# The Textile Innovation Engine of North Carolina

A regional catalyst for global innovation

# What are NSF Regional Innovation Engines?

- Addressing pressing national and societal challenges.
- Cultivating partnerships across industry, academia, government, nonprofits, civil society, and communities of practice.
- Creating a new model to drive breakthrough, cross sector research, boost innovation capacity and create sustainable innovation ecosystems.
- Drive speed and scale for translation in emerging and critical technologies.
- Place-based investment to spur economic and growth and job creation in regions and populations that have not fully participated in the tech boom of the past few decades.

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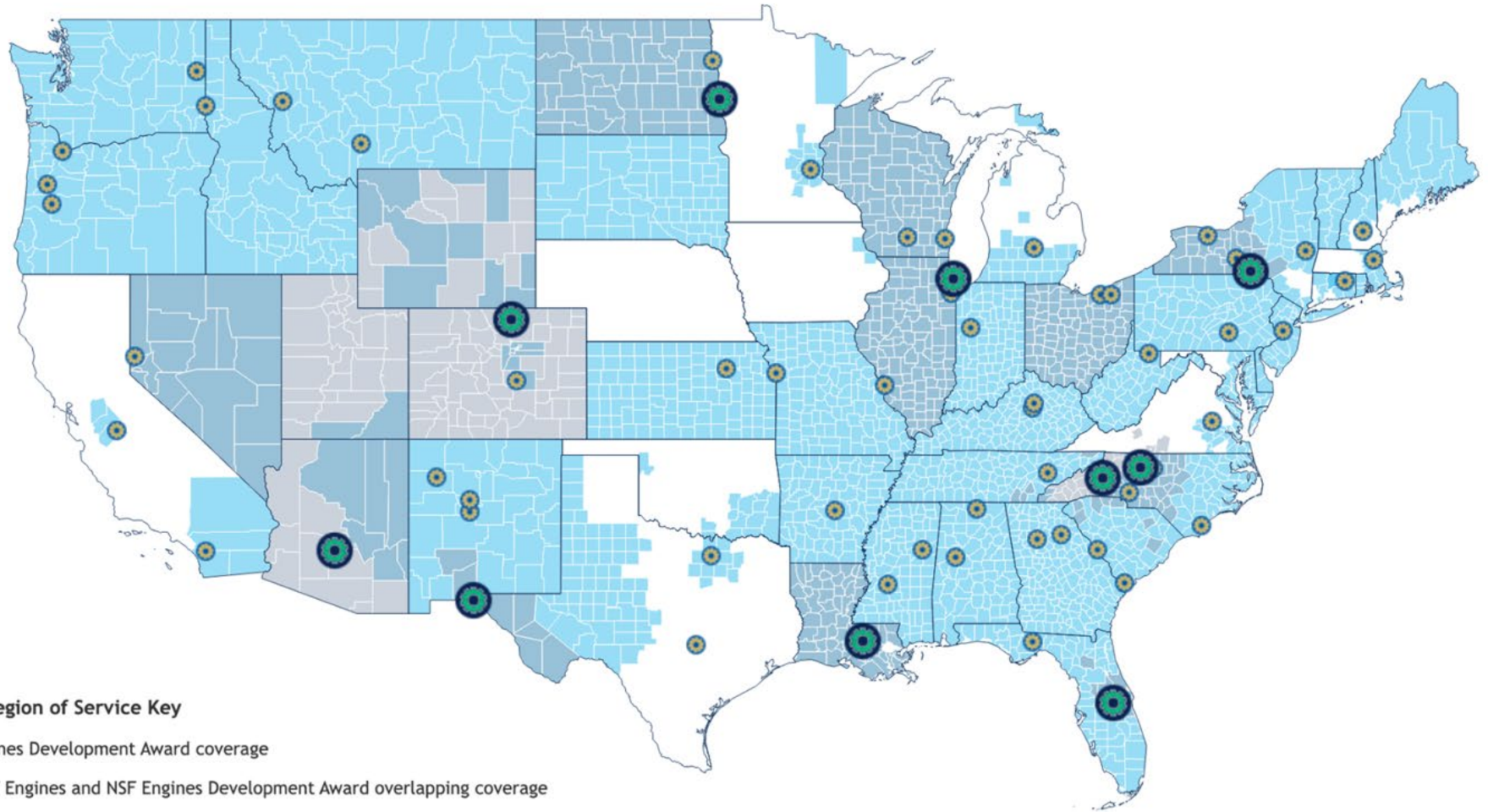
## NSF Engines

The inaugural NSF Engines awards will help regional partners collaborate to advance key technologies, address societal challenges, and spur economic growth and workforce development. The 10 NSF Engines awards span 18 states and include universities, nonprofits, businesses and other organizations.

