%
Business Development..... 3.7%
Chemistry..... 3.1%
Micro-Nano Technology..... 1.1%

INDUSTRIES OF SMALL BUSINESSES SERVED IN 2019

Manufacturing..... 44.8%
Professional, Scientific, and Technical Services..... 29.9%
Agriculture and Natural Resources..... 10.7%
Media and Hospitality.....2.9%
Other Services (except Public Administration).....2.9%
Retail and Wholesale Trade.....2.9%
Education Services and Health Care.....2.6%
Oil & Gas, Utilities, and Mining.....2.6%
Real Estate, Finance, Insurance, and Management Services.....0.7%

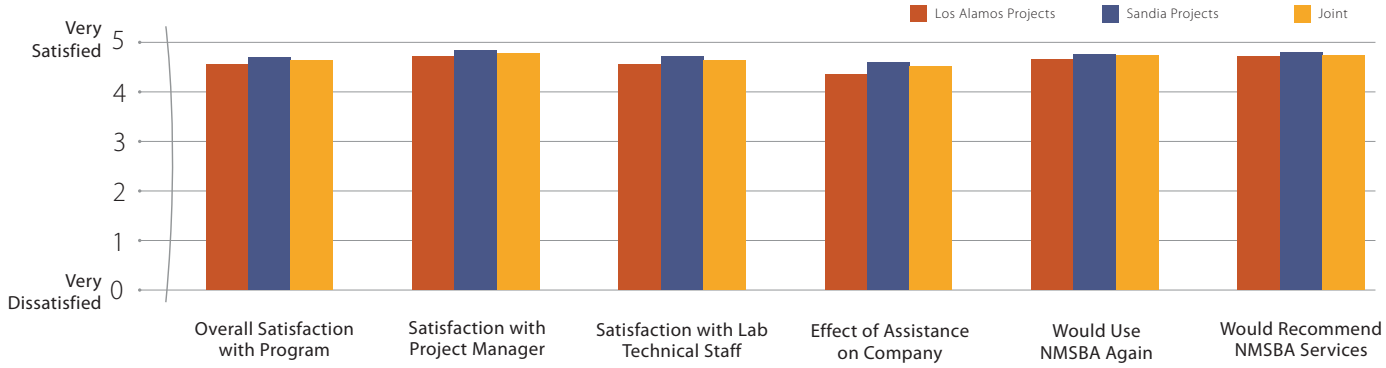
BUSINESSES ASSISTED BY COUNTY 2000-2019



NMSBA has provided assistance to 3051 small businesses in all 33 New Mexico counties during the life of the program.

CUSTOMER SATISFACTION IN 2019

Each year, NMSBA surveys the participating businesses to learn about their satisfaction with the program. In 2019, 93% of the businesses responded to the survey.



BRIAN RUMMEL
Chemical Engineer

ANDRE CHAVEZ
Chief Engineer

ANDREA GARCIA
Project Manager

BERNALILLO COUNTY

OSAZDA ENERGY

Small businesses do not necessarily have all the tools and expertise to conduct advanced materials characterization. With the help of NMSBA, we were able to access such world-class resources and improve our product so that it would meet the needs of the competitive international marketplace.

SANG M. HAN
CTO
Osazda Energy, LLC

A recent trend in manufacturing solar cells and PV modules is to make them thinner and lighter. This saves companies money in terms of reduced materials and shipping costs. It also makes installation easier and can enhance module performance. However, thin solar cells are more susceptible to cell cracking. Such cracks lead to reduced power generation, and in some cases, require module replacement.

To address this problem, Osazda Energy developed a product that enables electrically bridging these cell cracks with self-healing properties, and as a result, PV modules do not require time- and cost-intensive replacement. By minimizing the panel's vulnerability to cell cracking, the module lifespan can go from 25 years to as long as 50 years.

To improve Osazda Energy's product further, Sang Han reached out to NMSBA, which connected him to Brad Boyce at Sandia National Laboratories. Boyce and his team provided an advanced materials characterization of what the company calls MetZilla Paste. The characterization included a breakdown of the product's microstructure as well as its chemical and mechanical characteristics.

