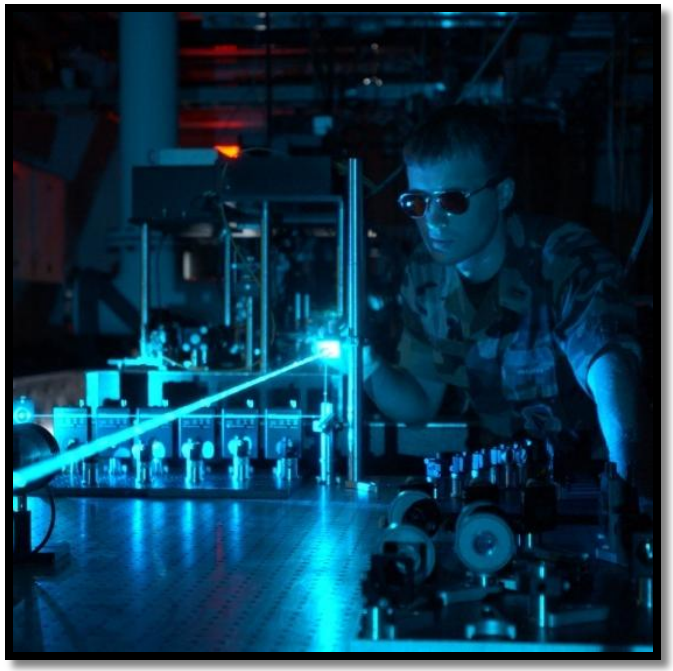


Directed Energy In New Mexico

Cynthia Kaiser
Chief Engineer
Air Force Research Laboratory
Directed Energy Directorate
Kirtland AFB, New Mexico

Air Force Research Laboratory PA RD#09-1636

What is Directed Energy?

Why Directed Energy?

Who are the Players in NM?

