515 Revised 5/6/22 Northern Forest Bioeconomy Regional Growth Cluster: Overarching Narrative

1. Synopsis

Northern Forest Bioeconomy Regional Growth Cluster. This project will dramatically accelerate our shared vision: ***Maine will become a global leader in a thriving, innovative, and diverse forest products economy that provides good jobs in vibrant Maine communities.*** The industry-led FOR/Maine (Forest Economy Roadmap for Maine) coalition developed and continues to drive the tremendous economic potential of our Cluster. Confronting economic disaster in 2016 with the devastating closure of six major paper and biomass-electric plants in 18 months, Maine forest sector stakeholders from industry, research, and community joined forces. FOR/Maine members and partners, many of whom remain central to this Phase 2 proposal, were aided by the deployment and assessment of a multi-agency, EDA-led Economic Development Assistance Team that helped to catalyze subsequent federal investments. This is Maine's ***Forest Bioeconomy Moment*** – Maine's forests, the forest manufacturing sector, innovation ecosystem, and recovering communities are poised to capitalize on this strategic investment.

Through historic federal, state and private strategic investments in six interrelated and highly integrated projects that emphasize innovation, resilience, and equity in business development, economic development, and workforce development, BBBRC investment will enable Maine to pivot toward its Bioeconomy Moment, while meeting intense global demand to reduce reliance on fossil fuels, and replace them with forest-based materials from the local economy that enhance carbon sequestration and slow global warming. Maine's rural communities, shaped by centuries of working in the state's commercial forests, mills, and logging roads, will achieve renewal while accelerating sustainability.

FOR/Maine's 2018 roadmap paved the way for an innovation-driven future in which research, commercialization, and capital investment coupled with sustainable forestry, resilient communities, and a skilled workforce can drive good jobs for rural Maine and supply the Northeast megalopolis region's biomaterial needs. Our original vision for transformational economic development remains unwavering, with a greater urgency to seize the Circular Bioeconomy momentum after the pandemic further undermined Maine's rural communities reeling from mill closures and in response to climate challenges that demand immediate investment.

The forest products sector is at the heart of Maine's economy, representing more than $8 billion in economic impact and 31,822 total direct/indirect jobs in 2019, or approximately 1 out of every 25 dollars of Maine's GDP and 1 out of 25 Maine jobs. A recent global market analysis and assessment of Maine's operating ecosystem indicates that we can spur such growth by investing in current strengths (sawn timber, pulp and paper, and building products) while forging ahead with new market development in biomaterials, nanocellulose, additive manufacturing, biochemicals and fuels and advanced building materials. ***Maine's Forest Bioeconomy Cluster will add nearly $4 billion to the Maine economy and build pathways to fill an estimated 5,000 replacement jobs and add up to 3,000 new jobs driven by emerging technologies over the next 15 years.*** Our Cluster and its individual component projects are intentionally designed to ensure that economic and other benefits are shared with diverse populations including low-income people, indigenous people, people of color, women, and youth.

Coalition members and additional partners: Our Cluster's ambition and reach are reflected in the numerous, deep and broad commitments reflected in our letters of support. Coalition members include leaders from industry, education, workforce and community development, state government, and community-based organizations serving underrepresented populations. Coalition members (many involved in multiple components) include: Industry leadership: Maine Forest Products Council (MFPC), Professional Logging Contractors of Maine, Maine Woodland Owners; Additional FOR/Maine founding partners and component project lead applicants: The University of Maine (BBBRC Lead Institution), Maine Development Foundation (MDF); Key state agency partners: Maine Department of Economic and Community Development, Maine Forest Service; Investment attraction partner Maine & Company; Workforce training

partners: Maine Community College System, Maine Adult Education, Maine Department of Education; and Community, workforce, and equity project partners: Four Directions Development Corporation (tribal CDFI), New Ventures Maine, Sunrise County Economic Council, Mano en Mano, Northern Forest Center. Many coalition members are consistently involved in the FOR/Maine governance structure; others have been introduced through the BBBRC planning process to assure effective and equitable delivery. Many additional partners described in component projects, including Maine Rural Development Authority, Eastern Maine Development Corporation, and Northern Maine Development Commission (EDDs), are critical to the success of the project. The state staff of Maine's four congressional members participate in all aspects of FOR/Maine activities and provide regular connections to a wide variety of other U.S. agency programs and support.