As a result of this technical assistance, Osazda Energy is in a position to improve the material properties of its MetZilla Paste. Armed with the scientific credence provided by this technical assistance, Osazda Energy has since hired one engineer and is negotiating with the Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) Solar Energy Technologies Office (SETO) for a $1.25 million contract.

BRAD BOYCE
Sandia National Laboratories

DOMINIQUE MARTIN

Owner

BERNALILLO COUNTY

The technical assistance provided by NMSBA and Los Alamos enabled me to secure my intellectual property and move forward with obtaining a patent. The people behind these organizations benefit more than just small businesses—they also benefit communities as a whole. They're changing people's lives.

DOMINIQUE MARTIN
Owner
Pomp & Circumstance, LLC

POMP & CIRCUMSTANCE

Founded by Dominique Martin, Pomp & Circumstance developed a game-changing beauty product, eliminating what many people consider a difficult and time-consuming chore. Martin says that the beauty industry will never be the same once she introduces her never-before-seen product into this highly competitive marketplace.

Wanting to improve her prototype design, Martin reached out to NMSBA, which connected her with Eric Olivas at Los Alamos National Laboratory. Olivas and his team examined Martin's 3-D printed prototype and CAD drawings. After testing the device they came up with design modifications, performed tests and implemented changes to the baseline design. The engineering team also suggested using injection molding as a more robust fabrication process for the device than the originally planned vacuum molding.

As Martin noted, even small tweaks to the design could have a monumental effect in preventing additional costs that would be incurred if it were necessary to stop and make alterations after the manufacturing process had begun. That's why it was so important to improve her drawings and prototype at this stage.

Martin credits the valuable help she received from NMSBA with helping her move forward. As a result of this technical assistance, she was able to secure her company's intellectual property and apply for a patent. With updated CAD drawings illustrating the modifications, the company is now also better prepared to begin manufacturing.

ERIC OLIVAS
Los Alamos National Laboratory

A GROUP OF
ST. CLOUD MINING WORKERS

SIERRA COUNTY

Many entrepreneurial and risk-taking businesses simply aren't large enough to support the expanded research and development of key products. By tapping into NMSBA and the national laboratories, we were able to do just that, and as a result expand our product into new application areas.

DAN EYDE
CTO
St. Cloud Mining Company, Inc.

ST. CLOUD MINING COMPANY

St. Cloud Mining is the largest North American producer of zeolites, naturally occurring volcanic minerals. Zeolites are safe, nontoxic, and inorganic, and are offered to customers as granules and powders. Unlike most companies, St. Cloud can customize its zeolites to specific applications that range from filtration to environmental remediation, aquaculture, removing heavy metals, and capturing ammonia.

Zeolite-based systems are already used to treat municipal and drinking water, as well as nuclear and industrial wastewater. Interested in applying clinoptilolite, a type of zeolite, to septic tanks, Dan Eyde reached out to NMSBA, which connected him with José-Maria Sansiñena at Los Alamos National Laboratory.

Sansiñena and his team were able to broaden the scope of the project and look at the comparative performance of a wider range of the company's zeolites in handling contaminants in all types of wastewater discharged into the environment. The team also looked at ways to regenerate the removal capacity of zeolites, which can load and unload cations, or positively charged ions. This allows the regenerated zeolite to remove much more ammonia from an effluent.

As a result of this technical assistance, St. Cloud scientists gained a better understanding of the effectiveness of various zeolites in treating wastewater for a number of industries. The detailed data enables the company to advise customers what type of zeolites are ideal for each specific application. St. Cloud Mining estimates 10% company growth due to NMSBA assistance.

JOSÉ-MARIA SANSIÑENA
Los Alamos National Laboratory

FRANK DREWETT
IT Specialist

ROCH HART
CEO/Founder

JAIME (JIM) PULIDO
Mechanical/
Electrical Engineer

Not shown:
JONATHAN WEST
Lead Engineer

BERNALILLO COUNTY

WILDLIFE PROTECTION MANAGEMENT

The technical assistance we received from Sandia could be a game changer when it comes to humanely controlling wildlife populations around the world.

