

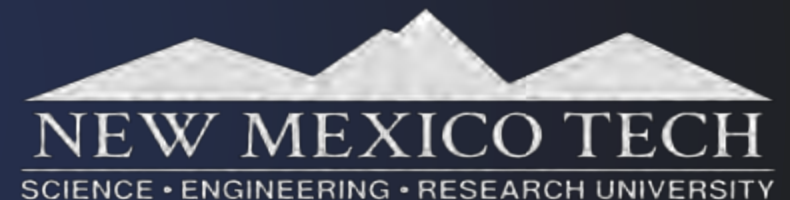


Education and the Economy: The Importance of Research and Development

Presentation to the Economic Development & Policy Committee

Deming, New Mexico

October 12, 2022



Presentation Overview

- **Combined Impact of Research Universities**
 - NMSU
 - NMT
 - UNM
- **Statewide Collaborations**
 - NM EPSCoR
 - RALI West
- **Advancing Collaborations**

Impact of Research Universities

Combined Impact of Research Universities

Research Expenditures



Sponsored research activity drives the procurement of goods/services and supports salaries

Graduate Degrees Conferred



Masters 1,792
Doctoral 306

Research universities play a key role in developing a highly skilled and well-trained workforce

Statewide Collaborations



Key Impacts

- \$207 million in Federal EPSCoR funding since 2001 (NSF/DOE/NASA/USDA)
- NM SMART Grid Center (\$24m; \$20m federal/\$4m state)
 - \$82 million in extramural funds (through Year 4)
 - 5:1 return on overall investment
 - 25:1 return on state investment
- Center for Research Excellence in Additive Technology and Education (CREATE)

Advancing Collaborative Research Excellence in New Mexico

- Manage NSF EPSCoR NM SMART Grid Center (\$24 million over 5 years)
- Partner with universities, national laboratories, industry, state government
- Facilitate education, outreach, and workforce development
- Cultivate research in emerging areas, e.g., quantum, dryland ecology



NM SMART Grid Center Team

47

Faculty

9

Post Docs

109

Graduate
Students

65

Undergraduate
Students

31

Staff/Other



Center for Research Excellence in Additive Technology and Education (CREATE) (2023 – 2028)

- \$24 million; \$20 million federal/\$4 million state (Technology Enhancement Fund)
- Additive Manufacturing/3D Printing
- Industry Applications: Space, Medicine, Defense
- Potential for NM to Become World Leader



Seed Funding and Emerging Areas

- **Year 1 (\$100,000 total)**

- Caitano da Silva, NMT
- Xiang Sun, UNM

- **Year 2 (\$150,000 total)**

- Nathan Jackson, UNM
- Eirini Tsiropoulou, UNM
- Frank Currie, SFCC

- **Year 3 (\$250,000 total)**

- Sihua Shao, NMT
- Kooktae Lee, NMT
- Jamal Mamkhezri, NMSU
- Xiang Sun, UNM
- Tatiana Timofeeva, NMHU