Component projects. We will invest over $80M with a requested EDA investment of $50M across six carefully selected component projects that align to the 2018 FOR/Maine roadmap. Success in seizing Maine's Bioeconomy Moment requires urgency, scale, and alignment; our component projects together overcome barriers and deliver these success factors, assuring feasibility and sustainability. The State of Maine is supplementing this investment with at least $75M of Federal ARP funds through the Maine Jobs and Recovery Program.

PROJECT SUMMARIES AND TIMELINES AT A GLANCE					
Component	**Lead**	**Project Cost (millions)**			**Timeline**
		Total	**EDA**	**Match**	
Forest Bioeconomy Cluster Coordination & Acceleration	UM	10.22	6.15	4.07	48
Resilient, Equitable, Sustainable Communities	MDF	7.71	5.12	2.59	48
Transforming Maine's Future Forest Workforce	MDF	9.95	6.8	3.15	48
Forest Biomaterials Innovation Center	UM	30	18.4	11.6	48
Green Engineering & Materials Factory of the Future	UM	16.25	10	6.25	48
Accelerating Forest Bioeconomy Innovation & Commercialization	UM	7.31	3.75	3.56	48
Total		81.44	50.21	30.23	48
% Distribution		100	62	38	

The six component projects of Accelerating the Northern Forest Bioeconomy represent an integrated implementation package in talent, innovation, infrastructure and investment that will transform the region into an advanced manufacturing powerhouse and exporter of high-value, sustainable forest biomaterials and products. Although formally submitted by UMaine or MDF due to organizational and compliance capacity, each component was developed in close collaboration with and include many industry and other FOR/Maine coalition partners.

In addition to serving as lead institution and hosting the RECO, UMaine will lead four components: ***Forest Bioeconomy Cluster Coordination and Acceleration***; the construction of both a ***Forest Biomaterials Innovation Center (FBIC)*** and a ***Green Engineering and Materials Factory of the Future (GEM***); and a project for ***Accelerating Forest Bioeconomy Innovation and Commercialization***. ***Cluster Coordination and Acceleration*** will deliver technical assistance to all members and partners and ensure sustained focus on equity and metrics evaluation. In addition, industry-led/ UMaine-supported teams will lead market attraction and forest inventory tasks while fostering effective governance and the durability of our Cluster. FBIC and GEM address industry needs and build on strong existing research and innovation assets including a statewide entrepreneurship program. **GEM** builds on UMaine's state-of-the-art Advanced Structures and Composites Center and **FBIC** leverages a 40-year industry led success at UMaine's Process Development Center. In 2021, these centers realized over $5M in industry-driven projects from over 45 companies. **Innovation & Commercialization** will feed all components, helping Maine companies and communities embrace new technologies and diversification, and avoid the vulnerability associated with reliance on a single product or service. All four UMaine projects will leverage the biomaterials "research

triangle" of UMaine, USDOE Oak Ridge National Lab (TN), and the USDA Forest Products Lab (WI). Much as Silicon Valley was built around the application of semiconductors, the demand for biomaterials to replace plastics and other materials creates an opportunity for Maine to become **"Nanocellulose Valley"**, a center of innovation and entrepreneurship where forest-based biomaterials can be applied in new products in multiple markets as an alternative to petroleum products.

The Maine Development Foundation will lead two component projects: ***Resilient, Equitable, Sustainable Communities***; and ***Transforming Maine's Future Forest Workforce***. Both projects contribute to the overall success of the Cluster by creating uniquely collaborative and integrated models of economic and workforce development, building pathways to help meet the demand for thousands of skilled workers, and by identifying and addressing gaps in education that hold community members back from full and equitable participation in employment opportunities. The Communities project includes pre-construction redevelopment assistance in idled brownfields that are an important anchor for community identity and business attraction, job creation, and economic renewal. This proposal will help communities to redevelop their commercial assets and attract businesses while invigorating core economic development supports for entrepreneurship, broadband, and childcare for working families — all necessary to create resilient, equitable and sustainable communities.

