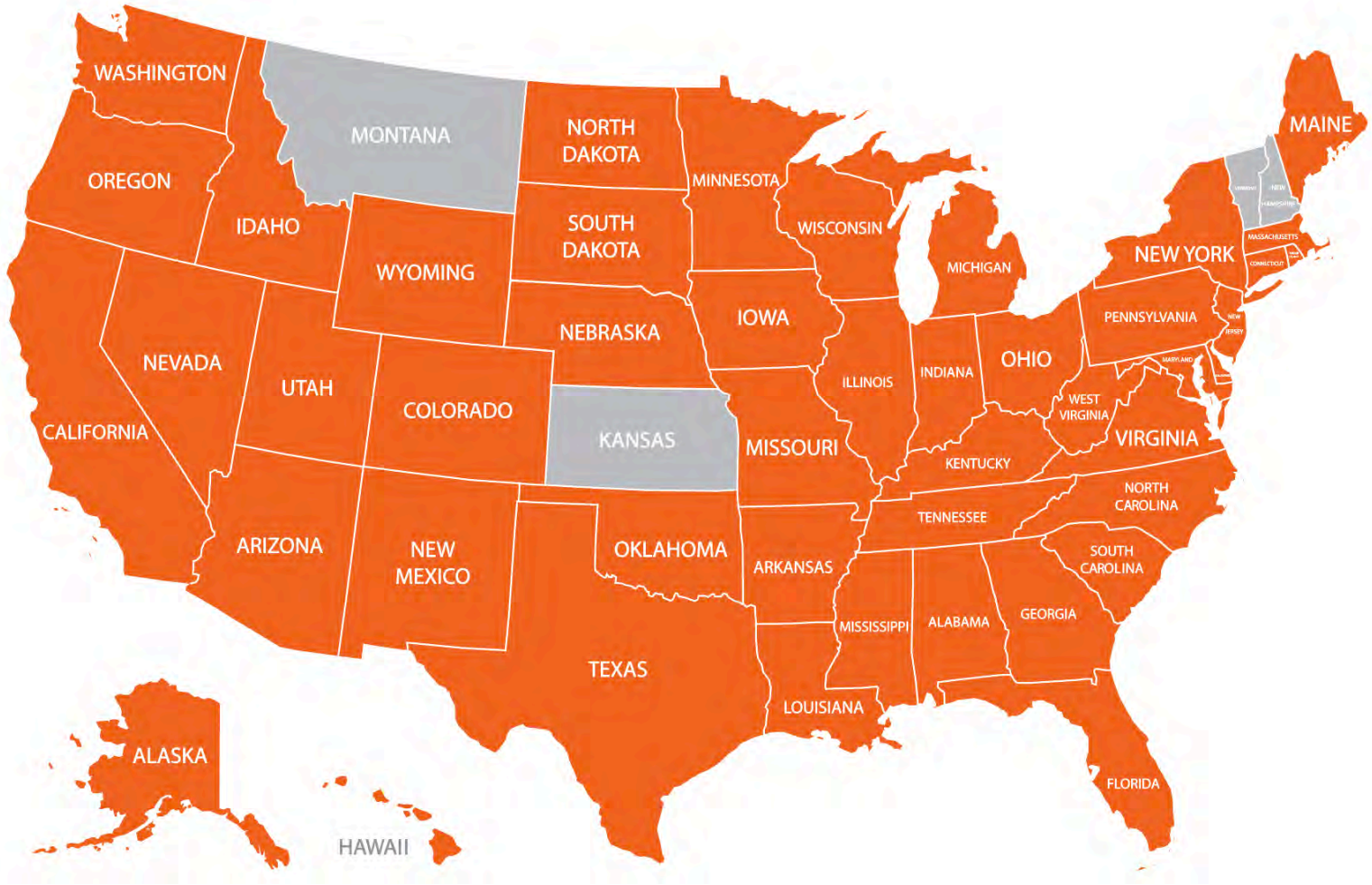
USTAR BEDL Interim Committee Meeting

USTAR

June 19, 2018

NATIONAL TBED LANDSCAPE



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NATIONAL TBED LANDSCAPE

Utah Ranks 18th in Per Capita Spending on TBED Programs

Rank	State	Per Capita Spending on TBED Programs	Rank	State	Per Capita Spending on TBED Programs
1	Texas	$174	11	Arizona	$7
2	New York	$90	12	Connecticut	$6
3	Michigan	$24	13	South Dakota	$6
4	Kentucky	$21	14	Nevada	$6
5	Maine	$15	15	Alaska	$6
6	Ohio	$14	16	Pennsylvania	$5
7	Wisconsin	$13	17	Iowa	$5
8	Colorado	$10	**18**	**Utah**	**$5**
9	New Jersey	$10	19	Oregon	$4
10	Hawaii	$9	20	North Dakota	$4

Selected TBED Agency Budgets: **TX = $5 billion** **OH = $161 million** **UT = $14.5 million**

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NATIONAL TBED LANDSCAPE

Utah Ranks 17th in TBED Spending as a Percentage of State Budget

Rank	State	Percent of State Budget Spent on TBED Programs	Rank	State	Percent of State Budget Spent on TBED Programs
1	Texas	4.60%	11	Iowa	0.20%
2	New York	1.05%	12	Colorado	0.19%
3	Michigan	0.42%	13	Arizona	0.13%
4	Kentucky	0.27%	14	South Dakota	0.11%
5	New Jersey	0.25%	15	Connecticut	0.11%
6	Ohio	0.25%	16	Delaware	0.10%
7	Maine	0.24%	**17**	**Utah**	**0.09%**
8	Pennsylvania	0.21%	18	Georgia	0.08%
9	Oklahoma	0.20%	19	Hawaii	0.08%
10	Wisconsin	0.20%	20	Nebraska	0.08%

USTAR's budget represents only 3% of Utah's overall economic development spending

NATIONAL TBED LANDSCAPE

Ben Franklin Technology PArtners

Pennsylvania

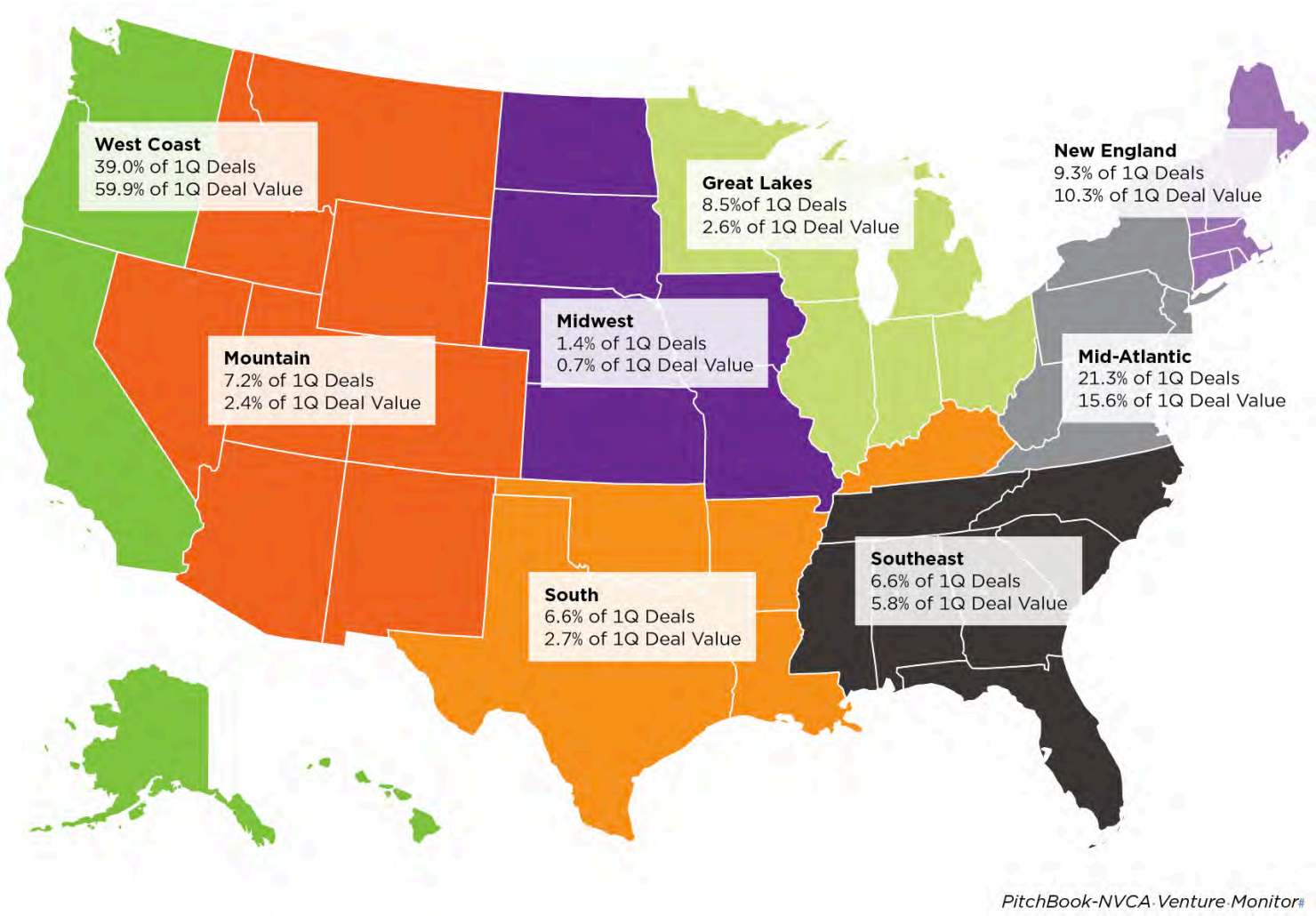
- Regionally based to meet needs of diverse communities
- Incubation facilities
- Acceleration programs
- Seed funding
- Angel funding
- Networks

Oklahoma

- Multiple agencies to address specific market gaps
- OCAST – grants for basic & applied research
- I2E – proof of concept non-recourse loans
- Oklahoma Seed Capital Fund: equity fund

Risk Capital Market Gap

VENTURE DEAL DISTRIBUTION



PitchBook-NVCA Venture Monitor

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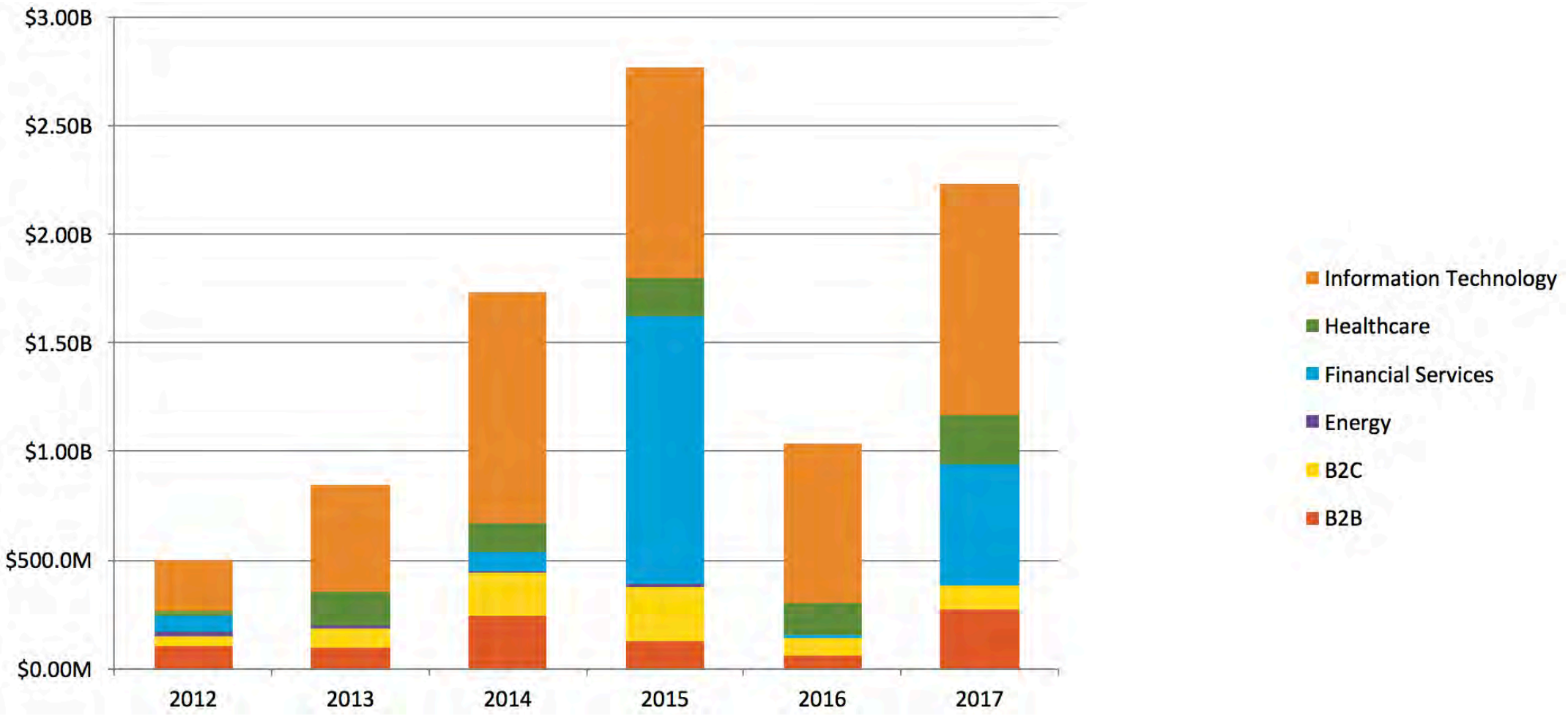
VENTURE DATA: UTAH