U.S. States & Territories | U.S. Counties

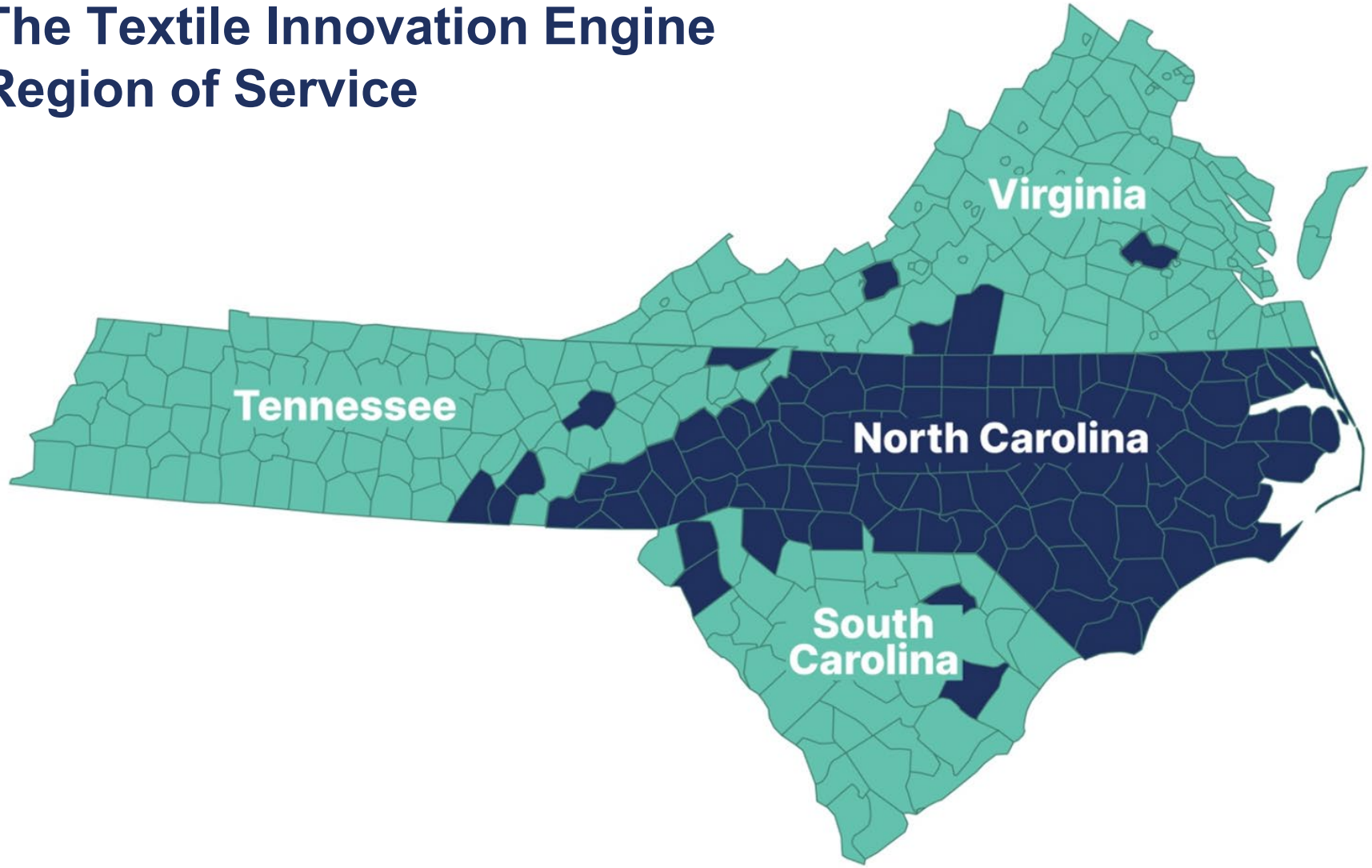


**NSF Award Region of Service Key**

- NSF Engines Development Award coverage
- Both NSF Engines and NSF Engines Development Award overlapping coverage
- NSF Engines Award coverage

500 mi

# The Textile Innovation Engine Region of Service

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AT CATAWBA VALLEY COMMUNITY COLLEGE

GASTON COLLEGE

WESTERN PIEDMONT COMMUNITY COLLEGE

# Our Vision

Renew America's textile industry to lead in global technological innovation, drive economic growth, create quality jobs, and safeguard the fabric of our nation.