Complementary efforts. The Coalition has worked actively and will continue to work on additional efforts to: deploy tools and resources that will propel capital investments by companies ineligible for EDA funds; attract funding for sector construction projects outside of the scope of BBBRC; and support host communities and entrepreneurs to implement recently announced new bioproducts manufacturing facilities, such as wood-based biofuels; biochar; and a wood-fiber insulation company; and co-location of complementary businesses ranging from recirculating land-based aquaculture to a green data center. Additionally, the Coalition will optimize deployment criteria to the sector of ARP and IIJA funds by the State and federal agencies, such as $20M in forest economy innovation funds through the Maine Technology Institute; help attain EPA certification of RINS/renewable fuel standard credits for Maine biofuels and other projects; and Enhance state-level provisions supporting woody biomass/CHP generation projects.

All six Cluster projects align with applicable regional CEDS and Maine's 10-Year Economic Development Strategy (see CEDS alignment letters). Metrics of success, as detailed in the Outcomes section, include the development of strategies, capabilities and tools with catalytic impact, as well as economic impacts that will be tracked through a specific and measurable evaluation process that encompasses capital investment, employment, job creation, intellectual property, wage and GDP growth. Component project timelines are set at four years due to their ambitious scope, which requires partnership development and thoughtful deployment on the front end, refinement, and careful transitions ensuring maturation and sustainability of new approaches and tools on the back end.

2. Location and Region: Maine's forest bioeconomy reaches statewide with commercial forests and forest products manufacturing in every county. However, the opportunity for growth and alleviation of significant economic distress is most concentrated in nine rural and high-poverty counties in Maine: Androscoggin, Aroostook, Franklin, Kennebec, Oxford, Penobscot, Piscataquis, Somerset and Washington. These counties and their FIPS codes are listed in the appendix. These counties are served by four EDDs, with each EDD as a key partner in the project (see CEDS alignment letters). The federal Northern Border Regional Commission (NBRC) serves 12 of Maine's 16 counties and deems these nine rural counties as "distressed" and eligible for the most favorable match rate[1]. Although Maine is currently one of the least racially diverse states, diversity is increasing rapidly through both in-migration and natural change; the target region includes the seats of tribal government for Maine's four Wabanaki tribes as well as a significant Latino/Hispanic population transitioning from seasonal agricultural and forestry employment.

The cumulative closure (especially in 2014-16) of six Maine pulp and paper mills and several biomass electric facilities, resulted in rapid market disruption and economic distress. Between 2014 and 2016, markets disappeared for approximately four million tons of softwood pulp and forestry/mill residuals; the estimated economic impact of the forest products industry fell from $9.8 billion to $8.5 billion; and more than 5,000 direct and indirect jobs were lost. The distressed rural communities where mills have closed have experienced significant poverty outcomes, including unemployment rates, loss of population, and significant basic infrastructure challenges. Other impacts of the mill closures on communities included decimated tax valuations, property tax levies, and municipal budgets; and vacated commercial and residential properties. Many communities also struggled with local identity as industries have left, resulting in reduced civic aspirations and engagement.

Despite segment declines, Maine's working forest still promises untapped opportunity. Our recovery and growth strategy leans on Maine's still-robust cluster assets. More than $1 billion in recent capital investments in Maine – including a reopened paper mill in Old Town and repurposing mill in Madison, ME – support this thesis: healthy paper and sawmill operators have invested in modernization, advanced technology/automation, innovation/market-based product diversification, emerging markets and reoriented supply chains. To seize the Bioeconomy Moment, we must leverage the strong foundation of these assets by urgent, aligned, scaled investment to attract the next generation of bioproducts.