RALI WEST

Key Impacts

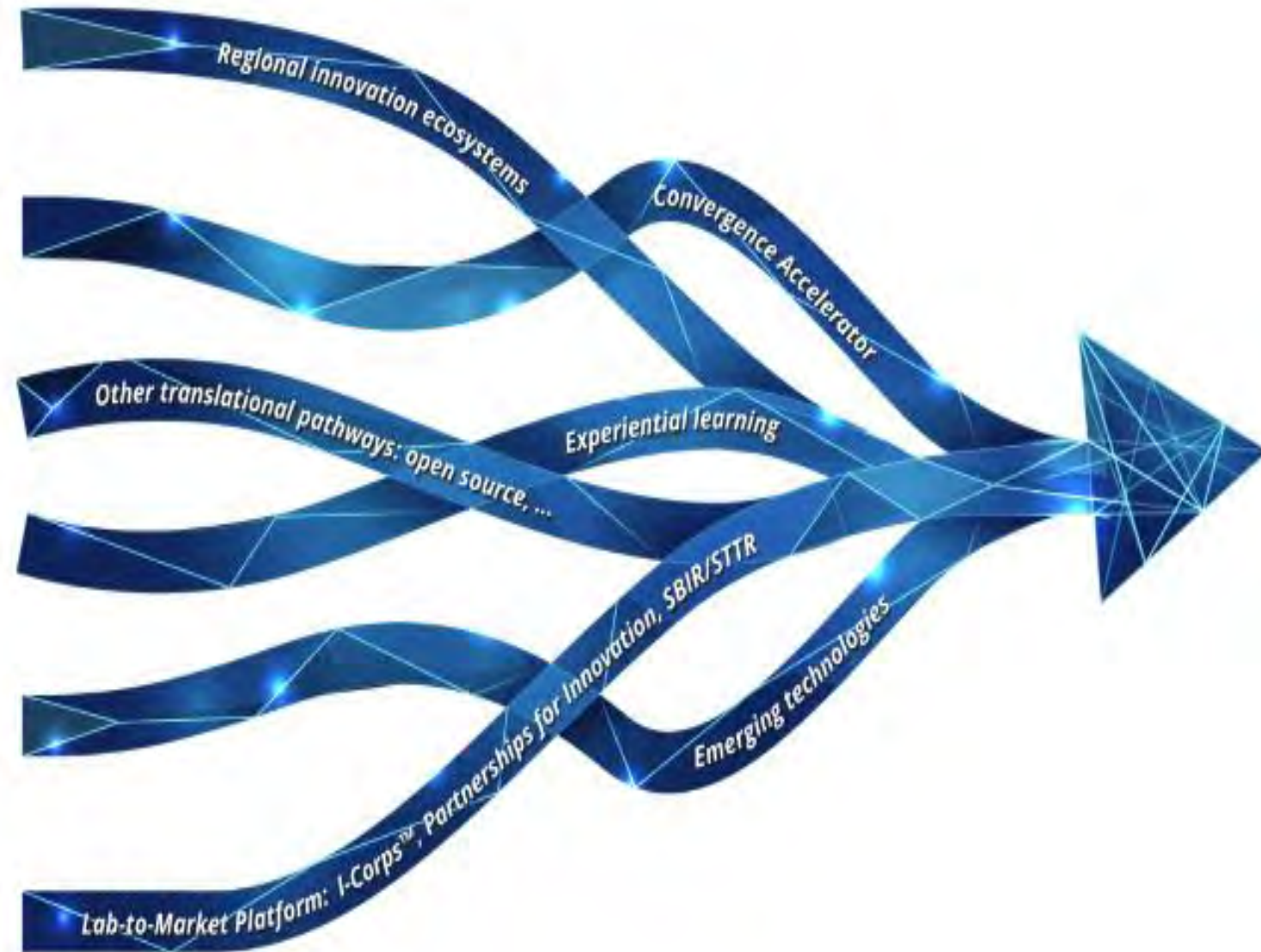
Research-driven regional economic growth

Clean water for health and sustainability

Clean energy for security and resilience

Meeting the needs of indigenous and rural communities

- New National Science Foundation (NSF) Technology, Innovation, and Partnerships (TIP) Directorate



Credit: National Science Foundation

NSF Regional Innovation Engines (RIE) Opportunity

- \$160 Million over 10 years in 3 phases
 - Nascent Phase: \$15 M over 2 years – advance existing collaborations and build new ones
 - Emergent Phase: \$45 M over 3 years – initial products from collaborations, expand investment 10x
 - Growth Phase: \$100 M over 5 years – collaborations maturing, impacts increasing, expand investment 10x

Collectively, the Engines have three core functions:



**Use-inspired research
and development**



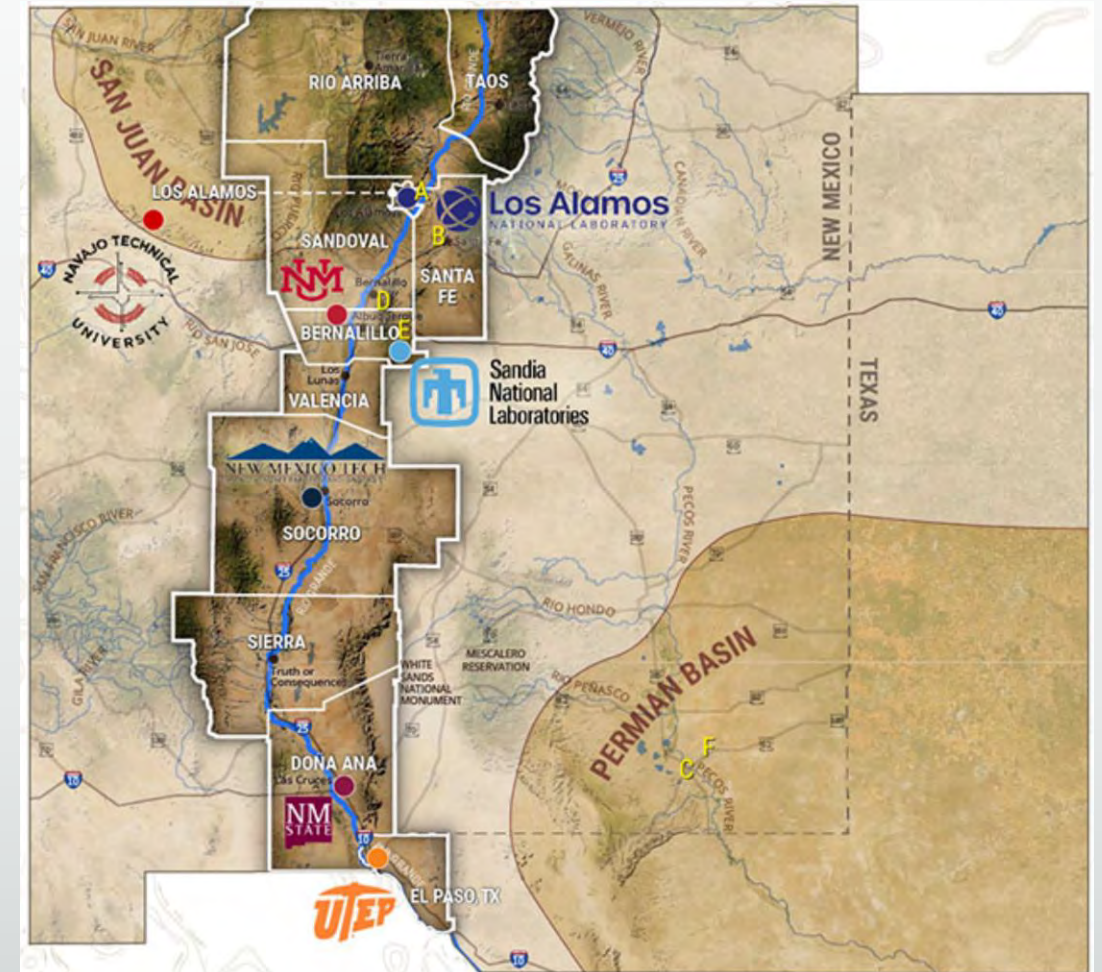
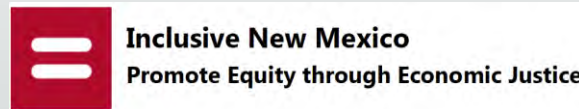
**Translation of innovation
results to society**



