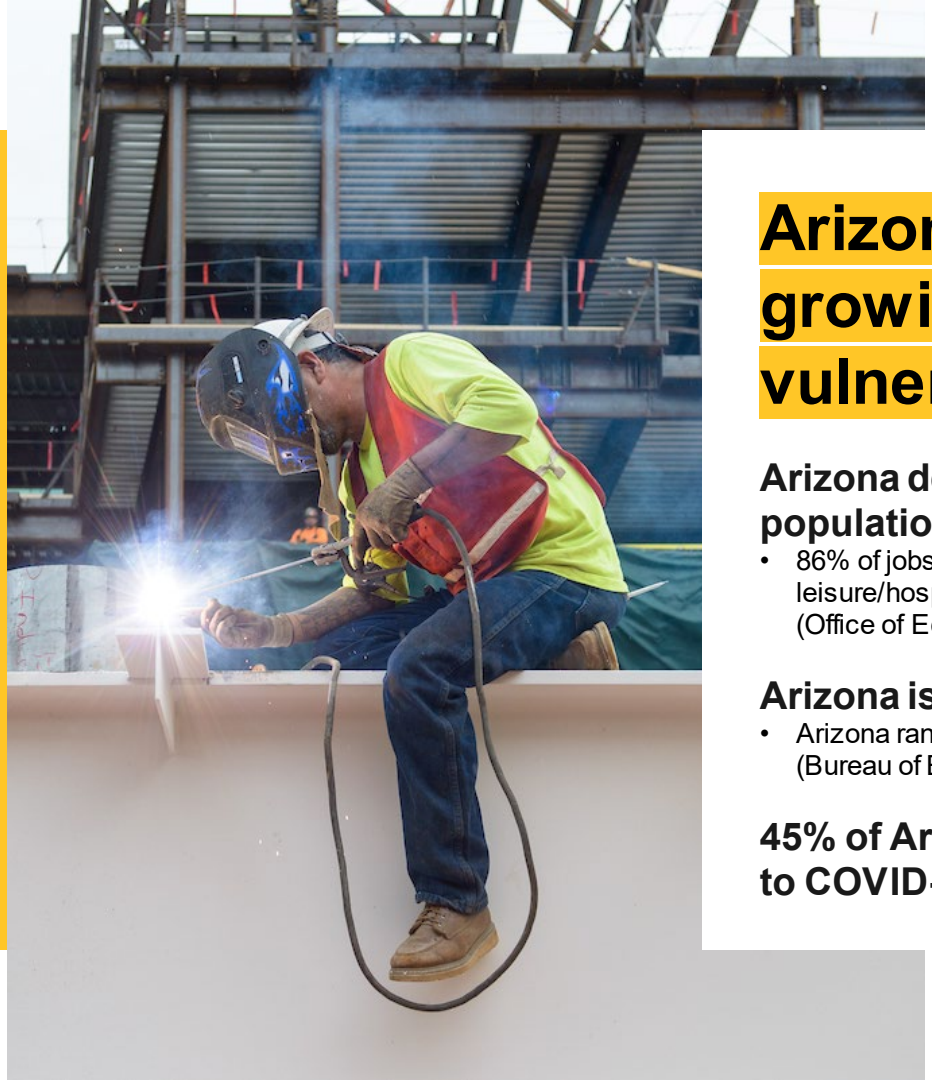
New Economy Initiative

Catalyzing a Future of Sustained Prosperity for Arizona



Arizona's economy is growing… but remains vulnerable

Arizona depends on industries that service population growth

- 86% of jobs created from May 2020-May 2021 were in leisure/hospitality, transportation, utilities, education, and health (Office of Economic Opportunity, 2021)

Arizona is still creating mostly low wage jobs

- Arizona ranks 42nd for per capita personal income (Bureau of Economic Analysis, 2021)

45% of Arizonans have lost income due to COVID-19 (Gallup, 2021)

Arizona needs a path to anti-fragility

Fragile

The quality of being **easily broken or damaged**.
—The Oxford Dictionary

Resilient

"The capacity of a system to absorb disturbance and re-organize while undergoing change so as to still retain **essentially the same** function, structure, identity and feedbacks."
—Walker et al., *Ecology and Society*, 2004

Anti-fragile

Something that "**thrives and grows** when exposed to volatility, randomness, disorder, and stressors and loves adventures, risk, and uncertainty."
—Nassim Taleb, author of *The Black Swan*, 2007

What is the New Economy?