ROCH HART
CEO & Founder
Wildlife Protection Management, Inc.

It's difficult and costly to manage feral and wildlife populations humanely. Wildlife Protection Management (WPM) has developed a patented system to control wildlife such as feral horses. This automated system starts by attracting horses to their preferred food at a hub while cameras record the encounter. While horses feed, they are implanted with a microchip that identifies each individual, collects data, and monitors overall health. Each horse is also injected with vaccines and contraceptives.

Wishing to eliminate microchip implantation, Roch Hart reached out to NMSBA, which partnered him with William Boone at Sandia National Laboratories. Boone and his team augmented WPM's video capture system to use deep learning and neural networks. As a first step towards being able to identify individual animals and eliminate microchipping, the scientists developed a system to determine if an animal in the company's videos is a cow or a horse, since both animals share rangeland. The next step will be to identify individual horses.

Boone's team achieved a 90% success rate in determining where the animals are in a video and if they are horses or cows. With the more advanced recognition system, WPM obtained approximately $100,000 from private investors.

This new technology could humanely control wild horses and other wildlife including deer in urban areas, feral swine, and even kangaroos. This technology could also be used to monitor wildlife health, particularly searching for diseases that jump from animals to humans, such as swine flu or COVID-19.

WILLIAM BOONE
Sandia National Laboratories

LEVERAGED PROJECTS

	PROJECT	DESCRIPTION	BUSINESS PARTICIPANTS	COUNTIES	FUNDING
Los Alamos	**Advanced Vibrational Testing**	The Lab performed a real-time road test of the special-designed art transport crate, a finite element analysis of the road test result, and outlined a multi-axis shaker table test.	Business Consulting Daniels Insurance Agency, Inc. Georgia O'Keeffe Museum Innovations (GOKMI) Ken's Machine & Tool Mountain Moving & Storage, Inc.	Bernalillo Santa Fe	$73,100
Sandia	**Bifacial Modules**	The Labs investigated new single axis tracking controls for bifacial PV modules using a miniaturized single axis tracking test bed along with a rotating pyranometer. Comparisons between conventional "true tracking" and alternate algorithms that use the measured multi-plane irradiance were made to potentially increase the output for bifacial PV tracking systems. Sandia's MiniSAT testbed is a 1/6th scale model of three rows of a typical tracker and has mini PV modules that are used to measure the front and backside irradiance at the center of the middle row.	ABQ Manufacturing, Inc. fka Quality Powder Coating, Inc. Array Technologies, Inc. Enchanted Machine Works, LLC Golden Rule Holdings dba TCS Industries, Inc. Navarro Machining Solar Rackworks Vic Brown Sales, Inc. dba VBS Mfg, Inc.	Bernalillo	$95,400
Sandia	**Develop a Lead Molecule for Tuberculosis (TB) Treatment**	The Labs studied a potential synergy between Biophagy's proprietary autophagy-inducing molecules and a standard antibiotic used to treat TB. Testing was performed with an in vitro human TB model (biosafety level 2) as well as a gene knockout model to identify the precise role of autophagy in the synergistic effect.	Avisa Pharma, Inc. Biophagy, Inc Omphalos Bioscience, LLC	Bernalillo Santa Fe Torrance	$78,500
Sandia	**Embedded System**	The Labs provided technical consulting on integrating simple stick figure computer images of guests generated through computer imaging devices similar to those used in current video games. The goal was to identify and track each guest individually, then have the entertainment facilities interact uniquely with each guest for a personalized entertainment experience.	Meow Wolf Santa Fe, LLC Meow Wolf, Inc.	Santa Fe	$29,000

Los Alamos National Laboratory and Sandia National Laboratories provide technical assistance for both individual and leveraged NMSBA projects. The following is a listing of this year's leveraged projects.

