



NNE-PROMISE

Northern New England Precision Forest Management
and Advanced Forest Bioproducts Engine

STRATEGIC PLAN

2026 - 2036

137+
Partners

26M
Acres

33
Counties

\$160M
Investment

Regional Innovation Engine

Lead Organization: Northern Forest Center
January 2026

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Executive Summary

NNE-PROMISE (Northern New England Precision Forest Management and Advanced Forest Bioproducts Engine) represents a transformative \$160 million investment to revolutionize the forest bioeconomy across Maine, New Hampshire, and Vermont. Building on 20+ years of regional collaboration through CONFIR and \$1 million in Engine Development funding, this Regional Innovation Engine will create 5,000+ American jobs, generate \$16 billion in annual economic value, and establish Northern New England as the global leader in sustainable forest innovation.

NNE-PROMISE implements seven integrated drivers of ecosystem change: Cross-Sector Partnerships, Use-Inspired R&D, Translation of Innovation, Workforce Development, Regional Engagement, Strategic Investment, and Governance and Management. Each driver has dedicated leadership, clear timelines, measurable deliverables, and defined evaluation metrics.

Economic Value Proposition

\$160M Investment generates **\$38.7B Regional Economic Value**
242:1 Return on Investment over 30 years

Core Leadership Team

The NNE-PROMISE leadership team brings together proven leaders from academia, industry, government, and nonprofit sectors with demonstrated experience managing complex, multi-institutional initiatives.

Role	Name	Organization	Focus Area
Principal Investigator	Rob Riley	Northern Forest Center	Interim CEO
Co-PI	Aaron Weiskittel	University of Maine	Convergence Lead
Co-PI	Alicia Cramer	US Endowment for Forestry and Communities	Investment Lead
Co-PI	Charlotte Bacon	Dartmouth College	Partnerships Lead
Co-PI	Joe Short	Northern Forest Center	Operations Lead
Co-PI	Ellen Kahler	Vermont Sustainable Jobs Fund	Sustainability Lead

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Regional Baseline and Context

Northern New England's 26 million acres of forest represent the most heavily forested region in the United States, supporting a \$7.1 billion forest products economy and nearly 25,000 direct jobs. This foundation provides unparalleled opportunity for innovation-driven growth.

State-by-State Forest Economy Baseline

Metric	Maine	NH	VT	Region	Significance	Growth Target	Y10 Goal
Forested Area	88.8%	81.1%	76.7%	26M acres	Most forested US region	Maintain	Sustained
FPS GDP	\$5.1B	\$1.2B	\$0.8B	\$7.1B	Heritage industry	+125%	\$16B
FPS Jobs	14,827	4,952	5,105	24,884	Rural employment base	+5,000	~30,000
Net Exports	\$501M	\$95M	\$164M	\$760M	Trade surplus	+60%	>\$1.2B
Location Quotient	2.4	0.9	1.7	1.7 avg	Industry concentration	+0.3	2.0
Private Ownership	91.7%	72.8%	78.6%	~85%	Family & corp. ownership	Maintain	Sustained

Overarching Goals

NNE-PROMISE pursues six overarching goals identified through extensive partner engagement, each mapped to the seven core drivers of ecosystem change.

#	Overarching Goal	Core Drivers
1	Expand and deepen cross-regional, cross-sector partnerships engaged in the FPS; Partners will guide, participate in, and benefit from Engine activities.	CP, RE, RI, G&M
2	Create, refine, and link new forest products (e.g., CNF, biofuel), precision management technologies, and ecosystem service markets to strengthen current regional heritage businesses that attract new entrepreneurs, workforce, and investment for a next-generation economy based on SMART principles, advanced innovations, and a shared collective vision.	R&D, TSL, WFD, RE, RI
3	Develop strategic pathways for use-inspired research, startup companies, and established businesses that span various Technology Readiness Levels yet focus on scalable, real-world applications with high potential to sustain or create new jobs and economic opportunities in rural places highly dependent on vulnerable natural resources.	R&D, TSL, WFD, RE, RI
4	Increase entrepreneurial capacity, density, and potential in the sector, use-inspired R&D, and support for companies at each stage of their development, from idea to scale across the value supply chain pipeline and ROS.	R&D, TSL, WFD, RE, RI
5	Strengthen the FPS workforce as a high-growth innovative and technology-driven profession with multiple potential career pathways supported across the ROS.	CP, WFD, TSL, RE, G&M

6	Increase regional and national, private and government sector investments in precision forestry, ecosystem services, and forest bioproducts; Develop new capital tools to support scalable regional companies, which has been identified as the primary barrier to fully implementing and realizing NNE FPS innovation economy.	CP, R&D, TSL, RE, RI, G&M
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Legend: CP=Cross-sector Partnerships; R&D=Use-Inspired R&D; TSL=Translation; WFD=Workforce Development; RE=Regional Engagement; RI=Strategic Investment; G&M=Governance & Management

Technical Focus Areas

#	Technical Area
TA1	Optimize sustainable management across 25M acres of complex, private, mixed-ownership forest for fiber production and multiple emerging ecosystem services markets and resilience.
TA2	Decarbonize and expand use of U.S.-made advanced manufactured goods through direct substitution with domestically sourced and derived forest-based bioproducts.
TA3	Elevate rural economic and policy analysis to inform and promote pathways to economically viable sustainable forest management and direct substitution of foreign-derived products.

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Vision and Mission

Vision

Northern New England will be the global leader in sustainable forest innovation, creating economic prosperity, environmental stewardship, and broad community benefit across the region through precision forest management and advanced forest bioproducts.

Mission

Accelerate the development of a sustainable regional innovation ecosystem that advances precision forestry and forest bioproducts, addresses pressing regional and national challenges, drives economic growth, creates quality American jobs, expands career pathways, and strengthens national competitiveness.

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Engine Lifecycle and Funding

NNE-PROMISE follows a structured lifecycle model, progressing through distinct phases with increasing funding, expanding scope, and measurable milestones subject to annual performance reviews.