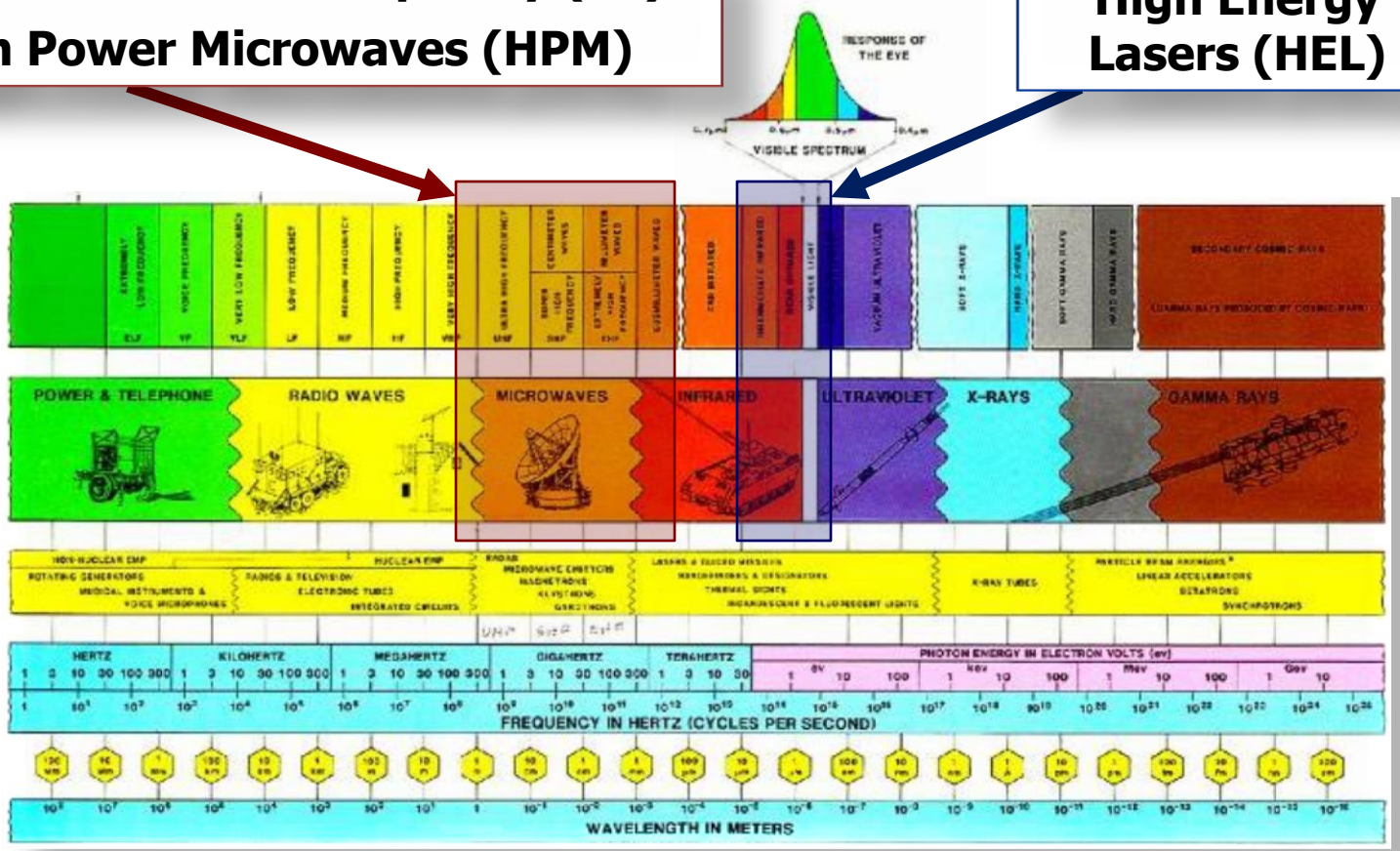
Economic Impact

- Reality
- Impact
- Future

Electromagnetic Spectrum
What is Directed Energy?

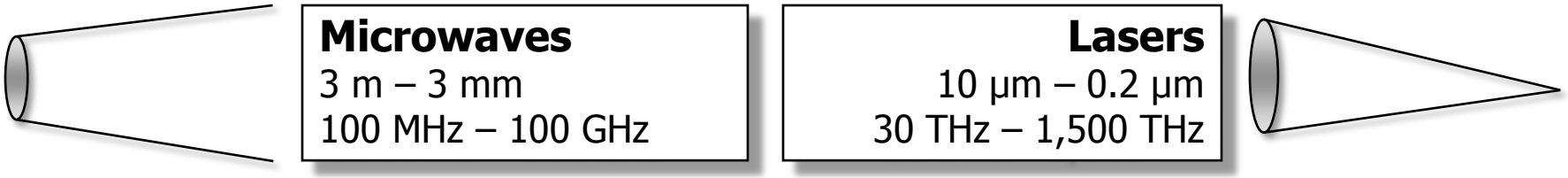
High Power Radio Frequency (RF)
High Power Microwaves (HPM)

High Energy Lasers (HEL)