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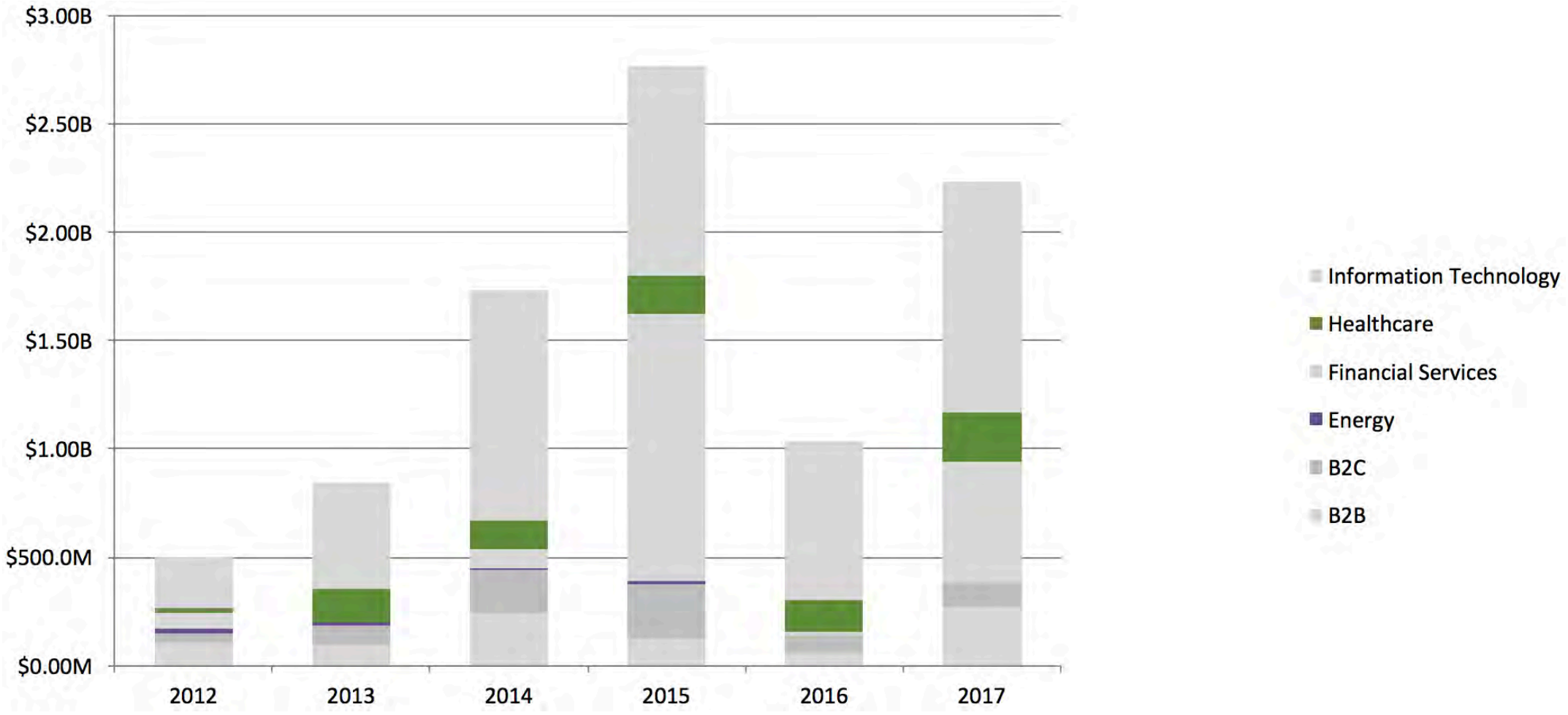
VENTURE DATA: UTAH



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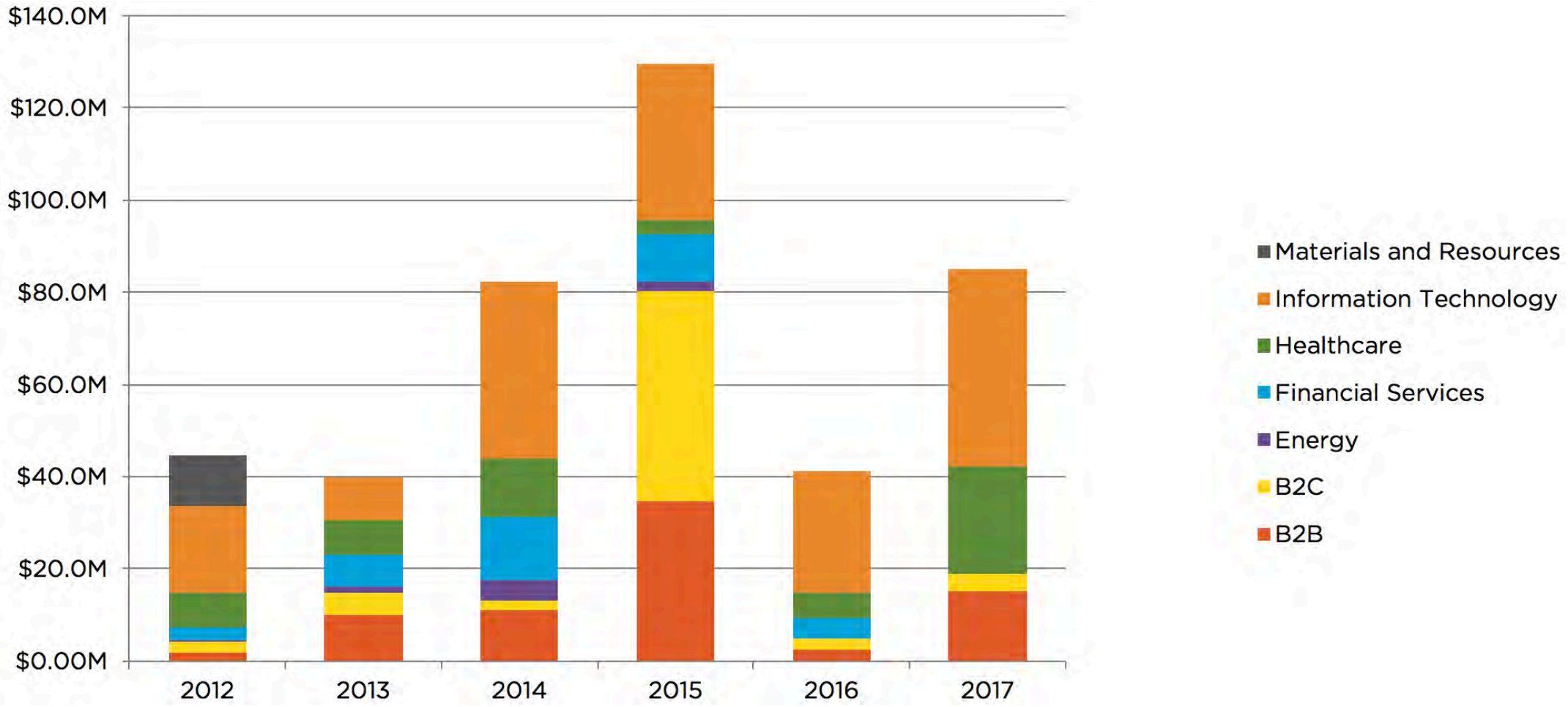
ANGEL DATA: UTAH



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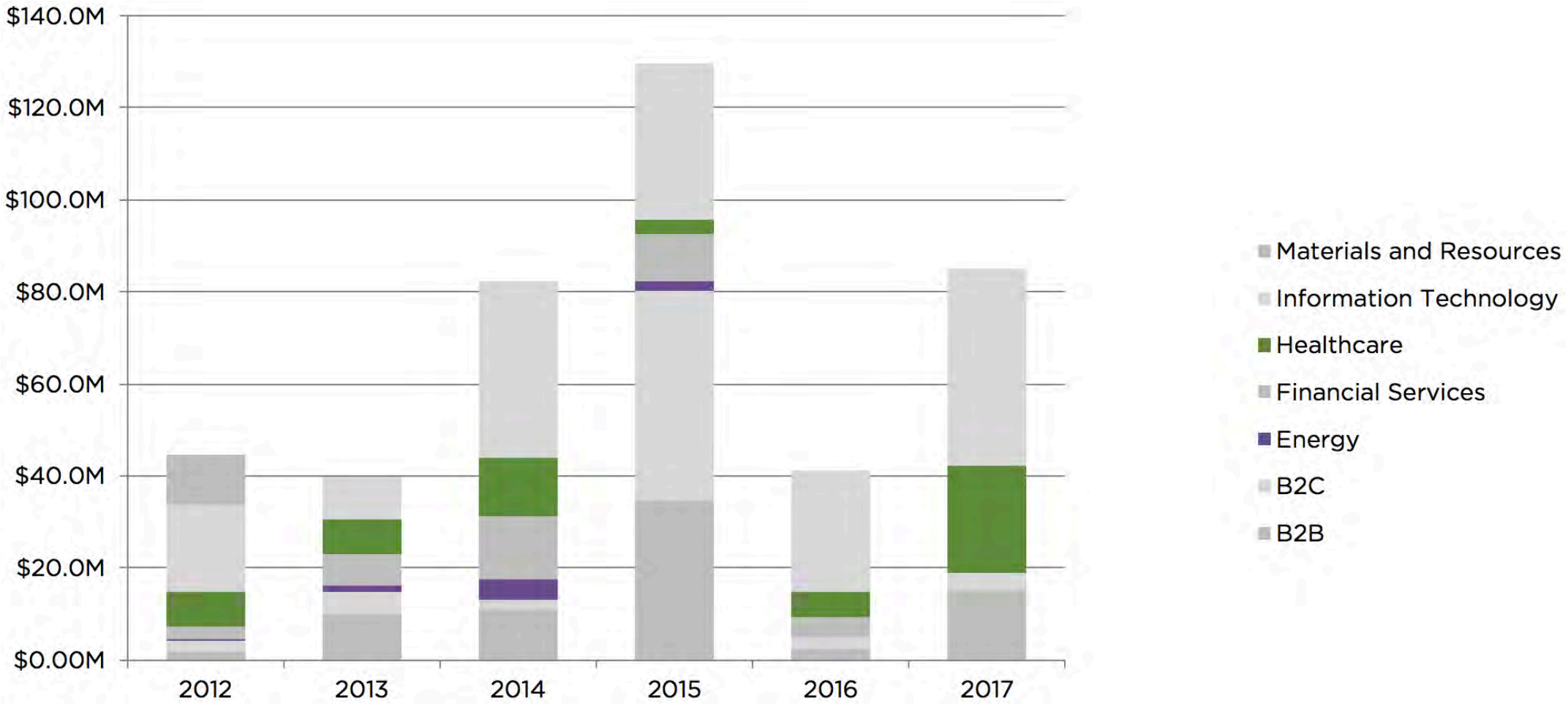