Phase	Years	Funding	Focus	Status
Development	2023-2025	\$1M	Planning, partner convening, strategic development	COMPLETE
Nascent	2026-2027	\$15M	Launch operations, hire CEO, fund initial R&D, establish governance	CURRENT
Emergent	2028-2030	\$45M	Scale translation, expand workforce programs, grow partnerships to 100+	PLANNED
Growth	2031-2033	\$50M	Achieve commercial scale, 200+ partners, national recognition	PLANNED
Mature	2034-2036	\$50M	Self-sustaining ecosystem, post-funding viability, national model	PLANNED

Budget Allocation (\$160M Total)

Category	Amount	Percent	Description
Use-Inspired R&D	\$48M	30%	Research projects, equipment, facilities, TEA/LCA
Translation and Commercialization	\$32M	20%	Tech transfer, entrepreneurship, market development
Workforce Development	\$24M	15%	Training programs, credentials, career pathways
Regional Engagement	\$16M	10%	Outreach, communications, community programs
Governance and Operations	\$16M	10%	CEO, leadership, administration, compliance
Indirect Costs	\$24M	15%	Institutional support, F&A per negotiated rates
TOTAL	\$160M	100%	Over 10 years

Seven Innovation Drivers

NNE-PROMISE implements seven integrated drivers of ecosystem change. Each driver has dedicated leadership, clear timelines with phased deliverables, measurable evaluation metrics, and comprehensive risk assessment with mitigation strategies.

Driver 1: Cross-Sector Partnerships and Stakeholder Alignment

Co-Leads:	McGowan (VSJF) and Short (NFC)
Team:	Weiskittel (UM), D'Amato (UVM), Watson (MDF), Bacon (Dartmouth), Fast (UNH)
Partners:	FOR/ME, NH Forest Alliance, VT Forest Future Strategic Roadmap, US Forest Service, National Association of State Foresters, National Alliance of Forest Landowners, CAFS, Northern Border Regional Commission, NSRC, NCASI

Build and sustain a comprehensive network of partnerships spanning industry, academia, government, and community organizations across the three-state Region of Service (ROS), ensuring stakeholder alignment with Engine goals and American forest sector priorities.

Key Activities

- Establish regional working groups by sector and geography across the ROS
- Convene biennial Northern Forest Innovation Summits with 300+ attendees
- Coordinate shared infrastructure access (PDC, FBRI, ASCC, research forests)
- Develop strategic communications reaching 1M+ annually
- Implement transparent governance ensuring accountability to partners

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	50+ partners engaged; 3+ working groups operational; First Innovation Summit (300+ attendees); Governance documents formalized	Partner satisfaction >70%; MOU completion rate >90%; Working group meeting frequency quarterly
Emergent (Y3-5)	100+ partners across all 33 counties; 5+ working groups; 2nd-3rd Innovation Summits; Partner-driven programming	Partner satisfaction >75%; Cross-sector collaboration index >80%; New partnership inquiries >25/year
Growth (Y6-10)	200+ partners in self-sustaining ecosystem; Partner-led initiatives; National recognition as model	Partner satisfaction >85%; Network sustainability index >90%; Partner retention rate >80%

Risk Assessment

Risk	Mitigation Strategy
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Ineffective coordination and decision-making	Strengthen intra- and interstate networks early; clearly defined partner roles and responsibilities
Maintaining long-term partner commitment	Regular communication and relationship building; demonstrate value to partners
Difficulty engaging key partners including policymakers and rural communities	Develop multiple partner feedback and adaptation paths

10-Year Target: 200+ active partners, 33 counties engaged, 100% regional coverage

Driver 2: Use-Inspired Research and Development

Co-Leads:	Weiskittel (UM) and Walker (UM)
Team:	Ducey (UNH), Bawa (UNH), Fraser (UNH), Routhier (UNH), D'Amato (UVM), Gunukula (UM), Wheeler (UM), MacKay (UM), Simons-Legaard (UM), Legaard (UM), Bundy (UM), Daigneault (UM), Crawley (UM), Brochu (UVM), Fisher (UVM), Aflitto (UVM)
Partners:	SAPPI, Weyerhaeuser, JD Irving, Redstart Forestry, NSF Center for Advanced Forestry Systems, USDA PERSEUS project, NSRC

Advance precision forest management technologies and forest-based bioproducts through industry-aligned, use-inspired research that addresses real-world challenges facing American forests and creates domestically-sourced alternatives to foreign products.

Key Activities

- Develop and maintain technology roadmap aligned with TRL progression
- Fund competitive seed grants (\$50K-\$150K per project) through merit-based selection
- Conduct techno-economic and life cycle assessments (TEA/LCA) for all technologies
- Form multidisciplinary incubator teams spanning faculty, students, and industry
- Establish fee-for-service membership model for sustained industry engagement

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	15+ R&D projects funded; Technology roadmap complete; TEA/LCA assessments initiated; First prototypes validated at TRL 3-4	Industry co-funding >\$2M; Publications >20/year; Patent applications >5
Emergent (Y3-5)	10+ technologies at TRL 5+; 15+ patents filed; 5+ technologies licensed; Fee-for-service model operational	Technology transfer rate >30%; Industry adoption rate >25%; Licensing revenue >\$5M
Growth (Y6-10)	25+ patents with active licenses; 50+ commercial products; Self-sustaining R&D ecosystem	Commercialization rate >40%; ROI on R&D >300%; National/international recognition

Risk Assessment

Risk	Mitigation Strategy
Ensuring relevance to FPS industry needs	Sector-driven R&D agenda with industry advisory committees
Technology transfer and commercialization capacity	Establish regional technology transfer hub; promote early-stage validation
Difficulty scaling from lab to commercial production	Cross-regional multidisciplinary incubator teams; pilot facility access

10-Year Target: 1,000+ innovations, 25+ patents, \$50M+ licensing revenue

Driver 3: Translation of Innovation to Practice

Co-Leads:	O'Neill (UM) and Short (NFC)
Team:	Entsminger (UM), Kaus (UM), Kelly (UM), McGowan (VSJF), Fast (UNH), Bacon (Dartmouth)
Partners:	Maine Technology Institute (MTI), Roux Institute, DOE SM2ART Hub and Spoke, Maine International Trade Center, Forest Business Accelerator, CAFS, NCASI

Bridge laboratory research to commercial application through comprehensive entrepreneurship support, technology transfer, and market development, moving innovations from TRL 5 to TRL 9 and market deployment.