Industries of the the future go by many names:

- The Knowledge Economy
- The Sharing Economy
- The Gig Economy
- The Data Economy
- The 4th Industrial Revolution

The future is technology-driven: digital, autonomous, virtual, data-intensive

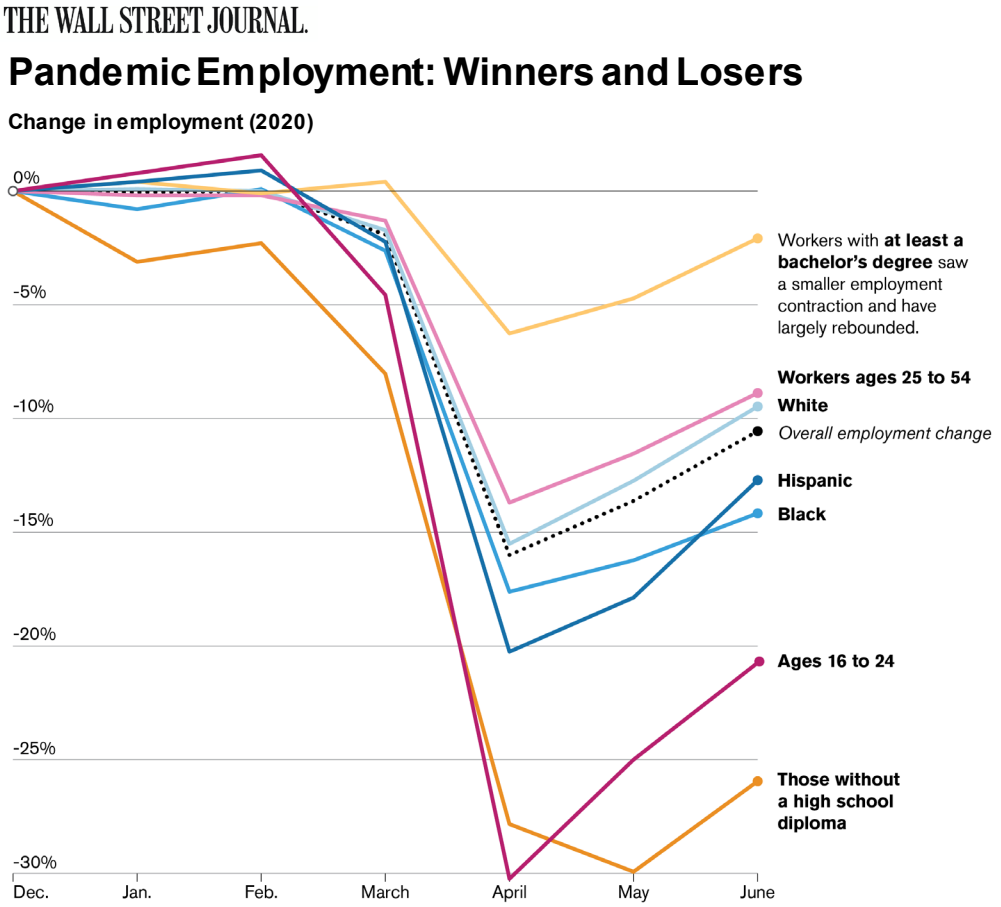
Technology creates new jobs in every generation…

What are New Economy industries?