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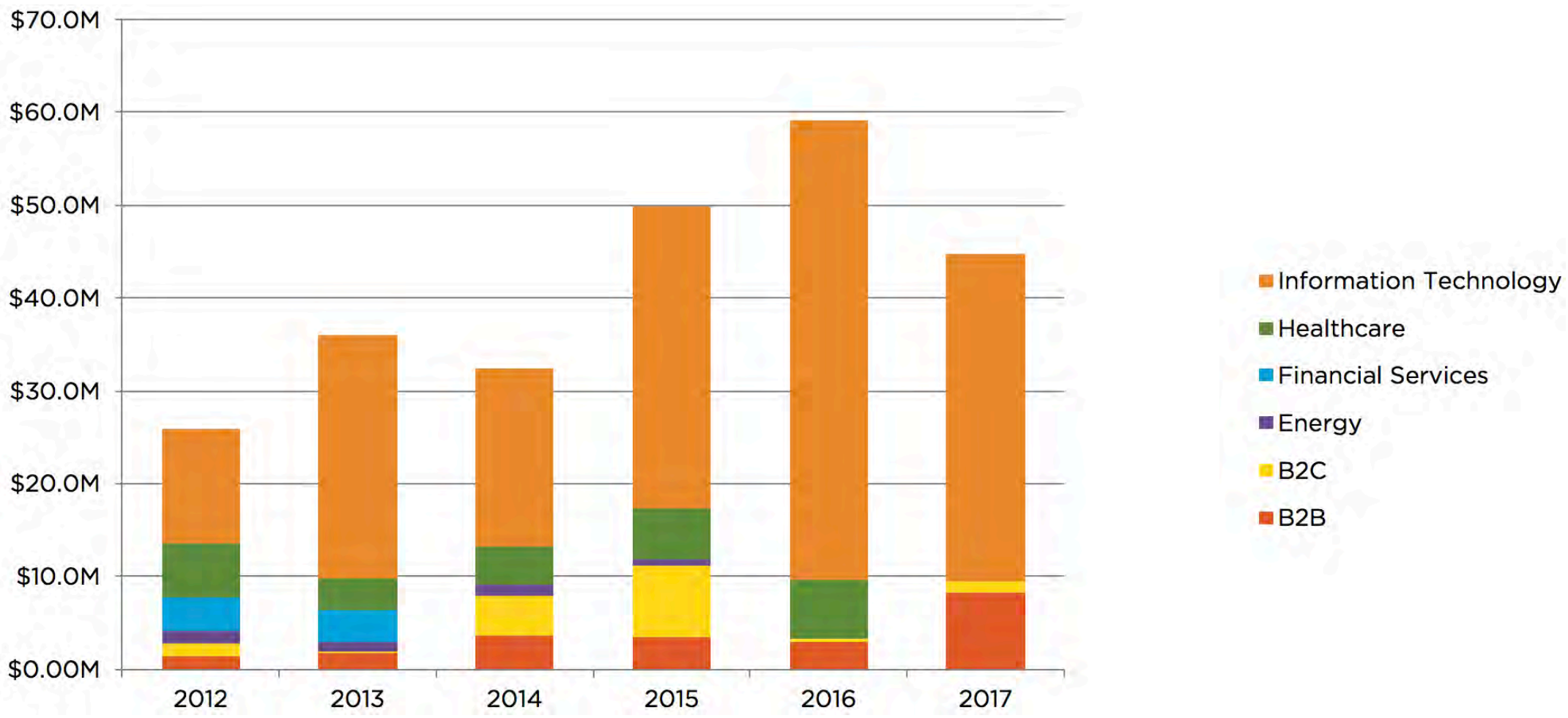

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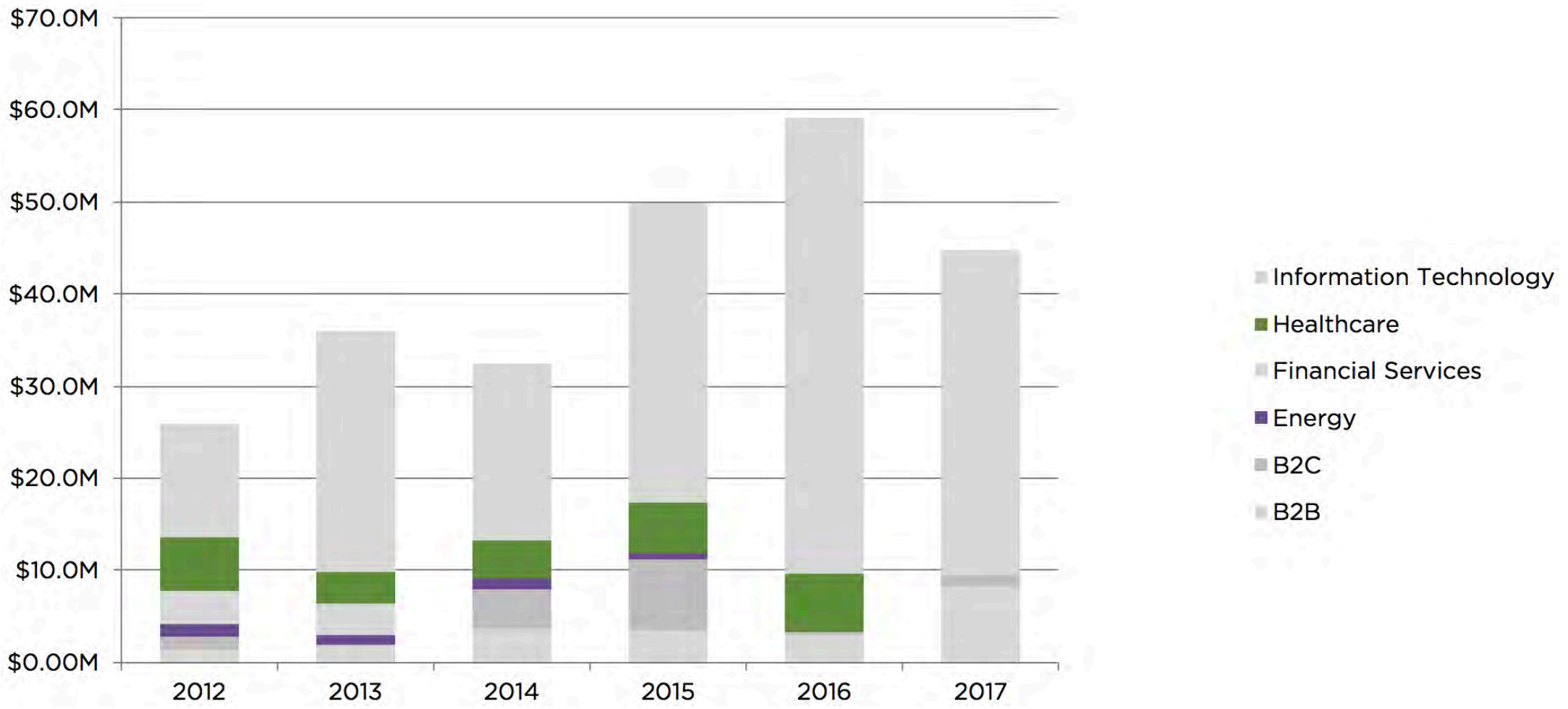

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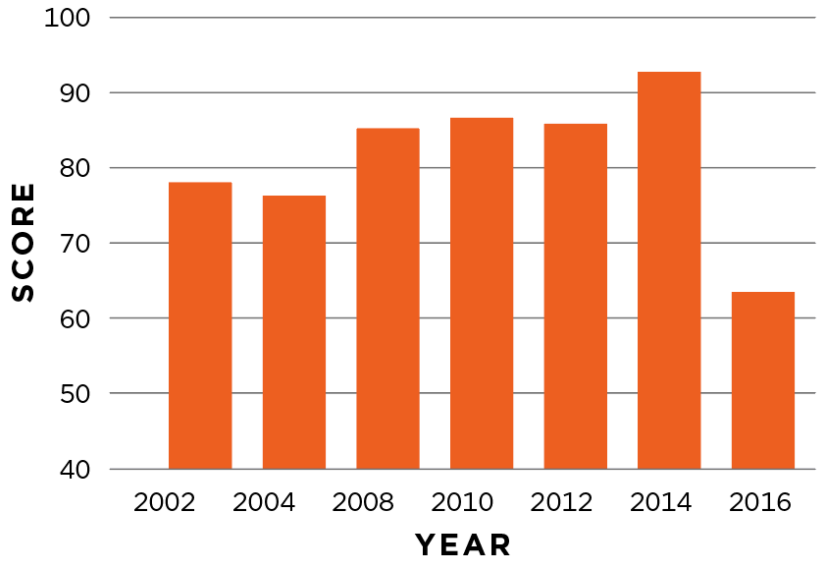
Economic Diversification

IMPORTANCE OF DIVERSIFIED ECONOMY

The **Milken Report** on diversity of investment

- Decrease in diversity dropping Utah's score

Rank	Average Score	Year
7	78.20	2002
7	76.40	2004
1	85.40	2008
1	86.80	2010
1	86.00	2012
1	92.89	2014
13	63.55	2016

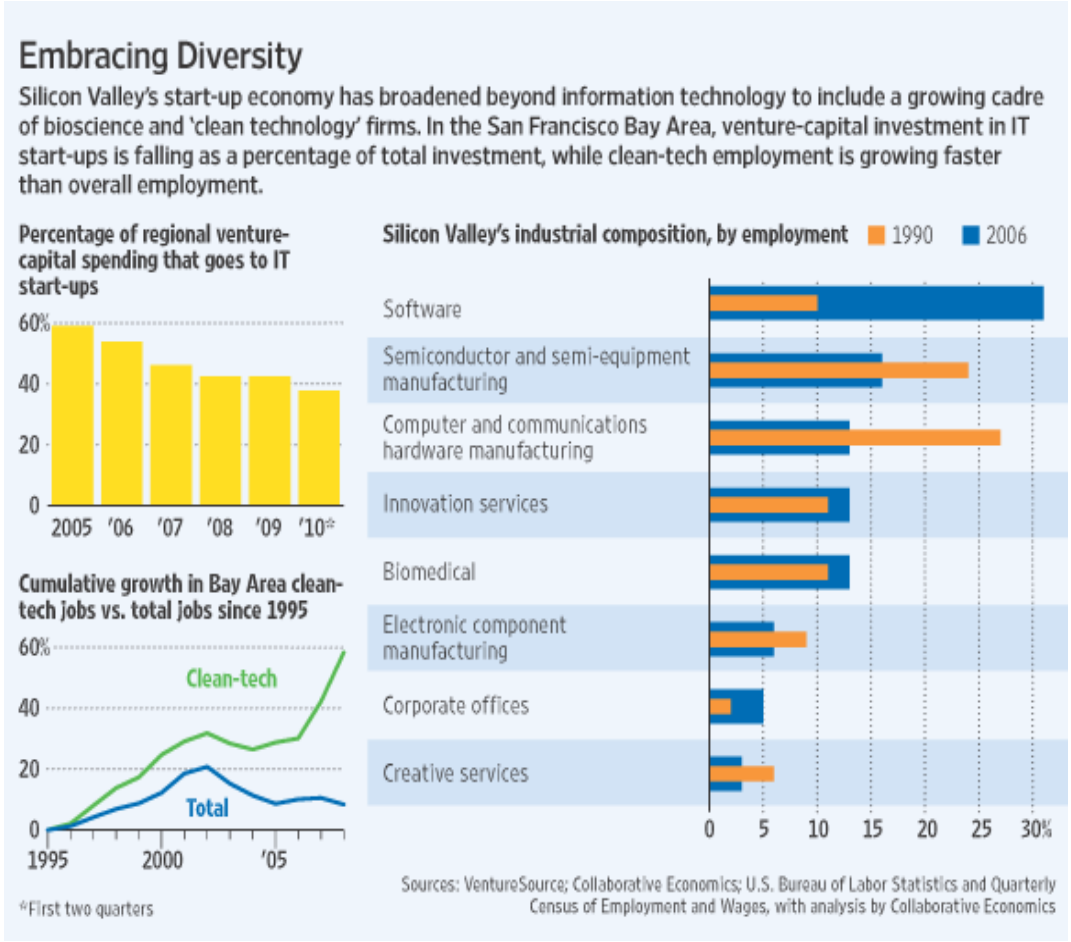


Recession proofing of the economy

- Aerospace and Life Science were the only 2 sectors that did not see a recession in 2008