**Workforce development to grow and sustain
regional innovation**

Northern Rio Grande Corridor Collaborative (NRGCC)

- **Regional collaboration**
 - Navajo Tech
 - LANL and SNL
 - UNM, NMT, NMSU, and UTEP
- Targeting **large funding opportunities**
- **Alignment** with state/regional goals: NMEDD plan



RALI WEST

Regional Advancement Leveraging Innovation for Water and Energy Secure Transformation

- Intersects at five of NMEDD's nine target industries



**Sustainable &
Green Energy**



Biosciences



**Outdoor
Recreation**



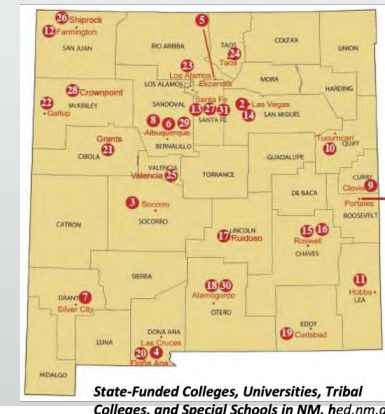
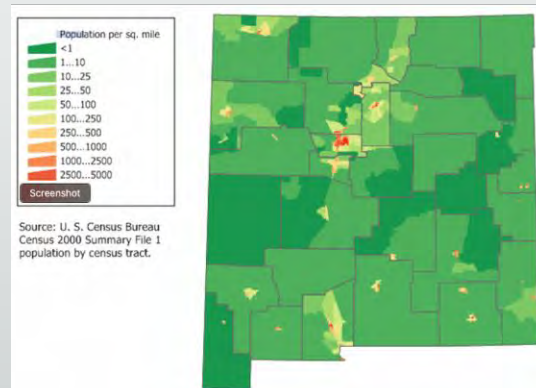
**Sustainable &
Value-Added
Agriculture**



**Intelligent
Manufacturing**

- Innovation and growth near and beyond population centers

- Training the workforce at all levels across our state institutions



RALI WEST

Co-locating and aligning solutions with needs and resources

- Research on **water resilience** in a changing climate
- De-risks economic development and inspires innovation
- Research on **energy resilience** in a changing climate
- Enables water security and inspires innovation

WATER CHALLENGE



*Freshwater Use
2000 nm.water.usgs.gov*

WATER RESOURCE



*Fresh and Brackish Water Quality
OFR-583 2016, geoinfo.nmt.edu*

ENERGY CHALLENGE



*Low-income Energy Affordability
2021 emnrd.nm.gov*

ENERGY RESOURCE



*Solar Potential
2000 nm.reta.com*

WATER RESEARCH



*Crop Climate Zones
planthardiness.ars.usda.gov*

WATER POLICY



*Water Planning Regions.
ose.state.nm.us/planning*

ENERGY RESEARCH



*EPSCoR Smart Grid Partners
nmlegis.gov*

ENERGY POLICY



*Electric Service Co-ops and PNM
2021 emnrd.nm.gov*

Advancing Collaborations

REQUEST

- Thank you to our policy makers for the \$45 million investment during this past legislative session for matching funds through the Technology Enhancement fund
- The Council of University Presidents, New Mexico Association of Community Colleges and the New Mexico Independent Community Colleges is requesting an additional \$25 million investment into the fund
- The additional investment will provide your research institutions with the opportunity to compete for research funding
- Our ultimate goal is investment in future and sustainable funding to enhance research and economic development in the State of New Mexico