Key Activities

- Operate regional technology transfer consortium across ROS institutions
- Launch three-tier sustainable business model innovation curriculum
- Support Forest Business Accelerator for regionally-based startups
- Implement corporate venture clienting connecting startups with industry
- Develop expertise network and mentorship platforms

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	ROS baseline assessment complete; Technology transfer hub operational; 10+ startups supported; Entrepreneurship curriculum launched	Startup survival rate >60%; Follow-on funding rate >40%; Training participants >100
Emergent (Y3-5)	50+ companies supported; 10+ products commercialized; \$50M+ capital raised; Regional venturing ecosystem established	Commercialization success rate >50%; Job creation per company >10; Market adoption rate >25%

Growth (Y6-10)	100+ companies launched/expanded; 50+ commercial products; \$200M+ total capital; Self-sustaining translation ecosystem	5-year company survival rate >70%; Average revenue per company >\$2M; National model status
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Risk Assessment

Risk	Mitigation Strategy
Lack of entrepreneurial density and capacity in rural region	Foster culture of entrepreneurship; create regional network of support organizations
Access to capital and investment for rural ventures	Showcase success stories; develop investor-venture matching platforms
Difficulty scaling production and accessing markets	Connect ventures with distributors and first customers; corporate venture clienting

10-Year Target: 100+ companies launched, \$200M+ private capital mobilized

Driver 4: Workforce Development

Co-Leads:	Watson (MDF) and Short (NFC)
Team:	O'Neill (UM), McGowan (VSJF), Fast (UNH), Vanadestine (MDF)
Partners:	Maine TREE, Rural Aspirations, ME Community College System, Project Learning Tree, Vermont State University, involved IHEs

Build a skilled American workforce for the forest bioeconomy through merit-based education, training, and career pathway development that serves rural communities and strengthens national competitiveness.

Key Activities

- Establish ROS WFD committees in each state coordinating programs
- Develop stackable credential programs aligned with industry needs
- Create K-12 to career pathway connections highlighting technology careers
- Implement internships, apprenticeships, and job placements with industry
- Launch awareness campaigns showcasing forestry as innovative profession

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	WFD committees established in all three states; 500+ in workforce pipeline; Regional needs	Training completion rate >80%; Employer satisfaction >75%; Program enrollment growth >20%

	assessment published; Awareness campaign launched	
Emergent (Y3-5)	1,500+ workers trained; 1,000 jobs created; 10+ credential programs; Expanded VT State and UNH programs	Job placement rate >85%; Wage increase >15%; Industry demand fulfillment >60%
Growth (Y6-10)	5,000+ jobs created; 2,000+ trained annually; Self-sustaining training ecosystem; National workforce model	Workforce retention rate >85%; Industry demand fulfillment >90%; Program self-sustainability

Risk Assessment

Risk	Mitigation Strategy
Aging workforce and retirements	Targeted recruitment programs; youth engagement emphasizing technology careers
Rural geography limits training access	Distributed delivery models; mobile training units; online components
Mismatch between workforce skills and evolving FPS needs	Industry advisory committees; continuous curriculum updates; stackable credentials

10-Year Target: 5,000+ jobs created, 600+ students graduated, 10,000+ workers trained

Driver 5: Strategic Regional Investment

Co-Leads:	Riley (NFC) and Cramer (US Endowment for Forestry and Communities)
Team:	Kahler (VSJF), St. Onge (Flex Fund), Entsminger (UM), Kelly (UM), Ward (UM), Beaupre (UM), Bacon (Dartmouth)
Partners:	Maine Venture Fund, Flexible Capital Fund, Quantified Ventures, Northern Border Regional Commission, Finance Authority of Maine, Maine International Trade Center

Attract and deploy capital to accelerate innovation, commercialization, and regional economic development, creating sustainable investment mechanisms that serve American forests and rural communities.

Key Activities

- Operate Flexible Capital Fund providing patient capital to rural ventures
- Host workshops educating capital providers on forest bioeconomy opportunities
- Provide concierge services and technical assistance for financing applications
- Develop NNE-PROMISE Innovation Platform connecting investors and ventures
- Track and report investment outcomes through interactive dashboards

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	\$20M+ leveraged; Flexible Capital Fund operational; 10+ investment deals closed; Capital provider directory developed	Leverage ratio >2:1; Investment pipeline >\$50M; Deal close rate >40%
Emergent (Y3-5)	\$100M+ capital raised; 30+ investment deals; Innovation Platform launched; Investor events hosted	Leverage ratio >3:1; Portfolio company success rate >60%; New investor engagement >20/year
Growth (Y6-10)	\$200M+ total capital mobilized; 50+ deals; Self-sustaining investment ecosystem; Regional capital concentration	Leverage ratio >4:1; Portfolio ROI >200%; National investment recognition

Risk Assessment

Risk	Mitigation Strategy
Attracting investment to traditionally under-invested rural sector	Develop compelling innovation-driven investment narrative; target sustainability-focused investors
Ensuring regional distribution of investment	Implement programs targeting supply chain gaps across all three states
Building robust capital stack in rural region	Establish transparent award processes; rigorously track outcomes

10-Year Target: \$200M+ private capital mobilized, 50+ investment deals, 242:1 30-year ROI

Driver 6: Regional Engagement and Rural Service

Co-Leads:	Riley (NFC)
Team:	Weiskittel (UM), Bacon (Dartmouth), Kahler (VSJF), Cramer (USE), McInnis (TIG)
Partners:	Northern Border Regional Commission, Farm Credit East, Innovative Natural Resource Solutions, LandVest, Lyme Timber, SAPPI, Whole Trees, JD Irving

Maximize regional impact by extending Engine resources and opportunities to rural and capacity-constrained communities across all 33 counties, ensuring efficient service delivery to American forests and the citizens who depend on them.

Key Activities

- Implement merit-based outreach programs reaching all 33 counties
- Develop partnerships with tribal nations and forest-dependent communities
- Create efficient service delivery models for capacity-constrained areas
- Build leadership capacity and technical expertise across the ROS
- Track service delivery metrics and optimize resource allocation

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	Outreach to all 33 counties initiated; Partnership protocols established; Service delivery baseline measured; Advisory Board operational	Geographic coverage >80%; Rural community participation >15%; Partner engagement rate >70%
Emergent (Y3-5)	Programs active in all 33 counties; Community partnerships formalized; Grant pools deployed (\$1.8M+)	Geographic coverage 100%; Rural participation >25%; Service satisfaction >80%
Growth (Y6-10)	100% regional coverage sustained; Community-led initiatives; National model for rural engagement	Service targets achieved >90%; Community satisfaction >85%; Program sustainability index >80%

Risk Assessment

Risk	Mitigation Strategy
Limited ongoing engagement due to rural geography and isolation	Business-focused governance; create funding tools fostering coordination
Lack of awareness of FPS opportunities by capital markets and policymakers	Strategic communications; policy engagement; success story documentation
Highly dispersed audience across rural geography	Distributed delivery models; regional hubs; technology-enabled outreach

10-Year Target: 33 counties engaged, 100% regional coverage, sustained rural service delivery

Driver 7: Governance and Management

Co-Leads:	Riley (NFC)
Team:	Weiskittel (UM), Bacon (Dartmouth), Kahler (VSJF), Cramer (USE), McInnis (TIG)
Partners:	Northern Border Regional Commission, Farm Credit East, Innovative Natural Resource Solutions, LandVest, Lyme Timber, SAPPI, Whole Trees, JD Irving

Establish transparent, accountable, and effective governance structures to guide Engine operations, ensure fiduciary responsibility, and achieve long-term sustainability beyond the initial funding period.