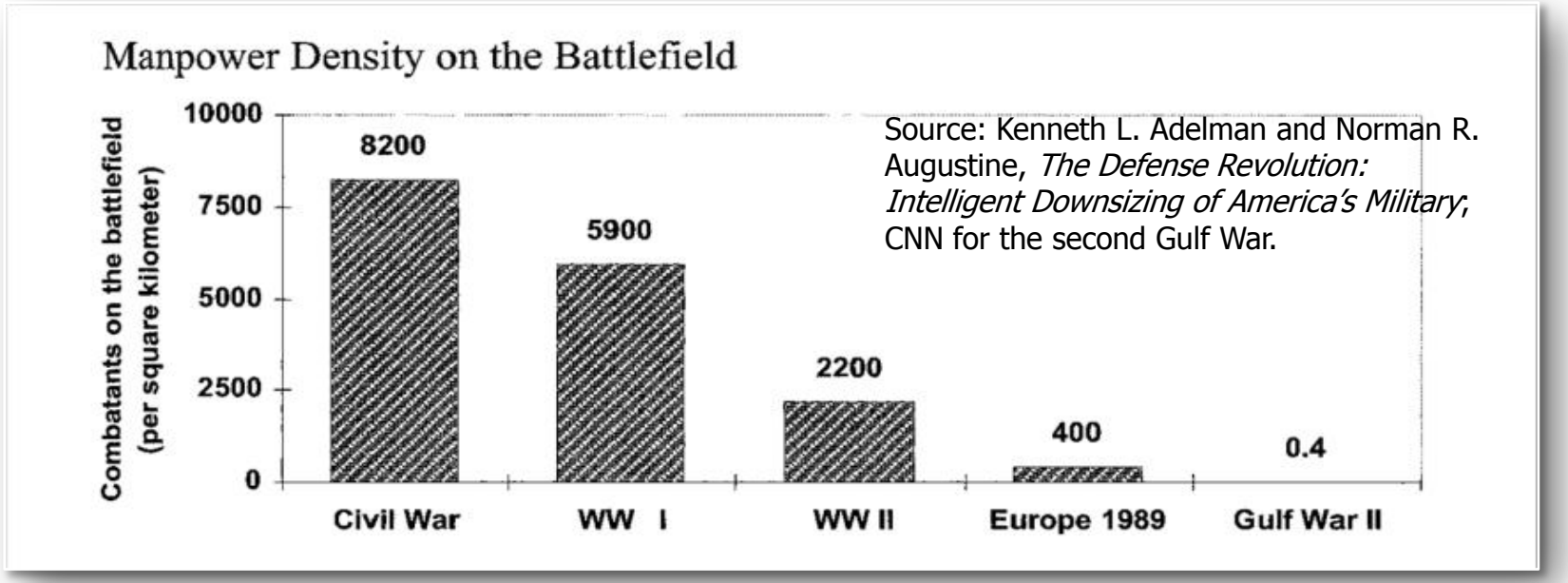
Microwaves Versus Lasers

What is Directed Energy?



Attribute	Microwaves	Lasers
Speed	Speed of light	Speed of light
Trajectory	Line of sight	Line of sight
Range	100s meters	100s Kilometers
Power	Gigawatts	Megawatts
Wavelength	Long	Short
Beam	Broad	Narrow

Investing in the Defense of our Nation
Why Technology Development?