A CAUTIONARY TALE: SILICON VALLEY

- Silicon Valley in the 1990s-2000s was almost exclusively IT and Semiconductor (silicon) companies, when the "dot-com" bust hit in 2000, vacancy rates increased to 25%
- Post-dot.com burst, Silicon Valley diversified into other technology industries: Clean Tech and Biosciences
- This diversification protected Silicon Valley from economic distress in the 2008 "Great Recession"



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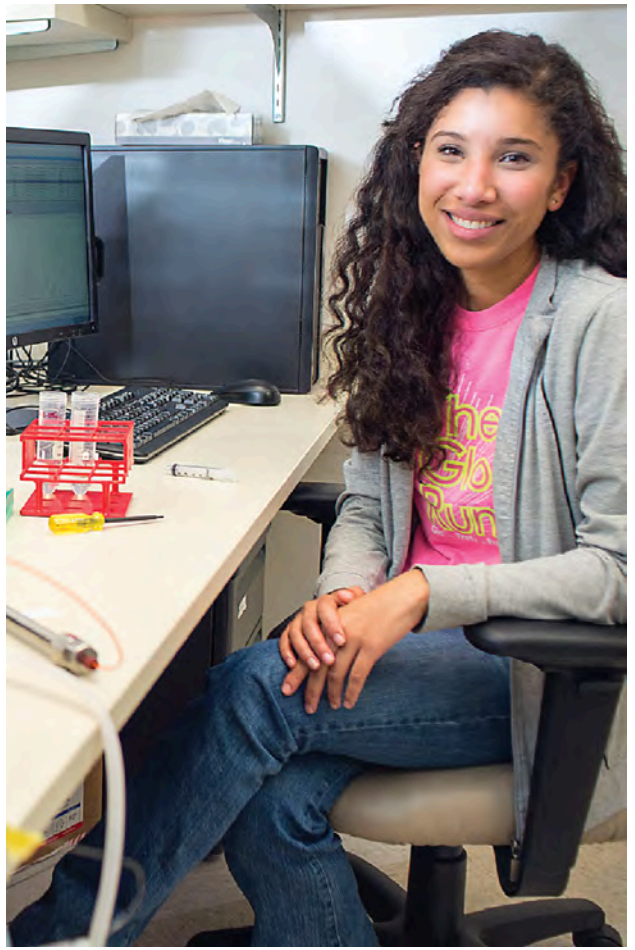
DIVERSE WORKFORCE OPTIONS

- Deep tech startups and small companies provide diverse employment options for Utah's STEM-educated workforce
- TBED programs like USTAR also provide resources for STEM entrepreneurs to start new deep tech businesses
- USTAR companies and researchers providing training, internship, and apprenticeship programs for university students in STEM fields
- Diverse employment options can help to stop Utah's graduate "brain drain"
    - 50% of graduates in aerospace and medical fields leave the state
    - 44% of graduates in engineering leave the state
- Texas has the best percentage of retained graduates at 77.75%



DEEP TECH ROOTS RUN DEEP

- High capital costs that are barrier to entry in early stages can provide geographic stability in later stages
- Developing critical mass in specific clusters can provide stability and growth opportunities
  - Example: Utah medical device community
- Many deep tech companies trace their histories in Utah back decades

→ BD

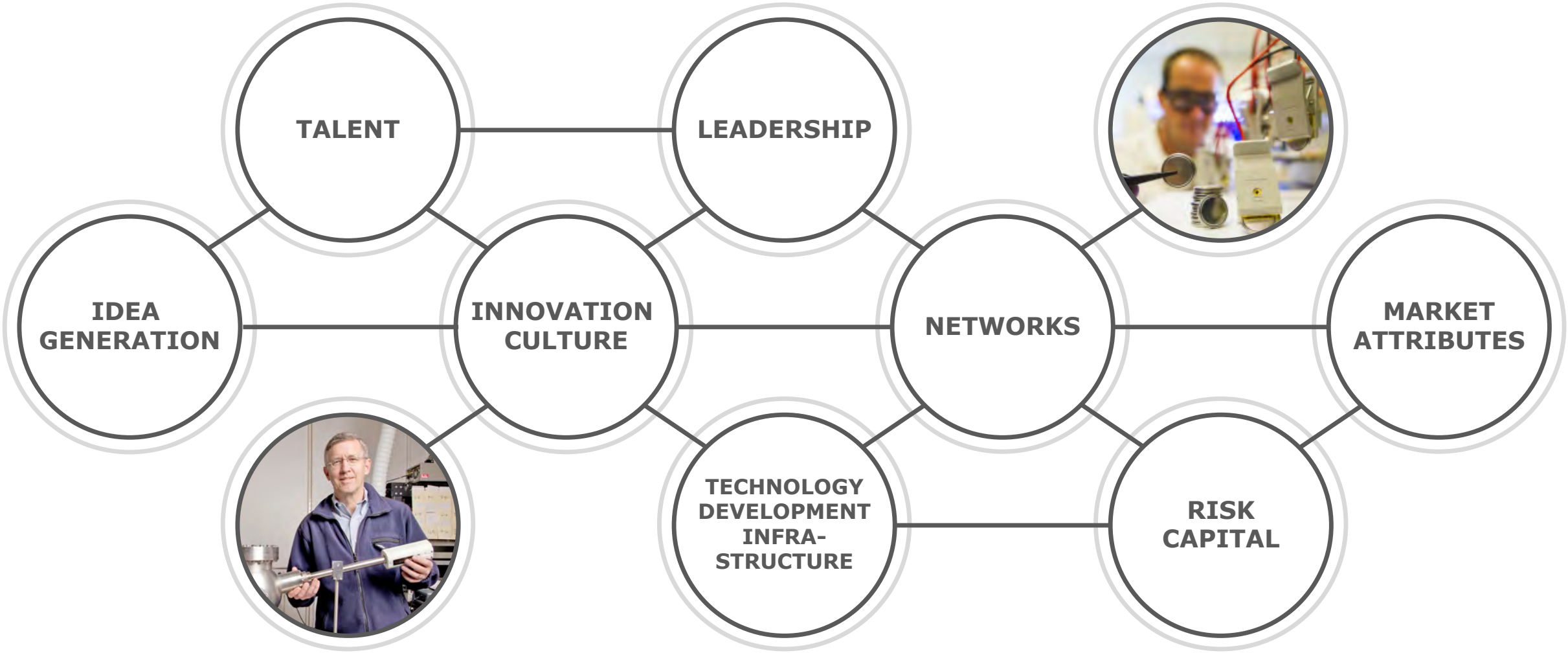
Thiokol → Orbital ATK → NORTHROP GRUMMAN

Innovation Infrastructure

INNOVATION INFRASTRUCTURE

- Build for Tommorrow
  - Fortune 500 and S&P 500
- Creating New Pies
- Examples of New Technologies
  - Horizontal drilling and fracking
  - Internet of Things
  - Genomics, genetics, personalized medicine
  - Autonomous systems

INNOVATION ECOSYSTEM



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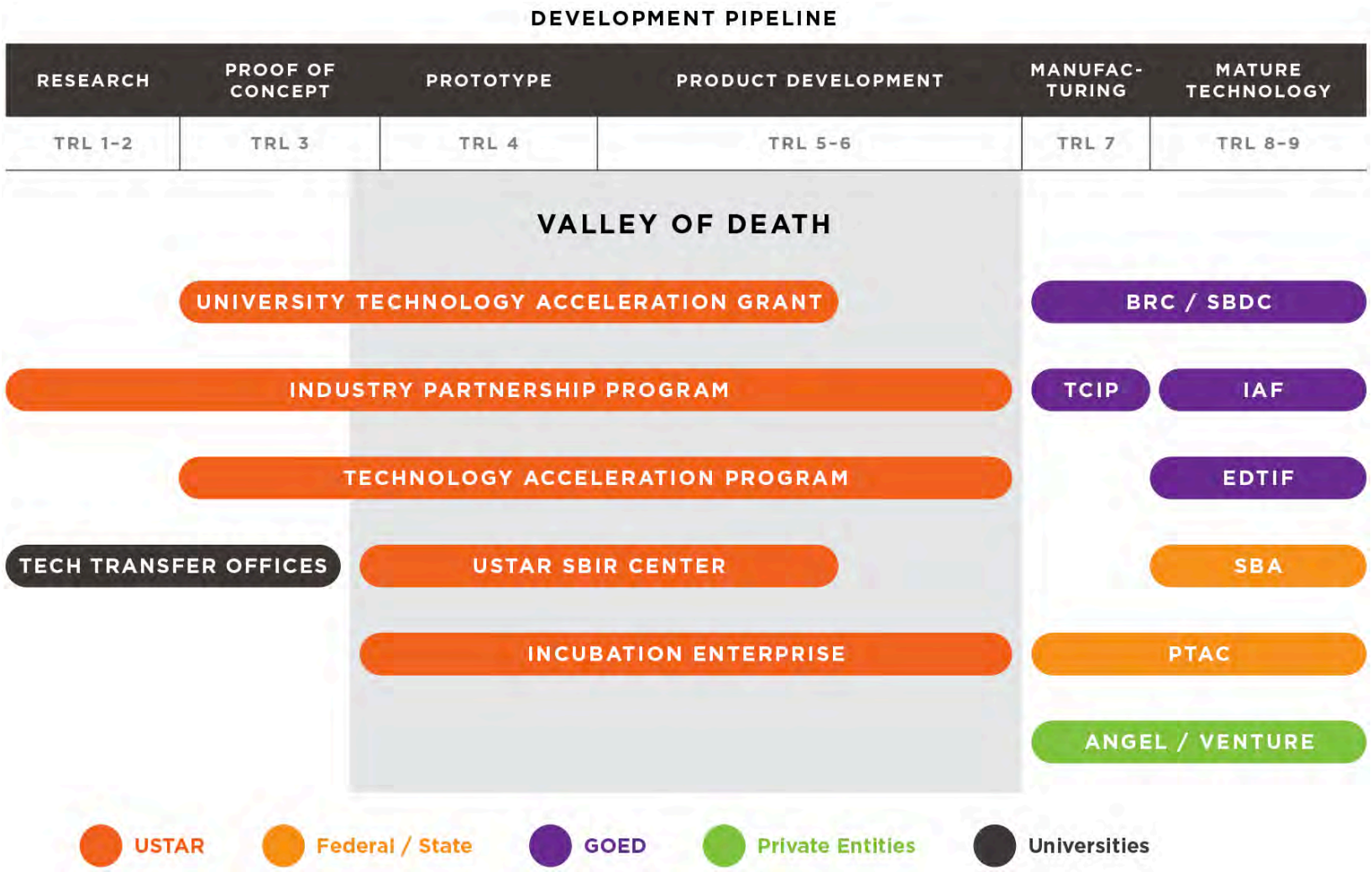
INNOVATION INFRASTRUCTURE ENTITIES



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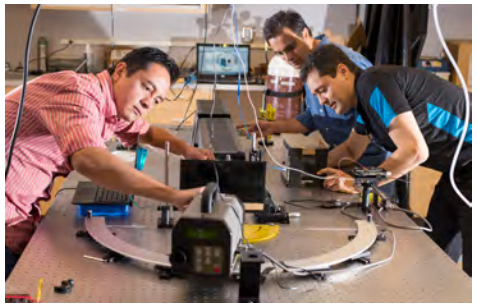
USTAR THEN & NOW