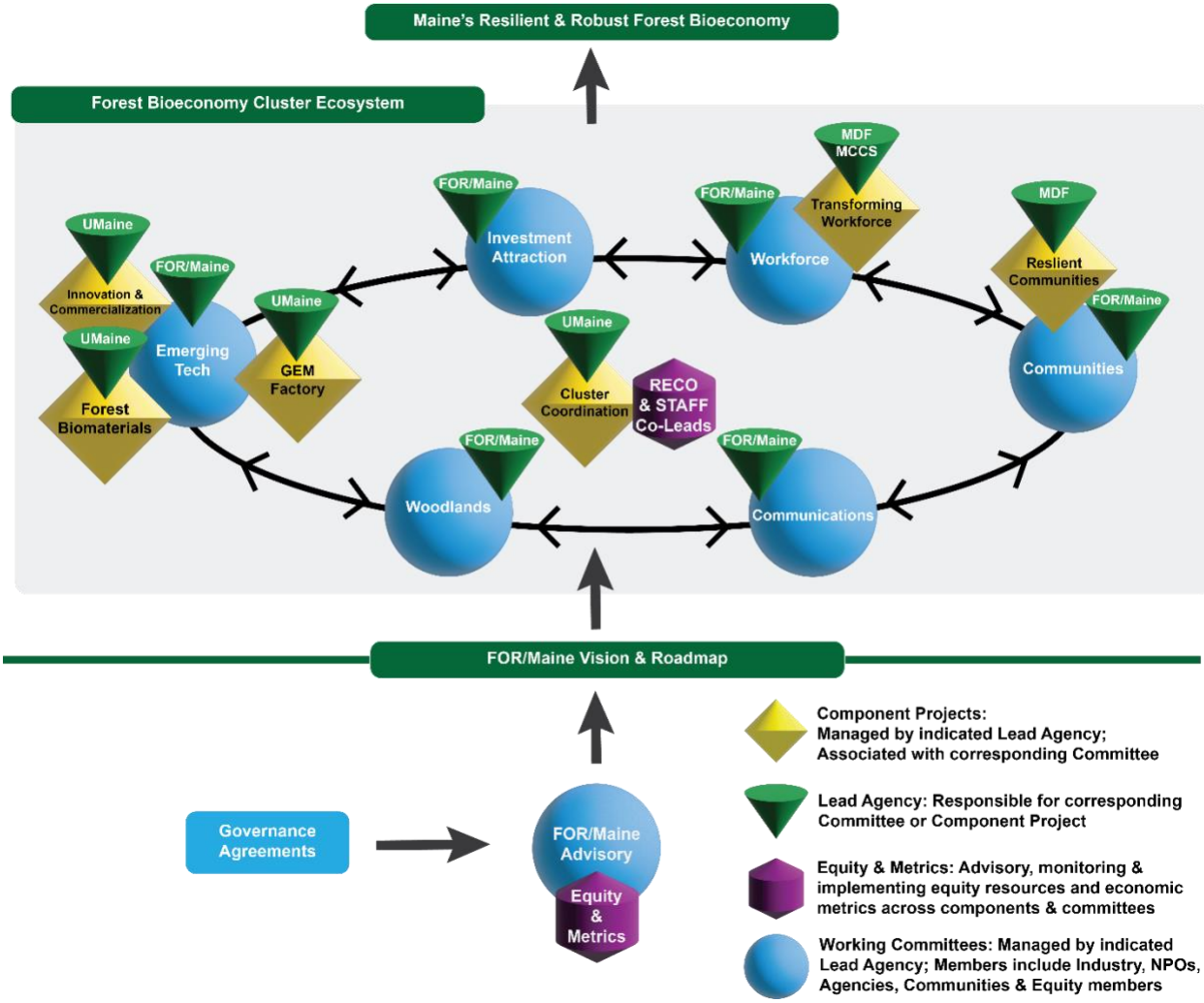
- 17 million acres of working forests (the largest contiguous forest east of the Mississippi) covering 90% of Maine, providing 13 million tons of sustainably harvested timber and biomass to our $8.1 billion forest economy, employing more than 30,000 people every year.
- Strategic location within 600 miles of 75 million consumers and bordering the Northeast megalopolis, accounting for 20% of the U.S. GDP.
- Foundational infrastructure from Maine's sawmills and pulp mills ready to supply the world with carbon sequestering advanced construction materials and residues for biomaterials, chemicals, and fuels.
- World-class forest-based research, development & commercialization capacities at the University of Maine ready to partner with expanding businesses.
- Municipalities and state agencies ready to support new ventures, partnerships, and mill transformations to meet the growing demand for bio-based products.

Our effort will also draw upon many other community, institutional, and innovation assets to transform our growth opportunities and address the long-term economic distress. Some of these assets, such as the University of Maine System, Maine Community College System, and Maine Department of Economic and Community Development, have a statewide presence that encompasses all of the targeted communities; other assets, such as the latent mill campuses, CBOs, and K-12 schools, are more localized. One of the greatest assets that FOR/Maine brings to the BBBRC table is a 5+ year history of successful governance and the quality of enduring relationships based on shared vision and respectful collaboration.