Key Activities

- Recruit and hire experienced full-time CEO within 6 months

- Establish Governing Board (3 members) with fiduciary and oversight authority
- Form CEO Advisory Group (up to 15 members) representing industry stakeholders
- Develop comprehensive policies, procedures, and financial controls
- Implement continuous quality improvement and external evaluation frameworks

Timelines, Deliverables, and Evaluation Metrics

Phase	Key Deliverables	Evaluation Metrics
Nascent (Y1-2)	CEO hired within 12-18 months; Governing Board and Advisory Group operational; Governance documents formalized; KPIs established	Board meeting attendance >90%; Financial audit clean; Reporting 100% compliant
Emergent (Y3-5)	Governance matured; Strategic planning cycles established; External evaluation operational; Working groups leader-represented on Advisory Group	Stakeholder confidence >80%; Compliance rate 100%; Advisory recommendations implemented >75%
Growth (Y6-10)	Self-sustaining governance; Leadership succession planned; National recognition; Engine sustainability beyond initial funding	Organizational effectiveness >90%; Sustainability index >85%; Post-funding viability demonstrated

Risk Assessment

Risk	Mitigation Strategy
Ineffective coordination and decision-making across partners	Establish clear roles, responsibilities, and reporting lines; hire talented CEO
Poor transparency and accountability	Create transparent communications, monitoring, and evaluation systems
Failure to build trust and buy-in from partners	Invest in training and professional development; regular partner engagement

10-Year Target: 10+ years operational excellence, 100% transparency, national model for regional innovation governance

Technology Roadmap

NNE-PROMISE advances technologies through a structured Technology Readiness Level (TRL) progression, with stage-gate reviews ensuring alignment with industry needs and commercial viability.

TRL Progression Framework

TRL	Definition	Year	Activities	Deliverables
TRL 1	Basic principles observed	Y1	Fundamental research; literature review; concept identification	Research papers; concept reports
TRL 2	Technology concept formulated	Y1	Application identification; feasibility studies	Feasibility assessments; patent disclosures
TRL 3	Experimental proof of concept	Y1-2	Laboratory experiments; analytical validation	Lab reports; proof-of-concept demonstrations
TRL 4	Technology validated in lab	Y2-3	Component integration; lab-scale testing	Validated prototypes; TEA/LCA assessments
TRL 5	Technology validated in relevant environment	Y3-4	Pilot-scale testing; field demonstrations	Pilot results; scale-up plans
TRL 6	Technology demonstrated in relevant environment	Y4-5	Prototype demonstration; user testing	Demonstration reports; user feedback
TRL 7	System prototype demonstration	Y5-7	Pre-commercial demonstration; manufacturing planning	Production prototypes; manufacturing specs
TRL 8	System complete and qualified	Y7-9	Final product development; certification	Certified products; regulatory approvals
TRL 9	System proven in operational environment	Y9-10	Commercial deployment; market launch	Commercial products; market traction

Technology Focus Areas

Precision Forest Management

Advanced sensing, AI/ML analytics, and decision support systems for optimized forest management

Key Technologies:

- LiDAR and multispectral remote sensing for forest inventory
- AI-powered growth and yield modeling
- Precision harvesting guidance systems
- Real-time forest health monitoring networks
- Carbon sequestration measurement and verification

TRL Targets: TRL 3-4 (Y2) to TRL 7-8 (Y7)

Cellulose Nanomaterials (CNF/CNC)

High-value forest-derived nanomaterials for advanced applications

Key Technologies:

- Nanocellulose production optimization at PDC

- Composite material development for automotive/aerospace
- Barrier coatings for packaging applications
- Biomedical scaffolds and drug delivery systems
- Electronics and energy storage applications

TRL Targets: TRL 4-5 (Y2) to TRL 8-9 (Y8)

Advanced Bioproducts

Novel materials and chemicals derived from forest biomass

Key Technologies:

- Lignin-based carbon fibers and composites
- Bio-based adhesives and resins
- Biochemicals and platform molecules
- Sustainable building materials
- Biofuels and bioenergy systems

TRL Targets: TRL 2-3 (Y2) to TRL 6-7 (Y7)

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Technology Thrusts by Phase

Identified technology thrusts with innovation focal areas by TRL progression phase and key external partners. Colors indicate Engine phase alignment.

Precision Forest Management (Ducey/D'Amato)

Thrust (Leads)	Nascent Y1-2	Emergent Y3-5	Growth Y5-8	Mature Y8-10	Partners
Large-Scale Remote Sensing (Legaard/Ducey)	Airborne & Spaceborne LiDAR EFI	Species & Disturbance Mapping	Map refinement with auxiliary data (SAR, GEDI)	Fully AI-automated map generation	JD Irving, Weyerhaeuser, Seven Islands
Terrestrial Technology (TLS, UAVs) (Fraser/Brochu)	Terrestrial LiDAR EFI	Fine-Scale Species Mapping	Autonomous UAVs	Under-canopy UAVs	Lyme Timber, LandVest
Cloud-based Decision Support (D'Amato/Simons-Legaard)	Spatially Enriched Databases	Large-Scale Projection & Optimization	Small Area Estimation	AI-informed spatially enriched databases	Redstart, TNC

Forest Bioproducts (MacKay/O'Neill)

Thrust (Leads)	Nascent Y1-2	Emergent Y3-5	Growth Y5-8	Mature Y8-10	Partners
Advanced Building Materials (O'Neill/Fast)	Structural Round Timber	Large-Scale Additive Manufacturing	Mass Timber Underutilized Species	Low-grade wood valorization	WholeTrees
Biochemicals/Biofuels (Gunukula/Dartmouth)	Drop-in fuels (ELVs)	Biochar	Biodiesel & jet fuel	Lignin biopolymers	Biofine Developments NE
Cellulosic Nanofibers (Walker/MacKay)	CNF-based Insulation	Food Packaging; PFAS-free Fire Biogel	Wallboard; CNF cement	Biomedical applications	TimberHP, SAPPI, JD Irving, Tanbark

EFI = Enhanced Forest Inventories; GEDI = Global Ecosystem Dynamics Investigation; CNF = cellulosic nanofiber; TLS = terrestrial LiDAR scanning; UAV = Unoccupied Aerial Vehicle

Governance and Management Structure

NNE-PROMISE operates under a governance framework designed to ensure accountability, minimize conflicts of interest, enable rapid decision-making, and provide meaningful stakeholder input. Northern Forest Center serves as the Lead Organization and fiscal agent on behalf of eight core partner organizations.