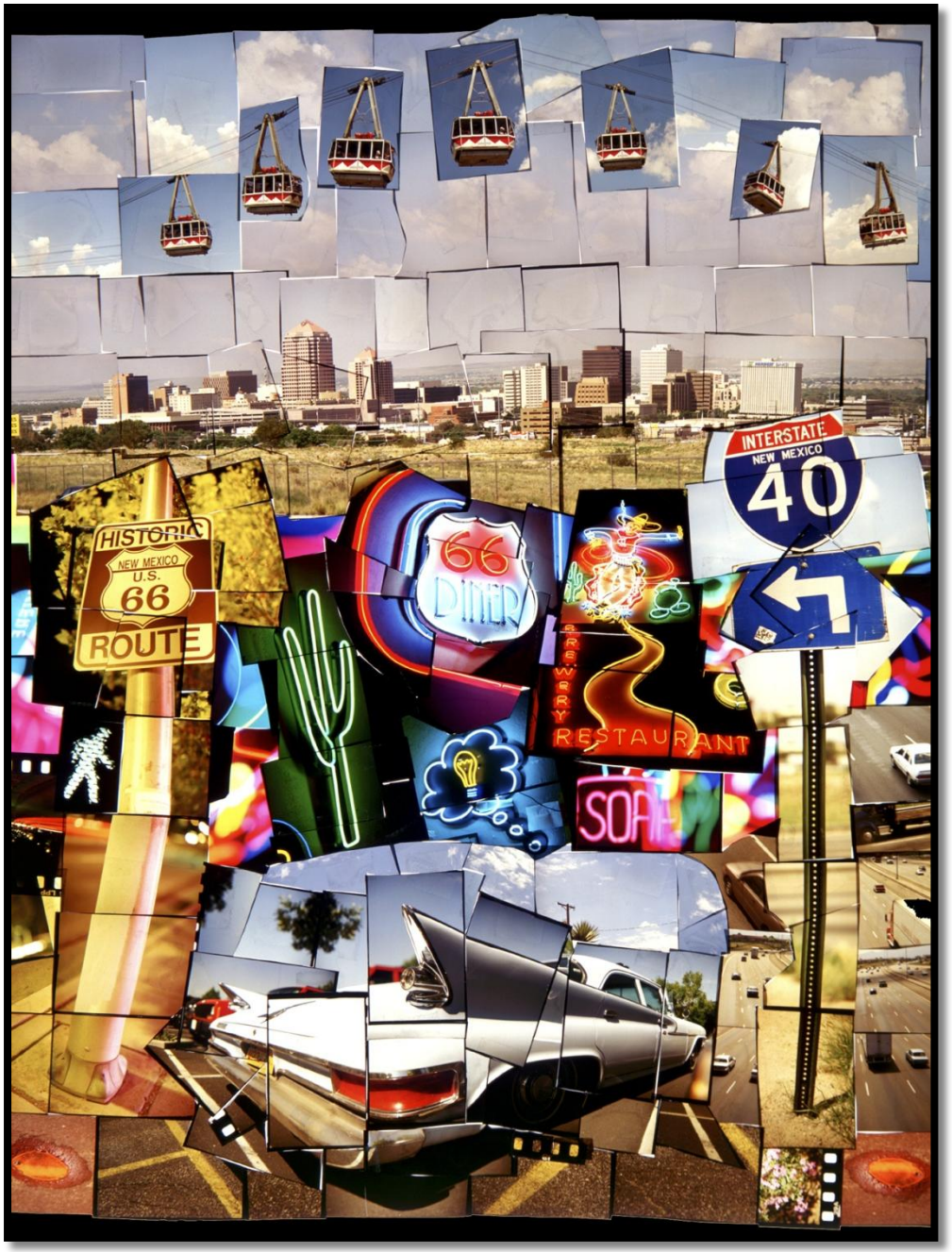


"The first essential of the airpower [and space power] necessary for our national security is pre-eminence in research…"

-- General Henry "Hap" Arnold, 1944

Why Directed Energy?

Precision Engagement
Speed-of-Light Delivery
Controlled Effects
Logistical Advantage

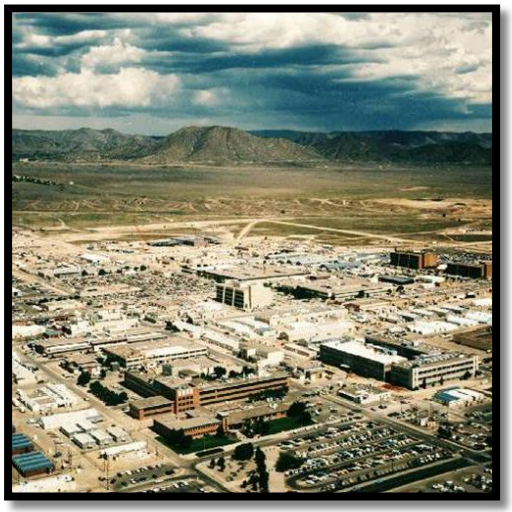


Economic Impact

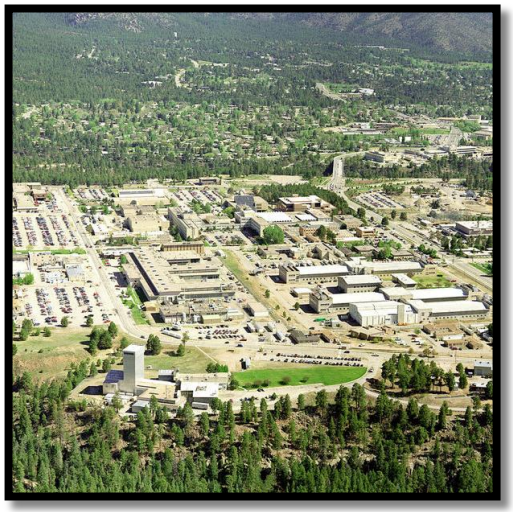
The Federal Players

The New Mexico Players

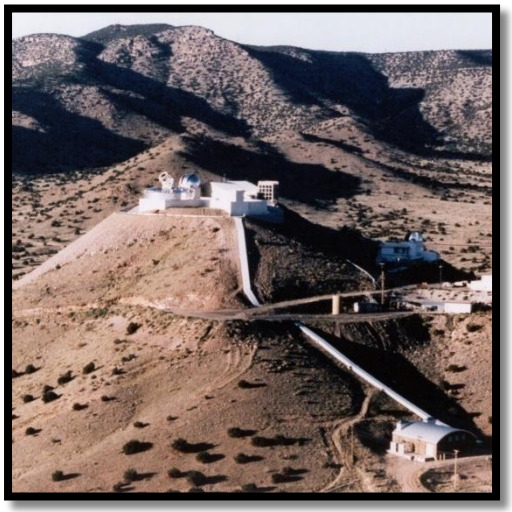
Sandia National Laboratories



Los Alamos National Laboratory



Air Force Research Laboratory
Directed Energy Directorate



The Federal Players

…the Federal Government invests in directed energy research in New Mexico through the Departments of Energy and Defense