A regional catalyst for global innovation.

# Our Mission

To advance the competitiveness of America's textile industry through research, development, and commercialization of next-generation materials and processes to extend the life of textile products, strengthen the U.S. textile supply chain, and rebuild the industry's workforce for future needs.

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# Our Purpose

The Textile Engine is **revitalizing** our nation's textile industry.

As a regional **catalyst** for global innovation, we collaborate with supply chain, market, education, and government leaders.

Together, we **accelerate** research, commercialization, manufacturing, and workforce readiness.

Our **ecosystem** strengthens rural communities, creates quality jobs, and safeguards the fabric of our nation.

We are committed to honoring our **textile legacy** and the people and places that move our industry forward.

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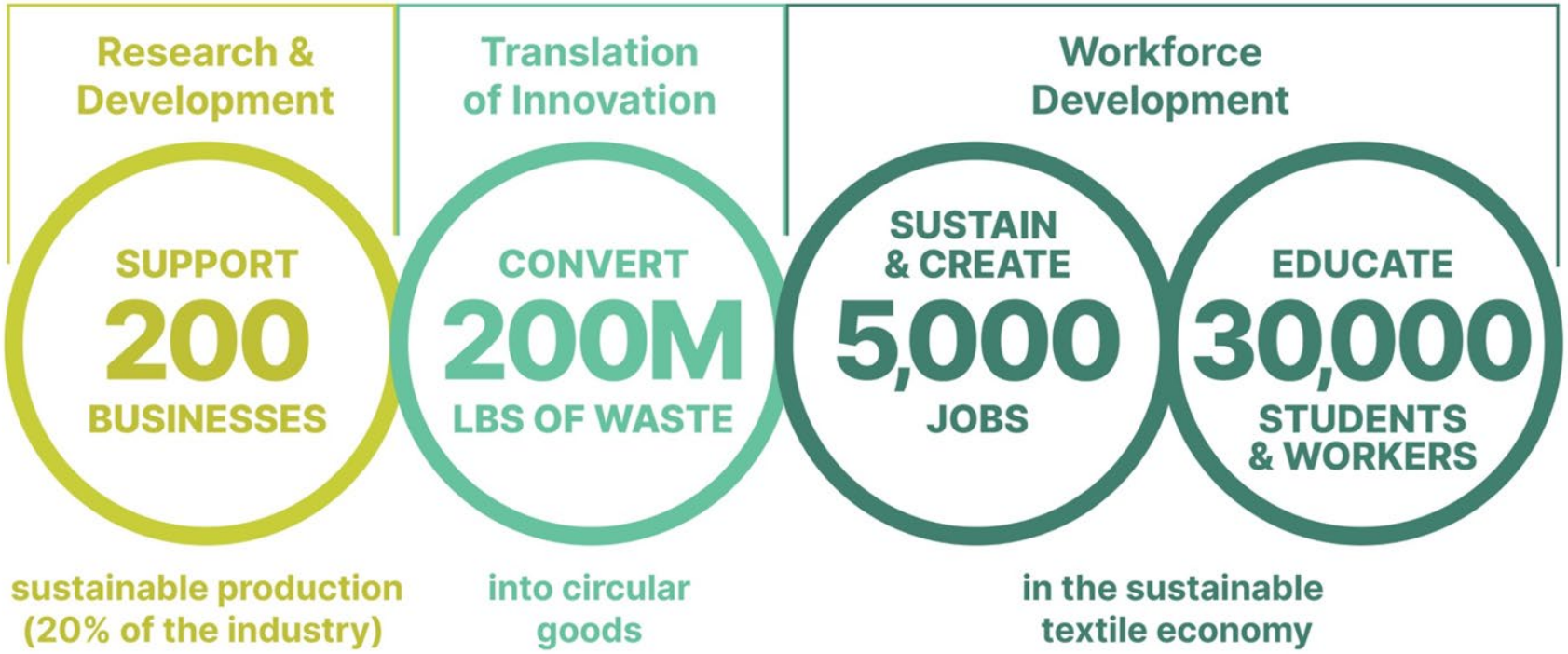
# Our Pillars


Research
Advance sustainable materials and technologies.
Translation
Accelerate innovation and commercialization.
Workforce
Expand training and job opportunities.
Ecosystem
Build a values-based industry network.