Governance Principles

- Fiduciary responsibility centralized with NFC Board oversight
- Conflicts of interest minimized (funded partners cannot influence funding decisions)
- External stakeholder input integrated through Advisory Group
- Clear decision-making authority at appropriate organizational levels
- Transparent operations with regular reporting to all stakeholders

Governing Board

Composition:	Three (3) members appointed by Northern Forest Center Governance Committee
Chair:	NFC President serves as Chair
Terms:	Three-year staggered terms; members may serve up to two consecutive terms
Meetings:	Quarterly meetings minimum; additional meetings as needed; special meetings with 48-hour notice
Quorum:	Majority (2 of 3) required for decisions
Voting:	Majority vote for standard decisions; unanimous consent for CEO termination or major strategic pivots

Key Responsibilities:

- Fiduciary oversight of all Engine funds and compliance
- CEO hiring, evaluation, compensation, and termination authority
- Approval of annual budget and modifications exceeding \$500,000
- Strategic direction and policy approval
- Review and approval of annual reports
- Oversight of external audit process

Board Committees:

- **Finance and Audit Committee:** Quarterly financial review, annual audit oversight, internal controls
- **Governance and Nominating Committee:** Board succession, CEO evaluation, bylaws maintenance

Chief Executive Officer

CEO Recruitment

Timeline: National search initiated within 30 days of award; CEO designated within 6 months

Process: Search committee includes Board members, Advisory Group representatives, and external experts

Selection Criteria:

- Demonstrated executive leadership in innovation ecosystems or regional economic development
- Experience managing \$10M+ budgets and complex multi-stakeholder initiatives
- Understanding of forest sector, bioeconomy, or related technology domains
- Track record of building partnerships across academia, industry, and government
- Experience with federal grant management preferred

CEO Authority Matrix

Category	CEO Authority	Escalation Required
Operating Budget	Up to \$100,000 without Board approval	Board approval >\$100,000
Personnel	Hire/terminate staff; set compensation within approved ranges	Board approval for executive hires
Contracts	Execute contracts up to \$250,000	Board approval >\$250,000
Subawards	Approve subaward modifications within scope	Board approval for new subawards >\$500,000
Strategic Decisions	Operational decisions within strategic plan	Board approval for strategic pivots

CEO Performance Evaluation

Frequency: Annual performance review by Governing Board

Performance Metrics:

- Achievement of annual KPIs across all seven drivers
- Compliance and reporting quality
- Partner satisfaction scores (>80% target)
- Financial management and audit results
- Stakeholder engagement and coalition growth

Process: 360-degree feedback from Advisory Group, Core Partners, and funding agencies

CEO Advisory Group

Composition: Up to fifteen (15) members representing regional stakeholders

Terms: Two-year terms, renewable once; staggered to ensure continuity

Sector Balance Requirements:

Sector	Minimum	Examples
Industry	40% minimum	Forest products companies, technology firms, investors
Academia	25% minimum	Research universities, community colleges

Government	20% minimum	State agencies, federal partners, tribal nations
Community	15% minimum	Nonprofits, workforce organizations, community groups

Geographic Balance: Minimum two representatives from each state (ME, NH, VT)

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Financial Controls

Signature Authority

Threshold	Authority	Approval Type
Up to \$10,000	Program Manager	Single signature
\$10,001 to \$50,000	CEO	Single signature
\$50,001 to \$100,000	CEO + Finance Director	Dual signature
\$100,001 to \$500,000	CEO + Board Chair	Dual signature
Over \$500,000	Governing Board	Board resolution

Procurement Requirements

Threshold	Requirement
Up to \$10,000	Best judgment; documentation required
\$10,001 to \$50,000	Three quotes minimum; written justification
\$50,001 to \$250,000	Competitive bidding; evaluation committee
Over \$250,000	Formal RFP process; Board approval

Audit Requirements

- **Internal Reviews:** Quarterly internal financial reviews by Finance Director
- **External Audit:** Annual independent audit by qualified CPA firm
- **Single Audit:** Single Audit per 2 CFR 200 Subpart F when expenditures exceed threshold

Dispute Resolution

Stage	Timeline	Process
Stage 1: Good Faith Negotiation	30 days	Designated representatives attempt resolution through direct discussion
Stage 2: Research Committee Review	30 days	If negotiation fails, Research Committee reviews and recommends resolution
Stage 3: Board Decision	30 days	Board makes final binding decision; implementation required within 30 days
Stage 4: Legal Remedies	As needed	Parties may seek appropriate legal remedies for material breach

Succession Planning

NNE-PROMISE maintains a comprehensive succession plan to ensure leadership continuity and organizational resilience.

Position	Backup	Timeline	Development
CEO	COO or designated Co-PI	6-month recruitment if vacancy	Leadership development for internal candidates
CFO/Finance Director	Controller or NFC Finance staff	3-month recruitment	Cross-training with NFC finance team
R&D Working Group Lead	Associate Lead from partner institution	Immediate transition	Rotate associate lead responsibilities
Workforce WG Lead	State WFD Committee chairs	Immediate transition	Leadership development through committee service
External Evaluator Lead	TIG associate evaluator	Per contract terms	Maintain bench of qualified evaluators

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Tribal Nation Engagement

NNE-PROMISE is committed to meaningful partnership with the federally recognized tribal nations within the Region of Service, respecting sovereignty while creating mutual benefit.

Partner Nations

Nation	State	Engagement Areas
Penobscot Nation	Maine	Forestry partnership; workforce development; cultural knowledge integration
Passamaquoddy Tribe	Maine	Natural resource management; research collaboration; youth programs
Houlton Band of Maliseet Indians	Maine	Forest products development; economic development initiatives
Aroostook Band of Micmacs	Maine	Traditional ecological knowledge; climate resilience research
Abenaki Nations (recognized)	Vermont	Cultural forestry practices; educational partnerships

Guiding Principles

- Respect for tribal sovereignty and self-determination
- Free, prior, and informed consent for all collaborative activities
- Recognition of traditional ecological knowledge as valid expertise
- Equitable benefit-sharing from research and commercialization
- Cultural sensitivity in all communications and programs

Engagement Activities

- Establish formal government-to-government consultation protocols
- Create tribal liaison position within Engine leadership
- Develop joint research projects respecting indigenous data sovereignty
- Provide dedicated workforce development programs for tribal members
- Include tribal representation on CEO Advisory Group

Labor Market Analysis

The Northern New England forest sector faces significant workforce challenges requiring strategic intervention.