- Advanced manufacturing + materials
- Artificial intelligence
- Automation/robotics
- Big data
- Biosciences + personalized medicine
- Cybersecurity
- Digital media
- Virtual/augmented reality

What COVID-19 revealed about the New Economy

- 10 million+ jobs lost
- Workers with a bachelor's degree or more were less affected and recovered more quickly
- Metros with clusters of New Economy industries were least affected



New Economy Initiative

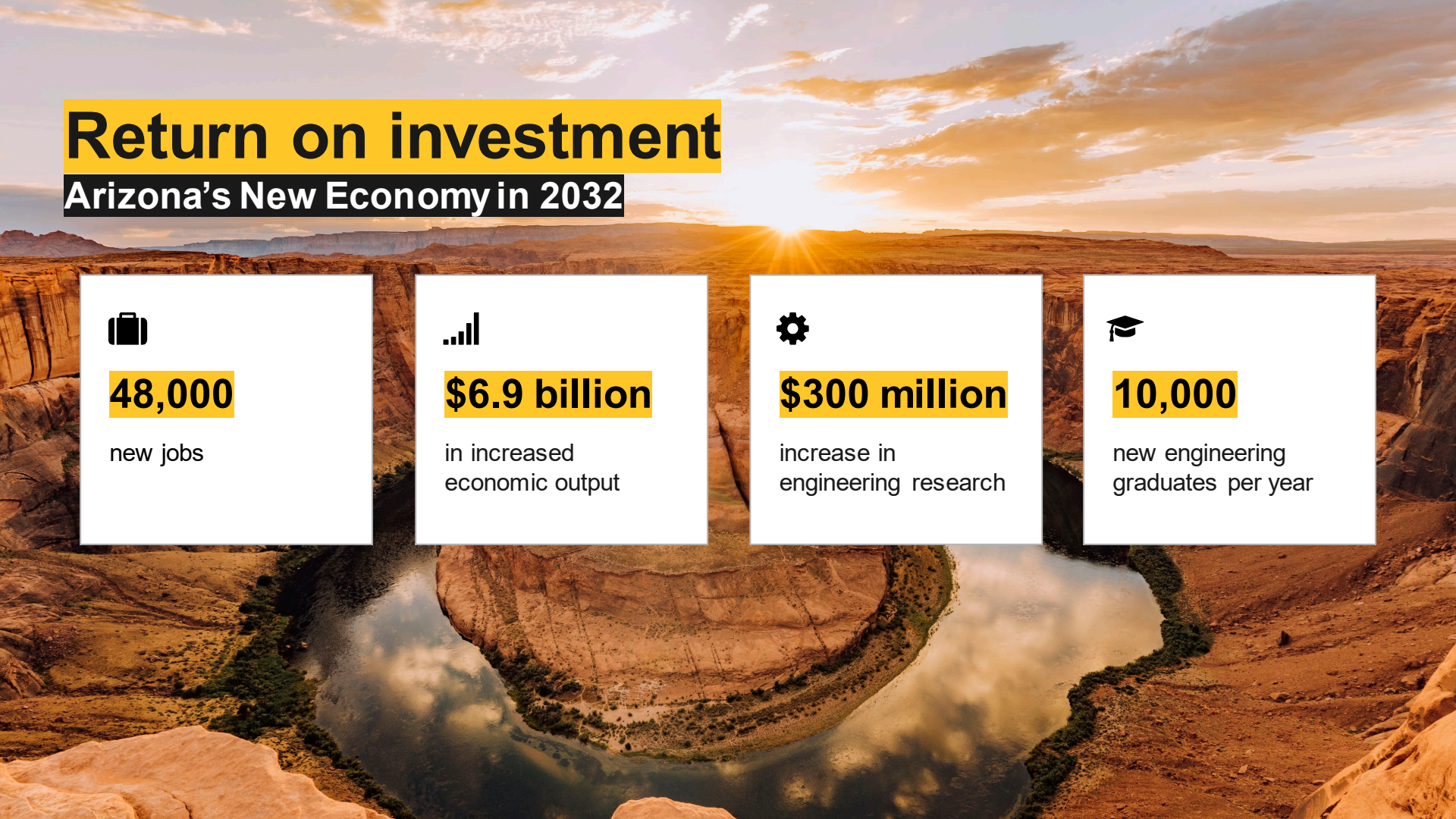
Accelerates talent and skills development