Legacy Programs

2006 - 2015

- Recruit faculty to UofU and USU
- Manage research buildings at UofU and USU
- Fund higher education institutions to conduct economic development activities (Weber State University, Utah Valley University, Dixie State University)



Current Programs

2016 - PRESENT

- Competitive grant programs
- Incubation/entrepreneur support services

USTAR STATEWIDE PROGRAMS

Competitive Grant Programs

Incubation / Technology Entrepreneur Services

Competitive Grants

COMPETITIVE GRANTS: TAP

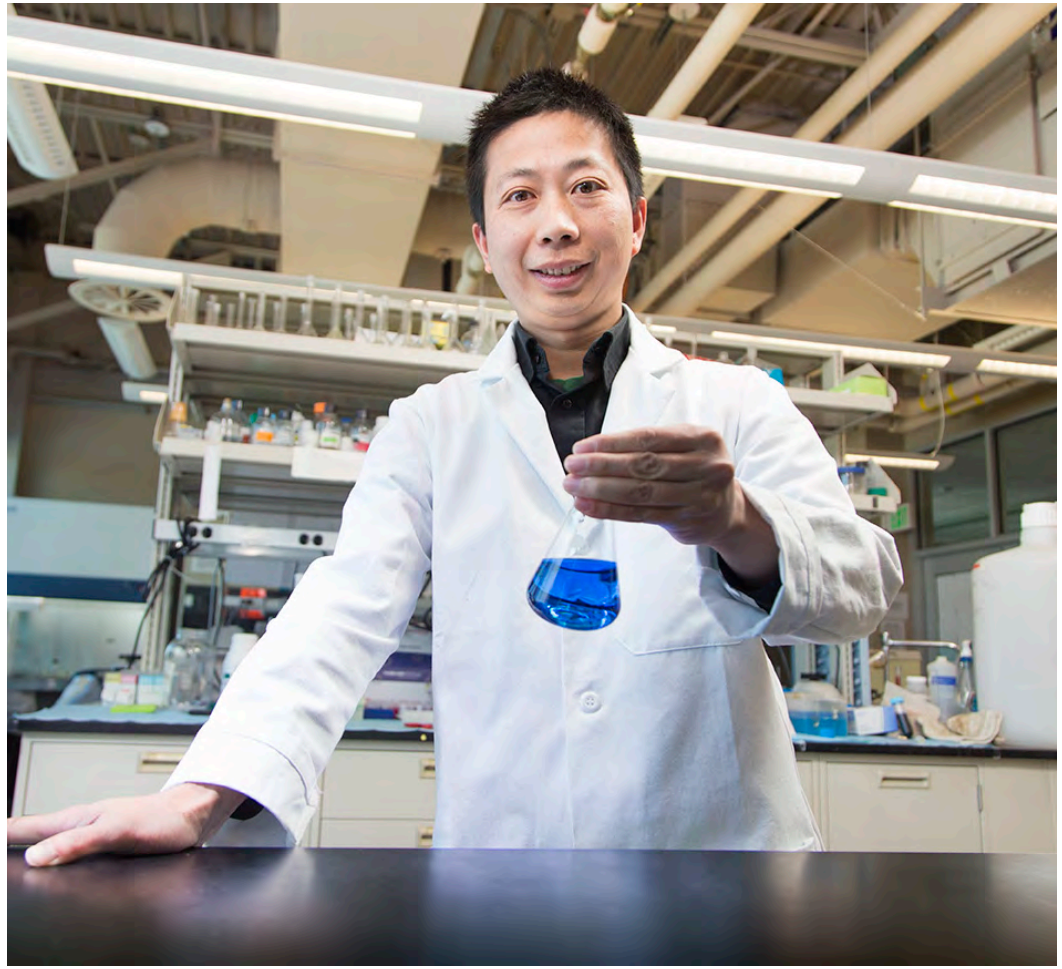
Technology Acceleration Program

Accelerates the development of commercially viable technology in emerging companies that is aligned to USTAR target technology areas

COMPETITIVE GRANTS: UTAG

University Technology Acceleration Grant

Accelerates the development of commercially viable technology aligned to USTAR target technology areas in the university setting



COMPETITIVE GRANTS: IPP

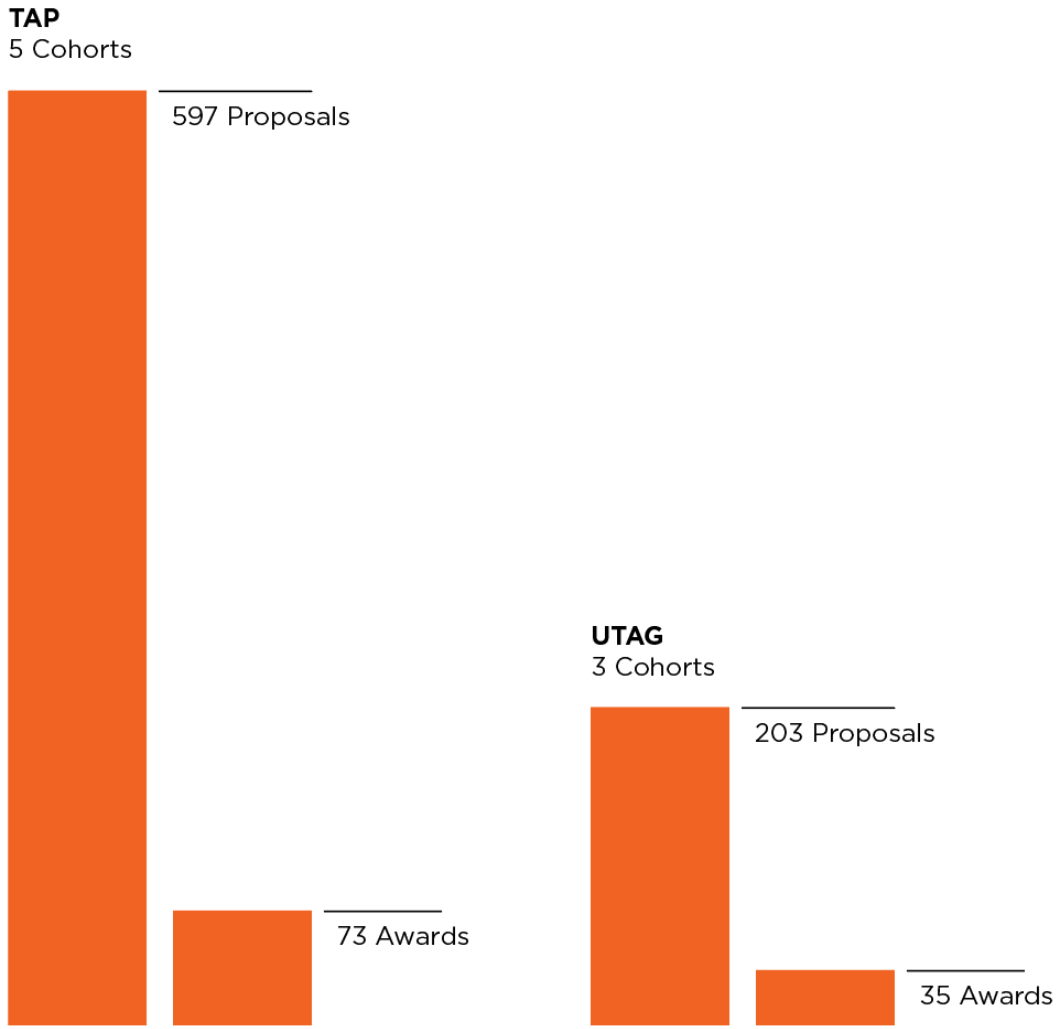
Industry Partnership Program

Supports partnerships between private industry and university researchers to address technology problems or gaps identified by the company

COMPETITIVE GRANTS: PROCESS

1. Targeted Technology Sectors, Admin Rules & Budgets Set by Governing Authority
2. Open Competitive Grant Solicitations
3. Letter of Intent & Application Submission
4. Administrative Review for Eligibility & Completeness
5. Peer Review by 1 Business & 2 Technical Experts*
6. Governing Authority Subcommittee Reviews Top Proposals & Makes Recommendations
7. Full Governing Authority Votes & Approves Winning Proposals
8. Contracts Negotiated & Milestones Finalized
9. USTAR Technical Staff Consults with Grantees
10. Milestone Completion Assessed by USTAR Technical Staff
11. Grant Funds Dispersed Upon Milestone Completion
12. Impact Data & Metrics Collected by Third Party Assessor**

COMPETITIVE GRANTS: DEMAND



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COMPETITIVE GRANTS: AVERAGE SIZE

Grant	Min	Max	Mean	Median	Number
TAP	$21,875	$567,997	$182,650	$183,400	73
UTAG*	$40,000	$499,907	$201,954	$193,222	34
IPP**	$10,000	$745,000	$260,602	$175,320	8
STIG	$29,170	$100,000	$73,981	$75,000	7
ERT	$15,000	$125,000	$77,500	$77,500	14

** Under UTAG, one project was funded at $1.6M. This was an outlier to fund a high potential grant that was matching funds.*

*** IPP requires $1:1 industry match*

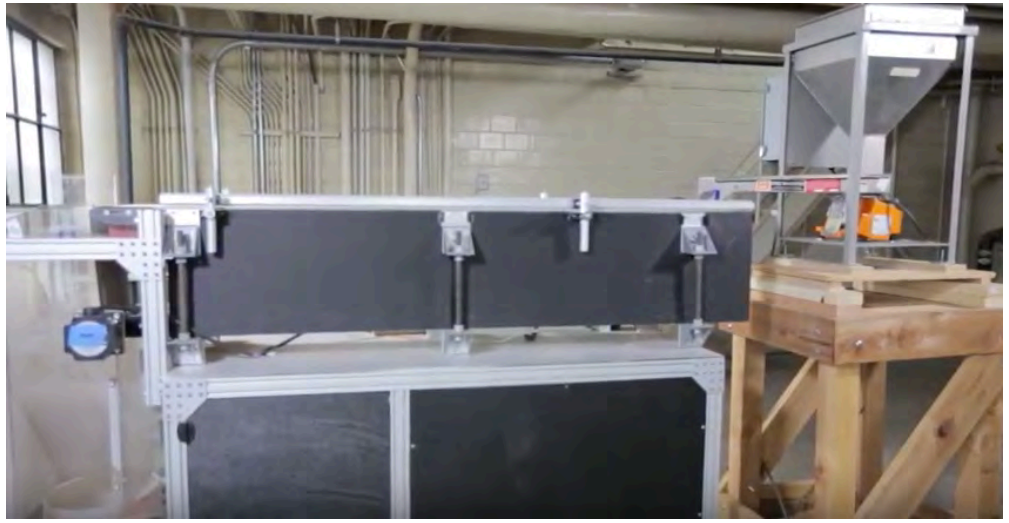
RAJ RAJAMANI (UTAG)

Technology: Automated recycling of copper, brass, aluminum from scrap

THE UNIVERSITY OF UTAH®

Impact:

- Licensed tech to Utah company, EDX Magnetics
- Rapid acceleration as a result of trade war with China



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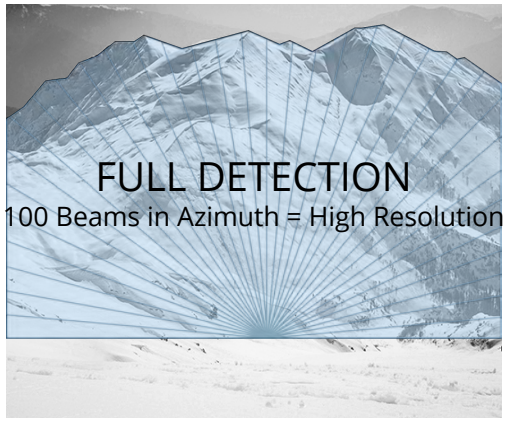
NIIVATECH (TAP)