# 10-Year Collective Impact



# Research Objectives

**Build and launch a repeatable RFP process** that targets challenge areas in current and future Consortia

**Lead the industry in innovation in textile science in advanced and functional materials** across core and adjacent industries

**Foster use-inspired research processes, testing and standards** needed to accelerate the adoption of functional, circular and regenerative textiles

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# Current Research Projects

- Mechanical and chemical recycling methods
- Hemp processing and hemp yarn development
- Biobased yarn development
- 3D bioprinting using cellulose waste
- Near infrared and imaging for sorting optimization and validation
- Hemp for wound-healing textiles
- Textiles for extreme environments
- Advanced materials for adjacent industries

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# Research Outputs

| PROJECTS & PARTNERS | PUBLICATIONS | ADOPTED STANDARDS | PATENTS | IP DISCLOSURES |
|---|---|---|---|---|
| 24 projects<br>16 PIs<br>1 RFP Cycle<br>5 R&D Partners<br>(4 new) | 2 published<br>1 submitted<br>3 drafts<br>4 anticipated<br>(over the next year) | 1 published<br>1 pending<br>(in review/revision stage) | 1 | 1 filed<br>1 in process<br>2 pending |

| INVITED PRESENTATIONS (SUMMITS, SYMPOSIUMS, CONFERENCES) | 8 | ADDITIONAL RESEARCH FUNDING | >$1M |
|---|---|---|---|

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# Translation Objectives

**Build a Hemp Consortia** to identify and solve gaps, de-risk, and connect the hemp textile fiber supply chain with demand.

**Build a Circular Consortia** to identify and solve gaps, de-risk, and connect the sustainable and circular fiber supply chain with demand.


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# The Consortia Strategy

**Consortia Defined:** A group formed to undertake an enterprise beyond the resources of any one member to achieve a shared purpose or commercial goal.

- Large targeted opportunities are unrealized due to **siloed entities working on components and unsolved bottlenecks.**
- **A rising tide floats all boats**: Collaboration will accelerate success faster than competition.
- The Engine is uniquely positioned to **de-risk investments and help fund innovative solutions.**
- The Engine **connects supply to demand** with end to end partnerships and agreements.

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# Translation Outputs

## CIRCULARITY CONSORTIUM

1 working group established
1 consortium pre meeting

**11** Brand LOIs:
Goodwill, Lululemon, Ralph Lauren
VF Brands: The North Face, Vans, Dickies, Smartwool, Jansport, Icebreaker, Timberland, Macrocycle

## HEMP CONSORTIUM

1 working group established
1 consortium pre meeting

**8** Brand LOIs:
Ralph Lauren, Lululemon, Biophil, Bast Fiber Tech, Patagonia, Vans, Eileen Fisher, Timberland

**3** Patents in process

## BUSINESSES SUPPORT

**3** Strategic Growth Fund Partners

**3** Strategic Trial Fund Partners

## INFRASTRUCTURE INVESTMENTS

Textile Equipment placed with Core Partners **30**

## PRESENTATIONS

(SUMMITS, SYMPOSIUMS, CONFERENCES)

*Active Governing Board Members*

**5**

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# Workforce Development Objectives

**Build a Strategic Roadmap** led by an integrated cross-educational work team to identify and
solve gaps in education and create an integrated continuity of experience for current and future
textile workers and students.