Advances innovation that drives industrial growth by leveraging Arizona's public universities

Strengthens Arizona as a New Economy leader

Creating a foundation for sustained prosperity through:

- **Public + private investment** in New Economy industries builds on Arizona's business-friendly environment
- **Building capacity** at Arizona's flagship public universities
- **Partnership and support** from Arizona's leading enterprises



Return on investment

Arizona's New Economy in 2032

48,000

new jobs

$6.9 billion

in increased economic output

$300 million

increase in engineering research

10,000

new engineering graduates per year

Arizona competes with other states for jobs and industries

- Western states like Texas, Colorado, Utah and Washington have made vast investments in the New Economy
- Silicon Valley is dispersing through remote work and industrial relocation (Tesla and HP in Texas)
- Industry giants are entering into different metros (Amazon in D.C., Facebook in NYC)

Family incomes in Arizona are middling

Median household income rankings across U.S. states, 2020

1 District of Columbia

2 Maryland

3 Massachusetts

4 New Jersey

5 Hawaii

6 California

7 New Hampshire

8 Washington

9 Alaska

10 Connecticut

. . .

25

Arizona, with a median household income of $64,777

Source: U.S. Census Bureau

Metros compete for New Economy talent

Median household income rankings in most populous U.S. metros, 2019

1 San Francisco, CA

2 Washington, DC

3 Boston, MA

4 Seattle, WA

5 Denver, CO

6 San Diego, CA

7 Minneapolis, MN

8 Baltimore, MD

9 New York, NY

10 Portland, OR

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Phoenix, AZ, with a median household income of $67,896

Source: U.S. Census Bureau

ASU Charter: our commitment to Arizona

ASU is a comprehensive **public research university,** measured not by whom it excludes, but by **whom it includes** and **how they succeed;** advancing **research and discovery** of public value; and assuming **fundamental responsibility** for the economic, social, cultural and overall health of the **communities it serves.**

ASU is driving the New Economy with:

A strong foundation in research and training
Fulton Schools of Engineering, Biodesign Institute, ASU-Mayo partnership, ASU at Mesa City Center

Deep partnerships
Industry, philanthropy, civic organizations, communities

Leveraging state and federal investment
$35 million in NEI funding; 5x growth in federal research expenditures

ASU's New Economy Initiative assignment from the state

Workforce development

New graduates, re-training and upskilling for existing workforce

Science and Technology Centers

Catalyze industry-relevant research, development and manufacturing

Support New Economy enterprises

Multiple ASU units partnering with enterprise and supporting entrepreneurship

Building the New Economy workforce

Enhancing job readiness

through hands-on research experiences

Accelerated learning

through hybrid online/in-person models

Upskilling the current workforce

through stackable certificates, micro-degrees, badges and other credentials

Increasing graduation rates

and decreasing time-to-degree through AI-infused advising platforms

Increasing capacity to serve students

by attracting world-class faculty

ASU’s pathway for Arizona’s New Economy workforce, 2025

6,000

new high-wage jobs in engineering per year

40,000

students enrolled in Fulton Schools of Engineering

ASU is #1

in the production of technical talent in the U.S.


ASU is currently seeking a public investment of
$34.5M
for FY23

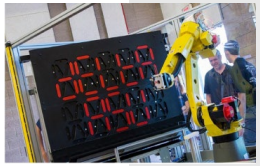
How does the New Economy Initiative enable student success?