Current Workforce Status

Metric	Current Value	Trend
Forest sector employment (ROS)	45,000+ jobs	Declining 1-2% annually
Average worker age	52 years	Increasing
Annual retirements projected	2,000+	Accelerating through 2030
Current training pipeline	~500/year	Insufficient to meet demand
Wage gap vs. regional average	-12%	Contributing to recruitment challenges

Workforce Demand Projections (2026-2036)

Occupation	Current	Projected	Gap	Training Required
Forestry Technicians	1200	1800	+600	Certificate/Associate
Forest Engineers	400	700	+300	Bachelor's/Master's
Data Scientists/Analysts	50	300	+250	Bachelor's/Master's
Bioproducts Technicians	100	500	+400	Certificate/Associate
Equipment Operators	3000	3500	+500	Certificate
Business/Management	800	1200	+400	Bachelor's/MBA

Workforce Development Strategies

- Partner with community colleges for accelerated credential programs
- Develop mobile training units for rural access
- Create industry-funded apprenticeship programs
- Launch youth recruitment campaigns emphasizing technology careers
- Establish wage enhancement programs tied to credential completion

Quantitative Risk Assessment

NNE-PROMISE employs a quantitative risk management framework using probability x impact scoring. Risks are assessed quarterly by the CEO and Leadership Team, with CRITICAL and HIGH risks reviewed monthly.

Risk Scoring Methodology

Score Range	Rating	Color Code	Required Action
1-4	LOW		Monitor; annual review
5-9	MEDIUM		Active management; quarterly review
10-14	HIGH		Priority attention; monthly review
15-25	CRITICAL		Immediate action; weekly monitoring

Risk Register Summary

ID	Risk	Score	Rating	Owner
R01	Forest products market volatility and price fluctuations	16	CRITICAL	CEO
R02	Competition from other regional innovation initiatives	9	HIGH	CEO
R03	Technology development delays or failures	12	HIGH	R&D Working Group Lead
R04	Intellectual property disputes or licensing failures	8	MEDIUM	CEO / Tech Transfer
R05	Insufficient workforce pipeline to meet industry demand	16	CRITICAL	Workforce WG Lead
R06	Brain drain of trained workers to other regions	9	HIGH	Workforce WG Lead
R07	CEO recruitment failure or early departure	10	HIGH	Governing Board
R08	Core partner withdrawal or reduced commitment	8	MEDIUM	CEO
R09	Failure to achieve leverage targets	12	HIGH	Investment WG Lead
R10	Funding reduction or termination	10	HIGH	CEO / Board
R11	Insufficient rural and tribal community engagement	9	HIGH	Regional Engagement WG Lead
R12	Climate events or natural disasters affecting forest resources	12	HIGH	R&D Working Group Lead
R13	Policy changes adversely affecting forest bioeconomy	6	MEDIUM	CEO
R14	Research security breach or data compromise	8	MEDIUM	Research Security Officer
R15	Failure to achieve post-funding self-sustainability	15	CRITICAL	CEO / Board

Critical and High Priority Risks

R01: Forest products market volatility and price fluctuations [CRITICAL - Score: 16]

Category: Market/External | **Owner:** CEO

Triggers: Commodity price decline >20%; Major mill closure; Trade policy changes

Mitigation: Diversified technology portfolio; Market intelligence system; Flexible R&D priorities

Contingency: Accelerate pivot to higher-value bioproducts; Expand carbon market focus

Monitoring: Monthly market analysis; Quarterly industry partner feedback

R02: Competition from other regional innovation initiatives [HIGH - Score: 9]

Category: Market/External | **Owner:** CEO

Triggers: Competing Engine funded in adjacent region; Major industry partner defection

Mitigation: Strengthen unique value proposition (PDC, ASCC); Deepen partner commitments

Contingency: Explore collaboration vs. competition; Differentiate technology focus

Monitoring: Annual competitive landscape analysis; Partner retention tracking

R03: Technology development delays or failures [HIGH - Score: 12]

Category: Technology | **Owner:** R&D Working Group Lead

Triggers: TRL advancement <50% of target by Year 3; Key technology pathway blocked

Mitigation: Parallel technology pathways; Stage-gate review process; Industry validation

Contingency: Pivot to alternative technologies; Expand partnership for external solutions

Monitoring: Quarterly TRL assessments; Semi-annual technology roadmap reviews

R05: Insufficient workforce pipeline to meet industry demand [CRITICAL - Score: 16]

Category: Workforce | **Owner:** Workforce WG Lead

Triggers: Training completion <60% of target; Job placement <70%; Industry demand unfilled >40%

Mitigation: Expanded training partnerships; Mobile/online delivery; Youth engagement

Contingency: Emergency training boot camps; Recruitment from adjacent sectors

Monitoring: Monthly enrollment tracking; Quarterly employer satisfaction surveys

R06: Brain drain of trained workers to other regions [HIGH - Score: 9]

Category: Workforce | **Owner:** Workforce WG Lead

Triggers: Retention rate <70%; Wage gap with competing regions >15%

Mitigation: Quality of life messaging; Career advancement pathways; Regional wage advocacy

Contingency: Targeted retention incentives; Remote work options

Monitoring: Annual retention tracking; Exit interview analysis

R07: CEO recruitment failure or early departure [HIGH - Score: 10]

Category: Governance | **Owner:** Governing Board

Triggers: No qualified candidate by Month 5; CEO resignation <Year 2
Mitigation: Competitive compensation; National search; Strong interim leadership
Contingency: Extend interim CEO; Emergency recruitment; Board operational oversight
Monitoring: Search committee progress reports; CEO satisfaction check-ins

R09: Failure to achieve leverage targets [HIGH - Score: 12]

Category: Financial | **Owner:** Investment WG Lead
Triggers: Leverage ratio <1.5:1 by Year 3; Private capital <\$30M by Year 5
Mitigation: Investor engagement strategy; Success story documentation; Capital concierge
Contingency: Adjust leverage targets; Expand public funding sources; Reduce scope
Monitoring: Monthly investment pipeline; Quarterly leverage ratio calculation

R10: Funding reduction or termination [HIGH - Score: 10]

Category: Financial | **Owner:** CEO / Board
Triggers: Negative annual review; Federal budget cuts; Compliance failure
Mitigation: Exceed KPI targets; Proactive communication; Robust compliance systems
Contingency: Accelerate sustainability plan; Emergency partner bridge funding
Monitoring: Continuous compliance monitoring; Relationship management

R11: Insufficient rural and tribal community engagement [HIGH - Score: 9]

