

*Driving Innovation
throughout
the Permian Basin*



INNOVATION & TECHNOLOGY
Growing a Regional Economy

A White Paper, presented by:



New Horizons Foundation
Lea County, New Mexico



LEA COUNTY, NEW MEXICO

The State of New Mexico has been the site of important scientific research for decades. The National Laboratories have drawn scientists and research organizations from all over the world. Some of the organizations key to the state's scientific history and recognition, include: Sandia National Labs, Los Alamos National Labs, The National Center for Genome Resources, and the New Mexico Research Engineering Institute.

LEA COUNTY, NM - Lea County plays a vital role in the production of the nation's energy resources. Its history includes the founding of Humble City by the Humble Oil Company.

- Production - Crude Oil: 4,455,365 barrels
- Production - Natural Gas: 16,232,506 cubic feet

Lea County is strategically located in the PERMIAN BASIN. In the southeast corner of the state, Lea County is the 'cornerstone' of NM's energy economy. Mining, nuclear, oil & gas, wind, mining, potash - all make up Lea County's largest industry: ENERGY. Halliburton, URENCO, Baker Hughes, Exelon - all have a home in Lea County.

ENERGY is one of the State's identified key industry segments.

2013	Production Volume
Crude Oil	100,807,507 barrels
Natural Gas	1,221,700,982 thousand cubic feet
Coal	21,968,639 thousand short tons
Potash	2,188,874 short tons
Copper	266,483,184 pounds
Molybdenum	2,384,874 pounds

SOURCE: State of New Mexico, Energy, Minerals & Natural Resources Dept.

WORKING WITH THE FEDERAL LABORATORIES

TECHNOLOGY TRANSFER

The Federal Laboratory Consortium for Technology Transfer (FLC) was formally chartered by Congress to facilitate technology transfer in the United States. Definition: Technology transfer is the process by which existing knowledge, facilities, or capabilities developed under federal research and development (R&D) funding are utilized to fulfill public and private needs.

There are occasions when technology transfer mechanisms can be used by a federal laboratory to import from the outside technologies or knowledge that can assist the laboratory with achieving its mission goals.

CRADA: COOPERATIVE RESEARCH & DEVELOPMENT AGREEMENT

A CRADA is an agreement between a government agency and a private company or university to work together on research and development. Private corporations participating in a CRADA are allowed review government-developed technologies, and to file related patents; they can retain patent rights on inventions developed through the CRADA. The government may receive a license to the patent.

PIA: PARTNERSHIP INTER-MEDIARY AGREEMENT

Department of Defense (DoD): Entities with Partnership Intermediary (PI) status, "increase the likelihood of success in the conduct of cooperative or joint activity between (federal) laboratories and small businesses." There are a very limited number of Partnership Intermediaries (PIs) in the country.

REGIONAL KNOWLEDGE ECOSYSTEMS

Regional Knowledge Ecosystems are different from industry "clusters", as economic development organizations have defined targeted efforts in the past. "Ecosystems" as described by Anthony Townsend of Institute for The Future, aren't limited to a single industry, and companies aren't necessarily the most important pieces. As Townsend describes it, to be successful, regional knowledge ecosystems, companies drive a 'network', expressing ideas about what technologies ought to be commercially developed.

The strength of Regional Knowledge Ecosystems, according to Townsend, is that they can adapt faster than national systems, which are dictated by federal politics, and they can scale up successful enterprises much more effectively than individual research parks or municipalities. Major policy think tanks in Washington - the Brookings Institution, the Center for American Progress, and the Information Technology and Innovation Foundation - are all advocating that federal research grants be targeted to regional partnerships of federal labs, universities, companies and entrepreneurs.

Anthony Townsend, The Institute for The Future: "If anything defines success to today's economic climate, it's flexibility, resilience and agility. Regional partnerships provide more choices for you in designing programs and create buffers to rapid economic shifts."





America's economy has long relied upon technological innovation as a driving force. Basic investment in science and technology continues to be considered a 'cure' for economic ills. The federal government continues to inject billions of dollars into federal labs and research universities. The challenge for communities and economic development organizations is to capture these investments in ways that promote sustainable economic growth, creating value and jobs for the long-term.