Kirtland
Air Force Base

Holloman
Air Force Base

Cannon
Air Force Base

Army White Sands
Missile Range

The Federal Players

…Department of Defense bases support directed energy research and/or testing in New Mexico

New Mexico Synergy

Government
Industry
Academia
Professional Organizations

Boeing SVS

Economic Impact

- 473 residing employees
- 419 direct jobs
- 959 retirees
- 902 shareholders
- 92 suppliers/vendors representing $150m in purchases
- $37M salaries and wages
- $122,667 charitable giving statewide
- $14,114 employee charitable giving
- 10 Non-manufacturing facilities

Information based on 2008 data

2005 Phillips Research Site Economy Study

Economic Impact

- **Organizations**
  - Air Force Research Laboratory
  - Airborne Laser Program Office
  - Space and Missile Systems Center
- **Impact (2005 dollars)**
  - 4,886 Direct, Indirect, and Induced Jobs
  - $228.2m Salaries and Wages
  - $21.4m State and Local Tax Revenues

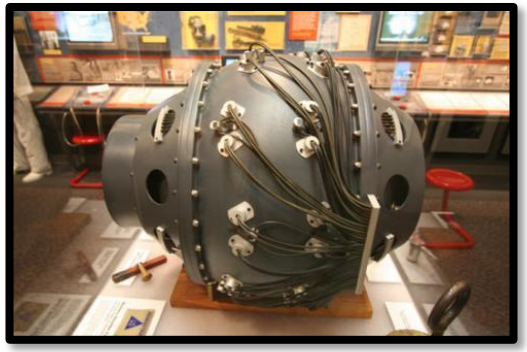
Commissioning 2010 Economic Impact Study
Directed Energy and Space Vehicles Technology Developments

From "The Economic Impact of PRS on the NM Economy" February 2005

Directed Energy Center of Excellence

Champion Technology Development

- Airborne Laser System Program Office (ABL)
- Air Force Research Laboratory (AFRL)
- Air Force Space Development and Test Wing (SDTW)
- High Energy Laser-Joint Technology Office (HEL-JTO)
- High Energy Laser Systems Test Facility (HELSTF)
- Los Alamos National Laboratory (LANL)
- Sandia National Laboratories (SNL)
- White Sands Missile Range (WSMR)
- 46th Test Group



Directed Energy Center of Excellence

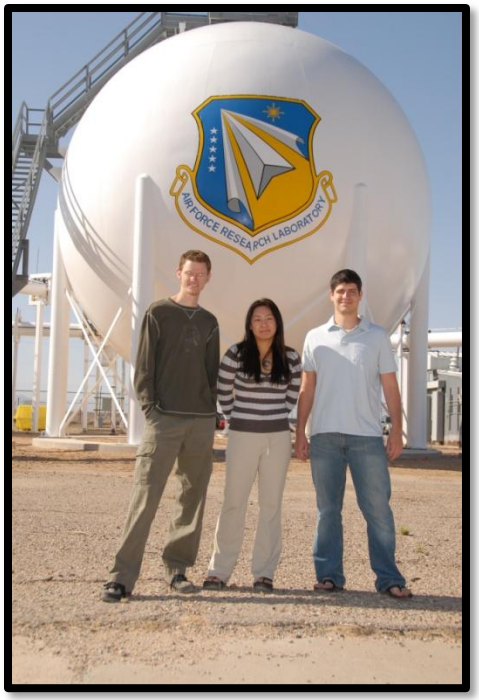
Create Growth Environment in Industry

- The Boeing Company
- Lockheed Martin
- Northrop Grumman
- Raytheon
- Small Businesses
- Subcontractors

Directed Energy Center of Excellence

Develop Scientists and Engineers

- Central New Mexico Community College
- New Mexico State University
- New Mexico Tech
- University of New Mexico



Directed Energy Center of Excellence

Encourage Professional Organizations

- Directed Energy Professional Society (DEPS)
- Albuquerque Economic Development
- City and State Economic Development Department
- American Institute of Aeronautics and Astronautics (AIAA)
- Association of Commerce and Industry
- Professional Aerospace Contractors Association (PACA)
- New Mexico Optics Industry Association (nmOptics)
- Technology Ventures Corporation (TVC)