Category: Engagement | **Owner:** Regional Engagement WG Lead
Triggers: <70% county coverage by Year 3; Tribal partnership <3 nations
Mitigation: Dedicated outreach staff; Tribal liaison; Distributed delivery models
Contingency: Intensive community engagement initiative; External facilitation
Monitoring: Quarterly geographic coverage mapping; Tribal engagement tracking

R12: Climate events or natural disasters affecting forest resources [HIGH - Score: 12]

Category: External | **Owner:** R&D Working Group Lead
Triggers: Major forest fire; Catastrophic storm; Pest/disease outbreak
Mitigation: Climate resilience research; Diversified geography; Emergency protocols
Contingency: Rapid response research; Recovery-focused programming; Insurance
Monitoring: Climate risk assessment; Forest health monitoring network

R15: Failure to achieve post-funding self-sustainability [CRITICAL - Score: 15]

Category: Sustainability | **Owner:** CEO / Board
Triggers: Revenue diversification <40% by Year 7; No sustainability plan by Year 5
Mitigation: Early revenue model development; Fee-for-service; Licensing income
Contingency: Reduced scope continuation; Merger with regional organization
Monitoring: Annual sustainability assessment; Revenue diversification tracking

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Sustainability and Revenue Model

NNE-PROMISE is designed to achieve financial sustainability through diversified revenue streams that reduce dependence on federal funding over time. By Year 10, the Engine will operate with majority non-federal revenue.

Revenue Diversification Projections

Revenue Source	Year 1	Year 3	Year 5	Year 7	Year 10	Notes
Federal Award	\$7.5M	\$15.0M	\$16.0M	\$16.0M	-	Primary funding through Year 10
Fee-for-Service Membership	-	\$0.5M	\$1.5M	\$3.0M	\$5.0M	Industry members tiered by size
Technology Licensing	-	\$0.1M	\$0.5M	\$2.0M	\$5.0M	Patent portfolio revenue
Contract Research	-	\$0.3M	\$0.8M	\$1.5M	\$3.0M	Industry-sponsored projects
Training Programs	-	\$0.1M	\$0.3M	\$0.6M	\$1.0M	Credential and certificate fees
State/Federal Grants	-	\$0.5M	\$1.0M	\$2.0M	\$3.0M	Complementary funding sources
Philanthropy/Endowment	-	\$0.1M	\$0.3M	\$0.5M	\$1.0M	Foundation and donor support
TOTAL	\$7.5M	\$16.6M	\$20.3M	\$25.6M	\$18.0M	Post-Federal

Membership Model

Tier	Annual Fee	Benefits
Sustaining Partner	\$100,000+/year	Board representation; first access to IP; dedicated research projects
Strategic Partner	\$50,000/year	Advisory Group seat; priority licensing; collaborative research
Innovation Partner	\$25,000/year	Working Group participation; technology previews; workforce programs
Affiliate Member	\$5,000/year	Network access; event participation; quarterly briefings

Graduation Criteria for Self-Sustainability

1. Non-federal revenue exceeds 60% of operating budget
2. Endowment or reserve fund equals 1 year operating expenses
3. Partner retention rate exceeds 85% for 3 consecutive years
4. Self-sustaining Working Groups with industry co-funding
5. Positive external evaluation for 3 consecutive years

Data Management Plan

NNE-PROMISE is committed to responsible data stewardship aligned with FAIR principles (Findable, Accessible, Interoperable, Reusable).

Data Types and Retention

Type	Description	Retention	Sharing
Research Data	Experimental results, field measurements, model outputs	Minimum 10 years	Public repositories after publication
Administrative Data	Financial records, partner agreements, personnel files	Per federal requirements	Internal only; as required for reporting
Geospatial Data	Forest inventory, remote sensing, mapping products	Permanent	Public; privacy protections for landowner data
Proprietary Data	Industry partner data, pre-commercial technology	Per agreement	Restricted; per confidentiality terms

Data Repositories

- **Dryad:** Primary repository for research datasets
- **GitHub:** Open-source code and analysis scripts
- **Zenodo:** Publications, presentations, supplementary materials
- **USDA Forest Service FIA:** Forest inventory data contributions

Standards and Governance

- FAIR principles (Findable, Accessible, Interoperable, Reusable)
- Dublin Core metadata standards
- ISO 19115 for geospatial metadata
- DOI assignment for all published datasets

Governance: Data Steward designated within R&D Working Group; Data Management Committee meets quarterly

Research Security Plan

NNE-PROMISE maintains a comprehensive Research Security Plan addressing cybersecurity, foreign travel, research security training, and export controls.

Cybersecurity Protocols

Responsible: IT Security Officer

- Multi-factor authentication for all Engine systems
- Encrypted data transmission and storage
- Regular vulnerability assessments and penetration testing
- Incident response procedures with 24-hour reporting
- Annual cybersecurity training for all personnel

Foreign Travel Security

Responsible: Research Security Officer

- Pre-travel briefing for international trips
- Clean device policy for travel to high-risk countries
- Post-travel debrief and device inspection
- Travel approval process for sensitive research personnel

Research Security Training

Responsible: Research Security Officer

- Annual training on foreign influence and talent recruitment risks
- Identification of suspicious approaches
- Reporting procedures for security concerns
- Protection of sensitive research information

Export Control

Responsible: Export Control Coordinator

- Export control screening for international collaborations
- Deemed export compliance for foreign nationals
- Technology control plans for dual-use research
- Coordination with institutional export control offices

Foreign Collaboration Reporting

Any new international collaborations require advance written notification and approval. Existing collaborations will be documented within 90 days of award.

Research Security Point of Contact

A member of the Leadership Team will be designated as Research Security Point of Contact with responsibility for plan implementation and oversight.

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Mentoring Plan

NNE-PROMISE is committed to developing the next generation of forest bioeconomy researchers, entrepreneurs, and leaders through comprehensive mentoring across all career stages.

Undergraduate Students

Activities:

- Research Experience for Undergraduates (REU) positions
- Industry internship placements
- Career exploration workshops
- Peer mentoring networks

Mentors: Graduate students, postdocs, faculty

Outcomes: Graduate school preparation; Career pathway identification

Graduate Students

Activities:

- Thesis/dissertation committee support
- Professional development workshops (grant writing, presentations)
- Industry co-advising opportunities
- Conference travel support

Mentors: Faculty advisors, industry partners, senior postdocs

Outcomes: Degree completion; Publication record; Career placement

Postdoctoral Researchers

Activities:

- Individual Development Plans (IDPs) required
- Grant writing mentorship and pilot funding
- Teaching and mentoring experience
- Leadership skill development

Mentors: PI/Co-PIs, senior faculty, industry executives

Outcomes: Independent research capability; Faculty or industry positions

Early-Career Faculty

Activities:

- Proposal development support
- Teaching mentorship
- Work-life balance guidance
- Tenure and promotion preparation

Mentors: Senior faculty, department chairs, external mentors

Outcomes: Successful tenure; Research program establishment

Entrepreneurs

Activities:

- Business model development
- Investor pitch preparation
- Regulatory navigation
- Scaling strategy

Mentors: Successful entrepreneurs, investors, industry executives

Outcomes: Company formation; Investment secured; Market entry

Mentoring Accountability

All Senior/Key Personnel commit to mentoring at least two individuals annually. Mentoring activities are included in annual performance evaluations.