	PROJECT	DESCRIPTION	BUSINESS PARTICIPANTS	COUNTIES	FUNDING
Los Alamos	**FlashAg Analysis**	The Lab tested and evaluated a specialized handheld Laser Induced Breakdown Spectroscopy (LIBS) instrument and provided elemental analysis of soil standards.	Brooks Technical Instruments FlashAnalysis Seco Spice Company, Ltd.	Dona Ana	$75,800
Sandia	**Health and Location Monitoring of Range Cattle**	The Labs provided technical consulting on the design and development of a cattle ear-tag that will monitor the health and geolocation of cattle and transmit the data remotely for collection.	Double Spring Ranch, LLC JX Cattle Company, LLC Keeler Ranches McKenzie Land & Livestock Company Roper Solutions, Inc. fka Reap, LLC	Dona Ana Hidalgo Quay Sierra Torrance	$95,400
Los Alamos	**High Impact Validation of VASP Instrument**	The Lab used the Vienna Ab initio Simulation Package (VASP) to run VASP calculations; the results will be used in a high-impact publication. These calculations centered on predicting new materials, and on the theory of liquids.	CreativeC, LLC Manufacturing Technology, Inc. Pajarito Cloud Computing, LLC	Los Alamos Sandoval	$91,200
Sandia	**Impact Analysis for Space Reactor**	The Labs aided in the development of a methodology to convert structural analysis results into a format suitable for nuclear criticality analysis codes. The technical effort simulates the failure of a launch vehicle carrying a nuclear reactor payload. The reactor is very benign when not abused due to an impact; Sandia codes model how safe the reactor design is under impact conditions. This methodology greatly aids in the launch vehicle flight safety analysis process.	Agricultural Minerals Company, LLC Little Prairie Services Surreal Studios	Santa Fe Torrance	$34,100
Los Alamos	**Lightweight Roman-type Cement (RtC)**	The Lab conducted property measurement on samples of new light-cement mix designs to evaluate the effect of individual additives on product strength, density, insulation, and resistance to fire.	Aerblock Enterprises, LLC Bonner Design Consultancy Luca Industries USA, LLC	Santa Fe	$57,000

	PROJECT	DESCRIPTION	BUSINESS PARTICIPANTS	COUNTIES	FUNDING
Los Alamos	**Medical Device Testing**	The Lab set up experiments and began testing and characterization of a Class I medical device as well as the particle size distribution exiting from a Class II medical device.	Creative-33 Gutierrez-Lara Law Group, LLC Pivotal Biotech, LLC RMRV Respiratory Consultants	Dona Ana	$97,700
Sandia	**New Mexico Electric Transmission Adequacy**	The Labs combined data and input from the leveraged project partners to model tangible economic impacts to the local and state economy of improving transmission capacity in three specific future scenarios. Modeling was based primarily on power flow analysis completed in 2018. The Labs also created NM maps of critical infrastructure facilities and the NM electric power system.	Assurance Engineering David Breecker Associates, Inc. Luz Energy Corporation Paradise Power Company, Inc. dba PPC Solar Reineke Construction	Bernalillo Rio Arriba Taos	$106,000
Sandia	**Photonic Nano-WaveGuide**	The Labs provided technical consulting, with computer calculations and simulations to help determine the shape and size of nanoantenna designs to correct heat-induced distortions within the components of a laser rod.	InSync, Inc. MZA Associates Corporation Voss Scientific	Bernalillo	$28,700
Los Alamos	**Piezoelectric Drivers**	The Lab analyzed the electro-acoustic properties of the flow cell and identified a mismatch between the flow cell and the driving electronics to improve the ultrasound alignment process and reduce costs for the business partner.	Acoustic Biosystems, Inc. BennuBio, Inc. DarklingX, LLC Lerner Venture Law, P.C.	Bernalillo Los Alamos Santa Fe	$75,700
Sandia	**Sky Board**	The Labs provided technical assistance with expert validation of an aerial jet drone hybrid design. The focus of the assistance was validation of the aircraft's power requirements, construction, and flight performance projections.	Altitude FX Jeb Stewart Enterprises Jet Suit Racing, Inc. Turquoise Trail Releasing, LLC	Bernalillo Santa Fe	$36,900
Sandia	**Solar Hot Water**	The Labs provided technical assistance in designing and evaluating passive one-way fluid cooling channels for a solar thermal collector, part of a water heating system. Computer modeling of the fluid flow in the collector was done and followed up by physical testing to evaluate the design.	Kreger Design Build, LLC dba Rain Vessels Ron Vigil's Plumbing & Heating Santa Fe Winnelson Company Solar Consulting Service SolarSPOT, LLC	Santa Fe	$45,900