In recent years, the FOR/Maine coalition has worked to strengthen and better align the ecosystem, tools, and policies supporting the Cluster, including: new mill site re-development resources both state and federal; alignment with the 2020-2029 Maine Economic Development Strategy commitment to advanced forest products manufacturing and Maine Climate Council embraced working forests as part of climate strategy; Active effort with EPA to include Maine's forests in Renewable Fuels Standards; Complementary investments of CARES and ARP funding to support sector businesses and innovation; State production tax credit for renewable fuels and chemicals; and active involvement in MDOT capital improvement planning; rail upgrades by CP Rail; and a truck-weight limit expansion on I-95.

3. Participation from Private Sector Entities: FOR/Maine was founded as an industry-led coalition and will continue to advance full private sector participation in the regional growth cluster. Six out

of eight FOR/Maine committees are chaired by industry representatives, and all include at least 40% industry membership. Committee recommendations were prioritized to define the component projects. Each component project aligns with existing FOR/Maine committees to serve an advisory role, which will work with the FOR/Maine Executive Committee; MDF as continued project management resource; the UM Regional Economic Competitiveness Officer; and coalition members and component project leads to ensure alignment to industry needs and across projects. Our members have a 5-year+ track record of productive collaboration, especially through the ongoing governance of FOR/Maine, that contributes to the feasibility and impact of the components. FOR/Maine's multistakeholder collaborative constellation governance model, shown below, has been updated to account for inclusion of the proposed component projects, the BBBRC RECO, and highlighted equity and economic metrics integration.



Other private sector participation includes:

- Engagement of organizations that represent private sector entities such as the Maine Forest Products Council, Maine Woodland Owners, and Professional Logging Contractors of Maine, and private company members from the sector and related businesses.
- The ***Cluster Coordination and Acceleration*** component will establish an industry advisory group supporting market attraction activities.

- Thoughtful onboarding of new industry partners from emerging tech and value-added businesses, coordinated by the ***Accelerating Innovation and Commercialization*** project component, based on an established track record that includes national and international industry client research and work with industry board members and clients of UMaine's Pulp and Paper Foundation, Cooperative Forestry Research Unit, Forest Bioproducts Research Institute, Advanced Structures and Composites Center, and Mass Timber Commercialization Center.
- Private-sector NGOs such as the Northern Forest Center, Sunrise County Economic Council, and membership organizations such as Maine Development Foundation and Maine & Company that bring scores of additional business leaders in as project allies.
- Private philanthropy investors include the Betterment Fund and Elmina B. Sewall, John T. Gorman, Avangrid, and Maine Community Foundations, which have contributed $800,000 in match for the ***Resilient Communities*** project and also grant many millions annually to complementary activities. UMaine's most recent comprehensive campaign raised over $208 million across four priority areas, which dovetail with this cluster. The Harold Alfond Foundation has committed $240 million to the University of Maine System to bring transformative change to UMaine's College of Engineering (FBIC and GEM) and student success through pathways to careers and internships.
- Our tight alignment with industry leaders, our Workforce assessment in 2021 and our Strategic Investment and Market Attraction efforts to date have generated a high confidence that every individual we can recruit and train – and more – will be employed; and that private capital investment is aggressively poised to respond to the ecosystem transformation we have scoped in this project.

4. Sustainability. Our Cluster is designed for sustainability and is rooted in a well-established, persistent, industry-led FOR/Maine coalition that actively engages research, education, community, and governmental partners to create a positive environment for sustained, long-range growth in the forest bioeconomy. FOR/Maine leadership is leveraging BBBRC to enhance the coalition by adding new partners in areas such as workforce, community redevelopment, and from organizations led by and serving historically underrepresented populations. All six project components will use BBBRC funding to make historic investments that accelerate implementation of the FOR/Maine strategic plan that will have near-term outcomes and provide a solid foundation for additional private-sector investment leading to sustainable outcomes. Two new UMaine RD&C buildings/pilot scale equipment will capitalize on the university's extensive assets and the strong track record of UMaine's external funding ($130m+ FY 2021) as well as well-funded partnerships with the USDOE Oak Ridge National Lab and USDA Forest Products Lab supporting applied research, innovation and commercialization in biomaterials applications and manufacturing,

The workforce development effort leverages existing education programs paired with innovation in credit and non-credit education and micro-credentials that will strengthen the workforce pipeline for current and new jobs beyond the project term. The Mitchell Center at UMaine will facilitate a series of statewide conversations about equity and educational opportunity to ensure that education and workforce offerings are aligned with community needs.