Technology: Radar technology for ground-based applications

Impact:

- Received $70k grant from State DOT organization (TARP)
- Avalanche product release Summer 2018
- Sales in 2018

NIIVATECH



LESSONS LEARNED

1. Business milestones are important for assuring the business is viable if the technology development is successful

2. Milestones at least every 3 months to track progress

3. Independent reviewers are important for removing bias

4. Verification of eligibility requirements, particularly as they relate to IP ownership/licensing is important independently of company assertions

Incubator / Entrepreneur Support Services

TECHNOLOGY ENTREPRENEUR SERVICES

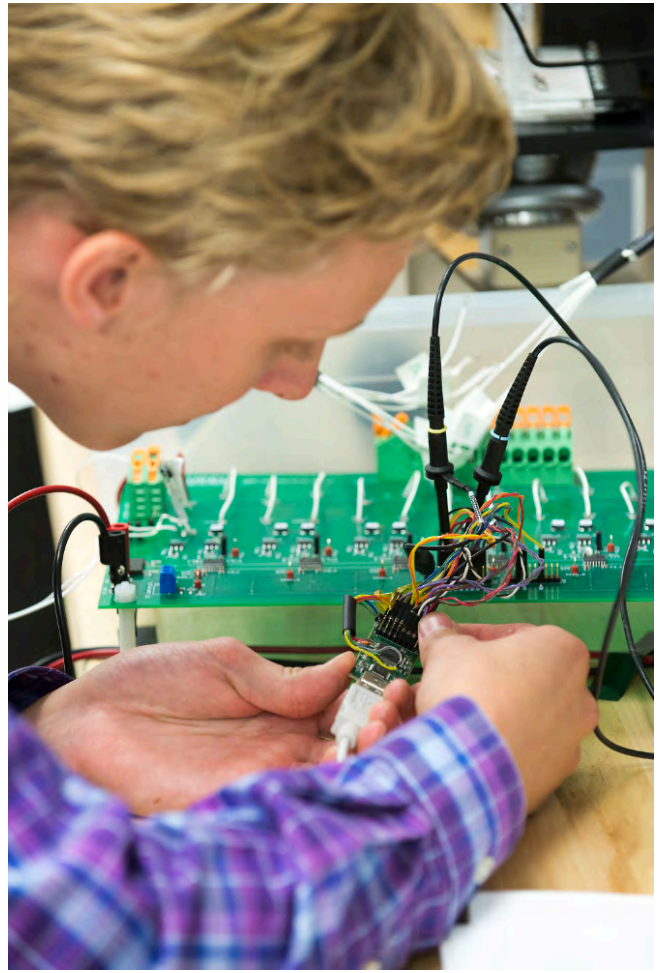
Resources for startups and emerging companies to successfully launch and grow their companies

USTAR SBIR Assistance Center

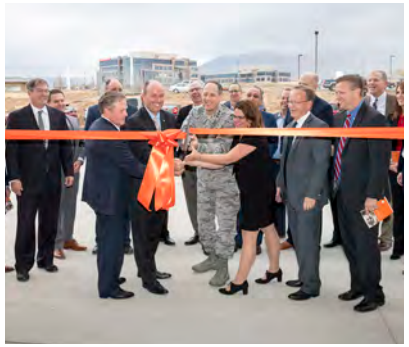
- Provides assistance to entrepreneurs applying for federal SBIR, STTR, and other technology commercialization programs
- 25% win rate

Satellite Offices

- Utah County
- Southern Utah



TECHNOLOGY ENTREPRENEUR SERVICES



Resources for startups and emerging companies to successfully launch and grow their companies

Incubation Enterprise

- USTAR Innovation Center
- BioInnovations Gateway

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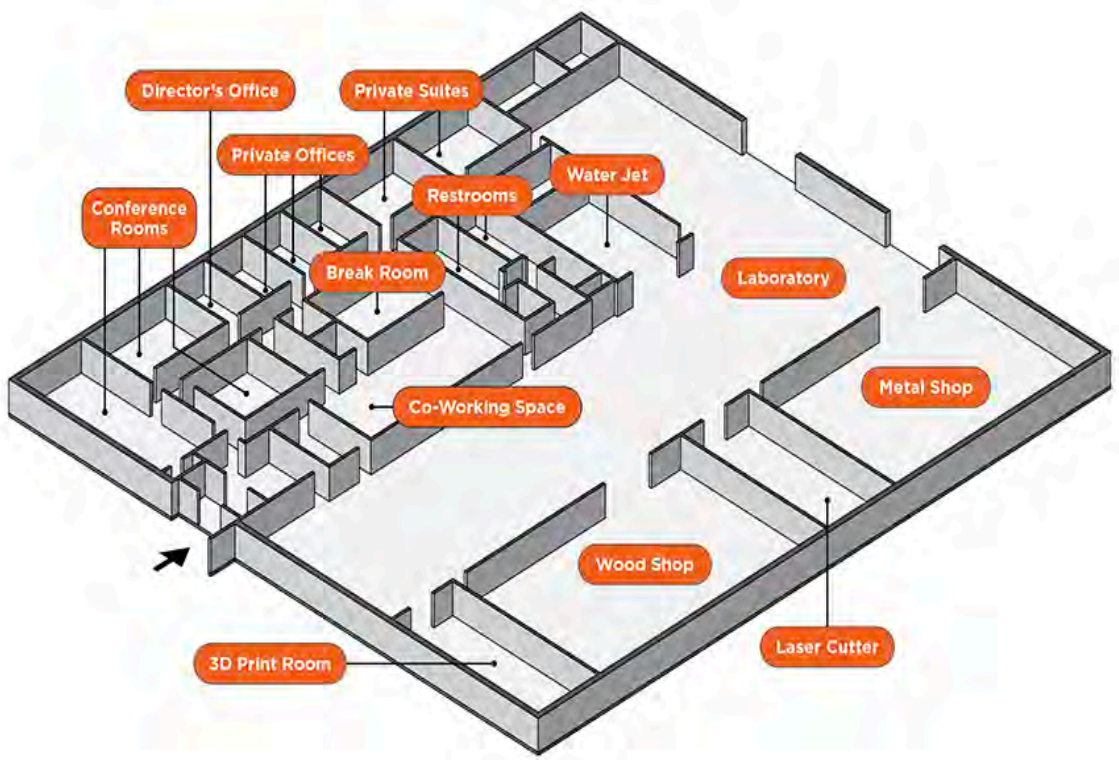
OXEON (TAP)

Technology: Can turn CO2 into oxygen (Mars) or can be used to create storable fuels from renewable energy

Impact:

- 12 new high-paying jobs
- First sales initiated
- Received NASA contract worth $3M directly attributable to TAP grant
- Established facility in Salt Lake County

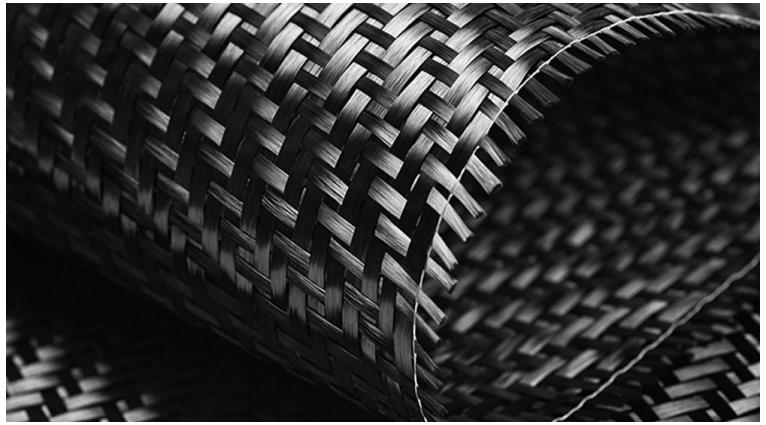
USTAR INNOVATION CENTER IMPACTS



- 5 early stage companies served since center opened
- $1.07M in follow on funding raised in one year
- 16 FT jobs created with average salary of $89,594
- 7 PT jobs created with average salary of $43,057
- One company has initial sales

Impact data is collected by TEConomy, an independent 3rd party on an annual basis.

USAF LIFECYCLE MANAGEMENT CENTER

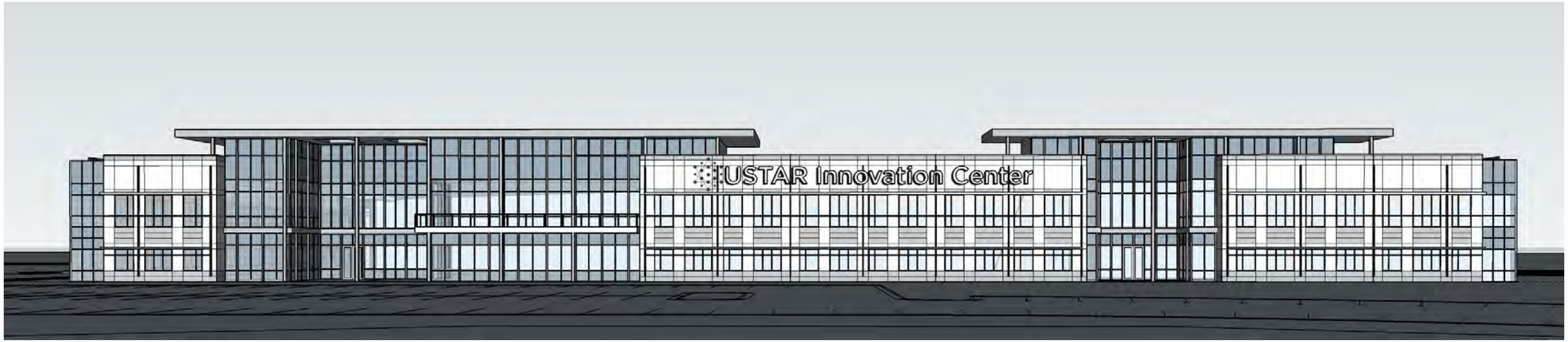


- USAF focus on innovation in sustainment
- Developing "ATTIC"s essentially innovation centers outside
  - Wright-Patterson Air Force Base, Ohio
  - Robbins Air Force Base, Georgia
  - Tinker Air Force Base, Oklahoma (Proposed)
  - Hill Air Force Base, Utah (Collaboration with USTAR)
- Each ATTIC has a specific focus on a major sustainment challenge
- Utah focus will be on composites
- SECAF approved USTAR-AFLCMC partnership
- AFLCMC has an IDIQ contract with Dayton University Research Institute

USTAR-USAF-UDRI COLLABORATION

- USTAR will be the partner for the Utah facility
- Center of Excellence for Composites
- USTAR will be a sub-contractor to UDRI
- Partnership will include purchase of equipment for engineering R&D, rotation of Hill engineers through the facility on 3-6 month innovation sabbaticals, integration of hands on engineering training in collaborations with educational institutions
- Benefit to USTAR
  - Access to equipment for Utah small businesses
  - Exposure to USAF problem sets, primes
  - Funding for the facility
  - Expansion of facility

USTAR-USAF-UDRI COLLABORATION



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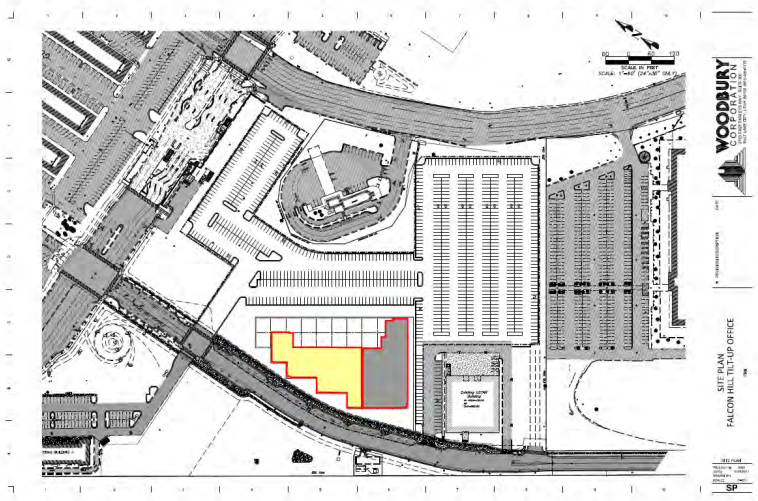
USTAR-USAF-UDRI COLLABORATION