	PROJECT	DESCRIPTION	BUSINESS PARTICIPANTS	COUNTIES	FUNDING
Los Alamos	**Solidified Remains Testing**	The Lab evaluated the physical and chemical properties of the solidified remains material in order to identify the major factors impacting the production process. The Lab assisted in evaluating the environmental impact of cremated remains versus the solidified remains material.	Chronicle Cremation Designs, LLC dba Parting Stone fka Purified Remains fka Lifeware CSS Productions Molecule Design Rachel Donner Ceramics Santa Fe IP, LLC	Bernalillo Santa Fe	$95,400
Sandia	**Stabilized Earth Block Testing**	The Labs provided technical assistance with experiments to test and refine an innovative approach of using adhesives to bond compressed earthen blocks together indefinitely. Testing was conducted on small assemblies and results were compared to relevant construction codes.	Adherent Technologies, Inc. EarthTek, LLC Neo Terra, LLC Paverde, LLC PG Enterprises, LLC	Bernalillo Sandoval	$60,000
Sandia	**Turbine Inspection using UAV**	The Labs developed tools for integrating nondestructive inspection sensors into a drone-deployed inspection system. A report was written to evaluate these tests and determine requirements for automated flaw detection.	Emerging Technology Ventures, Inc. Redhouse Additive Manufacturing Robotic Technology Solutions Systems Technology Solutions, LLC	Otero Sandoval	$77,000
Sandia	**Validation of Methane Plant**	The Labs provided technical assistance on a Biofuel Methane Production Plant with the following items: (1) Development of plant operations roadmap based on viscosity, total solids, and temperature; (2) Determining maximum viscosity of raw materials; (3) Computer modeling to manage production for larger amounts; (4) Improving the model based on experiments; and (5) Provided guidelines to maintain the best biofuel output of the system.	Phillip Box Farms R & P Farms Rancho Alma Linda Tucumcari Bio-Energy Company Tucumcari Mountain Cheese Factory	Quay	$115,000
Los Alamos	**Wind Turbine Manufacturing Hydrogen Creation**	The Lab deployed a sensor and assessed an electrolyzer for producing hydrogen as a method for developing renewable energy resources from remote areas where costs of connecting to the electrical grid are prohibitively high.	Curry County Ag, LLC George F. Curtis, Inc. Mike's Pump Service Renovar Energy TeePee C, Inc.	Curry	$66,900