Improvements to capabilities, readiness, and assets at the community level will contribute economic resilience and continue to attract employers and residents long after the grant. Host communities are motivated and prepared to capitalize on new assets to nurture new start-ups, expand existing companies, and attract new companies. Inclusive and collaborative governance structures resulting from the project, as well as deep engagement with local communities, should help make communities more connected and capable of responding to community crises, economic and otherwise, in the future.

The coalition members and other key partners will remain committed to the Cluster through their mission-driven responsibilities with ongoing, diverse funding. Many of our funders have clearly indicated

their work to sustain and complement these efforts are evergreen and not project-specific. In addition, the cluster leadership will continue to work to solidify policy support an alignment for the duration and beyond. This large EDA investment in an established and sustainable coalition will serve as the catalytic investment to accelerate programs and provide scale and momentum to attract co-investment. Without this EDA investment, the programs will have neither the resources nor the synergy to pivot rapidly enough to redeploy and build cluster assets that can capitalize on the huge opportunities for the exploding bioeconomy.

5. Engagement with Community Based Organizations. FOR/Maine and the Northern Forest Bioeconomy Regional Growth Cluster engage many community-based organizations including BIPOC-led organizations and organizations that advocate for underserved populations including low-income people and people of color. The breadth of our community partnerships is reflected in our letters of support. In many cases, these are long-term partnerships and not new to the proposed BBBRC activities.

Our Cluster and component project design ensures that the voices of underrepresented populations, local communities, and organizations advocating for equity are integrated into our collaborative governance and practice. Several of these key partners, further described in the Equity section below, will guide project partners and UMaine's Mitchell Center in designing community engagement processes and appropriate delivery throughout the initiative. In each community and sub-region, our delivery philosophy in economic development calls for activating local leaders, formal and informal – and even including a significant commitment to leadership skill development – to articulate and own the priority-setting and implementation. This has been the case since the foundation of the Communities work to date with the mill town cohort of distressed communities; and with our recent collaborations with communities on brownfields, housing, and downtown revitalization.

Labor unions are intrinsically involved in these efforts for cluster growth. UMaine is part of the University of Maine System (UMS) and UMS's ~5000 statewide employees and those associated with the UMaine component projects are represented by six collective bargaining units that promote strong and fair labor standards that impact contracts, wages, healthcare etc. The two UMaine construction projects will follow all state and federal procurement statutes including the Davis-Bacon and Related Acts which among other requirements include the use of prevailing wage rates in federally funded construction projects. FOR/Maine and the proposed Cluster includes Maine's large forest products companies (see letters of support) that are unionized, although pulp and paper mill closures and employment loss have reduced overall union membership in the sector. We also anticipate that much of our work nurturing Maine's innovation ecosystem, will focus on smaller companies – 99.2% of Maine companies are classified as small – a segment with historically lower rates of union organization. Overall, our project is committed to the guiding compass of good quality jobs for rural Maine and creating stronger career pathways and access to good wages and working conditions including in the skilled trades.

6. Equity. The Coalition is committed to ensuring that Cluster benefits are equitably shared across all affected communities. All six component projects will be involved in intentional, coordinated efforts to benefit and empower low-income people, BIPOC populations, youth, and women. As in Phase 1, we will ask BIPOC-led partners and those who work closely with them to guide and lead. Four equity partners agreed to steer the design of our work on ensuring equity including informing the further buildout of the seats at the table. As component project design deepened, each equity partner is also a meaningful, resourced delivery partner on an important set of component activities, especially within the projects for ***Resilient, Equitable, Sustainable Communities*** and ***Transforming Maine's Future Forest Workforce***.

- Four Directions Development Corporation, a joint CDFI of Maine's four Wabanaki tribes, serving on the Communities Committee, as a provider on broadband, and as an equity partner.

- Mano en Mano, an equity partner focused on migrant workers (largely Hispanic/Latino) who are in Maine seasonally or have moved to Maine permanently, will coordinate workforce training and childcare expansion.
- New Ventures Maine, an equity partner and statewide organization helping people (particularly women) in the workplace, will focus on women and single mothers to provide coaching and guide access to childcare; and engage women and girls in workforce opportunities through the Totally Trades program.
- Sunrise County Economic Council is an equity partner creating jobs and prosperity in Washington County, the poorest in Maine and one with a high Hispanic/Latino population. They will deliver work on entrepreneurship, broadband, and workforce engagement efforts with justice affected groups.