	FY19	FY20
IC Lease	$488,670	$1,802,973
IC Fee Collections (80% Occupancy – AF & Client Co's)	$265,680	$265,680
USAF 3D Metal Printer Space	$154,233	$157,745
USAF Lease Payment		$1,559,523
Net USTAR cost	**$68,757**	**-$179,975**

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USTAR INNOVATION CENTER ADVISORY BOARD

Perry Oaks Lockheed Martin

Jeff Edwards
UAMMI

Taylor Woodbury
Woodbury Corp

Brad Mortensen
Weber State University

Commissioner Bret Millburn
Davis County

Mayor Mark Shepherd
Clearfield

Randy Tymofichuk
BAE Systems

Clint Devitt
Janicki Industries

BG Stacey Hawkins
HAFB
(pending legal approval)

Lori Belnap Pehrson
Northrop Grumman Corporation

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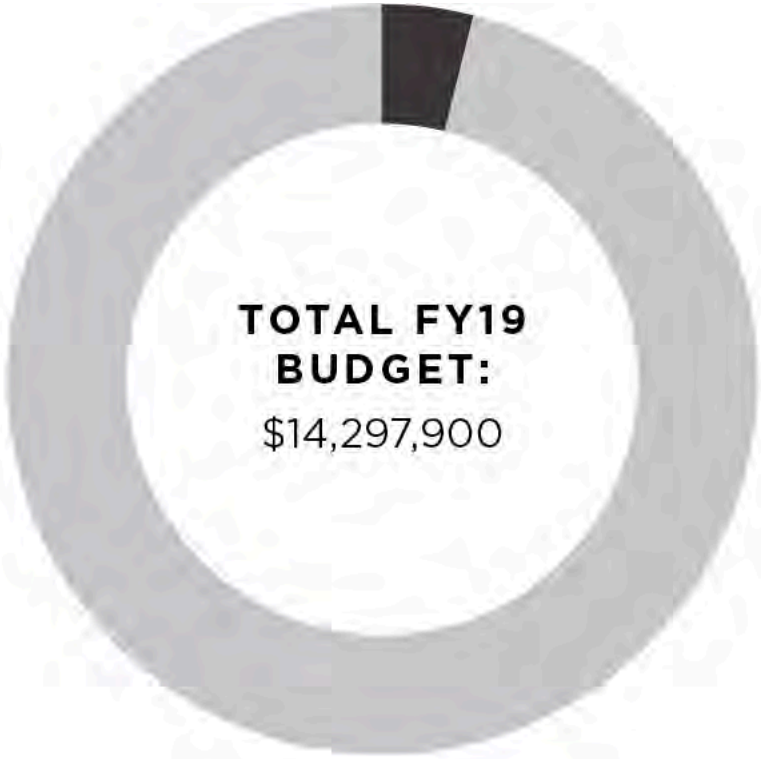
USTAR Internal Operations

USTAR FY19 BASE BUDGET

FY19 BUDGET

- **Administration** | 4% | $607,600
- **Program Management & Compliance** | 8% | $1,185,700
- **Technology Entrepreneur Services** | 23% | $3,284,600
- **Competitive Grants** | 65% | $9,220,000
- **University Researchers** | 0% | $0

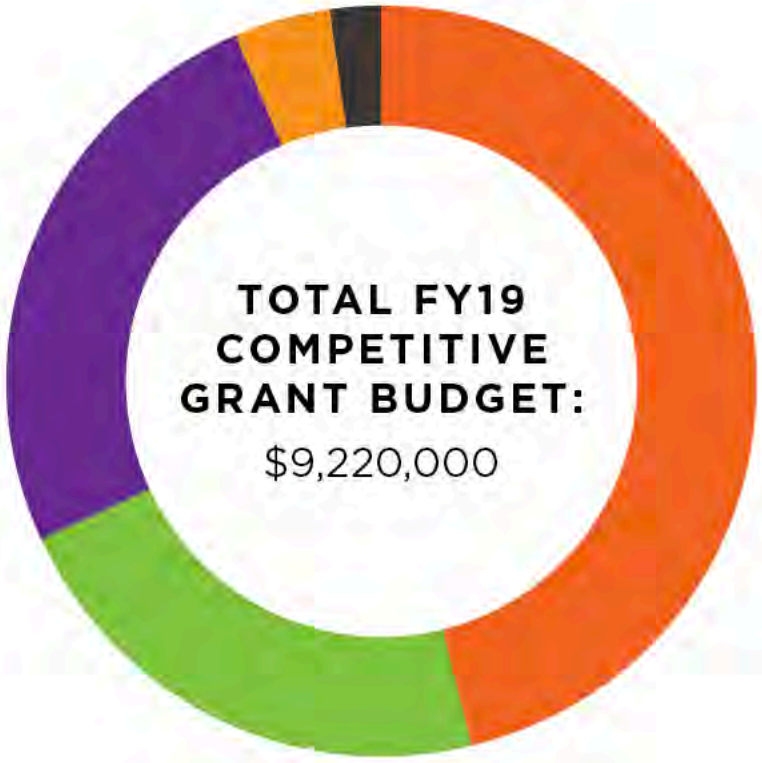
USTAR FY19 BASE BUDGET



ADMIN COSTS

- **Administration** | 4% | $607,600
- **Remainder of USTAR Budget** | 96% | $13,690,300

USTAR FY19 BASE BUDGET



COMPETITIVE GRANTS

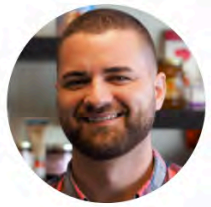
- **Technology Acceleration Program** | 46% | $4,275,000
- **University Technology Acceleration Grant** | 22% | $2,000,000
- **Industry Partnership Program** | 26% | $2,375,000
- **Energy Research Triangle** | 4% | $380,000
- **Science & Technology Initiation Grant** | 2% | $190,000

EXPERT STAFF

Ivy Estabrooke, Ph.D.
Executive Director
State Science Advisor

Barbara Araneo, Ph.D.
Emerging Technology
Development Lead

Lincoln Clark
Finance Director



Wayne Bradshaw
Director, USTAR
Incubation Enterprise

Brian Somers
Managing Director

Andrew Sweeney, Ph.D.
Emerging Technology
Development Lead

Mary Cardon
Director,
USTAR SBIR Center

Jared Goodspeed
Corporate &
Community
Outreach Manager

- 20 FTE
- 4 E-FTE Seasonal Interns
- 6 Locations
- State Science Advisor
- 3 PhDs
- **Deep staff experience:**
  - Tech commercialization
  - Economic development
  - Administration
  - Entrepreneurship
  - Research
  - Industry expertise
  - Public policy
  - Finance, budgeting, audit
  - Program management
  - Strategic partnerships
  - Systems strategy
  - Community outreach

WHY USTAR SHOULD REMAIN INDEPENDENT

- USTAR is a technical agency. ***It is critical to have technical expertise to run science and technology programs***
  - There are no technical staff managing other state tech commercialization and cluster programs
  - USTAR has 3 PhDs on staff and the State Science Advisor
  - USTAR has built an independent network of experts to provide peer review of grant proposals
    - Cadre of over 200 reviewers from 32 states and 11 countries
    - Technical reviews by PhD-level experts
    - Business/industry/market review by experts with substantial and verifiable experience
    - Strict conflict of interest (CoI) standards
  - Technical and business experts make decisions, not bureaucrats—Siri vs. Solyndra
  - USTAR technical staff work with awardees to assure they meet milestones—both business and technical
  - All USTAR grant and support programs are "high touch" and require staff experienced in tech commercialization, business scale-up, and related fields

WHY USTAR SHOULD REMAIN INDEPENDENT

- USTAR's grant processes are far more rigorous and transparent than other state tech commercialization programs
- USTAR's grants management, contacting, verification, disbursement, and reporting processes are more efficient and effective than other state tech commercialization programs
- Having a technical expert lead USTAR has allowed for the recruitment of other technical staff, created partnering opportunities with industry, academic, military, and national research organizations, and given exposure to Utah's innovation ecosystem which would likely be unavailable to a non-technical or less experienced manager
- USTAR's operational, support, outreach, and other ancillary programs perform to a higher level of efficiency and professionalism than those at other agencies
- USTAR has lower admin cost ratios than other state economic development agencies. Also, any potential admin savings are likely to be overstated given challenges in absorbing existing programs, grantees, contracts, etc., into another agency likely already at full capacity
- USTAR's Governing Authority is composed of appointees from the Governor, Senate President, House Speaker, Commissioner of Higher Education, and statutory appointees (including the State Treasurer). Other economic development agency boards are wholly appointed by the Governor

Success Metrics / Impact Data

SUCCESS METRICS

308 university students trained in a single year through the University Technology Acceleration Grant

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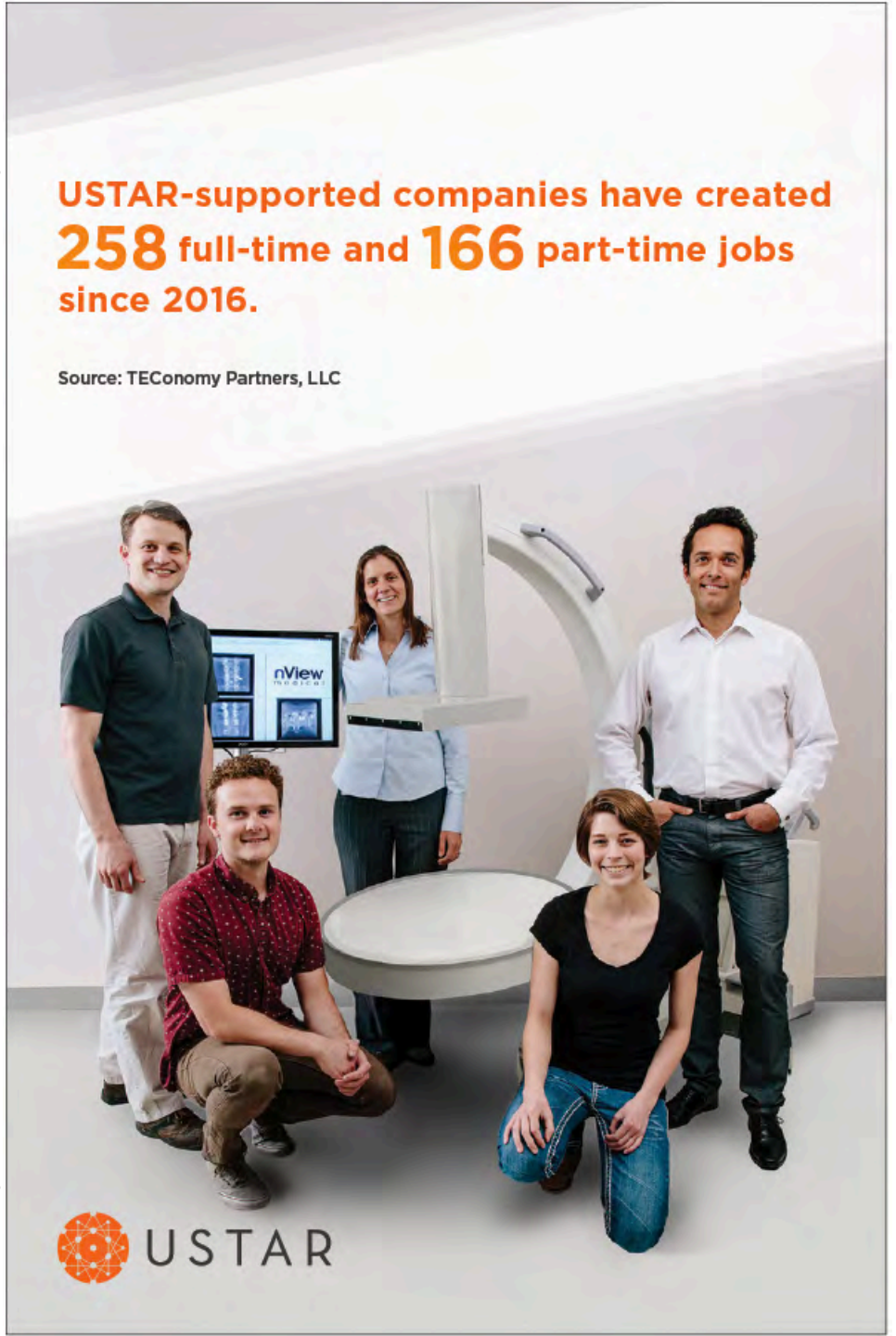
SUCCESS METRICS

USTAR-supported companies have created 258 full-time and 166 part-time jobs since 2016.