INDIVIDUAL PROJECTS

BERNALILLO

3D Glass Solutions
Advanced Optical Technologies, Inc. (AOT)
AEgis Technologies Group, Inc.
Albuquerque Slipsafe Services
Ale Republic, LLC
Allen Sigmon Real Estate Group
Angstrom Thin Film Technologies, LLC
Aqua Research, LLC
Aquila, Inc.
AWS Bio-Pharma Technologies
Biosafe Defenses, LLC
Bogue Machine Company
Cape Cordell & Veil - McNatt and Associate
CCW, LLC
Century Sign Builders
Cimarron Power, LLC
Closed Loop Sustainability, LLC
CO2ReSCUE
Continental Machining Company
Cornivore Popcorn Company
CureDM, Inc.
CVI Laser, LLC
Damage Control AthletiX, LLC
Danlin Products, Inc.
Dark Sea Industries, LLC
Desert Paper & Envelope Company, Inc.
Djopar Industries
Dragonfly Elementals
Energy Analyst, LLC
Enthentica, Inc.
ETV, LLC
EXHIB-IT!
Exigem, LLC
Fat Cat Enterprises, Ltd.
Fire Instrumentation Research, LLC
Fortitude Machine & Mold, LLC
FruitStand Technology, LLC
Garcia Enterprises dba The Original Garcia's Kitchen
Gilz, LLC
Globosocks, LLC
Gold Standard Radiation Detection, Inc.
Guardian Sensors, Inc. fka Sentient Business Systems, Inc.
Heidi's Raspberry Farm
HT MicroAnalytical, Inc.
I AM Machining
IDEAS Engineering & Technology, LLC
Introbotics Corporation
Janine Mahon, LLC
Just Health Care, Ltd. Co.
Keely Frazier
Kennedy Trimnell Company
Kimshe, LLC dba Kimshe Kimchi
Kiva Lighting, LLC dba Kiva Award Lighting fka Ark Enterprises, LLC
LAD Engineering
Little Dipper, Inc.
Los Poblanos Historic Inn & Organic Farm
Management Sciences, Inc.
MDM Solutions, LLC / Bike and Brew NM
Mystical Manufacturing, LLC
NanDei McAnally Enterprises, LLC
NICOR
OBTC Warehouse, LLC dba Old Barrel Tea Company - ABQ
OCO Biomedical
One Infinite Division, Inc.
OptiSource, LLC
Osazda Energy, LLC
Parental Values, LLC
Passages International, Inc.
Pomp & Circumstance, LLC
Precision Grinding, Inc. (PGI)
Qynergy Corporation
Radiant Technologies, Inc.
ReGen Technology, LLC fka SoilCo, LLC
Resonant Body
Reytek Corporation
Ridgeline Manufacturing, Inc.
RingIR, Inc.
Roadrunner 3D
Sentient Data Systems, LLC
SigmaDesic
Symmetrics, Inc.
Taycar Enterprises, Inc.
TEAM Technologies, Inc. fka TEAM Specialty Products
TPL, Inc.
Unirac, Inc.
Vagne
Vamco, LLC
VanDevender Enterprises, LLC
Westwind Computer Products, Inc.
Wildlife Protection Management, Inc.
World Exhibition Center, LLC
Xertrix Technologies, Inc. fka Diversified Tooling Corporation

COLFAX

Angel Fire Resort Operations

CURRY

Petricor, LLC

DONA ANA

Artifacts Unlimited Industries
Dr. Neon
Open Lab, LLC
Paul Neher
RB Designs, LLC
Sky Travel Technologies
Water Anywhere

GRANT

Di Bodine Fine Foods, Inc.

GUADALUPE

Milagro Ranch Resources, Inc. (MRRI)

HARDING

Callahan West Brewery
Ute Creek Cattle Company

HIDALGO

Lightning Dock Geothermal, HI-01, LLC

LOS ALAMOS

Aloha Acres fka Haynes Farm
Biodidact, The Community Lab
RockSmith Precision Machining, Inc.
SIVI, LLC dba CarbonACE.com
Tibbar Plasma Technologies, Inc.
UbiQD, LLC

LUNA

Lagomorph Fencing

MCKINLEY
Navajo Spirit
Southwestern Wear
Rhino Health, Inc.
Sacred Wind
Communications

OTERO
NaOClean, LLC
Remote Well Solutions, LLC

QUAY
Tucumcari Mountain
Cheese Factory

RIO ARRIBA
Black Mesa Winery
Freshies of New Mexico, LLC
Manzanar Los Silvestres
The Eyes of Time
Velarde Vines

SAN JUAN
ABC Canvas, Inc.
Alpha Bioscience
Company, LP
AMF Clean-up, LLC
Analytical Technologies, Inc.
Bio-Stic, LLC
Cooper Fire
Protection Services
Four Corners Orthodontic
and Dental (Dr. Herman)
Industrial Cooling
Exchanger (ICE)
J & T Distributing
Jack's Plastic Welding, Inc.
PESCO, Inc.
Pickering Enterprise, LLC
dba On the Spot Cleaning
Quick Carriers
dba Hauling Accessories
R & T Holdings, LLC
Real Green Building
Systems (RGBS)
Souther Manufacturing
Research dba Open Loop
Teresa Lackey
dba Valley Mills
Tethering Ideas
Third Axis, LLC / Third Axis
Custom Engraving, LLC
Trotting On Innovations

SAN MIGUEL
Montibon Provenance
International, Inc.
MxRam, LLC
Old Wood, LLC
Seed and Stone Farm