**Develop innovative and integrated K-12 curricula**
for Department of Public Instruction for our
region of service.

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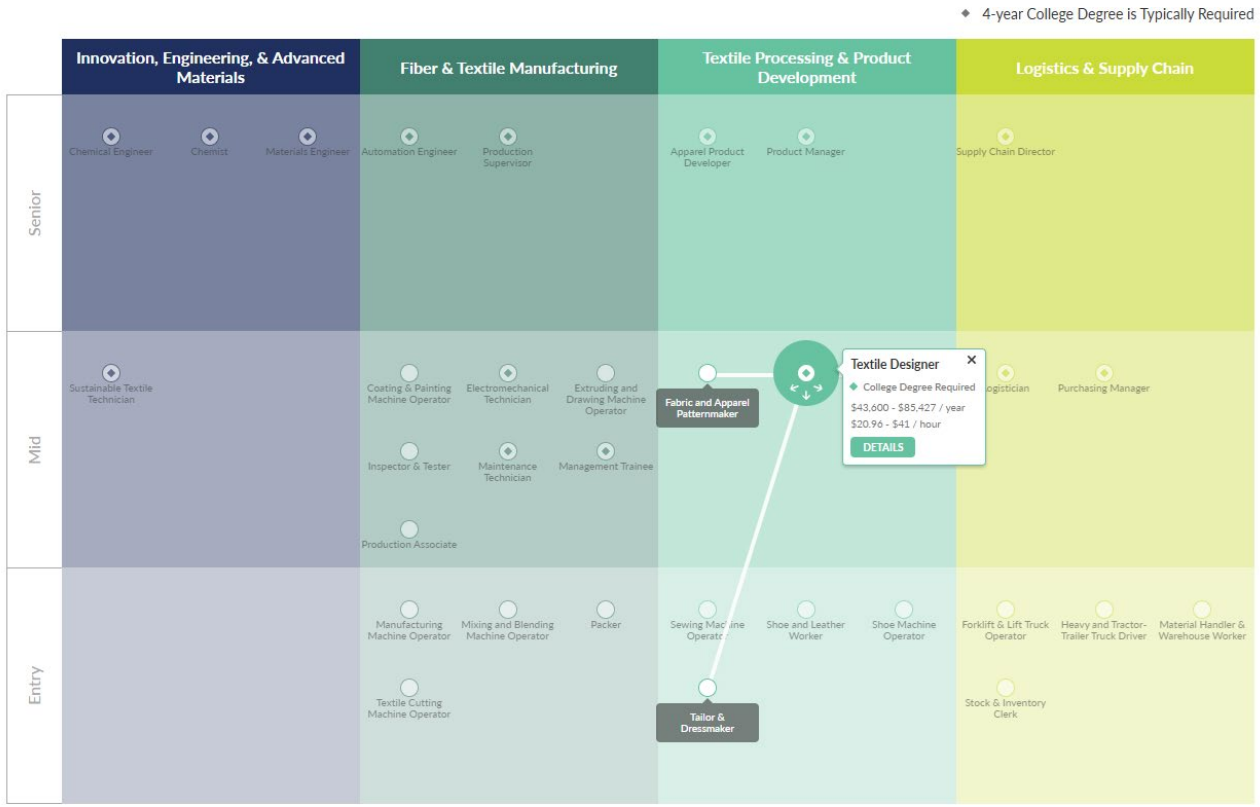
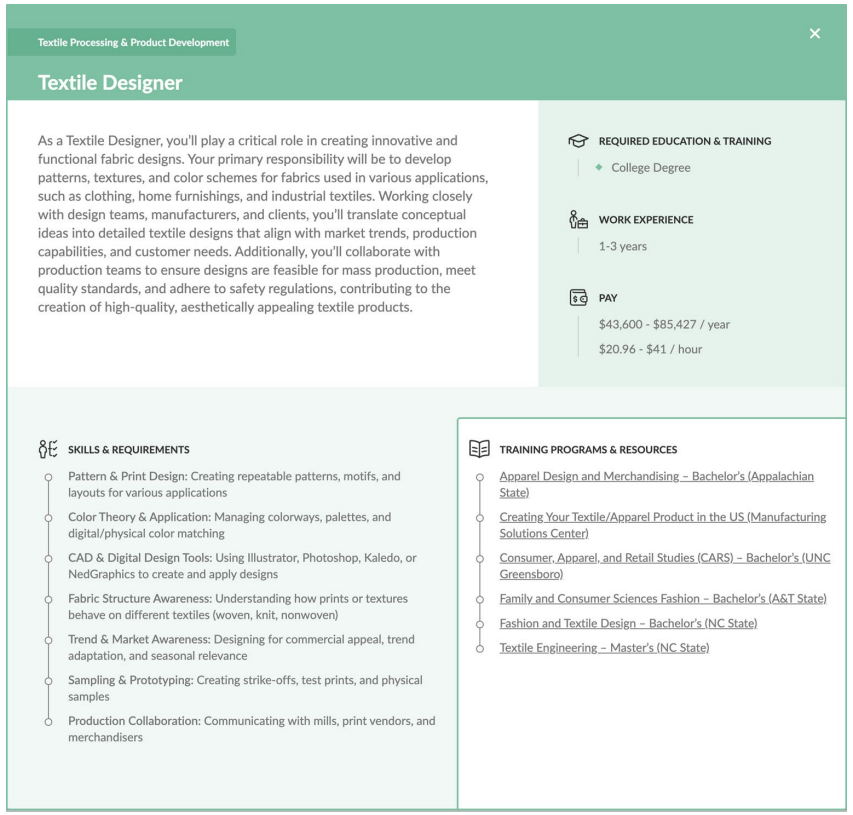
# Interactive North Carolina
# virtual career roadmap