- Experiential learning programs
- Outreach, coaching, and career services
- New academic programs connected to the New Economy
- Creating opportunities for students to make an impact

Science and Technology Centers (STCs)

Advancing industry-linked research and innovation

These five STCs will add to Arizona's existing two applied research centers focused on industry-led research – **WearTech** and **Blockchain**



MADE (Advanced manufacturing)

Focus on new technologies that strengthen links to private industry support in aerospace and defense

AMPED (Energy, materials and devices)

Focus on advancing new energy materials and device technologies to market, growing industry engagement

Extreme environments

Focus on engineering resiliency into transportation, energy, water and materials systems of future cities

Human performance

Focus on enhancing physical and cognitive performance, as well as medical prevention and intervention

Future communications technologies

Focus on driving Arizona to the forefront of physical information systems for sensing and communications

MADE STC

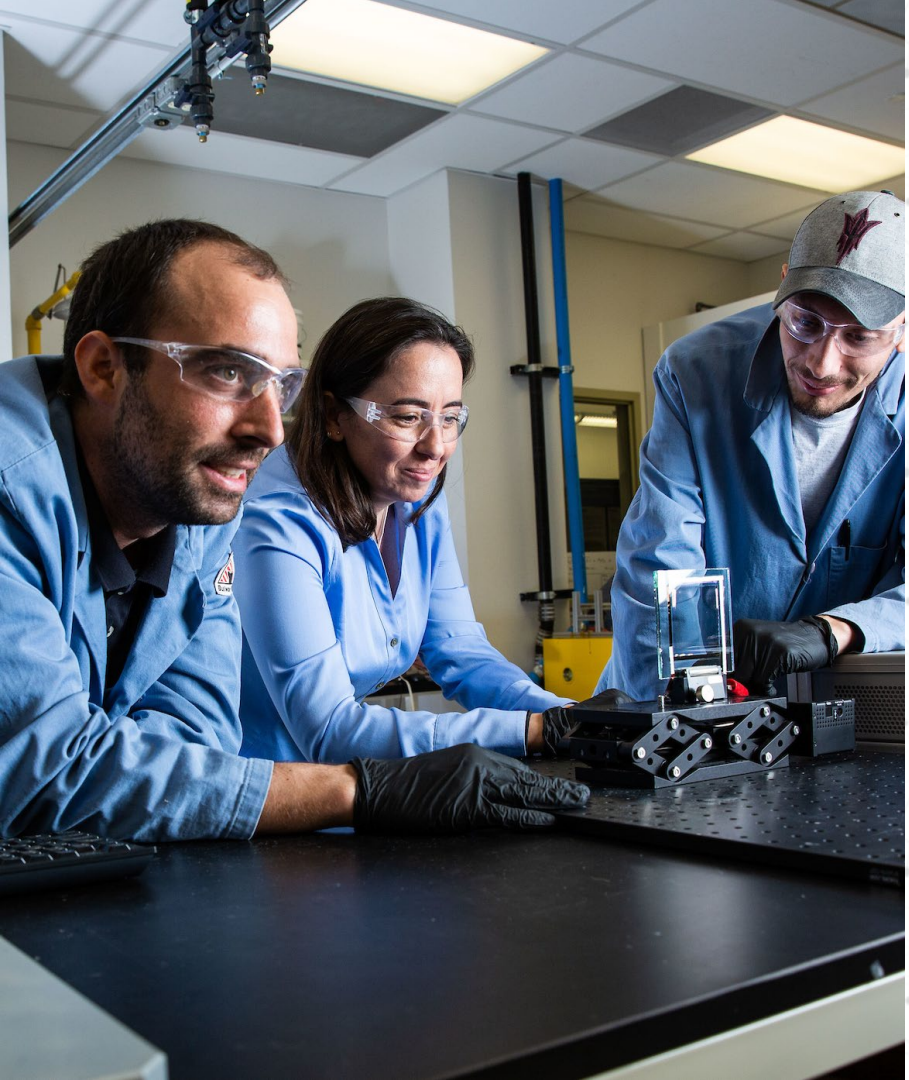
Advanced manufacturing

Builds advancing manufacturing capabilities for Arizona's aerospace and defense, semiconductor, medical and automotive sectors

Leverages ASU Polytechnic Manufacturing Research and Innovation Hub — testing/characterization, 3D printing, automation, next-gen materials processing