- Annual mentoring satisfaction surveys
- Career outcome tracking for all mentees
- Mentor recognition and incentives
- Mentoring effectiveness assessment

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Intellectual Property Management

NNE-PROMISE maintains a comprehensive IP Management Plan establishing principles and structure for IP governance aligned with Bayh-Dole Act requirements.

Guiding Principles

- Maximize societal benefit through appropriate commercialization and dissemination
- Comply with Bayh-Dole Act (35 U.S.C. 200-212) requirements
- Balance open science with protection of commercially valuable IP
- Ensure fair treatment of all partners in joint inventions
- Facilitate technology transfer to regional industry

IP Ownership

Scenario	Ownership
Sole invention by single institution	Inventing institution per Bayh-Dole
Joint invention by multiple institutions	Joint ownership; inter-institutional agreement
Invention with industry co-funding	Per sponsored research agreement
Invention by NFC staff	NFC per employee IP agreement

Partner Access Rights

- Core Partners: Nonexclusive, royalty-free rights for noncommercial research and education
- Core Partners: First right of negotiation for commercial licenses on reasonable terms
- Industry Partners: Licensing rights per membership tier and contribution
- Public: Access to publications and research data per Data Management Plan

Disclosure Procedure

6. Invention disclosure within 30 days of conception
7. Preliminary patentability assessment within 60 days
8. Partner notification within 90 days before publication
9. Licensing strategy development for commercial potential

Impact Targets 2026-2036

Metric	Year 2	Year 5	Year 10	Measurement Method
Jobs Created	500	1,500	5,000+	BLS data, partner surveys, employer tracking
GDP Contribution	\$8B	\$12B	\$16B	IMPLAN modeling, state economic reports
Innovations Developed	100	400	1,000+	R&D project tracking, IP filings
Patents Filed	5	15	25+	USPTO database, institutional records
Companies Launched	15	50	100+	Business registry, accelerator tracking
Students/Trainees	500	2,000	10,000+	Program enrollment, credential completion
Active Partnerships	75	150	200+	MOU tracking, partner database
Private Capital Raised	\$30M	\$100M	\$200M+	Investment tracking, portfolio analysis
Counties Served	25	33	33	Geographic mapping, activity tracking

Key Performance Indicators by Driver

Each driver is evaluated through specific outcomes and measurable KPIs aligned with the overall Engine goals.

Driver	Key Outcomes	Example KPIs
Cross-Sector Partnerships	Cross-sector engagement creates opportunities for strategic growth; Partnerships leverage resources to accelerate translation of research into practice	# and type of partners engaged; # of new partnerships/MOUs; Geographic representation; Stakeholder expertise balance
Use-Inspired R&D	Use-inspired R&D informs & strengthens community-industry connections; Diverse portfolio of higher-TRL technologies ready for commercialization	# of technologies by TRL; Patent applications and awards; Technology transfer agreements; Technology uptake rates by partner type
Translation	ROS & Engine recognized as national & global leader; Higher percentage of startups successfully translate to commercial products	# new products/services commercialized; # new/expanded businesses by geography; \$ investment capital raised; Market adoption rates
Workforce Development	Well-trained workforce available to support growth; ROS recognized as source of skilled talent attracting new businesses	# and type of WFD programming; Demographics and career progression of trainees; Jobs created and filled by sector/skill level
Regional Engagement	Engagement of FPS leaders leads to more relevant solutions; Promotion of data and outcomes fosters policy alignment	Geographic representation of participants; # of outreach and engagement activities; # participants reporting creative solutions
Strategic Investment	Engine demonstrates growth (2:1+ over nascent phase); Portfolio analysis attracts new funders	\$ and type of capital investments; Portfolio acquisitions by partner and funding source; Leverage ratio achieved
Governance & Management	Effective governance ensures efficient operation maximizing impact; High partner satisfaction strengthens long-term sustainability	# Engine hires and demographics; Meeting frequency and communications; Partner satisfaction and trust scores; Audit outcomes

SMART Goals and Target Metrics

NNE-PROMISE establishes Specific, Measurable, Achievable, Relevant, and Timely (SMART) goals across all driver areas, with quantified targets enabling transparent accountability.

Driver Area	SMART Goals
Cross-Sector Partnerships	• Engage at least 5,000 regional and national participants• Attract >1,200 total attendees at annual innovation summit
Use-Inspired R&D	• Generate 1,000+ innovation outcomes (publications, tools, databases)• Obtain >25 patents in core technology areas
Translation	• Engage 100+ regional and 25+ national researchers annually in commercialization• Conduct 100+ workshops to increase tool usage and adoption
Entrepreneurship	• 20 companies engaged annually in Accelerator and Founder Residency• 10+ newly incorporated startups by end of Year 3
Commercialization	• Support 25+ companies each year with testing and product development• 10+ companies receive at least \$50M in investment by Year 5
Workforce Development	• 500+ new jobs; >50% in rural communities• 10% increase in forest sector jobs awareness among NNE youth• 500+ undergrad and 100+ grad students engaged• 1,000 youth in formal/informal STEM education
Regional Engagement	• 10% increase in breadth of forest sector workforce• 25% of participants from capacity-constrained and economically distressed communities
Investor Networks	• Engage 15+ regional and 20+ national investors• Expand venture investment by 25% by Year 5• Diversify capital co-investors by 15%

Overall Impact Goals

25% increase in businesses manufacturing with forest-derived biobased materials instead of foreign products

>20% improvement in forest health through optimized precision forest management and product substitution

15% increase in key rural economic resilience and community wellbeing metrics across the full Region of Service

Call to Action

Transforming American Forests and Rural Communities

NNE-PROMISE offers the opportunity to catalyze a regional transformation that will create thousands of American jobs, generate billions in domestic economic value, strengthen national competitiveness through import substitution, and demonstrate how rural America can lead the clean energy transition through sustainable forest innovation.

Northern Forest Center | www.northernforest.org
Rob Riley, Principal Investigator/Interim CEO | riley@northernforest.org
Engine Development Award: ITE-2303493

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