Directed Energy Center of Excellence

Economic Realities

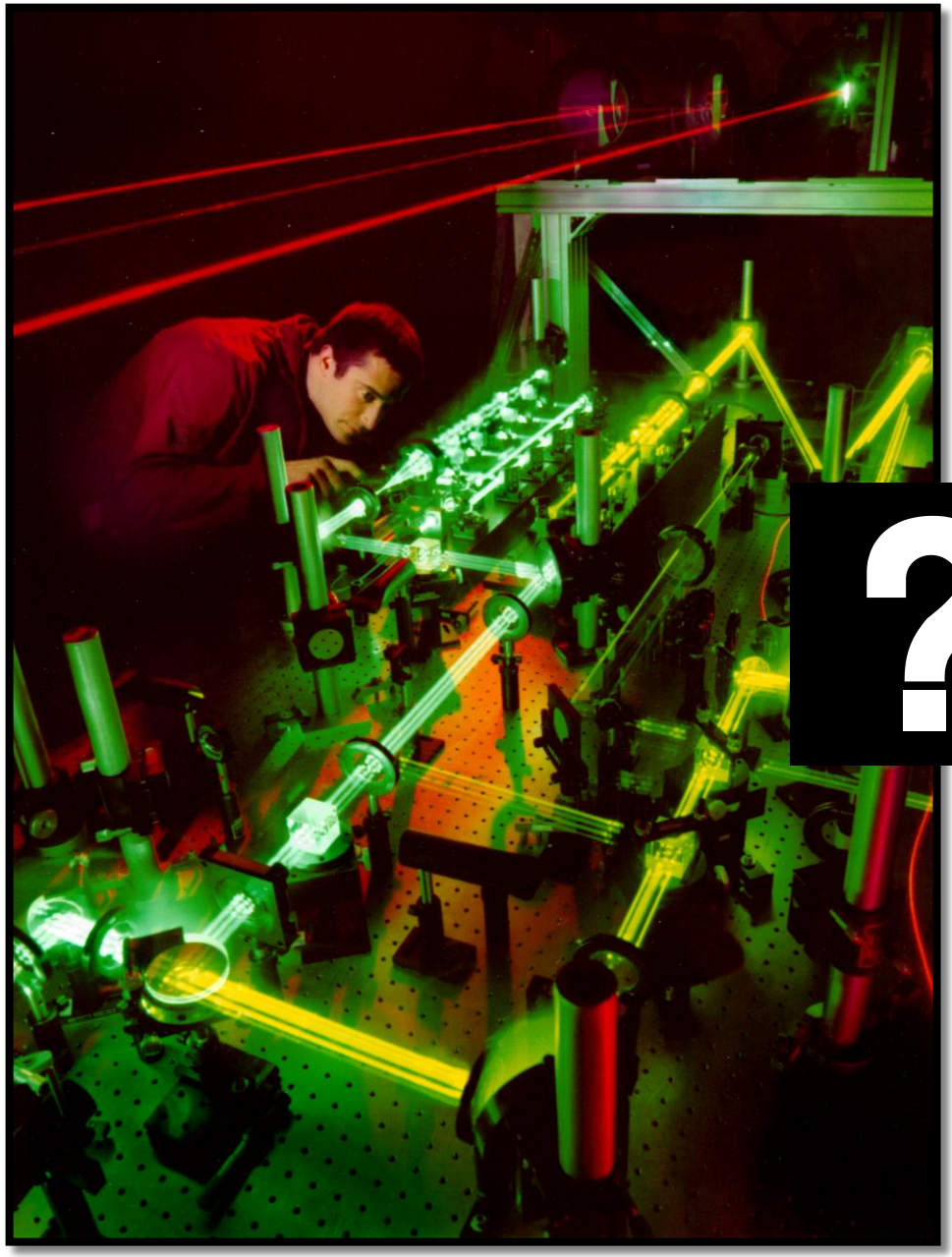
- Provides High –paying Technical Jobs
- Improves Educational Levels
- Promotes Research and Development in other Fields
- Offers Technical Careers to our Brightest Students
- Creates Opportunities for Small Businesses
- Provides Technical Experts to Universities
- Increases Creative Population
- Improves Quality of Life
- Increases Tax Base

Directed Energy Center of Excellence

Economic Future

- Champion Technology Development
- Create Growth Environment in Industry
- Develop Scientists and Engineers
- Encourage Professional Support Groups

Market New Mexico as
The Directed Energy Center of Excellence



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