Industry partners leverage capabilities and expertise, increasing student engagement with industry

Emphasis on re-skilling workforce, as well as undergraduate and graduate training



AMPED STC

Energy, materials and devices

Advanced materials support electronics, energy, and automotive industries

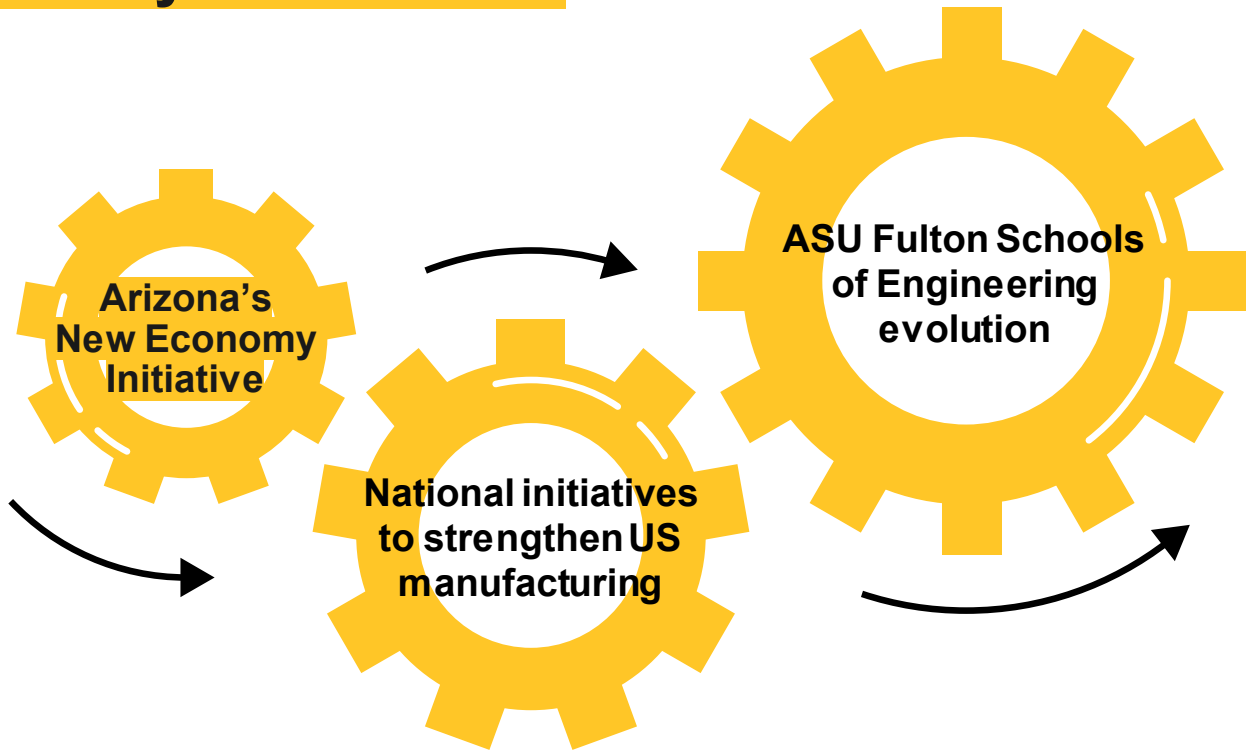
Arizona's advanced materials industry can support nearly 66,000 jobs annually through 2030

Advanced materials are the foundation for manufacturing industries and position Arizona to benefit from global demand

Focus areas

- Partner engagement to meet R&D needs
- Training students in future technologies
- Re-skilling of existing workforce

Leveraging engineering initiatives to advance New Economy innovations



Expanding workforce development opportunities in microelectronics through STCs

In 2021, ASU invested in the development of two STCs with cross-cutting microelectronics themes