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# Partnering with North Carolina Department of PUBLIC INSTRUCTION

Textile Fundamentals public high school curriculum and teacher professional development:

- Connect **high school curriculum** to industry needs specific to our region.
- Create **robust supplemental instructional materials** for teachers.
- **Upskill teachers** across North Carolina.
- **Connect students to textile pathways** across our region of service through the textile roadmap.

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# Ecosystem Objectives

**Drive industry collaboration** by building a strong membership system

**Create a new industry perception** through strong branding, education and communication

**Positively influence** local, regional, national and international **policy and regulation**

**Bring capital and resources** to innovative textile startups and scaling companies

**Ensure the Ecosystem is inclusive** of diverse businesses, communities, members and global allies

**Ensure the Ecosystem has built infrastructure** to accelerate the Engine's future growth and potential


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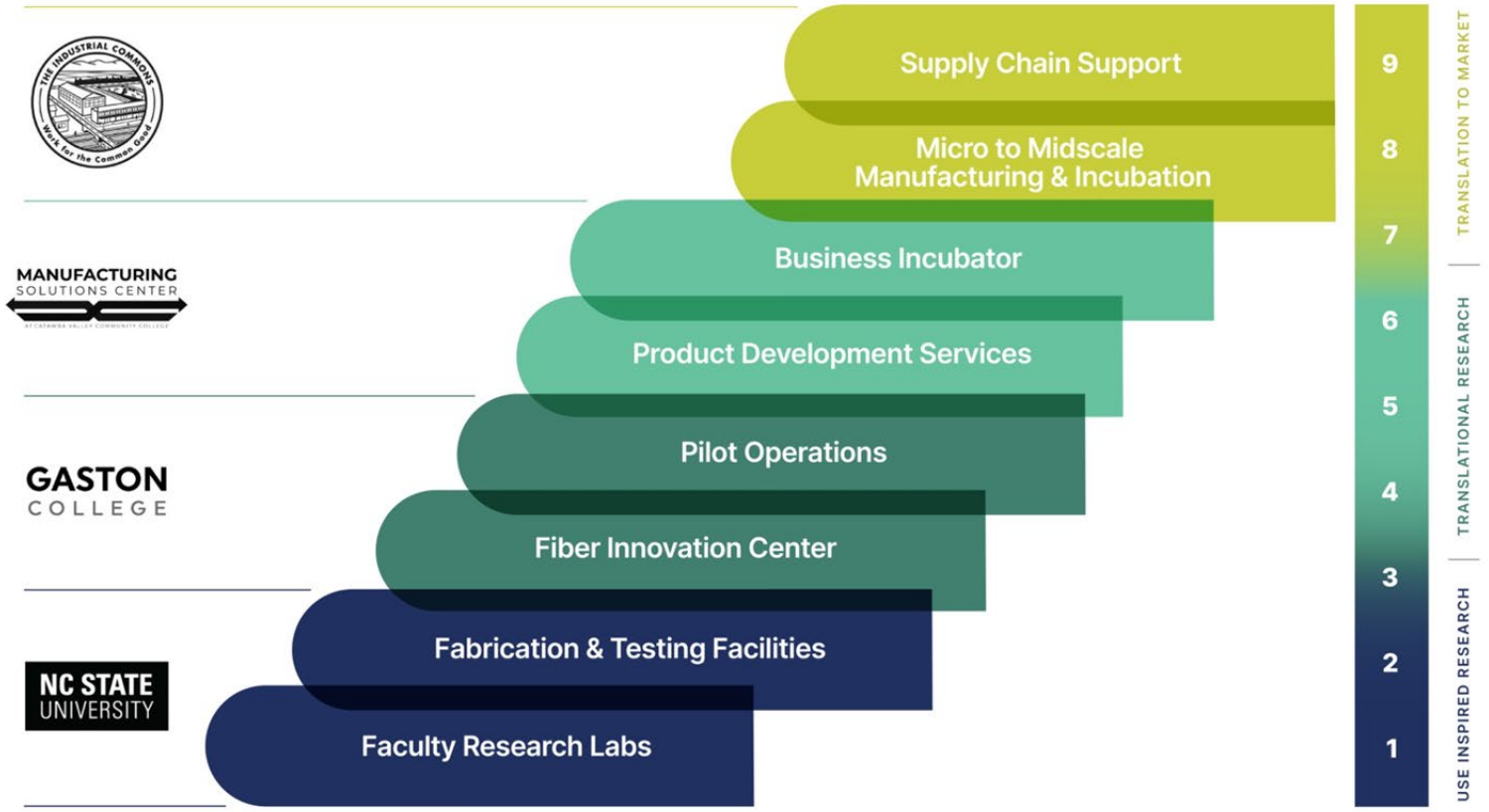
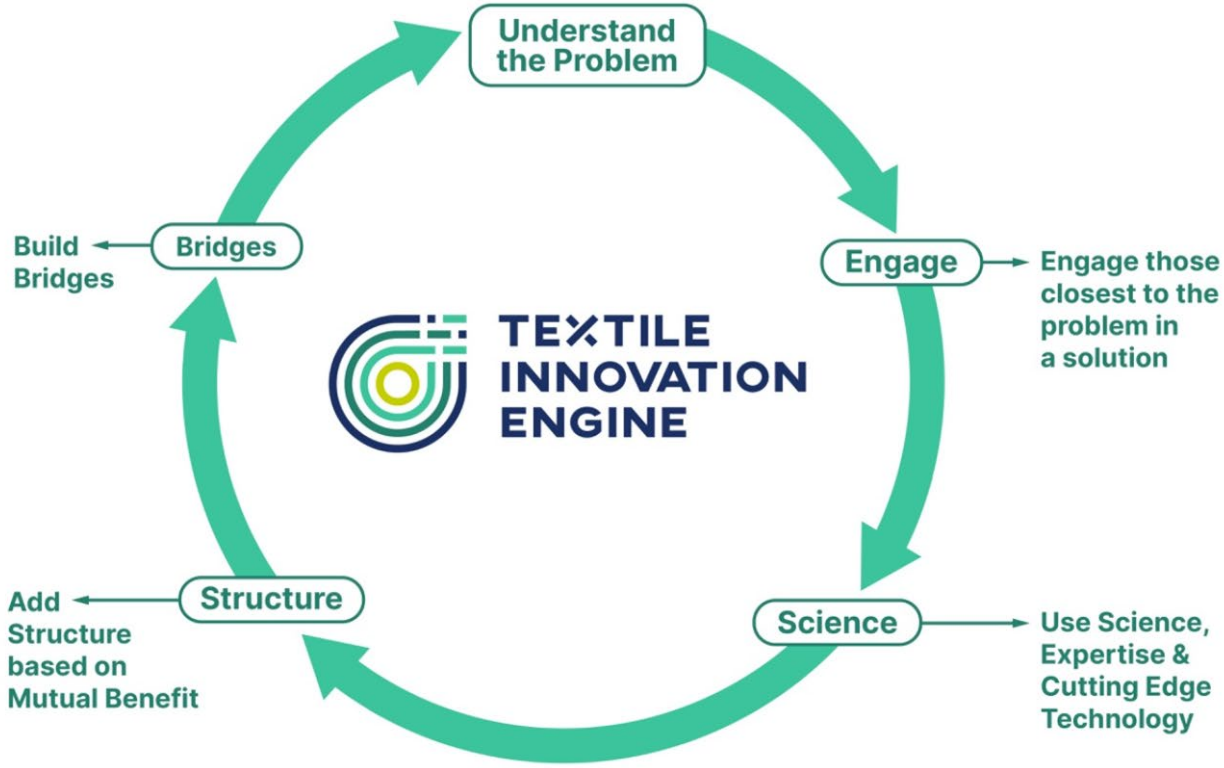
# Our Ecosystem Capabilities:
## Concept to Commercialization



# The Textile Innovation Engine:
## Starting the Flywheel

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Thank you!

Questions?

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