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SUCCESS METRICS

USTAR-supported companies have generated over $22M in sales from commercialized products.

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SUCCESS METRICS

Companies in USTAR's Technology Acceleration Program (TAP) received $26.2M in follow-on funding in 2017: 4.5 times the amount of the grants awarded.

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SUCCESS METRICS

Researchers awarded USTAR's University Technology Acceleration Grant (UTAG) received $17.4M in leveraged funding in 2017: 3 times the amount of the grants awarded.

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SUCCESS METRICS

USTAR-supported companies have received more than $123M in follow-on funding since 2016.

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Legislative Proposal

LEGISLATIVE PROPOSAL

Streamline USTAR Grant Programs

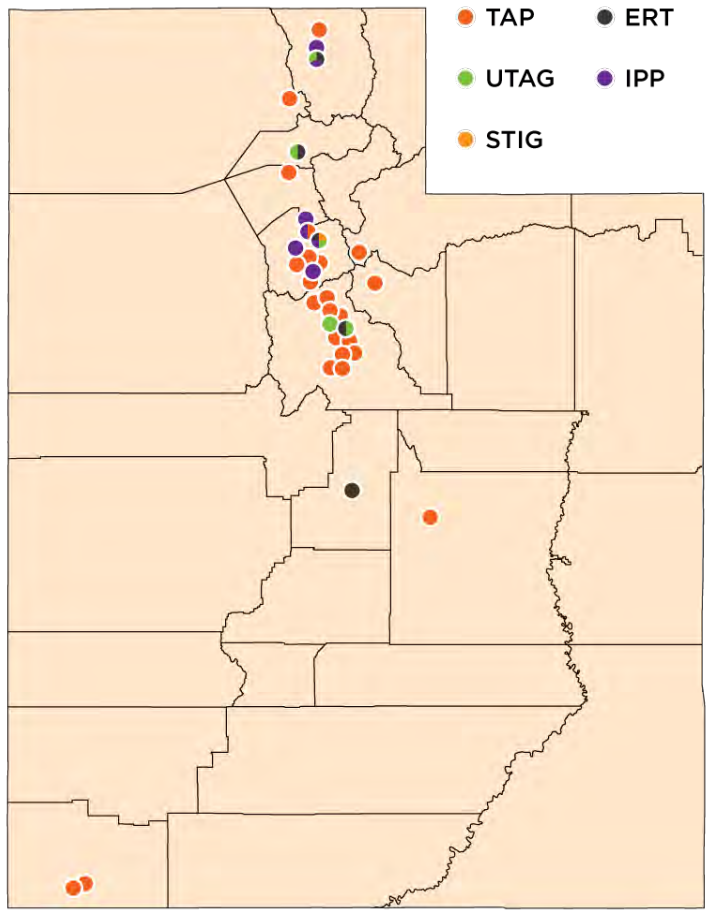
- Eliminate Science & Technology Initiation Grant (STIG)
- Eliminate Energy Research Triangle (ERT) Grant

Find Efficiencies between Economic Development Entities

- Partner with other economic development partners for basic business mentoring and resource discovery services
  - Eliminate USTAR Lean Launchpad Program
  - Partner with Small Business Development Centers (SBDC), tech transfer offices, private-sector organizations (Grow Utah, Goldman Sachs 10,000 Business, etc.) to provide services
  - Partner to provide technical mentors where needed

Create Grant Program for Underserved Populations

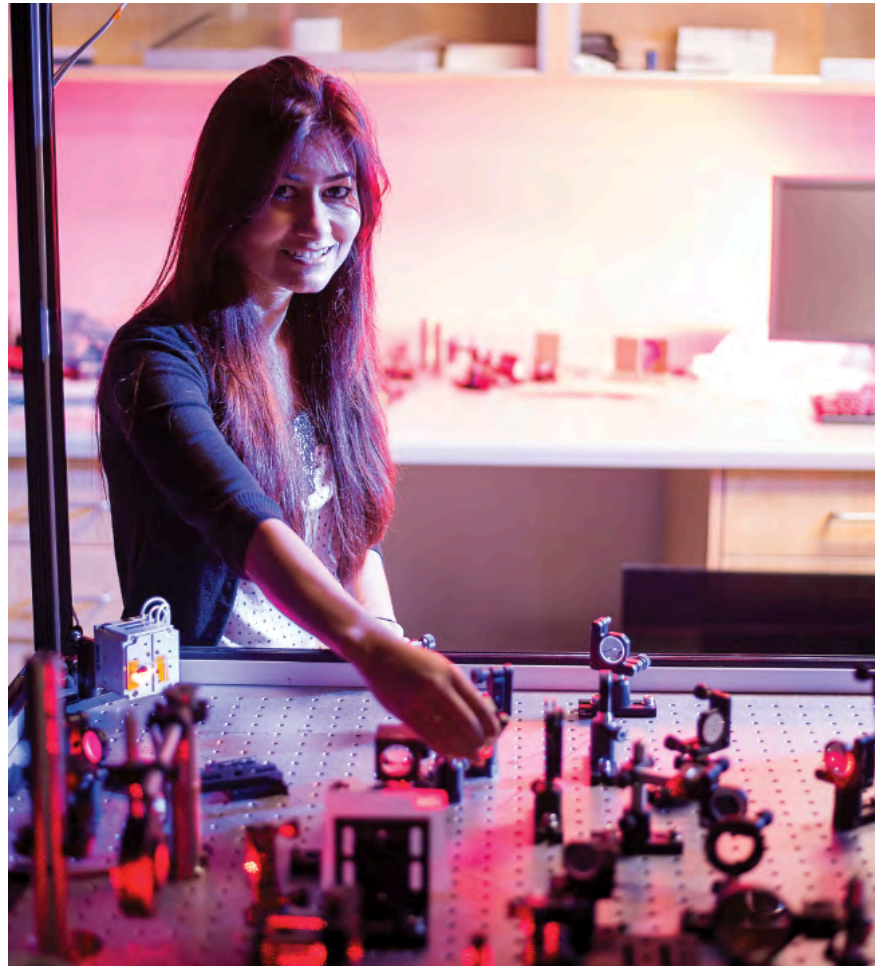
- Create focused TAP program for underserved populations
  - Tech entrepreneurs in rural counties
  - Woman-owned, veteran-owned, minority owned (8a) companies
  - Adjust economic impact criteria in rubric to recognize relative value of rural jobs vs. jobs on Wasatch Front



LEGISLATIVE PROPOSAL

Find Efficiencies between Economic Development Entities

- Combine TCIP and TAP tech commercialization programs
  - Eliminate TCIP grants for companies at Technology Readiness Levels (TRL) 7-9
  - Expand TAP grant program from TRL 3-5 to TRL 3-6
  - Use USTAR's established targeted technology sectors to determine eligibility, eliminating state competition and redundancies with the private market in industries where there is no market failure in Utah
  - Use USTAR's established processes and rules for grant solicitation, review, award, contracting, milestone-based funding, and reporting, eliminating less effective processes and conflicts of interest inherent in TCIP's system
  - Use USTAR's grants management system, eliminating less efficient TCIP system
  - Use existing USTAR staff to manage combined program, repurposing one GOED FTE



LEGISLATIVE PROPOSAL

Make Grant Funds More Self-Sustaining

- COA 1: Convert Technology Acceleration Grants (TAP) to non-recourse loans
- COA 2: Convert Technology Acceleration Grants (TAP) to convertible notes
- COA 3: Convert Technology Acceleration Grants (TAP) to hybrid program of grants and convertible note
- COA 4: Retain Current Structure of Technology Acceleration Grants (TAP) Program

OPTION 1: NON-RECOURSE LOANS

Non-Recourse Loans: Loan that does not require repayment if business venture fails.

Legislative Action: Require statute change to allow USTAR authority to provide loans.

PROS:

- Provides state return on successful companies
- Does not require significant staffing changes to execute, estimate additional 0.5 FTE of legal support

CONS: Will only return portion of investment made by state. Minimal room for "upside" return

Consideration: Must be structured so as not to impact cap table making companies less desirable to private investors

OPTION 2: CONVERTIBLE NOTE

Convertible Note: A debt option that requires interest but can convert to equity when company raises a funding round.

Legislative Action: (1) Make constitutional change to allow USTAR authority to hold equity. OR (2) Require statute change to allow USTAR authority to issue convertible notes and the establishment of a foundation or other arm of USTAR that can hold equity. (e.g. STEM Action Center Foundation, UofU Research Foundation)

PROS:

- Provides state upside return from successful companies
- Doesn't require a USTAR/State to negotiate valuation on early stage companies, valuation determined with companies private funding round
- State can hold equity or request loan payback at time of private funding round
- Will require minimum FTE changes at USTAR, 1 FTE legal support

CONS:

- Equity may not become liquid/return to state for decades after investment (e.g. acquisition, merger or IPO)

OPTION 3: HYBRID APPROACH

Grant & Convertible Note Combination: Provides a mixed model to de-risk technology and allow state to reap financial benefit. For awards to develop technology between TRL 3-4 and less than $150k, provide grant. For technologies between a 5-6 and above $150k, use a convertible note.

Legislative Action: Change 1x funding to ongoing for USTAR grant programs AND, EITHER: (1) Make constitutional change to allow USTAR authority to hold equity. OR (2) Require statute change to allow USTAR authority to issue convertible notes and the establishment of a foundation or other arm of USTAR that can hold equity. (e.g. STEM Action Center Foundation, UofU Research Foundation)

Pros: Maintains the best of both models while assuring return to the state for less risky work.

Cons: Additional complexity to programs. May create "gaming" of system to underestimate TRL or short the budget.

OPTION 4: GRANTS

Grant: Non-dilutive funding to de-risk technology.

Legislative Action: Change 1x funding to ongoing for USTAR grant programs for FY19, and redirect grant funds back to USTAR grant line item for FY20.

PROS:

- Private sector company maintains ownership of company
- Maintains attractiveness of the company to private investors
- Allows USTAR to stay agile in assuring programs meet market failures

CONS:

- Return to state is measured in secondary impacts, like follow on funding, job creation, etc.

LEGISLATIVE PROPOSAL

Funding

1. Repurpose budgeted funds saved from elimination of ERT and STIG grant programs and elimination of subsidy of Nanofabrication Facility at the University of Utah to restore University Technology Acceleration Grant (UTAG) funding:

ERT: *$400,000*
STIG: *$170,000*
Nanofab: *$150,000*

Total to transfer to UTAG: $820,000

2. Repurpose budgeted funds saved from elimination of subsidy of Synthetic BioManufacturing Facility (SBMF) at Utah State University, funds saved from restructure of TCIP, and funds from Office of Rural Development (ORD) to fund new TAP Grants for underserved populations:

SBMF: *$300,000*
TCIP: *$150,000*
ORD: *$50,000*

Total to transfer to underserved TAP: $500,000

LEGISLATIVE PROPOSAL

Funding

3. Transfer portion of appropriated funds from TCIP to fund expanded TAP Grants:

TCIP: $800,000

Total to transfer to expanded TAP: $800,000

4. Return savings to restricted account:

SBMF: $200,000

TCIP: $1,800,000

Total savings to return to restricted account: $2,000,000

Thank You