The UMaine Mitchell Center, which has over 15 years of equity work in Maine (see their letter of support), will work closely with coalition members, partners, and stakeholders including industry to focus on (i) breaking cycles of intergenerational poverty that exclude many rural community members from full participation in the forest bioeconomy, (ii) supporting women in accessing forestry sector careers, (iii) collaborating with citizens of Maine's Wabanaki tribes, (iv) creating equitable spaces for people of color, (iv) aligning educational opportunities and workforce demands to increase retention of youth and transitional workers. Anticipated outputs for overall equity work include (1) a deep listening campaign, (2) a guide of DEI best practices and strategies for the forestry sector, and an array of engagement and equity technical assistance supports customized for the stakeholder groups in the Cluster; (3) public resources to support modelling and replication efforts. To document and evaluate our process, the Center will engage in both qualitative and quantitative formative and summative assessment .

Component projects are deliberately designed to promote strategies and actions that will lead to procedural, distributional, structural, and generational equity. For example: a key goal of the ***Resilient, Equitable, Sustainable Communities*** component is to develop a community-led rural economy development model to transform the economic landscape from struggling to thriving. Engagement will occur through an inclusive and collaborative governance structure for the initiative (beginning with the equity partners described above) and engagement within and across local communities where the forestry industry is expanding. The ***Transforming Maine's Future Forest Workforce*** component aims to disrupt cycles of intergenerational poverty and increase opportunities for disengaged youth, under-employed women, individuals who have been justice involved, and BIPOC community members. Workforce partners have integrated collaborative governance structures into every level of this component project, so that equity in the process is as important as equity in outcomes. Work group membership includes people and organizations that bring the perspective of being and/or serving under-served populations; as a result there are customized programs for underserved populations (and opportunities to attend all programs). Education pathways are designed to better attract and serve aspiring students of all ages from underserved communities with high poverty rates; individuals who have been justice involved or in recovery from substance use; and connect girls, women, and others to forestry careers.

7. Outcomes. Ultimately, this project is about good jobs for economically distressed communities in rural Maine. Consistent with our Phase 1 application, categories of outcomes and outputs are below with select examples from component projects noted in sub-bullets.

- ***Economic Impact, Jobs & Equity:*** (i) Increase in the overall economic contribution of Maine's forest products sector, value-added impact, total employment and state and local taxes; (ii) Build pathways to employ and retain 5,000 quality jobs and add up to 3,000 new quality jobs in the most rural, higher-poverty areas of Maine over the next 15 years, (iii) design job opportunities to be responsive to poverty and equity challenges.

    - 36 middle & high schools reached with sector career pathways and awareness; 315 additional trainees in high-demand skilled occupations/certifications.
- ***New Market Opportunities & Innovation:*** (i) Grow new markets for wood fiber and next generation products; (ii) Increase private capital investment (including foreign direct investment) through attraction (iii); RD&C direct support metrics of new wood technologies, companies and startups.
    - Attract at least 10 new company leads annually with a target of 5 new companies established by the end of 4 years; RD&C direct support/contracts with at least 30 additional companies/year and technology acceleration, I-Corp support for 10 related startups/year by year 3, and 3-5 licensing agreements per year.
- ***Community Economic Resilience & Readiness:*** (i) Increase community economic base (including community economic development capacity built; idled capacity reactivated, redeveloped or transformed); (ii) Improve community socioeconomic resilience (community demographic, tax base, and asset metrics).
    - One integrated model of economic development delivery with over 20 communities served with technical assistance and asset-building – including 4 with entrepreneurial ecosystem assessments and 5 idled mill sites with pre-development sub-grants. 60 local economic development leaders provided with immersive training.
- ***Environmental Sustainability & Climate:*** (i) Maintain sustainable forest stewardship (net positive growth-to-harvest ratio; climate/carbon goals contribution via net forest/forest products carbon sequestration); (ii) Maintain or exceed estimated 70% offset of Maine's CO_2 emissions.
    - Support achievement of metrics by educating landowners on the economic value of carbon as a co-product, and developing Best Management Practices (BMPs) for climate-friendly forest harvesting and training 40 landowner/loggers per year.