Innovation and technology alone cannot make the difference – these key components to our daily lives must be fully embraced by all levels of community, recognizing not only the benefits from their integration, but also the losses that will occur if not embraced due to a very competitive landscape.

In the World Economic Forum's annual technology ranking survey, the U.S. ranked fifth behind: Sweden, Singapore, Switzerland, and Finland.

TURNING SCIENCE INTO GROWTH

So – what will it take? For the last fifty years, the primary strategy for turning science and technology into local economic growth was centered on the development of research parks and incubators. This is a strategy that's time has come, and gone. With resources limited, and competition growing, turning science into growth needs to take a more 'scientific' (i.e. strategic) approach.

The strategy that is currently favored: growing firms locally, as opposed to recruitment of companies. This is seen as a strategy more likely to produce secondary benefits, and longer lasting ones.

These are the trends that may further challenge existing models for technology-based economic development methodologies:

- **GLOBALLY-NETWORKED SCIENCE** – It is clear: we live & work, globally. Science is global. Local "clusters" cannot exist in isolation and succeed; they must be connected – regionally and globally.
- **TODAY'S SCIENTIST** - The days of the 'mad scientist' working in isolation are long gone. Young scientists have highly collabora-

tive work styles. Walls and borders do not exist for them.

- **TO-MARKET INNOVATION** – Competition dictates 'speed'; companies are stripping internal R&D organizations, favoring open innovation strategies. New systems and partnerships must be developed to net efficient and effective innovation, and get these innovations to market.

- **NO MORE IVORY TOWERS** – Universities are undergoing a necessary change in order to compete – amongst themselves, and in this fast-changing, dynamic marketplace. Driven largely by customer demand (i.e. students), universities becoming economic engines; making changes to existing technology transfer systems.

- **FEDERAL 'ACTION'** – The federal government - and its massive investments - is now calling for ROI (Return on Investment). The feds are now more than ever taking 'action' to measure the taxpayers' investments. Turning federal dollars into jobs has become a priority.

"Our company realized significant benefit working with NHF; access to the federal labs gave us additional tools, keeping us competitive." - Lea County Company

NEW HORIZONS CASE STUDY

NHF Secures Federal Lab Technology for Local Company

OVERVIEW

Working with regional companies, NHF has been identifying key 'needs' that are industry-wide: "issues" that stymie market and bottom line growth. NHF is examining – with industry leaders – federal technologies for their potential use in-market, near-term.

SITUATION

Example: NHF identified that oil & gas companies throughout the region were experiencing down well and sucker rod corrosion problems. Traditional research for solutions is slow and expensive, and funding for increased research is difficult to secure.

CHALLENGES

After numerous meetings and discussions, NHF determined that potential solutions, and/or analytical capability, were not in-market. Additionally, the cost of setting up infrastructure for proper analysis was 'out of reach'. Time was also a challenge: a long 'discovery' process was costing the industry each day.

PROCESS

NHF gathered information related to the corrosion problem from local businesses. NHF then organized a visit from the federal lab, Benet Army Laboratories. Local site visits were made; water samples and corroded rods were gathered. Lead scientists from Benet ran a three-month analysis funded by NHF. A model of a Lea County well was erected for accuracy.

NHF RESULTS

After research and analysis, Benet determined that through a combination of metals, a 10-16x longer life of these rods was achievable. Further, with NHF's assistance, Benet organized data from independent exploration and production companies based in The Permian Basin. The effort fostered by NHF has led to creation of cladding compounds and an application process that is now patent pending. This NHF-led and funded effort has created a MARKET-READY PRODUCT.



NHFOUNDATION.NET

Since the 1930s, New Mexico has been the site of important scientific research. The National Laboratories have drawn scientists and research organizations from all over the world to the Rio Grande Valley and Permian Basin region. Serving as an intermediary with the federal labs, New Horizons Foundation (NHF) continues this tradition, assisting: Companies with Technology Development & Deployment; Universities with Technology Transfer; and Federal Labs as a technology intermediary to industry. Technology is key to the region's future.

New Horizons Foundation (NHF) is a 501©3 supporting the growth of a technology, and a knowledge-based economy - local, regional, national, and government agreements assist companies to INNOVATE FOR GROWTH