MADE STC
Advanced manufacturing

Semiconductor packaging

Automation

Additive manufacturing

AMPED STC
Energy, materials and devices

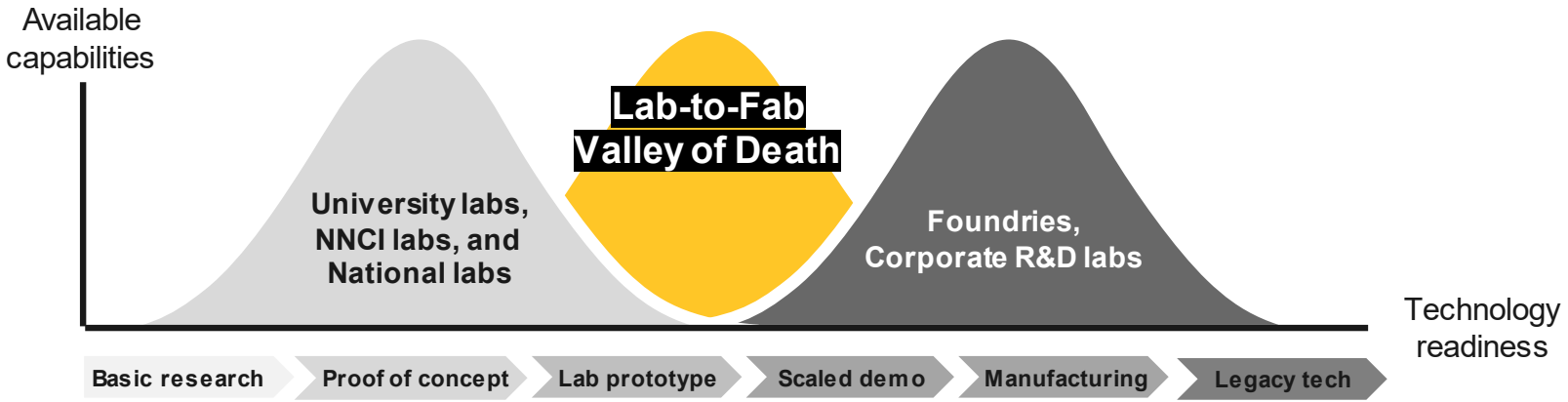
Power electronics

Batteries

Solar

The US semiconductor capabilities gap

The US leads in microelectronics research and development. However, the **Lab-to-Fab Valley of Death** hampers it's ability to integrate systems, prototype, scale and productize innovations.



School of Manufacturing Systems and Networks

Supporting regional priorities

- Aerospace and Defense, MedTech, Automotive, Semiconductor
- Workforce Development
- Resilience
- Clean Energy

+

New process technologies

- Additive Manufacturing
- Nano/Micro-technology
- Emerging Materials
- Semiconductors

+

Knowledge base

- Robotics and Automation
- Data Analytics, Cyber and Artificial Intelligence
- Process Science and Engineering
- Logistics
- Design

Workforce development

The New Economy Initiative is building the workforce of the future through education solutions including CareerCatalyst.

On-demand course library

A broad portfolio of self-paced programs accessible to learners anytime, anywhere

Career bootcamps

Prepare learners for entry-level roles in in-demand technical fields

Executive education

Working professionals learn future-ready skills and connect with a network of experts

Custom partnerships

Custom learning experiences designed based on your workforce education priorities

NEI is supported by industry partners committed to Arizona's success

Aerospace and Defense

Honeywell
Northrop Grumman
Boeing
Collins Aerospace
General Dynamics
BAE Systems
Raytheon
L3Harris
Able

Semiconductor

intel
tsmc
onsemi
Micron
NXP

Industrial Equipment

SIEMENS
FESTO
Vertech
Eclipse Automation
AEROSPEC Technologies
Delta Technology

MedTech

Medtronic
stryker
BD
West
GORE

Utility

SRP
aps

Automotive

LUCID
DAICEL Group
LEAR
NIKOLA
Exponent
ZF

Health Care

Mayo Clinic
Dignity Health

Others

PING
First Solar
AXON