Economists associated with an EDA-University Center at UMaine will conduct a highly particularized and dynamic economic impact assessment. Detailed understanding about interactions of people and businesses both in the traditional supply chain as well as in the wider regional ecosystem will allow us to estimate the economic impact of our Cluster activities. Our economic assessment will focus on two distinct but intertwined elements: (1) traditional output and employment multipliers as well as (2) skill and workforce dynamics. This project will adopt a common online assessment tool developed in coordination with the Cluster management team to capture different interactions in terms of traditional economic expenditures as well as activity-based metrics: number of businesses supported, new businesses set up, businesses expanded, and jobs created, expenditures on local consultants and service providers (generating output and employment multipliers), numbers of new construction projects and the resulting jobs created. This data will be collated in terms of industrial and socio-demographic information. This work also proposes to calculate trade area capture. These benchmarks will give us a unique ability to understand direct and indirect effects of Cluster activities. To carry out these tasks, the UMaine economists will develop and manage the online assessment tools as well as building and updating the proposed economic metrics.

8. Work Conducted Since the Phase 1 Award; Progress and proposal changes

Our shared vision for the Northern Forest Bioeconomy Regional Growth Cluster remains unwavering, reflecting our six-year shared commitment to the FOR/Maine initiative. The Coalition has, however, undertaken extensive planning to prepare for this Phase 2 proposal. This planning included discovery interviews with our Equity partners to confirm priorities and approach. Our planning resulted in a more extensive, better-defined needs assessment and partnerships (with higher match commitments than originally forecast.) Due to the complexity of EDA grant submission and management, UMaine and MDF will be the applicants for the component projects and include other partners as subrecipients. We have

consolidated topics into fewer applications and split-out construction and non-construction to follow EDA's guidance. We believe these changes increases the potential impact EDA investment, streamline execution, and better meet the needs of the Cluster, while ensuring EDA BBBRC compliance.

The Phase 1 component, *Stimulating Bioproducts Supply Chains by Accelerating Public Procurement* is partially integrated into other Phase 2 projects: i) UMaine's construction component projects will utilize Mass Timber and other advanced wood construction materials to demonstrate commercial use and serve as a promotion platform of Mass Timber technologies; ii) UMaine's **GEM Factory of the Future** will consume approximately 3 million pounds/year wood-fiber filled bioplastics manufactured using Maine-based forest residues, demonstrating commercial scale procurement of a new product sourced in Maine; and iii) The **Cluster Coordination** component project includes activities to promote modern wood heat and Combined Heat and Power (CHP) incentives systems to displace imported petrochemicals and utilize local forest-based residual resources.

The Phase 1 component project *Industrial Sites Reenergized and Redeveloped*, was scaled back (per EDA guidelines for non-construction sub-grants) to pre-development projects at idled and active mill sites in rural Maine. Some activities were merged with the Resilient Communities component project.

The Phase 1 component project *Strategic Investment & Market Attraction* has been merged into the ***Cluster Coordination & Acceleration*** component project as a key task of the FOR/Maine marketing subcommittee. The Cluster Coordination project also adjusted to include specific RECO and equity oversight activities, and expanded activities related to forest carbon accounting and inventory modeling to support forest landowners and policymakers on developing science-based land management strategies.

A new component project, ***Accelerating Innovation & Commercialization***, was created to allow for better separation of the two UMaine construction component projects and the non-construction staffing & equipment requested for those facilities. Phase 1 funds were used to complete the engineering and construction EDA application materials for the two UMaine Buildings and preliminary design, engineering and cost estimates were developed for the pilot plant equipment included in the component project.

Since the Phase 1 submission, we have made several other changes to strengthen our application and meet the goals of the BBBRC program. For example: Within the Cluster Coordination & Acceleration component, additional elements increase the alignment to Maine's Climate Action Plan goals and climate-friendly forestry practices; and we have increased the participation of the UMaine Mitchell Center on matters related to equity, as we want to ensure sustained attention and support of all component projects on this important aspect of our Cluster. More specific deliverables reaching historically excluded and underserved groups are articulated, especially in the Communities and Workforce components – most importantly, with several deliverables led by and resourced in the subrecipient budgets at our Equity partners, including two-BIPOC led partners. The UMaine team of the EDA University Centers program has also worked with component project teams to prepare to track specific outcomes for the Northern Forest Bioeconomy Regional Growth Cluster. This includes the required Semi-annual /Annual ED-916/917 Outcomes reporting and the development of component project specific metrics.

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[1] Northern Border Regional Commission, "NBRC Annual Economic & Demographic Research for Fiscal Year 2021" (2020). 13 pages.