SANDOVAL
AeroParts Manufacturing
& Repair, Inc.
Creative LIBS Solutions, LLC
Data Center Transitions, Inc.
Design Improvement
aka Philip S. Fullam, PE
DHF Technical Products, LLC
Guidance Foundation, Inc.
High Water Mark
Lone Tree Partners, LLC
Mezel Mods
Paulita's New Mexico, LLC
Santa Fe Quantum Solutions
Zap Marketing Partners

SANTA FE
AMENERGY, Inc.
Aromaland
ASM, LLC
Barnes Mediation and Law
Bruins, LLC
Columbarium by Design, LLC
Compact Fusion Systems, Inc.
DeployHub
Divine Beauty
Fab Lab Hub, LLC
Fault Tolerant Technology
Fidelity EHR
Gonzo Farms, LLC
Hollowpoint, LLC
dba Wicked Edge
Sharpeners
HoneyMoon Brewery
JNB Designs
Keystone Restoration
Ecology, Inc.
Leaf & Hive, LLC
Lithified Technologies
Lunar Rabbit, LLC
Merek Security Solutions, LLC
Michelle Berte, LLC
Molten Salt Solutions, Inc.
fka UCL3, Inc.
MT Agricultural Enterprises
Mud Hub Enchanted
Greenhouses, LLC
New Solutions Energy
Corporation (NSE)
NTxBio, LLC
Ocean-based Climate
Solutions, Inc.
OneForNeptune, LLC
PediBioMetrix, LLC
Rader Awning &
Upholstering, Inc.
Roar Echo, LLC
S. Silber & Associates, LLC
Sagche's Coffee House
Santa Fe Craft Cider
dba Santa Fe Cider Works
Sceery Outdoors, LLC
Siddha Labs
Sigma Labs, Inc.
dba B6 Sigma, Inc.
fka Beyond6 Sigma
Simtable
Stargazer Kombucha
TARTLE
The Chummy Factory
Transparent Sky, LLC
Turtle Rock Foods, LLC
dba The Kombucha Project
Verde Food Company
dba New Mexico
Fresh Food
Woodruff Scientific, Inc.

SIERRA
Dankart, Inc.
St. Cloud Mining
Company, Inc.

SOCORRO
Solaro Energy, Inc.
Space Sciences Corporation

TAOS
Beyond Laundry, LLC
dba Beyond Blue Green
Big Wheel Farm
Diamond Sow Garden
George R. Dreher
Global Data Research, LLC
Highborn
Michael Boyle, LLC
Walking Trout Farm

TORRANCE
Radiation Detection
Solutions, LLC (RDS)

VALENCIA
Crating International, LLC
Just 4 The Health of It
La Plata Dental
Mid-Valley Doors
dba Toby's Doors, Inc.
New Mexico Travertine, Inc.
Pi8 Solutions
Sisneros Bros. Mfg., LLC

ECONOMIC IMPACT RECOGNITION

Two projects from 2019 that achieved outstanding innovations through NMSBA received the annual *Honorable Speaker Ben Luján Award for Small Business Excellence* for demonstrating the most economic impact.

Guardian Sensors, after receiving technical assistance from NMSBA with testing of their safe in-line solar connectors, has won $225,000 in prize money and vouchers, provided research opportunities to New Mexico universities, and hired a new engineer.

Navajo Spirit Southwestern Wear increased production by 18% leading to a 48% increase in sales of their clothing line. They were also able to add new employees after receiving guidance on increasing automation at their business.

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- Thank you to all the small businesses for participating in NMSBA, creating jobs, and generating economic wealth for New Mexicans.
- Thank you to all Los Alamos and Sandia national laboratories' Principal Investigators who applied their expertise and knowledge to help New Mexico small businesses solve their unique technical challenges.
- Thank you to the Office of the Governor and the New Mexico State Legislature for supporting the *Laboratory Partnership with Small Business Tax Credit Act*, effective July 1, 2019.
- Thank you to the Advisory Council Members for their leadership, advice, and guidance in support of NMSBA.

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NMSBA

Los Alamos National Laboratory
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Solving New Mexico's Small Business Challenges

NMSBAPROGRAM.ORG

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